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

EM-SPRINT-119-130819	52 New Britain Avenue	Rocky Hill
EM-SPRINT-120-130828	Lower County Road a/k/a 35 Lower County Road	Roxbury
EM-SPRINT-126-130325	219 Nells Rock Road	Shelton
EM-SPRINT-126-130515	70 Platt Road	Shelton
EM-SPRINT-128-131112	22 Wintonbury Road (aka 49a and 53 Wintonbury Road)	Simsbury
EM-SPRINT-130-130531	1432 Old Waterbury Road	Southbury
EM-SPRINT-135-130128	69 Guinea Road	Stamford
EM-SPRINT-135-131112	366 Old Long Ridge Road	Stamford
EM-SPRINT-143-130712	350 Burr Mountain Road	Torrington
EM-SPRINT-151-131209	184 Garden Circle	Waterbury
EM-SPRINT-155-130828	345 North Main Street a/k/a 333 North Main Street	West Hartford
EM-SPRINT-157-130701	56 Norfield Road	Weston
EM-SPRINT-164-130920	Windsor Avenue a/k/a 494 Windsor Avenue	Windsor
EM-SPRINT-NEXTEL-166-130116	164 County Road	Wolcott

Dear Ms. Mulligan:

The Connecticut Siting Council (Council) is in receipt of your letter dated August 10, 2015, submitted on behalf of Sprint, requesting an extension of time to submit notices of completion of construction and associated post modification inspection reports for the above-referenced exempt modifications that were approved in 2013.

Please be advised that Council approval of these exempt modifications has expired. Therefore, any additional changes to these facilities will require explicit notice to the Council pursuant to Regulations of Connecticut State Agencies Section 16-50j-73 and a filing fee.

Thank you for your attention to this matter.

Sincerely,

Melanie A. Bachman
Acting Executive Director

MAB/cm

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

December 16, 2014

Melanie J. Howlett
HPC Wireless Services
22 Shelter Rock Lane, Building C
Danbury, CT 06810

RE: **EM-SPRINT-097-131127** – Sprint Spectrum L.P. notice of intent to modify an existing telecommunications facility located at 201 South Main Street, Newtown, Connecticut.

Dear Ms. Howlett:

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

- Prior to antenna installation, the modifications depicted in the modification drawings attached to the Structural Modification Report prepared by Paul J. Ford and Company dated August 20, 2013, and stamped by Joseph Jacobs, shall be implemented; and
- Within 45 days following completion of the antenna installation, Sprint shall provide documentation certified by a professional engineer that its installation complied with the requirements of the structural analysis.
- Any deviation from the proposed modification as specified in this notice and supporting materials with the Council shall render this acknowledgement invalid;
- Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
- Within 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration.

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated November 27, 2013. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure

that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

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

Very truly yours,

Melanie A. Bachman
Acting Executive Director

MAB/CDM/laf

c: The Honorable Patricia E. Llodra, First Selectman, Town of Newtown
Gary Frenette, Zoning Enforcement Officer, Town of Newtown
Crown Castle

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

December 2, 2013

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

RE: **EM-SPRINT-097-131127** – Sprint Spectrum L.P. notice of intent to modify an existing telecommunications facility located at 201 South Main Street, Newtown, Connecticut.

Dear First Selectman Llodra:

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 December 16, 2013.

Thank you for your cooperation and consideration.

Very truly yours,

Melanie Bachman
Acting Executive Director

MB/cm

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

EM-SPRINT-097-131129

HPC Wireless Services
22 Shelter Rock Lane.
Building C
Danbury, CT, 06810
P.: 203.797.1112

November 27, 2013

VIA OVERNIGHT COURIER

Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051
Attn: Ms. Melanie Bachman, Acting Executive Director

Re: Sprint Spectrum, L.P. – Exempt Modification
201 South Main Street, Newtown (aka Newton), Connecticut

Dear Ms. Bachman:

This letter and attachments are submitted on behalf of Sprint Spectrum, L.P. ("Sprint"). Sprint is undertaking modifications to certain existing sites in its Connecticut system in order to implement updated technology. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction that constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter and attachments is being sent to the First Selectman of the Town of Newtown (aka Town of Newton).

Sprint plans to modify the existing wireless communications facility owned by Crown Castle and located at 201 South Main Street, Newtown (aka Newton), Connecticut (coordinates 41°-22'-41.4" N, 73°-16'-26.74" W). Attached are plan and elevation drawings depicting the planned changes, and documentation of the structural sufficiency of the structure to accommodate the revised antenna configuration, subject to modifications detailed in the attached structural documentation. Also included is a power density report reflecting the modification to Sprint's operations at the site.

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

1. Sprint will add three (3) dual-band panel LTE antennas, and six (6) RRHs (remote radio heads) behind the LTEs, all on existing pipe masts attached to the existing platform, at a centerline height of approximately 137' AGL. During an interim period of up to one

year, the six (6) existing Sprint CDMA antennas will remain and will be consolidated onto one (1) dual pole. Sprint will also install three (3) hybriflex cables along the existing coaxial cable run, and will remove the coaxial cable at the end of the interim period. The proposed modifications will not extend the height of the approximately 150' AGL structure.

2. Sprint will replace the two (2) existing cabinets with three (3) similar cabinets, and add a fourth cabinet (4 cabinets in total) which will house a Fiber/Power Distribution Box on a new H-frame, all on the existing Concrete Equipment Pad under the Ice Canopy. The existing GPS antenna on the Ice Canopy will be replaced by another GPS antenna at that location. These changes will have no effect on the site boundaries.

3. The proposed changes will not increase the noise level at the existing facility by six decibels or more. The incremental effect of the proposed changes will be negligible.

4. The changes to the facility 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. As indicated on the attached report prepared by EBI Consulting, Sprint's operations at the site will result in a power density of power density of approximately 12.960%; the combined site operations will result in a total power density of approximately 53.920%.

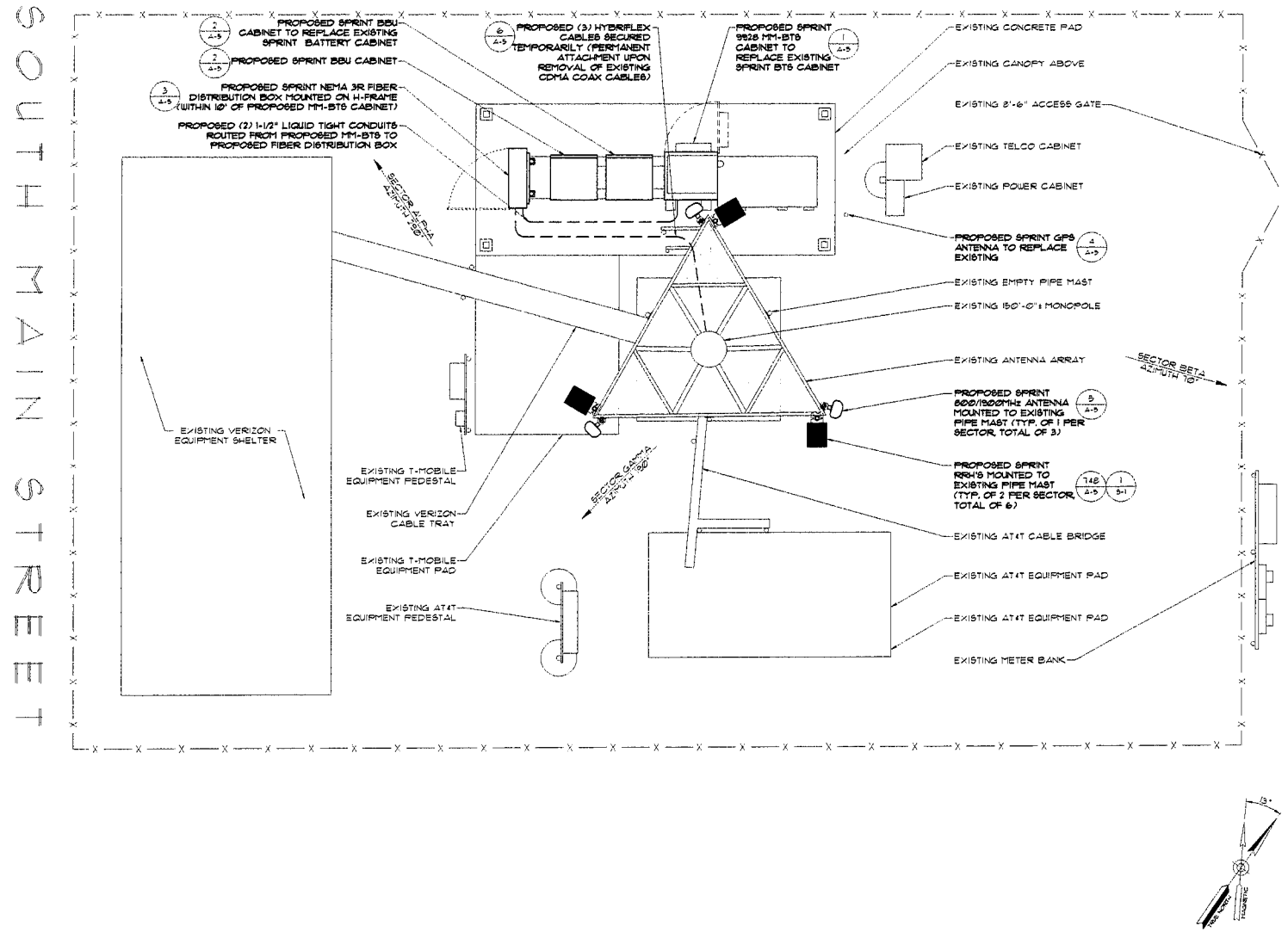
Please contact me by phone at (203) 610-1071 or by e-mail at mjhowlett@optonline.net with questions concerning this matter. Thank you for your consideration.

Respectfully yours,

Melanie J. Howlett

Attachments

cc: Honorable E. Patricia Llodra, First Selectman, Town of Newtown (aka Newton)
Blue Links Corp. (underlying property owner)



1 SITE PLAN

SCALE: 1/8"=1'-0"

Sprint

1 INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495
P: 800-357-7641

Alcatel·Lucent

600-700 MOUNTAIN AVE
MURRAY HILL, NJ 07974

Salient ARCHITECTS, LLC

New Jersey Office:
8 East Palisade Avenue
Englewood, NJ 07631
P: 201-567-0033 - F: 201-567-9566

NOT FOR CONSTRUCTION

PAUL GIONFRIDDO P.E.
CT # 13686

SUBMITTALS

NO	DATE	DESCRIPTION	BY
1	05/23/12	PRELIMINARY	KS
2	06/26/12	REVISED PER COMMENTS	NAS
3	09/28/12	ISSUED AS FINAL	AD
4	11/26/13	STRUCTURAL ANALYSIS COORD.	AMA

SITE NUMBER:
CT54XC716

SITE NAME:

SITE ADDRESS:
201 SOUTH MAIN STREET
NEWTON, CT 06470

SHEET TITLE:
SITE PLAN

SALIENT PROJ. NO:	SHEET NO:
CT54XC716	A-1
DATE:	
CHECKED BY: JHP	

STRUCTURAL VERIFICATION BY GENERAL CONTRACTOR:

GENERAL CONTRACTOR TO REFER TO THE STRUCTURAL ANALYSIS REPORT PREPARED BY PAUL J. FORD AND COMPANY, DATED AUGUST 20, 2013

1. EXISTING ANTENNA MOUNT ASSEMBLY MEMBER SIZES AND CONNECTIONS ARE ASSUMED TO BE AS SHOWN ON THE ORIGINAL CONSTRUCTION DOCUMENTS. GENERAL CONTRACTOR TO VERIFY THE ABOVE IN THE FIELD AND REPORT ANY VARIANCES TO THE ENGINEER OF RECORD PRIOR TO ANY INSTALLATION WORK BEING PERFORMED.

2. IT IS THE GENERAL CONTRACTOR'S/INSTALLER'S RESPONSIBILITY, PRIOR TO INSTALLATION OF THE EQUIPMENT TO INSPECT AND VERIFY THAT THE EXISTING ANTENNA MOUNT ASSEMBLY IS IN GOOD CONDITION, IN GOOD WORKING ORDER, AND INSTALLED ACCORDING TO THE MANUFACTURER'S ASSEMBLY DRAWINGS AND SPECIFICATIONS. IF ANY COMPONENTS ARE FOUND TO BE DEFECTIVE, INCLUDING MISSING OR LOOSE BOLTS/ANCHORS, REPORT SUCH DEFECTS IMMEDIATELY, AND DO NOT PROCEED WITH INSTALLATION UNTIL THE DEFECTS HAVE BEEN CORRECTED.

3. GENERAL CONTRACTOR'S ATTENTION IS DRAWN TO THE CONSTRUCTION DRAWINGS, PREPARED BY PAUL J. FORD AND COMPANY, DATED AUGUST 20, 2013, AND ENTITLED MONOPOLE REINFORCEMENT AND RETROFIT PROJECT, FOR STRUCTURAL WORK WHICH MUST BE DONE TO MAKE THE TOWER SAFE FOR THE PROPOSED ANTENNA INSTALLATION.

ANTENNA CONFIGURATION NOTE

ALL EXISTING CDMA ANTENNAS TO BE REMOVED / REPLACED WITH NETWORK VISION ANTENNAS FOR FINAL CONFIGURATION.

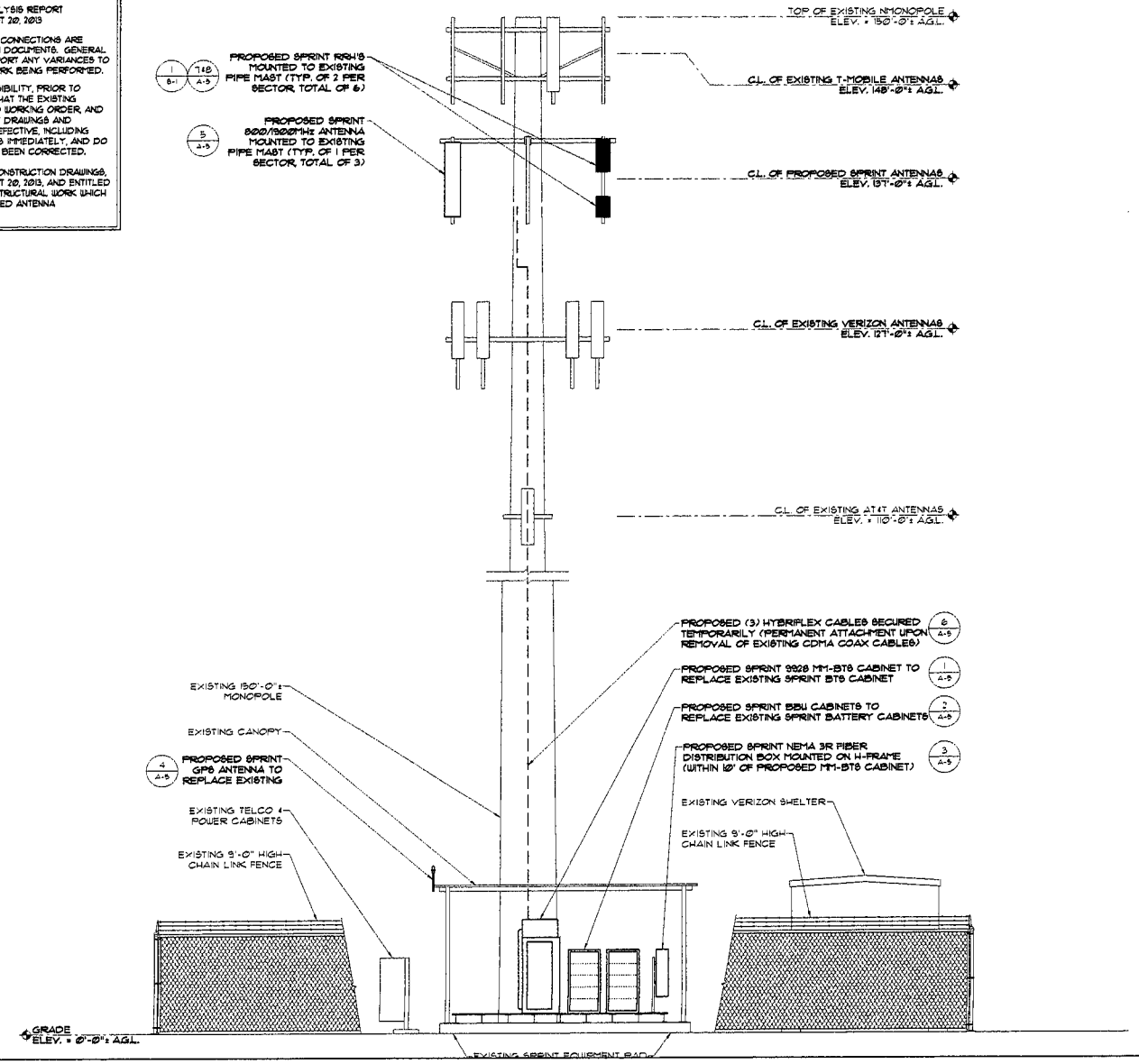
ANTENNA SEPARATION TO BE FIELD VERIFIED BY THE GENERAL CONTRACTOR.

NOTE:

ANTENNA BUSS BARS SHOULD BE INSTALLED DIRECTLY TO TOWER STEEL WITHOUT INCLUDING INSULATORS OR DOWN CONDUCTORS.

