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

out 11/9

November 8, 2013

Kenneth C. Baldwin, Esq.
Robinson & Cole LLP
280 Trumbull Street
Hartford, CT 06103-3597

RE: **EM-VER-007-131021** – Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 240 Kensington Road, Berlin, Connecticut.

Dear Attorney Baldwin:

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 drawings included in Appendix D of the Structural Modification Report prepared by B+T GRP dated May 6, 2013, and stamped by Chad Tuttle, shall be implemented;
- Within 45 days following completion of the antenna installation, Verizon 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 October 17, 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/jb

c: The Honorable Adam P. Salina, Mayor, Town of Berlin
Denise McNair, Town Manager, Town of Berlin
Arthur Simonian, Town Engineer, Town of Berlin
Crown Castle

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

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July 1, 2015

Kenneth C. Baldwin, Esq.
Robinson & Cole
280 Trumbull Street
Hartford, CT 06103-3597

RE: **EM-VER-007-131021** – Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 240 Kensington Road, Berlin, Connecticut. **Extension Request for Notification of Completion.**

Dear Attorney Baldwin:

The Connecticut Siting Council (Council) is in receipt of your letter dated July 1, 2015, submitted on behalf of Cellco Partnership d/b/a Verizon Wireless, requesting an extension of time to submit a notice of completion of construction and associated post modification inspection report for the above-referenced exempt modification.

The Council hereby grants a one-year extension of time to submit a notice of completion of construction and associated post modification inspection report for the above-referenced exempt modification to July 1, 2016.

This extension is granted with the understanding that the Council will be notified should Verizon need additional time beyond one-year to submit a notice of completion and associated post modification inspection reports or decides not to proceed with construction.

Thank you for your attention to this matter.

Sincerely,

Melanie A. Bachman
Acting Executive Director

MAB/cm

Robinson+Cole

KENNETH C. BALDWIN

280 Trumbull Street
Hartford, CT 06103-3597
Main (860) 275-8200
Fax (860) 275-8299
kbaldwin@rc.com
Direct (860) 275-8345

Also admitted in Massachusetts

July 1, 2015

Via Electronic and U.S. Mail

Melanie A. Bachman
Acting Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **EM-VER-007-131021 – Cellco Partnership d/b/a Verizon Wireless**
240 Kensington Road, Berlin, Connecticut

Dear Ms. Bachman:

On November 8, 2013, the Siting Council acknowledged receipt of Cellco's notice of intent to modify its telecommunications facility at 240 Kensington Road in Berlin, Connecticut. We were recently informed that the tower modifications needed to support Cellco's facility modifications have not been completed by the tower owner. We will not, therefore, be able to provide the Council with the required "construction complete" notice by the July 1, 2015 deadline, and request an extension of one (1) year to comply with this requirement.

If you have any questions please do not hesitate to contact me.

Sincerely,

Kenneth C. Baldwin

Copy to:
Tim Parks

13910941-v1

ROBINSON & COLE LLP

KENNETH C. BALDWIN

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Hartford, CT 06103-3597
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Also admitted in Massachusetts

October 17, 2013

Melanie A. Bachman
Acting Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **Notice of Exempt Modification – Antenna Swap**
240 Kensington Road, Berlin, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") has Council approval for twelve (12) antennas and currently maintains nine (9) wireless telecommunications antennas at the 160-foot level on an existing 190-foot tower at the above-referenced address. The tower is owned by T-Mobile. Cellco's use of the tower was approved by the Council in 2008. Cellco now intends to remove five (5) of its existing antennas and install two (2) LPA-80063-6CF cellular antennas; two (2) model BXA-171085-12BF PCS antennas; one (1) model BXA-171063-12BF PCS antenna; and three (3) model BXA-70063-6CF LTE antennas, for a total of twelve (12) antennas all at the same 160-foot level on the tower. Cellco also intends to install six (6) additional coax cables attached to the outside of the monopole tower. Specifications for Cellco's replacement antennas are included in Attachment 1.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Denise M. McNair, Town Manager of the Town of Berlin. The Town of Berlin is the owner of the property on which the tower is located.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2), as amended.

1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco's replacement antennas will be located at the 160-foot level on the existing 190-foot tower.

2. The proposed modifications do not involve any change to ground-mounted equipment and, therefore, will not require the extension of the site boundaries.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The operation of the replacement antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) adopted safety standard. A cumulative power density table for Cellco's modified facility is included behind Attachment 2.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The tower and its foundation, with certain modifications, can support Cellco's proposed modifications. (*See* Structural Modification Report attached behind Attachment 3).

For the foregoing reasons, Cellco respectfully submits that the proposed modifications to the above-referenced telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Kenneth C. Baldwin

Enclosures
Copy to:
Denise M. McNair, Berlin Town Manager
Sandy M. Carter

ATTACHMENT 1

Amphenol ANTENNA SOLUTIONS

LPA-80063-6CF-EDIN-X

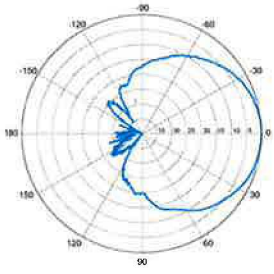
V-Pol | Log Periodic | 63° | 14.5 dBd

Replace "X" with desired electrical downtilt.

Antenna is also available with NE connector(s). Replace "EDIN" with "NE" in the model number when ordering.

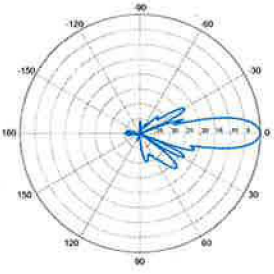
Electrical Characteristics				
Frequency bands	806-960 MHz			
Polarization	Vertical			
Horizontal beamwidth	63°			
Vertical beamwidth	10°			
Gain	14.5 dBd (16.6 dBi)			
Electrical downtilt (X)	0, 2, 4, 5, 6, 8, 10			
Impedance	50Ω			
VSWR	≤1.4:1			
Null fill	5% (-26.02 dB)			
Input power	500 W			
Lightning protection	Direct Ground			
Connector(s)	1 Port / EDIN or NE / Female / Center (Back)			
Mechanical Characteristics				
Dimensions Length x Width x Depth	1805 x 385 x 332 mm		71.1 x 15.2 x 13.1 in	
Depth of antenna with z-bracket	372 mm		14.6 in	
Weight without mounting brackets	12.3 kg		27 lbs	
Survival wind speed	> 201 km/hr		> 125 mph	
Wind area	Front: 0.70 m^2	Side: 0.59 m^2	Front: 7.5 ft^2	Side: 6.3 ft^2
Wind load @ 161 km/hr (100 mph)	Front: 885 N	Side: 757 N	Front: 199 lbf	Side: 170 lbf
Mounting Options	Part Number	Fits Pipe Diameter	Weight	
3-Point Mounting & Downtilt Bracket Kit (0-20°)	21700000	50-102 mm 2.0-4.0 in	11 kg 25 lbs	
Lock-Down Brace	If the lock-down brace is used, the maximum diameter of the mounting pipe is 88.9 mm or 3.5 in.			

LPA-80063-6CF-EDIN-X



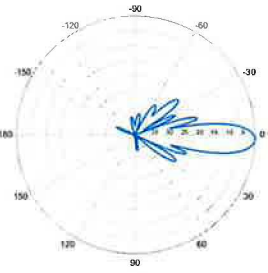
Horizontal

LPA-80063-6CF-EDIN-0



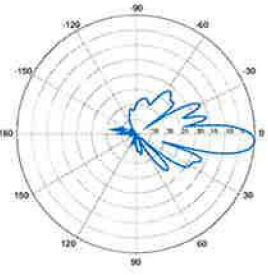
0° | Vertical

LPA-80063-6CF-EDIN-2



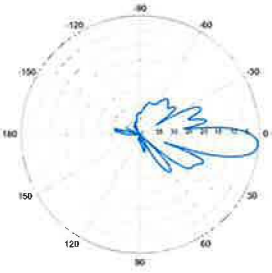
2° | Vertical

LPA-80063-6CF-EDIN-4



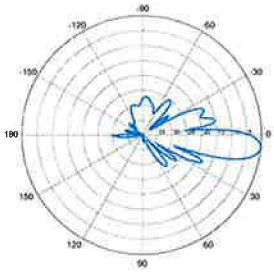
4° | Vertical

LPA-80063-6CF-EDIN-5



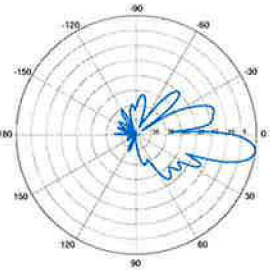
5° | Vertical

LPA-80063-6CF-EDIN-6



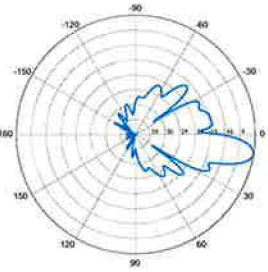
6° | Vertical

LPA-80063-6CF-EDIN-8



8° | Vertical

LPA-80063-6CF-EDIN-10



10° | Vertical

BXA-171085-12BF-EDIN-X

Replace "X" with desired electrical downtilt

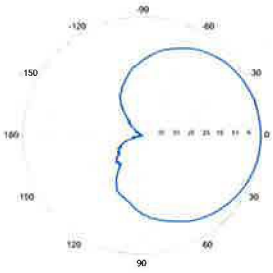
X-Pol | FET Panel | 85° | 18.0 dBi

Electrical Characteristics	1710-2170 MHz		
Frequency bands	1710-1880 MHz	1850-1990 MHz	1920-2170 MHz
Polarization	±45°	±45°	±45°
Horizontal beamwidth	88°	85°	80°
Vertical beamwidth	4.5°	4.5°	4.5°
Gain	15.1 dBd / 17.2 dBi	15.5 dBd / 17.6 dBi	15.9 dBd / 18.0 dBi
Electrical downtilt (X)	0, 2, 4		
Impedance	50Ω		
VSWR	≤1.5:1		
First upper sidelobe	< -17 dB		
Front-to-back ratio	> 30 dB		
In-band isolation	> 28 dB		
IM3 (20W carrier)	< -150 dBc		
Input power	300 W		
Lightning protection	Direct Ground		
Connector(s)	2 Ports / EDIN / Female / Bottom		
Operating temperature	-40° to +60° C / -40° to +140° F		

Mechanical Characteristics		
Dimensions Length x Width x Depth	1820 x 154 x 105 mm	71.7 x 6.1 x 4.1 in
Depth with z-brackets	133 mm	5.2 in
Weight without mounting brackets	6.8 kg	15 lbs
Survival wind speed	> 201 km/hr	> 125 mph
Wind area	Front: 0.28 m² Side: 0.19 m²	Front: 3.1 ft² Side: 2.1 ft²
Wind load @ 161 km/hr (100 mph)	Front: 460 N Side: 304 N	Front: 103 lbf Side: 68 lbf

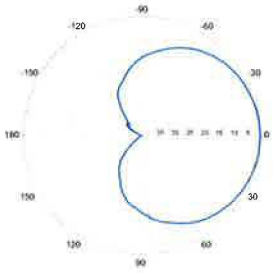
Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting Bracket Kit	26799997	50-102 mm 2.0-4.0 in	2.3 kg 5 lbs
2-Point Mounting & Downtilt Bracket Kit	26799999	50-102 mm 2.0-4.0 in	3.6 kg 8 lbs
Concealment Configurations	For concealment configurations, order BXA-171085-12BF-EDIN-X-FP		

BXA-171085-12BF-EDIN-X



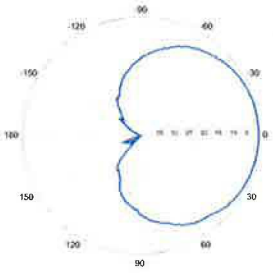
Horizontal | 1710-1880 MHz

BXA-171085-12BF-EDIN-X



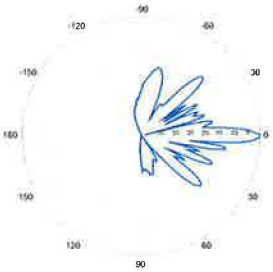
Horizontal | 1850-1990 MHz

BXA-171085-12BF-EDIN-X



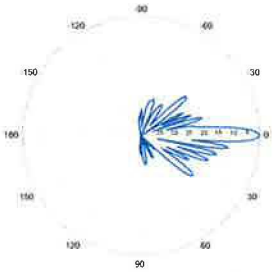
Horizontal | 1920-2170 MHz

BXA-171085-12BF-EDIN-0



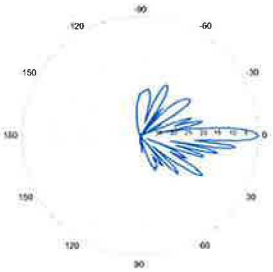
0° | Vertical | 1710-1880 MHz

BXA-171085-12BF-EDIN-0



0° | Vertical | 1850-1990 MHz

BXA-171085-12BF-EDIN-0

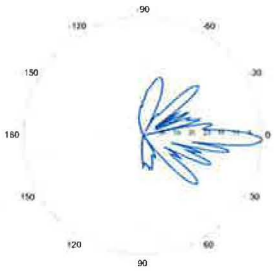


0° | Vertical | 1920-2170 MHz

BXA-171085-12BF-EDIN-X

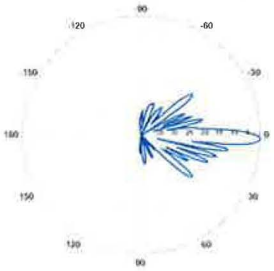
X-Pol | FET Panel | 85° | 18.0 dBi

BXA-171085-12BF-EDIN-2



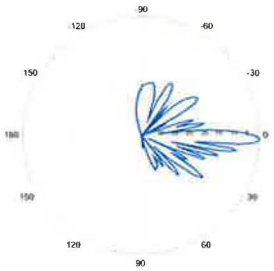
2° | Vertical | 1710-1880 MHz

BXA-171085-12BF-EDIN-2



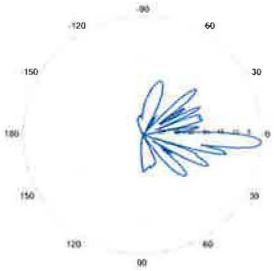
2° | Vertical | 1850-1990 MHz

BXA-171085-12BF-EDIN-2



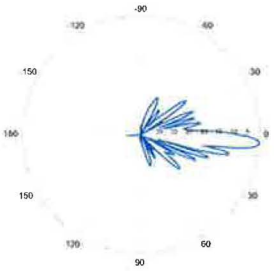
2° | Vertical | 1920-2170 MHz

BXA-171085-12BF-EDIN-4



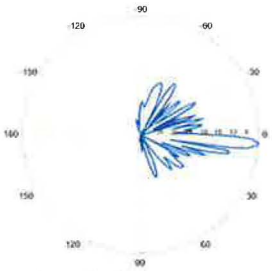
4° | Vertical | 1710-1880 MHz

BXA-171085-12BF-EDIN-4



4° | Vertical | 1850-1990 MHz

BXA-171085-12BF-EDIN-4



4° | Vertical | 1920-2170 MHz

BXA-171063-12BF-EDIN-X

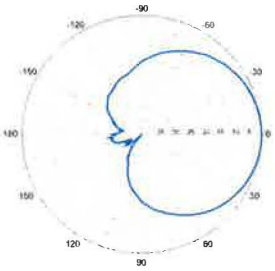
Replace "X" with desired electrical downtilt.

