EM-SPRINT-108-130712

Together with Nextel

48 Spruce Street
Oakland, NJ 07436
Phone: (201)-951-3869

May 20, 2013

ORIGINAL

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 338 Oxford Road, Oxford, CT 06478. Known to Sprint Spectrum L.P. as site CT23XC508.

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 JNotaro@Transcendwireless.com with questions concerning this matter.
Thank you for your consideration.

Sincerely,

Jennifer Palumbo
Real Estate Consultant

CT223XC508

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street • Suite 1500 • Columbus, Ohio 43215-3708

Date: **July 23, 2012**

Jason Rouse
Crown Castle USA Inc.
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
704.405.6605

Paul J. Ford and Company
250 East Broad St, Suite 1500
Columbus, OH 43215
614.221.6679
tdehnke@pjfweb.com

Subject: **Structural Modification Report**

Carrier Designation:	***Sprint PCS* Co-Locate**	
	Carrier Site Number:	CT223XC508
	Carrier Site Name:	N/A
Crown Castle Designation:	**Crown Castle BU Number:**	876362
	Crown Castle Site Name:	OXFORD / FRITZ PROPERTY
	Crown Castle JDE Job Number:	183460
	Crown Castle Work Order Number:	512743
Engineering Firm Designation:	**Paul J. Ford and Company Project Number:**	37512-1027 BP R2 **Aero Solutions**
Site Data:	**338 Oxford Rd., OXFORD, New Haven County, CT** **Latitude *41° 25' 40.77"*, Longitude *-73° 6' 30.75"*** **150 Foot - Monopole Tower**	

Dear Jason Rouse,

Paul J. Ford and Company is pleased to submit this **"Structural Modification Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 476988, in accordance with application 151572, revision 1.

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

LC4.7: Modified Structure w/ Existing + Reserved + Proposed **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 1.25 inch ice thickness and 50 mph under service loads.

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

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

Respectfully submitted by:

Thomas J. Dehnke, E.I.T. OKK
Project Engineer

tnxTower Report - version 6.0.3.0

STATE OF CONNECTICUT
DAVID L. SUMMERS
No. 21884
LICENSED
PROFESSIONAL ENGINEER

7/24/2012

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street • Suite 1500 • Columbus, Ohio 43215-3708

Date: **July 23, 2012**

Jason Rouse
Crown Castle USA Inc.
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
704.405.6605

Paul J. Ford and Company
250 East Broad St, Suite 1500
Columbus, OH 43215
614.221.6679
tdehnke@pjfweb.com

Subject: **Structural Modification Report**

Carrier Designation:

***Sprint PCS* Co-Locate**
Carrier Site Number: CT223XC508
Carrier Site Name: N/A

Crown Castle Designation:

Crown Castle BU Number: 876362
Crown Castle Site Name: OXFORD / FRITZ PROPERTY
Crown Castle JDE Job Number: 183460
Crown Castle Work Order Number: 512743

Engineering Firm Designation:

Paul J. Ford and Company Project Number: 37512-1027 BP R2
Aero Solutions

Site Data:

338 Oxford Rd., OXFORD, New Haven County, CT
Latitude *41° 25' 40.77"*, Longitude *-73° 6' 30.75"*
150 Foot - Monopole Tower

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Respectfully submitted by:

Thomas J. Dehnke, E.I.T.
Project Engineer

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 150 ft Monopole tower designed by ENGINEERED ENDEAVORS, INC. in September of 1999. The tower was originally designed for a wind speed of 89.25 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 1.25 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
152	152	1	tower mounts	Miscellaneous [NA 507-1]	3	1-1/4	-
	150	3	RFS/CELWAVE	APXVSPP18-C-A20			
		9	RFS/CELWAVE	ACU-A20-N			
		3	ALCATEL	1900MHz RRH (65MHz)			
		3	ALCATEL	800MHz RRH			
		3	ALCATEL	800 EXTERNAL NOTCH FILTER			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
152.0	152.0	6	decibel	DB980H90E-M w/ Mount Pipe	6	1 5/8	3
		1	tower mounts	Platform Mount [LP 601-1]	-	-	1
137.0	139.0	6	adc	DD1900 FULL BAND w/850 BY-PASS MASTHEAD	12	1 1/4	1
		3	powerwave	7770.00 w/ Mount Pipe			
		6	powerwave	LGP21901			
		4	andrew	SBNH-1D6565C w/ Mount Pipe			
		6	communication components inc.	DTMABP7819VG12A			
		3	ericsson	RRUS-11	1	3/8	2
		2	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe	2	3/4	
		3	powerwave	7020.00			
		1	raycap	DC6-48-60-18-8F			
	137.0	1	tower mounts	Collar Mount (MTC3335)			
		1	tower mounts	Platform Mount [LP 712-1]	-	-	1
	130.0	1	gps	GPS_A			
127.0	129.0	3	antel	BXA-171063-12BF w/ Mount Pipe			
		3	antel	BXA-70063-4CF-EDIN-X w/ Mount Pipe	1	1/2	1
		6	rfs celwave	APL866513-42T0 w/ Pipe	12	1 5/8	
		6	rfs celwave	FD9R6004/2C-3L			
	127.0	1	tower mounts	Platform Mount [LP 712-1]			
117.0	117.0	3	andrew	HBX-6516DS-VTM w/ Mount Pipe	6	1 5/8	1
		1	tower mounts	T-Arm Mount [TA 601-3]	1	3/8	
75.0	76.0	1	kathrein	OG-860/1920/GPS-A	1	1/2	1
	75.0	1	tower mounts	Side Arm Mount [SO 701-1]			

Notes:
1) Existing equipment
2) Reserved equipment
3) Existing Equipment to be removed.

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Clarence Welti Assoc., Sprint Site CT23xC508, 9/15/1999	1531939	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	EEI, 5724,1/26/2000	1440552	CCISITES
4-TOWER MANUFACTURER DRAWINGS	EEI, 99-1188, 9/21/1999	1441271	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Vertical Solutions, 080876.07, 12/01/2008	2364904	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA (PROPOSED #1)	PJF 37511-1194 BP, 12/21/2011	3041498	CCISITES
4-TOWER STRUCTURAL ANALYSIS REPORTS	PJF, 37512-1027R1 B, 06/06/2012	3232137	CCISITES

3.1) Analysis Method

tnxTower (version 6.0.3.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) Existing pier vertical reinforcing is assumed carry pole base shear across the interface between the pier and mat. The existing anchors are assumed to transfer the pole base moment directly into the mat portion of the foundation.
5) For the existing reinforcing, the monopole was reinforced in conformance with the referenced modification drawings.
6) Monopole will be reinforced in conformance to the referenced PJF proposed modification documents.
7) Monopole will be reinforced in conformance to the attached proposed modification documents.

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	150 - 123.42	Pole	TP20.74x15x0.1875	1	-5.59	614.69	78.5	Pass
L2	123.42 - 115.25	Pole	TP22.0918x19.6804x0.25	2	-7.46	901.01	94.5	Pass
L3	115.25 - 105.25	Pole	TP24.2182x22.0918x0.3845	3	-8.83	1293.52	88.9	Pass
L4	105.25 - 101.9	Pole	TP24.9305x24.2182x0.5774	4	-9.45	1426.64	88.2	Pass
L5	101.9 - 101.25	Pole	TP25.0687x24.9305x0.6054	5	-9.59	1621.83	78.8	Pass
L6	101.25 - 85.96	Pole	TP28.32x25.0687x0.5671	6	-11.77	1677.43	92.4	Pass
L7	85.96 - 76.25	Pole	TP29.8904x26.3182x0.6021	7	-15.43	1945.93	97.0	Pass
L8	76.25 - 75	Pole	TP30.1567x29.8904x0.599	8	-15.71	1954.55	97.8	Pass
L9	75 - 72.15	Pole	TP30.7639x30.1567x0.7005	9	-16.52	2327.11	85.3	Pass
L10	72.15 - 42.41	Pole	TP37.1x30.7639x0.6479	10	-23.13	2657.54	91.6	Pass
L11	42.41 - 31.25	Pole	TP38.849x34.7028x0.5358	11	-25.67	2781.17	93.0	Pass
L12	31.25 - 18.75	Pole	TP41.5094x38.849x0.5216	12	-30.23	3035.21	93.2	Pass
L13	18.75 - 0	Pole	TP45.5x41.5094x0.4491	13	-31.94	2925.92	99.6	Pass
							Summary	
						Pole (L13)	99.6	Pass
						RATING =	99.6	Pass

Table 5 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Anchor Rods	0	99.4	Pass
1	Base Plate	0	72.8	Pass
1	Base Foundation Soil Interaction	0	92.4	Pass
1	Base Foundation Structural Steel	0	52.8	Pass

Structure Rating (max from all components) =	99.6%

Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
2) Worst case scenario between existing and post installed anchors.

4.1) Recommendations

1) See attached proposed modification drawings
2) Existing empty pipe mounts at the 150-Ft elevation are to be removed upon installation of the proposed equipment.

APPENDIX A

TNXTOWER OUTPUT

Tower Input Data

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

1) Tower is located in New Haven County, Connecticut.
2) Basic wind speed of 85 mph.
3) Nominal ice thickness of 1.2500 in.
4) Ice thickness is considered to increase with height.
5) Ice density of 56.00 pcf.
6) A wind speed of 38 mph is used in combination with ice.
7) Temperature drop of 50 °F.
8) Deflections calculated using a wind speed of 50 mph.
9) A non-linear (P-delta) analysis was used.
10) Pressures are calculated at each section.
11) Stress ratio used in pole design is 1.333.
12) Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	150.00-123.42	26.58	3.17	18	15.0000	20.7400	0.1875	0.7500	A572-65 (65 ksi)
L2	123.42-115.25	11.34	0.00	18	19.6804	22.0918	0.2500	1.0000	A572-65 (65 ksi)
L3	115.25-105.25	10.00	0.00	18	22.0918	24.2182	0.3845	1.5378	Reinf 55.61 ksi (56 ksi)
L4	105.25-101.90	3.35	0.00	18	24.2182	24.9305	0.5774	2.3094	Reinf 39.97 ksi (40 ksi)
L5	101.90-101.25	0.65	0.00	18	24.9305	25.0687	0.6054	2.4215	Reinf 43.14 ksi (43 ksi)
L6	101.25-85.96	15.29	4.08	18	25.0687	28.3200	0.5671	2.2684	Reinf 43.34 ksi (43 ksi)
L7	85.96-76.25	13.79	0.00	18	26.3182	29.8904	0.6021	2.4083	Reinf 43.47 ksi (43 ksi)
L8	76.25-75.00	1.25	0.00	18	29.8904	30.1567	0.5990	2.3958	Reinf 43.49 ksi (43 ksi)
L9	75.00-72.15	2.85	0.00	18	30.1567	30.7639	0.7005	2.8020	Reinf 43.53 ksi

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L10	72.15-42.41	29.74	5.17	18	30.7639	37.1000	0.6479	2.5914	(44 ksi) Reinf 45.71 ksi
L11	42.41-31.25	16.33	0.00	18	34.7028	38.8490	0.5358	2.1432	(46 ksi) Reinf 57.63 ksi
L12	31.25-18.75	12.50	0.00	18	38.8490	41.5094	0.5216	2.0864	(58 ksi) Reinf 57.80 ksi
L13	18.75-0.00	18.75		18	41.5094	45.5000	0.4491	1.7965	(58 ksi) Reinf 62.50 ksi (63 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	15.2314	8.8153	244.3603	5.2584	7.6200	32.0683	489.0422	4.4085	2.3100	12.32
	21.0599	12.2313	652.7391	7.2961	10.5359	61.9537	1306.3371	6.1168	3.3202	17.708
L2	20.6685	15.4180	735.4139	6.8978	9.9977	73.5586	1471.7954	7.7105	3.0238	12.095
	22.4326	17.3314	1044.5920	7.7538	11.2226	93.0792	2090.5584	8.6674	3.4481	13.793
L3	22.4326	26.4882	1576.8910	7.7061	11.2226	140.5102	3155.8568	13.2466	3.2115	8.354
	24.5918	29.0829	2087.1766	8.4610	12.3028	169.6502	4177.0995	14.5442	3.5858	9.327
L4	24.5918	43.3220	3058.9375	8.3925	12.3028	248.6370	6121.9000	21.6651	3.2463	5.623
	25.3151	44.6274	3343.8668	8.6454	12.6647	264.0306	6692.1336	22.3179	3.3716	5.84
L5	25.3151	46.7394	3494.0634	8.6354	12.6647	275.8901	6992.7243	23.3741	3.3223	5.488
	25.4554	47.0050	3553.9642	8.6845	12.7349	279.0726	7112.6049	23.5069	3.3466	5.528
L6	25.4554	44.1016	3344.8858	8.6981	12.7349	262.6548	6694.1729	22.0550	3.4140	6.02
	28.7569	49.9537	4860.9588	9.8523	14.3866	337.8819	9728.3139	24.9816	3.9862	7.029
L7	27.7974	49.1436	4105.9834	9.1292	13.3697	307.1118	8217.3695	24.5765	3.5724	5.933
	30.3515	55.9700	6065.6957	10.3973	15.1843	399.4713	12139.372 9	27.9903	4.2010	6.978
L8	30.3515	55.6859	6036.1917	10.3985	15.1843	397.5283	12080.326 0	27.8482	4.2065	7.023
	30.6219	56.1922	6202.3316	10.4930	15.3196	404.8627	12412.824 5	28.1014	4.2534	7.101
L9	30.6219	65.4916	7179.1996	10.4569	15.3196	468.6286	14367.845 8	32.7520	4.0747	5.817
	31.2385	66.8416	7632.3832	10.6725	15.6281	488.3772	15274.809 2	33.4271	4.1816	5.97
L10	31.2385	61.9278	7096.0762	10.6912	15.6281	454.0602	14201.489 6	30.9698	4.2742	6.597
	37.6723	74.9568	12583.302 2	12.9405	18.8468	667.6625	25183.161 9	37.4855	5.3894	8.319
L11	36.5711	58.1065	8569.8988	12.1293	17.6290	486.1243	17151.074 0	29.0588	5.1647	9.639
	39.4483	65.1578	12083.733 7	13.6012	19.7353	612.2901	24183.367 6	32.5851	5.8944	11.001
L12	39.4483	63.4545	11776.576 0	13.6062	19.7353	596.7263	23568.647 9	31.7333	5.9194	11.348
	42.1498	67.8590	14403.048 5	14.5507	21.0868	683.0367	28825.049 0	33.9360	6.3876	12.246
L13	42.1498	58.5330	12467.588 9	14.5764	21.0868	591.2513	24951.583 0	29.2721	6.5152	14.506
	46.2019	64.2218	16467.436 0	15.9931	23.1140	712.4442	32956.540 3	32.1170	7.2175	16.07

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 150.00-123.42				1	1	1		
L2 123.42-115.25				1	1	1		
L3 115.25-				1	1	1		

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
105.25 L4 105.25-101.90				1	1	1		
L5 101.90-101.25				1	1	1		
L6 101.25-85.96				1	1	1		
L7 85.96-76.25				1	1	1		
L8 76.25-75.00				1	1	1		
L9 75.00-72.15				1	1	1		
L10 72.15-42.41				1	1	1		
L11 42.41-31.25				1	1	1		
L12 31.25-18.75				1	1	1		
L13 18.75-0.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
***								
LDF6-50A(1-1/4")	C	No	Inside Pole	137.00 - 0.00	12	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
FB-L98B-002-75000(3/8")	C	No	CaAa (Out Of Face)	137.00 - 0.00	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.01
WR-VG86ST-BRD(3/4)	C	No	CaAa (Out Of Face)	137.00 - 0.00	1	No Ice	0.00	0.02
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.01
WR-VG86ST-BRD(3/4)	C	No	CaAa (Out Of Face)	46.00 - 0.00	1	No Ice	0.08	0.02
						1/2" Ice	0.18	0.00
						1" Ice	0.28	0.00
						2" Ice	0.48	0.00
						4" Ice	0.88	0.01
WR-VG86ST-BRD(3/4)	C	No	CaAa (Out Of Face)	76.00 - 46.00	1	No Ice	0.00	0.02
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.01
WR-VG86ST-BRD(3/4)	C	No	CaAa (Out Of Face)	137.00 - 76.00	1	No Ice	0.08	0.02
						1/2" Ice	0.18	0.00
						1" Ice	0.28	0.00
						2" Ice	0.48	0.00
						4" Ice	0.88	0.01
***								0.02
LDF4-50A(1/2")	C	No	Inside Pole	127.00 - 0.00	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
LDF7-50A(1-5/8")	C	No	Inside Pole	127.00 - 0.00	12	4" Ice	0.00	0.00
						No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
**						4" Ice	0.00	0.00
FXL-1873(1 5/8")	C	No	Inside Pole	117.00 - 0.00	6	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
860 10033(3/8)	C	No	Inside Pole	117.00 - 0.00	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
**						4" Ice	0.00	0.00
LDF4-50A(1/2")	C	No	CaAa (Out Of Face)	75.00 - 0.00	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.01
**						4" Ice	0.00	0.02
LDF4-50A(1/2")	C	No	Inside Pole	60.00 - 0.00	2	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
**						4" Ice	0.00	0.00
**								
Aero MP3-03	C	No	CaAa (Out Of Face)	76.00 - 46.00	1	No Ice	0.26	0.00
						1/2" Ice	0.37	0.00
						1" Ice	0.48	0.00
						2" Ice	0.71	0.00
**						4" Ice	1.15	0.00
Aero MP3-05	A	No	CaAa (Out Of Face)	46.25 - 0.00	1	No Ice	0.35	0.00
						1/2" Ice	0.40	0.00
						1" Ice	0.66	0.00
						2" Ice	0.88	0.00
						4" Ice	1.32	0.00
Aero MP3-03	A	No	CaAa (Out Of Face)	76.00 - 46.25	1	No Ice	0.26	0.00
						1/2" Ice	0.37	0.00
						1" Ice	0.48	0.00
						2" Ice	0.71	0.00
						4" Ice	1.15	0.00
Aero MP3-03	A	No	CaAa (Out Of Face)	116.25 - 76.00	1	No Ice	0.26	0.00
						1/2" Ice	0.37	0.00
						1" Ice	0.48	0.00
						2" Ice	0.71	0.00
						4" Ice	1.15	0.00
HB114-1-0813U4-M5J(1 1/4")	A	No	CaAa (Out Of Face)	116.25 - 0.00	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.01
						4" Ice	0.00	0.03
HB114-1-0813U4-M5J(1 1/4")	A	No	CaAa (Out Of Face)	150.00 - 116.25	1	No Ice	0.15	0.00
						1/2" Ice	0.25	0.00
						1" Ice	0.35	0.00
						2" Ice	0.55	0.01
						4" Ice	0.95	0.03
HB114-1-0813U4-M5J(1 1/4")	A	No	CaAa (Out Of Face)	150.00 - 0.00	2	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.01
						4" Ice	0.00	0.03

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	150.00-123.42	A	0.000	0.000	0.000	4.093	0.10
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.051	0.16
L2	123.42-115.25	A	0.000	0.000	0.000	1.367	0.03
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.632	0.16
L3	115.25-105.25	A	0.000	0.000	0.000	2.625	0.04
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.774	0.23
L4	105.25-101.90	A	0.000	0.000	0.000	0.879	0.01
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.259	0.08
L5	101.90-101.25	A	0.000	0.000	0.000	0.171	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.050	0.02
L6	101.25-85.96	A	0.000	0.000	0.000	4.013	0.06
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.183	0.35
L7	85.96-76.25	A	0.000	0.000	0.000	2.549	0.03
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.752	0.23
L8	76.25-75.00	A	0.000	0.000	0.000	0.328	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.282	0.03
L9	75.00-72.15	A	0.000	0.000	0.000	0.748	0.01
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.748	0.07
L10	72.15-42.41	A	0.000	0.000	0.000	8.133	0.11
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	7.141	0.70
L11	42.41-31.25	A	0.000	0.000	0.000	3.881	0.04
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.864	0.26
L12	31.25-18.75	A	0.000	0.000	0.000	4.347	0.04
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.968	0.30
L13	18.75-0.00	A	0.000	0.000	0.000	6.521	0.07
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.451	0.44

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	150.00-123.42	A	1.482	0.000	0.000	0.000	11.969	0.56
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	5.075	0.33
L2	123.42-115.25	A	1.458	0.000	0.000	0.000	3.820	0.17
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	3.053	0.27
L3	115.25-105.25	A	1.445	0.000	0.000	0.000	5.835	0.20
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	3.663	0.35
L4	105.25-101.90	A	1.434	0.000	0.000	0.000	1.947	0.07
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	1.220	0.12
L5	101.90-101.25	A	1.431	0.000	0.000	0.000	0.377	0.01
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.236	0.02
L6	101.25-85.96	A	1.416	0.000	0.000	0.000	8.825	0.30
		B		0.000	0.000	0.000	0.000	0.00

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
		C		0.000	0.000	0.000	5.515	0.53
L7	85.96-76.25	A	1.392	0.000	0.000	0.000	5.605	0.19
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	3.502	0.34
L8	76.25-75.00	A	1.381	0.000	0.000	0.000	0.712	0.02
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.658	0.04
L9	75.00-72.15	A	1.376	0.000	0.000	0.000	1.620	0.05
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	1.620	0.11
L10	72.15-42.41	A	1.334	0.000	0.000	0.000	17.283	0.55
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	15.853	1.11
L11	42.41-31.25	A	1.266	0.000	0.000	0.000	8.156	0.21
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	3.842	0.42
L12	31.25-18.75	A	1.250	0.000	0.000	0.000	8.901	0.21
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	4.093	0.45
L13	18.75-0.00	A	1.250	0.000	0.000	0.000	13.352	0.32
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	6.139	0.68

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	150.00-123.42	-0.0490	-0.1761	-0.1676	-0.3264
L2	123.42-115.25	-0.0883	-0.1700	-0.3005	-0.2613
L3	115.25-105.25	-0.0855	-0.2854	-0.2943	-0.3714
L4	105.25-101.90	-0.0862	-0.2879	-0.2997	-0.3792
L5	101.90-101.25	-0.0864	-0.2886	-0.3013	-0.3814
L6	101.25-85.96	-0.0872	-0.2912	-0.3067	-0.3897
L7	85.96-76.25	-0.0880	-0.2938	-0.3140	-0.3990
L8	76.25-75.00	-0.2452	-0.1879	-0.4469	-0.3002
L9	75.00-72.15	-0.2825	-0.1631	-0.4800	-0.2771
L10	72.15-42.41	-0.2620	-0.1971	-0.4683	-0.3234
L11	42.41-31.25	-0.0885	-0.4080	-0.3158	-0.5919
L12	31.25-18.75	-0.0892	-0.4114	-0.3098	-0.5993
L13	18.75-0.00	-0.0900	-0.4150	-0.3164	-0.6120

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 7a
***									
Side Arm Mount [SO 701-1]	C	None		0.00	75.00	No Ice	0.85	1.67	0.07
						1/2" Ice	1.14	2.34	0.08
						1" Ice	1.43	3.01	0.09
						2" Ice	2.01	4.35	0.12
						4" Ice	3.17	7.03	0.18
OG-860/1920/GPS-A	B	From Face	2.00 0.00 1.00	0.00	75.00	No Ice	0.33	0.40	0.00
						1/2" Ice	0.43	0.51	0.01
							0.55	0.63	0.01

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
						1" Ice	0.80	0.89	0.02
						2" Ice	1.41	1.52	0.08
						4" Ice			
***									
T-Arm Mount [TA 601-3]	C	None		0.00	117.00	No Ice	10.90	10.90	0.73
						1/2" Ice	14.65	14.65	0.93
						1" Ice	18.40	18.40	1.13
						2" Ice	25.90	25.90	1.52
						4" Ice	40.90	40.90	2.32
HBX-6516DS-VTM w/ Mount Pipe	A	From Face	4.00 0.00 0.00	0.00	117.00	No Ice	3.60	3.24	0.03
						1/2" Ice	4.00	3.91	0.06
						1" Ice	4.43	4.56	0.10
						2" Ice	5.37	5.91	0.20
						4" Ice	7.36	8.88	0.50
HBX-6516DS-VTM w/ Mount Pipe	B	From Face	4.00 0.00 0.00	0.00	117.00	No Ice	3.60	3.24	0.03
						1/2" Ice	4.00	3.91	0.06
						1" Ice	4.43	4.56	0.10
						2" Ice	5.37	5.91	0.20
						4" Ice	7.36	8.88	0.50
HBX-6516DS-VTM w/ Mount Pipe	C	From Face	4.00 0.00 0.00	0.00	117.00	No Ice	3.60	3.24	0.03
						1/2" Ice	4.00	3.91	0.06
						1" Ice	4.43	4.56	0.10
						2" Ice	5.37	5.91	0.20
						4" Ice	7.36	8.88	0.50
***									
Platform Mount [LP 712-1]	C	None		0.00	127.00	No Ice	24.53	24.53	1.34
						1/2" Ice	29.94	29.94	1.65
						1" Ice	35.35	35.35	1.96
						2" Ice	46.17	46.17	2.58
						4" Ice	67.81	67.81	3.82
GPS_A	B	From Face	4.00 0.00 3.00	0.00	127.00	No Ice	0.30	0.30	0.00
						1/2" Ice	0.37	0.37	0.00
						1" Ice	0.46	0.46	0.01
						2" Ice	0.65	0.65	0.02
						4" Ice	1.15	1.15	0.08
***									
7770.00 w/ Mount Pipe	A	From Face	4.00 0.00 2.00	0.00	137.00	No Ice	6.12	4.25	0.06
						1/2" Ice	6.63	5.01	0.10
						1" Ice	7.13	5.71	0.16
						2" Ice	8.16	7.16	0.29
						4" Ice	10.36	10.41	0.66
7770.00 w/ Mount Pipe	B	From Face	4.00 0.00 2.00	0.00	137.00	No Ice	6.12	4.25	0.06
						1/2" Ice	6.63	5.01	0.10
						1" Ice	7.13	5.71	0.16
						2" Ice	8.16	7.16	0.29
						4" Ice	10.36	10.41	0.66
7770.00 w/ Mount Pipe	C	From Face	4.00 0.00 2.00	0.00	137.00	No Ice	6.12	4.25	0.06
						1/2" Ice	6.63	5.01	0.10
						1" Ice	7.13	5.71	0.16
						2" Ice	8.16	7.16	0.29
						4" Ice	10.36	10.41	0.66
(2) LGP21901	A	From Face	4.00 0.00 2.00	0.00	137.00	No Ice	0.27	0.18	0.01
						1/2" Ice	0.34	0.25	0.01
						1" Ice	0.43	0.32	0.01
						2" Ice	0.62	0.49	0.02
							1.10	0.94	0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) LGP21901	B	From Face	4.00	0.00	0.00	137.00	4" Ice			
			0.00				No Ice	0.27	0.18	0.01
			2.00				1/2" Ice	0.34	0.25	0.01
							1" Ice	0.43	0.32	0.01
							2" Ice	0.62	0.49	0.02
							4" Ice	1.10	0.94	0.07
(2) LGP21901	C	From Face	4.00	0.00	0.00	137.00	No Ice	0.27	0.18	0.01
			0.00				1/2" Ice	0.34	0.25	0.01
			2.00				1" Ice	0.43	0.32	0.01
							2" Ice	0.62	0.49	0.02
							4" Ice	1.10	0.94	0.07
(2) DD1900 FULL BAND w/850 BY-PASS MASTHEAD	A	From Face	4.00	0.00	0.00	137.00	No Ice	1.29	0.32	0.02
			0.00				1/2" Ice	1.44	0.42	0.02
			2.00				1" Ice	1.60	0.52	0.03
							2" Ice	1.95	0.76	0.06
							4" Ice	2.75	1.35	0.14
(2) DD1900 FULL BAND w/850 BY-PASS MASTHEAD	B	From Face	4.00	0.00	0.00	137.00	No Ice	1.29	0.32	0.02
			0.00				1/2" Ice	1.44	0.42	0.02
			2.00				1" Ice	1.60	0.52	0.03
							2" Ice	1.95	0.76	0.06
							4" Ice	2.75	1.35	0.14
(2) DD1900 FULL BAND w/850 BY-PASS MASTHEAD	C	From Face	4.00	0.00	0.00	137.00	No Ice	1.29	0.32	0.02
			0.00				1/2" Ice	1.44	0.42	0.02
			2.00				1" Ice	1.60	0.52	0.03
							2" Ice	1.95	0.76	0.06
							4" Ice	2.75	1.35	0.14
Platform Mount [LP 712-1]	C	None			0.00	137.00	No Ice	24.53	24.53	1.34
							1/2" Ice	29.94	29.94	1.65
							1" Ice	35.35	35.35	1.96
							2" Ice	46.17	46.17	2.58
							4" Ice	67.81	67.81	3.82
Collar Mount (MTC3335)	C	None			0.00	137.00	No Ice	6.00	6.00	0.15
							1/2" Ice	7.22	7.22	0.19
							1" Ice	8.44	8.44	0.23
							2" Ice	10.88	10.88	0.32
							4" Ice	15.76	15.76	0.50
(2) SBNH-1D6565C w/ Mount Pipe	A	From Face	4.00	0.00	0.00	137.00	No Ice	11.56	9.72	0.09
			0.00				1/2" Ice	12.22	11.19	0.18
			2.00				1" Ice	12.89	12.59	0.28
							2" Ice	14.29	14.87	0.51
							4" Ice	17.43	19.62	1.14
(2) SBNH-1D6565C w/ Mount Pipe	B	From Face	4.00	0.00	0.00	137.00	No Ice	11.56	9.72	0.09
			0.00				1/2" Ice	12.22	11.19	0.18
			2.00				1" Ice	12.89	12.59	0.28
							2" Ice	14.29	14.87	0.51
							4" Ice	17.43	19.62	1.14
(2) AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Face	4.00	0.00	0.00	137.00	No Ice	8.50	6.30	0.07
			0.00				1/2" Ice	9.15	7.48	0.14
			2.00				1" Ice	9.77	8.37	0.21
							2" Ice	11.03	10.18	0.38
							4" Ice	13.68	14.02	0.87
(2) DTMABP7819VG12A	A	From Face	4.00	0.00	0.00	137.00	No Ice	1.14	0.39	0.02
			0.00				1/2" Ice	1.28	0.49	0.03
			2.00				1" Ice	1.44	0.59	0.04
								1.77	0.83	0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	2.54	1.41	0.14
						4" Ice			
(2) DTMABP7819VG12A	B	From Face	4.00	0.00	137.00	No Ice	1.14	0.39	0.02
			0.00			1/2"	1.28	0.49	0.03
			2.00			Ice	1.44	0.59	0.04
						1" Ice	1.77	0.83	0.06
						2" Ice	2.54	1.41	0.14
						4" Ice			
(2) DTMABP7819VG12A	C	From Face	4.00	0.00	137.00	No Ice	1.14	0.39	0.02
			0.00			1/2"	1.28	0.49	0.03
			2.00			Ice	1.44	0.59	0.04
						1" Ice	1.77	0.83	0.06
						2" Ice	2.54	1.41	0.14
						4" Ice			
7020.00	A	From Face	4.00	0.00	137.00	No Ice	0.12	0.20	0.00
			0.00			1/2"	0.17	0.28	0.01
			2.00			Ice	0.23	0.36	0.01
						1" Ice	0.38	0.56	0.02
						2" Ice	0.78	1.05	0.07
						4" Ice			
7020.00	B	From Face	4.00	0.00	137.00	No Ice	0.12	0.20	0.00
			0.00			1/2"	0.17	0.28	0.01
			2.00			Ice	0.23	0.36	0.01
						1" Ice	0.38	0.56	0.02
						2" Ice	0.78	1.05	0.07
						4" Ice			
7020.00	C	From Face	4.00	0.00	137.00	No Ice	0.12	0.20	0.00
			0.00			1/2"	0.17	0.28	0.01
			2.00			Ice	0.23	0.36	0.01
						1" Ice	0.38	0.56	0.02
						2" Ice	0.78	1.05	0.07
						4" Ice			
RRUS-11	A	From Face	4.00	0.00	137.00	No Ice	4.42	1.19	0.05
			0.00			1/2"	4.71	1.35	0.07
			2.00			Ice	5.00	1.53	0.10
						1" Ice	5.61	1.90	0.17
						2" Ice	6.94	2.75	0.36
						4" Ice			
RRUS-11	B	From Face	4.00	0.00	137.00	No Ice	4.42	1.19	0.05
			0.00			1/2"	4.71	1.35	0.07
			2.00			Ice	5.00	1.53	0.10
						1" Ice	5.61	1.90	0.17
						2" Ice	6.94	2.75	0.36
						4" Ice			
RRUS-11	C	From Face	4.00	0.00	137.00	No Ice	4.42	1.19	0.05
			0.00			1/2"	4.71	1.35	0.07
			2.00			Ice	5.00	1.53	0.10
						1" Ice	5.61	1.90	0.17
						2" Ice	6.94	2.75	0.36
						4" Ice			
DC6-48-60-18-8F	A	From Face	4.00	0.00	137.00	No Ice	2.57	4.32	0.02
			0.00			1/2"	2.80	4.60	0.05
			2.00			Ice	3.04	4.88	0.09
						1" Ice	3.54	5.49	0.17
						2" Ice	4.66	6.80	0.38
						4" Ice			
***									
***									
(2) APL866513-42T0 w/ Mount Pipe	A	From Face	4.00	0.00	127.00	No Ice	4.53	4.92	0.03
			0.00			1/2"	4.97	5.60	0.08
			2.00			Ice	5.41	6.28	0.13
						1" Ice	6.34	7.71	0.25
						2" Ice	8.32	10.83	0.60
						4" Ice			
(2) APL866513-42T0 w/	B	From Face	4.00	0.00	127.00	No Ice	4.53	4.92	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Mount Pipe			0.00 2.00			1/2" Ice	4.97 5.41	5.60 6.28	0.08 0.13
						1" Ice	6.34	7.71	0.25
						2" Ice	8.32	10.83	0.60
						4" Ice			
(2) APL866513-42T0 w/ Mount Pipe	C	From Face	4.00 0.00 2.00	0.00	127.00	No Ice 1/2" Ice	4.53 4.97 5.41	4.92 5.60 6.28	0.03 0.08 0.13
						1" Ice	6.34	7.71	0.25
						2" Ice	8.32	10.83	0.60
						4" Ice			
(2) FD9R6004/2C-3L	A	From Face	4.00 0.00 2.00	0.00	127.00	No Ice 1/2" Ice	0.37 0.45 0.54	0.08 0.14 0.20	0.00 0.01 0.01
						1" Ice	0.75	0.34	0.02
						2" Ice	1.28	0.74	0.06
						4" Ice			
(2) FD9R6004/2C-3L	B	From Face	4.00 0.00 2.00	0.00	127.00	No Ice 1/2" Ice	0.37 0.45 0.54	0.08 0.14 0.20	0.00 0.01 0.01
						1" Ice	0.75	0.34	0.02
						2" Ice	1.28	0.74	0.06
						4" Ice			
(2) FD9R6004/2C-3L	C	From Face	4.00 0.00 2.00	0.00	127.00	No Ice 1/2" Ice	0.37 0.45 0.54	0.08 0.14 0.20	0.00 0.01 0.01
						1" Ice	0.75	0.34	0.02
						2" Ice	1.28	0.74	0.06
						4" Ice			
BXA-171063-12BF w/ Mount Pipe	A	From Face	4.00 0.00 2.00	0.00	127.00	No Ice 1/2" Ice	4.97 5.52 6.04	5.23 6.39 7.26	0.04 0.08 0.14
						1" Ice	7.09	9.05	0.27
						2" Ice	9.36	12.82	0.67
						4" Ice			
BXA-70063-4CF-EDIN-X w/ Mount Pipe	A	From Face	4.00 0.00 2.00	0.00	127.00	No Ice 1/2" Ice	5.40 5.84 6.30	3.69 4.29 4.91	0.03 0.07 0.12
						1" Ice	7.24	6.26	0.23
						2" Ice	9.26	9.29	0.58
						4" Ice			
BXA-171063-12BF w/ Mount Pipe	B	From Face	4.00 0.00 2.00	0.00	127.00	No Ice 1/2" Ice	4.97 5.52 6.04	5.23 6.39 7.26	0.04 0.08 0.14
						1" Ice	7.09	9.05	0.27
						2" Ice	9.36	12.82	0.67
						4" Ice			
BXA-70063-4CF-EDIN-X w/ Mount Pipe	B	From Face	4.00 0.00 2.00	0.00	127.00	No Ice 1/2" Ice	5.40 5.84 6.30	3.69 4.29 4.91	0.03 0.07 0.12
						1" Ice	7.24	6.26	0.23
						2" Ice	9.26	9.29	0.58
						4" Ice			
BXA-171063-12BF w/ Mount Pipe	C	From Face	4.00 0.00 2.00	0.00	127.00	No Ice 1/2" Ice	4.97 5.52 6.04	5.23 6.39 7.26	0.04 0.08 0.14
						1" Ice	7.09	9.05	0.27
						2" Ice	9.36	12.82	0.67
						4" Ice			
BXA-70063-4CF-EDIN-X w/ Mount Pipe	C	From Face	4.00 0.00 2.00	0.00	127.00	No Ice 1/2" Ice	5.40 5.84 6.30	3.69 4.29 4.91	0.03 0.07 0.12
						1" Ice	7.24	6.26	0.23
						2" Ice	9.26	9.29	0.58
						4" Ice			