NOTES:

SEE MONOPOLE NOTES ON GN-2



1 NORTHEAST ELEVATION

SCALE = 1/4"=1'-0"

Sprint

1 INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495
P: 800-357-7641

Alcatel·Lucent

600-700 MOUNTAIN AVE
MURRAY HILL, NJ 07974

Salient ARCHITECTS, LLC

New Jersey Office:
9 East Palisade Avenue
Englewood, NJ 07631
P: 201-567-0032 - F: 201-567-9656

NOT FOR CONSTRUCTION

PAUL GIONFRIDDO P.E.
CT # 13668

SUBMITTALS

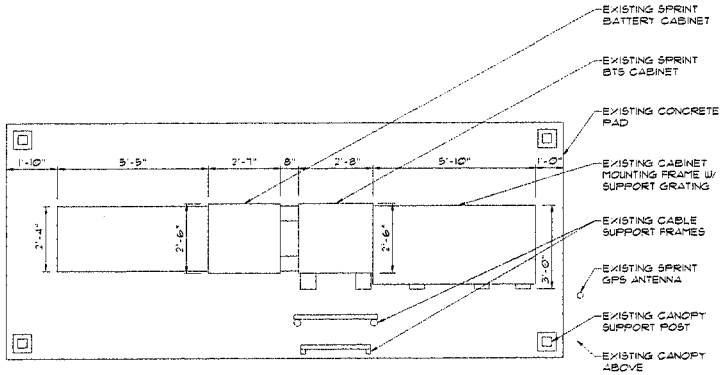
NO	DATE	DESCRIPTION	BY
1	05/09/13	PRELIMINARY	KS
2	06/26/13	REVISED PER COMMENTS	NAS
3	08/20/13	ISSUED AS FINAL	AD
4	11/29/13	STRUCTURAL ANALYSIS COORD.	ANA

SITE NUMBER:
CT54XC716
SITE NAME:

SITE ADDRESS:
201 SOUTH MAIN STREET
NEWTON, CT 06470

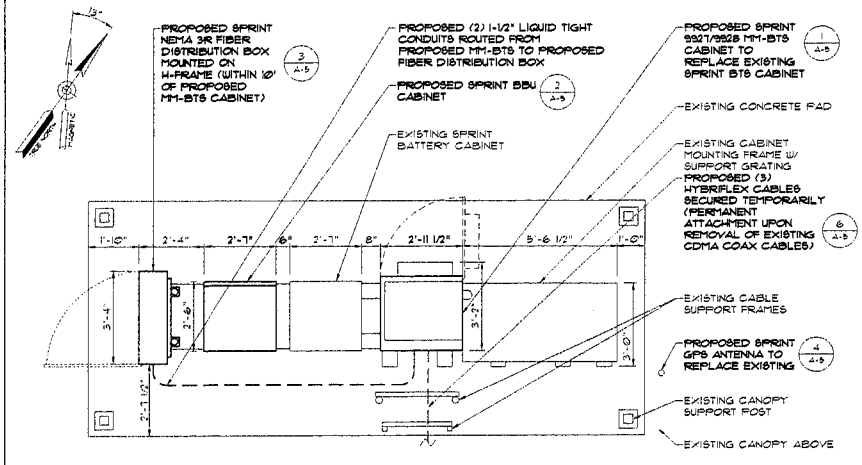
SHEET TITLE:
ELEVATION

SALIENT PROJ. NO: CT54XC716
DATE:
CHECKED BY: JHP
SHEET NO: A-2



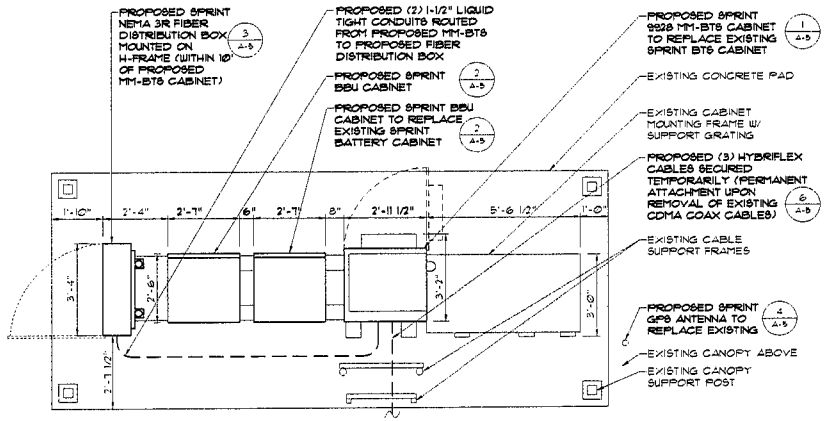
1 ENLARGED EQUIPMENT PLAN (EXISTING)

SCALE = 1/2"=1'-0"



2 ENLARGED EQUIPMENT PLAN (INTERMEDIATE)

SCALE = 1/2"=1'-0"



EQUIPMENT CABINET CONFIGURATION

EXISTING LAYOUT: 2 CABINETS
PROPOSED LAYOUT: 3 CABINETS

3 ENLARGED EQUIPMENT PLAN (FINAL)

SCALE = 1/2"=1'-0"

Sprint

1 INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495
P: 800-357-7641

Alcatel·Lucent

600-700 MOUNTAIN AVE
MURRAY HILL, NJ 07974

Salient ARCHITECTS, LLC

New Jersey Office:
8 East Palisade Avenue
Englewood, NJ 07631
P: 201-567-0032 - F: 201-567-9556

NOT FOR CONSTRUCTION

PAUL GIONFRIDDO P.E.
CT # 13666

SUBMITTALS

NO	DATE	DESCRIPTION	BY
1	05/03/13	PRELIMINARY	KB
2	05/28/13	REVISED PER COMMENTS	NAB
3	09/20/13	ISSUED AS FINAL	AD
4	11/26/13	STRUCTURAL ANALYSIS COORD	ANA

SITE NUMBER:
CT54XC716

SITE NAME:

SITE ADDRESS:
201 SOUTH MAIN STREET
NEWTON, CT 06470

SHEET TITLE:
ENLARGED EQUIPMENT CABINET LAYOUT

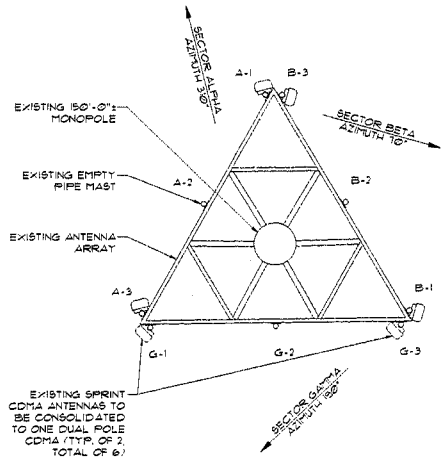
SALIENT PROJ. NO: CT54XC716

DATE:

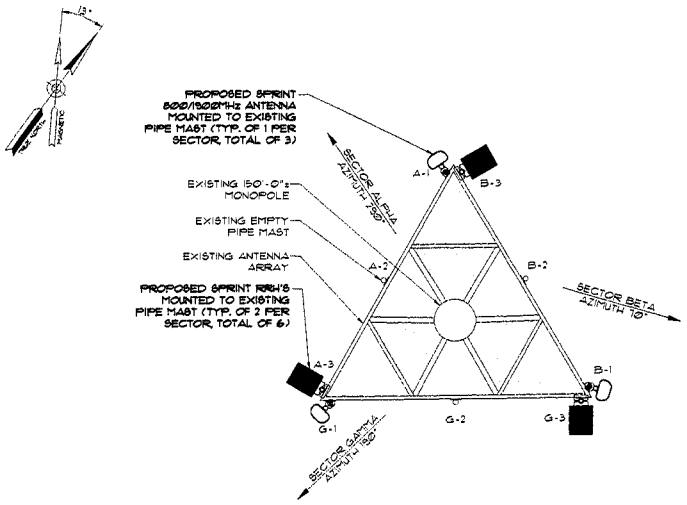
CHECKED BY: JHP

SHEET NO: A-3

EXISTING ANTENNA PLAN



FINAL ANTENNA PLAN



1 ANTENNA SCENARIO

SCALE = 1/4"=1'-0"

	POSITION	ANTENNA STATUS	FREQUENCY (MHZ)	ANTENNA MAKE	ANTENNA MODEL	AZIMUTHS EXISTING (FOR REFERENCE)	AZIMUTHS PROPOSED	MECHANICAL DOWN TILT	ELECTRICAL DOWN TILT	RAD CENTER (AGL)	*HYBRIFLEX CABLE LENGTH (FT)	RRH MODEL	TOP COAX JUMPER SIZE (IN.)	*TOP COAX JUMPER LENGTH (FT.)	TOP COAX JUMPER MAKE	TOP COAX JUMPER MODEL	COMBINER	*COMBINER JUMPER LENGTH (FT.)	ANTENNA COLOR CODING
ALPHA	A-1	PROPOSED	800/1900	RFS	APXV9PPI8-C-A20	310°	290°	0°	0°	137'-4"	160'-0"	(1) 800MHz	1/2	10	RFS	(2) LCF12-50J	--	--	TBD
								0°	0°			(1) 1900MHz	1/2	10	RFS	(4) LCF12-50J	--	--	
BETA	B-1	PROPOSED	800/1900	RFS	APXV9PPI8-C-A20	70°	70°	0°	-6°	137'-4"	160'-0"	(1) 800MHz	1/2	10	RFS	(2) LCF12-50J	--	--	TBD
								0°	0°			(1) 1900MHz	1/2	10	RFS	(4) LCF12-50J	--	--	
GAMMA	C-1	PROPOSED	800/1900	RFS	APXV9PPI8-C-A20	180°	130°	0°	-2°	137'-4"	160'-0"	(1) 800MHz	1/2	10	RFS	(2) LCF12-50J	--	--	TBD
								0°	0°			(1) 1900MHz	1/2	10	RFS	(4) LCF12-50J	--	--	

* CONTRACTOR TO FIELD VERIFY ALL CABLE/JUMPER LENGTHS AGAINST CURRENT B.O.M.

2 RF SYSTEM SCHEDULE

SCALE = N.T.S.

Sprint

1 INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495
P: 800-357-7641

Alcatel·Lucent

600-700 MOUNTAIN AVE
MURRAY HILL, NJ 07974

Salient ARCHITECTS, LLC

New Jersey Office:
8 East Palisade Avenue
Englewood, NJ 07631
P: 201-567-0032 - F: 201-567-9556

NOT FOR CONSTRUCTION

SUBMITTALS

NO	DATE	DESCRIPTION	BY
1	09/09/13		S
2	09/26/13	REVISED PER COMMENTS	NAS
3	09/30/13	ISSUED AS FINAL	AD

SITE NUMBER:

SITE NAME:

SITE ADDRESS:

SHEET TITLE:

ANTENNA SCENARIO AND RF SYSTEM SCHEDULE

SALIENT PROJ. NO:

SHEET NO: A-4

DATE:

CHECKED BY: JHP

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street • Suite 600 • Columbus, Ohio 43215-3708

Date: **August 20, 2013**

Steve Tuttle
Crown Castle USA Inc.
8 Parkmeadow Drive
Pittsford, NY 14534
(585) 899-3445

Paul J. Ford and Company
250 East Broad Street, Suite 600
Columbus, Ohio 43215
(614) 221-6679
kthorpe@pjfweb.com

Subject: **Structural Analysis Report**

Carrier Designation:	***Sprint PCS* Co-Locate – Final Loading**	
	Carrier Site Number:	CT54XC716
	Carrier Site Name:	N/A
Crown Castle Designation:	**Crown Castle BU Number:**	826222
	Crown Castle Site Name:	Newtown/RT-25
	Crown Castle JDE Job Number:	225018
	Crown Castle Work Order Number:	600035
	Crown Castle Application Number:	180205 Rev. 3
Engineering Firm Designation:	**Paul J. Ford and Company Project Number:**	37513-1642 BP
Site Data:	**201 Main Street, Newtown, Fairfield County, CT**	
	Latitude *41° 22' 41.322"*, Longitude *-73° 16' 26.843"*	
	150 Foot - Monopole Tower	

Dear Steve Tuttle,

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 557263, in accordance with application 180205, revision 3.

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:

LC4.5: Modified Structure w/ Existing + Proposed Equipment **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 the 2005 Connecticut Building Code and the 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 0.75 inch ice thickness and 50 mph under service loads.

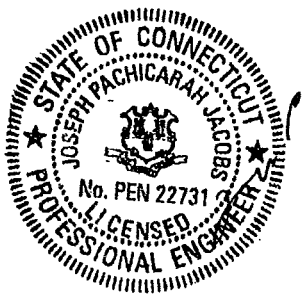
All modifications and equipment proposed in this report shall be installed in accordance with the attached drawings for the determined available structural capacity to be effective.

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:

Kyle Thorpe, E.I.
Structural Designer

tnxTower Report - version 6.0.4.0



AUG 2 1 2013

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 150 ft Monopole tower designed by PIROD MANUFACTURES INC. in October of 2000. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut Building Code and the 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 0.75 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
140.0	137.0	3	alcatel lucent	1900MHz RRH	3 (E)	1-1/4	1
		3	alcatel lucent	800MHZ RRH			
		6	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe			

Notes:
1) Proposed Equipment
(E) Coax to be mounted externally and exposed to the wind. See coax layout in Appendix B.

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
148.0	150.0	1	andrew	HP4-102	13 (I) 12 (E)	1-5/8 1-5/8	1
	148.0	6	andrew	ETW190VS12UB			
		12	andrew	TMBXX-6516-R2M w/ Mount Pipe			
		1	tower mounts	Sector Mount [SM 411-3]			
140.0	140.0	6	decibel	DB980F90E-M w/ Mount Pipe	9 (I)	1-5/8	2
		3	decibel	DB980F90T2E-M w/ Mount Pipe			
		1	tower mounts	Platform Mount [LP 712-1]	-	-	1
127.0	127.0	1	antel	BXA-171063-12BF w/ Mount Pipe	12 (I)	1-5/8	1
		2	antel	BXA-171063/8CF w/ Mount Pipe			
		6	rfs celwave	APL866513-42T0 w/ Mount Pipe			
		6	rfs celwave	FD9R6004/2C-3L			
		3	swedcom	SLCP 2x6014 w/ Mount Pipe			
		1	tower mounts	Platform Mount [LP 304-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
110.0	110.0	6	ericsson	RRUS-11	1 (I) 2 (I) 12 (I)	1/4 7/8 1-1/4	1
		3	powerwave technologies	7770.00 w/ Mount Pipe			
		6	powerwave technologies	LGP21401			
		3	powerwave technologies	P65-16-XLH-RR w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8F			
		1	tower mounts	Platform Mount [LP 303-1]			

Notes:
1) Existing Equipment
2) Equipment To Be Removed within 6 months, NOT considered in this analysis
(E) Coax to be mounted externally and exposed to the wind. See coax layout in Appendix B.
(I) Coax to be mounted internally and shielded from the wind. See coax layout in Appendix B.

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH, 1305751600, 08/15/2013	3536527	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Pirod, A-117711-F-1001206, 10/17/2000	3536528	CCISITES

3.1) Analysis Method

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

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) For proposed modifications: monopole will be reinforced in conformance with the attached proposed modification drawings, dated 8/16/2013.

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 - 133	Pole	TP26x21.83x0.25	1	-4.23	1032.38	15.3	Pass
L2	133 - 98.45	Pole	TP34.0625x24.7764x0.3125	2	-12.14	1691.15	53.7	Pass
L3	98.45 - 64.8	Pole	TP41.75x32.4841x0.375	3	-19.02	2488.32	66.2	Pass
L4	64.8 - 32	Pole	TP49.0625x39.8387x0.375	4	-27.21	2928.95	77.1	Pass
L5	32 - 0	Pole	TP56.125x46.9597x0.375	5	-38.28	3394.28	84.9	Pass
							Summary	
						Pole (L5)	84.9	Pass
						Rating =	84.9	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC4.5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	80.1	Pass
1	Base Plate	0	Pass	Pass
1	Base Foundation Structural Steel	0	95.9	Pass
1	Base Foundation Soil Interaction	0	84.2	Pass

Structure Rating (max from all components) =	95.9%

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

4.1) Recommendations

Reinforce the monopole in conformance with the attached proposed modification drawings, dated 8/20/2013.

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:

Tower is located in Fairfield County, Connecticut.
Basic wind speed of 85.00 mph.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56.00 pcf.
A wind speed of 37.60 mph is used in combination with ice.
Deflections calculated using a wind speed of 50.00 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

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

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	150.0000-133.0000	17.0000	2.95	18	21.8300	26.0000	0.2500	1.0000	A572-65 (65 ksi)
L2	133.0000-98.4500	37.5000	3.85	18	24.7764	34.0625	0.3125	0.1250	A572-65 (65 ksi)
L3	98.4500-64.8000	37.5000	4.70	18	32.4841	41.7500	0.3750	1.5000	A572-65 (65 ksi)
L4	64.8000-32.0000	37.5000	5.50	18	39.8387	49.0625	0.3750	0.1875	A572-65 (65 ksi)
L5	32.0000-0.0000	37.5000		18	46.9597	56.1250	0.3750	0.1875	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	22.1668	17.1237	1007.4853	7.6609	11.0896	90.8492	2016.2962	8.5635	3.4021	13.608
	26.4011	20.4326	1711.6544	9.1412	13.2080	129.5922	3425.5610	10.2183	4.1360	16.544
L2	25.9004	24.2651	1834.7231	8.6847	12.5864	145.7703	3671.8604	12.1349	4.2066	13.461
	34.5880	33.4758	4817.4335	11.9812	17.3038	278.4040	9641.2058	16.7411	5.8410	18.691
L3	33.9512	38.2179	4978.0707	11.3987	16.5019	301.6659	9962.6917	19.1126	5.0572	13.486
	42.3941	49.2466	10650.982 2	14.6881	21.2090	502.1916	21315.979 3	24.6280	6.6880	17.835
L4	41.6271	46.9716	9242.0494	14.0096	20.2380	456.6670	18496.259 7	23.4903	6.8136	18.17
	49.8194	57.9503	17355.137 8	17.2841	24.9238	696.3293	34733.111 9	28.9807	8.4370	22.499
L5	49.0491	55.4474	15202.142 0	16.5376	23.8555	637.2590	30424.287 3	27.7290	8.0669	21.512
	56.9908	66.3564	26056.150 6	19.7913	28.5115	913.8821	52146.586 5	33.1845	9.6800	25.813

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 150.0000-133.0000				1	1	1		
L2 133.0000-98.4500				1	1	1		
L3 98.4500-64.8000				1	1	1		
L4 64.8000-32.0000				1	1	1		
L5 32.0000-0.0000				1	1	1		

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
**********										

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
LDF7-50A(1-5/8")	C	No	Inside Pole	148.0000 - 0.0000	25	No Ice	0.0000	0.82
						1/2" Ice	0.0000	0.82
						1" Ice	0.0000	0.82
						2" Ice	0.0000	0.82
						4" Ice	0.0000	0.82
***								
HB114-1-0813U4-M5J(1 1/4")	C	No	CaAa (Out Of Face)	140.0000 - 0.0000	2	No Ice	0.0000	1.20
						1/2" Ice	0.0000	2.45
						1" Ice	0.0000	4.30
						2" Ice	0.0000	9.85
						4" Ice	0.0000	28.27
HB114-1-0813U4-M5J(1 1/4")	C	No	CaAa (Out Of Face)	140.0000 - 0.0000	1	No Ice	0.1540	1.20
						1/2" Ice	0.2540	2.45
						1" Ice	0.3540	4.30
						2" Ice	0.5540	9.85
						4" Ice	0.9540	28.27
***								

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	127.0000 - 0.0000	10	No Ice	0.0000	0.82
						1/2" Ice	0.0000	2.33
						1" Ice	0.0000	4.46
						2" Ice	0.0000	10.54
						4" Ice	0.0000	30.04
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	127.0000 - 0.0000	2	No Ice	0.1980	0.82
						1/2" Ice	0.2980	2.33
						1" Ice	0.3980	4.46
						2" Ice	0.5980	10.54
						4" Ice	0.9980	30.04
***								
LDF5-50A(7/8")	C	No	Inside Pole	110.0000 - 0.0000	2	No Ice	0.0000	0.33
						1/2" Ice	0.0000	0.33
						1" Ice	0.0000	0.33
						2" Ice	0.0000	0.33
						4" Ice	0.0000	0.33
LDF6-50A(1-1/4")	C	No	Inside Pole	110.0000 - 0.0000	12	No Ice	0.0000	0.66
						1/2" Ice	0.0000	0.66
						1" Ice	0.0000	0.66
						2" Ice	0.0000	0.66
						4" Ice	0.0000	0.66
9776(3/4")	C	No	Inside Pole	110.0000 - 0.0000	1	No Ice	0.0000	0.31
						1/2" Ice	0.0000	0.31
						1" Ice	0.0000	0.31
						2" Ice	0.0000	0.31
						4" Ice	0.0000	0.31
**********								