X-Pol | FET Panel | 63° | 19.0 dBi

Electrical Characteristics	1710-2170 MHz		
Frequency bands	1710-1880 MHz	1850-1990 MHz	1920-2170 MHz
Polarization	±45°	±45°	±45°
Horizontal beamwidth	68°	65°	60°
Vertical beamwidth	4.5°	4.5°	4.5°
Gain	16.1 dBd / 18.2 dBi	16.5 dBd / 18.6 dBi	16.9 dBd / 19.0 dBi
Electrical downtilt (X)	0, 2, 5		
Impedance	50Ω		
VSWR	≤1.5:1		
First upper sidelobe	< -17 dB		
Front-to-back ratio	> 30 dB		
In-band isolation	> 28 dB		
IM3 (20W carrier)	< -150 dBc		
Input power	300 W		
Lightning protection	Direct Ground		
Connector(s)	2 Ports / EDIN / Female / Bottom		
Operating temperature	-40° to +60° C / -40° to +140° F		
Mechanical Characteristics			
Dimensions Length x Width x Depth	1820 x 154 x 105 mm	71.7 x 6.1 x 4.1 in	
Depth with z-brackets	133 mm	5.2 in	
Weight without mounting brackets	6.8 kg	15 lbs	
Survival wind speed	> 201 km/hr	> 125 mph	
Wind area	Front: 0.28 m² Side: 0.19 m²	Front: 3.1 ft² Side: 2.1 ft²	
Wind load @ 161 km/hr (100 mph)	Front: 460 N Side: 304 N	Front: 103 lbf Side: 68 lbf	

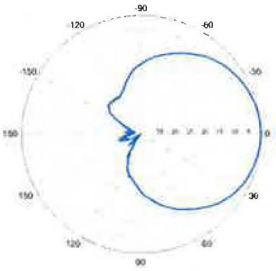
Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting Bracket Kit	26799997	50-102 mm 2.0-4.0 in	2.3 kg 5 lbs
2-Point Mounting & Downtilt Bracket Kit	26799999	50-102 mm 2.0-4.0 in	3.6 kg 8 lbs
Concealment Configurations	For concealment configurations, order BXA-171063-12BF-EDIN-X-FP		

BXA-171063-12BF-EDIN-X



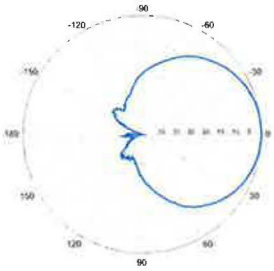
Horizontal | 1710-1880 MHz

BXA-171063-12BF-EDIN-X



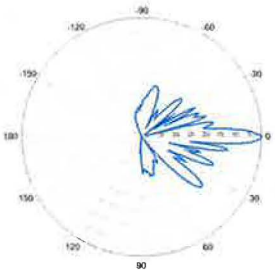
Horizontal | 1850-1990 MHz

BXA-171063-12BF-EDIN-X



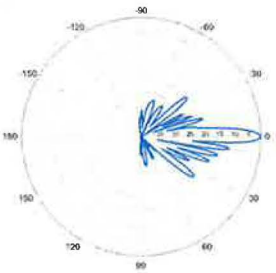
Horizontal | 1920-2170 MHz

BXA-171063-12BF-EDIN-0



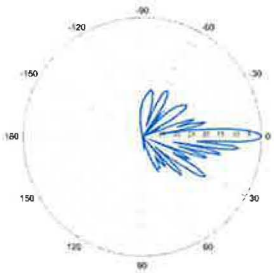
0° | Vertical | 1710-1880 MHz

BXA-171063-12BF-EDIN-0



0° | Vertical | 1850-1990 MHz

BXA-171063-12BF-EDIN-0

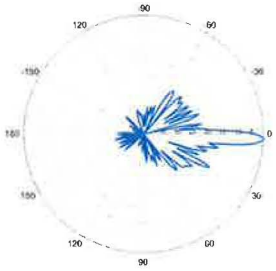


0° | Vertical | 1920-2170 MHz

BXA-171063-12BF-EDIN-X

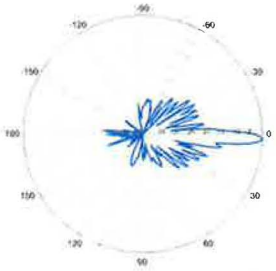
X-Pol | FET Panel | 63° | 19.0 dBi

BXA-171063-12BF-EDIN-2



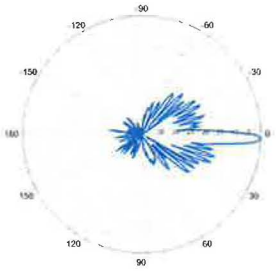
2° | Vertical | 1710-1880 MHz

BXA-171063-12BF-EDIN-2



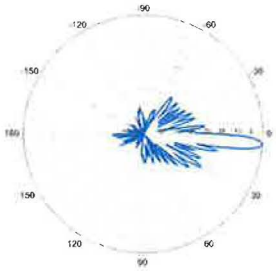
2° | Vertical | 1850-1990 MHz

BXA-171063-12BF-EDIN-2



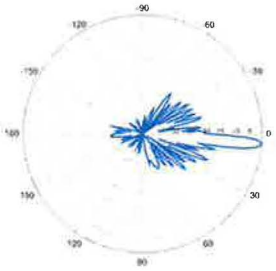
2° | Vertical | 1920-2170 MHz

BXA-171063-12BF-EDIN-5



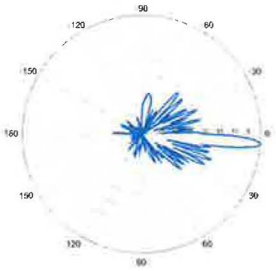
5° | Vertical | 1710-1880 MHz

BXA-171063-12BF-EDIN-5



5° | Vertical | 1850-1990 MHz

BXA-171063-12BF-EDIN-5



5° | Vertical | 1920-2170 MHz

BXA-70063-6CF-EDIN-X

X-Pol | FET Panel | 63° | 14.5 dBd

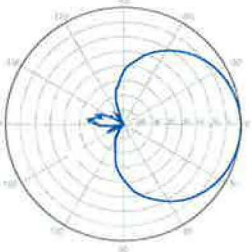
Replace "X" with desired electrical downtilt.

Antenna is also available with NE connector(s). Replace "EDIN" with "NE" in the model number when ordering.

Electrical Characteristics	696-900 MHz	
Frequency bands	696-806 MHz	806-900 MHz
Polarization	±45°	
Horizontal beamwidth	65°	63°
Vertical beamwidth	13°	11°
Gain	14.0 dBd (16.1 dBi)	14.5 dBd (16.6 dBi)
Electrical downtilt (X)	0, 2, 3, 4, 5, 6, 8, 10	
Impedance	50Ω	
VSWR	≤1.35:1	
Upper sidelobe suppression (0°)	-18.3 dB	-18.2 dB
Front-to-back ratio (+/-30°)	-33.4 dB	-36.3 dB
Null fill	5% (-26.02 dB)	
Isolation between ports	< -25 dB	
Input power with EDIN connectors	500 W	
Input power with NE connectors	300 W	
Lightning protection	Direct Ground	
Connector(s)	2 Ports / EDIN or NE / Female / Center (Back)	
Mechanical Characteristics		
Dimensions Length x Width x Depth	1804 x 285 x 132 mm	71.0 x 11.2 x 5.2 in
Depth with z-brackets	172 mm	6.8 in
Weight without mounting brackets	7.9 kg	17 lbs
Survival wind speed	> 201 km/hr	> 125 mph
Wind area	Front: 0.51 m^2 Side: 0.24 m^2	Front: 5.5 ft^2 Side: 2.6 ft^2
Wind load @ 161 km/hr (100 mph)	Front: 759 N Side: 391 N	Front: 169 lbf Side: 89 lbf

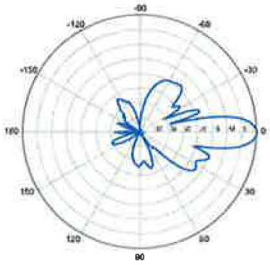
Mounting Options	Part Number	Fits Pipe Diameter	Weight
3-Point Mounting & Downtilt Bracket Kit	36210008	40-115 mm 1.57-4.5 in	6.9 kg 15.2 lbs
Concealment Configurations	For concealment configurations, order BXA-70063-6CF-EDIN-X-FP		

BXA-70063-6CF-EDIN-X



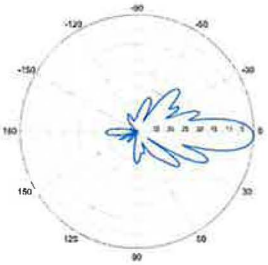
Horizontal | 750 MHz

BXA-70063-6CF-EDIN-0

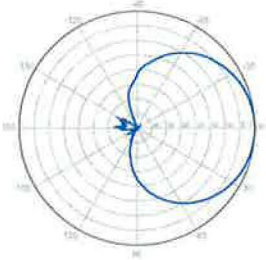


0° | Vertical | 750 MHz

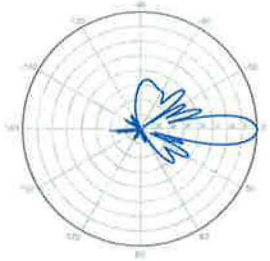
BXA-70063-6CF-EDIN-2



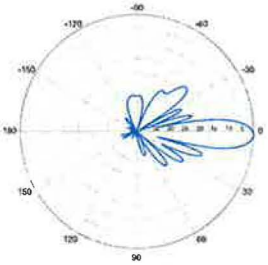
2° | Vertical | 750 MHz



Horizontal | 850 MHz



0° | Vertical | 850 MHz



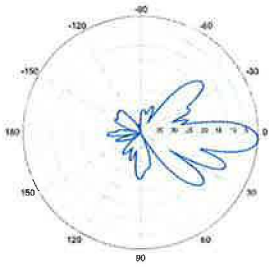
2° | Vertical | 850 MHz

Quoted performance parameters are provided to offer typical or range values only and may vary as a result of normal manufacturing and operational conditions. Extreme operational conditions and/or stress on structural supports is beyond our control. Such conditions may result in damage to this product. Improvements to product may be made without notice.

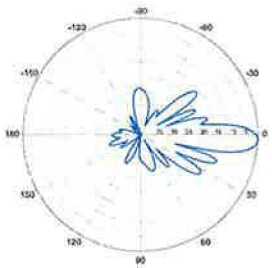
BXA-70063-6CF-EDIN-X

X-Pol | FET Panel | 63° | 14.5 dBd

BXA-70063-6CF-EDIN-3

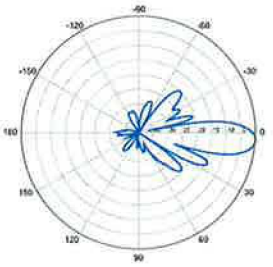


3° | Vertical | 750 MHz

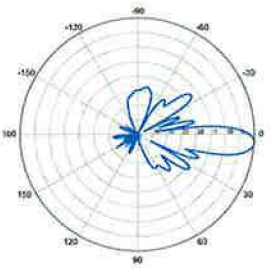


3° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-4

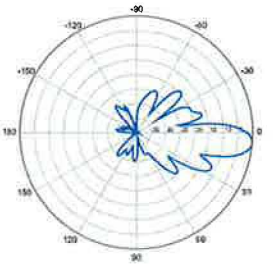


4° | Vertical | 750 MHz

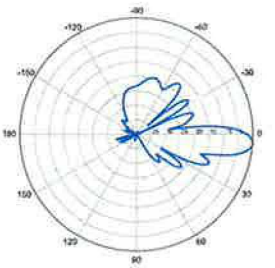


4° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-5

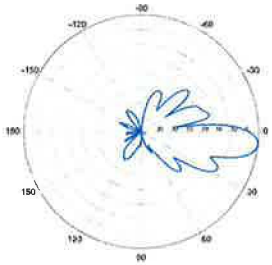


5° | Vertical | 750 MHz

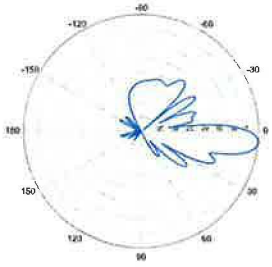


5° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-6



6° | Vertical | 750 MHz



6° | Vertical | 850 MHz

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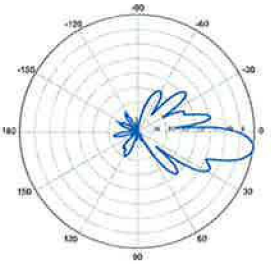
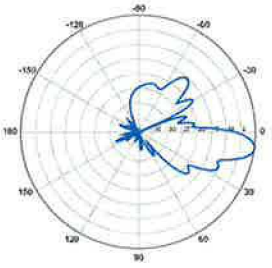


8° | Vertical | 750 MHz



8° | Vertical | 850 MHz

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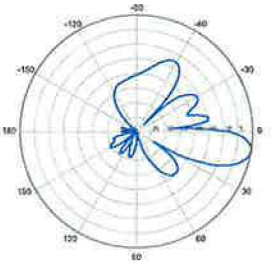
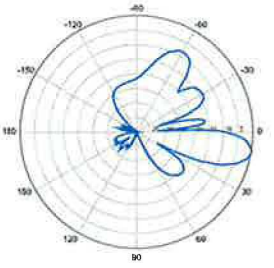