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
***									
1900MHz RRH (65MHz)	A	From Face	4.00 0.00 -2.00	0.00	152.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	2.70 2.94 3.18 3.70 4.85	2.77 3.01 3.26 3.78 4.93	0.06 0.08 0.11 0.18 0.35
800 EXTERNAL NOTCH FILTER	A	From Face	4.00 0.00 -2.00	0.00	152.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	0.77 0.89 1.02 1.30 1.97	0.37 0.46 0.56 0.79 1.34	0.01 0.02 0.02 0.04 0.11
800MHZ RRH	A	From Face	4.00 0.00 -2.00	0.00	152.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	2.49 2.71 2.93 3.41 4.46	2.07 2.27 2.48 2.93 3.93	0.05 0.07 0.10 0.16 0.32
(3) ACU-A20-N	A	From Face	4.00 0.00 -2.00	0.00	152.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	0.08 0.12 0.17 0.30 0.67	0.14 0.19 0.25 0.40 0.80	0.00 0.00 0.00 0.01 0.04
APXVSPP18-C-A20 w/ Mount Pipe	A	From Face	4.00 0.00 -2.00	0.00	152.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.95 8.13 9.02 10.84 14.85	0.08 0.15 0.22 0.41 0.91
1900MHz RRH (65MHz)	B	From Face	4.00 0.00 -2.00	0.00	152.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	2.70 2.94 3.18 3.70 4.85	2.77 3.01 3.26 3.78 4.93	0.06 0.08 0.11 0.18 0.35
800 EXTERNAL NOTCH FILTER	B	From Face	4.00 0.00 -2.00	0.00	152.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	0.77 0.89 1.02 1.30 1.97	0.37 0.46 0.56 0.79 1.34	0.01 0.02 0.02 0.04 0.11
800MHZ RRH	B	From Face	4.00 0.00 -2.00	0.00	152.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	2.49 2.71 2.93 3.41 4.46	2.07 2.27 2.48 2.93 3.93	0.05 0.07 0.10 0.16 0.32
(3) ACU-A20-N	B	From Face	4.00 0.00 -2.00	0.00	152.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	0.08 0.12 0.17 0.30 0.67	0.14 0.19 0.25 0.40 0.80	0.00 0.00 0.00 0.01 0.04
APXVSPP18-C-A20 w/ Mount Pipe	B	From Face	4.00 0.00 -2.00	0.00	152.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.95 8.13 9.02 10.84 14.85	0.08 0.15 0.22 0.41 0.91
1900MHz RRH (65MHz)	C	From Face	4.00 0.00 -2.00	0.00	152.00	No Ice 1/2" Ice Ice 1" Ice	2.70 2.94 3.18 3.70	2.77 3.01 3.26 3.78	0.06 0.08 0.11 0.18

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	4.85	4.93	0.35
						4" Ice			
800 EXTERNAL NOTCH FILTER	C	From Face	4.00 0.00 -2.00	0.00	152.00	No Ice	0.77	0.37	0.01
						1/2" Ice	0.89	0.46	0.02
						1" Ice	1.02	0.56	0.02
						2" Ice	1.30	0.79	0.04
						4" Ice	1.97	1.34	0.11
800MHZ RRH	C	From Face	4.00 0.00 -2.00	0.00	152.00	No Ice	2.49	2.07	0.05
						1/2" Ice	2.71	2.27	0.07
						1" Ice	2.93	2.48	0.10
						2" Ice	3.41	2.93	0.16
						4" Ice	4.46	3.93	0.32
(3) ACU-A20-N	C	From Face	4.00 0.00 -2.00	0.00	152.00	No Ice	0.08	0.14	0.00
						1/2" Ice	0.12	0.19	0.00
						1" Ice	0.17	0.25	0.00
						2" Ice	0.30	0.40	0.01
						4" Ice	0.67	0.80	0.04
APXVSPP18-C-A20 w/ Mount Pipe	C	From Face	4.00 0.00 -2.00	0.00	152.00	No Ice	8.50	6.95	0.08
						1/2" Ice	9.15	8.13	0.15
						1" Ice	9.77	9.02	0.22
						2" Ice	11.03	10.84	0.41
						4" Ice	13.68	14.85	0.91
Platform Mount [LP 602-1]	C	None		0.00	152.00	No Ice	32.03	32.03	1.34
						1/2" Ice	38.71	38.71	1.80
						1" Ice	45.39	45.39	2.26
						2" Ice	58.75	58.75	3.17
						4" Ice	85.47	85.47	5.00
8-ft Ladder	C	None		0.00	152.00	No Ice	5.00	5.00	0.04
						1/2" Ice	6.00	6.00	0.07
						1" Ice	7.00	7.00	0.08
						2" Ice	9.00	9.00	0.11
						4" Ice	13.00	13.00	0.15

Tower Pressures - No Ice

$G_H = 1.690$

Section Elevation ft	z ft	K_z	q_z ksf	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
L1 150.00-123.42	136.00	1.499	0.03	39.582	A	0.000	39.582	39.582	100.00	0.000	4.093
					B	0.000	39.582		100.00	0.000	0.000
					C	0.000	39.582		100.00	0.000	1.051
L2 123.42-115.25	119.28	1.444	0.03	14.449	A	0.000	14.449	14.449	100.00	0.000	1.367
					B	0.000	14.449		100.00	0.000	0.000
					C	0.000	14.449		100.00	0.000	0.632
L3 115.25-105.25	110.17	1.411	0.03	19.296	A	0.000	19.296	19.296	100.00	0.000	2.625
					B	0.000	19.296		100.00	0.000	0.000
					C	0.000	19.296		100.00	0.000	0.774
L4 105.25-101.90	103.57	1.386	0.03	6.860	A	0.000	6.860	6.860	100.00	0.000	0.879
					B	0.000	6.860		100.00	0.000	0.000
					C	0.000	6.860		100.00	0.000	0.259

Section Elevation ft	z ft	K_Z	q_z ksf	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
L5 101.90-101.25	101.57	1.379	0.03	1.354	A	0.000	1.354	1.354	100.00	0.000	0.171
					B	0.000	1.354		100.00	0.000	0.000
					C	0.000	1.354		100.00	0.000	0.050
L6 101.25-85.96	93.45	1.346	0.02	34.013	A	0.000	34.013	34.013	100.00	0.000	4.013
					B	0.000	34.013		100.00	0.000	0.000
					C	0.000	34.013		100.00	0.000	1.183
L7 85.96-76.25	81.03	1.293	0.02	23.169	A	0.000	23.169	23.169	100.00	0.000	2.549
					B	0.000	23.169		100.00	0.000	0.000
					C	0.000	23.169		100.00	0.000	0.752
L8 76.25-75.00	75.62	1.267	0.02	3.127	A	0.000	3.127	3.127	100.00	0.000	0.328
					B	0.000	3.127		100.00	0.000	0.000
					C	0.000	3.127		100.00	0.000	0.282
L9 75.00-72.15	73.57	1.257	0.02	7.234	A	0.000	7.234	7.234	100.00	0.000	0.748
					B	0.000	7.234		100.00	0.000	0.000
					C	0.000	7.234		100.00	0.000	0.748
L10 72.15-42.41	56.82	1.168	0.02	84.095	A	0.000	84.095	84.095	100.00	0.000	8.133
					B	0.000	84.095		100.00	0.000	0.000
					C	0.000	84.095		100.00	0.000	7.141
L11 42.41-31.25	36.76	1.031	0.02	34.812	A	0.000	34.812	34.812	100.00	0.000	3.881
					B	0.000	34.812		100.00	0.000	0.000
					C	0.000	34.812		100.00	0.000	0.864
L12 31.25-18.75	24.93	1	0.02	41.853	A	0.000	41.853	41.853	100.00	0.000	4.347
					B	0.000	41.853		100.00	0.000	0.000
					C	0.000	41.853		100.00	0.000	0.968
L13 18.75-0.00	9.23	1	0.02	67.976	A	0.000	67.976	67.976	100.00	0.000	6.521
					B	0.000	67.976		100.00	0.000	0.000
					C	0.000	67.976		100.00	0.000	1.451

Tower Pressure - With Ice

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z ksf	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
L1 150.00-123.42	136.00	1.499	0.01	1.4815	46.145	A	0.000	46.145	46.145	100.00	0.000	11.969
						B	0.000	46.145		100.00	0.000	0.000
						C	0.000	46.145		100.00	0.000	5.075
L2 123.42-115.25	119.28	1.444	0.01	1.4584	16.467	A	0.000	16.467	16.467	100.00	0.000	3.820
						B	0.000	16.467		100.00	0.000	0.000
						C	0.000	16.467		100.00	0.000	3.053
L3 115.25-105.25	110.17	1.411	0.01	1.4446	21.703	A	0.000	21.703	21.703	100.00	0.000	5.835
						B	0.000	21.703		100.00	0.000	0.000
						C	0.000	21.703		100.00	0.000	3.663
L4 105.25-101.90	103.57	1.386	0.01	1.4339	7.661	A	0.000	7.661	7.661	100.00	0.000	1.947
						B	0.000	7.661		100.00	0.000	0.000
						C	0.000	7.661		100.00	0.000	1.220
L5 101.90-101.25	101.57	1.379	0.00	1.4305	1.509	A	0.000	1.509	1.509	100.00	0.000	0.377
						B	0.000	1.509		100.00	0.000	0.000
						C	0.000	1.509		100.00	0.000	0.236
L6 101.25-85.96	93.45	1.346	0.00	1.4163	37.622	A	0.000	37.622	37.622	100.00	0.000	8.825
						B	0.000	37.622		100.00	0.000	0.000
						C	0.000	37.622		100.00	0.000	5.515
L7 85.96-76.25	81.03	1.293	0.00	1.3923	25.461	A	0.000	25.461	25.461	100.00	0.000	5.605
						B	0.000	25.461		100.00	0.000	0.000
						C	0.000	25.461		100.00	0.000	3.502
L8 76.25-75.00	75.62	1.267	0.00	1.3808	3.415	A	0.000	3.415	3.415	100.00	0.000	0.712
						B	0.000	3.415		100.00	0.000	0.000
						C	0.000	3.415		100.00	0.000	0.658
L9 75.00-72.15	73.57	1.257	0.00	1.3762	7.888	A	0.000	7.888	7.888	100.00	0.000	1.620
						B	0.000	7.888		100.00	0.000	0.000
						C	0.000	7.888		100.00	0.000	1.620
L10 72.15-42.41	56.82	1.168	0.00	1.3342	90.708	A	0.000	90.708	90.708	100.00	0.000	17.283
						B	0.000	90.708		100.00	0.000	0.000

Section Elevation ft	z ft	K_z	q_z ksf	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
L11 42.41-31.25	36.76	1.031	0.00	1.2663	37.294	C	0.000	90.708		100.00	0.000	15.853
						A	0.000	37.294	37.294	100.00	0.000	8.156
						B	0.000	37.294		100.00	0.000	0.000
						C	0.000	37.294		100.00	0.000	3.842
L12 31.25-18.75	24.93	1	0.00	1.2500	44.458	A	0.000	44.458	44.458	100.00	0.000	8.901
						B	0.000	44.458		100.00	0.000	0.000
						C	0.000	44.458		100.00	0.000	4.093
L13 18.75-0.00	9.23	1	0.00	1.2500	71.882	A	0.000	71.882	71.882	100.00	0.000	13.352
						B	0.000	71.882		100.00	0.000	0.000
						C	0.000	71.882		100.00	0.000	6.139

Tower Pressure - Service

$G_H = 1.690$

Section Elevation ft	z ft	K_z	q_z ksf	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
L1 150.00-123.42	136.00	1.499	0.01	39.582	A	0.000	39.582	39.582	100.00	0.000	4.093
					B	0.000	39.582		100.00	0.000	0.000
					C	0.000	39.582		100.00	0.000	1.051
L2 123.42-115.25	119.28	1.444	0.01	14.449	A	0.000	14.449	14.449	100.00	0.000	1.367
					B	0.000	14.449		100.00	0.000	0.000
					C	0.000	14.449		100.00	0.000	0.632
L3 115.25-105.25	110.17	1.411	0.01	19.296	A	0.000	19.296	19.296	100.00	0.000	2.625
					B	0.000	19.296		100.00	0.000	0.000
					C	0.000	19.296		100.00	0.000	0.774
L4 105.25-101.90	103.57	1.386	0.01	6.860	A	0.000	6.860	6.860	100.00	0.000	0.879
					B	0.000	6.860		100.00	0.000	0.000
					C	0.000	6.860		100.00	0.000	0.259
L5 101.90-101.25	101.57	1.379	0.01	1.354	A	0.000	1.354	1.354	100.00	0.000	0.171
					B	0.000	1.354		100.00	0.000	0.000
					C	0.000	1.354		100.00	0.000	0.050
L6 101.25-85.96	93.45	1.346	0.01	34.013	A	0.000	34.013	34.013	100.00	0.000	4.013
					B	0.000	34.013		100.00	0.000	0.000
					C	0.000	34.013		100.00	0.000	1.183
L7 85.96-76.25	81.03	1.293	0.01	23.169	A	0.000	23.169	23.169	100.00	0.000	2.549
					B	0.000	23.169		100.00	0.000	0.000
					C	0.000	23.169		100.00	0.000	0.752
L8 76.25-75.00	75.62	1.267	0.01	3.127	A	0.000	3.127	3.127	100.00	0.000	0.328
					B	0.000	3.127		100.00	0.000	0.000
					C	0.000	3.127		100.00	0.000	0.282
L9 75.00-72.15	73.57	1.257	0.01	7.234	A	0.000	7.234	7.234	100.00	0.000	0.748
					B	0.000	7.234		100.00	0.000	0.000
					C	0.000	7.234		100.00	0.000	0.748
L10 72.15-42.41	56.82	1.168	0.01	84.095	A	0.000	84.095	84.095	100.00	0.000	8.133
					B	0.000	84.095		100.00	0.000	0.000
					C	0.000	84.095		100.00	0.000	7.141
L11 42.41-31.25	36.76	1.031	0.01	34.812	A	0.000	34.812	34.812	100.00	0.000	3.881
					B	0.000	34.812		100.00	0.000	0.000
					C	0.000	34.812		100.00	0.000	0.864
L12 31.25-18.75	24.93	1	0.01	41.853	A	0.000	41.853	41.853	100.00	0.000	4.347
					B	0.000	41.853		100.00	0.000	0.000
					C	0.000	41.853		100.00	0.000	0.968
L13 18.75-0.00	9.23	1	0.01	67.976	A	0.000	67.976	67.976	100.00	0.000	6.521
					B	0.000	67.976		100.00	0.000	0.000
					C	0.000	67.976		100.00	0.000	1.451

Load Combinations

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	150 - 123.42	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-18.32	0.60	1.61
			Max. Mx	11	-5.61	192.70	-0.33
			Max. My	2	-5.59	-0.44	193.86
			Max. Vy	11	-15.54	192.70	-0.33
			Max. Vx	2	-15.62	-0.44	193.86
			Max. Torque	10			-2.14
L2	123.42 - 115.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-21.94	0.73	1.82
			Max. Mx	11	-7.48	374.87	-0.67
			Max. My	2	-7.46	-0.83	376.93
			Max. Vy	11	-17.29	374.87	-0.67
			Max. Vx	2	-17.36	-0.83	376.93
			Max. Torque	10			-2.15
L3	115.25 - 105.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-23.88	0.87	2.00
			Max. Mx	11	-8.84	551.22	-0.99
			Max. My	2	-8.83	-1.19	554.07
			Max. Vy	11	-18.00	551.22	-0.99
			Max. Vx	2	-18.08	-1.19	554.07
			Max. Torque	10			-2.16

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L4	105.25 - 101.9	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-24.72	0.91	2.06
			Max. Mx	11	-9.47	611.94	-1.10
			Max. My	2	-9.46	-1.30	615.05
			Max. Vy	11	-18.26	611.94	-1.10
			Max. Vx	2	-18.34	-1.30	615.05
			Max. Torque	10			-2.17
L5	101.9 - 101.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-24.89	0.92	2.07
			Max. Mx	11	-9.60	623.82	-1.12
			Max. My	2	-9.59	-1.33	626.99
			Max. Vy	11	-18.31	623.82	-1.12
			Max. Vx	2	-18.39	-1.33	626.99
			Max. Torque	10			-2.17
L6	101.25 - 85.96	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-27.81	1.09	2.28
			Max. Mx	11	-11.78	833.96	-1.48
			Max. My	2	-11.77	-1.73	838.03
			Max. Vy	11	-19.19	833.96	-1.48
			Max. Vx	2	-19.27	-1.73	838.03
			Max. Torque	10			-2.19
L7	85.96 - 76.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-32.63	1.29	2.55
			Max. Mx	11	-15.44	1106.89	-1.92
			Max. My	2	-15.43	-2.22	1112.07
			Max. Vy	11	-20.34	1106.89	-1.92
			Max. Vx	2	-20.42	-2.22	1112.07
			Max. Torque	10			-2.21
L8	76.25 - 75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-33.00	1.31	2.57
			Max. Mx	11	-15.73	1132.38	-1.96
			Max. My	2	-15.72	-2.26	1137.66
			Max. Vy	11	-20.45	1132.38	-1.96
			Max. Vx	2	-20.53	-2.26	1137.66
			Max. Torque	10			-2.21
L9	75 - 72.15	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-34.08	1.33	2.65
			Max. Mx	11	-16.54	1191.25	-2.05
			Max. My	2	-16.53	-2.36	1196.77
			Max. Vy	11	-20.78	1191.25	-2.05
			Max. Vx	2	-20.86	-2.36	1196.77
			Max. Torque	10			-2.22
L10	72.15 - 42.41	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-42.51	1.81	3.05
			Max. Mx	11	-23.14	1725.98	-2.81
			Max. My	2	-23.14	-3.20	1733.52
			Max. Vy	11	-22.79	1725.98	-2.81
			Max. Vx	2	-22.87	-3.20	1733.52
			Max. Torque	10			-2.26
L11	42.41 - 31.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-49.43	2.13	3.31
			Max. Mx	11	-28.55	2108.96	-3.32
			Max. My	2	-28.54	-3.76	2117.84
			Max. Vy	11	-24.01	2108.96	-3.32
			Max. Vx	2	-24.09	-3.76	2117.84
			Max. Torque	10			-2.30
L12	31.25 - 18.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-53.69	2.39	3.53
			Max. Mx	11	-31.92	2413.63	-3.70
			Max. My	2	-31.92	-4.18	2423.54
			Max. Vy	11	-24.77	2413.63	-3.70
			Max. Vx	2	-24.85	-4.18	2423.54

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Torque	10			-2.34
L13	18.75 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-59.90	2.79	3.87
			Max. Mx	11	-36.77	2887.86	-4.27
			Max. My	2	-36.77	-4.80	2899.27
			Max. Vy	11	-25.85	2887.86	-4.27
			Max. Vx	2	-25.93	-4.80	2899.27
			Max. Torque	10			-2.39

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	15	59.90	-0.01	7.25
	Max. H_x	11	36.78	25.83	-0.03
	Max. H_z	2	36.78	-0.03	25.91
	Max. M_x	2	2899.27	-0.03	25.91
	Max. M_z	5	2887.27	-25.83	0.03
	Max. Torsion	4	2.38	-22.39	12.98
	Min. Vert	1	36.78	0.00	0.00
	Min. H_x	5	36.78	-25.83	0.03
	Min. H_z	8	36.78	0.03	-25.91
	Min. M_x	8	-2897.60	0.03	-25.91
	Min. M_z	11	-2887.86	25.83	-0.03
	Min. Torsion	10	-2.39	22.39	-12.98

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	36.78	0.00	0.00	-0.80	0.28	0.00
Dead+Wind 0 deg - No Ice	36.78	0.03	-25.91	-2899.27	-4.80	-0.83
Dead+Wind 30 deg - No Ice	36.78	12.95	-22.46	-2513.48	-1447.87	-1.85
Dead+Wind 60 deg - No Ice	36.78	22.39	-12.98	-1454.44	-2502.93	-2.38
Dead+Wind 90 deg - No Ice	36.78	25.83	-0.03	-5.90	-2887.27	-2.27
Dead+Wind 120 deg - No Ice	36.78	22.36	12.92	1444.02	-2497.87	-1.56
Dead+Wind 150 deg - No Ice	36.78	12.89	22.42	2506.77	-1439.08	-0.42
Dead+Wind 180 deg - No Ice	36.78	-0.03	25.91	2897.60	5.37	0.83
Dead+Wind 210 deg - No Ice	36.78	-12.95	22.46	2511.82	1448.43	1.86
Dead+Wind 240 deg - No Ice	36.78	-22.39	12.98	1452.81	2503.50	2.39
Dead+Wind 270 deg - No Ice	36.78	-25.83	0.03	4.27	2887.86	2.28
Dead+Wind 300 deg - No Ice	36.78	-22.36	-12.92	-1445.67	2498.47	1.55
Dead+Wind 330 deg - No Ice	36.78	-12.89	-22.42	-2508.44	1439.67	0.41
Dead+Ice+Temp	59.90	-0.00	-0.00	-3.87	2.79	-0.00
Dead+Wind 0 deg+Ice+Temp	59.90	0.01	-7.25	-870.49	1.74	-0.23
Dead+Wind 30 deg+Ice+Temp	59.90	3.61	-6.28	-754.97	-428.89	-0.50
Dead+Wind 60 deg+Ice+Temp	59.90	6.25	-3.63	-438.22	-743.84	-0.64
Dead+Wind 90 deg+Ice+Temp	59.90	7.22	-0.01	-5.13	-858.70	-0.61
Dead+Wind 120 deg+Ice+Temp	59.90	6.25	3.62	428.27	-742.70	-0.41
Dead+Wind 150 deg+Ice+Temp	59.90	3.60	6.27	745.85	-426.93	-0.10
Dead+Wind 180 deg+Ice+Temp	59.90	-0.01	7.25	862.50	4.01	0.23
Dead+Wind 210	59.90	-3.61	6.28	746.98	434.64	0.50

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
deg+Ice+Temp						
Dead+Wind 240 deg+Ice+Temp	59.90	-6.25	3.63	430.24	749.59	0.64
Dead+Wind 270 deg+Ice+Temp	59.90	-7.22	0.01	-2.86	864.45	0.61
Dead+Wind 300 deg+Ice+Temp	59.90	-6.25	-3.62	-436.26	748.45	0.41
Dead+Wind 330 deg+Ice+Temp	59.90	-3.60	-6.27	-753.83	432.68	0.10
Dead+Wind 0 deg - Service	36.78	0.01	-8.97	-1005.73	-1.47	-0.29
Dead+Wind 30 deg - Service	36.78	4.48	-7.77	-871.99	-501.78	-0.65
Dead+Wind 60 deg - Service	36.78	7.75	-4.49	-504.82	-867.57	-0.84
Dead+Wind 90 deg - Service	36.78	8.94	-0.01	-2.61	-1000.81	-0.80
Dead+Wind 120 deg - Service	36.78	7.74	4.47	500.08	-865.81	-0.55
Dead+Wind 150 deg - Service	36.78	4.46	7.76	868.54	-498.73	-0.15
Dead+Wind 180 deg - Service	36.78	-0.01	8.97	1004.04	2.06	0.29
Dead+Wind 210 deg - Service	36.78	-4.48	7.77	870.30	502.37	0.65
Dead+Wind 240 deg - Service	36.78	-7.75	4.49	503.13	868.16	0.84
Dead+Wind 270 deg - Service	36.78	-8.94	0.01	0.92	1001.40	0.80
Dead+Wind 300 deg - Service	36.78	-7.74	-4.47	-501.77	866.40	0.55
Dead+Wind 330 deg - Service	36.78	-4.46	-7.76	-870.23	499.32	0.15

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	-36.78	0.00	0.00	36.78	0.00	0.000%
2	0.03	-36.78	-25.91	-0.03	36.78	25.91	0.000%
3	12.95	-36.78	-22.46	-12.95	36.78	22.46	0.000%
4	22.39	-36.78	-12.98	-22.39	36.78	12.98	0.000%
5	25.83	-36.78	-0.03	-25.83	36.78	0.03	0.000%
6	22.36	-36.78	12.92	-22.36	36.78	-12.92	0.000%
7	12.89	-36.78	22.42	-12.89	36.78	-22.42	0.000%
8	-0.03	-36.78	25.91	0.03	36.78	-25.91	0.000%
9	-12.95	-36.78	22.46	12.95	36.78	-22.46	0.000%
10	-22.39	-36.78	12.98	22.39	36.78	-12.98	0.000%
11	-25.83	-36.78	0.03	25.83	36.78	-0.03	0.000%
12	-22.36	-36.78	-12.92	22.36	36.78	12.92	0.000%
13	-12.89	-36.78	-22.42	12.89	36.78	22.42	0.000%
14	0.00	-59.90	0.00	0.00	59.90	0.00	0.000%
15	0.01	-59.90	-7.25	-0.01	59.90	7.25	0.000%
16	3.61	-59.90	-6.28	-3.61	59.90	6.28	0.000%
17	6.25	-59.90	-3.63	-6.25	59.90	3.63	0.000%
18	7.22	-59.90	-0.01	-7.22	59.90	0.01	0.000%
19	6.25	-59.90	3.62	-6.25	59.90	-3.62	0.000%
20	3.60	-59.90	6.27	-3.60	59.90	-6.27	0.000%
21	-0.01	-59.90	7.25	0.01	59.90	-7.25	0.000%
22	-3.61	-59.90	6.28	3.61	59.90	-6.28	0.000%
23	-6.25	-59.90	3.63	6.25	59.90	-3.63	0.000%
24	-7.22	-59.90	0.01	7.22	59.90	-0.01	0.000%
25	-6.25	-59.90	-3.62	6.25	59.90	3.62	0.000%
26	-3.60	-59.90	-6.27	3.60	59.90	6.27	0.000%
27	0.01	-36.78	-8.97	-0.01	36.78	8.97	0.000%
28	4.48	-36.78	-7.77	-4.48	36.78	7.77	0.000%
29	7.75	-36.78	-4.49	-7.75	36.78	4.49	0.000%
30	8.94	-36.78	-0.01	-8.94	36.78	0.01	0.000%
31	7.74	-36.78	4.47	-7.74	36.78	-4.47	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
32	4.46	-36.78	7.76	-4.46	36.78	-7.76	0.000%
33	-0.01	-36.78	8.97	0.01	36.78	-8.97	0.000%
34	-4.48	-36.78	7.77	4.48	36.78	-7.77	0.000%
35	-7.75	-36.78	4.49	7.75	36.78	-4.49	0.000%
36	-8.94	-36.78	0.01	8.94	36.78	-0.01	0.000%
37	-7.74	-36.78	-4.47	7.74	36.78	4.47	0.000%
38	-4.46	-36.78	-7.76	4.46	36.78	7.76	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00005624
3	Yes	6	0.00000001	0.00010859
4	Yes	6	0.00000001	0.00011754
5	Yes	5	0.00000001	0.00019467
6	Yes	6	0.00000001	0.00010860
7	Yes	6	0.00000001	0.00011260
8	Yes	5	0.00000001	0.00008226
9	Yes	6	0.00000001	0.00011640
10	Yes	6	0.00000001	0.00010760
11	Yes	5	0.00000001	0.00016803
12	Yes	6	0.00000001	0.00011511
13	Yes	6	0.00000001	0.00011096
14	Yes	4	0.00000001	0.00011724
15	Yes	6	0.00000001	0.00015600
16	Yes	6	0.00000001	0.00022561
17	Yes	6	0.00000001	0.00023103
18	Yes	6	0.00000001	0.00015412
19	Yes	6	0.00000001	0.00022077
20	Yes	6	0.00000001	0.00022349
21	Yes	6	0.00000001	0.00015384
22	Yes	6	0.00000001	0.00022892
23	Yes	6	0.00000001	0.00022306
24	Yes	6	0.00000001	0.00015523
25	Yes	6	0.00000001	0.00023067
26	Yes	6	0.00000001	0.00022837
27	Yes	4	0.00000001	0.00034387
28	Yes	5	0.00000001	0.00021835
29	Yes	5	0.00000001	0.00025331
30	Yes	4	0.00000001	0.00082439
31	Yes	5	0.00000001	0.00021642
32	Yes	5	0.00000001	0.00023159
33	Yes	4	0.00000001	0.00037501
34	Yes	5	0.00000001	0.00024808
35	Yes	5	0.00000001	0.00021436
36	Yes	4	0.00000001	0.00078710
37	Yes	5	0.00000001	0.00024281
38	Yes	5	0.00000001	0.00022641

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 123.42	41.41	28	2.71	0.01
L2	126.59 - 115.25	28.74	28	2.34	0.01
L3	115.25 - 105.25	23.52	28	2.02	0.01
L4	105.25 - 101.9	19.56	28	1.76	0.00

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L5	101.9 - 101.25	18.34	28	1.70	0.00
L6	101.25 - 85.96	18.11	28	1.69	0.00
L7	90.04 - 76.25	14.38	28	1.48	0.00
L8	76.25 - 75	10.39	28	1.26	0.00
L9	75 - 72.15	10.06	28	1.24	0.00
L10	72.15 - 42.41	9.34	28	1.19	0.00
L11	47.58 - 31.25	4.22	28	0.80	0.00
L12	31.25 - 18.75	1.84	28	0.56	0.00
L13	18.75 - 0	0.66	28	0.34	0.00

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
152.00	1900MHz RRH (65MHz)	28	41.41	2.71	0.01	9490
137.00	7770.00 w/ Mount Pipe	28	34.16	2.54	0.01	3649
127.00	Platform Mount [LP 712-1]	28	28.94	2.35	0.01	2112
117.00	T-Arm Mount [TA 601-3]	28	24.27	2.07	0.01	1926
75.00	Side Arm Mount [SO 701-1]	28	10.06	1.24	0.00	3287

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 123.42	118.96	2	7.80	0.04
L2	126.59 - 115.25	82.65	2	6.72	0.02
L3	115.25 - 105.25	67.66	2	5.80	0.02
L4	105.25 - 101.9	56.28	3	5.08	0.01
L5	101.9 - 101.25	52.79	3	4.90	0.01
L6	101.25 - 85.96	52.12	3	4.87	0.01
L7	90.04 - 76.25	41.41	3	4.27	0.01
L8	76.25 - 75	29.92	3	3.63	0.01
L9	75 - 72.15	28.98	3	3.56	0.01
L10	72.15 - 42.41	26.89	3	3.44	0.01
L11	47.58 - 31.25	12.16	3	2.32	0.00
L12	31.25 - 18.75	5.29	3	1.61	0.00
L13	18.75 - 0	1.91	3	0.99	0.00

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
152.00	1900MHz RRH (65MHz)	2	118.96	7.80	0.04	3421
137.00	7770.00 w/ Mount Pipe	2	98.20	7.31	0.03	1314
127.00	Platform Mount [LP 712-1]	2	83.23	6.75	0.02	757
117.00	T-Arm Mount [TA 601-3]	2	69.83	5.95	0.02	685
75.00	Side Arm Mount [SO 701-1]	3	28.98	3.56	0.01	1151

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	150 - 123.42 (1)	TP20.74x15x0.1875	26.58	0.00	0.0	39.00	11.8239	-5.59	461.13	0.012
L2	123.42 - 115.25 (2)	TP22.0918x19.6804x0.25	11.34	0.00	0.0	39.00	17.3314	-7.46	675.93	0.011
L3	115.25 - 105.25 (3)	TP24.2182x22.0918x0.3845	10.00	0.00	0.0	33.37	29.0829	-8.83	970.38	0.009
L4	105.25 - 101.9 (4)	TP24.9305x24.2182x0.5774	3.35	0.00	0.0	23.98	44.6274	-9.45	1070.25	0.009
L5	101.9 - 101.25 (5)	TP25.0687x24.9305x0.6054	0.65	0.00	0.0	25.88	47.0050	-9.59	1216.68	0.008
L6	101.25 - 85.96 (6)	TP28.32x25.0687x0.5671	15.29	0.00	0.0	26.00	48.3921	-11.77	1258.39	0.009
L7	85.96 - 76.25 (7)	TP29.8904x26.3182x0.6021	13.79	0.00	0.0	26.08	55.9700	-15.43	1459.81	0.011
L8	76.25 - 75 (8)	TP30.1567x29.8904x0.599	1.25	0.00	0.0	26.09	56.1922	-15.71	1466.28	0.011
L9	75 - 72.15 (9)	TP30.7639x30.1567x0.7005	2.85	0.00	0.0	26.12	66.8416	-16.52	1745.77	0.009
L10	72.15 - 42.41 (10)	TP37.1x30.7639x0.6479	29.74	0.00	0.0	27.43	72.6918	-23.13	1993.65	0.012
L11	42.41 - 31.25 (11)	TP38.849x34.7028x0.5358	16.33	0.00	0.0	34.58	60.3389	-25.67	2086.40	0.012
L12	31.25 - 18.75 (12)	TP41.5094x38.849x0.5216	12.50	0.00	0.0	34.68	65.6568	-30.23	2276.98	0.013
L13	18.75 - 0 (13)	TP45.5x41.5094x0.4491	18.75	0.00	0.0	37.50	58.5330	-31.94	2194.99	0.015

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	150 - 123.42 (1)	TP20.74x15x0.1875	193.94	40.21	39.00	1.031	0.00	0.00	39.00	0.000
L2	123.42 - 115.25 (2)	TP22.0918x19.6804x0.25	377.13	48.62	39.00	1.247	0.00	0.00	39.00	0.000
L3	115.25 - 105.25 (3)	TP24.2182x22.0918x0.3845	554.39	39.21	33.37	1.175	0.00	0.00	33.37	0.000
L4	105.25 - 101.9 (4)	TP24.9305x24.2182x0.5774	615.42	27.97	23.98	1.166	0.00	0.00	23.98	0.000
L5	101.9 - 101.25 (5)	TP25.0687x24.9305x0.6054	627.36	26.98	25.88	1.042	0.00	0.00	25.88	0.000
L6	101.25 - 85.96 (6)	TP28.32x25.0687x0.5671	838.53	31.75	26.00	1.221	0.00	0.00	26.00	0.000
L7	85.96 - 76.25 (7)	TP29.8904x26.3182x0.6021	1112.73	33.43	26.08	1.282	0.00	0.00	26.08	0.000
L8	76.25 - 75 (8)	TP30.1567x29.8904x0.599	1138.34	33.74	26.09	1.293	0.00	0.00	26.09	0.000
L9	75 - 72.15 (9)	TP30.7639x30.1567x0.7005	1197.47	29.42	26.12	1.127	0.00	0.00	26.12	0.000
L10	72.15 - 42.41 (10)	TP37.1x30.7639x0.6479	1734.47	33.16	27.43	1.209	0.00	0.00	27.43	0.000
L11	42.41 - 31.25 (11)	TP38.849x34.7028x0.5358	1854.07	42.42	34.58	1.227	0.00	0.00	34.58	0.000
L12	31.25 - 18.75 (12)	TP41.5094x38.849x0.5216	2270.68	42.63	34.68	1.229	0.00	0.00	34.68	0.000
L13	18.75 - 0 (13)	TP45.5x41.5094x0.4491	2424.78	49.21	37.50	1.312	0.00	0.00	37.50	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	150 - 123.42 (1)	TP20.74x15x0.1875	15.63	1.32	26.00	0.102	1.71	0.17	26.00	0.007
L2	123.42 - 115.25 (2)	TP22.0918x19.6804x0.25	17.38	1.00	26.00	0.077	1.68	0.11	26.00	0.004
L3	115.25 - 105.25 (3)	TP24.2182x22.0918x0.3845	18.09	0.62	22.24	0.056	1.69	0.06	22.24	0.003
L4	105.25 - 101.9 (4)	TP24.9305x24.2182x0.5774	18.35	0.41	15.99	0.051	1.70	0.04	15.99	0.002
L5	101.9 - 101.25 (5)	TP25.0687x24.9305x0.6054	18.40	0.39	17.26	0.045	1.70	0.04	17.26	0.002
L6	101.25 - 85.96 (6)	TP28.32x25.0687x0.5671	19.28	0.40	17.34	0.046	1.71	0.03	17.34	0.002
L7	85.96 - 76.25 (7)	TP29.8904x26.3182x0.6021	20.44	0.37	17.39	0.042	1.73	0.02	17.39	0.001
L8	76.25 - 75 (8)	TP30.1567x29.8904x0.599	20.54	0.37	17.40	0.042	1.73	0.02	17.40	0.001
L9	75 - 72.15 (9)	TP30.7639x30.1567x0.7005	20.88	0.31	17.41	0.036	1.71	0.02	17.41	0.001
L10	72.15 - 42.41 (10)	TP37.1x30.7639x0.6479	22.88	0.31	18.28	0.034	1.76	0.02	18.28	0.001
L11	42.41 - 31.25 (11)	TP38.849x34.7028x0.5358	23.46	0.39	23.05	0.033	1.78	0.02	23.05	0.001
L12	31.25 - 18.75 (12)	TP41.5094x38.849x0.5216	24.54	0.37	23.12	0.032	1.81	0.02	23.12	0.001
L13	18.75 - 0 (13)	TP45.5x41.5094x0.4491	24.92	0.43	25.00	0.034	1.82	0.02	25.00	0.001