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(4) TMBXX-6516-R2M w/ Mount Pipe	A	From Face	4.0000	0.0000	148.0000	No Ice	6.1758	4.5251	0.05
			0.00			1/2"	6.6547	5.2050	0.10
			0.00			Ice	7.1374	5.8987	0.16
						1" Ice	8.1341	7.3732	0.29
						2" Ice	10.2560	10.5560	0.67
						4" Ice			
(4) TMBXX-6516-R2M w/ Mount Pipe	B	From Face	4.0000	0.0000	148.0000	No Ice	6.1758	4.5251	0.05
			0.00			1/2"	6.6547	5.2050	0.10
			0.00			Ice	7.1374	5.8987	0.16
						1" Ice	8.1341	7.3732	0.29
						2" Ice	10.2560	10.5560	0.67
						4" Ice			
(4) TMBXX-6516-R2M w/ Mount Pipe	C	From Face	4.0000	0.0000	148.0000	No Ice	6.1758	4.5251	0.05
			0.00			1/2"	6.6547	5.2050	0.10
			0.00			Ice	7.1374	5.8987	0.16
						1" Ice	8.1341	7.3732	0.29
						2" Ice	10.2560	10.5560	0.67
						4" Ice			
(2) ETW190VS12UB	A	From Face	4.0000	0.0000	148.0000	No Ice	0.6644	0.3669	0.01
			0.00			1/2"	0.7783	0.4613	0.02
			0.00			Ice	0.9008	0.5644	0.03
						1" Ice	1.1717	0.7964	0.04
						2" Ice	1.8173	1.3642	0.11
						4" Ice			
(2) ETW190VS12UB	B	From Face	4.0000	0.0000	148.0000	No Ice	0.6644	0.3669	0.01
			0.00			1/2"	0.7783	0.4613	0.02
			0.00			Ice	0.9008	0.5644	0.03
						1" Ice	1.1717	0.7964	0.04
						2" Ice	1.8173	1.3642	0.11

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
							4" Ice			
(2) ETW190VS12UB	C	From Face	4.0000	0.0000	0.0000	148.0000	No Ice	0.6644	0.3669	0.01
			0.00				1/2"	0.7783	0.4613	0.02
			0.00				Ice	0.9008	0.5644	0.03
							1" Ice	1.1717	0.7964	0.04
							2" Ice	1.8173	1.3642	0.11
							4" Ice			
Sector Mount [SM 411-3]	C	None			0.0000	148.0000	No Ice	21.8800	21.8800	1.07
							1/2"	30.6800	30.6800	1.48
							Ice	39.4800	39.4800	1.90
							1" Ice	57.0800	57.0800	2.73
							2" Ice	92.2800	92.2800	4.40
							4" Ice			
***										
(2) APXVSPP18-C-A20 w/ Mount Pipe	A	From Face	4.0000	0.0000	0.0000	140.0000	No Ice	8.4975	6.9458	0.08
			0.00				1/2"	9.1490	8.1266	0.15
			-3.00				Ice	9.7672	9.0212	0.22
							1" Ice	11.0311	10.8440	0.41
							2" Ice	13.6786	14.8507	0.91
							4" Ice			
(2) APXVSPP18-C-A20 w/ Mount Pipe	B	From Face	4.0000	0.0000	0.0000	140.0000	No Ice	8.4975	6.9458	0.08
			0.00				1/2"	9.1490	8.1266	0.15
			-3.00				Ice	9.7672	9.0212	0.22
							1" Ice	11.0311	10.8440	0.41
							2" Ice	13.6786	14.8507	0.91
							4" Ice			
(2) APXVSPP18-C-A20 w/ Mount Pipe	C	From Face	4.0000	0.0000	0.0000	140.0000	No Ice	8.4975	6.9458	0.08
			0.00				1/2"	9.1490	8.1266	0.15
			-3.00				Ice	9.7672	9.0212	0.22
							1" Ice	11.0311	10.8440	0.41
							2" Ice	13.6786	14.8507	0.91
							4" Ice			
1900MHz RRH	A	From Face	4.0000	0.0000	0.0000	140.0000	No Ice	2.9069	3.8014	0.04
			0.00				1/2"	3.1446	4.0650	0.08
			-3.00				Ice	3.3909	4.3372	0.11
							1" Ice	3.9094	4.9076	0.19
							2" Ice	5.0502	6.1520	0.41
							4" Ice			
1900MHz RRH	B	From Face	4.0000	0.0000	0.0000	140.0000	No Ice	2.9069	3.8014	0.04
			0.00				1/2"	3.1446	4.0650	0.08
			-3.00				Ice	3.3909	4.3372	0.11
							1" Ice	3.9094	4.9076	0.19
							2" Ice	5.0502	6.1520	0.41
							4" Ice			
1900MHz RRH	C	From Face	4.0000	0.0000	0.0000	140.0000	No Ice	2.9069	3.8014	0.04
			0.00				1/2"	3.1446	4.0650	0.08
			-3.00				Ice	3.3909	4.3372	0.11
							1" Ice	3.9094	4.9076	0.19
							2" Ice	5.0502	6.1520	0.41
							4" Ice			
800MHZ RRH	A	From Face	4.0000	0.0000	0.0000	140.0000	No Ice	2.4899	2.0685	0.05
			0.00				1/2"	2.7061	2.2705	0.07
			-3.00				Ice	2.9310	2.4812	0.10
							1" Ice	3.4068	2.9284	0.16
							2" Ice	4.4620	3.9265	0.32
							4" Ice			
800MHZ RRH	B	From Face	4.0000	0.0000	0.0000	140.0000	No Ice	2.4899	2.0685	0.05
			0.00				1/2"	2.7061	2.2705	0.07
			-3.00				Ice	2.9310	2.4812	0.10
							1" Ice	3.4068	2.9284	0.16
							2" Ice	4.4620	3.9265	0.32
							4" Ice			
800MHZ RRH	C	From Face	4.0000	0.0000	0.0000	140.0000	No Ice	2.4899	2.0685	0.05
			0.00				1/2"	2.7061	2.2705	0.07
			-3.00				Ice	2.9310	2.4812	0.10

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
							1" Ice	3.4068	2.9284	0.16
							2" Ice	4.4620	3.9265	0.32
							4" Ice			
Platform Mount [LP 712-1]	C	None			0.0000	140.0000	No Ice	24.5300	24.5300	1.34
							1/2" Ice	29.9400	29.9400	1.65
							1" Ice	35.3500	35.3500	1.96
							2" Ice	46.1700	46.1700	2.58
							4" Ice	67.8100	67.8100	3.82
***										
(2) BXA-171063/8CF w/ Mount Pipe	A	From Face	4.0000	0.00	0.0000	127.0000	No Ice	3.1574	3.3303	0.03
			0.00				1/2" Ice	3.5312	3.9423	0.06
			0.00				1" Ice	3.9415	4.5633	0.10
							2" Ice	4.8273	5.8553	0.19
							4" Ice	6.7342	8.8407	0.48
(2) APL866513-42T0 w/ Mount Pipe	A	From Face	4.0000	0.00	0.0000	127.0000	No Ice	4.5308	4.9208	0.03
			0.00				1/2" Ice	4.9675	5.5962	0.08
							1" Ice	5.4135	6.2837	0.13
							2" Ice	6.3370	7.7123	0.25
							4" Ice	8.3197	10.8330	0.60
(2) SLCP 2x6014 w/ Mount Pipe	B	From Face	4.0000	0.00	0.0000	127.0000	No Ice	7.4514	6.9545	0.04
			0.00				1/2" Ice	7.9606	7.7563	0.10
							1" Ice	8.4698	8.5195	0.18
							2" Ice	9.5191	10.0997	0.34
							4" Ice	11.7421	13.4750	0.80
(2) APL866513-42T0 w/ Mount Pipe	B	From Face	4.0000	0.00	0.0000	127.0000	No Ice	4.5308	4.9208	0.03
			0.00				1/2" Ice	4.9675	5.5962	0.08
							1" Ice	5.4135	6.2837	0.13
							2" Ice	6.3370	7.7123	0.25
							4" Ice	8.3197	10.8330	0.60
SLCP 2x6014 w/ Mount Pipe	C	From Face	4.0000	0.00	0.0000	127.0000	No Ice	7.4514	6.9545	0.04
			0.00				1/2" Ice	7.9606	7.7563	0.10
							1" Ice	8.4698	8.5195	0.18
							2" Ice	9.5191	10.0997	0.34
							4" Ice	11.7421	13.4750	0.80
(2) APL866513-42T0 w/ Mount Pipe	C	From Face	4.0000	0.00	0.0000	127.0000	No Ice	4.5308	4.9208	0.03
			0.00				1/2" Ice	4.9675	5.5962	0.08
							1" Ice	5.4135	6.2837	0.13
							2" Ice	6.3370	7.7123	0.25
							4" Ice	8.3197	10.8330	0.60
BXA-171063-12BF w/ Mount Pipe	C	From Face	4.0000	0.00	0.0000	127.0000	No Ice	4.9710	5.2283	0.04
			0.00				1/2" Ice	5.5211	6.3892	0.08
							1" Ice	6.0361	7.2610	0.14
							2" Ice	7.0911	9.0462	0.27
							4" Ice	9.3593	12.8165	0.67
(2) FD9R6004/2C-3L	A	From Face	4.0000	0.00	0.0000	127.0000	No Ice	0.3665	0.0846	0.00
			0.00				1/2" Ice	0.4506	0.1362	0.01
							1" Ice	0.5433	0.1965	0.01
							2" Ice	0.7546	0.3430	0.02
							4" Ice	1.2809	0.7396	0.06
(2) FD9R6004/2C-3L	B	From Face	4.0000	0.00	0.0000	127.0000	No Ice	0.3665	0.0846	0.00
			0.00				1/2" Ice	0.4506	0.1362	0.01
							1" Ice	0.5433	0.1965	0.01
							2" Ice	0.7546	0.3430	0.02
							4" Ice	1.2809	0.7396	0.06
(2) FD9R6004/2C-3L	C	From Face	4.0000		0.0000	127.0000	No Ice	0.3665	0.0846	0.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00				1/2"	0.4506	0.1362	0.01
			0.00				Ice	0.5433	0.1965	0.01
							1" Ice	0.7546	0.3430	0.02
							2" Ice	1.2809	0.7396	0.06
							4" Ice			
Platform Mount [LP 304-1]	C	None			0.0000	127.0000	No Ice	17.4600	17.4600	1.35
							1/2"	22.4400	22.4400	1.62
							Ice	27.4200	27.4200	1.90
							1" Ice	37.3800	37.3800	2.45
							2" Ice	57.3000	57.3000	3.55
							4" Ice			
***										
7770.00 w/ Mount Pipe	A	From Face	4.0000		0.0000	110.0000	No Ice	6.1194	4.2543	0.06
			0.00				1/2"	6.6258	5.0137	0.10
			0.00				Ice	7.1283	5.7109	0.16
							1" Ice	8.1643	7.1553	0.29
							2" Ice	10.3599	10.4117	0.66
							4" Ice			
7770.00 w/ Mount Pipe	B	From Face	4.0000		0.0000	110.0000	No Ice	6.1194	4.2543	0.06
			0.00				1/2"	6.6258	5.0137	0.10
			0.00				Ice	7.1283	5.7109	0.16
							1" Ice	8.1643	7.1553	0.29
							2" Ice	10.3599	10.4117	0.66
							4" Ice			
7770.00 w/ Mount Pipe	C	From Face	4.0000		0.0000	110.0000	No Ice	6.1194	4.2543	0.06
			0.00				1/2"	6.6258	5.0137	0.10
			0.00				Ice	7.1283	5.7109	0.16
							1" Ice	8.1643	7.1553	0.29
							2" Ice	10.3599	10.4117	0.66
							4" Ice			
(2) LGP21401	A	From Face	4.0000		0.0000	110.0000	No Ice	1.2880	0.2326	0.01
			0.00				1/2"	1.4453	0.3134	0.02
			0.00				Ice	1.6112	0.4028	0.03
							1" Ice	1.9690	0.6076	0.05
							2" Ice	2.7883	1.1209	0.14
							4" Ice			
(2) LGP21401	B	From Face	4.0000		0.0000	110.0000	No Ice	1.2880	0.2326	0.01
			0.00				1/2"	1.4453	0.3134	0.02
			0.00				Ice	1.6112	0.4028	0.03
							1" Ice	1.9690	0.6076	0.05
							2" Ice	2.7883	1.1209	0.14
							4" Ice			
(2) LGP21401	C	From Face	4.0000		0.0000	110.0000	No Ice	1.2880	0.2326	0.01
			0.00				1/2"	1.4453	0.3134	0.02
			0.00				Ice	1.6112	0.4028	0.03
							1" Ice	1.9690	0.6076	0.05
							2" Ice	2.7883	1.1209	0.14
							4" Ice			
P65-16-XLH-RR w/ Mount Pipe	A	From Face	4.0000		0.0000	110.0000	No Ice	8.6375	6.3625	0.08
			0.00				1/2"	9.2903	7.5378	0.14
			0.00				Ice	9.9098	8.4270	0.22
							1" Ice	11.1763	10.2390	0.39
							2" Ice	13.8289	14.0988	0.89
							4" Ice			
P65-16-XLH-RR w/ Mount Pipe	B	From Face	4.0000		0.0000	110.0000	No Ice	8.6375	6.3625	0.08
			0.00				1/2"	9.2903	7.5378	0.14
			0.00				Ice	9.9098	8.4270	0.22
							1" Ice	11.1763	10.2390	0.39
							2" Ice	13.8289	14.0988	0.89
							4" Ice			
P65-16-XLH-RR w/ Mount Pipe	C	From Face	4.0000		0.0000	110.0000	No Ice	8.6375	6.3625	0.08
			0.00				1/2"	9.2903	7.5378	0.14
			0.00				Ice	9.9098	8.4270	0.22
							1" Ice	11.1763	10.2390	0.39
							2" Ice	13.8289	14.0988	0.89

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) RRUS-11	A	From Face	4.0000	0.0000	0.0000	110.0000	4" Ice No Ice	3.2486	1.3726	0.05
			0.00				1/2" Ice	3.4905	1.5510	0.07
			0.00				1" Ice	3.7411	1.7380	0.09
							2" Ice	4.2682	2.1381	0.15
							4" Ice	5.4260	3.0418	0.31
(2) RRUS-11	B	From Face	4.0000	0.0000	0.0000	110.0000	No Ice	3.2486	1.3726	0.05
			0.00				1/2" Ice	3.4905	1.5510	0.07
			0.00				1" Ice	3.7411	1.7380	0.09
							2" Ice	4.2682	2.1381	0.15
							4" Ice	5.4260	3.0418	0.31
(2) RRUS-11	C	From Face	4.0000	0.0000	0.0000	110.0000	No Ice	3.2486	1.3726	0.05
			0.00				1/2" Ice	3.4905	1.5510	0.07
			0.00				1" Ice	3.7411	1.7380	0.09
							2" Ice	4.2682	2.1381	0.15
							4" Ice	5.4260	3.0418	0.31
DC6-48-60-18-8F	A	From Face	4.0000	0.0000	0.0000	110.0000	No Ice	2.5667	2.5667	0.02
			0.00				1/2" Ice	2.7978	2.7978	0.04
			0.00				1" Ice	3.0377	3.0377	0.07
							2" Ice	3.5432	3.5432	0.13
							4" Ice	4.6580	4.6580	0.30
Platform Mount [LP 303-1]	C	None			0.0000	110.0000	No Ice	14.6600	14.6600	1.25
							1/2" Ice	18.8700	18.8700	1.48
							1" Ice	23.0800	23.0800	1.71
							2" Ice	31.5000	31.5000	2.18
							4" Ice	48.3400	48.3400	3.10
**********										
**										

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
HP4-102	C	Paraboloid w/Shroud (HP)	From Face	4.0000	0.0000	0.0000		148.0000	4.0000	No Ice	12.5700	0.08
				0.00						1/2" Ice	13.1000	0.15
				2.00						1" Ice	13.6200	0.21
										2" Ice	14.6800	0.35
										4" Ice	16.8000	0.62
**********												
*												

Tower Pressures - No Ice

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 150.0000-133.0000	141.2530	1.515	28.02	33.880	A	0.000	33.880	33.880	100.00	0.000	0.000
					B	0.000	33.880		100.00	0.000	0.000
					C	0.000	33.880		100.00	0.000	1.078
L2 133.0000-98.4500	115.0815	1.429	26.40	85.755	A	0.000	85.755	85.755	100.00	0.000	0.000
					B	0.000	85.755		100.00	0.000	0.000
					C	0.000	85.755		100.00	0.000	16.626
L3 98.4500-64.8000	81.2529	1.294	23.88	105.416	A	0.000	105.416	105.416	100.00	0.000	0.000
					B	0.000	105.416		100.00	0.000	0.000
					C	0.000	105.416		100.00	0.000	18.507
L4 64.8000-32.0000	48.3113	1.115	20.51	123.078	A	0.000	123.078	123.078	100.00	0.000	0.000
					B	0.000	123.078		100.00	0.000	0.000
					C	0.000	123.078		100.00	0.000	18.040
L5 32.0000-0.0000	15.6006	1	18.50	139.239	A	0.000	139.239	139.239	100.00	0.000	0.000
					B	0.000	139.239		100.00	0.000	0.000
					C	0.000	139.239		100.00	0.000	17.600

Tower Pressure - With Ice

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z psf	t_z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 150.0000-133.0000	141.2530	1.515	5.48	0.8930	36.410	A	0.000	36.410	36.410	100.00	0.000	0.000
						B	0.000	36.410		100.00	0.000	0.000
						C	0.000	36.410		100.00	0.000	2.328
L2 133.0000-98.4500	115.0815	1.429	5.17	0.8713	90.897	A	0.000	90.897	90.897	100.00	0.000	0.000
						B	0.000	90.897		100.00	0.000	0.000
						C	0.000	90.897		100.00	0.000	32.995
L3 98.4500-64.8000	81.2529	1.294	4.67	0.8356	110.303	A	0.000	110.303	110.303	100.00	0.000	0.000
						B	0.000	110.303		100.00	0.000	0.000
						C	0.000	110.303		100.00	0.000	36.099
L4 64.8000-32.0000	48.3113	1.115	4.01	0.7851	127.646	A	0.000	127.646	127.646	100.00	0.000	0.000
						B	0.000	127.646		100.00	0.000	0.000
						C	0.000	127.646		100.00	0.000	34.486
L5 32.0000-0.0000	15.6006	1	3.62	0.7500	143.426	A	0.000	143.426	143.426	100.00	0.000	0.000
						B	0.000	143.426		100.00	0.000	0.000
						C	0.000	143.426		100.00	0.000	32.674