10° | Vertical | 750 MHz



10° | Vertical | 850 MHz

ATTACHMENT 2

	General	Power	Density					
Site Name: Berlin-Kensington								
Tower Height: Verizon @ 160Ft.								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*Cingular UMTS	1	500	149	0.0081	880	0.5867	1.38%	
*Cingular GSM	8	296	149	0.0384	880	0.5867	6.54%	
*Cingular GSM	2	427	149	0.0138	1900	1.0000	1.38%	
*Clearwire	2	153	118	0.0079	2496	1.0000	0.79%	
*Clearwire	1	211	122	0.0051	11 GHz	1.0000	0.51%	
*Pocket	3	631	106	0.0606	2130	1.0000	6.06%	
*T-Mobile GSM	8	117	180	0.0104	1945	1.0000	1.04%	
*T-Mobile UMTS	2	600	180	0.0133	2100	1.0000	1.33%	
*Nextel	9	100	116	0.0240	851	0.5673	4.24%	
*Town of Berlin			194	0.0048	850	0.5667	0.84%	
*Town of Berlin			165	0.0013	45	0.2000	0.65%	
*Town of Berlin			165	0.0066	159	0.2000	3.30%	
*Town of Berlin			132	0.0021	45	0.2000	1.05%	
*Town of Berlin			136	0.0097	154	0.2000	4.85%	
*Town of Berlin			99	0.0073	45	0.2000	3.65%	
*Town of Berlin			75	0.0319	155	0.2000	15.95%	
*Town of Berlin			59	0.0516	850	0.5667	9.11%	
*Town of Berlin			45	0.0177	450	0.3000	5.90%	
*Town of Berlin			33	0.0330	460	0.3067	10.76%	
Verizon PCS	**11**	**233**	**160**	**0.0360**	**1970**	**1.0000**	**3.60%**	
Verizon Cellular	**9**	**246**	**160**	**0.0311**	**869**	**0.5793**	**5.37%**	
Verizon AWS	**1**	**1750**	**160**	**0.0246**	**2145**	**1.0000**	**2.46%**	
Verizon 700	**1**	**810**	**160**	**0.0114**	**698**	**0.4653**	**2.44%**	
								83.11%
* Source: Siting Council								

ATTACHMENT 3

May 6, 2013

Mr. Steve Tuttle
Crown Castle
349 West Commercial Street, Suite 2630
East Rochester, NY 14445
(585) 899-3445

B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630
ctuttle@btgrp.com

Subject:	**Structural Modification Report**	
Carrier Designation:	***Verizon Wireless* Co-Locate**	
	Carrier Site Number:	N/A
	Carrier Site Name:	N/A
Crown Castle Designation:	**Crown Castle BU Number:**	826217
	Crown Castle Site Name:	Newington_1
	Crown Castle JDE Job Number:	218597
	Crown Castle Work Order Number:	606486
	Crown Castle Application Number:	176116 Rev. 2
Engineering Firm Designation:	**B+T Group Project Number:**	87581.002.01
Site Data:	**240 Kensington Road, Berlin, CT, Hartford County** **Latitude *41° 37' 34.25"*, Longitude *-72° 46' 32.1"*** **190 Foot - Monopole**	

Dear Mr. Tuttle,

B+T Group 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 543113, in accordance with application 176116, revision 2.

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:

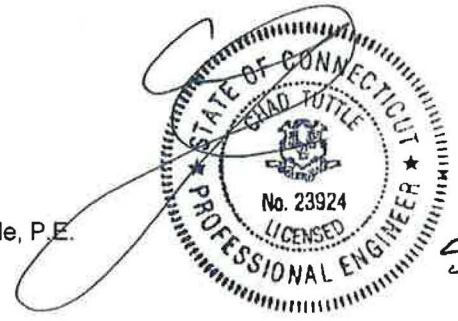
LC4: TSA specified load case with proposed modifications **Sufficient Capacity**
Note: See Table 1 and Table 2 for the proposed and existing/reserved loading, respectively.

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

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

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

Respectfully submitted by:
B+T Engineering, Inc.



5/6/13

Kiran Maroju
Project Engineer

Chad E. Tuttle, P.E.
President

tnxTower Report - version 6.0.4.0

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 190 ft. Monopole tower designed by Pirod Manufactures Inc. in February of 1999. The tower was originally designed for a wind speed of 80 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 37.6 mph with 1 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
160.0	160.0	1	Antel	BXA-171063-12BF	6	1-5/8	-
		2	Antel	BXA-171085-12BF-2			
		3	Antel	BXA-70063-6CF-2			
		2	Antel	LPA-80063-6CF-EDIN			

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
189.0	189.0	1	Andrew	DB589-A	2 1	7/8 1-5/8	1
		1	Kathrein	OGB4-900D			
		1	MTI Wireless	MT-485002			
		1	--	Side Arm Mount [SO 701-1]			
181.0	181.0	3	Ericsson	ERICSSON AIR 21 B2A B4P	1	1-5/8	2
		3	Ericsson	ERICSSON AIR 21 B4A B2P			
		3	Ericsson	KRY 112 144/1			
		1	--	Platform Mount [LP 405-1]	12	1-5/8	1
160.0	160.0	**2**	**Antel**	**LPA-80080/6CFx5**	-	-	**3**
		3	**Antel**	**LPA-185080/12CF**			
		4	Antel	LPA-80080/6CFx5	12	1-5/8	1
		1	--	Platform Mount [LP 303-1]			
158.0	158.0	1	Decibel	DB205-A	2	7/8	1
		1	Sinclair	SRL-224NM-4			
		2	--	Side Arm Mount [SO 701-1]			
151.0	151.0	2	Andrew	SBNH-1D6565C	2 1	3/8 7/16	2
		6	Communication Components Inc.	DTMABP7819VG12A			
		1	KMW	AM-X-CD-16-65-00T-RET			
		6	Powerwave	CM1007-DBPXBC-003			
		6	Powerwave	LGP21901			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
		6	**CSS**	**DUO1417-8686**	**2** **1**	**3/8** **7/16**	**3**
		6	**ADC**	**DD1900 FULL BAND w/850 BY-PASS MASTHEAD**			
		3	**Powerwave**	**LGP13519**			
		6	**Ericsson**	**RRUS 11**			
		1	**Raycap**	**DC6-48-60-18-8F**			
		1	KMW	AM-X-CD-16-65-00T-RET	12	1-1/4	1
		2	Andrew	SBNH-1D6565C			
		3	Powerwave	7770.00			
		1	--	Platform Mount [LP 403-1]			
148.0	148.0	6	Ericsson	RRU-11	-	-	2
		1	Raycap	DC6-48-60-18-8F			
		1	--	Pipe Mount [PM 601-1]			
		2	--	Pipe Mount [PM 601-3]			
132.0	132.0	1	Sinclair	SRL-235-2	1	7/8	1
		1	--	Side Arm Mount [SO 701-1]			
124.0	124.0	1	Decibel	DB205-A	1 1	1/2 1-5/8	1
		1	Decibel	PCS 1900 TMA RX			
		1	--	Side Arm Mount [SO 701-1]			
116.0	116.0	2	Andrew	VHLP2.5-10W	12 3 6	1-1/4 1/2 5/16	1
		6	Decibel	DB844G90A-XY			
		2	Dragonwave	HORIZON DUO			
		3	Kathrein	840 10054			
		3	Samsung	WIMAX DAP HEAD			
		1	--	Platform Mount [LP 405-1]			
100.0	100.0	3	Kathrein	742 213	6	1-5/8	1
		1	--	Pipe Mount [PM 601-3]			
90.0	90.0	1	Andrew	HP2-102	3 1	1/2 5/8	1
		2	Decibel	DB205-A			
		1	MTI Wireless	MT-485002			
		2	--	Side Arm Mount [SO 701-1]			
87.0	87.0	2	GPS	GPS_A	2	1/2	1
		2	--	Side Arm Mount [SO 702-1]			
70.0	70.0	1	Sinclair	SRL-235-2	1	1/2	1
		1	--	Side Arm Mount [SO 701-1]			
58.0	58.0	1	Decibel	DB583	1	1/2	1
		1	--	Side Arm Mount [SO 701-1]			
43.0	43.0	1	Decibel	DB909XVTE-M	1	1/2	1
		1	--	Side Arm Mount [SO 701-1]			

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

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
190	190	1	Decibel	DB809	1	1-5/8
177.667	177.667	12	EMS	RR90-17-00DP	12	1-5/8
155	155	2	Decibel	DB205	2	1-5/8
140	140	2	Decibel	DB205	2	1-5/8
127.667	127.667	12	EMS	RR90-17-00DP	12	1-5/8
117.667	117.667	12	EMS	RR90-17-00DP	12	1-5/8
25	25	1	Decibel	DB516	2	1-5/8
		1	Decibel	DB809M		
20	20	1	Decibel	DB205	1	1-5/8

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Online Application	Verizon Co-Locate Revision:2	176116	CCI Sites
Tower Manufacturer Drawings	Pirod Inc., File no:A-115400	3438498	CCI Sites
Tower Foundation Drawings	Pirod Inc., File no:A-115400	3463552	CCI Sites
Geotechnical Report	French & Parrello ; Job no:98A209ERI	3438510	CCI Sites
Antenna Configuration	Crown CAD Package	Date:04/23/2013	CCI Sites

3.1) Analysis Method

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

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.
5) Mount areas and weights are assumed based on photographs provided.
6) Base and flange plate design methodology of the manufacturer has been reviewed and found to be an acceptable means of designing to resist the full capacity of the bolts and shaft.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary) – LC4

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	190 - 180	Pole	P18x3/8	1	-3.334	697.495	4.5	Pass
L2	180 - 140	Pole	P24x3/8	2	-12.612	934.940	82.8	Pass
L3	140 - 120	Pole	P36x3/8	3	-16.637	1325.678	82.6	Pass
L4	120 - 104.33	Pole	P42x3/8	4	-22.337	1484.549	92.3	Pass
L5	104.33 - 100	Pole	P42x3/8 [0.449926]	5	-23.454	1805.415	85.2	Pass
L6	100 - 89.08	Pole	P48x3/8	6	-26.822	1643.282	97.9	Pass
L7	89.08 - 80	Pole	P48x3/8 [0.466244]	7	-29.597	2071.535	93.3	Pass
L8	80 - 60	Pole	P54x3/8 [0.486321]	8	-36.530	2370.940	96.8	Pass
L9	60 - 40	Pole	P60x3/8 [0.516129]	9	-44.498	2742.607	96.0	Pass
L10	40 - 20	Pole	P60x1/2 [0.600147]	10	-53.408	3378.235	95.4	Pass
L11	20 - 4.33	Pole	P60x5/8	11	-60.763	3682.439	99.2	Pass
L12	4.33 - 0	Pole	P60x5/8 [0.67691]	12	-62.933	4014.436	95.4	Pass
							Summary	
						Pole (L11)	99.2	Pass
						RATING =	**99.2**	**Pass**

Table 6 - Tower Component Stresses vs. Capacity – LC4

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Flange Connection	180	3.0	Pass
1	Flange Connection	140	64.1	Pass
1	Flange Connection	120	79.9	Pass
1	Flange Connection	100	69.1	Pass
1	Flange Connection	80	90.2	Pass
1	Flange Connection	60	83.1	Pass
1	Flange Connection (Bolts)	40	6.8	Pass
1	Flange Connection (Plate)	40	74.7	Pass
1	Flange Connection (Bolts)	20	8.7	Pass
1	Flange Connection (Plate)	20	91.4	Pass
1	Anchor Rods	Base	49.0	Pass
1	Base Plate	Base	96.6	Pass
1	Base Foundation	Base	90.4	Pass

Structure Rating (max from all components) =	99.2%

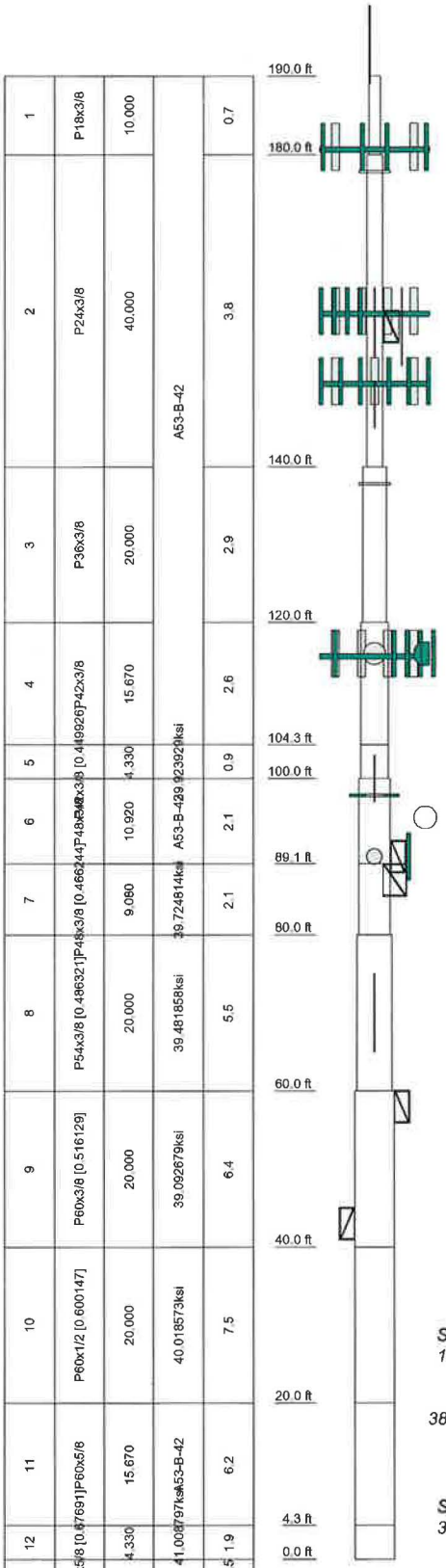
Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
2) Flange plate design methodology of the manufacturer has been reviewed and found to be an acceptable means of designing to resist the full capacity of the bots and shaft.

4.1) Recommendations

1) All modifications proposed in this report shall be installed in accordance with the attached drawings (Appendix D) for the determined available capacity to be effective.