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150 - 123.42 (1)	0.012	1.031	0.000	0.102	0.007	1.046 ✔	1.333	H1-3+VT ✔
L2	123.42 - 115.25 (2)	0.011	1.247	0.000	0.077	0.004	1.260 ✔	1.333	H1-3+VT ✔
L3	115.25 - 105.25 (3)	0.009	1.175	0.000	0.056	0.003	1.185 ✔	1.333	H1-3+VT ✔
L4	105.25 - 101.9 (4)	0.009	1.166	0.000	0.051	0.002	1.176 ✔	1.333	H1-3+VT ✔
L5	101.9 - 101.25 (5)	0.008	1.042	0.000	0.045	0.002	1.051 ✔	1.333	H1-3+VT ✔
L6	101.25 - 85.96 (6)	0.009	1.221	0.000	0.046	0.002	1.231 ✔	1.333	H1-3+VT ✔
L7	85.96 - 76.25 (7)	0.011	1.282	0.000	0.042	0.001	1.293 ✔	1.333	H1-3+VT ✔
L8	76.25 - 75 (8)	0.011	1.293	0.000	0.042	0.001	1.304 ✔	1.333	H1-3+VT ✔
L9	75 - 72.15 (9)	0.009	1.127	0.000	0.036	0.001	1.136 ✔	1.333	H1-3+VT ✔
L10	72.15 - 42.41 (10)	0.012	1.209	0.000	0.034	0.001	1.221 ✔	1.333	H1-3+VT ✔
L11	42.41 - 31.25 (11)	0.012	1.227	0.000	0.033	0.001	1.239 ✔	1.333	H1-3+VT ✔
L12	31.25 - 18.75 (12)	0.013	1.229	0.000	0.032	0.001	1.243 ✔	1.333	H1-3+VT ✔
L13	18.75 - 0 (13)	0.015	1.312	0.000	0.034	0.001	1.327	1.333	H1-3+VT ✔

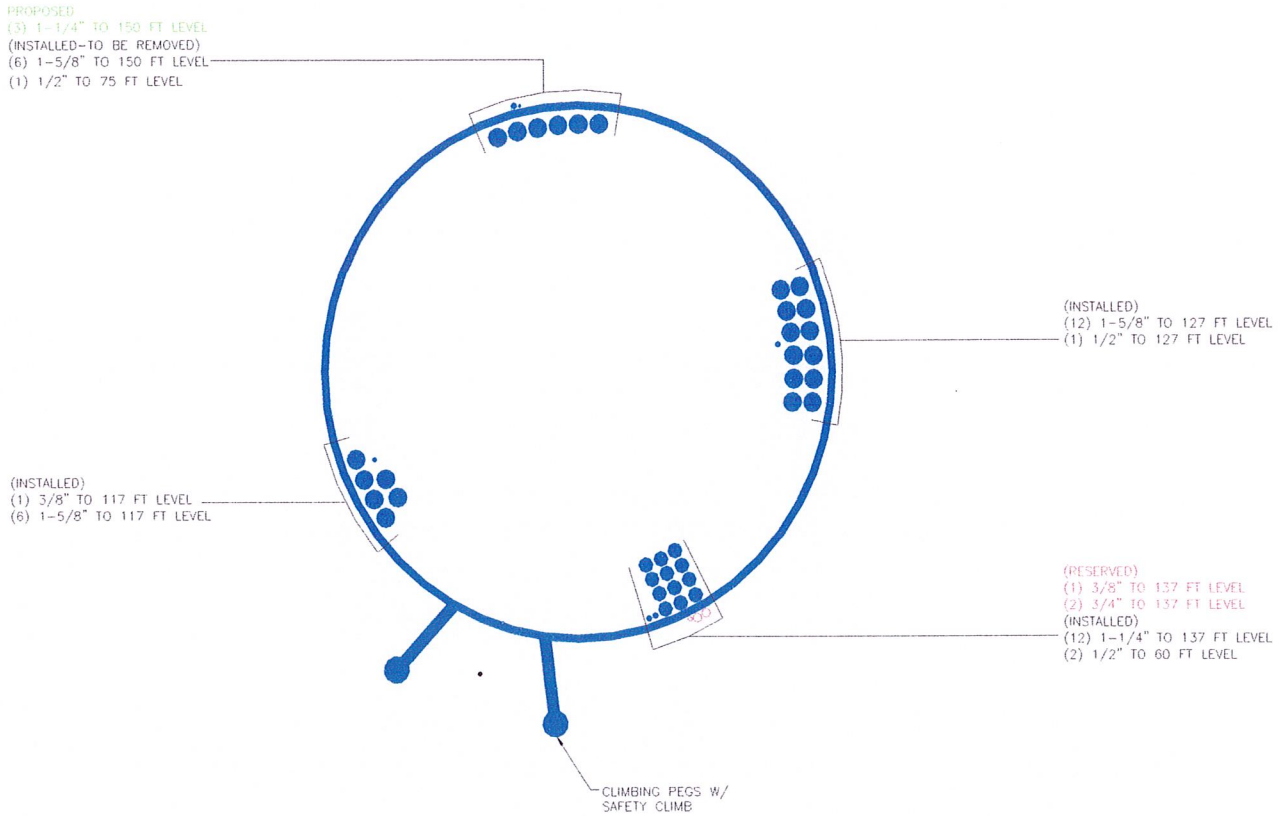
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio ✔	Allow. Stress Ratio	Criteria

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	150 - 123.42	Pole	TP20.74x15x0.1875	1	-5.59	614.69	78.5	Pass
L2	123.42 - 115.25	Pole	TP22.0918x19.6804x0.25	2	-7.46	901.01	94.5	Pass
L3	115.25 - 105.25	Pole	TP24.2182x22.0918x0.3845	3	-8.83	1293.52	88.9	Pass
L4	105.25 - 101.9	Pole	TP24.9305x24.2182x0.5774	4	-9.45	1426.64	88.2	Pass
L5	101.9 - 101.25	Pole	TP25.0687x24.9305x0.6054	5	-9.59	1621.83	78.8	Pass
L6	101.25 - 85.96	Pole	TP28.32x25.0687x0.5671	6	-11.77	1677.43	92.4	Pass
L7	85.96 - 76.25	Pole	TP29.8904x26.3182x0.6021	7	-15.43	1945.93	97.0	Pass
L8	76.25 - 75	Pole	TP30.1567x29.8904x0.599	8	-15.71	1954.55	97.8	Pass
L9	75 - 72.15	Pole	TP30.7639x30.1567x0.7005	9	-16.52	2327.11	85.3	Pass
L10	72.15 - 42.41	Pole	TP37.1x30.7639x0.6479	10	-23.13	2657.54	91.6	Pass
L11	42.41 - 31.25	Pole	TP38.849x34.7028x0.5358	11	-25.67	2781.17	93.0	Pass
L12	31.25 - 18.75	Pole	TP41.5094x38.849x0.5216	12	-30.23	3035.21	93.2	Pass
L13	18.75 - 0	Pole	TP45.5x41.5094x0.4491	13	-31.94	2925.92	99.6	Pass
							Summary	
						Pole (L13)	99.6	Pass
						RATING =	**99.6**	**Pass**

APPENDIX B

BASE LEVEL DRAWING

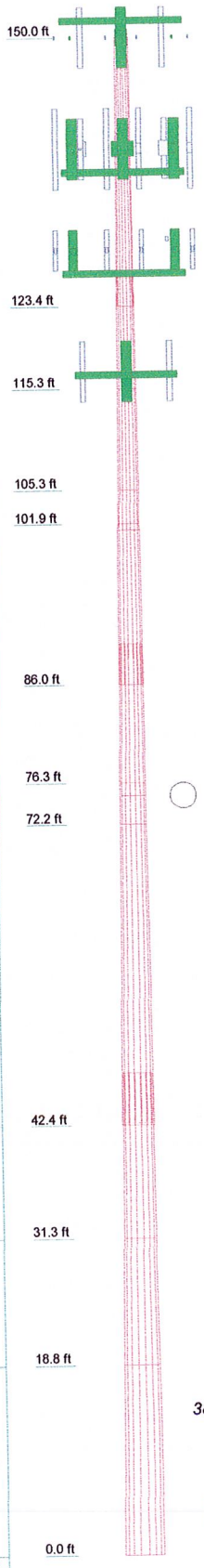

PROPOSED
(3) 1-1/4" TO 150 FT LEVEL
(INSTALLED-TO BE REMOVED)
(6) 1-5/8" TO 150 FT LEVEL
(1) 1/2" TO 75 FT LEVEL
(INSTALLED)
(12) 1-5/8" TO 127 FT LEVEL
(1) 1/2" TO 127 FT LEVEL
(INSTALLED)
(1) 3/8" TO 117 FT LEVEL
(6) 1-5/8" TO 117 FT LEVEL
(RESERVED)
(1) 3/8" TO 137 FT LEVEL
(2) 3/4" TO 137 FT LEVEL
(INSTALLED)
(12) 1-1/4" TO 137 FT LEVEL
(2) 1/2" TO 60 FT LEVEL
CLIMBING PEGS W/
SAFETY CLIMB

APPENDIX C

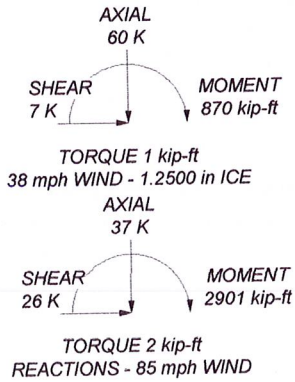
ADDITIONAL CALCULATIONS

Program Version 6.0.3.0 - 12/7/2011 File:T:/375_Crown_Castle/2012/37512-1027 BU 876362/37512-1027 BP R2 - WO512743 BU 876362/Aero/37512-1027 Reinforced - Aero - Check.eri

Program Version 6.0.3.0 - 12/7/2011 File:T:/375_Crown_Castle/2012/37512-1027 BU 876362/37512-1027 BP R2 - WO512743 BU 876362/Aero/37512-1027 Reinforced - Aero - Check.eri



Section	1	2	3	4	5	6	7	8	9	10	11	12	13
Length (ft)	26.58	11.34	10.00	0.63	0.35	15.29	13.79	2.85	1.25	29.74	16.33	12.50	18.75
Number of Sides	18	18	18	18	18	18	18	18	18	18	18	18	18
Thickness (in)	0.1875	0.2500	0.3845	0.5774	0.6053	0.5671	0.6021	0.7705	0.5990	0.6479	0.5358	0.5216	0.4491
Socket Length (ft)	3.17					4.08				5.17			
Top Dia (in)	15.0000	19.6804	22.0918	24.5182	24.9305	25.0687	26.3182	30.1568	29.8904	30.7639	34.7028	38.8490	41.5094
Bot Dia (in)	20.7400	22.0918	24.2182	24.9305	25.3437	28.3200	29.8904	30.7639	29.9567	37.1000	38.8490	41.5094	45.5000
Grade	A572-65					Reinf 43.34 ksi	Reinf 43.47 ksi	Reinf 43.53 ksi		Reinf 45.71 ksi	Reinf 57.63 ksi	Reinf 57.80 ksi	Reinf 62.50 ksi
Weight (K)	1.0	0.6	0.9	0.5	0.1	2.4	2.5	0.2	0.6	6.9	3.4	2.8	3.9



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
1900MHz RRH (65MHz)	152	7770.00 w/ Mount Pipe	137
800 EXTERNAL NOTCH FILTER	152	7770.00 w/ Mount Pipe	137
800MHZ RRH	152	(2) LGP21901	137
(3) ACU-A20-N	152	(2) LGP21901	137
APXVSPP18-C-A20 w/ Mount Pipe	152	(2) LGP21901	137
1900MHz RRH (65MHz)	152	(2) DD1900 FULL BAND w/850 BY-PASS MASTHEAD	137
800 EXTERNAL NOTCH FILTER	152	(2) DD1900 FULL BAND w/850 BY-PASS MASTHEAD	137
800MHZ RRH	152	(2) DD1900 FULL BAND w/850 BY-PASS MASTHEAD	137
(3) ACU-A20-N	152	BXA-70063-4CF-EDIN-X w/ Mount Pipe	127
APXVSPP18-C-A20 w/ Mount Pipe	152	BXA-171063-12BF w/ Mount Pipe	127
1900MHz RRH (65MHz)	152	BXA-70063-4CF-EDIN-X w/ Mount Pipe	127
800 EXTERNAL NOTCH FILTER	152	Platform Mount [LP 712-1]	127
800MHZ RRH	152	GPS_A	127
(3) ACU-A20-N	152	(2) APL866513-42T0 w/ Mount Pipe	127
APXVSPP18-C-A20 w/ Mount Pipe	152	(2) APL866513-42T0 w/ Mount Pipe	127
Platform Mount [LP 602-1]	152	(2) APL866513-42T0 w/ Mount Pipe	127
8-ft Ladder	152	(2) FD9R6004/2C-3L	127
Platform Mount [LP 712-1]	137	(2) FD9R6004/2C-3L	127
Collar Mount (MTC3335)	137	(2) FD9R6004/2C-3L	127
(2) SBNH-1D6565C w/ Mount Pipe	137	BXA-171063-12BF w/ Mount Pipe	127
(2) SBNH-1D6565C w/ Mount Pipe	137	BXA-70063-4CF-EDIN-X w/ Mount Pipe	127
(2) AM-X-CD-16-65-00T-RET w/ Mount Pipe	137	BXA-171063-12BF w/ Mount Pipe	127
(2) DTMABP7819VG12A	137	HBX-6516DS-VTM w/ Mount Pipe	117
(2) DTMABP7819VG12A	137	T-Arm Mount [TA 601-3]	117
(2) DTMABP7819VG12A	137	HBX-6516DS-VTM w/ Mount Pipe	117
7020.00	137	HBX-6516DS-VTM w/ Mount Pipe	117
7020.00	137	OG-860/1920/GPS-A	75
7020.00	137	Side Arm Mount [SO 701-1]	75
RRUS-11	137		
RRUS-11	137		
RRUS-11	137		
DC6-48-60-18-8F	137		
7770.00 w/ Mount Pipe	137		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi	Reinf 43.49 ksi	43 ksi	65 ksi
Reinf 55.61 ksi	56 ksi	70 ksi	Reinf 43.53 ksi	44 ksi	65 ksi
Reinf 39.97 ksi	40 ksi	65 ksi	Reinf 45.71 ksi	46 ksi	58 ksi
Reinf 43.14 ksi	43 ksi	65 ksi	Reinf 57.63 ksi	58 ksi	73 ksi
Reinf 43.34 ksi	43 ksi	55 ksi	Reinf 57.80 ksi	58 ksi	73 ksi
Reinf 43.47 ksi	43 ksi	55 ksi	Reinf 62.50 ksi	63 ksi	79 ksi

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 1.25 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 99.6%

Paul J. Ford and Company
250 East Broad St, Suite 1500
Columbus, OH 43215
Phone: 614.221.6679
FAX:

Job:	***150' MP; Oxford, CT; Oxford/ Fritz Property***		
Project:	***PJF 37512-1027 Rev (BU 876362)***		
Client: Crown Castle	Drawn by: TDehnke	App'd:	
Code: TIA/EIA-222-F	Date: 07/23/12	Scale: NTS	
Path:		Dwg No. E-1	

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

TIA Rev F

Site Data

BU#:	
Site Name:	
App #:	
Pole Manufacturer:	*Other*

Reactions		
Moment:	2332.44	ft-kips
Axial:	37	kips
Shear:	26	kips

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

Anchor Rod Data		
Qty:	12	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	54	in

Plate Data		
Diam:	60	in
Thick:	1.75	in
Grade:	60	ksi
Single-Rod B-eff:	12.03	in

Stiffener Data (Welding at both sides)		
Config:	3	*
Weld Type:	Both	
Groove Depth:	0.25	in **
Groove Angle:	45	degrees
Fillet H. Weld:	0.375	in
Fillet V. Weld:	0.375	in
Width:	6.75	in
Height:	13.75	in
Thick:	0.5	in
Notch:	0.75	in
Grade:	50	ksi
Weld str.:	80	ksi
Clear Space between Stiffeners (b):	5.5	in

Pole Data		
Diam:	45.5	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Anchor Rod Results

		Stiffened
Maximum Rod Tension:	169.7 Kips	Service, ASD
Allowable Tension:	195.0 Kips	Fty*ASIF
Anchor Rod Stress Ratio:	87.0% Pass	

Base Plate Results

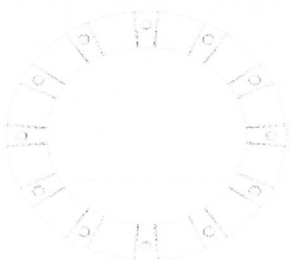
	Shear Check Only	Stiffened
Base Plate Stress:	7.4 ksi	Service, ASD
Allowable Plate Stress:	32.0 ksi	0.75*Fy*ASIF
Base Plate Stress Ratio:	23.3% Pass	Y.L. Length: N/A, Roark

Stiffener Results

Horizontal Weld :	54.1% Pass
Vertical Weld:	33.0% Pass
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	28.2% Pass
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	56.7% Pass
Plate Comp. (AISC Bracket):	72.8% Pass

Pole Results

Pole Punching Shear Check:	13.2% Pass



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

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

PAUL J. FORD AND COMPANY
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Phone 614-221-6679 • Fax 614-448-4105 • www.PJFweb.com

v4.1 - Effective 7-3-12

Date: 7/23/2012
PJF Project: 37512-1027
Client Ref. # 876362
Site Name:
Description:
Owner:
Engineer: TJD

Asymmetric Anchor Rod Analysis

Moment =	2901	k-ft	TIA Ref.	F		Location =	Base Plate	
Axial =	37.0	kips	ASIF =	1.3333		η =	N/A	for BP, Rev. G Sect. 4.9.9
Shear =	26.0	kips	Max Ratio =	100.0%		Threads =	N/A	for FP, Rev. G
Anchor Qty =	15							

** For Post Installed Anchors: Check anchors for embedment, epoxy/grout bond, and capacity based on proof load. **

Item	Nominal Anchor Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Anchor Circle, in	Area Override, in^2	Area, in^2	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	2.250	#18J A615 Gr 75	75	100	0.0	54.00	0.00	3.98	175.05	169.69	169.69	0.00	195.00	87.0%
2	2.250	#18J A615 Gr 75	75	100	30.0	54.00	0.00	3.98	175.05	169.69	169.69	0.00	195.00	87.0%
3	2.250	#18J A615 Gr 75	75	100	60.0	54.00	0.00	3.98	175.05	169.69	169.69	0.00	195.00	87.0%
4	2.250	#18J A615 Gr 75	75	100	90.0	54.00	0.00	3.98	175.05	169.69	169.69	0.00	195.00	87.0%
5	2.250	#18J A615 Gr 75	75	100	120.0	54.00	0.00	3.98	175.05	169.69	169.69	0.00	195.00	87.0%
6	2.250	#18J A615 Gr 75	75	100	150.0	54.00	0.00	3.98	175.05	169.69	169.69	0.00	195.00	87.0%
7	2.250	#18J A615 Gr 75	75	100	180.0	54.00	0.00	3.98	175.05	169.69	169.69	0.00	195.00	87.0%
8	2.250	#18J A615 Gr 75	75	100	210.0	54.00	0.00	3.98	175.05	169.69	169.69	0.00	195.00	87.0%
9	2.250	#18J A615 Gr 75	75	100	240.0	54.00	0.00	3.98	175.05	169.69	169.69	0.00	195.00	87.0%
10	2.250	#18J A615 Gr 75	75	100	270.0	54.00	0.00	3.98	175.05	169.69	169.69	0.00	195.00	87.0%
11	2.250	#18J A615 Gr 75	75	100	300.0	54.00	0.00	3.98	175.05	169.69	169.69	0.00	195.00	87.0%
12	2.250	#18J A615 Gr 75	75	100	330.0	54.00	0.00	3.98	175.05	169.69	169.69	0.00	195.00	87.0%
13	1.750	A193 Gr B7	105	125	15.0	69.00	0.00	2.41	134.72	131.49	131.49	0.00	132.29	99.4%
14	1.750	A193 Gr B7	105	125	135.0	69.00	0.00	2.41	134.72	131.49	131.49	0.00	132.29	99.4%
15	1.750	A193 Gr B7	105	125	255.0	69.00	0.00	2.41	134.72	131.49	131.49	0.00	132.29	99.4%
								54.98						

PJF job no. **37512-1027R1 A** Project name **150' MP**

Foundation Loads:

Pole weight or tower leg compression =	37	(kips)
Horizontal load at top of pier =	26	(kips)
Overturning moment at top of pier=	2901	(ft-kips)

Design criteria:

Safety factor against overturning =	1.5	

Soil Properties:

Soil density =	100	(pcf)
Allowable soil bearing =	16	(ksf)
Depth to water table =	99	(ft)

Dimensions:

Pier shape (round or square)	S	("R" or "S")
Pier width =	6	(ft)
Pier height above grade =	1	(ft)
depth to bottom of footing =	5	(ft)
Footing thickness =	4.5	(ft)
Footing width =	22.75	(ft)
Footing length =	22.75	(ft)

Concrete:

Concrete strength =	4	(ksi)
Rebar strength =	60	(ksi)
ultimate load factor =	1.3	

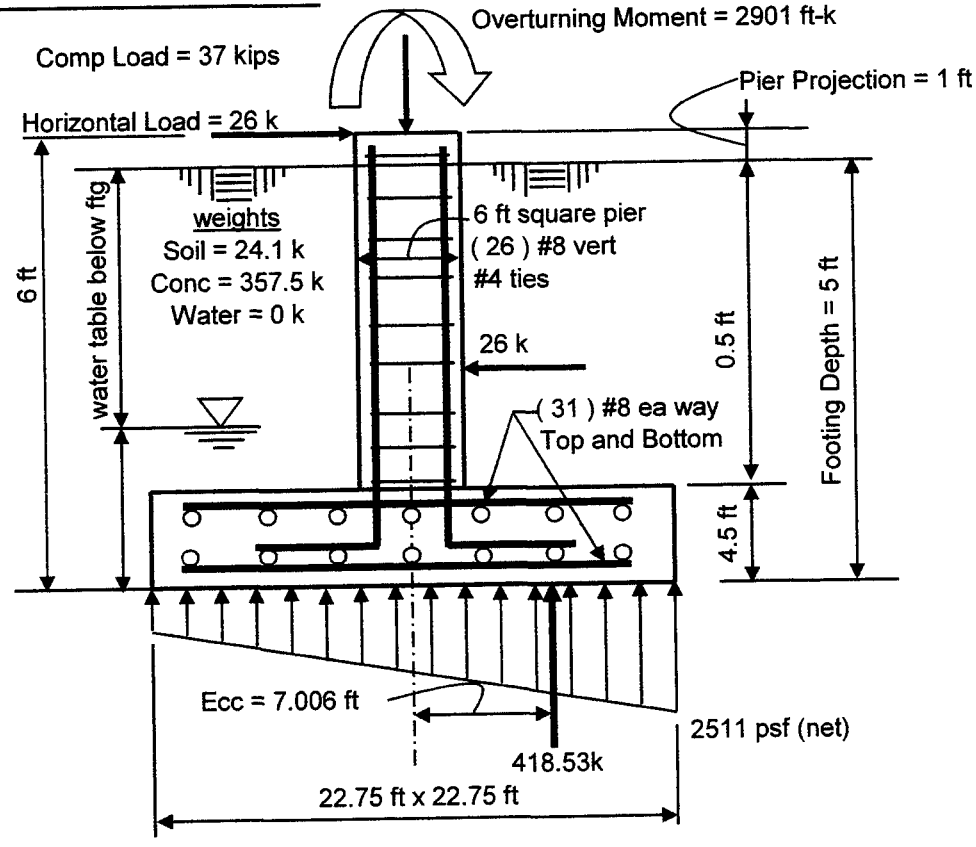
Reinforcing Steel:

	Pad	
minimum cover over rebar =	3	inches
size of pad rebar =	#8	bar
quantity of pad rebar =	31	(ea direction)

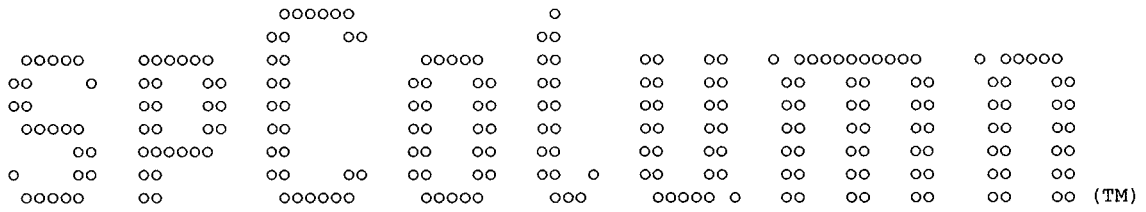
Reinforcing Steel:

	Pier	
size of vert rebar in pier=	#8	bar
vertical rebar quantity =	26	
size of pier ties =	#4	bar
minimum cover over rebar =	4.5	inches

Total volume of concrete = 88.3 cu yd



Summary of analysis results	
Maximum Net Soil Bearing = 2.511 ksf Allowable Net Soil Bearing = 16 ksf **Soil Bearing Stress Ratio = 0.16 Okay**	Ult Bending Shear Capacity = 126 psi Ult Bending Shear Stress = 23 psi **Bending Shear Stress Ratio = 0.18 Okay**
Ftg Overturning Resistance = 4761 ft-kips Overturning Moment = 2932 ft-kips Required Overturning Safety Factor = 1.5 Overturning Safety Factor = 1.624 **Ratio = 0.92 Okay**	Pad Bending Moment Capacity= 5368 ft-k Pad Bending Moment = 1539 ft-k **Bending Moment Stress Ratio = 0.29 OK**



spColumn v4.80 (TM)
Computer program for the Strength Design of Reinforced Concrete Sections

General Information:
==========
File Name: T:\375_Crown_Castle\2012\37512-1027 BU 876362\...\37512-1027R1_B_anchor fully develop.col
Project: 37512-1027
Column: Engineer: lgr
Code: ACI 318-08 Units: English

Run Option: Investigation Slenderness: Not considered
Run Axis: X-axis Column Type: Structural

Material Properties:
==========
f'c = 4 ksi fy = 60 ksi
Ec = 3605 ksi Es = 29000 ksi
Ultimate strain = 0.003 in/in
Beta1 = 0.85

Section:
==========
Rectangular: Width = 72 in Depth = 72 in

Gross section area, Ag = 5184 in^2
Ix = 2.23949e+006 in^4 Iy = 2.23949e+006 in^4
rx = 20.7846 in ry = 20.7846 in
Xo = 0 in Yo = 0 in

Reinforcement:
==========
Bar Set: ASTM A615

Size	Diam (in)	Area (in^2)	Size	Diam (in)	Area (in^2)	Size	Diam (in)	Area (in^2)
# 3	0.38	0.11	# 4	0.50	0.20	# 5	0.63	0.31
# 6	0.75	0.44	# 7	0.88	0.60	# 8	1.00	0.79
# 9	1.13	1.00	# 10	1.27	1.27	# 11	1.41	1.56
# 14	1.69	2.25	# 18	2.26	4.00			

Confinement: Tied; #4 ties with #10 bars, #4 with larger bars.
phi(a) = 0.8, phi(b) = 0.9, phi(c) = 0.65

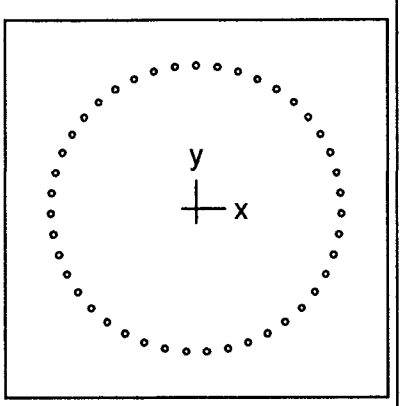
Layout: Circular
Pattern: All Sides Equal (Cover to transverse reinforcement)
Total steel area: As = 54.61 in^2 at rho = 1.05%
Minimum clear spacing = 2.72 in

43 #10 Cover = 7.56 in

Factored Loads and Moments with Corresponding Capacities:
==========

No.	Pu kip	Mux k-ft	PhiMnx k-ft	PhiMn/Mu	NA depth in	Dt depth in	eps_t	Phi
1	0.00	3822.00	7245.47	1.896	11.65	63.23	0.01330	0.900

*** End of output ***



72 x 72 in

Code: ACI 318-08

Units: English

Run axis: About X-axis

Run option: Investigation

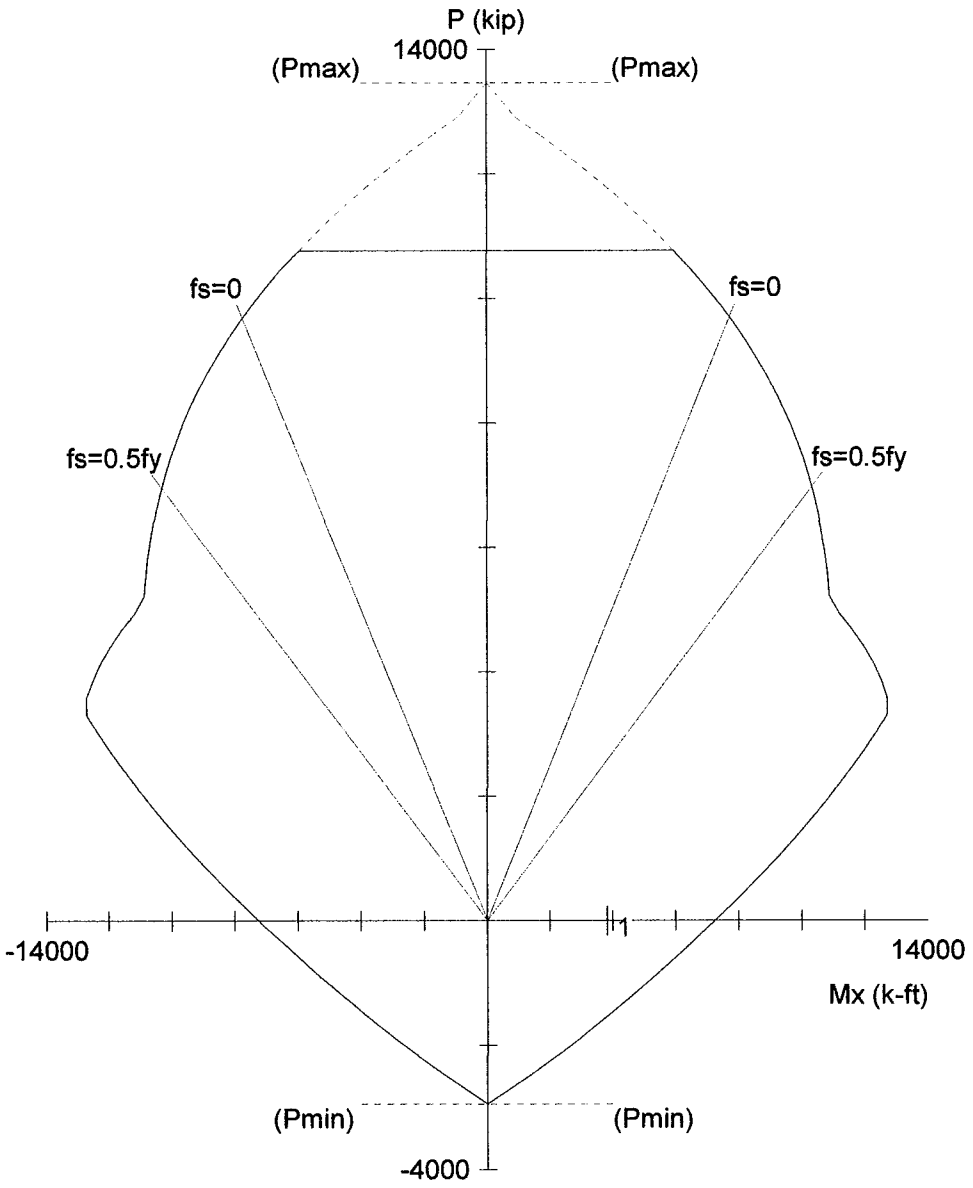
Slenderness: Not considered

Column type: Structural

Bars: ASTM A615

Date: 07/24/12

Time: 10:32:07



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File: T:\375_Crown_Castle\2012\37512-1027 BU 876362\37512-1027 BP R2...\37512-1027R1_B_anchor fully develop.col

Project: 37512-1027

Column:

Engineer: lgr

f'c = 4 ksi	fy = 60 ksi	Ag = 5184 in^2	43 #10 bars
Ec = 3605 ksi	Es = 29000 ksi	As = 54.61 in^2	rho = 1.05%
fc = 3.4 ksi		Xo = 0.00 in	Ix = 2.23949e+006 in^4
e_u = 0.003 in/in		Yo = 0.00 in	Iy = 2.23949e+006 in^4
Beta1 = 0.85		Min clear spacing = 2.72 in	Clear cover = 8.06 in

Confinement: Tied

phi(a) = 0.8, phi(b) = 0.9, phi(c) = 0.65

CROWN CASTLE PROJECT: BU #876362; OXFORD / FRITZ PROPERTY; OXFORD, CT
MONOPOLE RETROFIT PROJECT MASTER NOTES DOCUMENT (REV. 2, 1/22/2009)

UPON THE SUCCESSFUL AND COMPLETE INSTALLATION OF THE REINFORCING SYSTEM SPECIFIED IN THESE PLANS, THE REINFORCED POLE MEETS THE WIND DESIGN RECOMMENDATIONS OF THE TIA/EIA-222-F-1996 STANDARD FOR WIND SPEEDS OF 85 MPH AND 37.6 MPH + 1 1/4" RADIAL ICE