Tower Pressure - Service

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 150.0000-133.0000	141.2530	1.515	9.70	33.880	A	0.000	33.880	33.880	100.00	0.000	0.000
					B	0.000	33.880		100.00	0.000	0.000
					C	0.000	33.880		100.00	0.000	1.078
L2 133.0000-98.4500	115.0815	1.429	9.14	85.755	A	0.000	85.755	85.755	100.00	0.000	0.000
					B	0.000	85.755		100.00	0.000	0.000
					C	0.000	85.755		100.00	0.000	16.626
L3 98.4500-64.8000	81.2529	1.294	8.26	105.416	A	0.000	105.416	105.416	100.00	0.000	0.000
					B	0.000	105.416		100.00	0.000	0.000
					C	0.000	105.416		100.00	0.000	18.507
L4 64.8000-32.0000	48.3113	1.115	7.10	123.078	A	0.000	123.078	123.078	100.00	0.000	0.000
					B	0.000	123.078		100.00	0.000	0.000
					C	0.000	123.078		100.00	0.000	18.040

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L5 32.0000-0.0000	15.6006	1	6.40	139.239	A	0.000	139.239	139.239	100.00	0.000	0.000
					B	0.000	139.239		100.00	0.000	0.000
					C	0.000	139.239		100.00	0.000	17.600

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 133	28.859	27	1.6160	0.0090
L2	135.95 - 98.45	24.130	27	1.5869	0.0061
L3	102.3 - 64.8	13.845	27	1.2748	0.0027
L4	69.5 - 32	6.393	27	0.8671	0.0013
L5	37.5 - 0	1.878	27	0.4556	0.0006

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.0000	HP4-102	27	28.859	1.6160	0.0091	33522
148.0000	(4) TMBXX-6516-R2M w/ Mount Pipe	27	28.182	1.6139	0.0086	33522
140.0000	(2) APXVSPP18-C-A20 w/ Mount Pipe	27	25.482	1.6004	0.0068	16764
127.0000	(2) BXA-171063/8CF w/ Mount Pipe	27	21.206	1.5334	0.0047	8301
110.0000	7770.00 w/ Mount Pipe	27	16.000	1.3658	0.0031	5236

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 133	83.349	2	4.6723	0.0258
L2	135.95 - 98.45	69.693	2	4.5860	0.0172
L3	102.3 - 64.8	39.996	2	3.6833	0.0076
L4	69.5 - 32	18.475	2	2.5058	0.0038
L5	37.5 - 0	5.429	2	1.3168	0.0016

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.0000	HP4-102	2	83.349	4.6723	0.0259	11715
148.0000	(4) TMBXX-6516-R2M w/ Mount Pipe	2	81.392	4.6659	0.0246	11715
140.0000	(2) APXVSPP18-C-A20 w/ Mount Pipe	2	73.595	4.6256	0.0195	5857
127.0000	(2) BXA-171063/8CF w/ Mount Pipe	2	61.249	4.4307	0.0133	2892
110.0000	7770.00 w/ Mount Pipe	2	46.218	3.9462	0.0088	1827

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 - 133 (1)	TP26x21.83x0.25	17.0000	0.0000	0.0	39.000	19.8584	-4.23	774.48	0.005
L2	133 - 98.45 (2)	TP34.0625x24.7764x0.3125	37.5000	0.0000	0.0	39.000	32.5302	-12.14	1268.68	0.010
L3	98.45 - 64.8 (3)	TP41.75x32.4841x0.375	37.5000	0.0000	0.0	39.000	47.8643	-19.02	1866.71	0.010
L4	64.8 - 32 (4)	TP49.0625x39.8387x0.375	37.5000	0.0000	0.0	39.000	56.3401	-27.21	2197.26	0.012
L5	32 - 0 (5)	TP56.125x46.9597x0.375	37.5000	0.0000	0.0	38.374	66.3564	-38.28	2546.35	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 - 133 (1)	TP26x21.83x0.25	78.64	7.711	39.000	0.198	0.00	0.000	39.000	0.000
L2	133 - 98.45 (2)	TP34.0625x24.7764x0.3125	602.50	27.509	39.000	0.705	0.00	0.000	39.000	0.000
L3	98.45 - 64.8 (3)	TP41.75x32.4841x0.375	1342.88	33.977	39.000	0.871	0.00	0.000	39.000	0.000
L4	64.8 - 32 (4)	TP49.0625x39.8387x0.375	2171.22	39.595	39.000	1.015	0.00	0.000	39.000	0.000
L5	32 - 0 (5)	TP56.125x46.9597x0.375	3261.45	42.825	38.374	1.116	0.00	0.000	38.374	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 - 133 (1)	TP26x21.83x0.25	10.43	0.525	26.000	0.040	0.01	0.000	26.000	0.000
L2	133 - 98.45 (2)	TP34.0625x24.7764x0.3125	20.87	0.641	26.000	0.049	0.83	0.018	26.000	0.001
L3	98.45 - 64.8 (3)	TP41.75x32.4841x0.375	24.29	0.508	26.000	0.039	0.66	0.008	26.000	0.000
L4	64.8 - 32 (4)	TP49.0625x39.8387x0.375	27.41	0.487	26.000	0.037	0.49	0.004	26.000	0.000
L5	32 - 0 (5)	TP56.125x46.9597x0.375	30.74	0.463	26.000	0.036	0.28	0.002	26.000	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150 - 133 (1)	0.005	0.198	0.000	0.040	0.000	0.204 ✔	1.333	H1-3+VT ✔

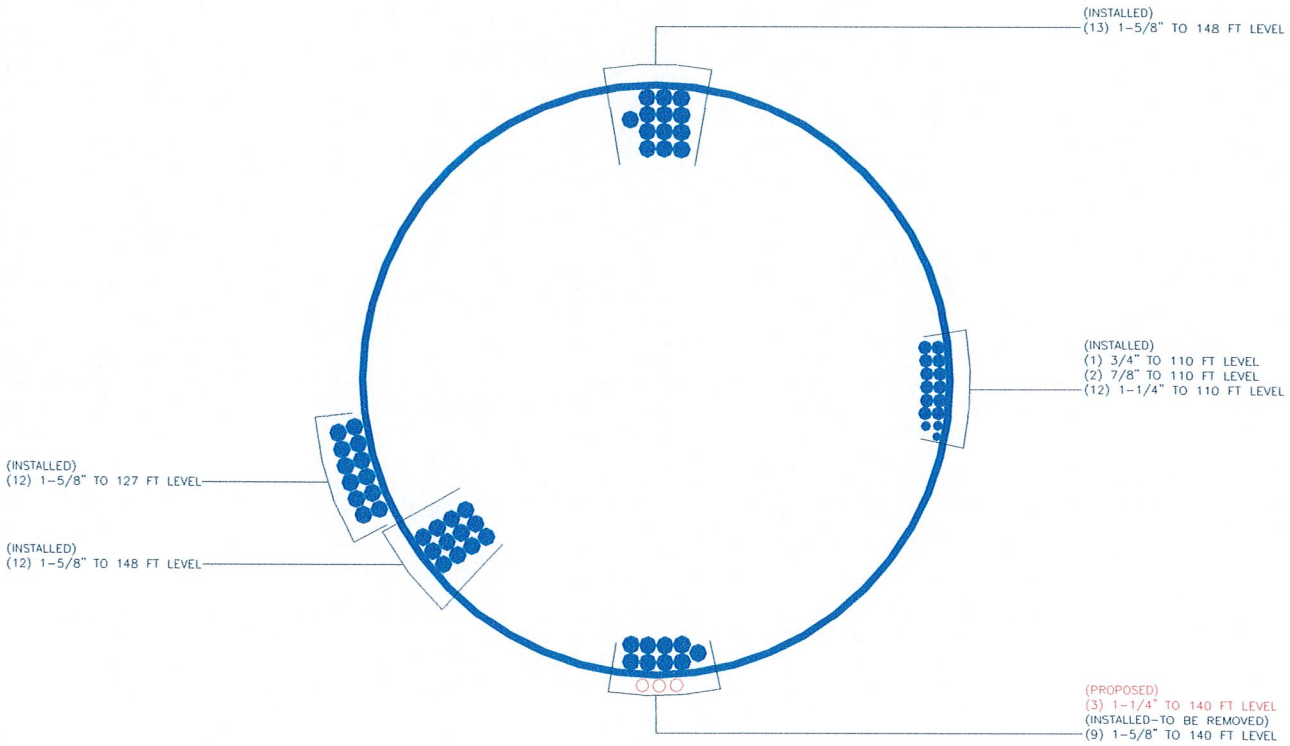
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L2	133 - 98.45 (2)	0.010	0.705	0.000	0.049	0.001	0.716 ✔	1.333	H1-3+VT ✔
L3	98.45 - 64.8 (3)	0.010	0.871	0.000	0.039	0.000	0.882 ✔	1.333	H1-3+VT ✔
L4	64.8 - 32 (4)	0.012	1.015	0.000	0.037	0.000	1.028 ✔	1.333	H1-3+VT ✔
L5	32 - 0 (5)	0.015	1.116	0.000	0.036	0.000	1.131 ✔	1.333	H1-3+VT ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	150 - 133	Pole	TP26x21.83x0.25	1	-4.23	1032.38	15.3	Pass
L2	133 - 98.45	Pole	TP34.0625x24.7764x0.3125	2	-12.14	1691.15	53.7	Pass
L3	98.45 - 64.8	Pole	TP41.75x32.4841x0.375	3	-19.02	2488.32	66.2	Pass
L4	64.8 - 32	Pole	TP49.0625x39.8387x0.375	4	-27.21	2928.95	77.1	Pass
L5	32 - 0	Pole	TP56.125x46.9597x0.375	5	-38.28	3394.28	84.9	Pass
							Summary	
						Pole (L5)	84.9	Pass
						RATING =	**84.9**	**Pass**

APPENDIX B

BASE LEVEL DRAWING

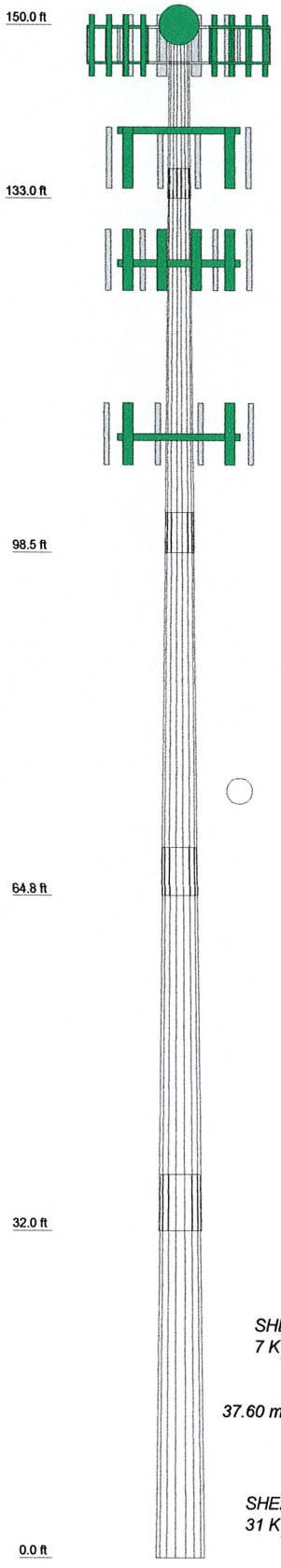


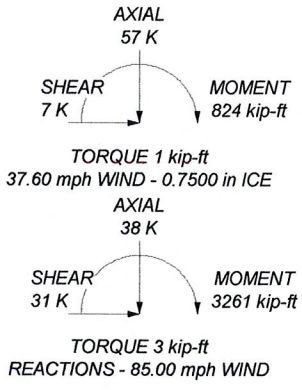
APPENDIX C

ADDITIONAL CALCULATIONS

Section	1	2	3	4	5
Length (ft)	17.0000	37.5000	37.5000	37.5000	37.5000
Number of Sides	18	18	18	18	18
Thickness (in)	0.2500	0.3125	0.3750	0.3750	0.3750
Socket Length (ft)	2.9500	3.8500	4.7000	5.5000	
Top Dia (in)	21.8300	24.7764	32.4841	39.8387	46.9597
Bot Dia (in)	26.0000	34.0625	41.7500	49.0625	56.1250
Grade			A572-65		
Weight (K)	1.1	3.7	5.6	6.7	7.8

24.8





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(4) TMBXX-6516-R2M w/ Mount Pipe	148	(2) APL866513-42T0 w/ Mount Pipe	127
(4) TMBXX-6516-R2M w/ Mount Pipe	148	BXA-171063-12BF w/ Mount Pipe	127
(4) TMBXX-6516-R2M w/ Mount Pipe	148	(2) FD9R6004/2C-3L	127
(2) ETW190VS12UB	148	(2) FD9R6004/2C-3L	127
(2) ETW190VS12UB	148	(2) FD9R6004/2C-3L	127
(2) ETW190VS12UB	148	Platform Mount [LP 304-1]	127
Sector Mount [SM 411-3]	148	(2) BXA-171063/8CF w/ Mount Pipe	127
HP4-102	148	7770.00 w/ Mount Pipe	110
(2) APXVSPP18-C-A20 w/ Mount Pipe	140	7770.00 w/ Mount Pipe	110
(2) APXVSPP18-C-A20 w/ Mount Pipe	140	(2) LGP21401	110
1900MHz RRH	140	(2) LGP21401	110
1900MHz RRH	140	(2) LGP21401	110
1900MHz RRH	140	P65-16-XLH-RR w/ Mount Pipe	110
800MHZ RRH	140	P65-16-XLH-RR w/ Mount Pipe	110
800MHZ RRH	140	P65-16-XLH-RR w/ Mount Pipe	110
800MHZ RRH	140	(2) RRUS-11	110
Platform Mount [LP 712-1]	140	(2) RRUS-11	110
(2) APXVSPP18-C-A20 w/ Mount Pipe	140	(2) RRUS-11	110
(2) APL866513-42T0 w/ Mount Pipe	127	DC6-48-60-18-8F	110
(2) SLCP 2x6014 w/ Mount Pipe	127	Platform Mount [LP 303-1]	110
(2) APL866513-42T0 w/ Mount Pipe	127	7770.00 w/ Mount Pipe	110
SLCP 2x6014 w/ Mount Pipe	127		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for a 85.00 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 37.60 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50.00 mph wind.
5. TOWER RATING: 84.9%

Paul J. Ford and Company
250 East Broad Street, Suite 600
Columbus, Ohio 43215
Phone: (614) 221-6679
FAX: (614) 448-4118

Job: ***150-ft Monopole / Newton, CT / Newton/Rt-25***			
Project: ***BU# 8256222 / PJF# 37513-1642 BP***			
Client: Crown Castle	Drawn by: Kyle Thorpe, E.I.	App'd:	
Code: TIA/EIA-222-F	Date: 08/22/13	Scale: NTS	
Path: G:\TOWER\375 Crown Castle\2013\37513-1642 BU 826222\37513-1642 BP.eri		Dwg No. E-1	

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

TIA Rev F

Site Data

BU#: *826222*
Site Name: *Newtown/RT-25*
App #:
Pole Manufacturer: *Pirod*

Reactions		
Moment:	3261	ft-kips
Axial:	38	kips
Shear:	31	kips

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

Anchor Rod Data		
Qty:	39	
Diam:	1.25	in
Rod Material:	Other	
Strength (Fu):	150	ksi
Yield (Fy):	105	ksi
Bolt Circle:	61	in

Plate Data		
Diam:	65	in
Thick:	1.5	in
Grade:	50	ksi
Single-Rod B-eff:	4.57	in

Stiffener Data (Welding at both sides)		
Config:	1	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.5	in
Fillet V. Weld:	0.5	in
Width:	4.5	in
Height:	8	in
Thick:	0.75	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	56.125	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:	64.8 Kips	Service, ASD
Allowable Tension:	81.0 Kips	Fty*ASIF
Anchor Rod Stress Ratio:	80.1% **Pass**	

Base Plate Results — Shear Check Only

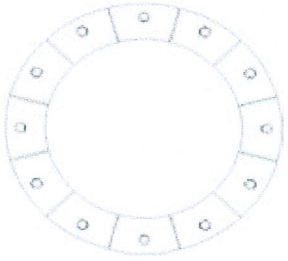
		Stiffened
Base Plate Stress:	Rohn/Pirod, OK	Service, ASD
Allowable Plate Stress:	26.7 ksi	0.75*Fy*ASIF
Base Plate Stress Ratio:	Rohn/Pirod, OK	Y.L. Length: N/A, Roark

Stiffener Results N/A for Rohn / Pirod

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

Pole Results

Pole Punching Shear Check: N/A



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

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

Foundation Loads:

Pole weight or tower leg compression =	38	(kips)
Horizontal load at top of pier =	31	(kips)
Overturning moment at top of pier=	3261	(ft-kips)

Design criteria:

Safety factor against overturning =	1.5	

Soil Properties:

Soil density =	125	(pcf)
Allowable soil bearing =	15	(ksf)
Depth to water table =	99	(ft)

Dimensions:

Pier shape (round or square)	R	("R" or "S")
Pier width =	7	(ft)
Pier height above grade =	0.5	(ft)
depth to bottom of footing =	6	(ft)
Footing thickness =	2	(ft)
Footing width =	21	(ft)
Footing length =	21	(ft)

Concrete:

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

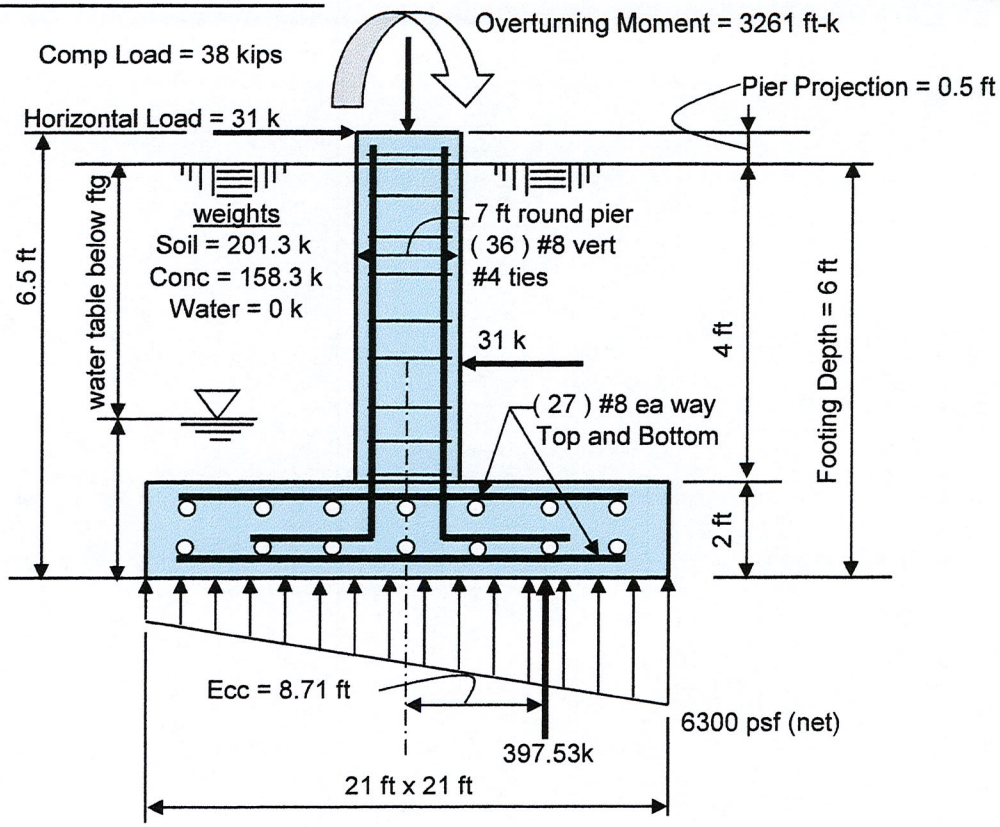
Reinforcing Steel:

	Pad	
minimum cover over rebar =	3	inches
size of pad rebar =	#8	bar
quantity of pad rebar =	27	(ea direction)

Reinforcing Steel:

	Pier	
size of vert rebar in pier=	#8	bar
vertical rebar quantity =	36	
size of pier ties =	#4	bar
minimum cover over rebar =	3	inches

Total volume of concrete = 39.1 cu yd



REINFORCING IS REQUIRED. SEE FOLLOWING PAGES.