APPENDIX A

tnxTOWER OUTPUT



Section	Size	Length (ft)	Grade	Weight (K)
1	P18x3/8	10.000	A53-B-42	0.7
2	P24x3/8	40.000		3.8
3	P36x3/8	20.000		2.9
4	P42x3/8	15.670		2.6
5	P42x3/8 [0.449926]	4.330	39.923929ksi	0.9
6	P48x3/8 [0.466244]	10.920	A53-B-42	2.1
7	P48x3/8 [0.466244]	9.080	39.724814ksi	2.1
8	P54x3/8 [0.486321]	20.000	39.481858ksi	5.5
9	P60x3/8 [0.516129]	20.000	39.092679ksi	6.4
10	P60x1/2 [0.600147]	20.000	40.018573ksi	7.5
11	P60x5/8 [0.687691]	15.670	A53-B-42	6.2
12	P60x3/8 [0.687691]	4.330	41.008797ksi	1.9
				42.5

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 5/8" x 4' on 4' Pole (E)	190	(2) LGP21901 (P)	151
		(2) LGP21901 (P)	151
DB589-A (E)	189	(4) DTMABP7819VG12A (P)	151
OGB4-900D (E)	189	(2) DTMABP7819VG12A (P)	151
MT-485002 w/ Mount Pipe (E)	189	Platform Mount [LP 403-1] (E)	151
6' x 2" Mount Pipe (E)	189	(2) SBNH-1D6565C w/ Mount Pipe (E)	151
6' x 2" Mount Pipe (E)	189		
Side Arm Mount [SO 701-1] (E)	189	(2) RRU-11 (P)	148
ERICSSON AIR 21 B2A B4P w/ Mount Pipe (R)	181	(2) RRU-11 (P)	148
		DC6-48-60-18-8F (P)	148
ERICSSON AIR 21 B2A B4P w/ Mount Pipe (R)	181	(2) Pipe Mount [PM 601-3] (P)	148
		Pipe Mount [PM 601-1] (P)	148
ERICSSON AIR 21 B2A B4P w/ Mount Pipe (R)	181	(2) RRU-11 (P)	148
		4' ICE SHIELDS (E)	138
ERICSSON AIR 21 B4A B2P w/ Mount Pipe (R)	181	Side Arm Mount [SO 701-1] (E)	132
		SRL-235-2 (E)	132
ERICSSON AIR 21 B4A B2P w/ Mount Pipe (R)	181	6' x 2" Mount Pipe (E)	132
		Side Arm Mount [SO 701-1] (E)	124
		6' x 2" Mount Pipe (E)	124
KRY 112 144/1 (R)	181	DB205-A (E)	124
KRY 112 144/1 (R)	181	PCS 1900 TMA RX (E)	124
KRY 112 144/1 (R)	181	HORIZON DUO (E)	116
(2) 6' x 2" Mount Pipe (E)	181	HORIZON DUO (E)	116
(2) 6' x 2" Mount Pipe (E)	181	840 10054 w/ Mount Pipe (E)	116
(2) 6' x 2" Mount Pipe (E)	181	840 10054 w/ Mount Pipe (E)	116
Platform Mount [LP 405-1] (E)	181	840 10054 w/ Mount Pipe (E)	116
4' ICE SHIELDS (E)	178	WIMAX DAP HEAD (E)	116
(2) LPA-80080/6CFx5 w/ Mount Pipe (E)	160	WIMAX DAP HEAD (E)	116
		WIMAX DAP HEAD (E)	116
BXA-70063-6CF-2 w/ Mount Pipe (R)	160	Platform Mount [LP 405-1] (E)	116
BXA-70063-6CF-2 w/ Mount Pipe (R)	160	(3) DB844G90A-XY w/ Mount Pipe (E)	116
BXA-70063-6CF-2 w/ Mount Pipe (R)	160	(3) DB844G90A-XY w/ Mount Pipe (E)	116
BXA-171085-12BF-2 w/ Mount Pipe (R)	160	VHLP2.5-10W (E)	116
		VHLP2.5-10W (E)	116
BXA-171063-12BF w/ Mount Pipe (R)	160	742 213 (E)	100
		742 213 (E)	100
BXA-171085-12BF-2 w/ Mount Pipe (R)	160	742 213 (E)	100
		Pipe Mount [PM 601-3] (E)	100
(2) LPA-80063-6CF-EDIN w/ Mount Pipe (R)	160	4' ICE SHIELDS (E)	98
		4' ICE SHIELDS (E)	98
Platform Mount [LP 303-1] (E)	160	4' ICE SHIELDS (E)	98
(2) LPA-80080/6CFx5 w/ Mount Pipe (E)	160	DB205-A (E)	90
		DB205-A (E)	90
SRL-224NM-4 (E)	158	Side Arm Mount [SO 701-1] (E)	90
Side Arm Mount [SO 701-1] (E)	158	6' x 2" Mount Pipe (E)	90
Side Arm Mount [SO 701-1] (E)	158	MT-485002 w/ Mount Pipe (E)	90
4' x 2" Pipe Mount (E)	158	Side Arm Mount [SO 701-1] (E)	90
4' x 2" Pipe Mount (E)	158	HP2-102 (E)	90
DB205-A (E)	158	GPS_A (E)	87
(3) 7770.00 w/ Mount Pipe (E)	151	Side Arm Mount [SO 702-1] (E)	87
AM-X-CD-16-65-00T-RET w/ Mount Pipe (E)	151	Side Arm Mount [SO 702-1] (E)	87
		GPS_A (E)	87
AM-X-CD-16-65-00T-RET w/ Mount Pipe (P)	151	SRL-235-2 (E)	70
(2) SBNH-1D6565C w/ Mount Pipe (P)	151	6' x 2" Mount Pipe (E)	70
		Side Arm Mount [SO 701-1] (E)	70
(2) CM1007-DBPXBC-003 (P)	151	4' x 2" Pipe Mount (E)	58
(2) CM1007-DBPXBC-003 (P)	151	Side Arm Mount [SO 701-1] (E)	58
(2) CM1007-DBPXBC-003 (P)	151	DB583 (E)	58
(2) LGP21901 (P)	151	DB909XVTE-M (E)	43
		Side Arm Mount [SO 701-1] (E)	43
		4' x 2" Pipe Mount (E)	43

AXIAL 103 K
SHEAR 13 K
M 15

TORQUE 4 kip-ft
38 mph WIND - 1.000 in

AXIAL 63 K
SHEAR 38 K
M 45

TORQUE 11 kip-ft
REACTIONS - 80 mph W

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-42	42 ksi	63 ksi	39.092679ksi	39 ksi	54 ksi
39.923929ksi	40 ksi	55 ksi	40.018573ksi	40 ksi	55 ksi
39.724814ksi	40 ksi	55 ksi	41.008797ksi	41 ksi	56 ksi
39.481858ksi	39 ksi	54 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. Tower Rating: 99.2%

B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK
Phone: (918) 587-4630
FAX: (918) 295-0265

Job: 87581.002.01 - Newington, CT(BU #826217)			
Project:			
Client: Crown Castle	Drawn by: HKarande	App'd:	
Code: TIA/EIA-222-F	Date: 05/05/13	Scale: NTS	
Path:		Dwg No. E-1	

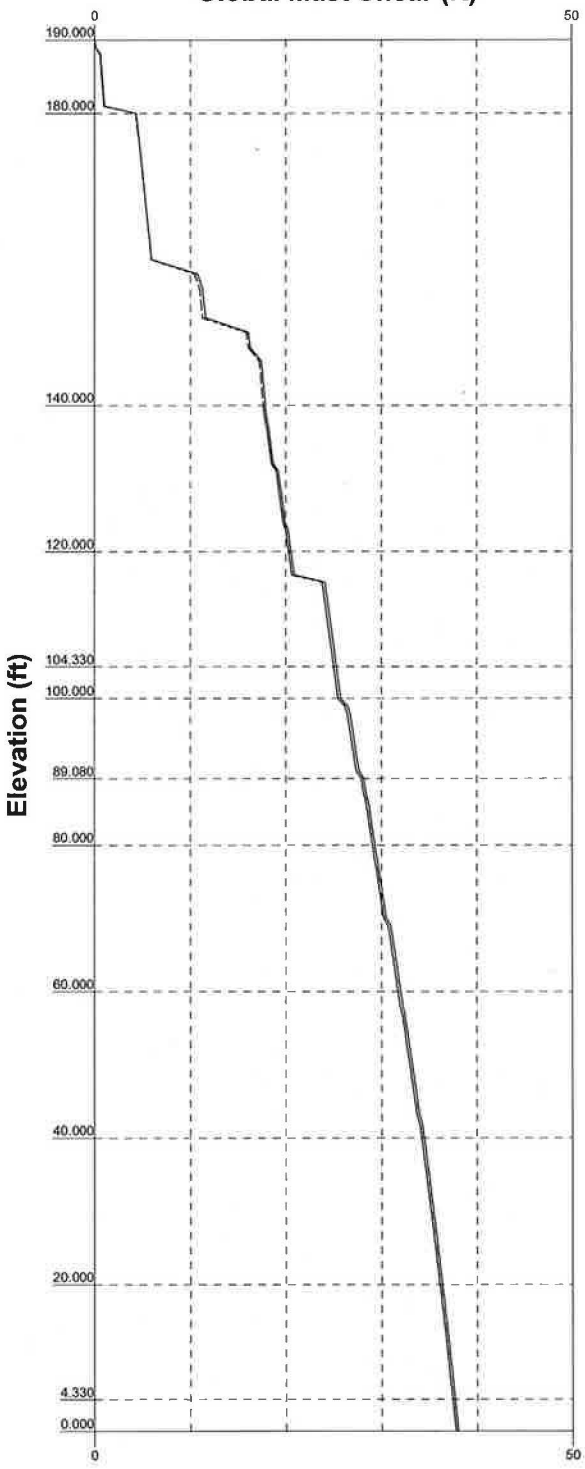
TIA/EIA-222-F - 80 mph/38 mph 1.000 in Ice

Vx ---------- Vz

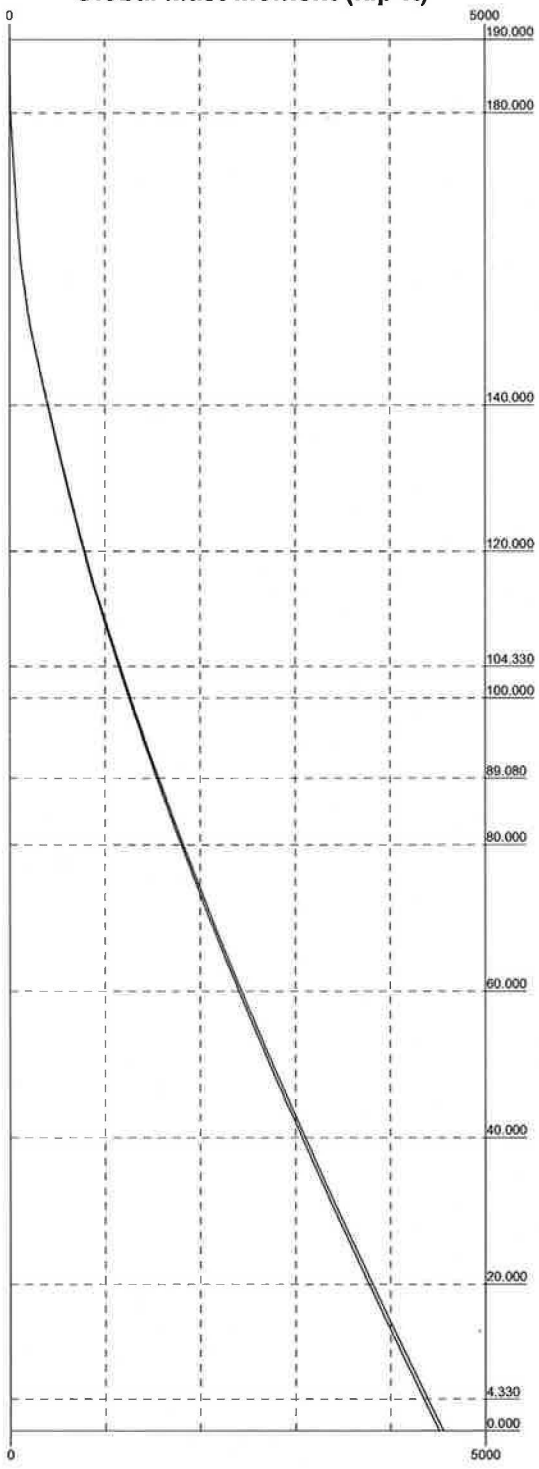
Maximum Values

Mx ---------- Mz

Global Mast Shear (K)



Global Mast Moment (kip-ft)



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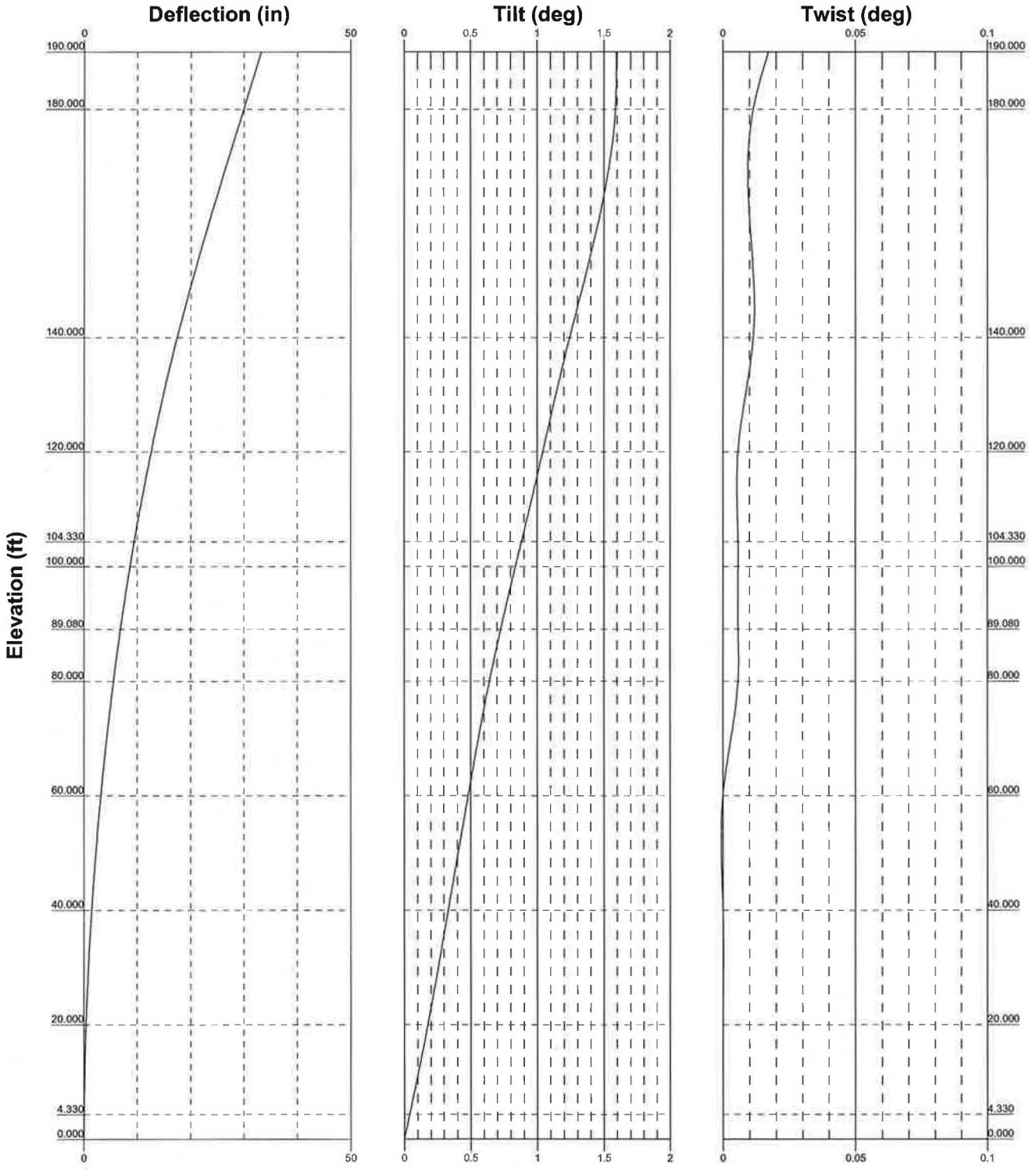
Project:		
Client: Crown Castle	Drawn by: HKarande	App'd:
Code: TIA/EIA-222-F	Date: 05/05/13	Scale: NTS
Path:		Dwg No. E-4