A. GENERAL NOTES

1. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS PRIOR TO FABRICATION AND CONSTRUCTION. THESE DRAWINGS WERE PREPARED FROM INFORMATION AND DOCUMENTS PROVIDED TO PAUL J. FORD & COMPANY BY CROWN CASTLE. THIS INFORMATION PROVIDED HAS NOT BEEN FIELD VERIFIED BY PAUL J. FORD & COMPANY FOR ACCURACY AND THEREFORE DISCREPANCIES BETWEEN THESE DRAWINGS AND ACTUAL SITE CONDITIONS SHOULD BE ANTICIPATED. ANY DISCREPANCIES AND/OR CHANGES BETWEEN THE INFORMATION CONTAINED IN THESE DRAWINGS AND THE ACTUAL VERIFIED SITE CONDITIONS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF CROWN CASTLE AND PAUL J. FORD & COMPANY SO THAT ANY CHANGES AND/OR ADJUSTMENTS, IF NECESSARY, CAN BE MADE TO THE DESIGN AND DRAWINGS.
2. THE EXISTING UNREINFORCED MONOPOLE STRUCTURE DOES NOT HAVE THE STRUCTURAL CAPACITY TO CARRY ALL OF THE ANTENNA AND PLATFORM LOADS SHOWN ON THESE DRAWINGS AT THE REQUIRED MINIMUM TIA/EIA-222-F BASIC WIND SPEEDS. DO NOT INSTALL ANY ADDITIONAL OR NEW ANTENNA AND PLATFORM LOADS UNTIL THE MONOPOLE REINFORCING SYSTEM IS COMPLETELY AND SUCCESSFULLY INSTALLED.
3. IF MATERIALS, QUANTITIES, STRENGTHS OR SIZES INDICATED BY THE DRAWINGS OR SPECIFICATIONS ARE NOT IN AGREEMENT WITH THESE NOTES, THE BETTER QUALITY AND/OR GREATER QUANTITY, STRENGTH OR SIZE INDICATED, SPECIFIED OR NOTED SHALL BE PROVIDED.
4. THIS STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER THE INSTALLATION OF THE REINFORCING REPAIR SYSTEM HAS BEEN PROPERLY AND ADEQUATELY COMPLETED. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO ENSURE THE SAFETY AND STABILITY OF THE MONOPOLE AND ITS COMPONENT PARTS DURING FIELD MODIFICATIONS. THIS INCLUDES, BUT IS NOT LIMITED TO, THE ADDITION OF WHATEVER TEMPORARY BRACING, GUYS OR TIE DOWNS THAT MAY BE NECESSARY. SUCH MATERIAL SHALL BE REMOVED AND SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AFTER THE COMPLETION OF THE PROJECT. IMPORTANT CUTTING, WELDING AND SAFETY GUIDELINES: THE CONTRACTOR SHALL FOLLOW ALL CROWN CASTLE CUTTING, WELDING, FIRE PREVENTION AND SAFETY GUIDELINES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL OBTAIN A COPY OF THE CURRENT CROWN CASTLE GUIDELINES FROM CROWN CASTLE. PER THE 12-01-2005 CROWN CASTLE DIRECTIVE: "ALL CUTTING AND WELDING ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH CROWN CASTLE POLICY 'CUTTING AND WELDING PLAN' (DOC # ENG-PLN-10015) ON AN ONGOING BASIS THROUGHOUT THE ENTIRE LIFE OF THE PROJECT".
5. THE STRUCTURAL CONTRACT DOCUMENTS DO NOT INDICATE THE METHOD OR MEANS OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES. OBSERVATION VISITS TO THE SITE BY THE OWNER AND/OR THE ENGINEER SHALL NOT INCLUDE INSPECTIONS OF THE PROTECTIVE MEASURES OR THE CONSTRUCTION PROCEDURES.
6. ANY SUPPORT SERVICES PERFORMED BY THE ENGINEER DURING CONSTRUCTION SHALL BE DISTINGUISHED FROM CONTINUOUS AND DETAILED INSPECTION SERVICES WHICH ARE FURNISHED BY THE INSPECTION/TESTING AGENCY. THESE SUPPORT SERVICES PERFORMED BY THE ENGINEER ARE SOLELY FOR THE PURPOSE OF ASSISTING IN QUALITY CONTROL AND IN ACHIEVING CONFORMANCE WITH CONTRACT DOCUMENTS. THEY DO NOT GUARANTEE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF CONSTRUCTION.
7. ALL MATERIALS AND EQUIPMENT FURNISHED WILL BE NEW AND OF GOOD QUALITY, FREE FROM FAULTS AND DEFECTS AND IN CONFORMANCE WITH THE CONTRACT DOCUMENTS. ANY AND ALL SUBSTITUTIONS MUST BE PROPERLY APPROVED AND AUTHORIZED IN WRITING BY THE OWNER AND ENGINEER PRIOR TO INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF MATERIALS AND EQUIPMENT BEING SUBSTITUTED.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT THIS PROJECT AND RELATED WORK COMPLIES WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY CODES AND REGULATIONS GOVERNING THIS WORK AS WELL AS CROWN CASTLE SAFETY GUIDELINES.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING AND NEW COAXIAL CABLES AND OTHER EQUIPMENT DURING CONSTRUCTION.
10. ANY EXISTING ATTACHMENTS AND/OR PROJECTIONS ON THE POLE THAT MAY INTERFERE WITH THE INSTALLATION OF THE REINFORCING SYSTEM WILL HAVE TO BE REMOVED, AND/OR RELOCATED, *AND/OR REPLACED AND RE-INSTALLED AFTER THE REINFORCING IS SUCCESSFULLY COMPLETED.* THE CONTRACTOR SHALL IDENTIFY AND COORDINATE THESE ITEMS PRIOR TO CONSTRUCTION WITH THE OWNER, TESTING AGENCY, AND ENGINEER.
11. ANY AND ALL EXISTING PLATFORMS THAT ARE LOCATED IN AREAS OF THE POLE SHAFT WHERE SHAFT REINFORCING MUST BE APPLIED SHALL BE TEMPORARILY REMOVED OR OTHERWISE SUPPORTED TO PERMIT NEW CONTINUOUS REINFORCEMENT TO BE ATTACHED. AFTER THE CONTRACTOR HAS SUCCESSFULLY INSTALLED THE MONOPOLE REINFORCEMENT SYSTEM, THE CONTRACTOR SHALL RE-INSTALL THE PLATFORMS. IN NO CASE SHALL ANY NEW AND/OR ADDITIONAL PLATFORMS AND/OR ANTENNAS AND/OR COAX CABLES AND/OR OTHER EQUIPMENT BE INSTALLED ON THE MONOPOLE UNTIL THE CONTRACTOR HAS SUCCESSFULLY COMPLETED THE INSTALLATION OF ALL OF THE REQUIRED STRUCTURAL REINFORCING SYSTEM COMPONENTS.

B. "LOW HEAT" WELDING PROCEDURES:

1. ANY AND ALL FIELD WELDING REQUIRED ON THIS PROJECT SHALL BE PERFORMED BY AWS CERTIFIED WELDERS USING "LOW HEAT" WELDING TECHNIQUES.
2. FOR THE PURPOSES OF THIS PROJECT, "LOW HEAT" WELDING IS DEFINED AS A CAREFUL AND CONTROLLED WELDING PROCESS, PERFORMED BY EXPERIENCED AWS CERTIFIED WELDERS, SUCH THAT THE CORRECT AMOUNT OF WELD METAL IS DEPOSITED AND IS PROPERLY FUSED IN SUCH A WAY THAT EXCESSIVE AMOUNTS OF HEAT BUILDUP AT THE WELDED JOINT, DUE TO EXCESSIVE MOLTEN WELD METAL POOLING, IS AVOIDED.
3. THE "LOW HEAT" WELDING PROCESS SHALL BE SET UP SO THAT ANY FIELD WELDING ACTIVITY ON THE POLE STRUCTURE DOES NOT SCORCH OR OTHERWISE DAMAGE THE EXISTING GALVANIZED SURFACE ON THE INSIDE OF THE POLE SHAFT IN AND AROUND THE REGION OF THE WELD.
4. THE "LOW HEAT" WELDING PROCESS, USED IN CONJUNCTION WITH THE CROWN CASTLE COAX PROTECTION AND FIRE SAFETY GUIDELINES, SHALL BE SET UP SO THAT ANY FIELD WELDING ACTIVITY ON THE POLE STRUCTURE DOES NOT SCORCH AND/OR OTHERWISE DAMAGE THE EXISTING COAX CABLES THAT RUN ON THE INSIDE AND/OR OUTSIDE OF THE POLE SHAFT IN AND AROUND THE REGION OF THE WELD.
5. "LOW HEAT" WELD DEMONSTRATION REQUIRED: PRIOR TO BEGINNING THE FIELD WELDING FOR THE REINFORCEMENT WORK, THE CONTRACTOR'S AWS CERTIFIED WELDER SHALL DEMONSTRATE THE "LOW HEAT" WELDING PROCESS THAT WILL BE USED ON THIS PROJECT SO THAT CROWN CASTLE REPRESENTATIVES CAN OBSERVE AND VERIFY THAT THE PROPOSED PROCESS DOES NOT DAMAGE THE EXISTING GALVANIZED SURFACE ON THE BACK SIDE OF THE SAMPLE PLATE THAT IS BEING WELDED. THE CONTRACTOR SHALL USE TEMPERATURE MONITORING DEVICES SUCH AS THERMOCOUPLE, HEAT CRAYON, AND/OR INFRARED SENSOR TO MEASURE AND DEMONSTRATE THE TEMPERATURE OF THE STEEL ON THE BACK SURFACE IN THE REGION OF THE WELD. THE "LOW HEAT" WELD DEMONSTRATION SHALL BE CARRIED OUT ON-SITE AND USING A GALVANIZED STEEL PLATE SAMPLE WITH A THICKNESS EQUAL TO THE MINIMUM SHAFT THICKNESS THAT WILL BE REINFORCED. ONLY AFTER THE "LOW HEAT" TECHNIQUES HAVE BEEN SUCCESSFULLY DEMONSTRATED AND ARE APPROVED BY CROWN CASTLE REPRESENTATIVES, CAN THE CONTRACTOR PROCEED WITH THE FIELD WELDING ON THE STRUCTURE.
6. CAUTION: THE CONTRACTOR SHALL CAREFULLY FOLLOW ALL CROWN CASTLE CUTTING, WELDING, FIRE SAFETY, AND ALL OTHER SAFETY GUIDELINES WHICH ALSO INCLUDE "LOW HEAT" WELDING TECHNIQUES. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR MAINTAINING THE SAFETY AND STABILITY OF THE STRUCTURE DURING CONSTRUCTION. THE CONTRACTOR SHALL BE HELD FULLY LIABLE FOR ANY DAMAGE (INCLUDING HEAT AND FIRE DAMAGE CAUSED BY FIELD WELDING) TO THE STRUCTURE AND ANY OF ITS COMPONENTS WHICH OCCURS DURING CONSTRUCTION.

C. SPECIAL INSPECTION AND TESTING

1. ALL WORK SHALL BE SUBJECT TO REVIEW AND OBSERVATION BY THE OWNER'S REPRESENTATIVE AND THE OWNER'S AUTHORIZED INDEPENDENT INSPECTION AND TESTING AGENCY. REFER TO CROWN CASTLE DOCUMENT ENG-SOW-10066 FOR SPECIFICATION.
2. ANY SUPPORT SERVICES PERFORMED BY THE ENGINEER DURING CONSTRUCTION SHALL BE DISTINGUISHED FROM CONTINUOUS AND DETAILED INSPECTION SERVICES WHICH ARE FURNISHED BY OTHERS. THESE SUPPORT SERVICES PERFORMED BY THE ENGINEER ARE PERFORMED SOLELY FOR THE PURPOSE OF ASSISTING IN QUALITY CONTROL AND IN ACHIEVING CONFORMANCE WITH CONTRACT DOCUMENTS. THEY DO NOT GUARANTEE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF CONSTRUCTION.
3. OBSERVED DISCREPANCIES BETWEEN THE WORK AND THE CONTRACT DOCUMENTS SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST.
4. AN INDEPENDENT QUALIFIED INSPECTION/TESTING AGENCY SHALL BE SELECTED, RETAINED AND PAID FOR BY THE OWNER FOR THE SOLE PURPOSE OF INSPECTING, TESTING, DOCUMENTING, AND APPROVING ALL WELDING AND FIELD WORK PERFORMED BY THE CONTRACTOR.
   (A.) ACCESS TO ANY PLACE WHERE WORK IS BEING DONE SHALL BE PERMITTED AT ALL TIMES.
   (B.) THE INSPECTION AGENCY SHALL SO SCHEDULE THIS WORK AS TO CAUSE A MINIMUM OF INTERRUPTION TO, AND COORDINATE WITH, THE WORK IN PROGRESS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE THE WORK SCHEDULE WITH THE TESTING AGENCY. THE CONTRACTOR SHALL ALLOW FOR ADEQUATE TIME AND ACCESS FOR THE TESTING AGENCY TO PERFORM THEIR DUTIES.
5. THE INSPECTION AND TESTING AGENCY SHALL BE RESPONSIBLE TO PERFORM THE FOLLOWING SERVICES FOR THE OWNER. THE TESTING AGENCY SHALL INSPECT THE FOLLOWING ITEMS IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS. THE TESTING AGENCY SHALL INSPECT ITEMS ON THIS LIST AND OTHER ITEMS AS NECESSARY TO FULFILL THEIR RESPONSIBILITY. THE TESTING AGENCY SHALL UTILIZE EXPERIENCED, TRAINED INSPECTORS INCLUDING AWS CERTIFIED WELDING INSPECTORS (CWI). INSPECTORS SHALL HAVE THE TRAINING, CREDENTIALS, AND EXPERIENCE APPROPRIATE FOR AND COMMENSURATE WITH THE SCOPE AND TYPE OF INSPECTION WORK TO BE PERFORMED.

A. GENERAL:
   (1.) PERFORM CONTINUOUS ON-SITE OBSERVATION, INSPECTION, VERIFICATION, AND TESTING DURING THE TIME THE CONTRACTOR IS WORKING ON-SITE. AGENCY SHALL NOTIFY OWNER IMMEDIATELY WHEN FIELD PROBLEMS OR DISCREPANCIES OCCUR.

B. FOUNDATIONS, CONCRETE, AND SOIL PREPARATION
   (1.) VERIFY MATERIALS AT BOTTOM OF EXCAVATION ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY.
   (2.) VERIFY THAT EXCAVATIONS HAVE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL.
   (3.) PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS.
   (4.) VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESS DURING PLACEMENT AND COMPACTION OF COMPACTED FILL.
   (5.) PRIOR TO PLACEMENT OF COMPACTED FILL, OBSERVE SUBGRADE AND VERIFY SITE HAS BEEN PREPARED PROPERLY.

C. CONCRETE TESTING PER ACI
   (1.) INSPECTION OF PLACEMENT OF REINFORCING STEEL.
   (2.) INSPECT BOLTS TO BE INSTALLED IN CONCRETE PRIOR TO AND DURING PLACEMENT OF CONCRETE.
   (3.) VERIFYING USE OF REQUIRED MIX DESIGN.
   (4.) AT THE TIME FRESH CONCRETE IS SAMPLED TO FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TEST AND DETERMINE TEMPERATURE OF THE CONCRETE.
   (5.) INSPECTION OF CONCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUE.
   (6.) INSPECTION OF SPECIFIED CURING AND TEMPERATURE TECHNIQUES.

D. STRUCTURAL STEEL
   (1.) CHECK THE STEEL ON THE JOB WITH THE PLANS.
   (2.) CHECK MILL CERTIFICATIONS.
   (3.) CHECK GRADE OF STEEL MEMBERS, AND BOLTS FOR CONFORMANCE WITH DRAWINGS.
   (4.) INSPECT STEEL MEMBERS FOR DISTORTION, EXCESSIVE RUST, FLAWS AND BURNED HOLES.
   (5.) CALL FOR LABORATORY TEST REPORTS WHEN IN DOUBT.
   (6.) CHECK STEEL MEMBERS FOR SIZES, SWEEP AND DIMENSIONAL TOLERANCES.
   (7.) CHECK FOR SURFACE FINISH SPECIFIED, GALVANIZED.
   (8.) CHECK BOLT TIGHTENING ACCORDING TO AISC "TURN OF THE NUT" METHOD.

E. WELDING:
   (1.) VERIFY FIELD WELDING PROCEDURES, WELDERS, AND WELDING OPERATORS, NOT DEEMED PREQUALIFIED, IN ACCORDANCE WITH AWS D1.1.
   (2.) *INSPECT FIELD WELDED CONNECTIONS IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED* AND IN ACCORDANCE WITH AWS D1.1.
   (3.) APPROVE FIELD WELDING SEQUENCE.
      (A.) A PROGRAM OF THE APPROVED SEQUENCES SHALL BE SUBMITTED TO THE OWNER BEFORE WELDING BEGINS. NO CHANGE IN APPROVED SEQUENCES MAY BE MADE WITHOUT PERMISSION FROM THE OWNER.
   (4.) INSPECT WELDED CONNECTIONS AS FOLLOWS AND IN ACCORDANCE WITH AWS D1.1:
      (A.) INSPECT WELDING EQUIPMENT FOR CAPACITY, MAINTENANCE AND WORKING CONDITIONS.
      (B.) VERIFY SPECIFIED ELECTRODES AND HANDLING AND STORAGE OF ELECTRODES FOR CONFORMANCE TO SPECIFICATIONS.
      (C.) INSPECT PREHEATING AND INTERPASS TEMPERATURES FOR CONFORMANCE WITH AWS D1.1.
      (D.) VISUALLY INSPECT ALL WELDS AND VERIFY THAT QUALITY OF WELDS MEETS THE REQUIREMENTS OF AWS D1.1.
      (E.) SPOT TEST AT LEAST ONE FILLET WELD OF EACH MEMBER USING MAGNETIC PARTICLE OR DYE PENETRANT.
      (F.) INSPECT FOR SIZE, SPACING, TYPE AND LOCATION AS PER APPROVED PLANS.
      (G.) VERIFY THAT THE BASE METAL CONFORMS TO THE DRAWINGS.
      (H.) REVIEW THE REPORTS BY TESTING LABS.
      (I.) CHECK TO SEE THAT WELDS ARE CLEAN AND FREE FROM SLAG.
      (J.) INSPECT RUST PROTECTION OF WELDS AS PER SPECIFICATIONS.
      (K.) CHECK THAT DEFECTIVE WELDS ARE CLEARLY MARKED AND HAVE BEEN ADEQUATELY REPAIRED.

F. SPECIAL INSPECTION OF EXISTING SHAFT-TO-FLANGE WELD CONNECTIONS:
   (1.) PRIOR TO CONSTRUCTION, TESTING AGENCY SHALL INSPECT CONDITION OF EXISTING SHAFT-TO-BASE-PLATE WELD CONNECTION. ALSO INSPECT EXISTING STIFFENERS IF PRESENT. THE INSPECTOR SHALL USE THE FOLLOWING INSPECTION METHODS, OR COMBINATION OF METHODS, AS REQUIRED TO IDENTIFY ANY CRACKS: VISUAL, MAGNETIC PARTICLE, AND/OR ULTRA-SONIC. IN ADDITION, OTHER TEST METHODS MAY ALSO BE USED AT THE RECOMMENDATION OF THE TESTING AGENCY AND UPON THE APPROVAL OF THE OWNER AND THE ENGINEER. THE TESTING AGENCY SHALL PROVIDE CAREFUL AND THOROUGH DOCUMENTATION OF THIS INSPECTION TO THE OWNER AND THE ENGINEER. TESTING AGENCY SHALL COORDINATE THESE INSPECTION ACTIVITIES WITH THE OWNER'S REQUIRED PROCESSES AND PROCEDURES. IMPORTANT: THE TESTING AGENCY SHALL IMMEDIATELY REPORT ANY INDICATIONS OF CRACKS, FRACTURES, DISTRESS, AND/OR CORROSION TO THE OWNER AND ENGINEER.
   (2.) AFTER CONSTRUCTION, TESTING AGENCY SHALL INSPECT ANY AND ALL FIELD REPAIRS IMPLEMENTED AS REQUIRED BY THE OWNER FROM THE RESULTS OF THE INSPECTION IN THE PREVIOUS NOTE 5.F.(1.) ABOVE.
   (3.) REFER TO CROWN CASTLE DOCUMENTS ENG-SOW-10033 AND ENG-BUL-10051 FOR SPECIFICATIONS.

G. REPORTS:
   (1.) COMPILE AND PERIODICALLY SUBMIT DAILY INSPECTION REPORTS TO THE OWNER.

6. THE INSPECTION PLAN OUTLINED HEREIN IS INTENDED AS A DESCRIPTION OF GENERAL AND SPECIFIC ITEMS OF CONCERN. IT IS NOT INTENDED TO BE ALL-INCLUSIVE. IT DOES NOT LIMIT THE TESTING AND INSPECTION AGENCY TO THE ITEMS LISTED. ADDITIONAL TESTING, INSPECTION, AND CHECKING MAY BE REQUIRED AND SHOULD BE ANTICIPATED. THE TESTING AGENCY SHALL USE THEIR PROFESSIONAL JUDGMENT AND KNOWLEDGE OF THE JOB SITE CONDITIONS AND THE CONTRACTOR'S PERFORMANCE TO DECIDE WHAT OTHER ITEMS REQUIRE ADDITIONAL ATTENTION. THE TESTING AGENCY'S JUDGMENT MUST PREVAIL ON ITEMS NOT SPECIFICALLY COVERED. ANY DISCREPANCIES AND PROBLEMS SHALL BE BROUGHT IMMEDIATELY TO THE OWNER'S ATTENTION. RESOLUTIONS ARE NOT TO BE MADE WITHOUT THE OWNER'S REVIEW AND SPECIFIC WRITTEN CONSENT. THE OWNER RESERVES THE RIGHT TO DETERMINE WHAT IS AN ACCEPTABLE RESOLUTION OF DISCREPANCIES AND PROBLEMS.
7. AFTER EACH INSPECTION, THE TESTING AGENCY WILL PREPARE A WRITTEN ACCEPTANCE OR REJECTION WHICH WILL BE GIVEN TO THE CONTRACTOR AND FILED AS DAILY REPORTS TO THE OWNER. THIS WRITTEN ACTION WILL GIVE THE CONTRACTOR A LIST OF ITEMS TO BE CORRECTED, PRIOR TO CONTINUING CONSTRUCTION, AND/OR LOADING OF STRUCTURAL ITEMS.
8. RESPONSIBILITY: THE TESTING AGENCY DOES NOT RELIEVE THE CONTRACTOR'S CONTRACTUAL OR STATUTORY OBLIGATIONS. THE CONTRACTOR HAS THE SOLE RESPONSIBILITY FOR ANY DEVIATIONS FROM THE OFFICIAL CONTRACT DOCUMENTS. THE TESTING AGENCY WILL NOT REPLACE THE *CONTRACTOR'S QUALITY CONTROL PERSONNEL.*

STATE OF CONNECTICUT
DAVID L. SUMMERS
No. 21884
LICENSED PROFESSIONAL ENGINEER

7/24/2012

AEROSOLUTIONS SHAFT REINFORCING OPTION

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BU #876362; OXFORD / FRITZ PROPERTY
OXFORD, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37512-1027	ISSUE DATE OF PERMIT: 7-6-2012
DRAWN BY: B.M.S.	
CHECKED BY: T.J.D.	
APPROVED BY:	S-1A
DATE: 7-6-2012	

D. STRUCTURAL STEEL

1. STRUCTURAL STEEL MATERIALS, FABRICATION, DETAILING, AND WORKMANSHIP SHALL CONFORM TO THE LATEST EDITION OF THE FOLLOWING REFERENCE STANDARDS:

A. BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC):
   (A.) "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS."
   (B.) "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS," AS APPROVED BY THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS OF THE ENGINEERING FOUNDATION.
   (C.) "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES" (PARAGRAPH 4.2.1 SPECIFICALLY EXCLUDED).

B. BY THE AMERICAN WELDING SOCIETY (AWS):
   (A.) "STRUCTURAL WELDING CODE - STEEL D1.1."
   (B.) "SYMBOLS FOR WELDING AND NON-DESTRUCTIVE TESTING"

2. ANY MATERIAL OR WORKMANSHIP WHICH IS OBSERVED TO BE DEFECTIVE OR INCONSISTENT WITH THE CONTRACT DOCUMENTS SHALL BE CORRECTED, MODIFIED, OR REPLACED AT THE CONTRACTOR'S EXPENSE.
3. TIGHTEN ALL STRUCTURAL BOLTS, INCLUDING THE AJAX M20 BOLTS WITH SHEAR SLEEVES, ACCORDING TO THE REQUIREMENTS OF THE AISC "TURN OF THE NUT" METHOD. TIGHTEN BOLTS 1/3 TURN PAST THE SNUG TIGHT CONDITION AS DEFINED BY AISC.
4. WELDED CONNECTIONS SHALL CONFORM TO THE LATEST REVISED CODE OF THE AMERICAN WELDING SOCIETY, AWS D1.1. ALL WELD ELECTRODES SHALL BE E80XX UNLESS NOTED OTHERWISE ON THE DRAWINGS.
5. ALL WELDED CONNECTIONS SHALL BE MADE BY WELDERS CERTIFIED BY AWS. CONTRACTOR SHALL SUBMIT WELDERS' CERTIFICATION AND QUALIFICATION DOCUMENTATION TO THE OWNER'S TESTING AGENCY FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
6. STRUCTURAL STEEL PLATES SHALL CONFORM TO ASTM A572 GRADE 65 (FY = 65 KSI MIN.) UNLESS NOTED OTHERWISE ON THE DRAWINGS.
7. SURFACES OF EXISTING STEEL SHALL BE PREPARED AS REQUIRED FOR FIELD WELDING PER AWS. SEE SECTION I NOTES REGARDING TOUCH-UP OF GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS FIELD WELDING.
8. UNLESS OTHERWISE NOTED, ALL STEEL MEMBERS SHALL BE HOT-DIP GALVANIZED, AFTER FABRICATION, IN ACCORDANCE WITH ASTM A123. SEE SECTION J FOR FURTHER NOTES AND FOR EXCEPTIONS (IF ANY).
9. ALL WELDS SHALL BE VISUALLY INSPECTED BY THE OWNER'S APPROVED TESTING AGENCY. OTHER TESTS MAY ALSO BE PERFORMED ON THE WELDS BY THE TESTING AGENCY IN ORDER FOR THEM TO PERFORM THEIR DUTIES FOR THIS PROJECT. THE CONTRACTOR SHALL COOPERATE WITH THE TESTING AGENCY IN THEIR TESTING EFFORTS.
10. NO WELDING SHALL BE DONE TO THE EXISTING STRUCTURE WITHOUT THE PRIOR APPROVAL AND SUPERVISION OF THE TESTING AGENCY.
11. FIELD CUTTING OF STEEL:
   (A.) PRIOR TO ANY FIELD CUTTING, THE CONTRACTOR SHALL MARK THE CUT OUTLINES ON THE STEEL AND THE INSPECTION/TESTING AGENCY SHALL VERIFY PROPOSED LAYOUT, LOCATION, AND DIMENSIONS.
   (B.) ANY REQUIRED CUTS IN THE STEEL SHALL BE CAREFULLY CUT BY MECHANICAL METHODS SUCH AS DRILLING, SAW CUTTING, AND GRINDING. THE CONTRACTOR IS RESPONSIBLE TO PREVENT ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE, DURING THE CUTTING WORK. ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE, RESULTING FROM THE CONTRACTOR'S ACTIVITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.
   (C.) ALL REQUIRED CUTS SHALL BE CUT WITHIN THE DIMENSIONS SHOWN ON THE DRAWINGS. NO CUTS SHALL EXTEND BEYOND THE OUTLINE OF THE DIMENSIONS SHOWN ON THE DRAWINGS. ALL CUT EDGES SHALL BE GROUND SMOOTH AND DE-BURRED. CUT EDGES THAT ARE TO BE FIELD WELDED SHALL BE PREPARED FOR FIELD WELDING PER AWS D1.1 AND AS SHOWN ON THE DRAWINGS. IT MAY BE NECESSARY TO DRILL STARTER HOLES AS REQUIRED TO MAKE THE CUTS. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.

E. BASE PLATE GROUT

1. NEW GROUT FOR THE POLE BASE SHALL BE NON-SHRINK, NON-METALLIC, GROUT (EUCO NS GROUT BY EUCLID, OR APPROVED EQUAL) WITH A 7500 PSI MINIMUM COMPRESSIVE STRENGTH. PVC DRAINAGE PIPES SHALL BE PROVIDED FROM INSIDE THE POLE SHAFT OUT THROUGH THE GROUT SPACE UNDER THE BASE PLATE IN ORDER TO ALLOW MOISTURE TO ADEQUATELY DRAIN FROM THE INTERIOR OF THE POLE SHAFT. CONTRACTOR SHALL SUBMIT PROPOSED GROUT SPECIFICATION INFORMATION TO THE OWNER FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION. CONTRACTOR SHALL FOLLOW GROUT MANUFACTURER'S SPECIFICATIONS FOR COLD WEATHER GROUTING PROCEDURES (IF NECESSARY) AND THE TESTING AGENCY SHALL PREPARE GROUT SAMPLE SPECIMENS FOR COMPRESSIVE STRENGTH TESTING AND VERIFICATION.
2. GROUT SHALL BE INSTALLED TIGHT UNDER BASE PLATE WITH NO VOIDS REMAINING BETWEEN TOP OF EXISTING CONCRETE AND UNDERSIDE OF EXISTING BASE PLATE (EXCEPT FOR DRAIN PIPES). GROUT COMPLETELY SOLID (EXCEPT FOR DRAIN PIPES) UNDER ENTIRE SURFACE OF BASE PLATE FROM OUTSIDE EDGE TO INSIDE EDGE.

F. FOUNDATION WORK - (NOT REQUIRED)

G. CAST-IN-PLACE CONCRETE

1. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS.
   (A.) CONCRETE EXPOSED TO WEATHER SHALL BE AIR ENTRAINED (6% +/- 1.5%).
   (B.) WATER CEMENT RATIO = 0.52 (MAXIMUM).
1. ALL REINFORCING STEEL SHALL BE NEW DOMESTIC DEFORMED BILLET STEEL CONFORMING TO ASTM A615 GRADE 60.
2. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH "THE BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" ACI 318, LATEST EDITION. CONTRACTOR SHALL FOLLOW ALL APPLICABLE ACI PROCEDURES FOR COLD WEATHER CONCRETE PLACEMENT.
3. ALL REINFORCING DETAILS SHALL CONFORM TO "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES" ACI 315, LATEST EDITION, UNLESS DETAILED OTHERWISE ON THE STRUCTURAL DRAWINGS.
4. CONTRACTOR SHALL VERIFY LOCATIONS OF ALL OPENINGS, SLEEVES, ANCHOR RODS, INSERTS, ETC., AS REQUIRED BEFORE CONCRETE IS PLACED.
5. WHERE BAR LENGTHS ARE GIVEN ON THE DRAWINGS, THE LENGTH OF ANY HOOK, IF REQUIRED, IS NOT INCLUDED.
6. CONTRACTOR SHALL PROVIDE SPACERS, CHAIRS, BOLSTERS, ETC., NECESSARY TO SUPPORT REINFORCING STEEL. CHAIRS WHICH BEAR ON EXPOSED CONCRETE SURFACES SHALL HAVE ENDS WHICH ARE PLASTIC TIPPED OR STAINLESS STEEL.
7. ALL STRUCTURAL MEMBERS SHALL BE POURED MONOLITHICALLY, EXCEPT FOR REQUIRED CONSTRUCTION JOINTS. CONTRACTOR SHALL SUBMIT PROPOSED CONSTRUCTION JOINT LOCATIONS AND DETAILS TO THE ENGINEER FOR REVIEW.
8. CONTRACTOR SHALL PROVIDE 3/4-INCH CHAMFER ON ALL EXPOSED CORNERS UNLESS OTHERWISE INDICATED ON THE DRAWINGS. MINIMUM CLEARANCES FOR REINFORCING STEEL SHALL BE MAINTAINED AS SPECIFIED BY ACI.
9. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCEMENT:
   3" ..... CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH.
   2" ..... CONCRETE EXPOSED TO EARTH OR WEATHER, #6 THROUGH #18 BARS.
   1-1/2" ..... CONCRETE EXPOSED TO EARTH OR WEATHER, #5 BAR AND SMALLER.
10. FOOTING BARS SHALL BE BENT 1'-6" AROUND CORNERS, OR PROVIDE CORNER BARS WITH A 2'-0" LAP ON EACH LEG.
11. TESTING LABORATORY SHALL SUBMIT ONE COPY OF ALL CONCRETE TEST REPORTS DIRECTLY TO THE ENGINEER.
12. CONTRACTOR SHALL KEEP A COPY OF "FIELD REFERENCE MANUAL" (ACI PUBLICATION SP-15, LATEST EDITION) AT THE PROJECT FIELD OFFICE.
FLY ASH SHALL BE PERMITTED. FLY ASH CONTENT SHALL BE A MAXIMUM OF 25% OF CEMENT WEIGHT

H. EPOXY GROUTED REINFORCING ANCHOR RODS

1. UNLESS OTHERWISE NOTED, REINFORCING ANCHOR RODS SHALL BE 150 KSI ALL-THREAD BAR CONFORMING TO ASTM A722. RECOMMENDED MANUFACTURERS/SUPPLIERS OF 150 KSI ALL-THREAD BAR ARE WILLIAMS FORM ENGINEERING CORPORATION AND DYWIDAG SYSTEMS INTERNATIONAL.
2. ALL REINFORCING ANCHOR RODS SHALL BE HOT DIP GALVANIZED PER ASTM A153. ALTERNATIVELY, ALL REINFORCING ANCHOR RODS MAY BE EPOXY COATED PER ASTM A775.
3. THE CORE-DRILLED HOLES IN THE CONCRETE FOR THE ANCHOR RODS SHALL BE CLEAN AND DRY, AND OTHERWISE PROPERLY PREPARED ACCORDING TO THE ANCHOR ROD AND EPOXY MANUFACTURERS' INSTRUCTIONS, PRIOR TO PLACEMENT OF ANCHOR RODS AND EPOXY. CONTRACTOR SHALL FOLLOW ALL ANCHOR ROD AND EPOXY MANUFACTURER RECOMMENDATIONS REGARDING HANDLING OF RODS, EPOXY, ACCEPTABLE AMBIENT TEMPERATURE RANGE DURING INSTALLATION AND POST-INSTALLATION CURING, THE EFFECT OF TEMPERATURE ON EPOXY CURING TIME, PREPARATION OF HOLE, ETC.
4. ULTRABOND 1, HILTI HIT RE-500 OR ANCHORTITE EPOXY SHALL BE USED TO ANCHOR THE 150 KSI ALL-THREAD BAR IN THE DRILL HOLES. IF CONTRACTOR WISHES TO USE A DIFFERENT EPOXY, A REQUEST INCLUDING THE EPOXY TECHNICAL DATA SHEET(S) SHALL BE SUBMITTED TO PAUL J FORD AND COMPANY FOR REVIEW PRIOR TO CONSTRUCTION. AS NOTED ABOVE, FOLLOW ALL EPOXY MANUFACTURER RECOMMENDATIONS REGARDING HANDLING OF EPOXY, ACCEPTABLE AMBIENT TEMPERATURE RANGE DURING INSTALLATION AND POST-INSTALLATION CURING, THE EFFECT OF TEMPERATURE ON EPOXY CURING TIME, PREPARATION OF HOLE, ETC.
5. ONCE THE REINFORCING ANCHOR RODS HAVE BEEN INSTALLED AND ALL EPOXY AND GROUT HAVE CURED (IF BASE PLATE AND/OR BEARING PLATES HAVE BEEN GROUTED PRIOR TO TESTING), ALL REINFORCING ANCHOR RODS SHALL BE LOAD TESTED PER CROWN CASTLE ENGINEERING DOCUMENT #ENG-PRC-10119. REFER TO THE NEW ANCHOR & BRACKET DETAIL ON FOLLOWING DRAWING SHEETS FOR SPECIFIED ANCHOR ROD PROOF LOAD.
6. ONCE THE REINFORCING ANCHOR RODS HAVE BEEN SUCCESSFULLY LOAD TESTED AND APPROVED AND BASE PLATE / BEARING PLATE GROUT HAS CURED (IF BASE PLATE AND/OR BEARING PLATES HAVE BEEN GROUTED AFTER TESTING), CONTRACTOR SHALL TIGHTEN ALL HEAVY HEX ANCHOR NUTS TO SNUG TIGHT PLUS 1/8 TURN OF NUT.

I. TOUCH UP OF GALVANIZING

1. THE CONTRACTOR SHALL TOUCH UP ANY AND/OR ALL AREAS OF GALVANIZING ON THE EXISTING STRUCTURE OR NEW COMPONENTS THAT ARE DAMAGED OR ABRADED DURING CONSTRUCTION. **GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS ANY AND ALL ABRASIONS, CUTS, FIELD DRILLING, AND ALL FIELD WELDING SHALL BE TOUCHED UP WITH TWO (2) COATS OF ZRC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.0 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-831-3275 FOR PRODUCT INFORMATION.**
2. CONTRACTOR SHALL CLEAN AND PREPARE ALL FIELD WELDS ON GALVANIZED AND PRIME PAINTED SURFACES FOR TOUCH-UP COATING IN ACCORDANCE WITH AWS D1.1. THE OWNER'S TESTING AGENCY SHALL VERIFY THE PREPARED SURFACE PRIOR TO APPLICATION OF THE TOUCH-UP COATING.
3. THE OWNER'S TESTING AGENCY SHALL TEST AND VERIFY THE COATING THICKNESS AFTER THE CONTRACTOR HAS APPLIED THE ZRC COLD GALVANIZING COMPOUND AND IT HAS SUFFICIENTLY DRIED. AREAS FOUND TO BE INADEQUATELY COATED, SHALL BE RE-COATED BY THE CONTRACTOR AND RE-TESTED BY THE TESTING AGENCY.