Summary of analysis results	
Maximum Net Soil Bearing = 6.3 ksf Allowable Net Soil Bearing = 15 ksf **Soil Bearing Stress Ratio = 0.42 Okay**	Ult Bending Shear Capacity = 126 psi Ult Bending Shear Stress = 110 psi **Bending Shear Stress Ratio = 0.87 Okay**
Ftg Overturning Resistance = 4174 ft-kips Overturning Moment = 3463 ft-kips Required Overturning Safety Factor = 1.5 Overturning Safety Factor = 1.206 **Ratio = 1.24 Not OK**	Pad Bending Moment Capacity= 1800 ft-k Pad Bending Moment = 2157 ft-k **Bending Shear Stress Ratio = 1.2 Not OK**

PJF job no. **37513-1642 BP** Project name **BU 826222 (Pad Bending Check, Part 1)**

Foundation Loads:

Pole weight or tower leg compression =	38	(kips)
Horizontal load at top of pier =	25	(kips)
Overturning moment at top of pier=	2609	(ft-kips)

Design criteria:

Safety factor against overturning =	1.5	

Soil Properties:

Soil density =	125	(pcf)
Allowable soil bearing =	15	(ksf)
Depth to water table =	99	(ft)

Dimensions:

Pier shape (round or square)	R	("R" or "S")
Pier width =	7	(ft)
Pier height above grade =	0.5	(ft)
depth to bottom of footing =	6	(ft)
Footing thickness =	2	(ft)
Footing width =	21	(ft)
Footing length =	21	(ft)

Concrete:

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

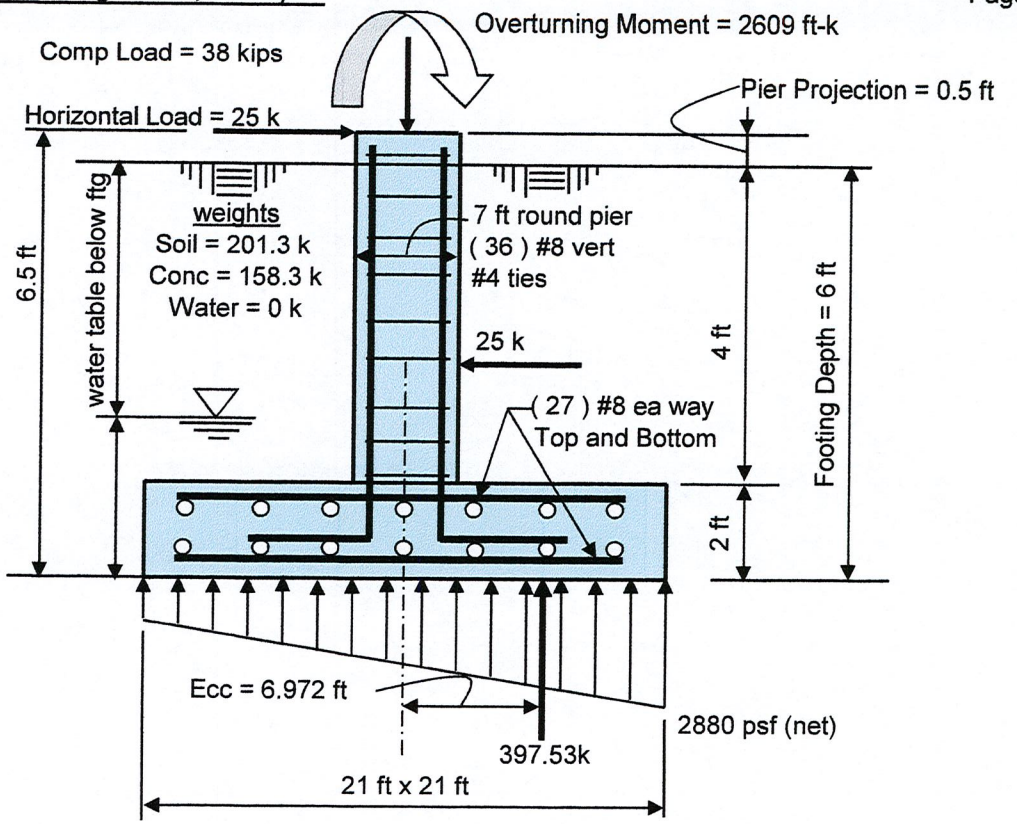
Reinforcing Steel:

	Pad	
minimum cover over rebar =	3	inches
size of pad rebar =	#8	bar
quantity of pad rebar =	27	(ea direction)

Reinforcing Steel:

	Pier	
size of vert rebar in pier=	#8	bar
vertical rebar quantity =	36	
size of pier ties =	#4	bar
minimum cover over rebar =	3	inches

Total volume of concrete = 39.1 cu yd



LOADS SHOWN ARE ASSUMED TO BE CARRIED BY BEARING OF PAD ON SOIL.
REMAINDER OF LOAD ASSUMED TO BE CARRIED BY MICROPILES.

Summary of analysis results	
Maximum Net Soil Bearing = 2.88 ksf Allowable Net Soil Bearing = 15 ksf **Soil Bearing Stress Ratio = 0.19 Okay**	Ult Bending Shear Capacity = 126 psi Ult Bending Shear Stress = 70 psi **Bending Shear Stress Ratio = 0.55 Okay**
SEE LAST PAGE OF SA PACKAGE FOR OVERTURNING CHECK	Pad Bending Moment Capacity= 1800 ft-k Pad Bending Moment = 1330 ft-k **Bending Moment Stress Ratio =** SEE NEXT PAGE

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

Page: 1 of 1
By: KAT Date: 8/20/2013
Project: 826222
Client: Crown
PROJ#: 37513-1642 BP

Revision Date: 6/17/2013

Micropile/Rock Anchor Design for Mat or Pad Pier

TNX Reactions

M =	691	k-ft
A =	0	kips
S =	0	kips

Foundation Parameters

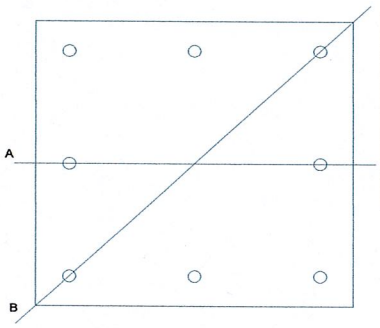
Pier Shape =	R	
Pier Width =	7	ft
Height Above Grade =	0.5	ft
Depth to Bottom =	6	ft
Pad Thickness =	2	ft
Pad Width =	21	ft
Pad Length =	21	ft

Soil Parameters

Unit Weight = 120 pcf

Micropile/Rock Anchor Parameters

Rock Anchor Lockoff =	0	kips
Steel Yield Cap. =	218.1	kips
Steel Ultimate Cap =	260.9	ksi
Total # =	4	



Pad Bending Check, Part 2

Remainder of pole base load assumed to be carried by Micropiles.

Wind Side (About A)

Bolt #	#	Area, in^2	Ybar, in
1	4	3.07	62.2254
2	0		

$I_{boltsA} = \Sigma NA\bar{y}^2 = 47548$ in^4

M = 8292 k-in

Soil and Foundation Compression = 87.87 kips

$f_{1A} = M*y_{bar1}/I_{boltsA} =$ 10.9 ksi $C_{1A} =$ 121.2 kips $T_{1A} =$ 0.0 kips

$f_{2A} = M*y_{bar2}/I_{boltsA} =$ 0 ksi $C_{2A} =$ 0.0 kips $T_{2A} =$ 0.0 kips

Capacity,k
156.54
156.54

Wind Into Corner (About B)

Bolt #	#	Area, in^2	Ybar, in
1	2	3.07	88.0625
2	0		
3	0		
4	0		

$I_{boltsB} = \Sigma NA\bar{y}^2 = 47616$ in^4

M = 8292 k-in

Soil and Foundation Compression = 87.87 kips

$f_{1B} = M*y_{bar1}/I_{boltsB} =$ 15.3 ksi $C_{1B} =$ 135.0 kips $T_{1B} =$ 0.0 kips

$f_{2B} = M*y_{bar2}/I_{boltsB} =$ 0.0 ksi $C_{2B} =$ 0.0 kips $T_{2B} =$ 0.0 kips

$f_{3B} = M*y_{bar3}/I_{boltsB} =$ 0.0 ksi $C_{3B} =$ 0.0 kips $T_{3B} =$ 0.0 kips

$f_{4B} = M*y_{bar4}/I_{boltsB} =$ 0.0 ksi $C_{3B} =$ 0.0 kips $T_{3B} =$ 0.0 kips

Capacity,k
156.54
156.54
156.54
156.54

Steel Check

Revision = F

Actual Load

Max Tension/Compression Load = 135.0 kips

Capacity

Capacity = 0.6*Steel Ultimate Capacity = 156.5 kips

Stress Ratio = 86.2%

Bending Check (Wind into side)

Distance from center to end of pier = 42.0 in.

Bending Moment = ∑[# of Bolts * (ybar- 42.0 in.)*Tension] = 408.5 k-ft

Additional Pad Bending Moment from Pad & Pier Spreadsheet = 1330.0 k-ft

Use 1861.1 k-ft to analyze bending in pad

Bottom Clear Dist. =	4	in.	b =	84.0 in.
f_c' =	4	ksi	As =	21.33 in^2
fy =	60	ksi	a =	4.48 in.
Number of Bars =	27		d =	19.5 in.
Bar # =	8			
Bar Area =	0.790	in.^{2}		
Bar Diameter =	1.000	in.		

$$a = \frac{A_s * f_y}{0.85 * f'_c * b}$$

$$\emptyset M_n = 0.9 * A_s * f_y * \left(d - \frac{a}{2}\right)$$

øMn = 1969.7 k-ft (Overrided from SPColumn)

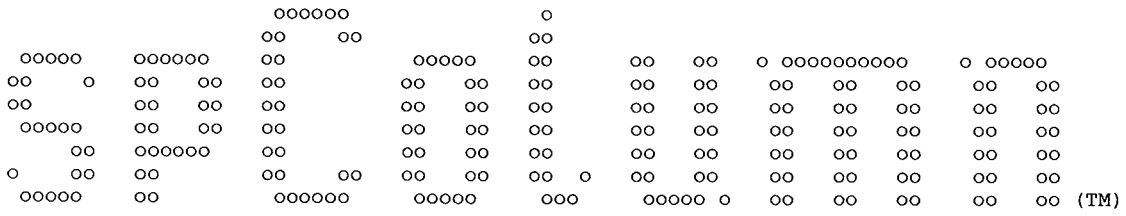
Capacity = 94.5%

Micropile Embedment Check

Hole Diameter =	10.5	in
Skin Friction =	30	psi
Actual Embed =	27	ft

Required Embedment = 22.7 ft

Ratio = 84.2%



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

General Information:
==========
File Name: G:\TOWER\375_Crown_Castle\2013\37513-1642 BU 826222\37513-1642 BP_Pier Steel Check.col
Project:
Column: Engineer:
Code: ACI 318-05 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:
==========
Circular: Diameter = 84 in

Gross section area, Ag = 5541.77 in^2
Ix = 2.44392e+006 in^4 Iy = 2.44392e+006 in^4
rx = 21 in ry = 21 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

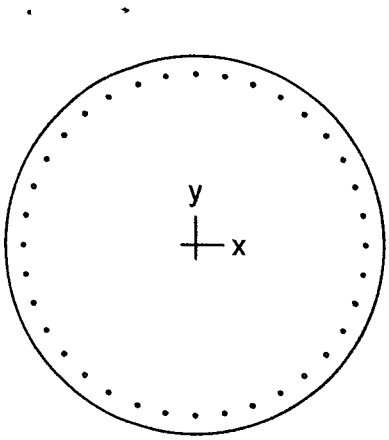
Layout: Circular
Pattern: All Sides Equal (Cover to transverse reinforcement)
Total steel area: As = 28.44 in^2 at rho = 0.51% (Note: rho < 1.0%)
Minimum clear spacing = 5.62 in

36 #8 Cover = 3 in

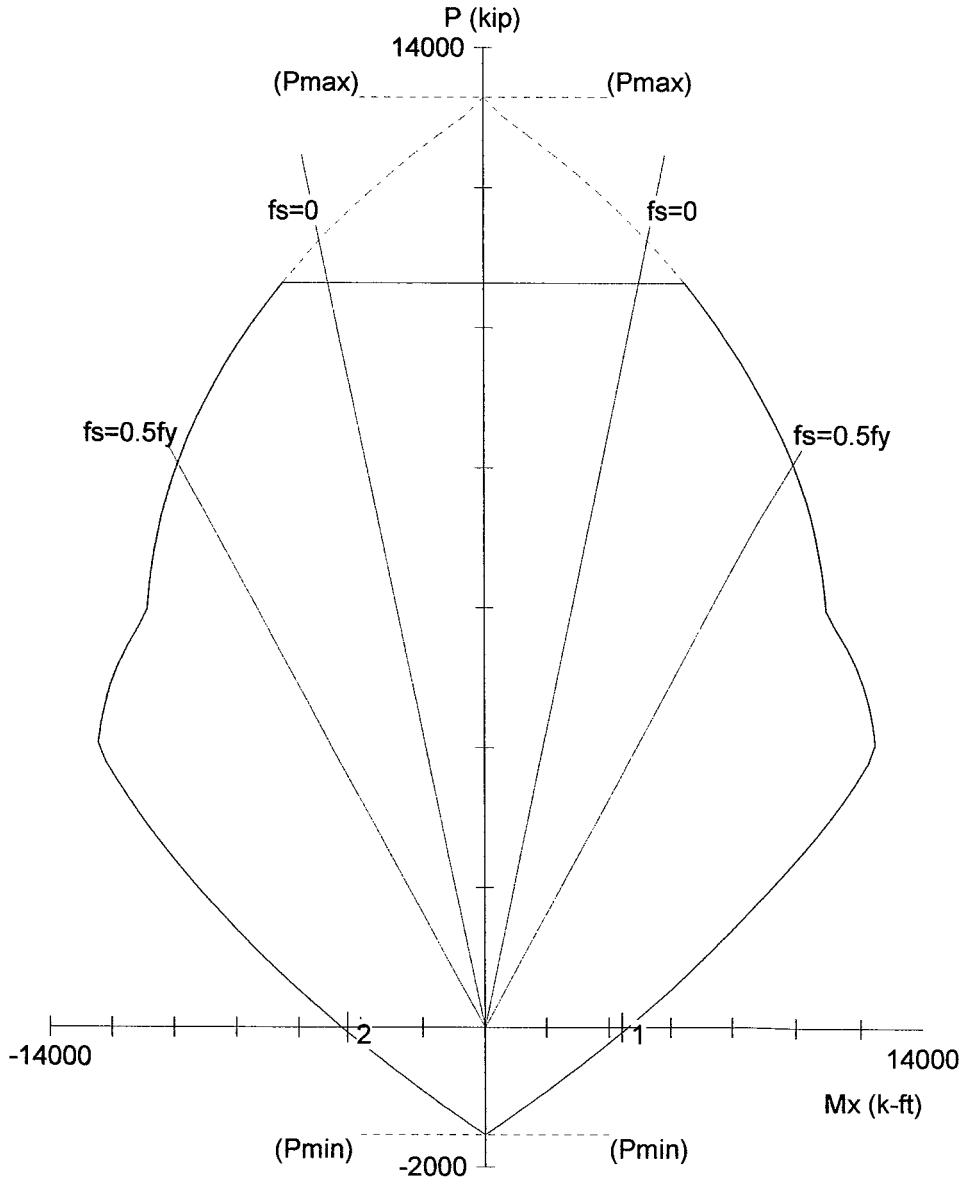
Factored Loads and Moments with Corresponding Capacities:
==========

No.	Pu kip	Mux k-ft	PhiMnx k-ft	PhiMn/Mu	NA depth in	Dt depth in	eps_t	Phi
1	0.00	4420.70	4611.67	1.043	10.79	80.00	0.01924	0.900
2	0.00	-4420.70	-4611.67	1.043	10.79	80.00	0.01924	0.900

*** End of output ***



84 in diam.



Code: ACI 318-05

Units: English

Run axis: About X-axis

Run option: Investigation

Slenderness: Not considered

Column type: Structural

Bars: ASTM A615

Date: 08/22/13

Time: 07:59:57

File: G:\TOWER\375_Crown_Castle\2013\37513-1642 BU 826222\37513-1642 BP_Pier Steel Check.col

Project:

Column:

Engineer:

f'c = 4 ksi	fy = 60 ksi	Ag = 5541.77 in^2	36 #8 bars
Ec = 3605 ksi	Es = 29000 ksi	As = 28.44 in^2	rho = 0.51%
fc = 3.4 ksi		Xo = 0.00 in	Ix = 2.44392e+006 in^4
e_u = 0.003 in/in		Yo = 0.00 in	Iy = 2.44392e+006 in^4
Beta1 = 0.85		Min clear spacing = 5.62 in	Clear cover = 3.50 in

Confinement: Tied

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

Check Overturning Capacity of Foundation System

PJF job no. **37513-1642**

Assumptions: 1) Micropile reinforcing has been installed
2) Wind into side of foundation is worst case scenario

Pole base moment =	**3261**	ft-k
Pole base shear =	**31**	kips
Pole axial load =	**38**	kips
Total foundation thickness / height =	**6.5**	feet
Distance from center of pole to edge of fdn =	**10.5**	feet
Foundation weight =	**158.3**	kips
Soil weight (abv fdn) =	**201.3**	kips
Quantity of piles =	**2**	
Pile yield strength =	**218.1**	kips
Pile distance to edge of fdn =	**15.75**	feet
Overturning resistance (pole/fdn/soil) =	**4174.8**	ft-k
Overturning resistance (piles) =	**6870.2**	ft-k
Total overturning resistance =	**11045.0**	ft-k
Overturning moment at base of foundation =	**3462.5**	ft-k
Required safety factor against overturning =	**1.5**	
% Capacity =	**47.0%**	**OK**

MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

BU NUMBER; SITE NAME

BU #826222; NEWTOWN/RT-25

APP: 180205 REV. 3; WO: 600035

SITE ADDRESS

201 MAIN STREET
NEWTOWN, CT 06470
FAIRFIELD COUNTY

PROJECT NOTES

1. DETAILED FIELD INFORMATION REGARDING INTERFERENCES AND/OR EXISTING FIELD CONDITIONS MAY BE AVAILABLE ON CROWN'S CCISITES AND FROM CONTRACTOR'S PRE-MOD MAPPING. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS AND COORDINATE WITH THE AVAILABLE SOURCES OF INFORMATION ABOVE AND WITH THE PROJECT PLANS BEFORE PROCEEDING WITH THE WORK. CONTRACTOR SHALL IMMEDIATELY REPORT ANY AND ALL DISCREPANCIES TO PAUL J. FORD AND COMPANY AND CROWN CASTLE FIELD PERSONNEL BEFORE PROCEEDING WITH THE WORK.
2. 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.
3. ALL STRUCTURAL BOLTS SHALL BE FIELD INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.