TIA/EIA-222-F - Service - 50 mph **Maximum Values**



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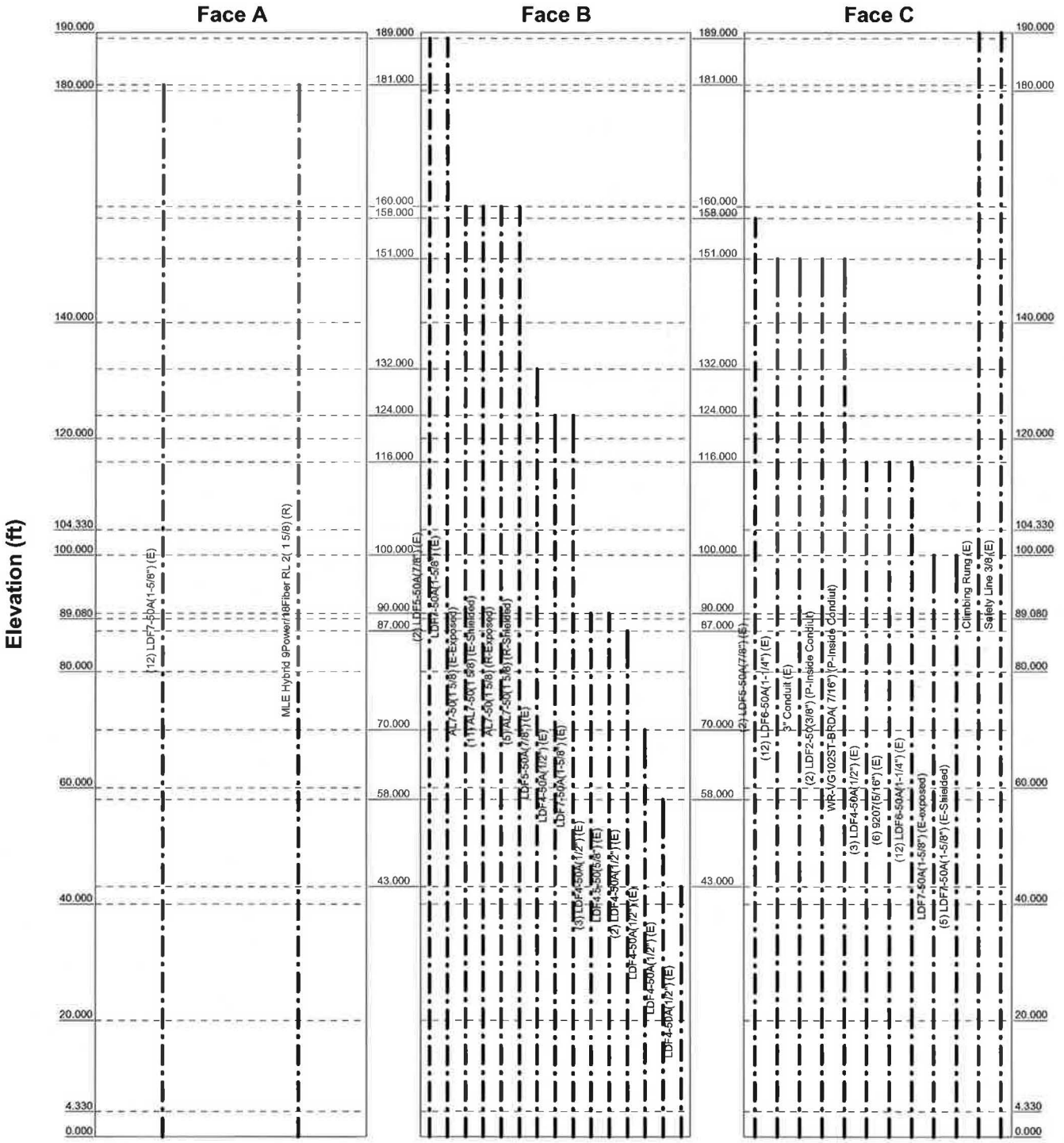
Job: 87581.002.01 - Newington, CT(BU #826217)		
Project:		
Client: Crown Castle	Drawn by: HKarande	App'd:
Code: TIA/EIA-222-F	Date: 05/05/13	Scale: NTS
Path:		Dwg No. E-5

Feedline Distribution Chart
0' - 190'

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



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Tulsa, OK
Phone: (918) 587-4630
FAX: (918) 295-0265

Job: 87581.002.01 - Newington, CT(BU #826217)		
Project:		
Client: Crown Castle	Drawn by: HKarande	App'd:
Code: TIA/EIA-222-F	Date: 05/05/13	Scale: NTS
Path:		Dwg No. E-7

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 Hartford County, Connecticut.
Basic wind speed of 80 mph.
Nominal ice thickness of 1.000 in.
Ice thickness is considered to increase with height.
Ice density of 56.000 pcf.
A wind speed of 38 mph is used in combination with ice.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Pole Section Geometry

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L1	190.000-180.000	10.000	P18x3/8	A53-B-42 (42 ksi)	
L2	180.000-140.000	40.000	P24x3/8	A53-B-42 (42 ksi)	
L3	140.000-120.000	20.000	P36x3/8	A53-B-42 (42 ksi)	
L4	120.000-104.330	15.670	P42x3/8	A53-B-42 (42 ksi)	
L5	104.330-100.000	4.330	P42x3/8 [0.449926]	39.923929ksi (40 ksi)	
L6	100.000-89.080	10.920	P48x3/8	A53-B-42 (42 ksi)	
L7	89.080-80.000	9.080	P48x3/8 [0.466244]	39.724814ksi (40 ksi)	
L8	80.000-60.000	20.000	P54x3/8 [0.486321]	39.481858ksi (39 ksi)	
L9	60.000-40.000	20.000	P60x3/8 [0.516129]	39.092679ksi (39 ksi)	
L10	40.000-20.000	20.000	P60x1/2 [0.600147]	40.018573ksi (40 ksi)	
L11	20.000-4.330	15.670	P60x5/8	A53-B-42 (42 ksi)	
L12	4.330-0.000	4.330	P60x5/8 [0.67691]	41.008797ksi (41 ksi)	

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				1	1	1		

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
190.000-180.000								
L2				1	1	1		
180.000-140.000								
L3				1	1	1		
140.000-120.000								
L4				1	1	1		
120.000-104.330								
L5				1	1	0.988718		
104.330-100.000								
L6				1	1	1		
100.000-89.080								
L7				1	1	0.984296		
89.080-80.000								
L8				1	1	0.980513		
80.000-60.000								
L9				1	1	0.981503		
60.000-40.000								
L10				1	1	0.986381		
40.000-20.000								
L11				1	1	1		
20.000-4.330								
L12				1	1	0.995967		
4.330-0.000								

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 klf
/										

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#		C_AA_A ft^2/ft	Weight klf
LDF5-50A(7/8") (E)	B	No	Inside Pole	189.000 - 0.000	0.000	0	2	No Ice	0.000	0.000
								1/2" Ice	0.000	0.000
								1" Ice	0.000	0.000
								2" Ice	0.000	0.000
								4" Ice	0.000	0.000
LDF7-50A(1-5/8") (E)	B	No	Inside Pole	189.000 - 0.000	0.000	0	1	No Ice	0.000	0.001
								1/2" Ice	0.000	0.001
								1" Ice	0.000	0.001
								2" Ice	0.000	0.001
								4" Ice	0.000	0.001
/										

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#		C_AA_A ft^2/ft	Weight klf
LDF7-50A(1-5/8") (E)	A	No	Inside Pole	181.000 - 0.000	0.000	0	12	No Ice	0.000	0.001
								1/2" Ice	0.000	0.001
								1" Ice	0.000	0.001
								2" Ice	0.000	0.001
								4" Ice	0.000	0.001
MLE Hybrid 9Power/18Fiber RL 2(1 5/8) (R)	A	No	Inside Pole	181.000 - 0.000	0.000	0	1	No Ice	0.000	0.001
								1/2" Ice	0.000	0.001
								1" Ice	0.000	0.001
								2" Ice	0.000	0.001
								4" Ice	0.000	0.001
/										
AL7-50(1 5/8) (E-Exposed)	B	No	CaAa (Out Of Face)	160.000 - 0.000	0.000	0	1	No Ice	0.196	0.001
								1/2" Ice	0.296	0.002
								1" Ice	0.396	0.004
								2" Ice	0.596	0.010
								4" Ice	0.996	0.030
AL7-50(1 5/8) (E-Shielded)	B	No	CaAa (Out Of Face)	160.000 - 0.000	0.000	0	11	No Ice	0.000	0.001
								1/2" Ice	0.000	0.002
								1" Ice	0.000	0.004
								2" Ice	0.000	0.010
								4" Ice	0.000	0.030
AL7-50(1 5/8) (R-Exposed)	B	No	CaAa (Out Of Face)	160.000 - 0.000	1.000	0	1	No Ice	0.196	0.001
								1/2" Ice	0.296	0.002
								1" Ice	0.396	0.004
								2" Ice	0.596	0.010
								4" Ice	0.996	0.030
AL7-50(1 5/8) (R-Shielded)	B	No	CaAa (Out Of Face)	160.000 - 0.000	1.000	0	5	No Ice	0.000	0.001
								1/2" Ice	0.000	0.002
								1" Ice	0.000	0.004
								2" Ice	0.000	0.010
								4" Ice	0.000	0.030
/										
LDF5-50A(7/8") (E)	C	No	Inside Pole	158.000 - 0.000	0.000	0	2	No Ice	0.000	0.000
								1/2" Ice	0.000	0.000
								1" Ice	0.000	0.000
								2" Ice	0.000	0.000
								4" Ice	0.000	0.000
/										
LDF6-50A(1-1/4") (E)	C	No	Inside Pole	151.000 - 0.000	0.000	0	12	No Ice	0.000	0.001
								1/2" Ice	0.000	0.001
								1" Ice	0.000	0.001
								2" Ice	0.000	0.001
								4" Ice	0.000	0.001
3" Conduit (E)	C	No	Inside Pole	151.000 - 0.000	0.000	0	1	No Ice	0.000	0.003
								1/2" Ice	0.000	0.003
								1" Ice	0.000	0.003
								2" Ice	0.000	0.003
								4" Ice	0.000	0.003
LDF2-50(3/8") (P-Inside Condiut)	C	No	Inside Pole	151.000 - 0.000	0.000	0	2	No Ice	0.000	0.000
								1/2" Ice	0.000	0.000
								1" Ice	0.000	0.000
								2" Ice	0.000	0.000
								4" Ice	0.000	0.000
WR-VG102ST-BRDA(7/16") (P-Inside Condiut)	C	No	Inside Pole	151.000 - 0.000	0.000	0	1	No Ice	0.000	0.000
								1/2" Ice	0.000	0.000
								1" Ice	0.000	0.000
								2" Ice	0.000	0.000
								4" Ice	0.000	0.000
/										
LDF5-50A(7/8")	B	No	Inside Pole	132.000 - 0.000	0.000	0	1	No Ice	0.000	0.000
								1/2" Ice	0.000	0.000

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#		C_AA_A ft^2/ft	Weight klf
(E)								1" Ice	0.000	0.000
								2" Ice	0.000	0.000
								4" Ice	0.000	0.000
/										
LDF4-50A(1/2")	B	No	Inside Pole	124.000 - 0.000	0.000	0	1	No Ice	0.000	0.000
(E)								1/2" Ice	0.000	0.000
								1" Ice	0.000	0.000
								2" Ice	0.000	0.000
								4" Ice	0.000	0.000
LDF7-50A(1-5/8")	B	No	Inside Pole	124.000 - 0.000	0.000	0	1	No Ice	0.000	0.001
(E)								1/2" Ice	0.000	0.001
								1" Ice	0.000	0.001
								2" Ice	0.000	0.001
								4" Ice	0.000	0.001
/										
LDF4-50A(1/2")	C	No	Inside Pole	116.000 - 0.000	0.000	0	3	No Ice	0.000	0.000
(E)								1/2" Ice	0.000	0.000
								1" Ice	0.000	0.000
								2" Ice	0.000	0.000
								4" Ice	0.000	0.000
9207(5/16")	C	No	Inside Pole	116.000 - 0.000	0.000	0	6	No Ice	0.000	0.001
(E)								1/2" Ice	0.000	0.001
								1" Ice	0.000	0.001
								2" Ice	0.000	0.001
								4" Ice	0.000	0.001
//**										
LDF6-50A(1-1/4")	C	No	Inside Pole	116.000 - 0.000	0.000	0	12	No Ice	0.000	0.001
(E)								1/2" Ice	0.000	0.001
								1" Ice	0.000	0.001
								2" Ice	0.000	0.001
								4" Ice	0.000	0.001
/										
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	100.000 - 0.000	0.000	0	1	No Ice	0.198	0.001
(E-exposed)								1/2" Ice	0.298	0.002
								1" Ice	0.398	0.004
								2" Ice	0.598	0.011
								4" Ice	0.998	0.030
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	100.000 - 0.000	0.000	0	5	No Ice	0.000	0.001
(E-Shielded)								1/2" Ice	0.000	0.002
								1" Ice	0.000	0.004
								2" Ice	0.000	0.011
								4" Ice	0.000	0.030
/										
LDF4-50A(1/2")	B	No	Inside Pole	90.000 - 0.000	0.000	0	3	No Ice	0.000	0.000
(E)								1/2" Ice	0.000	0.000
								1" Ice	0.000	0.000
								2" Ice	0.000	0.000
								4" Ice	0.000	0.000
LDF4.5-50(5/8")	B	No	Inside Pole	90.000 - 0.000	0.000	0	1	No Ice	0.000	0.000
(E)								1/2" Ice	0.000	0.000
								1" Ice	0.000	0.000
								2" Ice	0.000	0.000
								4" Ice	0.000	0.000
/										
LDF4-50A(1/2")	B	No	Inside Pole	87.000 - 0.000	0.000	0	2	No Ice	0.000	0.000
(E)								1/2" Ice	0.000	0.000
								1" Ice	0.000	0.000
								2" Ice	0.000	0.000
								4" Ice	0.000	0.000
/										
LDF4-50A(1/	B	No	Inside Pole	70.000 - 0.000	0.000	0	1	No Ice	0.000	0.000