J. HOT DIP GALVANIZING

1. HOT-DIP GALVANIZE ALL STRUCTURAL STEEL MEMBERS AND ALL STEEL ACCESSORIES, BOLTS, WASHERS, ETC. PER ASTM A123 OR PER ASTM A153, AS APPROPRIATE.
2. PROPERLY PREPARE STEEL ITEMS FOR GALVANIZING.
3. DRILL OR PUNCH WEEP AND/OR DRAINAGE HOLES AS REQUIRED.
4. ALL GALVANIZING SHALL BE DONE AFTER FABRICATION IS COMPLETED AND PRIOR TO FIELD INSTALLATION.

K. PERPETUAL INSPECTION AND MAINTENANCE BY THE OWNER

1. AFTER THE CONTRACTOR HAS SUCCESSFULLY COMPLETED THE INSTALLATION OF THE MONOPOLE REINFORCING SYSTEM AND THE WORK HAS BEEN ACCEPTED BY THE OWNER, THE OWNER WILL BE RESPONSIBLE FOR THE LONG TERM AND PERPETUAL INSPECTION AND MAINTENANCE OF THE POLE AND REINFORCING SYSTEM.
2. THE MONOPOLE REINFORCING SYSTEM INDICATED IN THESE DOCUMENTS USES REINFORCING COMPONENTS THAT INVOLVE FIELD WELDING STEEL MEMBERS TO THE EXISTING GALVANIZED STEEL POLE STRUCTURE. THESE FIELD WELDED CONNECTIONS ARE SUBJECT TO CORROSION DAMAGE AND DETERIORATION IF THEY ARE NOT PROPERLY MAINTAINED AND COVERED WITH CORROSION PREVENTIVE COATING SUCH AS THE ZRC GALVANIZING COMPOUND SPECIFIED PREVIOUSLY. THE STRUCTURAL LOAD CARRYING CAPACITY OF THE REINFORCED POLE SYSTEM IS DEPENDENT UPON THE INSTALLED SIZE AND QUALITY, MAINTAINED SOUND CONDITION AND STRENGTH OF THESE FIELD WELDED CONNECTIONS. **ANY CORROSION OF, DAMAGE TO, FATIGUE, FRACTURE, AND/OR DETERIORATION OF THESE WELDS AND/OR THE CONNECTED COMPONENTS WILL RESULT IN THE LOSS OF STRUCTURAL LOAD CARRYING CAPACITY AND MAY LEAD TO FAILURE OF THE STRUCTURAL SYSTEM. THEREFORE, IT IS IMPERATIVE THAT THE OWNER REGULARLY INSPECTS, MAINTAINS, AND REPAIRS AS NECESSARY, ALL OF THESE WELDS, CONNECTIONS, AND COMPONENTS FOR THE LIFE OF THE STRUCTURE.**
3. THE OWNER SHALL REFER TO TIA/EIA-222-F-1996, SECTION 14 AND ANNEX E 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. **PAUL J. FORD & COMPANY RECOMMENDS THAT A COMPLETE AND THOROUGH INSPECTION OF THE ENTIRE REINFORCED MONOPOLE STRUCTURAL SYSTEM BE PERFORMED YEARLY AND/OR AS FREQUENTLY AS CONDITIONS WARRANT.** ACCORDING TO TIA/EIA-222-F-1996 SECTION 14.1, NOTE 1: "IT IS RECOMMENDED THAT THE STRUCTURE BE INSPECTED AFTER SEVERE WIND AND/OR ICE STORMS OR OTHER EXTREME LOADING CONDITIONS".

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7/24/2012

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AJAX BOLT NOTE SHEET: REV. 1.2, 01-23-2012

NOTES:
1. ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.

2. ALL STRUCTURAL BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.

3. ALL AJAX M20 BOLTS WITH SHEAR SLEEVES SHALL BE PRETENSIONED AND TIGHTENED UNTIL THE DIRECT TENSION INDICATOR (DTI) WASHERS SHOW THAT THE PROPER BOLT TENSION HAS BEEN REACHED. SEE NOTES AND DETAIL BELOW FOR THE USE OF DIRECT TENSION INDICATOR (DTI) WASHERS WITH THE AJAX M20 BOLTS.

4. ALL AJAX BOLTS SHALL BE INSTALLED USING DIRECT TENSION INDICATORS (DTI'S) AND HARDENED WASHERS. DTI'S SHALL BE THE SQUIRTER® STYLE, MADE TO ASTM F959 LATEST REVISION; AND HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A HARDNESS OF RC 38 OR HIGHER.

NOTES FOR AJAX M20 'ONE-SIDE' BOLTS WITH DIRECT TENSION INDICATORS (DTI'S):

DTI'S REQUIRED: DTI'S SHALL BE "SELF-INDICATING" SQUIRTER® STYLE DTI'S MADE WITH SILICONE EMBEDDED IN THEM, INSPECTED BY MEANS OF THE VISUAL EJECTION OF SILICONE AS THE DTI PROTRUSIONS COMPRESS. SQUIRTER® DTI'S SHALL BE CALIBRATED PER MANUFACTURER'S INSTRUCTIONS PRIOR TO USE.

THE DIRECT TENSION INDICATOR (DTI) WASHERS SHALL BE THE "SQUIRTER® STYLE" AS MANUFACTURED BY:

APPLIED BOLTING TECHNOLOGY PRODUCTS, INC.
1413 ROCKINGHAM ROAD BELLOWS FALLS, VERMONT, USA 05101
PHONE 1-800-552-1999
WEBSITE: WWW.APPLIEDBOLTING.COM

DISTRIBUTORS OF SQUIRTER® DTI'S:
HTTP://WWW.APPLIEDBOLTING.COM/APPLIED-BOLTING-DISTRIBUTORS.HTML

DTI: USE DIRECT TENSION INDICATOR (DTI) WASHERS COMPATIBLE WITH 3/4" NOMINAL A325 BOLTS FOR THE AJAX M20 BOLTS. DTI'S SHALL NOT BE HOT-DIP GALVANIZED. DTI'S SHALL BE MECHANICALLY GALVANIZED (MG) BY THE COLD MECHANICAL PROCESS ONLY AS PROVIDED BY THE DTI MANUFACTURER.

HARDENED WASHERS REQUIRED: USE A HARDENED WASHER FOR A 3/4" NOMINAL BOLT BETWEEN THE TOP OF THE DIRECT TENSION INDICATOR (DTI) WASHER AND THE NUT OF THE AJAX M20 BOLTS. HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A MINIMUM HARDNESS OF RC 38 OR HIGHER. THE HARDENED WASHERS SHALL BE MECHANICALLY GALVANIZED BY THE COLD MECHANICAL PROCESS. ALTERNATIVELY, CORRECTLY MADE HOT DIP GALVANIZED HARDENED FLAT WASHERS HAVING A MINIMUM HARDNESS OF RC 38 CAN BE USED; CONTRACTOR SHALL PROVIDE DOCUMENTATION OF WASHER SPECIFICATION AND HARDNESS.

NUT LUBRICATION REQUIRED: PROPERLY LUBRICATE THE THREADS OF THE NUT OF THE AJAX BOLT SO THAT IT CAN BE PROPERLY TIGHTENED WITHOUT GALLING AND/OR LOCKING UP ON THE BOLT THREADS. CONTRACTOR SHALL FOLLOW DTI MANUFACTURER INSTRUCTIONS FOR PROPER LUBRICATION AND TIGHTENING.

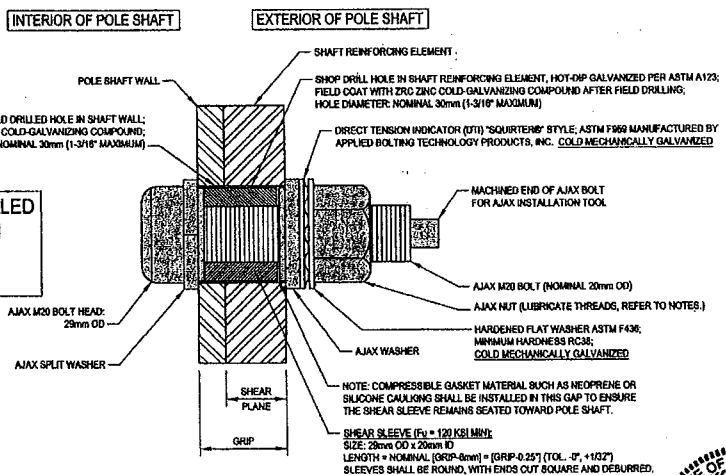
NOTE: COMPLETELY COMPRESSED DTI'S SHOWING NO VISIBLE REMAINING GAP ARE ACCEPTABLE. DTI WASHERS SHALL BE PLACED DIRECTLY AGAINST THE OUTER AJAX WASHER WITH THE DTI BUMPS FACING AWAY FROM THE AJAX WASHER. PLACE A HARDENED WASHER BETWEEN THE DTI AND THE AJAX NUT. THE DTI BUMPS SHALL BEAR AGAINST THE UNDERSIDE OF A HARDENED FLAT WASHER, NEVER DIRECTLY AGAINST THE NUT.

CONTRACTOR SHALL FOLLOW DTI MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION, LUBRICATION, TIGHTENING AND INSPECTION.

INSPECTION REQUIRED: ALL AJAX BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009, BY A QUALIFIED BOLT INSPECTOR. DURING INSTALLATION, THE BOLT INSPECTOR SHALL VERIFY AND DOCUMENT: THE SHOP-DRILLED AND FIELD-DRILLED HOLE SIZES; THE INSTALLATION OF THE AJAX BOLT ASSEMBLY, INCLUDING THE SHEAR SLEEVE PLACEMENT AND NUT LUBRICATION; AND THE CONTRACTOR'S TENSIONING PROCEDURE. IN ADDITION, ALL AJAX BOLTS AND DTI'S SHALL BE VISUALLY INSPECTED ACCORDING TO THE DTI MANUFACTURER'S INSTRUCTIONS. THE BOLT INSPECTOR SHALL PROVIDE COMPLETE PHOTO DOCUMENTATION OF ALL BOLTS AFTER TIGHTENING CLEARLY SHOWING THE CONDITION OF THE DTI'S.

NOTE: ALL SHOP AND FIELD DRILLED HOLES SHALL BE NOMINAL 30MM DIAMETER. THE MAXIMUM HOLE DIAMETER PERMITTED IS 1-3/16".

NOTE: ALL AJAX BOLTS, AJAX SPLIT WASHERS, AJAX WASHERS, AJAX NUTS, AND SHEAR SLEEVES SHALL BE HOT DIP GALVANIZED PER ASTM A123.



TYPICAL AJAX BOLT DETAIL 1 S-3A

STATE OF CONNECTICUT
DAVID L. SUMMERS
No. 21884
LICENSED
PROFESSIONAL ENGINEER

7/24/2012

AEROSOLUTIONS SHAFT REINFORCING OPTION

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BU #876362; OXFORD / FRITZ PROPERTY
OXFORD, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37512-1027	ISSUE DATE OF PERMIT: 7-6-2012
DRAWN BY: B.M.S.	
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APPROVED BY:	S-3A
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NOTE: NO DETAILED INFORMATION REGARDING INTERFERENCES WAS PROVIDED. THEREFORE, CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS BEFORE PROCEEDING WITH THE WORK. REPORT ANY AND ALL DISCREPANCIES TO PAUL J. FORD AND COMPANY AND CROWN CASTLE FIELD PERSONNEL IMMEDIATELY.

THIS POLE REINFORCEMENT DRAWING IS FOR THE POLE DESIGN AND ANTENNA LOADING DOCUMENTED IN THE PJF CO-LOCATION ANALYSIS FOR THIS SITE (PJF#37512-1027), DATED 7-23-2012.

POLE SPECIFICATIONS	
POLE SHAPE TYPE:	18-SIDED POLYGON
TAPER:	0.2033 IN/FT
SHAFT STEEL:	ASTM A572 GRADE 65
BASE PL STEEL:	ASTM A633 GR. E (60 KSI)
ANCHOR RODS:	2 1/4"Ø #18J ASTM A615 GRADE 75

SHAFT SECTION DATA					
SHAFT SECTION	SECTION LENGTH (FT)	PLATE THICKNESS (IN)	LAP SPLICE (IN)	DIAMETER ACROSS FLATS (IN) @ TOP	DIAMETER ACROSS FLATS (IN) @ BOTTOM
1	26.5600	0.1875	3.17	15.000	20.740
2	40.6300	0.2500	4.08	19.680	28.320
3	47.6300	0.3125	5.17	28.952	37.100
4	47.5800	0.3750		36.374	45.500

NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

CONTRACTOR SHALL PROVIDE ASTM A36 SHIM PLATES BELOW SLIP JOINTS. THE SHIM PLATES SHALL BE PLACED BETWEEN THE NEW SHAFT REINFORCEMENT AND THE EXISTING POLE SHAFT FROM THE SLIP JOINT TO THE NEW SHAFT REINFORCEMENT SPLICE PLATE LOCATION AND A EXTRA LONG "SPLICE SHIM" SHALL BE PLACED BETWEEN THE NEW UPPER AND LOWER SHAFT REINFORCEMENT PLATES AT THE SHAFT REINFORCEMENT SPLICE PLATE LOCATION.

NOTES:

1. ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC "SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.

2. ALL STRUCTURAL BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC "SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.

3. * ALL AJAX M20 BOLTS WITH SHEAR SLEEVES SHALL BE PRETENSIONED AND TIGHTENED UNTIL THE DIRECT TENSION INDICATOR (DTI) WASHERS SHOW THAT THE PROPER BOLT TENSION HAS BEEN REACHED. SEE NOTES AND DETAIL ON SHEET S-3 FOR THE USE OF DIRECT TENSION INDICATOR (DTI) WASHERS WITH THE AJAX M20 BOLTS.

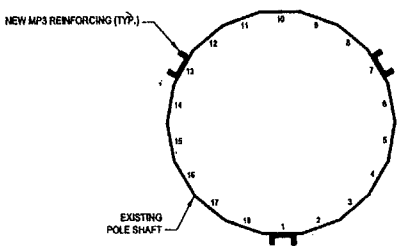
4. DTI'S REQUIRED: * ALL AJAX BOLTS SHALL BE INSTALLED USING DIRECT TENSION INDICATORS (DTI'S) AND HARDENED WASHERS. DTI'S SHALL BE THE SQUIRTER® STYLE, MADE TO ASTM F959 LATEST REVISION; AND HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A HARDNESS OF RC 38 OR HIGHER.

5. NUT LUBRICATION REQUIRED: * PROPERLY LUBRICATE THE THREADS OF THE NUT OF THE AJAX BOLT SO THAT IT CAN BE PROPERLY TIGHTENED WITHOUT GALLING AND/OR LOCKING UP ON THE BOLT THREADS. CONTRACTOR SHALL FOLLOW DTI MANUFACTURER INSTRUCTIONS FOR PROPER LUBRICATION AND TIGHTENING. REFER TO SHEET S-3.

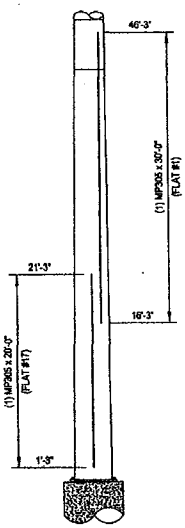
6. AJAX BOLT HOLE SIZE: ALL SHOP- AND FIELD-DRILLED HOLES SHALL BE NOMINAL 36MM DIAMETER. THE MAXIMUM HOLE DIAMETER PERMITTED IS 1-3/16". REFER TO SHEET S-3.

* AS OF 5/30/2012, UNTIL FURTHER NOTICE, CROWN CASTLE WILL ACCEPT AJAX BOLTS TIGHTENED USING AISC "TURN-OF-THE-NUT" METHODOLOGY. INSTALLERS SHALL FOLLOW CROWN GUIDELINES FOR AISC "TURN-OF-THE-NUT" METHOD AND ALSO PROVIDE COMPLETE INSPECTION DOCUMENTATION IN THE PIM.

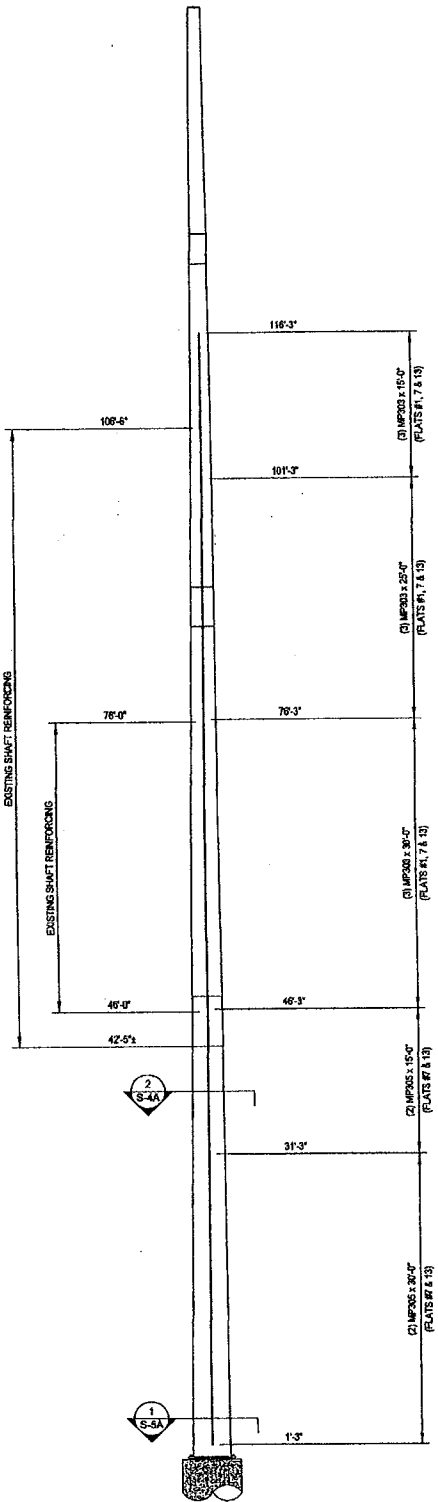
NDE OF THE CIRCUMFERENTIAL WELD OF THE BASE PLATE TO SHAFT CONNECTION IS REQUIRED. PLEASE SEE ENG-SOW-1033 : TOWER BASE PLATE NDE AND ENG-SUL-10051 : NDE REQUIREMENTS FOR MONOPOLE BASE PLATE TO PREVENT CONNECTION FAILURE. NOTIFY THE EOR AND CROWN ENGINEERING IMMEDIATELY IF ANY CRACKS ARE SUSPECTED OR HAVE BEEN IDENTIFIED. THE NDE SHALL INCLUDE ALL EXISTING REINFORCEMENTS THAT HAVE BEEN WELDED TO THE BASE PLATE. FULL PENETRATION WELDING TO THE BASE PLATE REQUIRED AS PART OF THIS ACTIVE REINFORCEMENT DESIGN SHALL BE INCLUDED IN THE NDE SCOPE OF WORK.



SECTION 2 / S-4A



POLE ELEVATION 2 / S-4A



POLE ELEVATION 1 / S-4A

STATE OF CONNECTICUT DAVID L. SUMMERS No. 21884 LICENSED PROFESSIONAL ENGINEER 7/24/2012

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SPECIAL INSPECTION OF EXISTING SHAFT-TO-FLANGE WELD CONNECTIONS:

(1.) PRIOR TO CONSTRUCTION, CONTRACTOR'S INSPECTION AGENCY SHALL INSPECT CONDITION OF EXISTING SHAFT-TO-BASE-PLATE WELD CONNECTION. ALSO INSPECT EXISTING STIFFENERS IF PRESENT. THE CONTRACTOR'S INSPECTION AGENCY SHALL USE THE FOLLOWING INSPECTION METHODS, OR COMBINATION OF METHODS, AS REQUIRED TO IDENTIFY ANY CRACKS: VISUAL, MAGNETIC PARTICLE, AND/OR ULTRA-SONIC. IN ADDITION, OTHER TEST METHODS MAY ALSO BE USED AT THE RECOMMENDATION OF THE TESTING AGENCY AND UPON THE APPROVAL OF THE OWNER AND THE ENGINEER. CONTRACTOR SHALL PROVIDE CAREFUL AND THOROUGH DOCUMENTATION OF THIS INSPECTION TO THE OWNER AND THE ENGINEER BEFORE PROCEEDING WITH WORK. CONTRACTOR SHALL COORDINATE THESE INSPECTION ACTIVITIES WITH THE OWNER'S REQUIRED PROCESSES AND PROCEDURES. IMPORTANT: THE TESTING AGENCY SHALL IMMEDIATELY REPORT ANY INDICATIONS OF CRACKS, FRACTURES, DISTRESS, AND/OR CORROSION TO THE OWNER AND ENGINEER.

(2.) AFTER CONSTRUCTION, TESTING AGENCY SHALL INSPECT ANY AND ALL FIELD WELDS AND FIELD REPAIRS IMPLEMENTED AS REQUIRED BY THE OWNER FROM THE RESULTS OF THE INSPECTION IN THE PREVIOUS NOTE (1) ABOVE.

GENERAL NOTES:

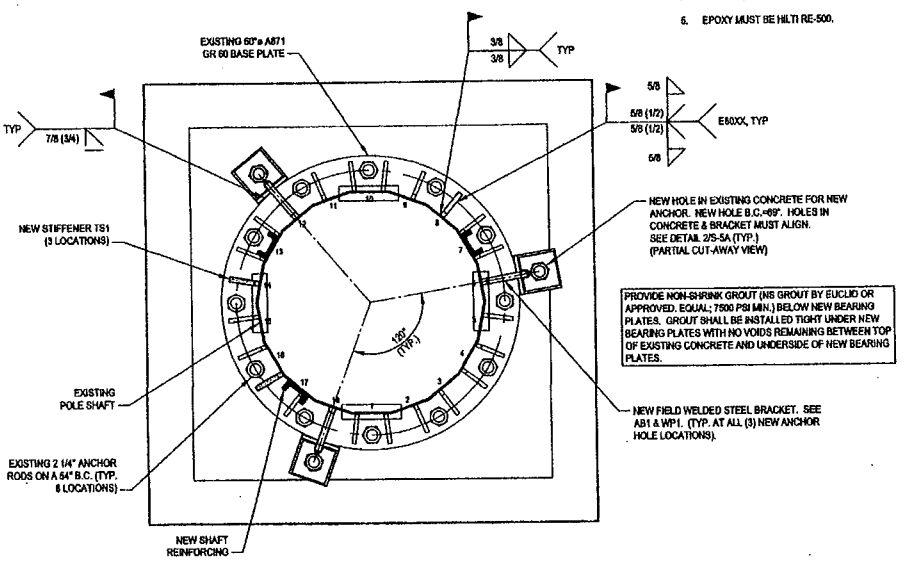
1. AJAX BOLTS ARE TO BE 20 mm Ø WITH CORRESPONDING 29 mm Ø SHEAR SLEEVE WITH MATCHING STEEL GRADE. DRILLED HOLE DIAMETERS IN REINFORCING STEEL AND EXISTING SHAFT SHALL BE 1 3/16"ø MAX.

2. ALL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123. ALTERNATIVELY, ALL NEW STIFFENER PLATE STEEL REINFORCING MAY BE COLD GALVANIZED AS FOLLOWS: APPLY A MINIMUM OF TWO COATS OF ZRC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.0 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-831-3276 FOR PRODUCT INFORMATION.

3. ALL SHAFT REINFORCING IS A572 GR 65.

4. PRELIM DESIGN BASED ON FAILING SA BY PAUL J FORD & COMPANY, DATED JUNE 6, 2012.

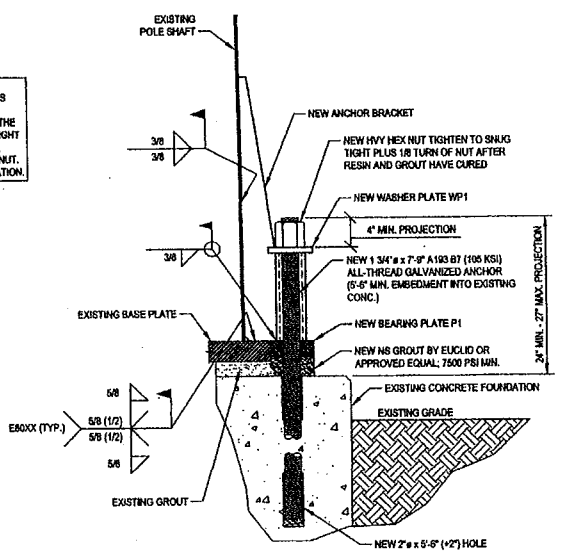
6. EPOXY MUST BE HILTI RE-500.



PROVIDE NON-SHRINK GROUT (NS GROUT BY EUCLID OR APPROVED. EQUAL; 7500 PSI MIN.) BELOW NEW BEARING PLATES. GROUT SHALL BE INSTALLED TIGHT UNDER NEW BEARING PLATES WITH NO VOIDS REMAINING BETWEEN TOP OF EXISTING CONCRETE AND UNDERSIDE OF NEW BEARING PLATES.

BASE PLATE 1 / S-5A

NEW ANCHOR ROD REINFORCING SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS. ONCE ALL RESIN HAS CURED PRIOR TO GROUTING, ALL NEW ANCHOR ROD REINFORCING SHALL BE PROOF LOADED TO 100 KIPS. ONCE THE PROOF LOAD HAS BEEN RELEASED, TIGHTEN NUT TO SNUG TIGHT CONDITION AND INSTALL GROUT. AFTER GROUT HAS CURED, TIGHTEN HEAVY HEX NUT TO SNUG TIGHT PLUS 1/8 TURN OF NUT. REFER TO SHEET S-2A, SECTION H FOR ADDITIONAL INFORMATION.



NEW ANCHOR & BRACKET DETAIL 2 / S-5A

STATE OF CONNECTICUT
DAVID L. SUMMERS
No. 21884
LICENSED PROFESSIONAL ENGINEER

7/24/2013

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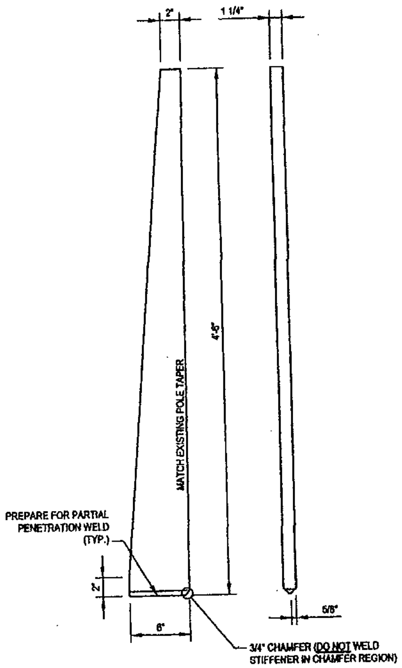
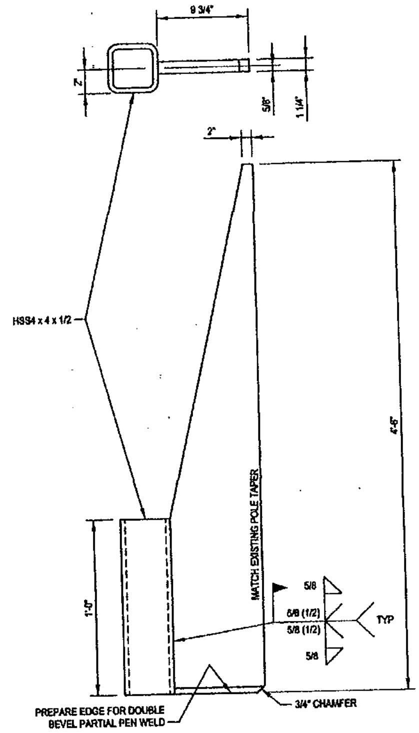


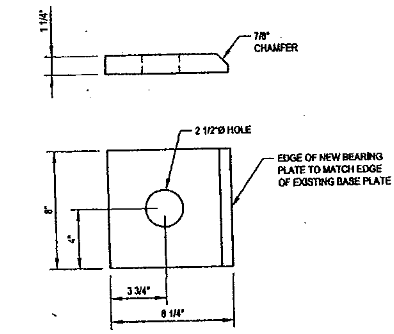
TRANSITION STIFFENER MK~TS1

(3 REQUIRED) (Fy = 65 KSI)



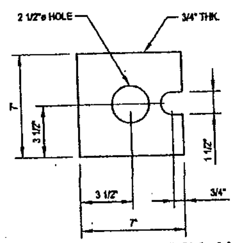
ANCHOR BRACKET MK~AB1

(3 REQUIRED) (TUBE Fy = 46 KSI) (STIFFENER Fy = 65 KSI)



BEARING PLATE MK~P1

(4 REQUIRED) (Fy = 50 KSI)



WASHER PLATE MK~WP1

(3 REQUIRED) (Fy = 50 KSI)

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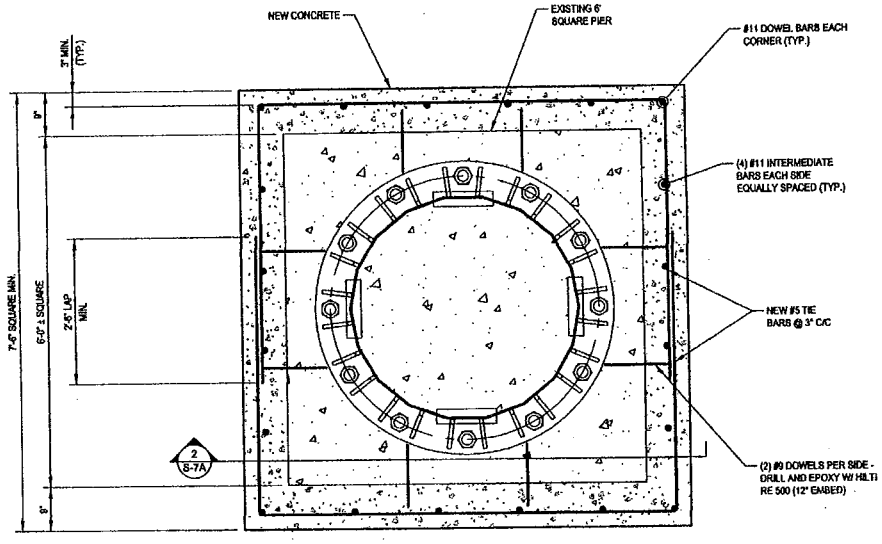
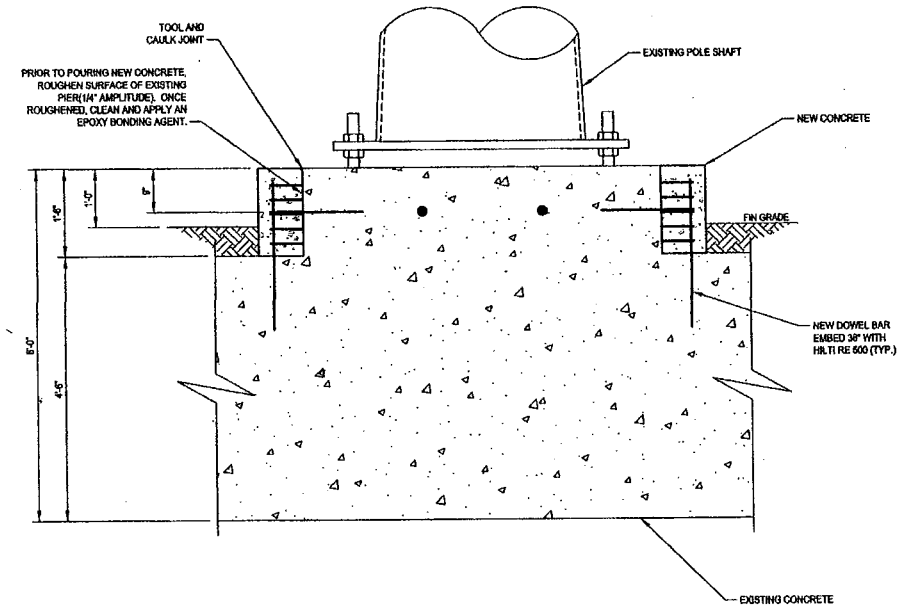


FOUNDATION REINFORCING PLAN (1 / S-7A)



FOUNDATION REINFORCING (2 / S-7A)

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MODIFICATION INSPECTION NOTES:

GENERAL
THE MODIFICATION INSPECTION (MI) IS A VISUAL INSPECTION OF TOWER MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTIONS AND OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS, AS DESIGNED BY THE ENGINEER OF RECORD (EOR).

THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, NOR DOES THE MI INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES.

ALL MI'S SHALL BE CONDUCTED BY A CROWN ENGINEERING VENDOR (AEV) OR ENGINEERING SERVICE VENDOR (AESV) THAT IS APPROVED TO PERFORM ELEVATED WORK FOR CROWN. SEE ENG-BUL-10173 LIST OF APPROVED MI VENDORS.

TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PO IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY. IF CONTACT INFORMATION IS NOT KNOWN, CONTACT YOUR CROWN POINT OF CONTACT (POC).

REFER TO ENG-SOW-10007 : MODIFICATION INSPECTION SOW FOR FURTHER DETAILS AND REQUIREMENTS.

MI INSPECTOR
THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO FOR THE MI TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS

THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GENERAL CONTRACTOR (GC) INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING THE IN-FIELD INSPECTIONS, AND SUBMITTING THE MI REPORT TO CROWN.

GENERAL CONTRACTOR
THE GC IS REQUIRED TO CONTACT THE MI INSPECTOR AS SOON AS RECEIVING A PO FOR THE MODIFICATION INSTALLATION OR TURNKEY PROJECT TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS
- BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS

THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST AN DENG-SOW-10007.

RECOMMENDATIONS
THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING A MI REPORT:

- IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLE 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
- THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS
- IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND MI INSPECTION(S) TO COMMENCE WITH ONE SITE VISIT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY DEFICIENCIES CORRECTED DURING THE INITIAL MI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MI CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON SITE.

CANCELLATION OR DELAYS IN SCHEDULED MI
IF THE GC AND MI INSPECTOR AGREE TO A DATE ON WHICH THE MI WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, CROWN SHALL NOT BE RESPONSIBLE FOR ANY COSTS, FEES, LOSS OF DEPOSITS AND/OR OTHER PENALTIES RELATED TO THE CANCELLATION OR DELAY INCURRED BY EITHER PARTY FOR ANY TIME (E.G. TRAVEL AND LODGING, COSTS OF KEEPING EQUIPMENT ON-SITE, ETC.). IF CROWN CONTRACTS DIRECTLY FOR A THIRD PARTY MI, EXCEPTIONS MAY BE MADE IN THE EVENT THAT THE DELAY/CANCELLATION IS CAUSED BY WEATHER OR OTHER CONDITIONS THAT MAY COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.

CORRECTION OF FAILING MI'S
IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI ("FAILED MI"), THE GC SHALL WORK WITH CROWN TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:

- CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI.
- OR, WITH CROWN'S APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION

MI VERIFICATION INSPECTIONS
CROWN RESERVES THE RIGHT TO CONDUCT A MI VERIFICATION INSPECTION TO VERIFY THE ACCURACY AND COMPLETENESS OF PREVIOUSLY COMPLETED MI INSPECTION(S) ON TOWER MODIFICATION PROJECTS.

ALL VERIFICATION INSPECTIONS SHALL BE HELD TO THE SAME SPECIFICATIONS AND REQUIREMENTS IN THE CONTRACT DOCUMENTS AND IN ACCORDANCE WITH ENG-SOW-10007.

VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT AEV/AESV FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASSING MI" OR "PASS AS NOTED MI" REPORT FOR THE ORIGINAL PROJECT.