PROJECT CONTACTS:

MONOPOLE OWNER:
CROWN CASTLE
8 PARKMEADOW DRIVE, PITTSFORD, NY 14534
CONTACT: STEVE TUTTLE
PH: (585) 899-3445

STRUCTURAL ENGINEER OF RECORD (EOR):
PAUL J. FORD AND COMPANY
250 EAST BROAD STREET, SUITE 600
COLUMBUS, OHIO 43215-3708
CONTACT: KYLE THORPE AT KTHORPE@PJFWEB.COM
PHONE: 614-221-6679

DESIGN STANDARD

THIS REINFORCEMENT DESIGN IS BASED UPON THE REQUIREMENTS OF THE TIA/EIA-222-F-1996 STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS, USING A DESIGN BASIC WIND SPEED OF 85 MPH (FASTEST MILE) WITH NO ICE, 37.6 MPH WITH 3/4 INCH ICE AND 50 MPH SERVICE LOADS.

REFER TO THE POLE DESIGN AND ANTENNA LOADING DOCUMENTED IN THE PJF STRUCTURAL ANALYSIS FOR THIS SITE (PJF#37513-1642), DATED 8-20-2013.

THIS PROJECT INCLUDES THE FOLLOWING REINFORCING ELEMENTS:

FOUNDATION AUGMENTATION: MICROPILES

SHEET INDEX

SHEET NUMBER	DESCRIPTION
T-1	TITLE SHEET
S-1	GENERAL NOTES
S-2	GENERAL NOTES
S-3	MONOPOLE PROFILE
S-4	FOUNDATION REINFORCING DETAILS
S-5	MI CHECKLIST

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street · Suite 600 · Columbus, Ohio 43215
(614) 221-6679 www.pjfweb.com

CROWN CASTLE
8 PARKMEADOW DRIVE, PITTSFORD, NY 14534
PH: (585) 899-3445 FAX: (585) 899-3448

BU #826222; NEWTOWN/RT-25
NEWTOWN, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37513-1642
DRAWN BY: B.M.S.
CHECKED BY: K.A.T.
APPROVED BY:
DATE: 8-20-2013

ISSUE DATE OF PERMIT: 8-20-2013

CROWN CASTLE PROJECT: BU #826222; NEWTOWN/RT-25; NEWTOWN, CT
MONOPOLE RETROFIT PROJECT MASTER NOTES DOCUMENT (REV. 2, 1/22/2009)

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 INSURE 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 INSURE 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. (SECTION NOT USED)

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 - (NOT REQUIRED)
   C. CONCRETE TESTING PER ACI - (NOT REQUIRED)
   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 - (NOT REQUIRED)
   F. SPECIAL INSPECTION OF EXISTING SHAFT-TO-FLANGE WELD CONNECTIONS - (NOT REQUIRED)
   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.

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street - Suite 600 - Columbus, Ohio 43215
(614) 221-6679 www.pjfweb.com

CROWN CASTLE
8 PARKMEADOW DRIVE, PITTSFORD, NY 14534
PH: (585) 899-3445 FAX: (585) 899-3448

BU #826222; NEWTOWN/RT-25
NEWTOWN, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37513-1642	ISSUE DATE OF PERMIT: 8-20-2013
DRAWN BY: B.M.S.	
CHECKED BY: K.A.T.	
APPROVED BY:	S-1
DATE: 8-20-2013	

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 - (NOT REQUIRED)**

F. **FOUNDATION WORK**

1. THE CONTRACTOR SHALL PROTECT THE EXISTING MONOPOLE STRUCTURE, AS WELL AS ANY OTHER NEARBY EXISTING FOUNDATIONS FOR OTHER STRUCTURES OR EQUIPMENT, FROM LOSS OF SOIL AROUND AND/OR BENEATH FOOTINGS DURING ANY REQUIRED EXCAVATION. THE CONTRACTOR SHALL BRACE THE SIDES OF THE OPEN EXCAVATION AS REQUIRED.
2. THE EFFECT OF ADDITIONAL EXCAVATION (WHERE REQUIRED) FOR THE NEW MAT FOOTING (WHERE REQUIRED) OR OTHER FOUNDATION AUGMENTATION AND REINFORCING (WHERE REQUIRED) MAY HAVE IMPACT ON EXISTING EQUIPMENT AND/OR OTHER EXISTING STRUCTURES NEAR THE EXCAVATION. (ENGINEER-OF- RECORD) HAS NOT BEEN PROVIDED WITH ANY SPECIFIC INFORMATION OR DETAILS REGARDING EXISTING EQUIPMENT OR OTHER EXISTING STRUCTURES ON THE SITE. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE THE IMPACT OR EFFECT THAT ANY REQUIRED EXCAVATION WORK HAS ON ANY EXISTING NEARBY EQUIPMENT AND/OR STRUCTURES. CONTRACTOR SHALL COORDINATE THIS SITE-SPECIFIC INFORMATION WITH THE OWNER AND TESTING AGENCY PRIOR TO CONSTRUCTION AND FOUNDATION WORK. THE CONTRACTOR SHALL ADEQUATELY BRACE, SHORE, AND/OR RELOCATE (AFTER OBTAINING THE PRIOR WRITTEN PERMISSION OF THE OWNER), AS NECESSARY, THE INTERFERING EXISTING NEARBY EQUIPMENT AND/OR STRUCTURES.

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).
2. ALL REINFORCING STEEL SHALL BE NEW DOMESTIC DEFORMED BILLET STEEL CONFORMING TO ASTM A615 GRADE 60.
3. 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.
4. 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.
5. CONTRACTOR SHALL VERIFY LOCATIONS OF ALL OPENINGS, SLEEVES, ANCHOR RODS, INSERTS, ETC., AS REQUIRED BEFORE CONCRETE IS PLACED.
6. WHERE BAR LENGTHS ARE GIVEN ON THE DRAWINGS, THE LENGTH OF ANY HOOK, IF REQUIRED, IS NOT INCLUDED.
7. 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.
8. 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.
9. 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.
10. 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.
11. FOOTING BARS SHALL BE BENT 1'-6" AROUND CORNERS, OR PROVIDE CORNER BARS WITH A 2'-0" LAP ON EACH LEG.
12. TESTING LABORATORY SHALL SUBMIT ONE COPY OF ALL CONCRETE TEST REPORTS DIRECTLY TO THE ENGINEER.
13. 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 - (NOT REQUIRED)**

I. **TOUCH UP OF GALVANIZING - (NOT REQUIRED)**

J. **HOT DIP GALVANIZING - (NOT REQUIRED)**

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".

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street · Suite 600 · Columbus, Ohio 43215
(614) 221-6679 www.pjfweb.com

CROWN CASTLE
8 PARKMEADOW DRIVE, PITTSFORD, NY 14534
PH: (585) 899-3445 FAX: (585) 899-3448

BU #826222; NEWTOWN/RT-25
NEWTOWN, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

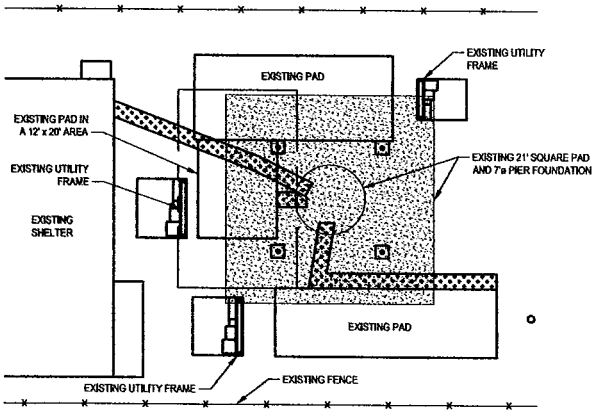
PROJECT No: 37513-1642	ISSUE DATE OF PERMIT: 8-20-2013
DRAWN BY: B.M.S.	
CHECKED BY: K.A.T.	
APPROVED BY:	S-2
DATE: 8-20-2013	

POLE SPECIFICATIONS	
POLE SHAPE TYPE:	18-SIDED POLYGON
TAPER:	0.244406 IN/FT
SHAFT STEEL:	ASTM A572 GRADE 65
BASE PL STEEL:	ASTM A572 GRADE 50
ANCHOR RODS:	1 1/4"ø ASTM A36

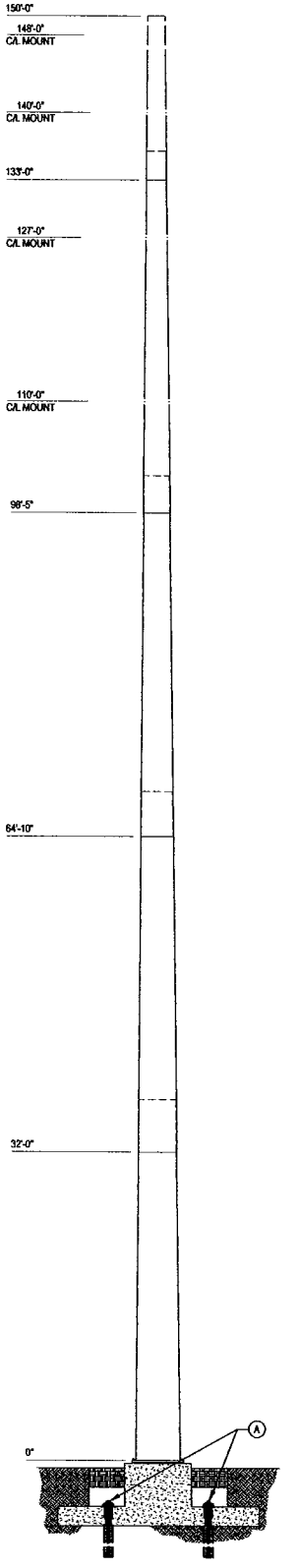
SHAFT SECTION DATA					
SHAFT SECTION	SECTION LENGTH (FT)	PLATE THICKNESS (IN)	LAP SPLICE (IN)	DIAMETER ACROSS FLATS (IN)	
				@ TOP	@ BOTTOM
1	17.00	0.2500	35.40	21.830	26.000
2	37.50	0.3125	46.20	24.776	34.063
3	37.50	0.3750	56.40	32.484	41.750
4	37.50	0.3750	66.00	39.839	49.063
5	37.50	0.3750		46.960	56.125
NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES					

MODIFICATIONS:

(A) INSTALL (4) NEW MICROPILES IN EXISTING FOUNDATION. SEE SHEET S-4 & S-5.



PARTIAL SITE MAP 2 / S-3



POLE ELEVATION 1 / S-3

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street · Suite 600 · Columbus, Ohio 43215
(614) 221-6679 www.pjfweb.com

CROWN CASTLE
8 PARKMEADOW DRIVE, PITTSFORD, NY 14534
PH: (585) 899-3445 FAX: (585) 899-3448

BU #826222; NEWTOWN/RT-25
NEWTOWN, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37513-1642	ISSUE DATE OF PERMIT: 8-20-2013
DRAWN BY: B.M.S.	
CHECKED BY: K.A.T.	
APPROVED BY:	S-3
DATE: 8-20-2013	

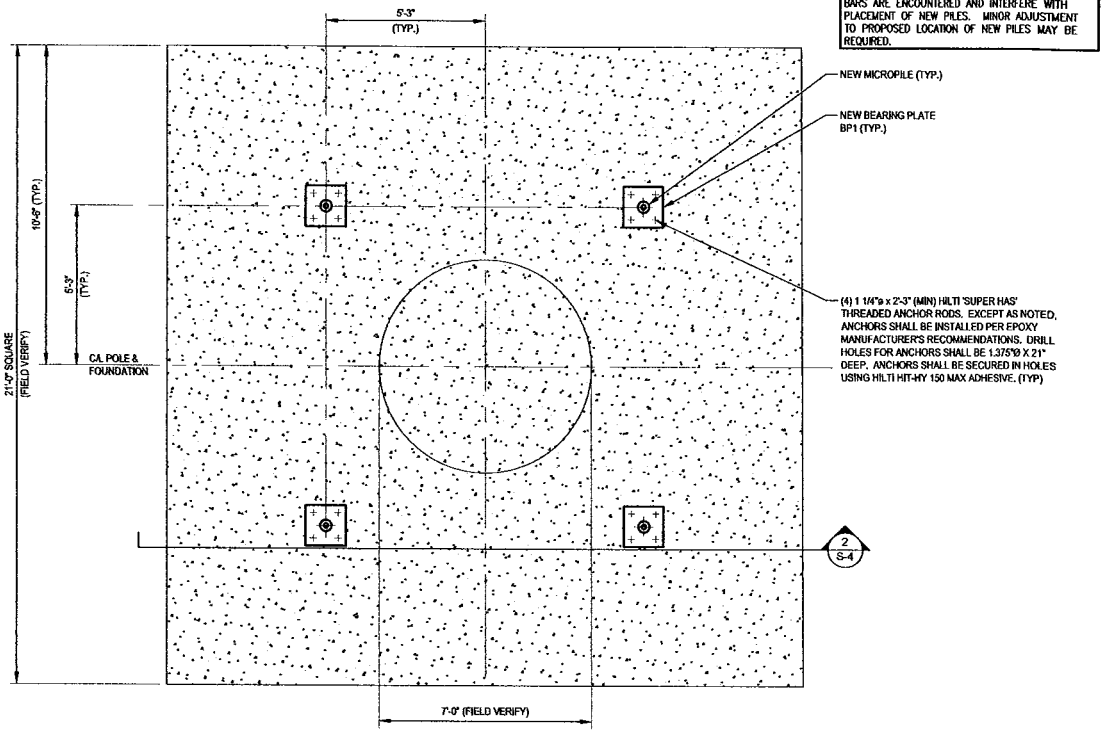
37513-1642 PERMIT.DWG

MICROPILE TESTING REQUIREMENTS

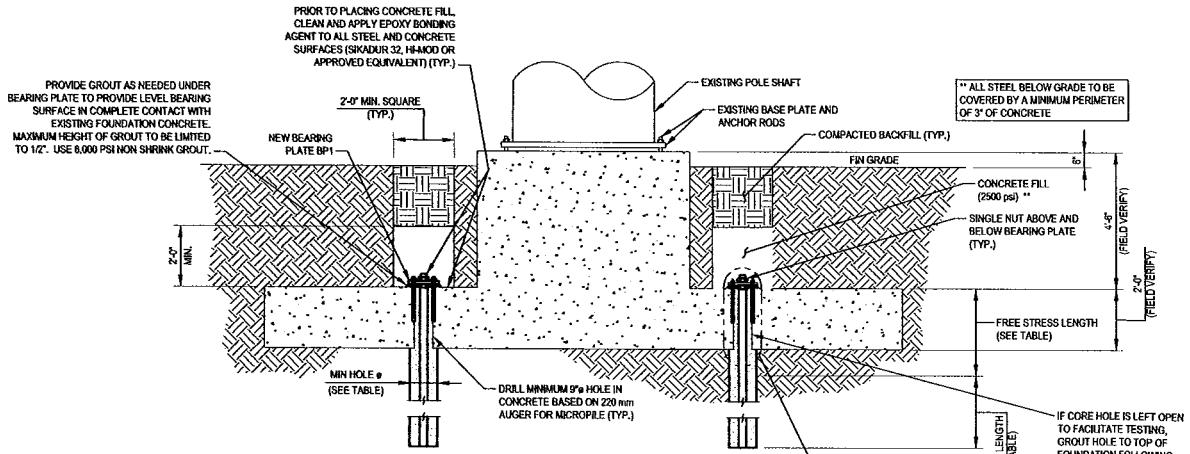
A MINIMUM OF 2 IN-PLACE MICROPILES (TEST PILES SHALL BE IN OPPOSITE CORNERS) ARE TO BE TESTED TO 208k IN TENSION. ALL PILE TESTING SHALL BE CARRIED OUT IN GENERAL CONFORMANCE WITH ASTM D3689. A HYDRAULIC JACK MAY BE SUBSTITUTED FOR THE PILE TESTING SET-UPS SHOWN IN THE ASTM SPECS. IF A HYDRAULIC JACK IS USED, FOLLOW EQUIPMENT GUIDELINES DISCUSSED IN THE POST TENSIONING INSTITUTE "RECOMMENDATIONS FOR PRESTRESSED ROCK AND SOIL ANCHORS" DESIGN GUIDE, SECTION 8.2. PILES SHALL BE LOADED USING PTI'S PROOF TEST METHODOLOGY (REFER TO SECTION 8.3.3 OF THE PTI DESIGN GUIDE; ALIGNMENT LOAD, AL, SHALL BE 16 KIPS; DESIGN LOAD, DL, IS 156 KIPS). PROVISION SHALL BE MADE TO ALLOW FOR MOVEMENT BETWEEN MICROPILE CROSS-SECTION AND SOIL SO THAT GROUT-TO-SOIL BOND LINE IS ADEQUATELY TESTED.

CONTECH'S 73/53 HOLLOW BAR MICROPILE OR EQUIVALENT SYSTEM.

TAKE ALL MEASURES NECESSARY TO AVOID DAMAGING EXISTING REINFORCING BARS DURING DRILLING OPERATIONS. NOTIFY PAUL J. FORD AND COMPANY IMMEDIATELY IF EXISTING REINFORCING BARS ARE ENCOUNTERED AND INTERFERE WITH PLACEMENT OF NEW PILES. MINOR ADJUSTMENT TO PROPOSED LOCATION OF NEW PILES MAY BE REQUIRED.