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#		C_AA_A ft^2/ft	Weight klf
2")								1/2" Ice	0.000	0.000
(E)								1" Ice	0.000	0.000
								2" Ice	0.000	0.000
								4" Ice	0.000	0.000
/										
LDF4-50A(1/2")	B	No	Inside Pole	58.000 - 0.000	0.000	0	1	No Ice	0.000	0.000
(E)								1/2" Ice	0.000	0.000
								1" Ice	0.000	0.000
								2" Ice	0.000	0.000
								4" Ice	0.000	0.000
/										
LDF4-50A(1/2")	B	No	Inside Pole	43.000 - 0.000	0.000	0	1	No Ice	0.000	0.000
(E)								1/2" Ice	0.000	0.000
								1" Ice	0.000	0.000
								2" Ice	0.000	0.000
								4" Ice	0.000	0.000
/										
Climbing Rung	C	No	CaAa (Out Of Face)	190.000 - 0.000	0.000	0	1	No Ice	0.234	0.005
(E)								1/2" Ice	0.547	0.008
								1" Ice	0.859	0.013
								2" Ice	1.484	0.029
								4" Ice	2.734	0.087
Safety Line 3/8	C	No	CaAa (Out Of Face)	190.000 - 0.000	0.000	0	1	No Ice	0.037	0.000
(E)								1/2" Ice	0.137	0.001
								1" Ice	0.238	0.001
								2" Ice	0.437	0.002
								4" Ice	0.838	0.004
/										

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	190.000-180.000	A	0.000	0.000	0.000	0.000	0.011
		B	0.000	0.000	0.000	0.000	0.013
		C	0.000	0.000	0.000	2.719	0.055
L2	180.000-140.000	A	0.000	0.000	0.000	0.000	0.436
		B	0.000	0.000	0.000	7.840	0.246
		C	0.000	0.000	0.000	10.876	0.353
L3	140.000-120.000	A	0.000	0.000	0.000	0.000	0.218
		B	0.000	0.000	0.000	7.840	0.225
		C	0.000	0.000	0.000	5.438	0.344
L4	120.000-104.330	A	0.000	0.000	0.000	0.000	0.171
		B	0.000	0.000	0.000	6.143	0.190
		C	0.000	0.000	0.000	4.261	0.410
L5	104.330-100.000	A	0.000	0.000	0.000	0.000	0.047
		B	0.000	0.000	0.000	1.697	0.053
		C	0.000	0.000	0.000	1.177	0.126
L6	100.000-89.080	A	0.000	0.000	0.000	0.000	0.119
		B	0.000	0.000	0.000	4.281	0.133
		C	0.000	0.000	0.000	5.131	0.372
L7	89.080-80.000	A	0.000	0.000	0.000	0.000	0.099
		B	0.000	0.000	0.000	3.559	0.118
		C	0.000	0.000	0.000	4.267	0.310
L8	80.000-60.000	A	0.000	0.000	0.000	0.000	0.218
		B	0.000	0.000	0.000	7.840	0.262
		C	0.000	0.000	0.000	9.398	0.682

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L9	60.000-40.000	A	0.000	0.000	0.000	0.000	0.218
		B	0.000	0.000	0.000	7.840	0.267
		C	0.000	0.000	0.000	9.398	0.682
L10	40.000-20.000	A	0.000	0.000	0.000	0.000	0.218
		B	0.000	0.000	0.000	7.840	0.270
		C	0.000	0.000	0.000	9.398	0.682
L11	20.000-4.330	A	0.000	0.000	0.000	0.000	0.171
		B	0.000	0.000	0.000	6.143	0.211
		C	0.000	0.000	0.000	7.363	0.535
L12	4.330-0.000	A	0.000	0.000	0.000	0.000	0.047
		B	0.000	0.000	0.000	1.697	0.058
		C	0.000	0.000	0.000	2.035	0.148

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	190.000-180.000	A	1.230	0.000	0.000	0.000	0.000	0.011
		B		0.000	0.000	0.000	0.000	0.013
		C		0.000	0.000	0.000	12.865	0.179
L2	180.000-140.000	A	1.209	0.000	0.000	0.000	0.000	0.436
		B		0.000	0.000	0.000	17.510	2.004
		C		0.000	0.000	0.000	50.764	0.837
L3	140.000-120.000	A	1.179	0.000	0.000	0.000	0.000	0.218
		B		0.000	0.000	0.000	17.271	1.917
		C		0.000	0.000	0.000	24.889	0.576
L4	120.000-104.330	A	1.158	0.000	0.000	0.000	0.000	0.171
		B		0.000	0.000	0.000	13.402	1.480
		C		0.000	0.000	0.000	19.233	0.586
L5	104.330-100.000	A	1.145	0.000	0.000	0.000	0.000	0.047
		B		0.000	0.000	0.000	3.681	0.403
		C		0.000	0.000	0.000	5.268	0.174
L6	100.000-89.080	A	1.135	0.000	0.000	0.000	0.000	0.119
		B		0.000	0.000	0.000	9.237	1.004
		C		0.000	0.000	0.000	17.831	0.783
L7	89.080-80.000	A	1.120	0.000	0.000	0.000	0.000	0.099
		B		0.000	0.000	0.000	7.625	0.827
		C		0.000	0.000	0.000	14.686	0.644
L8	80.000-60.000	A	1.094	0.000	0.000	0.000	0.000	0.218
		B		0.000	0.000	0.000	16.595	1.770
		C		0.000	0.000	0.000	31.834	1.391
L9	60.000-40.000	A	1.051	0.000	0.000	0.000	0.000	0.218
		B		0.000	0.000	0.000	16.249	1.680
		C		0.000	0.000	0.000	30.946	1.345
L10	40.000-20.000	A	1.000	0.000	0.000	0.000	0.000	0.218
		B		0.000	0.000	0.000	15.840	1.572
		C		0.000	0.000	0.000	29.898	1.290
L11	20.000-4.330	A	1.000	0.000	0.000	0.000	0.000	0.171
		B		0.000	0.000	0.000	12.411	1.231
		C		0.000	0.000	0.000	23.425	1.011
L12	4.330-0.000	A	1.000	0.000	0.000	0.000	0.000	0.047
		B		0.000	0.000	0.000	3.429	0.340
		C		0.000	0.000	0.000	6.473	0.279

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L1	190.000-180.000	-0.299	0.173	-0.838	0.484
L2	180.000-140.000	-0.080	0.284	-0.553	0.655
L3	140.000-120.000	0.128	0.408	-0.280	0.894
L4	120.000-104.330	0.131	0.419	-0.293	0.947
L5	104.330-100.000	0.131	0.419	-0.290	0.942
L6	100.000-89.080	-0.083	0.532	-0.613	1.115
L7	89.080-80.000	-0.083	0.532	-0.608	1.110
L8	80.000-60.000	-0.085	0.543	-0.627	1.150
L9	60.000-40.000	-0.086	0.551	-0.633	1.174
L10	40.000-20.000	-0.086	0.551	-0.613	1.151
L11	20.000-4.330	-0.086	0.551	-0.613	1.151
L12	4.330-0.000	-0.086	0.551	-0.613	1.151

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Lightning Rod 5/8" x 4' on 4' Pole	C	From Leg	0.000	0.000	0.000	190.000	No Ice	1.465	1.465	0.066
(E)			0.000				1/2" Ice	2.131	2.131	0.089
			4.000				1" Ice	2.702	2.702	0.111
							2" Ice	3.805	3.805	0.175
							4" Ice	6.417	6.417	0.373
/										
DB589-A	A	From Leg	2.000	0.000	0.000	189.000	No Ice	2.763	2.763	0.012
(E)			0.000				1/2" Ice	4.170	4.170	0.033
			0.000				1" Ice	5.593	5.593	0.063
							2" Ice	8.490	8.490	0.150
							4" Ice	12.440	12.440	0.437
OGB4-900D	A	From Leg	3.000	0.000	0.000	189.000	└ 酒	0.785	0.785	0.010
(E)			0.000				1/2" Ice	1.028	1.028	0.016
			0.000				1" Ice	1.281	1.281	0.025
							2" Ice	1.814	1.814	0.053
							4" Ice	3.111	3.111	0.148
MT-485002 w/ Mount Pipe	C	From Leg	4.000	0.000	0.000	189.000	No Ice	1.572	0.473	0.011
(E)			0.000				1/2" Ice	1.797	0.681	0.022
			0.000				1" Ice	2.044	0.932	0.036
							2" Ice	2.587	1.512	0.075
							4" Ice	3.843	2.909	0.209
6' x 2" Mount Pipe	A	From Leg	2.000	0.000	0.000	189.000	No Ice	1.425	1.425	0.022
(E)			0.000				1/2" Ice	1.925	1.925	0.033
			0.000				1" Ice	2.294	2.294	0.048
							2" Ice	3.060	3.060	0.090
							4" Ice	4.702	4.702	0.231
6' x 2" Mount Pipe	A	From Leg	3.000	0.000	0.000	189.000	No Ice	1.425	1.425	0.022
(E)			0.000				1/2" Ice	1.925	1.925	0.033
			0.000				1" Ice	2.294	2.294	0.048
							2" Ice	3.060	3.060	0.090
							4" Ice	4.702	4.702	0.231
Side Arm Mount [SO 701-1]	A	From Leg	1.500	0.000	0.000	189.000	No Ice	0.850	1.670	0.065
(E)			0.000				1/2" Ice	1.140	2.340	0.079

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.000			1" Ice	1.430	3.010	0.093
						2" Ice	2.010	4.350	0.121
						4" Ice	3.170	7.030	0.177
/									
ERICSSON AIR 21 B2A	A	From Leg	4.000	0.000	181.000	No Ice	6.825	5.642	0.112
B4P w/ Mount Pipe			0.000			1/2" Ice	7.347	6.480	0.167
(R)			0.000			1" Ice	7.863	7.257	0.231
						2" Ice	8.926	8.864	0.383
						4" Ice	11.175	12.293	0.807
ERICSSON AIR 21 B2A	B	From Leg	4.000	0.000	181.000	No Ice	6.825	5.642	0.112
B4P w/ Mount Pipe			0.000			1/2" Ice	7.347	6.480	0.167
(R)			0.000			1" Ice	7.863	7.257	0.231
						2" Ice	8.926	8.864	0.383
						4" Ice	11.175	12.293	0.807
ERICSSON AIR 21 B2A	C	From Leg	4.000	0.000	181.000	No Ice	6.825	5.642	0.112
B4P w/ Mount Pipe			0.000			1/2" Ice	7.347	6.480	0.167
(R)			0.000			1" Ice	7.863	7.257	0.231
						2" Ice	8.926	8.864	0.383
						4" Ice	11.175	12.293	0.807
ERICSSON AIR 21 B4A	A	From Leg	4.000	0.000	181.000	No Ice	6.825	5.642	0.112
B2P w/ Mount Pipe			0.000			1/2" Ice	7.347	6.480	0.167
(R)			0.000			1" Ice	7.863	7.257	0.231
						2" Ice	8.926	8.864	0.383
						4" Ice	11.175	12.293	0.807
ERICSSON AIR 21 B4A	B	From Leg	4.000	0.000	181.000	No Ice	6.825	5.642	0.112
B2P w/ Mount Pipe			0.000			1/2" Ice	7.347	6.480	0.167
(R)			0.000			1" Ice	7.863	7.257	0.231
						2" Ice	8.926	8.864	0.383
						4" Ice	11.175	12.293	0.807
ERICSSON AIR 21 B4A	C	From Leg	4.000	0.000	181.000	No Ice	6.825	5.642	0.112
B2P w/ Mount Pipe			0.000			1/2" Ice	7.347	6.480	0.167
(R)			0.000			1" Ice	7.863	7.257	0.231
						2" Ice	8.926	8.864	0.383
						4" Ice	11.175	12.293	0.807
KRY 112 144/1	A	From Leg	4.000	0.000	181.000	No Ice	0.408	0.204	0.011
(R)			0.000			1/2" Ice	0.497	0.273	0.014
			0.000			1" Ice	0.594	0.351	0.019
						2" Ice	0.815	0.533	0.032
						4" Ice	1.359	0.999	0.082
KRY 112 144/1	B	From Leg	4.000	0.000	181.000	No Ice	0.408	0.204	0.011
(R)			0.000			1/2" Ice	0.497	0.273	0.014
			0.000			1" Ice	0.594	0.351	0.019
						2" Ice	0.815	0.533	0.032
						4" Ice	1.359	0.999	0.082
KRY 112 144/1	C	From Leg	4.000	0.000	181.000	No Ice	0.408	0.204	0.011
(R)			0.000			1/2" Ice	0.497	0.273	0.014
			0.000			1" Ice	0.594	0.351	0.019
						2" Ice	0.815	0.533	0.032
						4" Ice	1.359	0.999	0.082
(2) 6' x 2" Mount Pipe	A	From Leg	4.000	0.000	181.000	No Ice	1.425	1.425	0.022
(E)			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
						4" Ice	4.702	4.702	0.231
(2) 6' x 2" Mount Pipe	B	From Leg	4.000	0.000	181.000	No Ice	1.425	1.425	0.022
(E)			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	3.060	3.060	0.090
						4" Ice	4.702	4.702	0.231
(2) 6' x 2" Mount Pipe	C	From Leg	4.000	0.000	181.000	No Ice	1.425	1.425	0.022
(E)			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
						4" Ice	4.702	4.702	0.231
Platform Mount [LP 405-1]	C	None		0.000	181.000	No Ice	20.800	20.800	1.800
(E)						1/2" Ice	28.100	28.100	2.066
						1" Ice	35.400	35.400	2.332
						2" Ice	50.000	50.000	2.864
						4" Ice	79.200	79.200	3.928
/									
(2) LPA-80080/6CFx5 w/	A	From Leg	4.000	0.000	160.000	No Ice	4.349	10.513	0.043
Mount Pipe			0.000			1/2" Ice	4.795	11.562	0.105
(E)			0.000			1" Ice	5.246	12.489	0.177
						2" Ice	6.171	14.396	0.349
						4" Ice	8.113	18.425	0.824
(2) LPA-80080/6CFx5 w/	C	From Leg	4.000	0.000	160.000	No Ice	4.349	10.513	0.043
Mount Pipe			0.000			1/2" Ice	4.795	11.562	0.105
(E)			0.000			1" Ice	5.246	12.489	0.177
						2" Ice	6.171	14.396	0.349
						4" Ice	8.113	18.425	0.824
BXA-70063-6CF-2 w/ Mount	A	From Leg	4.000	0.000	160.000	No Ice	7.969	5.801	0.042
Pipe			0.000			1/2" Ice	8.609	6.953	0.100
(R)			0.000			1" Ice	9.216	7.819	0.170
						2" Ice	10.459	9.601	0.335
						4" Ice	13.066	13.366	0.803
BXA-70063-6CF-2 w/ Mount	B	From Leg	4.000	0.000	160.000	No Ice	7.969	5.801	0.042
Pipe			0.000			1/2" Ice	8.609	6.953	0.100
(R)			0.000			1" Ice	9.216	7.819	0.170
						2" Ice	10.459	9.601	0.335
						4" Ice	13.066	13.366	0.803
BXA-70063-6CF-2 w/ Mount	C	From Leg	4.000	0.000	160.000	No Ice	7.969	5.801	0.042
Pipe			0.000			1/2" Ice	8.609	6.953	0.100
(R)			0.000			1" Ice	9.216	7.819	0.170
						2" Ice	10.459	9.601	0.335
						4" Ice	13.066	13.366	0.803
BXA-171085-12BF-2 w/	A	From Leg	4.000	0.000	160.000	No Ice	4.971	5.228	0.040
Mount Pipe			0.000			1/2" Ice	5.521	6.389	0.083
(R)			0.000			1" Ice	6.036	7.261	0.137
						2" Ice	7.091	9.046	0.271
						4" Ice	9.359	12.817	0.671
BXA-171063-12BF w/	B	From Leg	4.000	0.000	160.000	No Ice	4.971	5.228	0.040
Mount Pipe			0.000			1/2" Ice	5.521	6.389	0.083
(R)			0.000			1" Ice	6.036	7.261	0.137
						2" Ice	7.091	9.046	0.271
						4" Ice	9.359	12.817	0.671
BXA-171085-12BF-2 w/	C	From Leg	4.000	0.000	160.000	No Ice	4.971	5.228	0.040
Mount Pipe			0.000			1/2" Ice	5.521	6.389	0.083
(R)			0.000			1" Ice	6.036	7.261	0.137
						2" Ice	7.091	9.046	0.271
						4" Ice	9.359	12.817	0.671
(2) LPA-80063-6CF-EDIN	B	From Leg	4.000	0.000	160.000	No Ice	10.745	10.700	0.052
w/ Mount Pipe			0.000			1/2" Ice	11.412	11.967	0.143
(R)			0.000			1" Ice	12.045	12.948	0.246
						2" Ice	13.341	14.963	0.480