PHOTOGRAPHS
BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:

- PRE-CONSTRUCTION GENERAL SITE CONDITION
- PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION
  - RAW MATERIALS
  - PHOTOS OF ALL CRITICAL DETAILS
  - FOUNDATION MODIFICATIONS
  - WELD PREPARATION
  - BOLT INSTALLATION AND TORQUE
  - FINAL INSTALLED CONDITION
  - SURFACE COATING REPAIR
- POST CONSTRUCTION PHOTOGRAPHS
  - FINAL INFIELD CONDITION

PHOTOS OF ELEVATED MODIFICATIONS TAKEN FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.

THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS, PLEASE REFER TO ENG-SOW-10007.

MI CHECKLIST

CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY EOR)	REPORT ITEM
	PRE-CONSTRUCTION
X	MI CHECKLIST DRAWINGS
X	EOR APPROVED SHOP DRAWINGS
X	FABRICATION INSPECTION
X	FABRICATOR CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT (MTR)
NA	FABRICATOR NDE INSPECTION
X	NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED)
X	PACKING SLIPS
ADDITIONAL TESTING AND INSPECTIONS:	
	CONSTRUCTION
X	CONSTRUCTION INSPECTIONS
X	FOUNDATION INSPECTIONS
X	CONCRETE COMP. STRENGTH AND SLUMP TESTS
X	POST INSTALLED ANCHOR ROD VERIFICATION
X	BASE PLATE GROUT VERIFICATION
X	CONTRACTOR'S CERTIFIED WELD INSPECTION
NA	EARTHWORK: LIFT AND DENSITY
X	ON SITE COLD GALVANIZING VERIFICATION
NA	GUY WIRE TENSION REPORT
X	GC AS-BUILT DOCUMENTS
X	INSPECTION OF BOLT PRETENSION PER AISC BOLT SPEC.
X	INSPECTION OF AJAX BOLTS AND DTI'S PER REQUIREMENTS ON SHEET S-3
ADDITIONAL TESTING AND INSPECTIONS:	
	POST-CONSTRUCTION
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
X	POST INSTALLED ANCHOR ROD PULL-OUT TESTING
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

NOTE: X DENOTES A DOCUMENT NEEDED FOR THE PMI REPORT
NA DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE PMI REPORT

STATE OF CONNECTICUT
DAVID L SUMMERS
No. 21884
LICENSED PROFESSIONAL ENGINEER
7/24/2012

AEROSOLUTIONS SHAFT REINFORCING OPTION

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street · Suite 1500 · Columbus, Ohio 43215
(614) 221-6679 www.pjfweb.com

CROWN CASTLE
3530 TORINGDON WAY, SUITE 300, CHARLOTTE, NC 28277
PH: (908) 258-7010 FAX: (301) 780-5649

BU #876362; OXFORD / FRITZ PROPERTY
OXFORD, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37512-1027	ISSUE DATE OF PERMIT: 7-6-2012
DRAWN BY: B.M.S.	
CHECKED BY: T.J.D.	
APPROVED BY:	S-8A
DATE: 7-6-2012	

EBI Consulting
environmental | engineering | due diligence

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

Sprint Existing Facility

Site ID: CT23XC508

Oxford / Fritz Property
338 Oxford Road
Oxford, CT 06478

August 28, 2012

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

EBI Consulting
environmental | engineering | due diligence

August 28, 2012

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

Re: Emissions Values for Site **CT23XC508 – Oxford / Fritz Property**

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at 338 Oxford Road, Oxford, 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 338 Oxford Road, Oxford, CT, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. All calculations were performed assuming the main lobe of the antenna was focused at the base of the tower to present a worst case scenario. Actual values seen from this site will be dramatically less than those shown in this report. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

For all calculations, all emissions were calculated using the following assumptions:

1) 2 CDMA Carriers (1900 MHz) were considered for each sector of the proposed installation.
2) 1 CDMA Carrier (850 MHz) was considered for each sector of the proposed installation
3) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
4) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The actual gain in this direction was used per the manufactures supplied specifications.
5) The antenna used in this modeling is the RFS APXVSPP18-C-A20. This is based on feedback from the carrier with regards to anticipated antenna selection. This antenna has a 15.9 dBd gain value at its main lobe at 1900 MHz and 13.4 dBd at its main lobe for 850 MHz. All calculations were performed assuming the main lobe of the antenna was focused at the base of the tower to present a worst case scenario.

6) The antenna mounting height centerline of the proposed antennas is **150.4 feet** above ground level (AGL)
7) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

All calculation were done with respect to uncontrolled / general public threshold limits

EBI Consulting

environmental | engineering | due diligence

Summary

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

The anticipated Maximum Composite contributions from the Sprint facility are **10.731% (3.577% from each sector)** of the allowable FCC established general public limit considering all three sectors simultaneously sampled at the ground level.

The anticipated composite MPE value for this site assuming all carriers present is **38.521%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions

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

Scott Heffernan
RF Engineering Director

EBI Consulting
21 B Street
Burlington, MA 01803

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

July 12, 2013

The Honorable George R. Temple
First Selectman
Town of Oxford
486 Oxford Road
Oxford, CT 06478-1298

RE: **EM-SPRINT-108-130712** – Sprint Spectrum, L.P. notice of intent to modify an existing telecommunications facility located at 338 Oxford Road, Oxford, Connecticut.

Dear First Selectman Temple:

The Connecticut Siting Council (Council) received a request to modify an existing telecommunications facility, pursuant to Regulations of Connecticut State Agencies Section 16-50j-72, a copy of which has already been provided to you.

If you have any questions or comments regarding the proposal, please call me or inform the Council by July 26, 2013.

Thank you for your cooperation and consideration.

Very truly yours,

Melanie Bachman
Acting Executive Director

MB/cm

c: Vincent Vizzo, Planning & Zoning Chairman, Town of Oxford

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

August 10, 2015

Camille M. Mulligan
Alcatel-Lucent
1 Robbins Road
Westford, MA 01886

RE: **Compliance Extension Request**

EM-SPRINT-008-130130	93 Old Amity Road	Bethany
EM-SPRINT-009-131008	8 Sky Edge Drive	Bethel
EM-SPRINT-017-131008	371 Terryville Avenue	Bristol
EM-SPRINT-018-130322	39 Carmen Hill Road	Brookfield
EM-SPRINT-033-130920	179 Shunpike Road	Cromwell
EM-SPRINT-034-130920	41 Padanaram Road	Danbury
EM-SPRINT-069-130409	246 East Franklin Street	Danielson
EM-SPRINT-035-130322	126 Ledge Road	Darien
EM-SPRINT-043-130311	310 Prestige Park Road	East Hartford
EM-SPRINT-047-131008	232 South Main Street	East Windsor
EM-SPRINT-051-130606	280 Morehouse Drive	Fairfield
EM-SPRINT-052-130606	45 Maple Ridge Road	Farmington
EM-SPRINT-057-120122	363 Riversville Road	Greenwich
EM-SPRINT-057-131127	9 Sound Shore Dr., a/k/a 12 Sound Shore Drive	Greenwich
EM-SPRINT-059-130819	99 Briar Road	Groton
EM-SPRINT-062-130509	Talmadge Road	Hamden
EM-SPRINT-068-121226	136 Bulls Bridge Road	Kent
EM-SPRINT-076-130819	135 New Road	Madison
EM-SPRINT-077-130828	Olcott Street a/k/a 250 Olcott Street	Manchester
EM-SPRINT-080-131024	21 West Peak Drive	Meriden
EM-SPRINT-081-130716	1 Service Road	Middlebury
EM-SPRINT-084-130124	528 Wheeler's Farm Rd.	Milford
EM-SPRINT-091-130606	302 Ball Pond Road	New Fairfield
EM-SPRINT-095-131008	26 Washinton Street	New London
EM-SPRINT-097-131008	8 Ferris Road	Newtown
EM-SPRINT-097-131129	201 South Main St.	Newtown
EM-SPRINT-103-121226	173/177 West Rocks Road	Norwalk
EM-SPRINT-104-131112	2 Hinkley Hill Road	Norwich
EM-SPRINT-108-130215	20 Great Oak Road	Oxford
EM-SPRINT-108-130401	133 Coppermine Road	Oxford
EM-SPRINT-108-130712	338 Oxford Road	Oxford
EM-SPRINT-119-130314	47 Inwood Road	Rocky Hill

Site ID	CT23XC508 - Oxford / Fritz Property
Site Addresss	338 Oxford Road, Oxford, CT 06478
Site Type	Monopole

Sector 1

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
1a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	2	40	15.9	150.4	144.4	1/2 "	0.5	0	1386.9474	23.91286	2.39129%
1a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	150.4	144.4	1/2 "	0.5	0	389.96892	6.723596	1.18582%
														Sector total Power Density Value:		3.577%	

Sector 2

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
2a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	2	40	15.9	150.4	144.4	1/2 "	0.5	0	1386.9474	23.91286	2.39129%
2a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	150.4	144.4	1/2 "	0.5	0	389.96892	6.723596	1.18582%
														Sector total Power Density Value:		3.577%	

Sector 3

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
3a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	2	40	15.9	150.4	144.4	1/2 "	0.5	0	1386.9474	23.91286	2.39129%
3a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	150.4	144.4	1/2 "	0.5	0	389.96892	6.723596	1.18582%
														Sector total Power Density Value:		3.577%	

Site Composite MPE %	
Carrier	MPE %
Sprint	10.731%
AT&T	6.830%
Verizon Wireless	20.960%
Total Site MPE %	**38.521%**

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

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

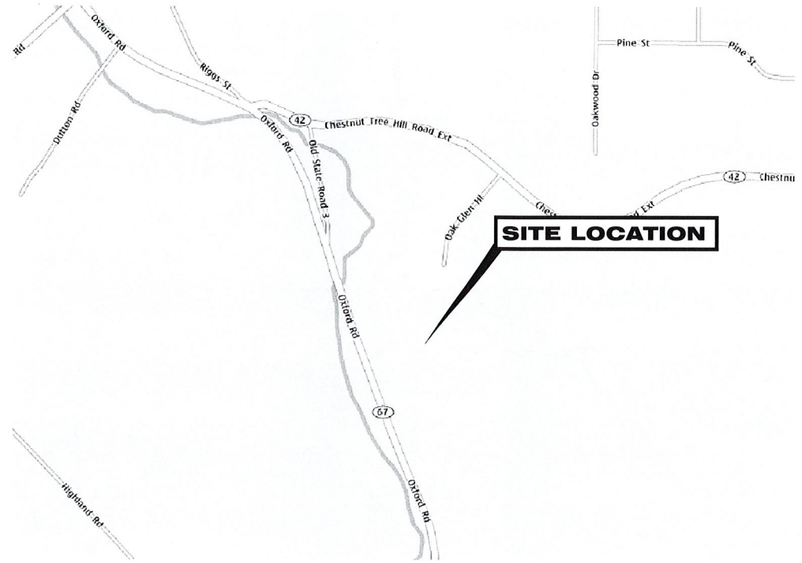
Sprint® TM

SITE ID: CT23XC508
CROWN CASTLE # 876362
SITE NAME: OXFORD / FRITZ PROPERTY

NETWORK VISION CONSTRUCTION DRAWINGS

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

AERIAL VIEW
SCALE: NTS



LOCATION MAP
SCALE: NTS

DRAWING INDEX

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

CODES & STANDARDS

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

State Building Code: 2005 Connecticut Supplement

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

2005 National Electrical Code (NFPA-70)

DRIVING DIRECTIONS

1. DEPART 1 INTERNATIONAL BLVD, MAHWAH, NJ 07495
2. TAKE 3RD EXIT FROM ROUNDABOUT INTERNATIONAL BLVD ONTO LEISURE LN.
3. TAKE RAMP ONTO STATE HIGHWAY 17 (RT-17 N).
4. CONTINUE ON I-287 N.
5. TAKE THE I-87 S/I-287/NEW YORK STATE THRUWAY SOUTH/TAPPAN ZEE BR/NEW YORK CITY EXIT ONTO NEW YORK STATE THRUWAY SOUTH (I-287 E, I-87 S) (PARTIAL TOLL ROAD).
6. KEEP RIGHT ONTO NEW YORK STATE THRUWAY SOUTH (I-87 S) TOWARD RT-119/SAW MILL PKWY NORTH/SAW MILL PKWY SOUTH/NEW YORK CITY/ELMSFORD.
7. TAKE EXIT #8A/RT-119/SAW MILL PKWY NORTH/ELMSFORD ONTO SAW MILL PKY NORTH, SAW MILL RIVER PKY N TOWARD SAW MILL RIVER PKWY NORTH/KATONAH.
8. TAKE LEFT RAMP ONTO I-684 N TOWARD BREWSTER.
9. TAKE EXIT #9E/I-84 E/DANBURY ONTO I-84 E.
10. TAKE EXIT #15/US-6 E/CT-67/SOUTHBURY TOWARD US-6 E/CT-67 N/WOODBURY/ROXBURY.
11. TURN RIGHT ONTO CT-67. YOUR DESTINATION ON OXFORD RD (CT-67) IS ON THE LEFT.

SITE INFORMATION

BLOCK: 9
LOT: 34A
MAP: 34
ZONING CLASSIFICATION: TBD
ZONING JURISDICTION: TBD

PROJECT INFORMATION:

SITE ADDRESS:
338 OXFORD ROAD
OXFORD CT, 06478
NEW HAVEN COUNTY

COORDINATES:
LATITUDE: N 41° 25' 40.98"
LONGITUDE: W 73° 06' 30.92"
DATUM : NAD 83

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

PROJECT DIRECTORY:

PROPERTY OWNER:
CROWN CASTLE USA
2000 CORPORATE DRIVE
CANONSBURG, PA 15317

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

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

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

CONSTRUCTION MANAGER:
TODD AMANN
(914) 715-9363

CROWN CASTLE CONSTRUCTION MANAGER:
MIKE CALLAHAN
(860) 919-7278

NOTE:
NO CONSTRUCTION IS TO COMMENCE PRIOR TO CROWN CASTLE APPROVAL

Sprint®

Alcatel·Lucent

REV.	DATE	REVISION DESCRIPTION	DRAWN BY	CHKD. BY
0	05-14-13	ISSUED FOR CONSTRUCTION	JRF	KCD

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

Stephen A. Bray
PROFESSIONAL ENGINEER

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

CT LICENSE: 26657 5/16/13

PROJECT NUMBER:
332.1485

SITE INFORMATION:
338 OXFORD ROAD
OXFORD, CT 06478
NEW HAVEN COUNTY
CROWN CASTLE # 876362
CT23XC508

DESIGN TYPE:
NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
JLS		04-19-12

SHEET TITLE:
COVER SHEET

SHEET NUMBER:	REV.:
A01	0

K:\332_Sprint_332.1000_Alcatel-Lucent\332.1485_CT23XC508_338 Oxford Road\332.1485_CAD\332.1485_Construction\332.1485.A01.dwg, 5/16/2013 9:19:09 AM, jsypniewski

GENERAL CONSTRUCTION NOTES:

1. This set of plans has been prepared for the purposes of municipal and agency review and approval. This set of plans shall not be utilized as construction documents until all drawings have been revised to indicate "ISSUED FOR CONSTRUCTION." Contractor shall e-mail plans@kmbdg.com to ensure that they have the latest set of construction drawings prior to commencing any work whatsoever.
2. ADA compliance: The facility is a normally unoccupied mobile radio facility.
3. These plans are intended to be used to direct the proposed layout. Drawings should not be scaled unless otherwise noted. Plans, elevations and details are intended to show the end result of design. Minor modifications may be required to suit job dimensions or conditions.
4. The contractor shall verify all dimensions and conditions and notify the Project Manager of any discrepancies before starting any work.
5. These plans are designed to reflect observed field conditions. Certain conditions are assumed to comply with general standard construction design methods and principles, and the Contractor shall note that not all areas of structural attachment have been opened or specifically verified. The Contractor is therefore requested to notify the Engineer immediately should encountered field conditions vary from those depicted on the drawings. KMB Design Group, LLC will issue field change direction if required. The Project Manager is referenced on the cover sheet.
6. All equipment and materials shall be installed in accordance with the manufacturer's recommendations unless otherwise noted by the Engineer of Record.
7. The Contractor shall be responsible for all work performed and materials installed to be in strict conformance, as a minimum standard, with all applicable codes, regulations and ordinances having jurisdiction. Electrical systems shall be installed in conformance with the National Electrical Code, and all other local and state jurisdictional codes, ordinances, and with local utility company specifications, whichever is more stringent.
8. The Contractor shall keep contract area clean, hazard free and dispose of all dirt, stumps, stones, rubbish or debris in accordance with all local and environmental laws. No materials or equipment shall be placed anywhere on or in the structure without making adequate provisions to protect existing property. Upon completion, repair any damage that may have occurred during construction. Repair all existing wall surfaces damaged during construction such that they match and blend with adjacent surfaces.
9. The Contractor shall be solely responsible and have control over construction means, methods, techniques, sequences, and procedures.

SPRINT SPECIFICATIONS:

1. Contractor shall ensure that they obtain the latest copy of the following documents from ALU:
   A. Cell Site Installation & De-Installation Services - Attachment G-1
   B. Sprint Integrated Construction Standards for Wireless Sites
   C. Standard Construction Specifications for Wireless Sites
2. Contractor shall notify the Engineer immediately if any of the Sprint standards contradict the standards provided by KMB Design Group, LLC so that the Engineer can provide direction.
3. State, Federal and Local codes prevail.

DIVISION 1 - GENERAL REQUIREMENTS SECTION 01010 SUMMARY OF WORK:

1. The Contractor shall review and become familiar with specifications contained in the bid package prepared by KMB Design Group, LLC and the client. The Contractor shall e-mail plans@kmbdg.com to ensure that they have the latest set of construction drawings prior to commencing any work whatsoever.
2. In the event of a conflict between the bid package specifications and these notes, the provisions of the clients specifications shall take precedence.
3. The Contractor shall visit the site of the proposed work and fully acquaint themselves with the conditions as they exist in order that any restrictions pertaining to the work are understood. All areas and dimensions are indicated on the drawings as accurately as possible, but all conditions shall be verified by each contractor and/or subcontractor at the site. The failure of the contractor to examine or receive any form, instrument or document, or to visit the site shall not relieve the Contractor from any obligation with respect to their quoted price. The submission of a quotation shall acknowledge that the Contractor and their Subcontractors have fully examined the site and know the existing conditions and have made provisions for operating under the conditions as they exist at the site and have included all necessary items.
4. The General Contractor's responsibilities shall include, but not be limited to, construction of the equipment foundation, including electrical service, telephone conduits, grounding system and coordination with local utility companies.
5. The antenna installers responsibilities shall include, but not be limited to, cable tray installation, routing of cables from radio equipment to antennas, associated hardware for securing antenna cables, antenna mounts, determining supplier of antennas, grounding of antennas to grounding system, installing antennas and verifying with Radio Frequency Engineers, the alignment, location, and proper orientation of antennas.
6. The Contractors shall coordinate construction activities with the Crown Castle Construction Manager in order to avoid conflicts with current use of the site.
7. The Contractor shall conform to all applicable local, county, state, and federal codes, laws and requirements, including OSHA.
8. The Contractor shall apply and pay for the construction permit, certificate of occupancy and all other required permits or licenses. The Contractor is responsible for obtaining all inspections.
9. Safety procedures: Attention is directed to federal, state, and local laws, rules and regulations concerning construction safety and health standards. The construction company awarded this project shall ensure all working surroundings and conditions are sanitary, and are not hazardous or dangerous to the health or safety of the work crews or building occupants. Precaution shall be exercised at all times for the protection of persons and property. It is mandatory that the safety provisions of applicable local laws, OSHA regulations and building and construction codes, be observed for all contractors and antenna riggers.

SECTION 01613 - DELIVERY, STORAGE AND HANDLING:

1. The Contractor shall be responsible for all procedures and scheduling associated with hoisting, staging, and erecting of materials and equipment to and/or upon the site.
2. All elements of the existing site, i.e. structures, site plantings, etc. shall be protected as necessary from said actions. This work must be done in a safe, secure nondestructive manner for protecting personnel and property.

SECTION 01740 WARRANTIES AND BONDS:

1. The Contractor shall guarantee all labor and materials used in this project for a minimum period of one (1) year commencing from the date of final acceptance by the client. The Contractor is not required to guarantee material supplied by the Owner.
2. Final date of acceptance is deemed as the date that all required state and federal approval have been obtained including, but not limited to:
   A. Final inspection
   B. Certificate of Occupancy
3. Any deficiencies that come evident during this one (1) year period shall be corrected by the Contractor at the Contractor's expense.

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Stephen A. Bray
PROFESSIONAL ENGINEER

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

CT LICENSE: 26657 5/16/13

PROJECT NUMBER:
332.1485

SITE INFORMATION:
338 OXFORD ROAD
OXFORD, CT 06478
NEW HAVEN COUNTY
CROWN CASTLE # 876362
CT23XC508

DESIGN TYPE:
NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
JLS		04-19-12

SHEET TITLE:
GENERAL NOTES
1 OF 2

SHEET NUMBER:	REV.:
C01	0

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DIVISION 2 - SITE WORK

1. The Contractor shall call utilities prior to the start of construction.

2. All existing active sewer, water, gas, electric, and other utilities where encountered in the work, shall be protected at all times, and where required for the proper execution of the work, shall be relocated as directed by Engineers. Extreme caution should be used by the Contractor when excavating or pier drilling around or near utilities. The Contractor shall provide safety training for the working crew. This will include but not limited to:
   A. Fall protection
   B. Confined space
   C. Electrical safety
   D. Trenching & excavation

3. All site work shall be as indicated on the drawing and stipulated in the specification project summary.

4. If necessary, rubbish, stumps, debris, sticks, stones, and other refuse shall be removed from the site and disposed of legally.

5. The site shall be graded to cause surface water flow away from the equipment shelter and monopole areas.

6. No fill or embankment material shall be placed on frozen ground. Frozen materials, snow or ice shall not be placed in any fill or embankment.

7. The sub grade shall be compacted and brought to a smooth uniform grade prior to finished surface application.

8. All existing inactive sewer, water, gas, electric and other utilities, which interfere with the execution of the work, shall be removed and/or capped, plugged or otherwise discontinued at points which will not interfere with the execution of the work, subject to the approval of engineering.

9. The areas of the Owners property disturbed by the work and not covered by the building or driveway, shall be graded to a uniform slope, fertilized, seeded, and covered with mulch as specified in the specification of landscape work.

10. The Contractor shall minimize disturbance to existing site during construction. Erosion control measures, shall be in conformance with the local guidelines for erosion and sediment control.

11. All back fill shall be compacted to 95% modified proctor density as determined by ASTM standard test procedures.

DIVISION 3 - CONCRETE

1. Design and construction of all concrete elements shall conform to the latest editions of the following applicable codes: ACI 301 "Specifications for Structural Concrete for Buildings"; ACI 318 "Building Code Requirements for Reinforced Concrete".

2. Mix design shall be approved by Owner's representative prior to placing concrete.

3. Concrete shall be normal weight, 6% air entrained (±1.5%) with a maximum 4" slump, and have a minimum 28-day compressive strength of 3000 psi unless otherwise noted.

4. Maximum aggregate size shall be 1".

5. The following materials shall be used:

Portland cement:	ASTM C 150, TYPE I
Reinforcement:	ASTM A 185
Normal weight aggregate:	ASTM C 33
Water:	Drinkable
Admixtures:	Non-chloride containing

6. Reinforcing details shall be in accordance with the latest edition of ACI 315.

7. Reinforcing steel shall conform to ASTM A 615, grade 60, deformed unless noted otherwise. Welded wire fabric shall conform to ASTM A 185 welded steel wire fabric unless noted otherwise. Splices shall be class "B" and all hooks shall be standard, unless otherwise noted.

8. The following minimum concrete cover shall be provided for reinforcing steel unless shown otherwise on drawings:
   - Concrete cast against earth ..... 3"
   - Concrete exposed to earth or weather:

   #6 and larger ..... 2"
   #5 and smaller ..... 1 1/2"
   - Concrete not exposed to earth or weather or not cast against the ground:

   Slab and wall ..... 3/4"
   Beams and columns ..... 1 1/2"

9. A 1" chamfer shall be provided at all exposed edges of concrete, unless otherwise noted, in accordance with ACI 30 section 4.2.4.

10. Installation of concrete anchor, shall be per manufacturers written recommended procedure, the anchor bolt, dowel or rod shall conform to manufacturer's recommendation for embedment depth or as shown on the drawing. No rebar shall be cut without prior engineering approval when drilling holes in concrete.

11. Curing compounds shall conform to ASTM C-309.

12. Admixtures shall conform to the appropriate ASTM standard as referenced in ACI-301.

13. Do not weld or tack weld reinforcing steel.

14. All dowels, anchor bolts, embedded steel, electrical conduits, pipe sleeves, grounds and all other embedded items and formed details shall be in place before start of concrete placement.

15. Locate additional construction joints required to facilitate construction as acceptable to Engineer. Place reinforcement continuously through joint.

16. Reinforcement shall be cold bent whenever bending is required.

17. Place concrete in a uniform manner to prevent the formation of cold joints and other planes of weakness. Vibrate the concrete to fully embed reinforcing. Do not use vibrators to transport concrete thorough chutes or formwork.

18. Do not place concrete in water, ice, or on frozen ground.

19. Do not allow concrete sub base to freeze during concrete curing and setting period, or a minimum of 14 days after placement.

20. For cold -weather and hot-weather concrete placement, conform to applicable ACI codes and recommendations. In either case, materials containing chloride, calcium, salts, etc. shall not be used. Protect fresh concrete from weather for 7 days minimum.

DIVISION 5 - METALS

SECTION 05120 - STRUCTURAL STEEL

1. Codes and specifications:
   A. The fabrication/erection shall conform to the requirements of the following codes and specifications, latest edition, unless otherwise noted:
      - The local building code.
      - AISC-specification for structural steel buildings, allowable stress design, 1989.
      - ASTM A992 structural steel (for all w sections only).
      - ASTM A36 structural steel (all other sections).
      - ASTM A53, type E, grade B, electric resistance welded steel pipe.
      - ASTM 123 zinc (hot-dip galvanized) coatings on iron and steel products.
      - ASTM 153 zinc coated (hot-dip) iron and steel hardware.
      - AWS D1.1 structural welding code.
      - EIA/TIA-222 structural standards for steel antenna towers and antenna supporting structures.

2. Design parameters:
   A. The structural steel antenna mounting frames are designed to provide support for antennas and all hardware and accessories associated with antennas.

3. Fabrication and installation requirements:
   A. The antenna supports, antennas and mounting hardware shall be constructed plumb, level and true.
   B. All structural elements and fasteners shall be galvanized in accordance with ASTM A123 and A153.
   C. Welds should be shop made wherever possible, conforming to AISC specification and AWS requirements. All welds are to be of the size and type indicated. Contractor shall employ a licensed welder and shall provide the engineer with their name and a copy of their license prior to commencing any field welding.
   D. Contractor shall provide fire watch during all welding operations, brazing and soldering and other work requiring the use of an open flame. Two (2) hand held 30 lb fire extinguishers and adequate water supply shall be maintained on site. Fire watch plan shall be submitted to the client for approval prior to welding.
   E. All bolted connections shall be A325 high strength bolts 5/8" diameter minimum size unless otherwise noted. Bolts shall be supplied with flat washers. Bolts shall be tightened in accordance with the AISC snug tight condition, unless otherwise noted.
   F. Protective galvanized coatings which were damaged or removed during erection or transportation shall be restored by painting with zinc-rich primer.
   G. All threaded rods shall be 1/2" diameter A36 steel unless otherwise noted.
   H. Temporary structures for staging and construction shall be capable of withstanding forces specified by the local building code current edition.

4. Inspections:
   A. All structural steel antenna frames, and connections shall be inspected prior to installation of antennas.
   B. All antenna cable trays, supports, channels and clamps shall be inspected prior to installation of antenna cables.
   C. Coordinate all inspections with the client's Construction Manager.
   D. Contractor to make notifications 72 hours prior to any required inspections.

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CROWN CASTLE # 876362
CT23XC508

DESIGN TYPE:
NETWORK VISION

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SHEET TITLE:
GENERAL NOTES
2 OF 2

SHEET NUMBER:	REV:
C01A	0

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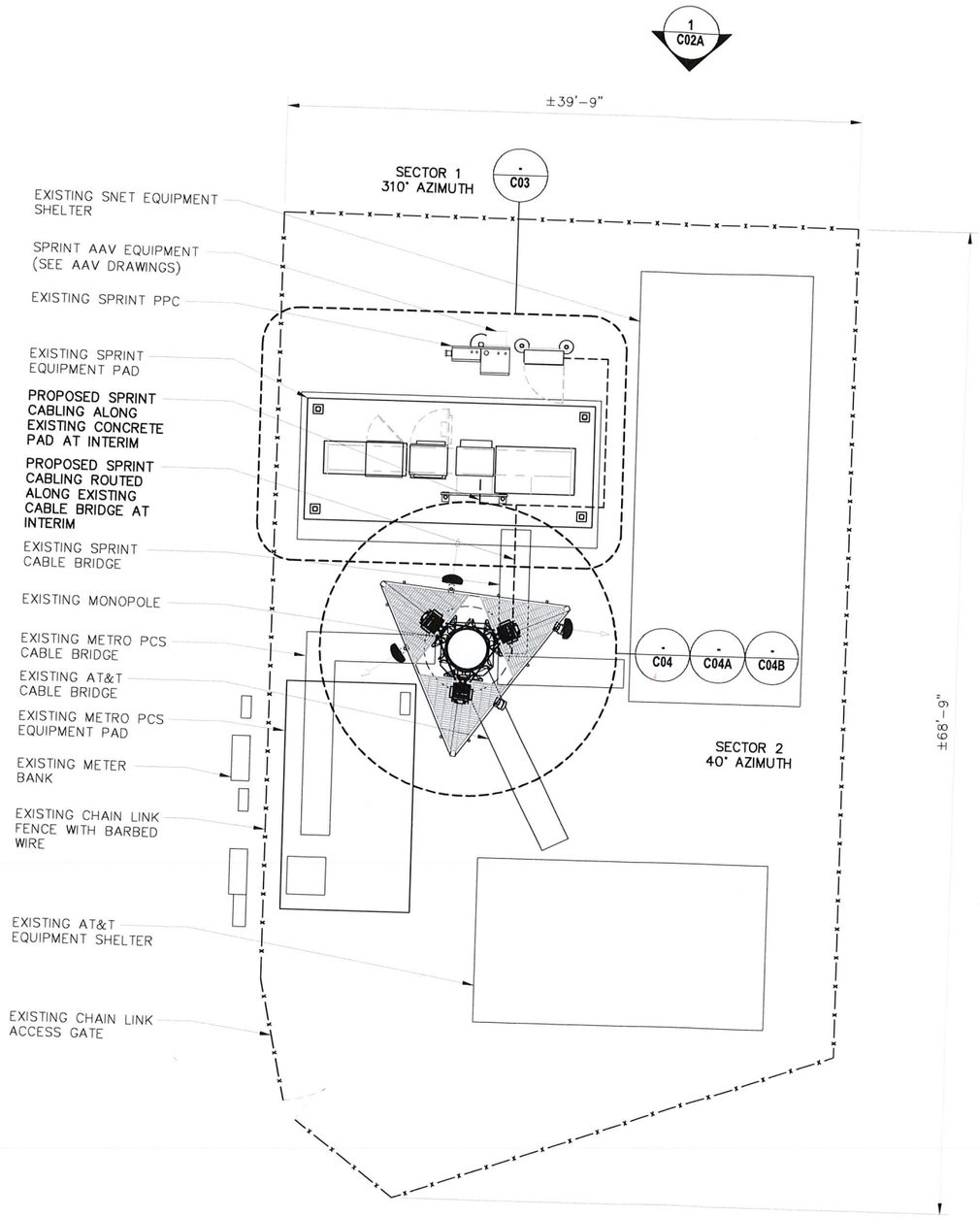

1 COMPOUND PLAN

11x17 SCALE: 1" = 10' | 24x36 SCALE: 1" = 5'

GROUNDING NOTES:
1. HOME RUN GROUNDS NOT APPROVED. ALL ANTENNA BUSS BARS SHOULD BE INSTALLED DIRECTLY TO TOWER STEEL WITHOUT INSULATORS OR DOWN CONDUCTORS.

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

GENERAL NOTES:
1. FINAL ANTENNA & EQUIPMENT CONFIGURATION SHOWN ON THIS PLAN. SEE EQUIPMENT & ANTENNA PLAN SHEETS FOR EXISTING AND INTERIM CONFIGURATION.
2. CONTRACTOR TO REPLACE ALL MISSING GROUND BARS AND GROUNDING CONNECTIONS AS REQUIRED WITH GALVANIZED GROUND BARS. CONTRACTOR SHALL PROVIDE BEFORE & AFTER PHOTOS.
3. CONTRACTOR TO RESTORE ANY RUST AREA TO ORIGINAL CONDITION AND PROTECTIVE COATING TO BE APPLIED.
4. STRUCTURAL ANALYSIS PROVIDED UNDER SEPARATE COVER.
5. PROPOSED SPRINT 1600 MHz GPS UNIT TO REPLACE EXISTING GPS AT FINAL.

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SHEET TITLE:
COMPOUND PLAN

SHEET NUMBER:	REV.:
C02	0

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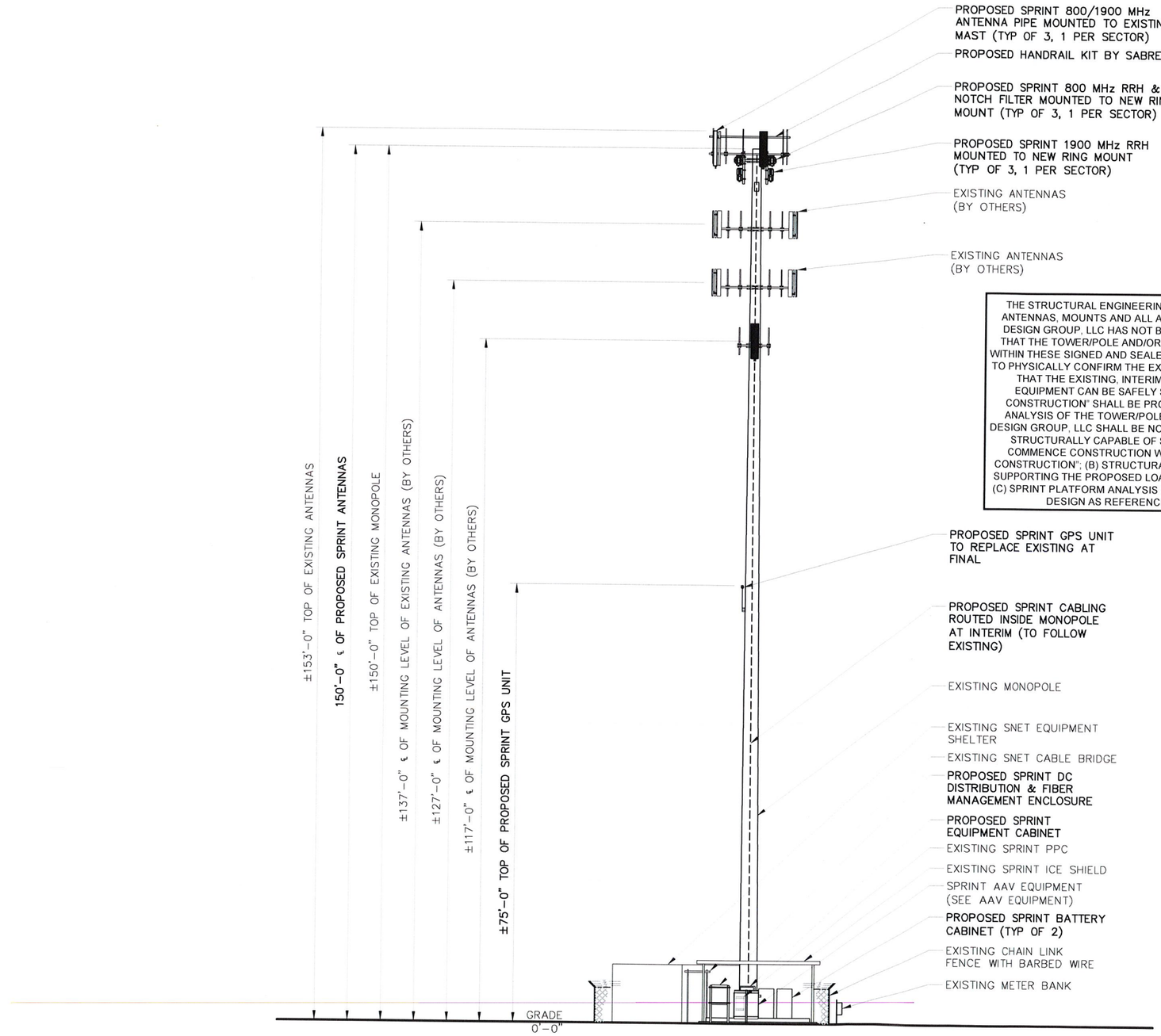

THE STRUCTURAL ENGINEERING CONCERNING THE STRUCTURAL STABILITY OF THE TOWER/POLE, FOUNDATION, ANTENNAS, MOUNTS AND ALL ASSOCIATED ANCILLARY RADIO EQUIPMENT IS BEING COMPLETED BY OTHERS. KMB DESIGN GROUP, LLC HAS NOT BEEN REQUESTED TO PERFORM ANY STRUCTURAL ANALYSIS SERVICES TO VERIFY THAT THE TOWER/POLE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

NOTES:
1. NO CONSTRUCTION TO COMMENCE PRIOR TO CROWN CASTLE APPROVAL.
2. FINAL ANTENNA & EQUIPMENT CONFIGURATION SHOWN ON THIS PLAN. SEE EQUIPMENT & ANTENNA PLAN SHEETS FOR EXISTING AND INTERIM CONFIGURATION.