A FOUNDATION REINFORCING PLAN 1 S-4



A FOUNDATION REINFORCING 2 S-4

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street - Suite 600 - Columbus, Ohio 43215
(614) 221-6879 www.pjfweb.com

CROWN CASTLE
8 PARKMEADOW DRIVE, PITTSFORD, NY 14534
PH: (585) 899-3445 FAX: (585) 899-3448

BU #826222; NEWTOWN/RT-25
NEWTOWN, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37513-1642	ISSUE DATE OF PERMIT: 8-20-2013
DRAWN BY: B.M.S.	
CHECKED BY: K.A.T.	
APPROVED BY:	S-4
DATE: 8-20-2013	

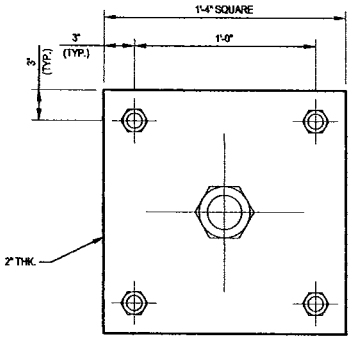
MICROPILE NOTES:

1. ALL HOLLOW BAR STEEL AND ASSOCIATED HARDWARE SHALL BE SUPPLIED BY CON-TECH SYSTEMS OR OWNER/EOR APPROVED EQUIVALENT.
2. ALL HOLLOW BAR, NUTS AND BEARING PLATES SHALL BE HOT-DIP GALVANIZED PER ASTM A123 OR A153, AS APPROPRIATE.
3. CONTACT CON-TECH SYSTEMS (OR MANUFACTURER OF APPROVED ALTERNATE) FOR MATERIALS AND INSTALLATION PROCEDURES AND RECOMMENDATIONS.
4. SPECIAL INSPECTION OF THE MICROPILES IS REQUIRED AS FOLLOWS: (1) VERIFY THAT MICROPILE MATERIAL, SIZE AND LENGTH COMPLY WITH THE INFORMATION SHOWN ON THIS DRAWING, (2) VERIFY PLACEMENT OF EACH MICROPILE, (3) OBSERVE DRILLING, GROUTING AND TESTING (AS APPROPRIATE) OPERATIONS FOR EACH MICROPILE AND MAINTAIN COMPLETE AND ACCURATE RECORDS FOR EACH MICROPILE.
5. FOUNDATION DESIGN IS BASED ON THE GEOTECHNICAL REPORT PREPARED BY FDH, PROJECT NO. 1305751600, DATED 8/15/13.
6. CONTACT CONTECH SYSTEMS (OR MANUFACTURER OF APPROVED ALTERNATE) TO VERIFY NUT & WASHER CONNECTION ARE COMPATIBLE WITH MICROPILE THREADS.
7. ALL MICROPILES SHALL BE GROUTED FOR FULL HEIGHT. GROUT TO BE 4,000 PSI MIN COMPRESSION STRENGTH WITH 0.5 (MAXIMUM WATER/CEMENT) W/C RATIO (TO BE COLLOIDALLY MIXED FOR MICROPILE).

PRELIMINARY PILE DESIGN PARAMETER SCHEDULE*

PARAMETER / OPTIONS	MIN. HOLE w/STEEL AREA	ALLOWABLE PILE CAPACITY (kips)	ULTIMATE SKIN FRICTION (PSI)	FREE STRESS LENGTH	FRICTION DEVELOPMENT LENGTH/BOND LENGTH	ROCK SOCKET/ PLUNGE LENGTH	TOTAL EMBEDMENT LENGTH
MICROPILE	10.5"ø / 2.53 IN^2 MIN.	156K	SEE GEOTECH REPORT	5'	27' MIN.	N.A.	33' MIN.

* THE FINAL DESIGN GROUT DIAMETER IS BASED ON A MINIMUM 220MM AUGER IN SILTY SAND. THE DESIGN REQUIRES UNCASED MICROPILES FOR THE LISTED CAPACITY IN TENSION AND COMPRESSION AS LAID OUT PER PLAN. THE CONTRACTOR/MICROPILE INSTALLER IS RESPONSIBLE FOR THE MEANS AND METHODS TO ENSURE THE NECESSARY CAPACITY AND WILL DEMONSTRATE THE INSTALLED CAPACITY PER THE SPECIFIED TESTING. THE EMBEDMENT DEPTH AND AUGER/GROUT DIAMETERS ARE LISTED AS A PRELIMINARY BASIS FOR BIDDING. THE INTENT IS FOR THE INSTALLER TO REVIEW THE CURRENT SOIL INFORMATION AND DESIGN REQUIREMENTS TO ENSURE THAT THE CONTRACTOR'S SPECIFIC EQUIPMENT OR INSTALLATION TECHNIQUE IS APPROPRIATE. IF THE CONTRACTOR BELIEVES THE SCOPE SHOULD CHANGE UPON REVIEW, PLEASE ADDRESS PRIOR TO BIDDING. AS REQUIRED, PLEASE COORDINATE WITH ENGINEER OF RECORD PRIOR TO INSTALLATION.



NEW BEARING PLATE MK~BP1

(Fy=50 KSI) (TYP. 4 LOCATIONS)

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street · Suite 600 · Columbus, Ohio 43215
(614) 221-6679 www.pjfweb.com

CROWN CASTLE
8 PARKMEADOW DRIVE, PITTSFORD, NY 14534
PH: (585) 899-3445 FAX: (585) 899-3448

BU #826222; NEWTOWN/RT-25
NEWTOWN, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37513-1642	ISSUE DATE OF PERMIT: 8-20-2013
DRAWN BY: B.M.S.	
CHECKED BY: K.A.T.	
APPROVED BY:	S-5
DATE: 8-20-2013	

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
NA	FABRICATOR CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT (MTR)
NA	FABRICATOR NDE INSPECTION
NA	NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED)
X	PACKING SLIPS
ADDITIONAL TESTING AND INSPECTIONS: PRIOR TO CONSTRUCTION, CONTRACTOR SHALL SUBMIT PILE INSTALLATION AND TESTING PLAN TO CROWN AND PJF FOR REVIEW. TESTING PLAN SHALL INCLUDE DETAILS REGARDING HOW CONTRACTOR INTENDS TO PREVENT INTERACTION BETWEEN THE TEST PILE AND THE EXISTING FOUNDATION DURING TESTING.	
CONSTRUCTION	
X	CONSTRUCTION INSPECTIONS
X	FOUNDATION INSPECTIONS
X	CONCRETE COMP. STRENGTH AND SLUMP TESTS
NA	POST INSTALLED ANCHOR ROD VERIFICATION
NA	BASE PLATE GROUT VERIFICATION
NA	CONTRACTOR'S CERTIFIED WELD INSPECTION
NA	EARTHWORK: LIFT AND DENSITY
NA	ON SITE COLD GALVANIZING VERIFICATION
NA	GUY WIRE TENSION REPORT
X	GC AS-BUILT DOCUMENTS
NA	THIRD PARTY ONSITE INSPECTION OF BOLT PRETENSION PER CROWN REQUIREMENTS
NA	INSPECTION OF AJAX BOLTS AND DTI'S PER REQUIREMENTS ON SHEET S-3
ADDITIONAL TESTING AND INSPECTIONS: VERIFY MICROPILE INSTALLATION DETAILS, SPECIFICALLY MICROPILE SIZES, DRILL HOLE DIAMETERS & DEPTHS, GROUT f'c AND THAT INSTALLATION WAS PER MANUFACTURER RECOMMENDATION	
POST-CONSTRUCTION	
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
NA	THIRD PARTY ONSITE BOLT INSPECTION REPORT
NA	POST INSTALLED ANCHOR ROD PULL-OUT TESTING
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS: PROVIDE REPORT DOCUMENTING RESULTS OF MICROPILE INSTALLATION AND PROOF TESTING	

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

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street · Suite 600 · Columbus, Ohio 43215
(614) 221-6679 www.pjfweb.com

CROWN CASTLE
8 PARKMEADOW DRIVE, PITTSFORD, NY 14534
PH: (585) 899-3445 FAX: (585) 899-3448

BU #826222; NEWTOWN/RT-25
NEWTOWN, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37513-1642	ISSUE DATE OF PERMIT: 8-20-2013
DRAWN BY: B.M.S.	
CHECKED BY: K.A.T.	
APPROVED BY:	S-6
DATE: 8-20-2013	

37513-1642 PERMIT.DWG

MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

BU NUMBER; SITE NAME

BU #826222; NEWTOWN/RT-25

APP: 180205 REV. 3; WO: 600035

SITE ADDRESS

201 MAIN STREET
NEWTOWN, CT 06470
FAIRFIELD COUNTY

PROJECT NOTES

1. DETAILED FIELD INFORMATION REGARDING INTERFERENCES AND/OR EXISTING FIELD CONDITIONS MAY BE AVAILABLE ON CROWN'S CCISITES AND FROM CONTRACTOR'S PRE-MOD MAPPING. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS AND COORDINATE WITH THE AVAILABLE SOURCES OF INFORMATION ABOVE AND WITH THE PROJECT PLANS BEFORE PROCEEDING WITH THE WORK. CONTRACTOR SHALL IMMEDIATELY REPORT ANY AND ALL DISCREPANCIES TO PAUL J. FORD AND COMPANY AND CROWN CASTLE FIELD PERSONNEL BEFORE PROCEEDING WITH THE WORK.
2. 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.
3. ALL STRUCTURAL BOLTS SHALL BE FIELD INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.

PROJECT CONTACTS:

MONOPOLE OWNER:
CROWN CASTLE
8 PARKMEADOW DRIVE, PITTSFORD, NY 14534
CONTACT: STEVE TUTTLE
PH: (585) 899-3445

STRUCTURAL ENGINEER OF RECORD (EOR):
PAUL J. FORD AND COMPANY
250 EAST BROAD STREET, SUITE 600
COLUMBUS, OHIO 43215-3708
CONTACT: KYLE THORPE AT KTHORPE@PJFWEB.COM
PHONE: 614-221-6679

DESIGN STANDARD

THIS REINFORCEMENT DESIGN IS BASED UPON THE REQUIREMENTS OF THE TIA/EIA-222-F-1996 STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS, USING A DESIGN BASIC WIND SPEED OF 85 MPH (FASTEST MILE) WITH NO ICE, 37.6 MPH WITH 3/4 INCH ICE AND 50 MPH SERVICE LOADS.

REFER TO THE POLE DESIGN AND ANTENNA LOADING DOCUMENTED IN THE PJF STRUCTURAL ANALYSIS FOR THIS SITE (PJF#37513-1642), DATED 8-20-2013.

THIS PROJECT INCLUDES THE FOLLOWING REINFORCING ELEMENTS:

FOUNDATION AUGMENTATION: MICROPILES

SHEET INDEX

STATE OF CONNECTICUT
JOSEPH PACHICARAH JACOBS
No. PEN 22731
LICENSED PROFESSIONAL ENGINEER

AUG 2 1 2013

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street - Suite 600 - Columbus, Ohio 43215
(614) 221-6679 www.pjfweb.com

CROWN CASTLE
8 PARKMEADOW DRIVE, PITTSFORD, NY 14534
PH: (585) 899-3445 FAX: (585) 899-3448

BU #826222; NEWTOWN/RT-25
NEWTOWN, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No:	37513-1642
DRAWN BY:	B.M.S.
CHECKED BY:	K.A.T.
APPROVED BY:	KH
DATE:	8-20-2013

ISSUE DATE OF PERMIT: 8-20-2013

T-1

CROWN CASTLE PROJECT: BU #826222; NEWTOWN/RT-25; NEWTOWN, CT
MONOPOLE RETROFIT PROJECT MASTER NOTES DOCUMENT (REV. 2, 1/22/2009)

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 INSURE 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 INSURE 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. (SECTION NOT USED)

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 - (NOT REQUIRED)
   C. CONCRETE TESTING PER ACI - (NOT REQUIRED)
   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 - (NOT REQUIRED)
   F. SPECIAL INSPECTION OF EXISTING SHAFT-TO-FLANGE WELD CONNECTIONS - (NOT REQUIRED)
   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
JOSEPH PACHICARAH JACOBS
No. PEN 22731
LICENSED PROFESSIONAL ENGINEER

AUG 2 1 2013

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street - Suite 600 - Columbus, Ohio 43215
(614) 221-6679 www.pjfweb.com

CROWN CASTLE
8 PARKMEADOW DRIVE, PITTSFORD, NY 14534
PH: (585) 899-3445 FAX: (585) 899-3448

BU #826222; NEWTOWN/RT-25
NEWTOWN, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37513-1642	ISSUE DATE OF PERMIT: 8-20-2013
DRAWN BY: B.M.S.	
CHECKED BY: K.A.T.	
APPROVED BY: KAT	S-1
DATE: 8-20-2013	

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 - (NOT REQUIRED)

F. FOUNDATION WORK

1. THE CONTRACTOR SHALL PROTECT THE EXISTING MONOPOLE STRUCTURE, AS WELL AS ANY OTHER NEARBY EXISTING FOUNDATIONS FOR OTHER STRUCTURES OR EQUIPMENT, FROM LOSS OF SOIL AROUND AND/OR BENEATH FOOTINGS DURING ANY REQUIRED EXCAVATION. THE CONTRACTOR SHALL BRACE THE SIDES OF THE OPEN EXCAVATION AS REQUIRED.
2. THE EFFECT OF ADDITIONAL EXCAVATION (WHERE REQUIRED) FOR THE NEW MAT FOOTING (WHERE REQUIRED) OR OTHER FOUNDATION AUGMENTATION AND REINFORCING (WHERE REQUIRED) MAY HAVE IMPACT ON EXISTING EQUIPMENT AND/OR OTHER EXISTING STRUCTURES NEAR THE EXCAVATION. (ENGINEER-OF- RECORD) HAS NOT BEEN PROVIDED WITH ANY SPECIFIC INFORMATION OR DETAILS REGARDING EXISTING EQUIPMENT OR OTHER EXISTING STRUCTURES ON THE SITE. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE THE IMPACT OR EFFECT THAT ANY REQUIRED EXCAVATION WORK HAS ON ANY EXISTING NEARBY EQUIPMENT AND/OR STRUCTURES. CONTRACTOR SHALL COORDINATE THIS SITE-SPECIFIC INFORMATION WITH THE OWNER AND TESTING AGENCY PRIOR TO CONSTRUCTION AND FOUNDATION WORK. THE CONTRACTOR SHALL ADEQUATELY BRACE, SHORE, AND/OR RELOCATE (AFTER OBTAINING THE PRIOR WRITTEN PERMISSION OF THE OWNER), AS NECESSARY, THE INTERFERING EXISTING NEARBY EQUIPMENT AND/OR STRUCTURES.

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).
2. ALL REINFORCING STEEL SHALL BE NEW DOMESTIC DEFORMED BILLET STEEL CONFORMING TO ASTM A615 GRADE 60.
3. 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.
4. 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.
5. CONTRACTOR SHALL VERIFY LOCATIONS OF ALL OPENINGS, SLEEVES, ANCHOR RODS, INSERTS, ETC., AS REQUIRED BEFORE CONCRETE IS PLACED.
6. WHERE BAR LENGTHS ARE GIVEN ON THE DRAWINGS, THE LENGTH OF ANY HOOK, IF REQUIRED, IS NOT INCLUDED.
7. 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.
8. 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.
9. 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.
10. 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.
11. FOOTING BARS SHALL BE BENT 1'-6" AROUND CORNERS, OR PROVIDE CORNER BARS WITH A 2'-0" LAP ON EACH LEG.
12. TESTING LABORATORY SHALL SUBMIT ONE COPY OF ALL CONCRETE TEST REPORTS DIRECTLY TO THE ENGINEER.
13. 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 - (NOT REQUIRED)

I. TOUCH UP OF GALVANIZING - (NOT REQUIRED)

J. HOT DIP GALVANIZING - (NOT REQUIRED)

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".

STATE OF CONNECTICUT
JOSEPH PACHICARAH JACOBS
No. PEN 22731
LICENSED PROFESSIONAL ENGINEER

AUG 2 1 2013

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street - Suite 600 - Columbus, Ohio 43215
(614) 221-6679 www.pjfweb.com

CROWN CASTLE
8 PARKMEADOW DRIVE, PITTSFORD, NY 14534
PH: (585) 899-3445 FAX: (585) 899-3448

BU #826222; NEWTOWN/RT-25
NEWTOWN, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No:	37513-1642
DRAWN BY:	B.M.S.
CHECKED BY:	K.A.T.
APPROVED BY:	KH
DATE:	8-20-2013

ISSUE DATE OF PERMIT: 8-20-2013

S-2

37513-1642 PERMIT.DWG

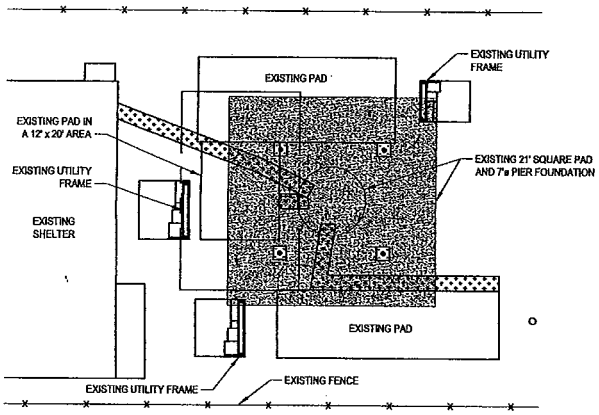
POLE SPECIFICATIONS	
POLE SHAPE TYPE:	18-SIDED POLYGON
TAPER:	0.244406 IN/FT
SHAFT STEEL:	ASTM A572 GRADE 65
BASE PL STEEL:	ASTM A572 GRADE 50
ANCHOR RODS:	1 1/4"ø ASTM A36

SHAFT SECTION DATA					
SHAFT SECTION	SECTION LENGTH (FT)	PLATE THICKNESS (IN)	LAP SPLICE (IN)	DIAMETER ACROSS FLATS (IN)	
				@ TOP	@ BOTTOM
1	17.00	0.2500	35.40	21.830	26.000
2	37.50	0.3125	46.20	24.776	34.063
3	37.50	0.3750	56.40	32.484	41.750
4	37.50	0.3750	66.00	39.839	49.063
5	37.50	0.3750		46.960	56.125

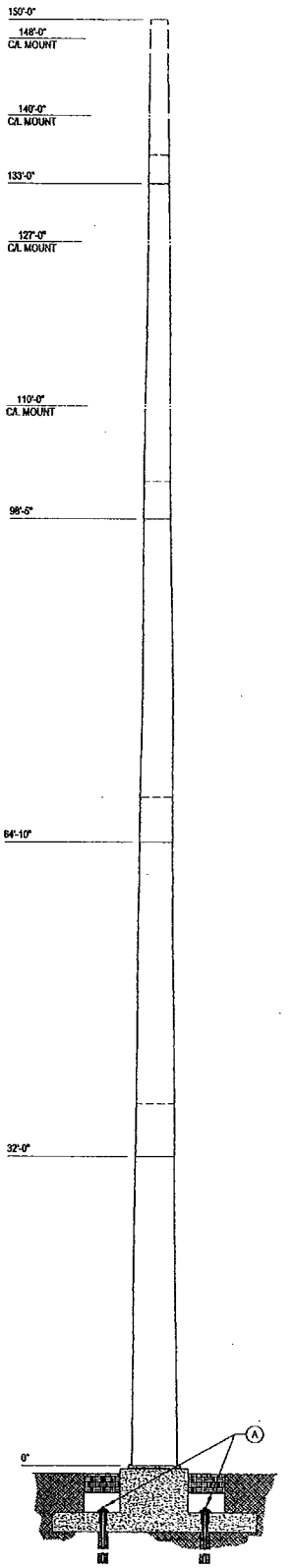
NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

MODIFICATIONS:

(A) INSTALL (4) NEW MICROPILES IN EXISTING FOUNDATION. SEE SHEET S-4 & S-5.