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice	16.054	19.208	1.095
Platform Mount [LP 303-1]	C	None		0.000	160.000	No Ice	14.660	14.660	1.250
(E)						1/2" Ice	18.870	18.870	1.481
						1" Ice	23.080	23.080	1.713
						2" Ice	31.500	31.500	2.175
						4" Ice	48.340	48.340	3.101
/									
DB205-A	A	From Leg	3.000	0.000	158.000	No Ice	1.200	1.200	0.038
(E)			0.000			1/2" Ice	2.160	2.160	0.049
			0.000			1" Ice	3.120	3.120	0.061
						2" Ice	5.040	5.040	0.084
						4" Ice	8.880	8.880	0.129
SRL-224NM-4	B	From Leg	3.000	0.000	158.000	No Ice	2.600	2.600	0.035
(E)			0.000			1/2" Ice	4.680	4.680	0.045
			0.000			1" Ice	6.760	6.760	0.056
						2" Ice	10.920	10.920	0.077
						4" Ice	19.240	19.240	0.119
Side Arm Mount [SO 701-1]	A	From Leg	1.500	0.000	158.000	No Ice	0.850	1.670	0.065
(E)			0.000			1/2" Ice	1.140	2.340	0.079
			0.000			1" Ice	1.430	3.010	0.093
						2" Ice	2.010	4.350	0.121
						4" Ice	3.170	7.030	0.177
Side Arm Mount [SO 701-1]	B	From Leg	1.500	0.000	158.000	No Ice	0.850	1.670	0.065
(E)			0.000			1/2" Ice	1.140	2.340	0.079
			0.000			1" Ice	1.430	3.010	0.093
						2" Ice	2.010	4.350	0.121
						4" Ice	3.170	7.030	0.177
4' x 2" Pipe Mount	A	From Leg	3.000	0.000	158.000	No Ice	0.866	0.866	0.015
(E)			0.000			1/2" Ice	1.111	1.111	0.022
			0.000			1" Ice	1.365	1.365	0.032
						2" Ice	1.901	1.901	0.062
						4" Ice	3.228	3.228	0.161
4' x 2" Pipe Mount	B	From Leg	3.000	0.000	158.000	No Ice	0.866	0.866	0.015
(E)			0.000			1/2" Ice	1.111	1.111	0.022
			0.000			1" Ice	1.365	1.365	0.032
						2" Ice	1.901	1.901	0.062
						4" Ice	3.228	3.228	0.161
/									
(2) SBNH-1D6565C w/	A	From Leg	4.000	0.000	151.000	No Ice	11.644	9.842	0.094
Mount Pipe			0.000			1/2" Ice	12.365	11.366	0.180
(E)			0.000			1" Ice	13.095	12.914	0.281
						2" Ice	14.553	15.267	0.516
						4" Ice	17.825	20.139	1.160
(3) 7770.00 w/ Mount Pipe	C	From Leg	4.000	0.000	151.000	No Ice	6.119	4.254	0.055
(E)			0.000			1/2" Ice	6.626	5.014	0.101
			0.000			1" Ice	7.128	5.711	0.155
						2" Ice	8.164	7.155	0.287
						4" Ice	10.360	10.412	0.665
AM-X-CD-16-65-00T-RET	A	From Leg	4.000	0.000	151.000	No Ice	8.498	6.304	0.074
w/ Mount Pipe			0.000			1/2" Ice	9.149	7.479	0.136
(E)			0.000			1" Ice	9.767	8.368	0.210
						2" Ice	11.031	10.179	0.385
						4" Ice	13.679	14.024	0.874
AM-X-CD-16-65-00T-RET	B	From Leg	4.000	0.000	151.000	No Ice	8.498	6.304	0.074
w/ Mount Pipe			0.000			1/2" Ice	9.149	7.479	0.136
(P)			0.000			1" Ice	9.767	8.368	0.210
						2" Ice	11.031	10.179	0.385

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	13.679	14.024	0.874
(2) SBNH-1D6565C w/ Mount Pipe (P)	B	From Leg	4.000 0.000 0.000	0.000	151.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.644 12.365 13.095 14.553 17.825	9.842 11.366 12.914 15.267 20.139	0.094 0.180 0.281 0.516 1.160
(2) CM1007-DBPXBC-003 (P)	A	From Leg	4.000 0.000 0.000	0.000	151.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.429 0.523 0.626 0.858 1.425	0.156 0.214 0.280 0.438 0.858	0.007 0.010 0.015 0.029 0.082
(2) CM1007-DBPXBC-003 (P)	B	From Leg	4.000 0.000 0.000	0.000	151.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.429 0.523 0.626 0.858 1.425	0.156 0.214 0.280 0.438 0.858	0.007 0.010 0.015 0.029 0.082
(2) CM1007-DBPXBC-003 (P)	C	From Leg	4.000 0.000 0.000	0.000	151.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.429 0.523 0.626 0.858 1.425	0.156 0.214 0.280 0.438 0.858	0.007 0.010 0.015 0.029 0.082
(2) LGP21901 (P)	A	From Leg	4.000 0.000 0.000	0.000	151.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.270 0.343 0.425 0.616 1.101	0.184 0.248 0.322 0.494 0.943	0.006 0.008 0.011 0.022 0.066
(2) LGP21901 (P)	B	From Leg	4.000 0.000 0.000	0.000	151.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.270 0.343 0.425 0.616 1.101	0.184 0.248 0.322 0.494 0.943	0.006 0.008 0.011 0.022 0.066
(2) LGP21901 (P)	C	From Leg	4.000 0.000 0.000	0.000	151.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.270 0.343 0.425 0.616 1.101	0.184 0.248 0.322 0.494 0.943	0.006 0.008 0.011 0.022 0.066
(4) DTMABP7819VG12A (P)	A	From Leg	4.000 0.000 0.000	0.000	151.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.139 1.284 1.437 1.769 2.538	0.391 0.488 0.595 0.833 1.414	0.019 0.026 0.036 0.060 0.140
(2) DTMABP7819VG12A (P)	B	From Leg	4.000 0.000 0.000	0.000	151.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.139 1.284 1.437 1.769 2.538	0.391 0.488 0.595 0.833 1.414	0.019 0.026 0.036 0.060 0.140
Platform Mount [LP 403-1] (E)	C	None		0.000	151.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	18.850 24.300 29.750 40.650 62.450	18.850 24.300 29.750 40.650 62.450	1.500 1.797 2.093 2.686 3.872
/									
(2) RRU-11 (P)	A	From Leg	1.000 0.000 0.000	0.000	148.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.912 2.102 2.301 2.725 3.676	1.472 1.645 1.827 2.218 3.102	0.044 0.060 0.078 0.123 0.254

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) RRU-11	B	From Leg	1.000	0.000	148.000	No Ice	1.912	1.472	0.044
(P)			0.000			1/2" Ice	2.102	1.645	0.060
			0.000			1" Ice	2.301	1.827	0.078
						2" Ice	2.725	2.218	0.123
						4" Ice	3.676	3.102	0.254
(2) RRU-11	C	From Leg	1.000	0.000	148.000	No Ice	1.912	1.472	0.044
(P)			0.000			1/2" Ice	2.102	1.645	0.060
			0.000			1" Ice	2.301	1.827	0.078
						2" Ice	2.725	2.218	0.123
						4" Ice	3.676	3.102	0.254
DC6-48-60-18-8F	C	From Leg	1.000	0.000	148.000	No Ice	2.567	4.317	0.019
(P)			0.000			1/2" Ice	2.798	4.596	0.050
			0.000			1" Ice	3.038	4.885	0.085
						2" Ice	3.543	5.488	0.167
						4" Ice	4.658	6.797	0.383
(2) Pipe Mount [PM 601-3]	C	None		0.000	148.000	No Ice	4.390	4.390	0.195
(P)						1/2" Ice	5.480	5.480	0.237
						1" Ice	6.570	6.570	0.280
						2" Ice	8.750	8.750	0.365
						4" Ice	13.110	13.110	0.534
Pipe Mount [PM 601-1]	C	From Leg	0.500	0.000	148.000	No Ice	3.000	0.900	0.065
(P)			0.000			1/2" Ice	3.740	1.120	0.079
			0.000			1" Ice	4.480	1.340	0.093
						2" Ice	5.960	1.780	0.122
						4" Ice	8.920	2.660	0.178
/									
SRL-235-2	A	From Leg	3.000	0.000	132.000	No Ice	7.000	7.000	0.076
(E)			0.000			1/2" Ice	9.037	9.037	0.125
			0.000			1" Ice	11.092	11.092	0.187
						2" Ice	15.250	15.250	0.351
						4" Ice	22.255	22.255	0.836
6' x 2" Mount Pipe	A	From Leg	3.000	0.000	132.000	No Ice	1.425	1.425	0.022
(E)			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
						4" Ice	4.702	4.702	0.231
Side Arm Mount [SO 701-1]	A	From Leg	1.500	0.000	132.000	No Ice	0.850	1.670	0.065
(E)			0.000			1/2" Ice	1.140	2.340	0.079
			0.000			1" Ice	1.430	3.010	0.093
						2" Ice	2.010	4.350	0.121
						4" Ice	3.170	7.030	0.177
/									
DB205-A	A	From Leg	3.000	0.000	124.000	No Ice	1.200	1.200	0.038
(E)			0.000			1/2" Ice	2.160	2.160	0.049
			0.000			1" Ice	3.120	3.120	0.061
						2" Ice	5.040	5.040	0.084
						4" Ice	8.880	8.880	0.129
PCS 1900 TMA RX	A	From Leg	3.000	0.000	124.000	No Ice	0.628	0.617	0.018
(E)			0.000			1/2" Ice	0.744	0.732	0.023
			0.000			1" Ice	0.869	0.856	0.031
						2" Ice	1.145	1.131	0.052
						4" Ice	1.799	1.783	0.122
Side Arm Mount [SO 701-1]	A	From Leg	1.500	0.000	124.000	No Ice	0.850	1.670	0.065
(E)			0.000			1/2" Ice	1.140	2.340	0.079
			0.000			1" Ice	1.430	3.010	0.093
						2" Ice	2.010	4.350	0.121
						4" Ice	3.170	7.030	0.177

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
6' x 2" Mount Pipe	A	From Leg	3.000	0.000	124.000	No Ice	1.425	1.425	0.022
(E)			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
						4" Ice	4.702	4.702	0.231
/									
(3) DB844G90A-XY w/ Mount Pipe	A	From Leg	4.000	0.000	116.000	No Ice	3.299	4.921	0.032
(E)			0.000			1/2" Ice	3.690	5.596	0.070
			0.000			1" Ice	4.119	6.284	0.116
						2" Ice	5.007	7.712	0.228
						4" Ice	6.920	10.833	0.557
(3) DB844G90A-XY w/ Mount Pipe	B	From Leg	4.000	0.000	116.000	No Ice	3.299	4.921	0.032
(E)			0.000			1/2" Ice	3.690	5.596	0.070
			0.000			1" Ice	4.119	6.284	0.116
						2" Ice	5.007	7.712	0.228
						4" Ice	6.920	10.833	0.557
HORIZON DUO	A	From Leg	4.000	0.000	116.000	No Ice	0.547	0.343	0.007
(E)			0.000			1/2" Ice	0.648	0.426	0.012
			0.000			1" Ice	0.759	0.518	0.018
						2" Ice	1.005	0.728	0.036
						4" Ice	1.601	1.252	0.097
HORIZON DUO	B	From Leg	4.000	0.000	116.000	No Ice	0.547	0.343	0.007
(E)			0.000			1/2" Ice	0.648	0.426	0.012
			0.000			1" Ice	0.759	0.518	0.018
						2" Ice	1.005	0.728	0.036
						4" Ice	1.601	1.252	0.097
840 10054 w/ Mount Pipe	A	From Leg	4.000	0.000	116.000	No Ice	5.413	2.385	0.051
(E)			0.000			1/2" Ice	5.833	2.917	0.086
			0.000			1" Ice	6.263	3.466	0.128
						2" Ice	7.156	4.614	0.230
						4" Ice	9.093	7.316	0.533
840 10054 w/ Mount Pipe	B	From Leg	4.000	0.000	116.000	No Ice	5.413	2.385	0.051
(E)			0.000			1/2" Ice	5.833	2.917	0.086
			0.000			1" Ice	6.263	3.466	0.128
						2" Ice	7.156	4.614	0.230
						4" Ice	9.093	7.316	0.533
840 10054 w/ Mount Pipe	C	From Leg	4.000	0.000	116.000	No Ice	5.413	2.385	0.051
(E)			0.000			1/2" Ice	5.833	2.917	0.086
			0.000			1" Ice	6.263	3.466	0.128
						2" Ice	7.156	4.614	0.230
						4" Ice	9.093	7.316	0.533
WIMAX DAP HEAD	A	From Leg	4.000	0.000	116.000	No Ice	1.804	0.778	0.033
(E)			0.000			1/2" Ice	1.988	0.918	0.045
			0.000			1" Ice	2.180	1.067	0.058
						2" Ice	2.589	1.391	0.094
						4" Ice	3.512	2.143	0.201
WIMAX DAP HEAD	B	From Leg	4.000	0.000	116.000	No Ice	1.804	0.778	0.033
(E)			0.000			1/2" Ice	1.988	0.918	0.045
			0.000			1" Ice	2.180	1.067	0.058
						2" Ice	2.589	1.391	0.094
						4" Ice	3.512	2.143	0.201
WIMAX DAP HEAD	C	From Leg	4.000	0.000	116.000	No Ice	1.804	0.778	0.033
(E)			0.000			1/2" Ice	1.988	0.918	0.045
			0.000			1" Ice	2.180	1.067	0.058
						2" Ice	2.589	1.391	0.094
						4" Ice	3.512	2.143	0.201
Platform Mount [LP 405-1]	C	None		0.000	116.000	No Ice	20.800	20.800	1.800