1 NORTHWEST ELEVATION

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

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SHEET TITLE:
ELEVATION

SHEET NUMBER: C02A | REV.: 0

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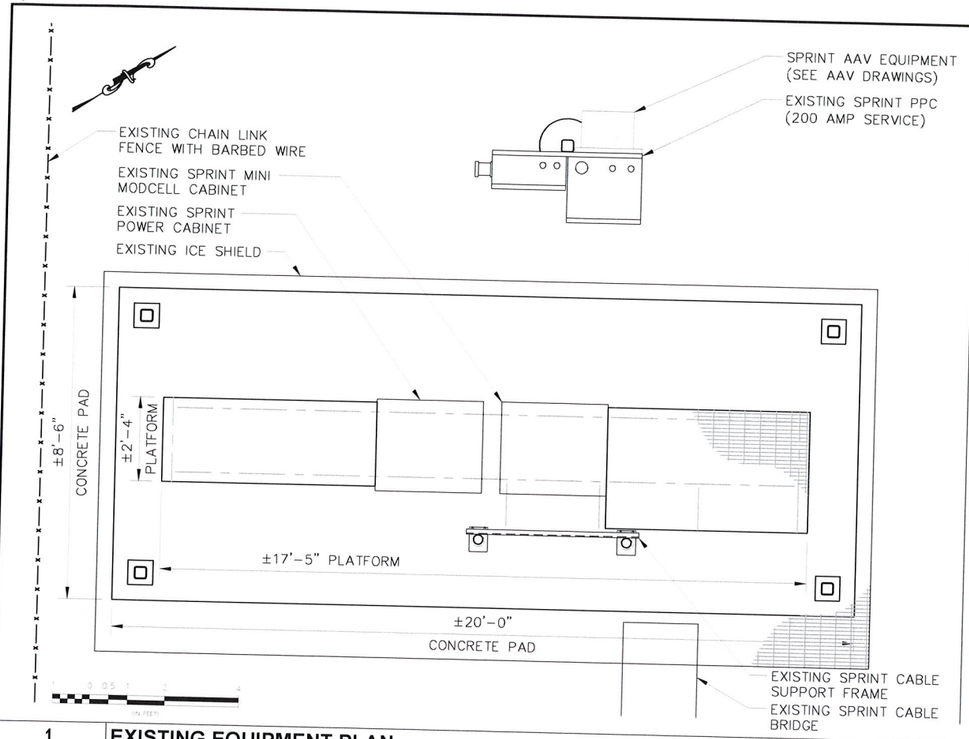
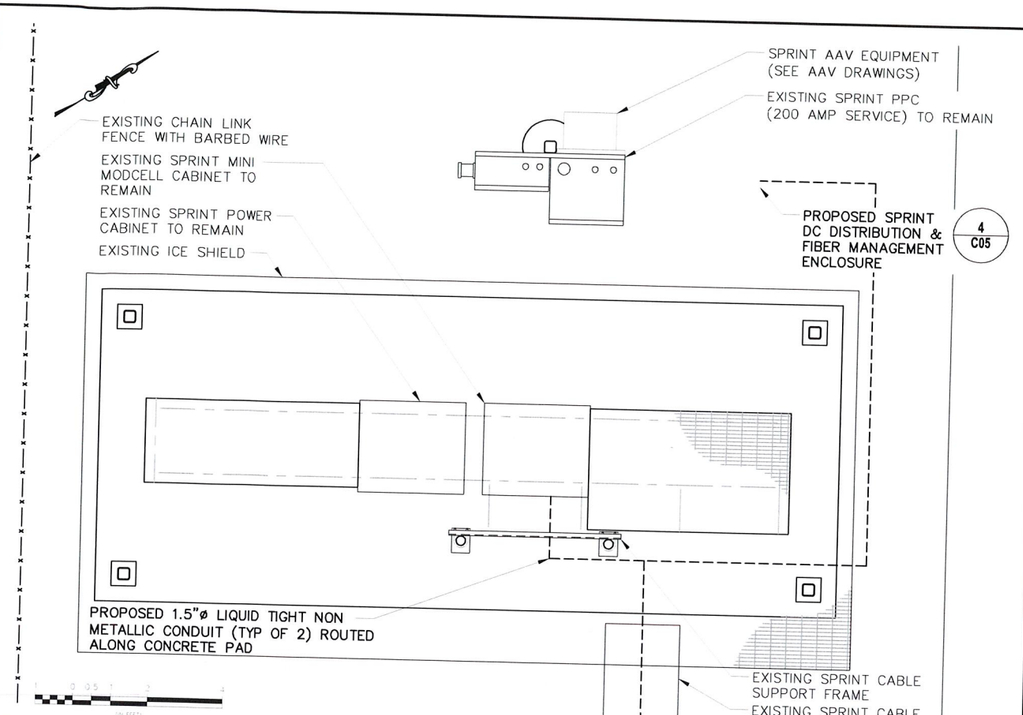


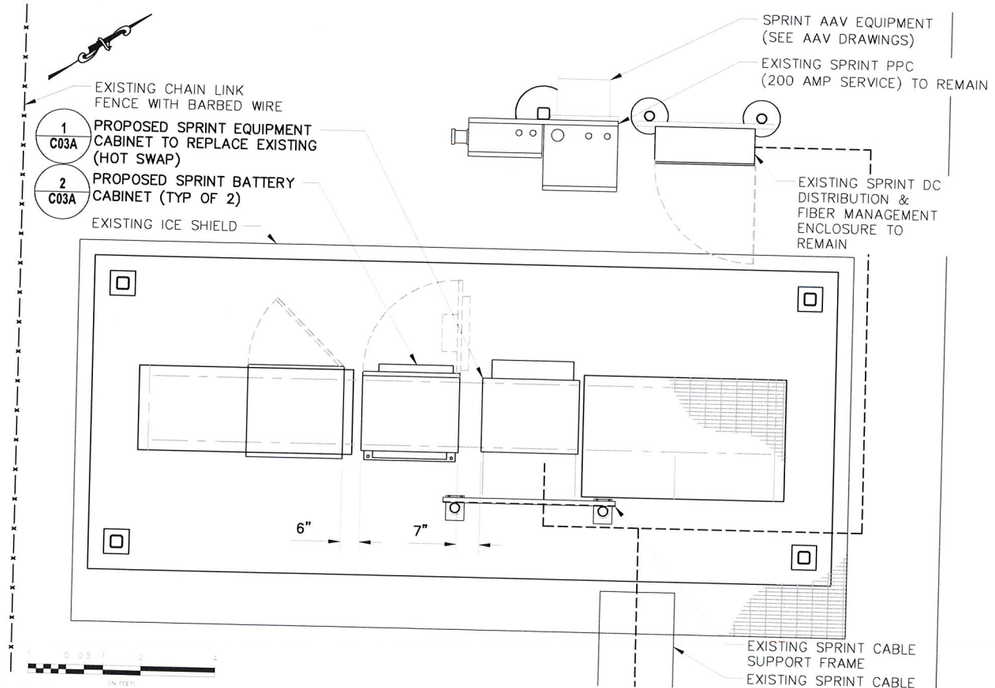
1 **EXISTING EQUIPMENT PLAN**

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



2 **INTERIM EQUIPMENT PLAN**

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



3 **FINAL EQUIPMENT PLAN**

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

NOTE:
1. NO CONSTRUCTION TO COMMENCE PRIOR TO CROWN CASTLE APPROVAL.
2. CONTRACTOR TO REPLACE ALL MISSING GROUND BARS AND GROUNDING CONNECTIONS AS REQUIRED.

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SHEET TITLE:
EQUIPMENT PLANS

SHEET NUMBER: C03 | REV.: 0

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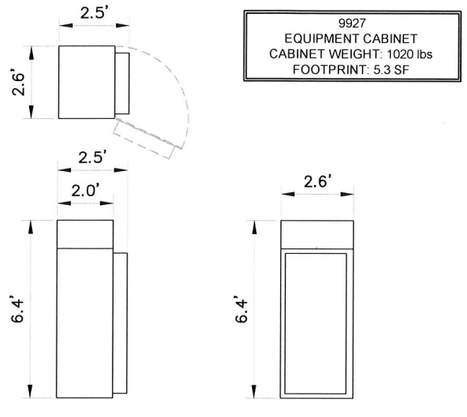
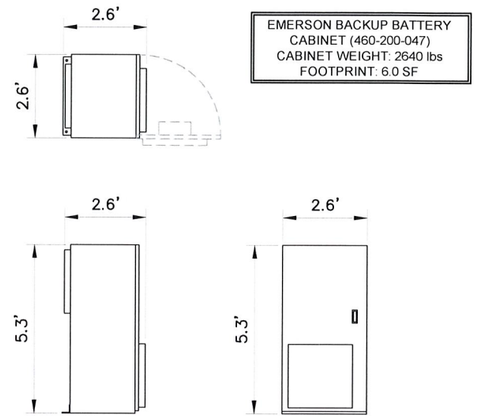


9927
EQUIPMENT CABINET
CABINET WEIGHT: 1020 lbs
FOOTPRINT: 5.3 SF

1 EQUIPMENT CABINET SPECIFICATIONS

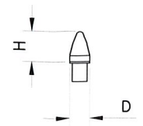
11x17 SCALE: 3/16" = 1'-0" 24x36 SCALE: 3/8" = 1'-0"



EMERSON BACKUP BATTERY
CABINET (460-200-047)
CABINET WEIGHT: 2640 lbs
FOOTPRINT: 6.0 SF

2 BATTERY CABINET SPECIFICATION

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



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

3 GPS UNIT SPECIFICATIONS

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

DETAIL NOT USED

4

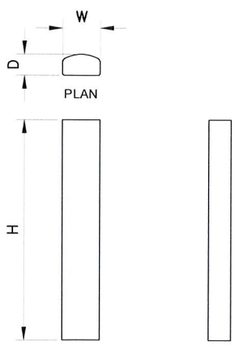
DETAIL NOT USED

5

DETAIL NOT USED

6

DETAIL NOT USED



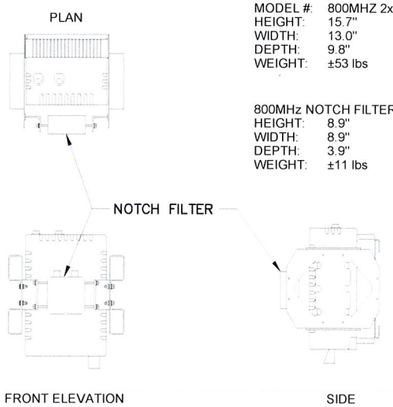
MANUF.: RFS
MODEL: APXVSPP18-C-A20
LENGTH 72.0"
WIDTH: 11.8"
DEPTH: 7.0"
WEIGHT: 64.5 lbs
AREA: 5.9 SF

7 ANTENNA SPECIFICATIONS - 800/1900 MHz

SCALE: NTS

DETAIL NOT USED

8

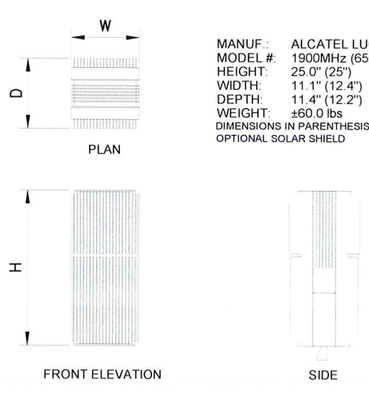


MANUF.: ALCATEL-LUCENT
MODEL #: 800MHZ 2x50W
HEIGHT: 15.7"
WIDTH: 13.0"
DEPTH: 9.8"
WEIGHT: ±53 lbs

800MHz NOTCH FILTER:
HEIGHT: 8.9"
WIDTH: 8.9"
DEPTH: 3.9"
WEIGHT: ±11 lbs

9 RRH SPECIFICATIONS - 800 MHz

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



MANUF.: ALCATEL LUCENT
MODEL #: 1900MHz (65MHz)
HEIGHT: 25.0" (25")
WIDTH: 11.1" (12.4")
DEPTH: 11.4" (12.2")
WEIGHT: ±60.0 lbs
DIMENSIONS IN PARENTHESIS INCLUDE OPTIONAL SOLAR SHIELD

10 RRH SPECIFICATIONS - 1900 MHz

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

DETAIL NOT USED

11

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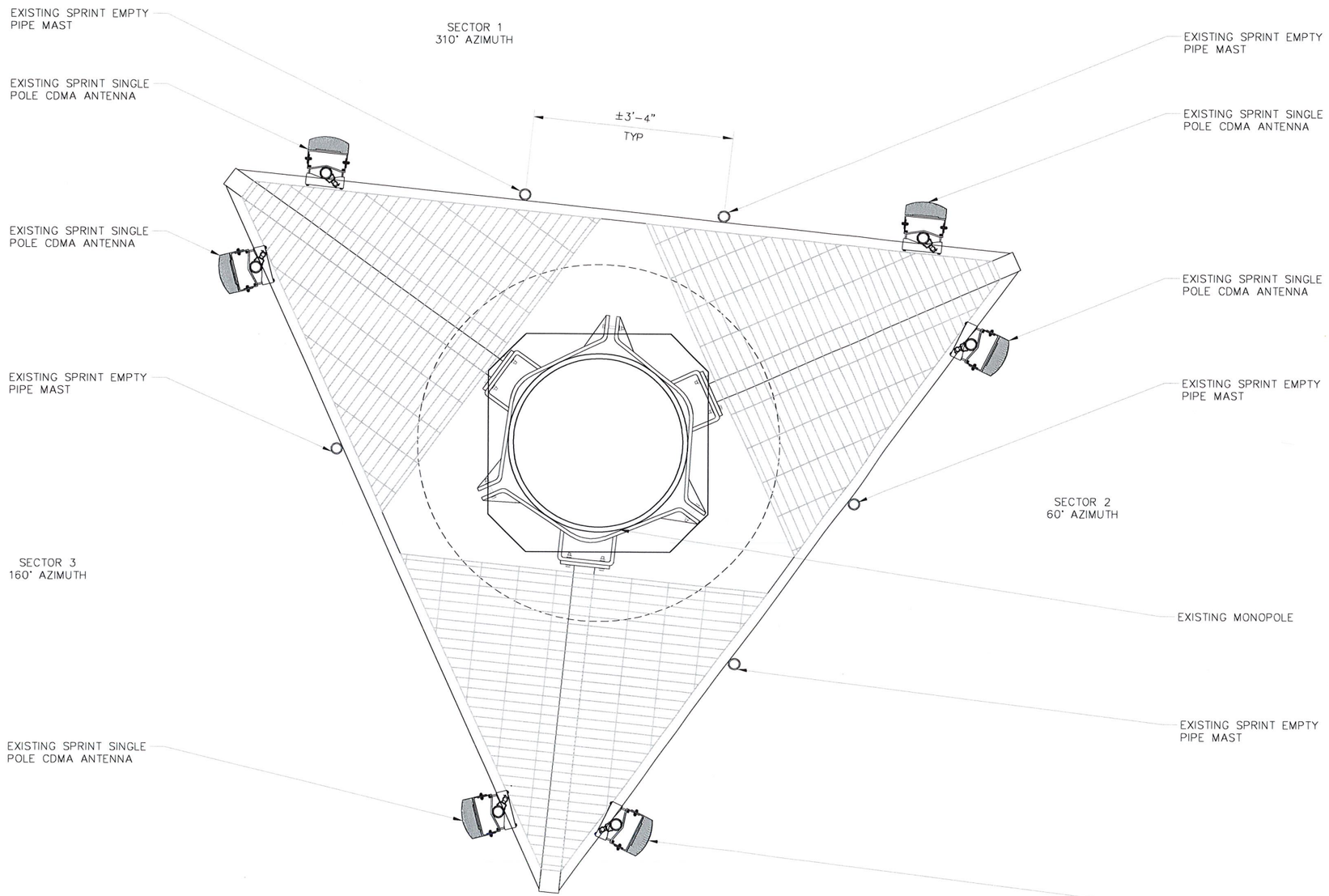

NOTES:
1. NO CONSTRUCTION TO COMMENCE PRIOR TO CROWN CASTLE APPROVAL.

1 EXISTING ANTENNA PLAN @ ±150'-0" AGL (ALL SECTORS)

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

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REV.	DATE	REVISION DESCRIPTION	DRAWN BY	CHKD. BY
0	05-14-13	ISSUED FOR CONSTRUCTION	JRF	KCD

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

Stephen A. Bray
PROFESSIONAL ENGINEER

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

CT LICENSE: 26657 5/16/13

PROJECT NUMBER:
332.1485

SITE INFORMATION:
338 OXFORD ROAD
OXFORD, CT 06478
NEW HAVEN COUNTY
CROWN CASTLE # 876362
CT23XC508

DESIGN TYPE:
NETWORK VISION

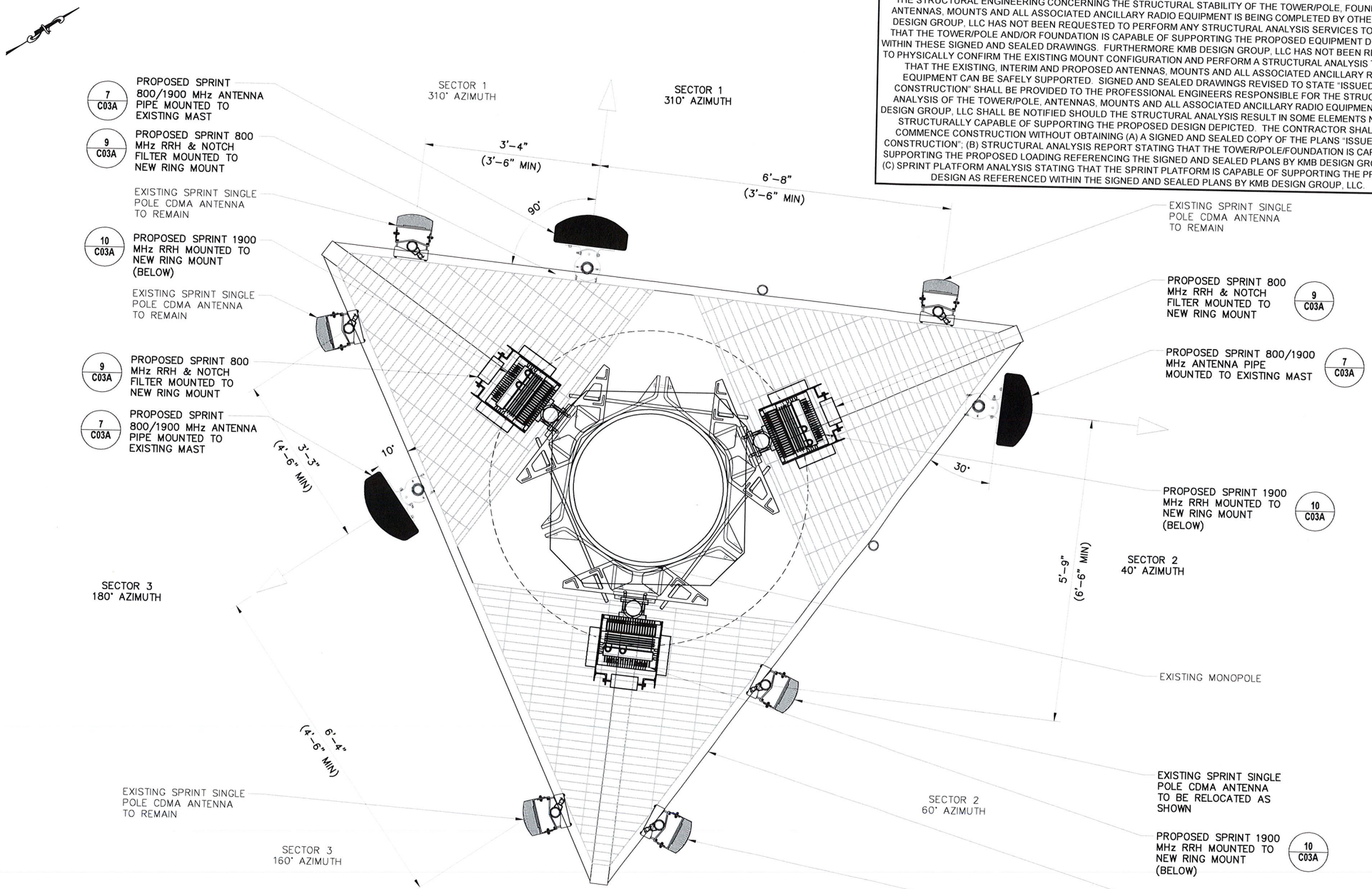
DRAWN BY:	CHECKED BY:	DATE:
JLS		04-19-12

SHEET TITLE:
EXISTING ANTENNA PLAN
(ALL SECTORS)

SHEET NUMBER:	REV.:
C04	0

K:\332_Sprint_332.1000_Alcatel-Lucent\332.1485_CT23XC508_338 Oxford Road\332.1485_CAD\332.1485_Construction\332.1485.C04.dwg, 5/16/2013 9:20:02 AM, jsypniewski

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



7 C03A — PROPOSED SPRINT 800/1900 MHz ANTENNA PIPE MOUNTED TO EXISTING MAST

9 C03A — PROPOSED SPRINT 800 MHz RRH & NOTCH FILTER MOUNTED TO NEW RING MOUNT

EXISTING SPRINT SINGLE POLE CDMA ANTENNA TO REMAIN

10 C03A — PROPOSED SPRINT 1900 MHz RRH MOUNTED TO NEW RING MOUNT (BELOW)

EXISTING SPRINT SINGLE POLE CDMA ANTENNA TO REMAIN

9 C03A — PROPOSED SPRINT 800 MHz RRH & NOTCH FILTER MOUNTED TO NEW RING MOUNT

7 C03A — PROPOSED SPRINT 800/1900 MHz ANTENNA PIPE MOUNTED TO EXISTING MAST

EXISTING SPRINT SINGLE POLE CDMA ANTENNA TO REMAIN

PROPOSED SPRINT 800 MHz RRH & NOTCH FILTER MOUNTED TO NEW RING MOUNT 9 C03A

PROPOSED SPRINT 800/1900 MHz ANTENNA PIPE MOUNTED TO EXISTING MAST 7 C03A

PROPOSED SPRINT 1900 MHz RRH MOUNTED TO NEW RING MOUNT (BELOW) 10 C03A

EXISTING MONOPOLE

EXISTING SPRINT SINGLE POLE CDMA ANTENNA TO BE RELOCATED AS SHOWN

PROPOSED SPRINT 1900 MHz RRH MOUNTED TO NEW RING MOUNT (BELOW) 10 C03A

PROPOSED HANDRAIL KIT BY SABRE

EXISTING SPRINT SINGLE POLE CDMA ANTENNA TO REMAIN

NOTES:
1. NO CONSTRUCTION TO COMMENCE PRIOR TO CROWN CASTLE APPROVAL.

1 INTERIM ANTENNA PLAN @ ±150'-0" AGL (ALL SECTORS)

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

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REV.	DATE	REVISION DESCRIPTION	DRAWN BY	CHKD BY
0	05-14-13	ISSUED FOR CONSTRUCTION	JRF	KCD

KMB DESIGN GROUP
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Stephen A. Bray
PROFESSIONAL ENGINEER

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

CT LICENSE: 26657 5/16/13

PROJECT NUMBER: 332.1485

SITE INFORMATION:
338 OXFORD ROAD
OXFORD, CT 06478
NEW HAVEN COUNTY
CROWN CASTLE # 876362
CT23XC508

DESIGN TYPE: NETWORK VISION

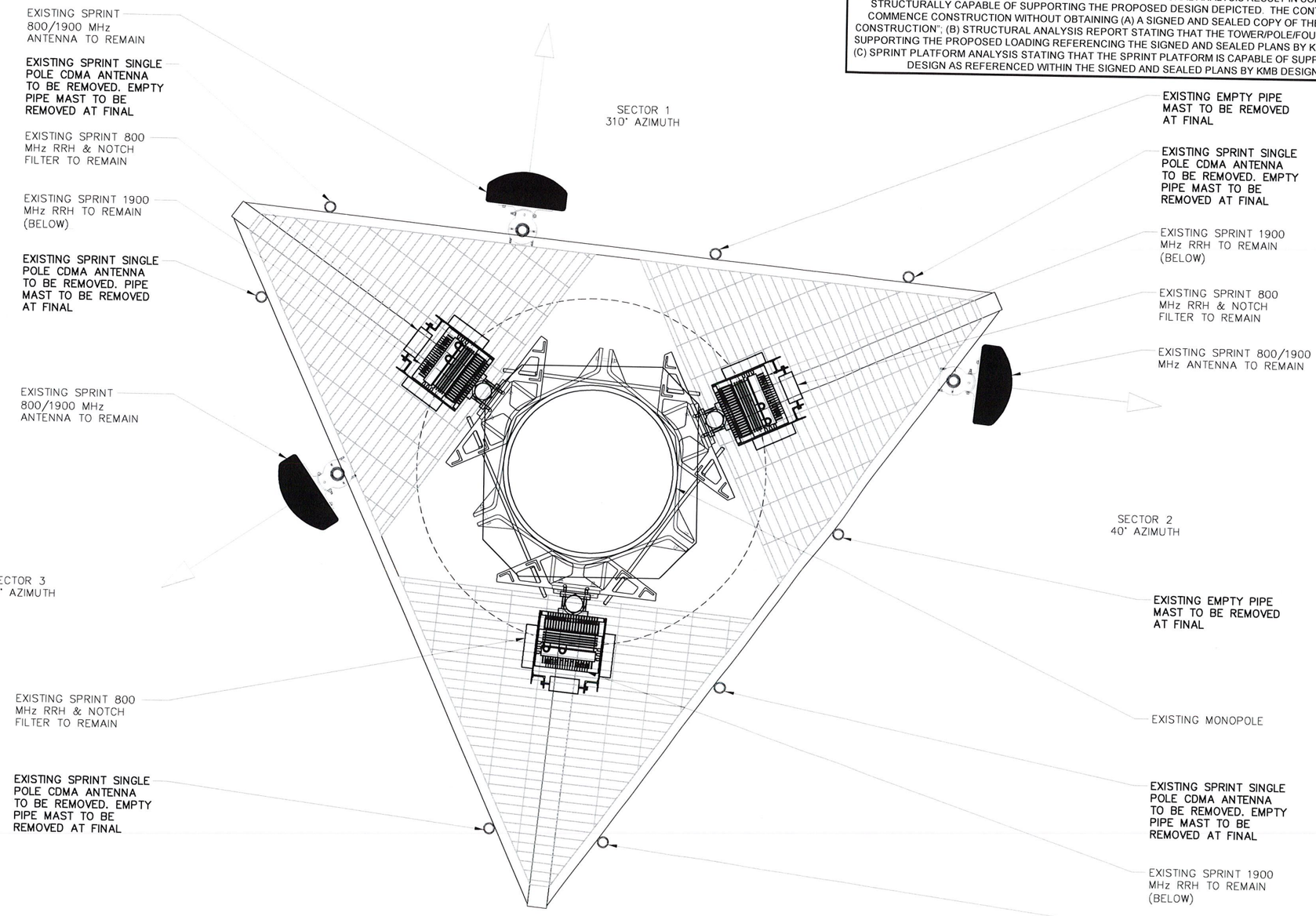
DRAWN BY:	CHECKED BY:	DATE:
JLS		04-19-12

SHEET TITLE: INTERIM ANTENNA PLAN (ALL SECTORS)

SHEET NUMBER: C04A | REV: 0

K:\332_Sprint_332.1000_Alcatel-Lucent\332.1485_CT23XC508_338 Oxford Road\332.1485_CAD\332.1485_Construction\332.1485.C04A.dwg, 5/16/2013 9:20:11 AM, jsypniewski

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



NOTES:
1. NO CONSTRUCTION TO COMMENCE PRIOR TO CROWN CASTLE APPROVAL.

1 **FINAL ANTENNA PLAN @ ±150'-0" AGL (ALL SECTORS)**

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

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REV.	DATE	REVISION DESCRIPTION	DRAWN BY	CHKD. BY
0	05-14-13	ISSUED FOR CONSTRUCTION	JRF	KCD

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

Stephen A. Bray
PROFESSIONAL ENGINEER
STATE OF CONNECTICUT STEPHEN A. BRAY No. 26657 LICENSED PROFESSIONAL ENGINEER
CT LICENSE: 26657 5/16/13

PROJECT NUMBER:
332.1485

SITE INFORMATION:
338 OXFORD ROAD
OXFORD, CT 06478
NEW HAVEN COUNTY
CROWN CASTLE # 876362
CT23XC508

DESIGN TYPE:
NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
JLS		04-19-12

SHEET TITLE:
FINAL ANTENNA PLAN
(ALL SECTORS)

SHEET NUMBER: C04B | REV: 0

K:\332_Sprint_332.1000_Alcatel Lucent\332.1485_CT23XC508_338 Oxford Road\332.1485_CAD\332.1485_Construction\332.1485.C04B.dwg, 5/16/2013 9:20:20 AM, jsyniewski

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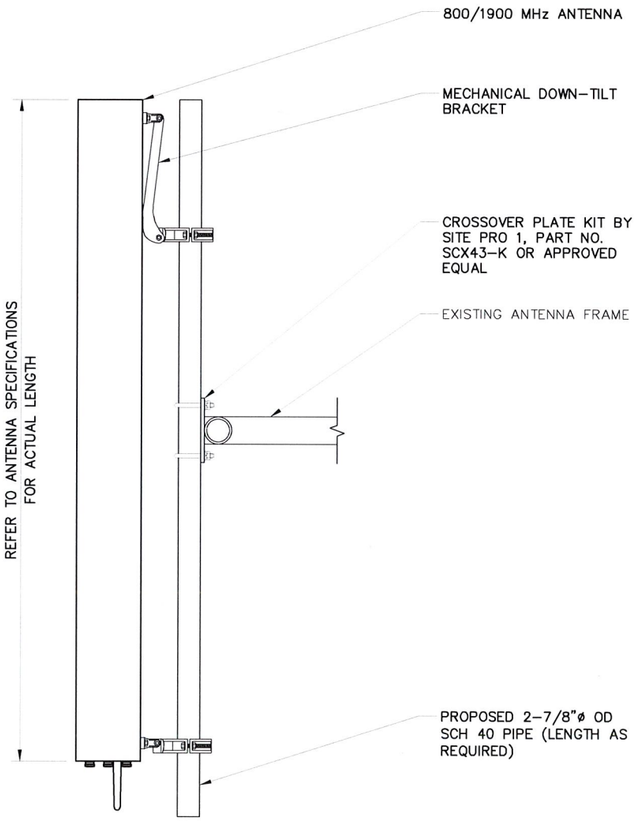
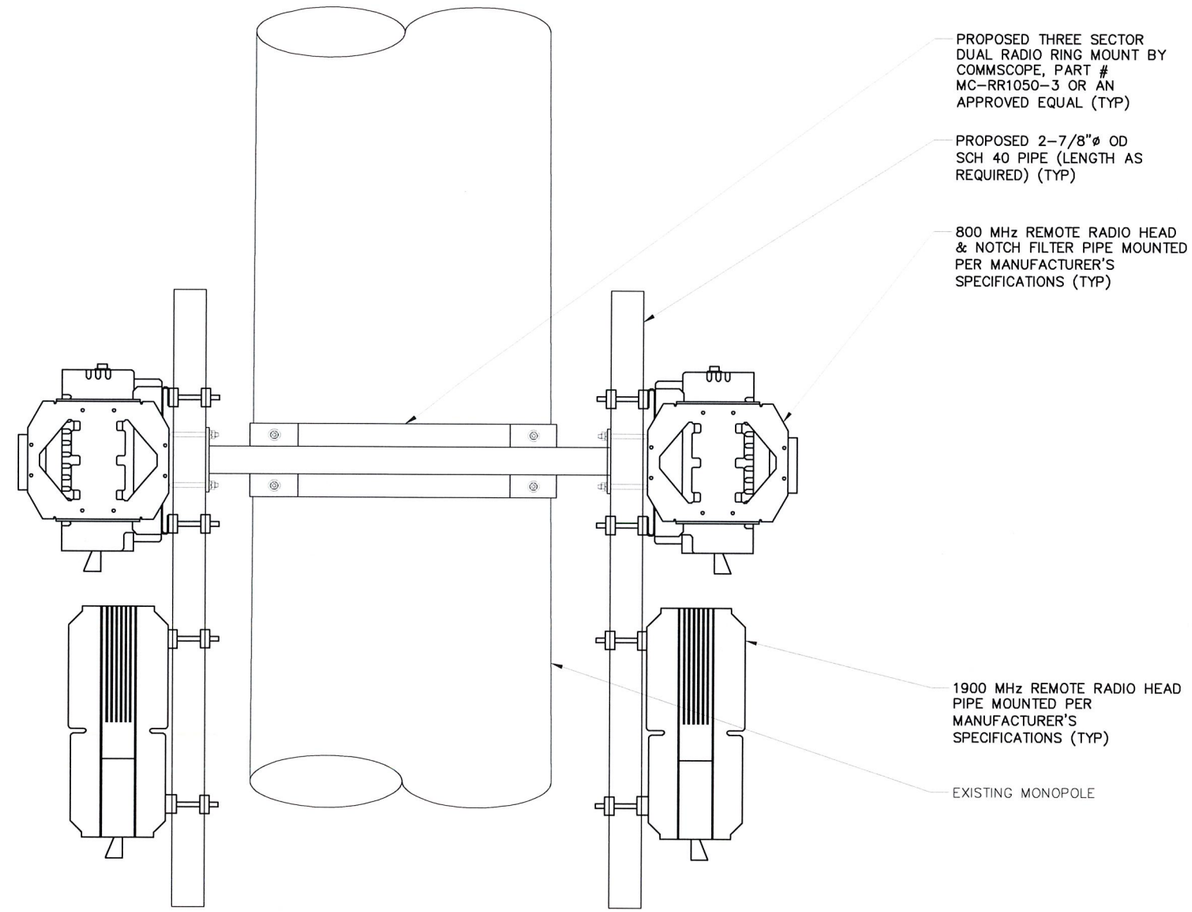


1 **ANTENNA MOUNT SECTION**

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



2 **RRH MOUNT ELEVATION**

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

NOTE:
1. NO CONSTRUCTION TO COMMENCE PRIOR TO CROWN CASTLE APPROVAL.
2. CONTRACTOR TO REPLACE ALL MISSING GROUND BARS AND GROUNDING CONNECTIONS AS REQUIRED IN ACCORDANCE WITH SPRINT GROUNDING AND ANTI-THEFT GUIDELINES. CONTRACTOR SHALL PROVIDE BEFORE & AFTER PHOTOS.