PARTIAL SITE MAP (2 / S-3)



POLE ELEVATION (1 / S-3)

STATE OF CONNECTICUT
JOSEPH PACHICARA JACOBS
No. PEN 22731
LICENSED PROFESSIONAL ENGINEER

AUG 2 1 2013

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street - Suite 600 - Columbus, Ohio 43215
(614) 221-6679 www.pjfweb.com

CROWN CASTLE
6 PARKMEADOW DRIVE, PITTSFORD, NY 14534
PH: (585) 899-3445 FAX: (585) 899-3448

BU #826222; NEWTOWN/RT-25
NEWTOWN, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37513-1642	ISSUE DATE OF PERMIT: 8-20-2013
DRAWN BY: B.M.S.	
CHECKED BY: K.A.T.	
APPROVED BY:	S-3
DATE: 8-20-2013	

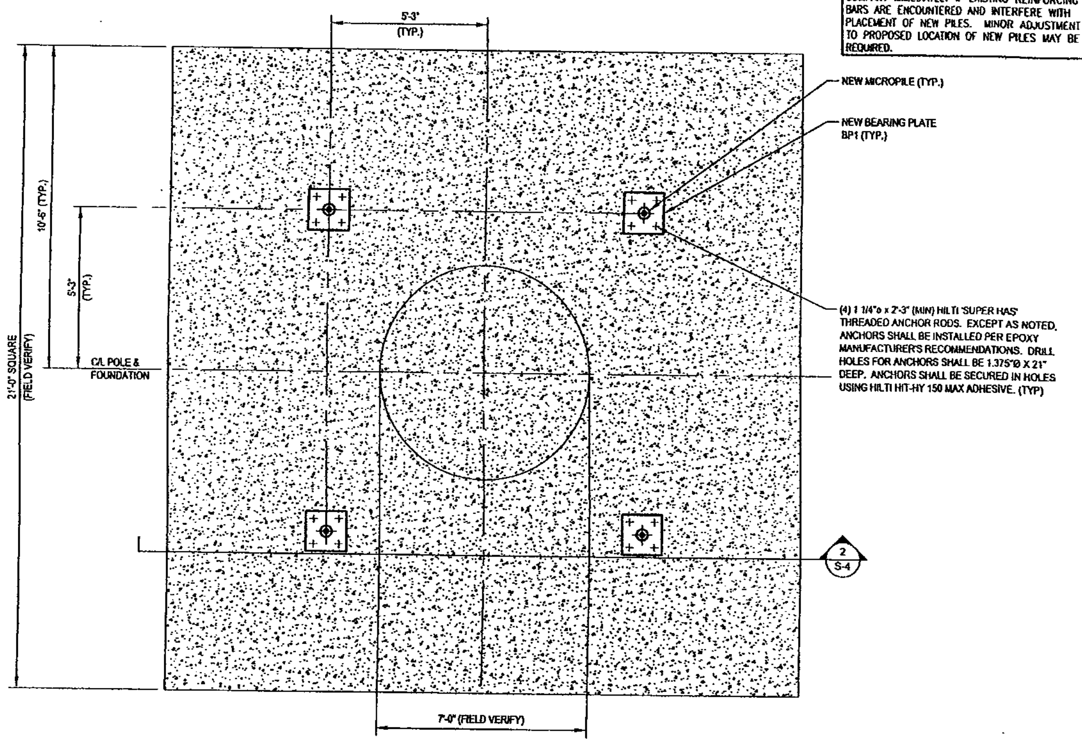
37513-1642 PERMIT.DWG

MICROPILE TESTING REQUIREMENTS

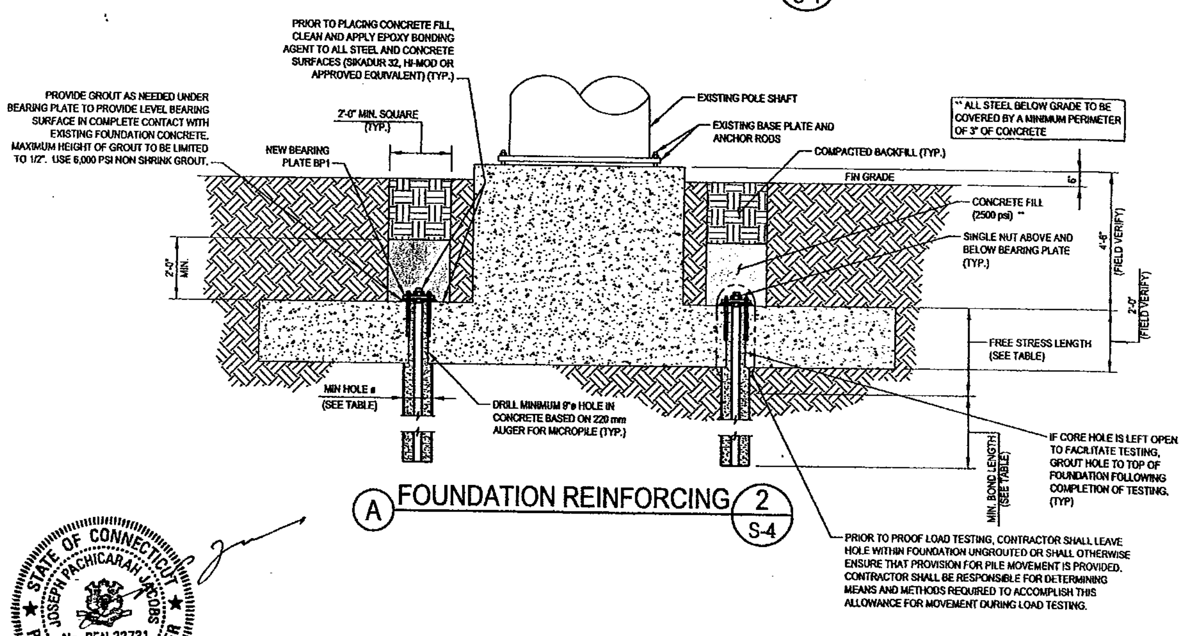
A MINIMUM OF 2 IN-PLACE MICROPILES (TEST PILES SHALL BE IN OPPOSITE CORNERS) ARE TO BE TESTED TO 208k IN TENSION. ALL PILE TESTING SHALL BE CARRIED OUT IN GENERAL CONFORMANCE WITH ASTM D3689. A HYDRAULIC JACK MAY BE SUBSTITUTED FOR THE PILE TESTING SET-UPS SHOWN IN THE ASTM SPECS. IF A HYDRAULIC JACK IS USED, FOLLOW EQUIPMENT GUIDELINES DISCUSSED IN THE POST TENSIONING INSTITUTE "RECOMMENDATIONS FOR PRESTRESSED ROCK AND SOIL ANCHORS" DESIGN GUIDE, SECTION 8.2. PILES SHALL BE LOADED USING PTI'S PROOF TEST METHODOLOGY (REFER TO SECTION 8.3.3 OF THE PTI DESIGN GUIDE; ALIGNMENT LOAD, AL, SHALL BE 16 KIPS; DESIGN LOAD, DL, IS 156 KIPS). PROVISION SHALL BE MADE TO ALLOW FOR MOVEMENT BETWEEN MICROPILE CROSS-SECTION AND SOIL SO THAT GROUT-TO-SOIL BOND LINE IS ADEQUATELY TESTED.

CONTECH'S 73/53 HOLLOW BAR MICROPILE OR EQUIVALENT SYSTEM.

TAKE ALL MEASURES NECESSARY TO AVOID DAMAGING EXISTING REINFORCING BARS DURING DRILLING OPERATIONS. NOTIFY PAUL J. FORD AND COMPANY IMMEDIATELY IF EXISTING REINFORCING BARS ARE ENCOUNTERED AND INTERFERE WITH PLACEMENT OF NEW PILES. MINOR ADJUSTMENT TO PROPOSED LOCATION OF NEW PILES MAY BE REQUIRED.



A FOUNDATION REINFORCING PLAN 1/S-4



A FOUNDATION REINFORCING 2/S-4

STATE OF CONNECTICUT
JOSEPH PACHICARAH JACOBS
No. PEN 22731
LICENSED PROFESSIONAL ENGINEER

AUG 2 1 2013

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street · Suite 600 · Columbus, Ohio 43215
(614) 221-6679
www.pjfweb.com

CROWN CASTLE
8 PARKMEADOW DRIVE, PITTSFORD, NY 14534
PH: (585) 899-3445 FAX: (585) 899-3448

BU #826222; NEWTOWN/RT-25
NEWTOWN, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37513-1642	ISSUE DATE OF PERMIT: 8-20-2013
DRAWN BY: B.M.S.	
CHECKED BY: K.A.T.	
APPROVED BY: KH	S-4
DATE: 8-20-2013	

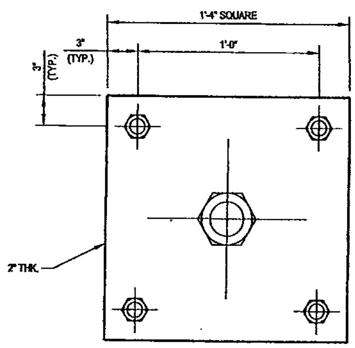
MICROPILE NOTES:

1. ALL HOLLOW BAR STEEL AND ASSOCIATED HARDWARE SHALL BE SUPPLIED BY CON-TECH SYSTEMS OR OWNER/EOR APPROVED EQUIVALENT.
2. ALL HOLLOW BAR, NUTS AND BEARING PLATES SHALL BE HOT-DIP GALVANIZED PER ASTM A123 OR A153, AS APPROPRIATE.
3. CONTACT CON-TECH SYSTEMS (OR MANUFACTURER OF APPROVED ALTERNATE) FOR MATERIALS AND INSTALLATION PROCEDURES AND RECOMMENDATIONS.
4. SPECIAL INSPECTION OF THE MICROPILES IS REQUIRED AS FOLLOWS: (1) VERIFY THAT MICROPILE MATERIAL, SIZE AND LENGTH COMPLY WITH THE INFORMATION SHOWN ON THIS DRAWING, (2) VERIFY PLACEMENT OF EACH MICROPILE, (3) OBSERVE DRILLING, GROUTING AND TESTING (AS APPROPRIATE) OPERATIONS FOR EACH MICROPILE AND MAINTAIN COMPLETE AND ACCURATE RECORDS FOR EACH MICROPILE.
5. FOUNDATION DESIGN IS BASED ON THE GEOTECHNICAL REPORT PREPARED BY FDH, PROJECT NO. 1305751600, DATED 8/15/13.
6. CONTACT CONTECH SYSTEMS (OR MANUFACTURER OF APPROVED ALTERNATE) TO VERIFY NUT & WASHER CONNECTION ARE COMPATIBLE WITH MICROPILE THREADS.
7. ALL MICROPILE SHALL BE GROUTED FOR FULL HEIGHT. GROUT TO BE 4,000 PSI MIN COMPRESSION STRENGTH WITH 0.5 (MAXIMUM WATER/CEMENT) W/C RATIO (TO BE COLLOIDALLY MIXED FOR MICROPILE).

PRELIMINARY PILE DESIGN PARAMETER SCHEDULE*

PARAMETER / OPTIONS	MIN. HOLE ø/STEEL AREA	ALLOWABLE PILE CAPACITY (kips)	ULTIMATE SKIN FRICTION (PSI)	FREE STRESS LENGTH	FRICTION DEVELOPMENT LENGTH/BOND LENGTH	ROCK SOCKET/ PLUNGE LENGTH	TOTAL EMBEDMENT LENGTH
MICROPILE	10.5"ø / $2.53\ IN^2$ MIN.	156K	SEE GEOTECH REPORT	5'	27' MIN.	N.A.	33' MIN.

* THE FINAL DESIGN GROUT DIAMETER IS BASED ON A MINIMUM 220MM AUGER IN SILTY SAND. THE DESIGN REQUIRES UNCASED MICROPILES FOR THE LISTED CAPACITY IN TENSION AND COMPRESSION AS LAID OUT PER PLAN. THE CONTRACTOR/MICROPILE INSTALLER IS RESPONSIBLE FOR THE MEANS AND METHODS TO ENSURE THE NECESSARY CAPACITY AND WILL DEMONSTRATE THE INSTALLED CAPACITY PER THE SPECIFIED TESTING. THE EMBEDMENT DEPTH AND AUGER/GROUT DIAMETERS ARE LISTED AS A PRELIMINARY BASIS FOR BIDDING. THE INTENT IS FOR THE INSTALLER TO REVIEW THE CURRENT SOIL INFORMATION AND DESIGN REQUIREMENTS TO ENSURE THAT THE CONTRACTOR'S SPECIFIC EQUIPMENT OR INSTALLATION TECHNIQUE IS APPROPRIATE. IF THE CONTRACTOR BELIEVES THE SCOPE SHOULD CHANGE UPON REVIEW, PLEASE ADDRESS PRIOR TO BIDDING. AS REQUIRED, PLEASE COORDINATE WITH ENGINEER OF RECORD PRIOR TO INSTALLATION.



NEW BEARING PLATE MK~BP1
(Fy=60 KSI) (TYP. 4 LOCATIONS)

STATE OF CONNECTICUT
JOSEPH PACHICARAH JACOBS
No. PEN 22731
LICENSED PROFESSIONAL ENGINEER

AUG 2 1 2013

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street · Suite 600 · Columbus, Ohio 43215
(614) 221-6679 www.pjfweb.com

CROWN CASTLE
8 PARKMEADOW DRIVE, PITTSFORD, NY 14534
PH: (585) 899-3445 FAX: (585) 899-3448

BU #826222; NEWTOWN/RT-25
NEWTOWN, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37513-1642	ISSUE DATE OF PERMIT: 8-20-2013
DRAWN BY: B.M.S.	
CHECKED BY: K.A.T.	
APPROVED BY: KH	S-5
DATE: 8-20-2013	

37513-1642 PERMIT.DWG

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 MPS
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:

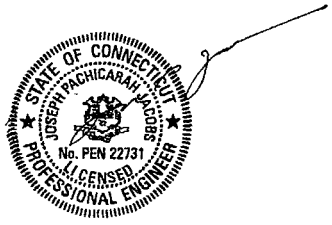
- PRE-CONSTRUCTION GENERAL SITE CONDITION
- PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION
  - RAW MATERIALS
  - PHOTOS OF ALL CRITICAL DETAILS
  - FOUNDATION MODIFICATIONS
  - WELD PREPARATION
  - BOLT INSTALLATION AND TORQUE
  - FINAL INSTALLED CONDITION
  - 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
NA	FABRICATOR CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT (MTR)
NA	FABRICATOR NDE INSPECTION
NA	NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED)
X	PACKING SLIPS
ADDITIONAL TESTING AND INSPECTIONS: PRIOR TO CONSTRUCTION, CONTRACTOR SHALL SUBMIT PILE INSTALLATION AND TESTING PLAN TO CROWN AND PJF FOR REVIEW. TESTING PLAN SHALL INCLUDE DETAILS REGARDING HOW CONTRACTOR INTENDS TO PREVENT INTERACTION BETWEEN THE TEST PILE AND THE EXISTING FOUNDATION DURING TESTING.	
CONSTRUCTION	
X	CONSTRUCTION INSPECTIONS
X	FOUNDATION INSPECTIONS
X	CONCRETE COMP. STRENGTH AND SLUMP TESTS
NA	POST INSTALLED ANCHOR ROD VERIFICATION
NA	BASE PLATE GROUT VERIFICATION
NA	CONTRACTOR'S CERTIFIED WELD INSPECTION
NA	EARTHWORK LIFT AND DENSITY
NA	ON SITE COLD GALVANIZING VERIFICATION
NA	GUY WIRE TENSION REPORT
X	GC AS-BUILT DOCUMENTS
NA	THIRD PARTY ONSITE INSPECTION OF BOLT PRETENSION PER CROWN REQUIREMENTS
NA	INSPECTION OF AJAX BOLTS AND DTIS PER REQUIREMENTS ON SHEET S-3
ADDITIONAL TESTING AND INSPECTIONS: VERIFY MICROPILE INSTALLATION DETAILS, SPECIFICALLY MICROPILE SIZES, DRILL HOLE DIAMETERS & DEPTHS, GROUT f'c AND THAT INSTALLATION WAS PER MANUFACTURER RECOMMENDATION	
POST-CONSTRUCTION	
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
NA	THIRD PARTY ONSITE BOLT INSPECTION REPORT
NA	POST INSTALLED ANCHOR ROD PULL-OUT TESTING
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS: PROVIDE REPORT DOCUMENTING RESULTS OF MICROPILE INSTALLATION AND PROOF TESTING	

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



AUG 2 1 2013

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street - Suite 600 - Columbus, Ohio 43215
(614) 221-6679 www.pjfweb.com

CROWN CASTLE
8 PARKMEADOW DRIVE, PITTSFORD, NY 14534
PH: (585) 899-3445 FAX: (585) 899-3448

BU #826222; NEWTOWN/RT-25
NEWTOWN, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37513-1642	ISSUE DATE OF PERMIT: 8-20-2013
DRAWN BY: B.M.S.	
CHECKED BY: K.A.T.	
APPROVED BY:	S-6
DATE: 8-20-2013	

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: CT54XC716

Botsford Newtown
201 South Main Street
Newtown, CT 06470

September 09, 2012

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

EBI Consulting
environmental | engineering | due diligence

September 9, 2012

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

Re: Emissions Values for Site **CT54XC716 - Botsford Newtown**

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at 201 South Main Street, Newtown, CT, for the purpose of determining whether the emissions from the proposed Sprint equipment upgrades on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of μW/cm2 calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limit for the cellular band is approximately 567 $\mu W/cm^2$, and the general population exposure limit for the PCS band is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed upgrades to the existing Sprint Wireless antenna facility located at 201 South Main Street, Newtown, CT, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. All calculations were performed assuming the main lobe of the antenna was focused at the base of the tower to present a worst case scenario. Actual values seen from this site will be dramatically less than those shown in this report. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

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

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

6) The antenna mounting height centerline of the proposed antennas is **137.4 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

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 **12.960% (4.320% 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 **53.920%** 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

Site ID	CT54XC716 - Botsford Newtown
Site Addresss	201 South Main Street, Newtown, CT 06470
Site Type	Monopole

Sector 1

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
1a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	2	40	15.9	137.4	131.4	1/2 "	0.5	0	1386.9474	28.87854	2.88785%
1a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	137.4	131.4	1/2 "	0.5	0	389.96892	8.119798	1.43206%
														Sector total Power Density Value:			4.320%

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	137.4	131.4	1/2 "	0.5	0	1386.9474	28.87854	2.88785%
2a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	137.4	131.4	1/2 "	0.5	0	389.96892	8.119798	1.43206%
														Sector total Power Density Value:			4.320%

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	137.4	131.4	1/2 "	0.5	0	1386.9474	28.87854	2.88785%
3a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	137.4	131.4	1/2 "	0.5	0	389.96892	8.119798	1.43206%
														Sector total Power Density Value:			4.320%

Site Composite MPE %	
Carrier	MPE %
Sprint	12.960%
AT&T	14.640%
T-Mobile	5.130%
Verizon Wireless	21.190%
Total Site MPE %	**53.920%**