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REV.	DATE	REVISION DESCRIPTION	DRAWN BY	CHKD. BY
0	05-14-13	ISSUED FOR CONSTRUCTION	JRF	KCD

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Stephen A. Bray
PROFESSIONAL ENGINEER

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

CT LICENSE: 26657 5/16/13

PROJECT NUMBER:
332.1485

SITE INFORMATION:
338 OXFORD ROAD
OXFORD, CT 06478
NEW HAVEN COUNTY
CROWN CASTLE # 876362
CT23XC508

DESIGN TYPE:
NETWORK VISION

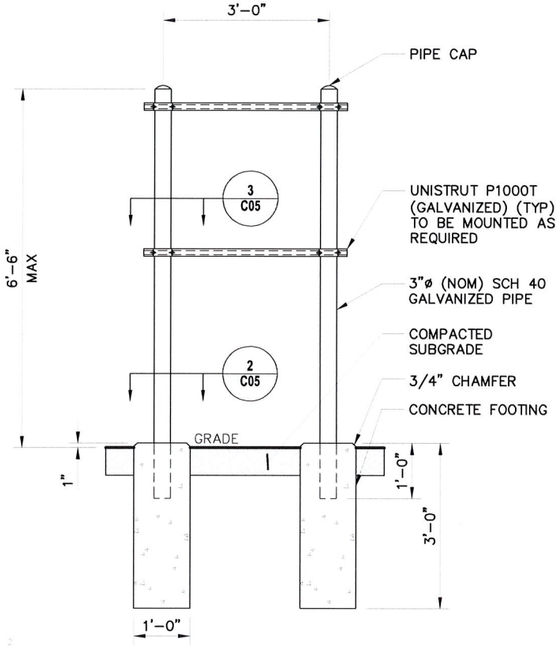
DRAWN BY:	CHECKED BY:	DATE:
JLS		04-19-12

SHEET TITLE:
ANTENNA & RRH MOUNT DETAILS
(ALL SECTORS)

SHEET NUMBER: C04C

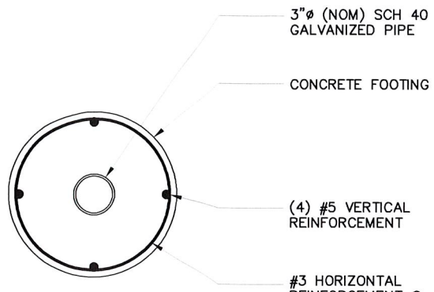
REV.: 0

K:\332_Sprint_332.1000_Alcatel-Lucent\332.1485_CT23XC508_338 Oxford Road\332.1485_CAD\332.1485_Construction\332.1485.C04C.dwg, 5/16/2013 9:20:27 AM, jsypniewski



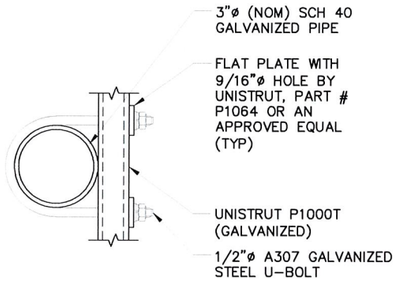
1 UNISTRUT FRAME DETAIL

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



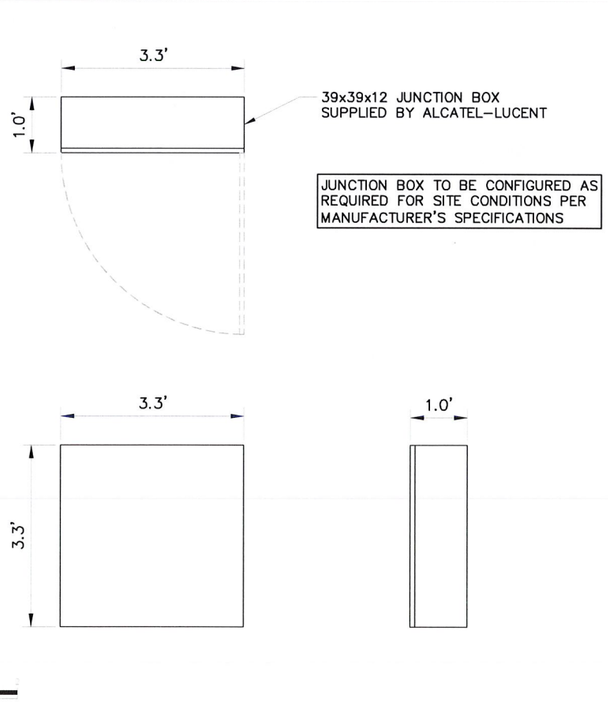
2 CONCRETE PIER DETAIL

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



3 UNISTRUT CONNECTION DETAIL

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



4 DC DISTRIBUTION & FIBER MGMT ENCLOSURE DETAIL

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

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Alcatel·Lucent

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0	05-14-13	ISSUED FOR CONSTRUCTION	JRF	KCD

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Stephen A. Bray
PROFESSIONAL ENGINEER
STATE OF CONNECTICUT STEPHEN A. BRAY No. 26657 LICENSED PROFESSIONAL ENGINEER
CT LICENSE: 26657 5/16/13

PROJECT NUMBER:
332.1485

SITE INFORMATION:
338 OXFORD ROAD
OXFORD, CT 06478
NEW HAVEN COUNTY
CROWN CASTLE # 876362
CT23XC508

DESIGN TYPE:
NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
JLS		04-19-12

SHEET TITLE:
SITE DETAILS

SHEET NUMBER:	REV:
C05	0

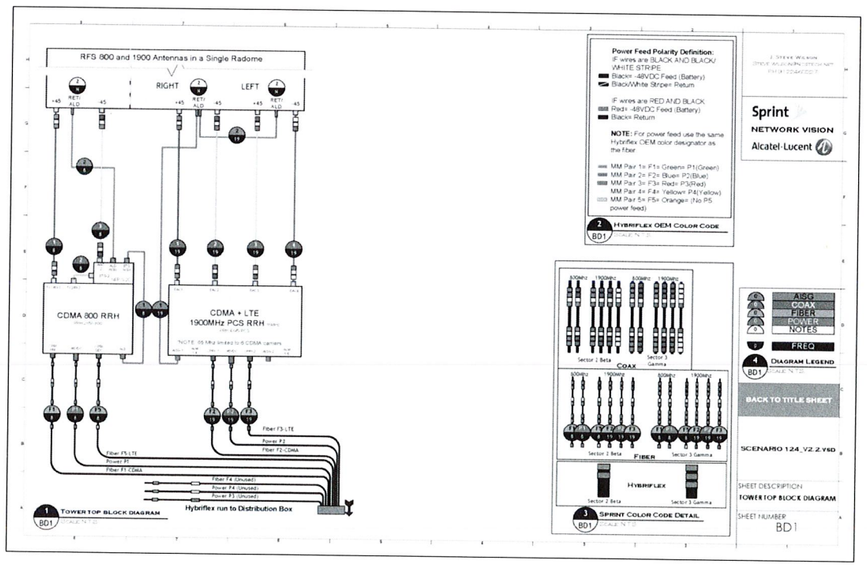
K:\332_Sprint_332.1000_Alcatel-Lucent\332.1485_CT23XC508_338 Oxford Road\332.1485_CAD\332.1485_Construction\332.1485.C05.dwg, 5/16/2013 9:20:35 AM, jypihlevski

FINAL ANTENNA AND CABLE SCHEDULE

SECTOR	ANTENNA	AZIMUTH (DEGREES)	MECHANICAL DT (DEGREES)	ELECTRICAL DT (DEGREES)	RAD CENTER AGL (FT)	ANTENNA MAKE	ANTENNA MODEL	RRH QTY	TOP COAX JUMPER QTY	TOP COAX JUMPER LENGTH (FT)	COMBINER JUMPER QTY	COMBINER JUMPER LENGTH (FT)	NOTCH FILTER JUMPER QTY	NOTCH FILTER JUMPER LENGTH (FT)	HYBRIFLEX LENGTH (FT)
1	–														200
	800/1900	310	0	800: −8 / 1900: −4	150	RFS	APXVSPP18−C−A20	800: 1 / 1900: 1	6	10	–	–	1	3	
	–														
	–														
2	800/1900	40	0	800: 0 / 1900: 0	150	RFS	APXVSPP18−C−A20	800: 1 / 1900: 1	6	10	–	–	1	3	200
	–														
	–														
	–														
3	–														200
	800/1900	180	0	800: −1 / 1900: 0	150	RFS	APXVSPP18−C−A20	800: 1 / 1900: 1	6	10	–	–	1	3	
	–														

NOTES:
1. DUE TO FIELD MEASUREMENTS AND THE INSTALLATION OF NEW ANTENNAS THAT VARY IN SIZE FROM THE EXISTING ANTENNAS, THE ANTENNA RAD CENTER HAS CHANGED FROM WHAT IS ON RECORD. THE DATABASE MAY NEED TO BE UPDATED TO MATCH THESE PLANS.
2. SOME CABLING MAY CHANGE AT THE TIME OF CONSTRUCTION. CONTRACTOR TO CONFIRM ALL CABLE LENGTHS, TYPE, QUANTITIES, AND CONFIGURATION PRIOR TO CONSTRUCTION.
3. ALL UNUSED POWER AND FIBER MUST BE PROPERLY TERMINATED AND WEATHERPROOFED.

CONTRACTOR TO VERIFY & USE THE LATEST TOWER TOP SCENARIO AS PROVIDED BY ALCATEL−LUCENT CONSTRUCTION MANAGER



ALL SECTORS

Sprint®

Alcatel·Lucent

REV.	DATE	REVISION DESCRIPTION	DRAWN BY	CHKD. BY
0	05-14-13	ISSUED FOR CONSTRUCTION	JRF	KCD

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SITE INFORMATION:
338 OXFORD ROAD
OXFORD, CT 06478
NEW HAVEN COUNTY
CROWN CASTLE # 876362
CT23XC508

DESIGN TYPE: NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
JLS		04-19-12

SHEET TITLE: RF SCHEDULE

SHEET NUMBER: C06 REV.: 0

K:\332_Sprint_332.1000_Alcatel-Lucent\332.1485_CT23XC508_338 Oxford Road\332.1485_CAD\332.1485_Construction\332.1485.C06.dwg, 5/16/2013 9:20:43 AM, jsypniewski

		Market	Southern Connecticut		
		Cascade ID	CT23XC508		
			SECTOR 1	SECTOR 2	SECTOR 3
	Split sector present		No	No	No
1900	1900MHz_Azimuth		310	40	180
	1900MHz_No_of_Antennas		1	1	1
	1900MHz_RADCenter(ft)		150	150	150
	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		-4	0	0
	1900MHz _M_Tilt		0	0	0
	1900MHz_Carrier_Forecast_Year_2013		2	2	2
	1900MHz_RRH Manufacturer		ALU	ALU	ALU
	1900MHz_RRH Model		RRH 1900 4X45 65MHz	RRH 1900 4X45 65MHz	RRH 1900 4X45 65MHz
	1900MHz_RRH Count		1	1	1
	1900MHz_RRH Location		Top of the Pole/Tower	Top of the Pole/Tower	Top of the Pole/Tower
	1900MHz Combiner Model		No Combiner Required	No Combiner Required	No Combiner Required
	1900MHz_Top_Jumper #1_Length (RRH or Combiner-to-Antenna for TT or Main Coax to		10	10	10
	1900MHz_Top_Jumper #1_Cable_Model (RRH or Combiner-to-Antenna for TT or Main Coax		LCF12-50J	LCF12-50J	LCF12-50J
	1900MHz_Top_Jumper #2_Length (RRH to Combiner for TT if applicable, ft)		N/A	N/A	N/A
	1900MHz_Top_Jumper #2_Cable_Model (RRH to Combiner for TT if applicable)		N/A	N/A	N/A
	1900MHz_Main_Coax_Cable_Length (ft)		N/A	N/A	N/A
	1900MHz_Main_Coax_Cable_Model		N/A	N/A	N/A
	1900MHz_Bottom_Jumper #1_Length (Ground based RRH to Combiner-OR-Main Coax, ft)		N/A	N/A	N/A
	1900MHz_Bottom_Jumper #1_Cable_Model (Ground based RRH to Combiner-OR-Main Coax)		N/A	N/A	N/A
	1900MHz_Bottom_Jumper #2_Length (Ground based-Combiner to Main Coax, ft)		N/A	N/A	N/A
	1900MHz_Bottom_Jumper #2_Cable_Model (Ground based-Combiner to Main Coax)		N/A	N/A	N/A
800	800MHz_Azimuth		310	40	180
	800MHz_No_of_Antennas		0	0	0
	800MHz_RADCenter(ft)		150	150	150
	800MHz_AntennaMake		RFS	RFS	RFS
	800MHz_AntennaModel		APXVSPP18-C-A20 (Shared w/1900)	APXVSPP18-C-A20 (Shared w/1900)	APXVSPP18-C-A20 (Shared w/1900)
	800MHz_Horizontal_Beamwidth		65	65	65
	800MHz_Vertical_Beamwidth		11.5	11.5	11.5
	800MHz_AntennaHeight (ft)		6	6	6
	800MHz_AntennaGain (dBd)		13.4	13.4	13.4
	800MHz_E_Tilt		-8	0	-1
	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
	800_Top_Jumper_Cable_Model (RRH to Antenna for TT or Main Coax to Antenna for GM)		LCF12-50J	LCF12-50J	LCF12-50J
	800MHz_Main_Coax_Cable_Length (ft)		N/A	N/A	N/A
	800MHz_Main_Coax_Cable_Model		N/A	N/A	N/A
	800_Bottom_Jumper #1_Length (Ground based RRH to Main Coax)		N/A	N/A	N/A
	800_Bottom_Jumper #1_Cable_Model (Ground based RRH to Main Coax)		N/A	N/A	N/A
	Plumbing Scenario *		124	124	124
Comments	* If plumbing scenario does not match the material received, please contact your Construction Manager				
	11/9/2012				

DUE TO FIELD MEASUREMENTS AND THE INSTALLATION OF NEW ANTENNAS THAT VARY IN SIZE FROM THE EXISTING ANTENNAS, THE ANTENNA RAD CENTER HAS CHANGED FROM WHAT IS ON RECORD. THE DATABASE NEEDS TO BE UPDATED TO MATCH THESE PLANS.

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Stephen A. Bray
PROFESSIONAL ENGINEER

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

CT LICENSE: 26657 5/16/13

PROJECT NUMBER:
332.1485

SITE INFORMATION:
338 OXFORD ROAD
OXFORD, CT 06478
NEW HAVEN COUNTY
CROWN CASTLE # 876362
CT23XC508

DESIGN TYPE:
NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
JLS		04-19-12

SHEET TITLE:
RF DATA SHEET

SHEET NUMBER:	REV:
C06A	0

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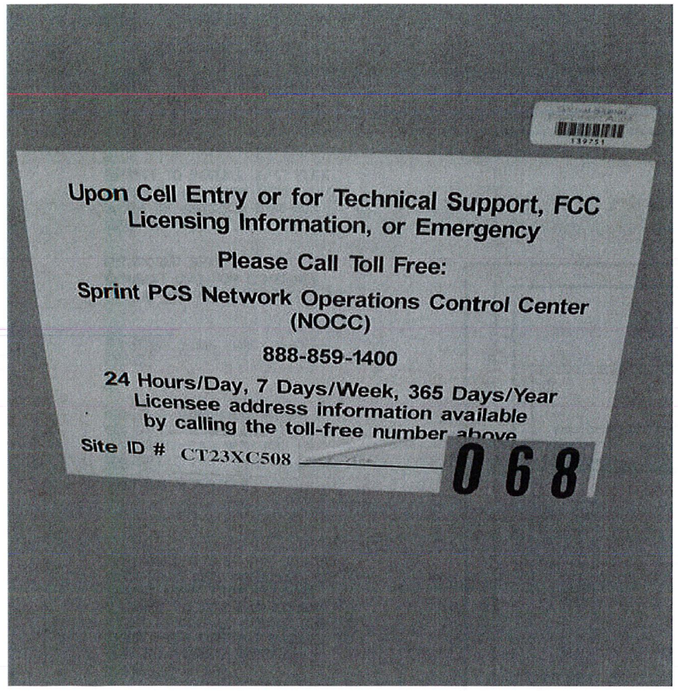
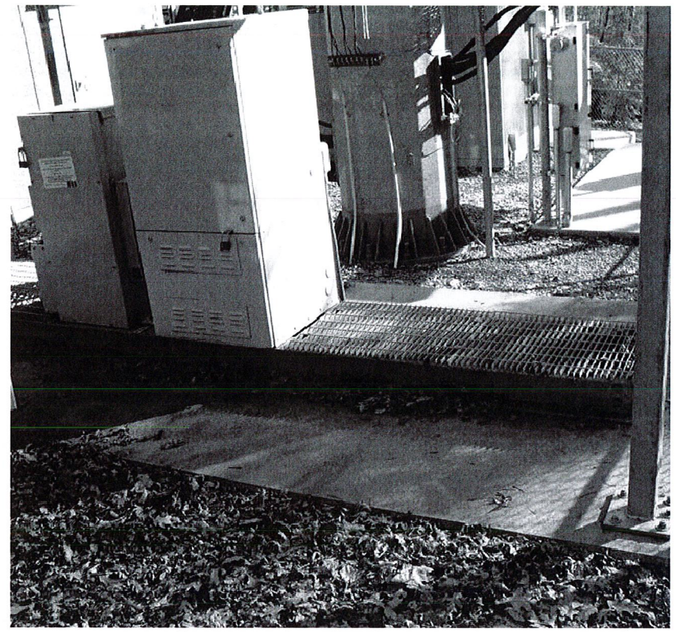
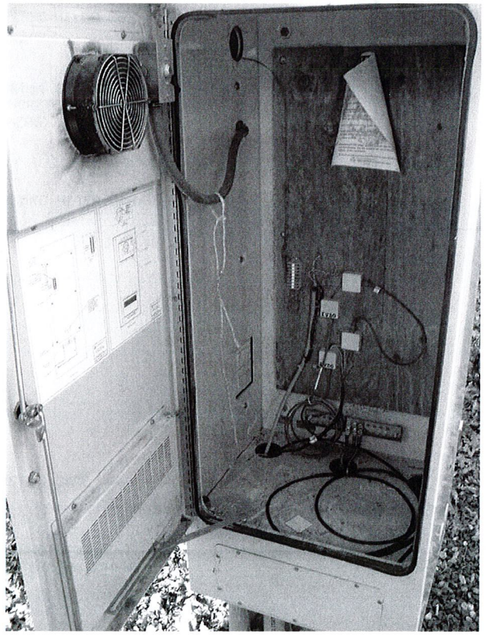


1 EXISTING SIGNAGE

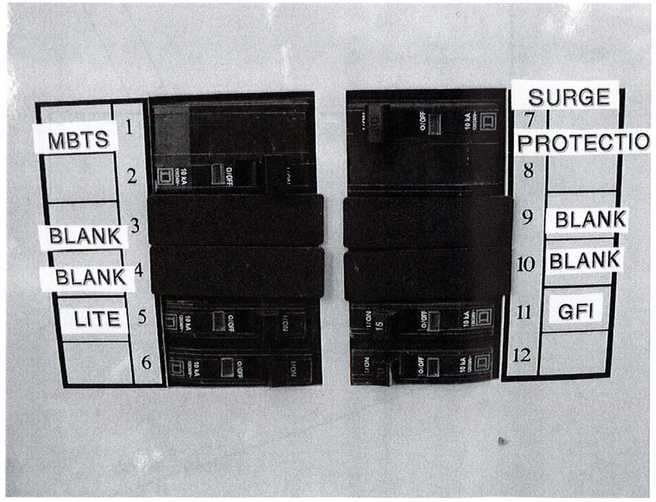
2 PROPOSED MEET POINT



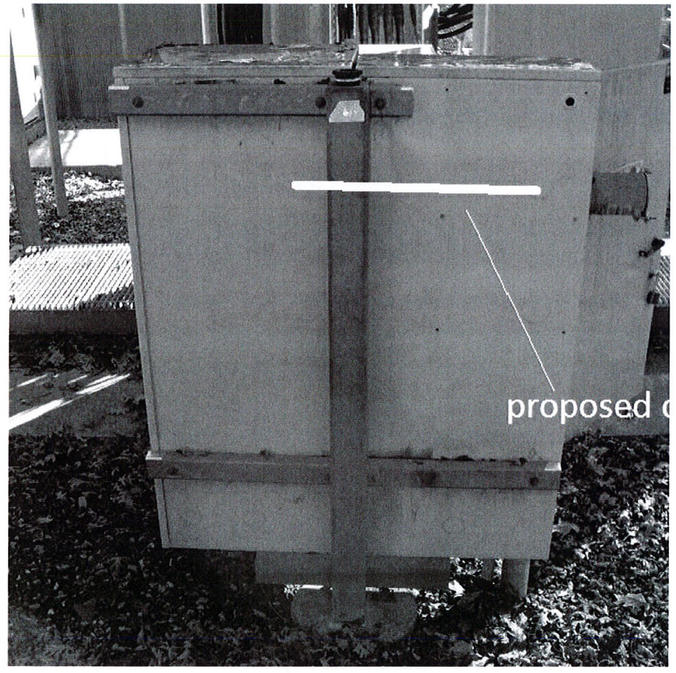
3 EXISTING EQUIPMENT AREA



4 EXISTING TELCO CABINET



5 EXISTING POWER SOURCE



6 PROPOSED NID EQUIPMENT LOCATION

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JLS		04-19-12

SHEET TITLE:
AAV DRAWINGS
SITE PHOTOS

SHEET NUMBER: C07 REV: 0

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GENERAL SPECIFICATIONS

1. Contractor shall verify that the total number of service entrance disconnects in the existing utility company pedestal must not exceed six. If the new service added exceeds this value, contractor must coordinate with the utility company and authority having jurisdiction. Run an additional exclusive and dedicated service lateral set for the new load added to the compound as per NEC Article # 230-2(B)
2. All work should be done in a neat workmanlike manner, left clean and free from defects, and completely operable. The contractor shall provide all equipment as scheduled on the drawings. All materials shall be new and all work and materials shall be guaranteed by the contractor for a period of one (1) year from the date of acceptance by the owner.
3. All work shall be carefully coordinated with the landlord and all trades involved, and the contractor shall provide proper connections, fittings, valves, piping, etc. for all equipment furnished by carrier or other trades involved in this contract.
4. Contractor shall inform the engineer immediately of any conflict discovered before performing any work related to such conflict.
5. Provide all required temporary utilities and pay all associated fees and operating costs.
6. Before submitting this bid, the contractor shall visit the job site to examine and fully acquaint himself with the existing job conditions, paying particular attention to the location of existing conditions to make a complete and operable system without additional cost to the carrier or the engineer.
7. Obtain all permits and approvals from authorities having jurisdiction and paying all fees required.
8. Label all equipment served from Sprint panelboard with phenolic labels sized in relation to usage.
9. Contractor to provide and install engraved label on the Sprint meter socket enclosure.
10. Redlined As-Builts are to be delivered to a Sprint representative.
11. The equipment/protections must be rated for standard of AIC rate higher than incoming equipment and/or utility company AIC rate.

GROUNDING NOTES

1. The subcontractor is responsible for properly sequencing grounding and underground conduit installation as to prevent any loss of continuity in the grounding system or damage to the conduit.
2. All exterior ground conductors shall be #2 AWG solid tinned copper unless otherwise indicated.
3. All ground connections above grade (interior & exterior) shall be formed using high press crimps.
4. All ground connections below grade shall be exothermic (Cadweld).
5. Connections to equipment and enclosures shall be made utilizing two-hole ground lugs with an antioxidant compound.
6. Maximum resistance of the completed ground system shall not exceed 5 Ohms. Testing shall be performed in accordance with technical specification for facility grounding, using fall potential method.
7. Where grounding connections are made to painted metal surfaces shall be scraped clean to bear metal to ensure proper contact. Surfaces shall be restored to match original finishes.
8. Use of 90° bends in the protection grounding conductors shall be avoided when 45° bends can be adequately supported.
9. Ground depth shall be 30" minimum below finished grade, or 6" below frost line, whichever is greater.
10. Home run grounds not approved. All antenna buss bars should be installed directly to tower steel without insulators or down conductors.

ELECTRICAL SYMBOLS		ABBREVIATIONS	
WIRING SYMBOLS		AWG	AMERICAN WIRE GAUGE
	DISCONNECT SWITCH	BCW	BARE COPPER WIRE
M	METER	DWG	DRAWING
	CIRCUIT BREAKER	EMT	ELECTRICAL METALLIC TUBING
	CADWELD TYPE CONNECTION	GEN	GENERATOR
	COMPRESSION TYPE CONNECTION	MGB	MASTER GROUND BAR
	GROUND ROD WITH ACCESS	PVC	RIGID (SCH 40) PVC CONDUIT
	CHEMICAL GROUND ROD	RGS	RIGID GALVANIZED STEEL
	GROUND ROD	RWY	RACEWAY
	CONDUIT TURNING DOWN	TYP	TYPICAL
	CONDUIT TURNING UP		
JB	JUNCTION BOX		
PB	PULL BOX		
	CONDUIT RUNNING ABOVE GRADE		
	CONDUIT RUNNING UNDER GROUND		

ELECTRICAL SPECIFICATIONS

1. General:
   - A. The electrical contractor shall furnish all labor,materials, tools, transportation equipment, services and facilities required for the complete, proper and substantial installation of all electrical work. All fixtures, devices, and equipment shown, noted or required on these drawings, and/or contained herein shall be connected from the source of electric power to the final connection, tested and made ready for satisfactory operation.
   - B. Service equipment shall be 120/240 VAC, 100 Amp, single phase, unless otherwise directed by the Sprint Construction Manager.
   - C. Unless otherwise indicated, the arrangement, position, connections, etc. shown on the drawings shall be taken on a diagram basis. The right is reserved by the engineer to make minor changes in locations and arrangements when required by job development without additional compensation to the contractor.
   - D. All work shall conform to the adopted edition of the National Electrical Code and local, state and applicable codes.
   - E. When a utility company meter is specified, the contractor shall obtain all associated cut-in cards, inspections, etc., necessary to have the meter set. It is the responsibility of the contractor to meet with utility company prior to construction to verify source of electric service, tap and meter location.
2. Identification:
   - A. Provide typewritten directories for panels, indicating use of each branch circuit and designating spare circuits. Handwritten directories are not acceptable.
   - B. All panel boards, switches and other equipment enclosures shall bear engraved nameplates as manufactured by Seton Nameplate Corp., or equal lettering to be 1/2" white letters on black background unless noted otherwise.
3. Raceways:
   - A. Minimum conduit size shall be 3/4" unless otherwise noted on the drawings.
   - B. Exposed raceways shall be run true, plumb, and parallel or perpendicular to building lines.
   - C. Conduit routings are schematic. Sub contractor shall install conduits so that access to equipment is not blocked.
4. Wiring Methods:
   - A. All feeders shall consist of pulled conductors in conduit. All branch circuits shall consist of pulled conductors in conduit. Except 15 and 20 Ampere 1 pole lighting receptacles, miscellaneous branch circuits concealed above suspended ceilings or within dry walls shall consist of type MC metal clad cable if allowed by code. Connections to communications cabinets and vibrating equipment shall consist of pulled conductors in LFMC, maximum 6' in length.
   - B. Conductors shall be continuous from origin to panel or equipment without splices. Where tap splices are necessary and approved, they shall be made with suitable connectors in junction boxes.
   - C. Equipment ground conductors shall be provided for all feeders and branch circuits.
   - D. The contractor shall conceal all conduit routing passing through finished areas. Conduit routing through unfinished shall be supported as specified in drawings. Unless clearly specified, no conduits shall be routed on exterior surface of buildings.
   - E. All conductor terminals shall be U.L. listed for minimum of 75° C.
   - F. Provide fire stopping around all conduits at wall and floor penetrations.
   - G. Seal all exterior wall penetrations as required.
   - H. Underground conduits shall be a minimum of 24" below finished grade. All underground work shall be documented by photograph before any backfill is begun. Photos will be required at time punchlist is performed. Feeders shall be individual conductors in schedule 40 PVC, direct burial conduit. When buried conduits are subject to vehicular traffic, conduits shall be encased in concrete. All sweeps below grade shall be schedule 80 PVC.
   - I. All feeders in "damp" or "wet" locations shall consist of individual conductor in rigid galvanized steel or rigid aluminum conduit. Liquid-tight flexible metallic conduit shall be utilized when connecting to equipment cabinets and vibrating equipment. The maximum length for flexible conduit shall be 6'-0".
5. Wiring Devices:
   - A. Switches, receptacles and other wiring devices shall be specification grade of type, size and rating indicated on the drawings.
6. Disconnect Switches:
   - A. Switches shall be quick-make, quick-break NEMA 1 for indoor use and NEMA 3R for outdoor use as manufactured by General Electric, Square D or equal. Electrical contractor to provide all safety disconnects.
7. Special Requirements:
   - A. The electrical contractor shall furnish and install all power and control wiring for equipment contained in contract documents.
   - B. All work requiring an outage or interruption of service (power, telephone) shall be scheduled only at such time permitted by owner.
8. Lighting fixtures and lamps:
   - A. Lighting fixtures shall be furnished complete with necessary hardware and lamps.
9. Transformers:
   - A. Transformers shall be dry type with average temperature rise not to exceed 150° C (115° C)(80° C)
   - B. Transformers shall be as manufactured by Square D, General Electric, or Siemens.

The contractor is required to contact the utility companies prior to starting construction. This is necessary to reconfirm that the utility points have remained consistent with the contractor documents:

* Telephone Demarcation Point
* Electrical Service Tap Point
* New Utility Meter Location

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DRAWN BY:	CHECKED BY:	DATE:
JLS		04-19-12

SHEET TITLE:
ELECTRICAL NOTES

SHEET NUMBER:	REV.:
E01	0

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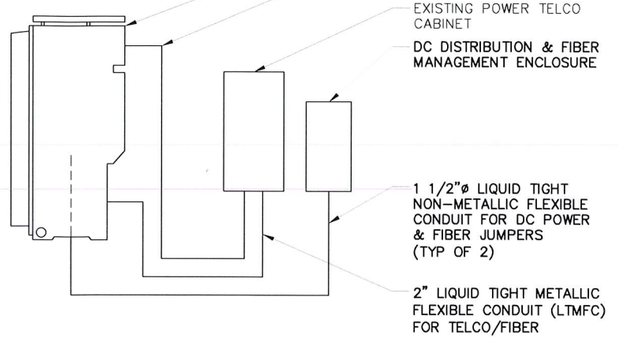
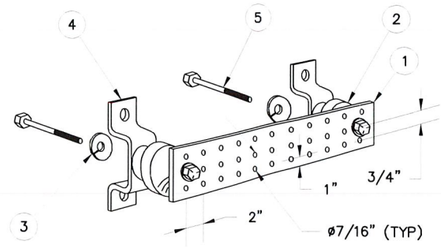


1 PLUMBING SCHEMATIC (IF REQUIRED)

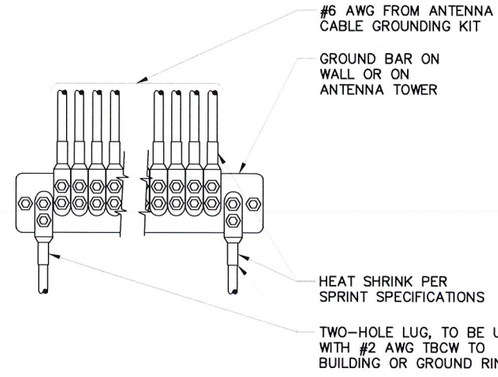
SCALE: NTS



1. GALVANIZED STEEL GROUND BAR, 1/4" x 4" x 20", HAGER PART NO TGBI-14420C OR A.L.T. PART NO. 382227. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.
2. INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4.
3. 5/8" LOCKWASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8.
4. WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A-6056.
5. 5/8-11 X 1" H.H.C.S.BOLTS, NEWTON INSTRUMENT CO. CAT NO. 3012-1

2 GROUND BAR DETAIL

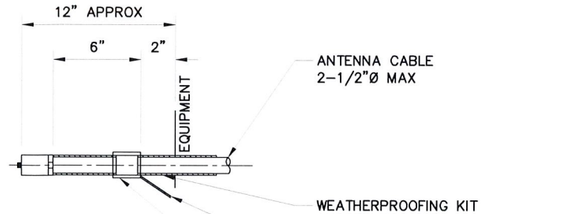
SCALE: NTS



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

3 GROUND LUG TO GROUND BAR CONNECTION DETAIL

SCALE: NTS



NOTE:
DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.

4 CABLE GROUND KIT CONNECTION DETAIL

SCALE: NTS

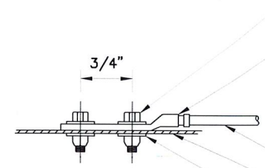
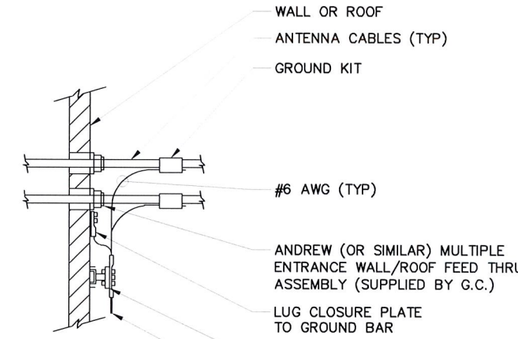


TABLE		
WIRE SIZE	LUG #	BOLT SIZE
#4/0	53212	1/2" - 20 NC x 1/2" S.S. BOLT & NUT W/ LOCK WASHERS
#2	53207	1/4" - 20 NC x 1/2" S.S. BOLT & NUT W/ LOCK WASHERS
#6	53205	

BOLT/ NUT W/ LOCK WASHER, SEE TABLE
GROUND LUG SIMILAR TO T&B #53207 SIZE AS REQUIRED
GROUND WIRE
GROUND BAR
STANDARD LOCK WASHERS SHALL BE USED ON GROUND BARS, SERRATED "DRAGON TOOTH" LOCK WASHERS SHALL BE USED ON CONNECTIONS TO BUILDING STEEL AND MISCELLANEOUS METALS.

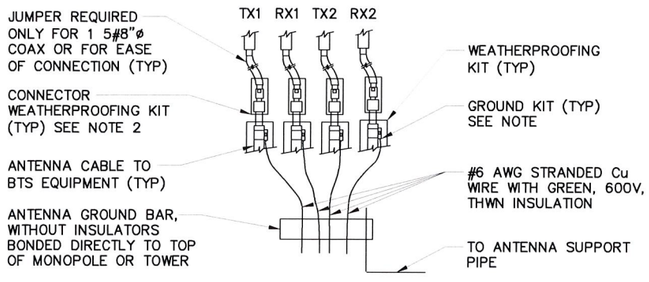
5 GROUND LUG CONNECTION DETAIL

SCALE: NTS



6 CABLE GROUNDING DETAIL

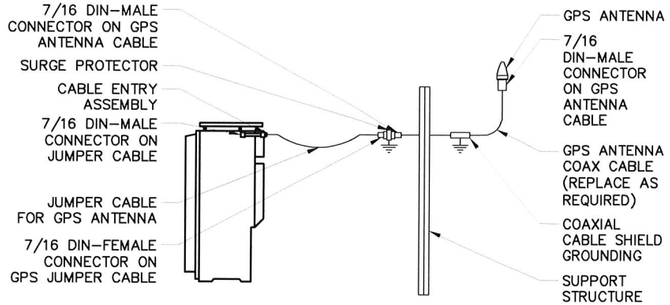
SCALE: NTS



NOTES:
1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO ANTENNA GROUND BAR.
2. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT. COLD SHRINK SHALL NOT BE USED.
3. ATTACH "DO NOT DISCONNECT" LABELS TO GROUND BARS. CAN USE BRASS TAG "DO NOT DISCONNECT" AT EACH COAX GROUND POINT OR BACK-A-LITE PLATE ON GROUND BAR.

7 GROUND BAR TO GROUND WIRE CONNECTION DETAIL

SCALE: NTS



NOTES:
1. GPS SURGE NEEDS TO BE INSTALLED AWAY FROM, AND SEPARATE FROM THE MMBTS CABINET.
2. THE JUMPERS ARE DESIGNED TO BE INSTALLED BEFORE / AFTER THE GPS SURGE.
3. THE GPS SURGE NEEDS TO BE CONNECTED TO THE GROUND SYSTEM VIA A GROUND LEAD.
4. CONTRACTOR TO SWEEP EXISTING COAX AND REPLACE AS REQUIRED.

8 GPS SURGE ARRESTOR & GROUNDING SCHEMATIC

SCALE: NTS

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ELECTRICAL & GROUNDING DETAILS

SHEET NUMBER: E02

REV.: 0

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