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(E)						1/2" Ice	28.100	28.100	2.066
						1" Ice	35.400	35.400	2.332
						2" Ice	50.000	50.000	2.864
						4" Ice	79.200	79.200	3.928
/									
742 213	A	From Leg	4.000	0.000	100.000	No Ice	5.135	2.869	0.022
(E)			0.000			1/2" Ice	5.609	3.483	0.047
			0.000			1" Ice	6.090	3.946	0.078
						2" Ice	7.074	4.893	0.158
						4" Ice	9.130	6.876	0.394
742 213	B	From Leg	4.000	0.000	100.000	No Ice	5.135	2.869	0.022
(E)			0.000			1/2" Ice	5.609	3.483	0.047
			0.000			1" Ice	6.090	3.946	0.078
						2" Ice	7.074	4.893	0.158
						4" Ice	9.130	6.876	0.394
742 213	C	From Leg	4.000	0.000	100.000	No Ice	5.135	2.869	0.022
(E)			0.000			1/2" Ice	5.609	3.483	0.047
			0.000			1" Ice	6.090	3.946	0.078
						2" Ice	7.074	4.893	0.158
						4" Ice	9.130	6.876	0.394
Pipe Mount [PM 601-3]	C	None		0.000	100.000	No Ice	4.390	4.390	0.195
(E)						1/2" Ice	5.480	5.480	0.237
						1" Ice	6.570	6.570	0.280
						2" Ice	8.750	8.750	0.365
						4" Ice	13.110	13.110	0.534
/									
DB205-A	A	From Leg	3.000	0.000	90.000	No Ice	1.200	1.200	0.038
(E)			0.000			1/2" Ice	2.160	2.160	0.049
			0.000			1" Ice	3.120	3.120	0.061
						2" Ice	5.040	5.040	0.084
						4" Ice	8.880	8.880	0.129
DB205-A	B	From Leg	3.000	0.000	90.000	No Ice	1.200	1.200	0.038
(E)			0.000			1/2" Ice	2.160	2.160	0.049
			0.000			1" Ice	3.120	3.120	0.061
						2" Ice	5.040	5.040	0.084
						4" Ice	8.880	8.880	0.129
MT-485002 w/ Mount Pipe	B	From Leg	3.000	0.000	90.000	No Ice	1.572	0.473	0.011
(E)			0.000			1/2" Ice	1.797	0.681	0.022
			0.000			1" Ice	2.044	0.932	0.036
						2" Ice	2.587	1.512	0.075
						4" Ice	3.843	2.909	0.209
Side Arm Mount [SO 701-1]	A	From Leg	1.500	0.000	90.000	No Ice	0.850	1.670	0.065
(E)			0.000			1/2" Ice	1.140	2.340	0.079
			0.000			1" Ice	1.430	3.010	0.093
						2" Ice	2.010	4.350	0.121
						4" Ice	3.170	7.030	0.177
Side Arm Mount [SO 701-1]	B	From Leg	1.500	0.000	90.000	No Ice	0.850	1.670	0.065
(E)			0.000			1/2" Ice	1.140	2.340	0.079
			0.000			1" Ice	1.430	3.010	0.093
						2" Ice	2.010	4.350	0.121
						4" Ice	3.170	7.030	0.177
6' x 2" Mount Pipe	A	From Leg	3.000	0.000	90.000	No Ice	1.425	1.425	0.022
(E)			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
						4" Ice	4.702	4.702	0.231
/									

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
GPS_A	A	From Leg	2.000	0.000	87.000	No Ice	0.297	0.297	0.001
(E)			0.000			1/2" Ice	0.374	0.374	0.005
			0.000			1" Ice	0.459	0.459	0.010
						2" Ice	0.655	0.655	0.025
						4" Ice	1.151	1.151	0.079
GPS_A	B	From Leg	2.000	0.000	87.000	No Ice	0.297	0.297	0.001
(E)			0.000			1/2" Ice	0.374	0.374	0.005
			0.000			1" Ice	0.459	0.459	0.010
						2" Ice	0.655	0.655	0.025
						4" Ice	1.151	1.151	0.079
Side Arm Mount [SO 702-1]	A	From Leg	1.000	0.000	87.000	No Ice	1.000	1.430	0.027
(E)			0.000			1/2" Ice	1.000	2.050	0.038
			0.000			1" Ice	1.000	2.670	0.049
						2" Ice	1.000	3.910	0.071
						4" Ice	1.000	6.390	0.115
Side Arm Mount [SO 702-1]	B	From Leg	1.000	0.000	87.000	No Ice	1.000	1.430	0.027
(E)			0.000			1/2" Ice	1.000	2.050	0.038
			0.000			1" Ice	1.000	2.670	0.049
						2" Ice	1.000	3.910	0.071
						4" Ice	1.000	6.390	0.115
/									
SRL-235-2	A	From Leg	3.000	0.000	70.000	No Ice	7.000	7.000	0.076
(E)			0.000			1/2" Ice	9.037	9.037	0.125
			0.000			1" Ice	11.092	11.092	0.187
						2" Ice	15.250	15.250	0.351
						4" Ice	22.255	22.255	0.836
6' x 2" Mount Pipe	A	From Leg	3.000	0.000	70.000	No Ice	1.425	1.425	0.022
(E)			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
						4" Ice	4.702	4.702	0.231
Side Arm Mount [SO 701-1]	A	From Leg	1.500	0.000	70.000	No Ice	0.850	1.670	0.065
(E)			0.000			1/2" Ice	1.140	2.340	0.079
			0.000			1" Ice	1.430	3.010	0.093
						2" Ice	2.010	4.350	0.121
						4" Ice	3.170	7.030	0.177
/									
DB583	B	From Leg	3.000	0.000	58.000	No Ice	0.537	0.537	0.006
(E)			0.000			1/2" Ice	0.711	0.711	0.012
			0.000			1" Ice	0.894	0.894	0.019
						2" Ice	1.336	1.336	0.041
						4" Ice	2.392	2.392	0.116
4' x 2" Pipe Mount	B	From Leg	3.000	0.000	58.000	No Ice	0.866	0.866	0.015
(E)			0.000			1/2" Ice	1.111	1.111	0.022
			0.000			1" Ice	1.365	1.365	0.032
						2" Ice	1.901	1.901	0.062
						4" Ice	3.228	3.228	0.161
Side Arm Mount [SO 701-1]	B	From Leg	1.500	0.000	58.000	No Ice	0.850	1.670	0.065
(E)			0.000			1/2" Ice	1.140	2.340	0.079
			0.000			1" Ice	1.430	3.010	0.093
						2" Ice	2.010	4.350	0.121
						4" Ice	3.170	7.030	0.177
/									
DB909XVTE-M	C	From Leg	3.000	0.000	43.000	No Ice	2.301	2.301	0.024
(E)			0.000			1/2" Ice	2.622	2.622	0.047
			0.000			1" Ice	2.952	2.952	0.073
						2" Ice	3.733	3.733	0.139

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice	5.478	5.478	0.323
4' x 2" Pipe Mount (E)	C	From Leg	3.000 0.000 0.000	0.000	43.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.866 1.111 1.365 1.901 3.228	0.866 1.111 1.365 1.901 3.228	0.015 0.022 0.032 0.062 0.161
Side Arm Mount [SO 701-1] (E)	C	From Leg	1.500 0.000 0.000	0.000	43.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.850 1.140 1.430 2.010 3.170	1.670 2.340 3.010 4.350 7.030	0.065 0.079 0.093 0.121 0.177
/									
4' ICE SHIELDS (E)	A	From Leg	0.500 0.000 0.000	0.000	178.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.400 1.884 2.377 3.388 5.514	0.467 0.640 0.821 1.210 2.091	0.030 0.095 0.167 0.332 0.748
4' ICE SHIELDS (E)	A	From Leg	0.500 0.000 0.000	0.000	138.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.400 1.884 2.377 3.388 5.514	0.467 0.640 0.821 1.210 2.091	0.030 0.095 0.167 0.332 0.748
4' ICE SHIELDS (E)	A	From Leg	0.500 0.000 0.000	0.000	98.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.400 1.884 2.377 3.388 5.514	0.467 0.640 0.821 1.210 2.091	0.030 0.095 0.167 0.332 0.748
4' ICE SHIELDS (E)	B	From Leg	0.500 0.000 0.000	0.000	98.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.400 1.884 2.377 3.388 5.514	0.467 0.640 0.821 1.210 2.091	0.030 0.095 0.167 0.332 0.748
4' ICE SHIELDS (E)	C	From Leg	0.500 0.000 0.000	0.000	98.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.400 1.884 2.377 3.388 5.514	0.467 0.640 0.821 1.210 2.091	0.030 0.095 0.167 0.332 0.748
/									

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
VHLP2.5-10W (E)	A	Paraboloid w/Shroud (HP)	From Leg	4.000 0.000 0.000	0.000		116.000	2.917	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.681 7.069 7.456 8.230 9.779	0.048 0.084 0.120 0.193 0.338
VHLP2.5-10W (E)	B	Paraboloid w/Shroud (HP)	From Leg	4.000 0.000 0.000	0.000		116.000	2.917	No Ice 1/2" Ice 1" Ice 2" Ice	6.681 7.069 7.456 8.230	0.048 0.084 0.120 0.193

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft²	Weight K
									4" Ice	9.779	0.338
/											
HP2-102	A	Paraboloid	From	3.000	0.000		90.000	2.000	No Ice	3.142	0.025
(E)		w/Shroud (HP)	Leg	0.000					1/2" Ice	3.409	0.042
				0.000					1" Ice	3.676	0.060
									2" Ice	4.211	0.095
									4" Ice	5.280	0.165
/											

Load Combinations

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

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	190 - 180	33.255	31	1.595	0.015
L2	180 - 140	29.921	31	1.590	0.014
L3	140 - 120	17.453	31	1.243	0.009
L4	120 - 104.33	12.616	31	1.045	0.007
L5	104.33 - 100	9.434	31	0.885	0.005
L6	100 - 89.08	8.652	31	0.838	0.005
L7	89.08 - 80	6.855	31	0.730	0.004
L8	80 - 60	5.548	31	0.642	0.003
L9	60 - 40	3.183	31	0.480	0.002
L10	40 - 20	1.466	31	0.335	0.001
L11	20 - 4.33	0.380	31	0.178	0.001
L12	4.33 - 0	0.018	31	0.039	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
190.000	Lightning Rod 5/8" x 4' on 4' Pole	31	33.255	1.595	0.015	322820
189.000	DB589-A	31	32.922	1.595	0.015	322820
181.000	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	31	30.254	1.592	0.014	124679
178.000	4' ICE SHIELDS	31	29.254	1.584	0.014	50187
160.000	(2) LPA-80080/6CFx5 w/ Mount Pipe	31	23.365	1.459	0.011	7434
158.000	DB205-A	31	22.735	1.439	0.011	6778
151.000	(2) SBNH-1D6565C w/ Mount Pipe	31	20.587	1.364	0.010	5177
148.000	(2) RRU-11	31	19.700	1.331	0.010	4701
138.000	4' ICE SHIELDS	31	16.921	1.222	0.009	3979
132.000	SRL-235-2	31	15.396	1.162	0.008	4554
124.000	DB205-A	31	13.508	1.083	0.007	5727
116.000	VHLP2.5-10W	31	11.755	1.005	0.007	6038
100.000	742 213	31	8.652	0.838	0.005	5695
98.000	4' ICE SHIELDS	31	8.304	0.818	0.005	5829
90.000	HP2-102	31	6.996	0.739	0.004	5657
87.000	GPS_A	31	6.541	0.709	0.004	5833
70.000	SRL-235-2	31	4.282	0.556	0.003	7145
58.000	DB583	31	2.983	0.465	0.002	7493
43.000	DB909XVTE-M	31	1.683	0.356	0.001	7746

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	190 - 180	84.971	12	4.078	0.039
L2	180 - 140	76.452	12	4.065	0.036
L3	140 - 120	44.620	12	3.179	0.023
L4	120 - 104.33	32.262	12	2.671	0.018
L5	104.33 - 100	24.128	12	2.263	0.013
L6	100 - 89.08	22.129	12	2.144	0.012
L7	89.08 - 80	17.534	12	1.866	0.010

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L8	80 - 60	14.193	12	1.642	0.008
L9	60 - 40	8.143	12	1.227	0.005
L10	40 - 20	3.750	12	0.856	0.003
L11	20 - 4.33	0.972	12	0.457	0.002
L12	4.33 - 0	0.045	12	0.100	0.000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
190.000	Lightning Rod 5/8" x 4' on 4' Pole	12	84.971	4.078	0.039	135694
189.000	DB589-A	12	84.119	4.079	0.039	135694
181.000	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	12	77.303	4.070	0.036	51292
178.000	4' ICE SHIELDS	12	74.749	4.050	0.035	20192
160.000	(2) LPA-80080/6CFx5 w/ Mount Pipe	12	59.714	3.728	0.029	2936
158.000	DB205-A	12	58.105	3.677	0.029	2677
151.000	(2) SBNH-1D6565C w/ Mount Pipe	12	52.624	3.487	0.026	2045
148.000	(2) RRU-11	12	50.359	3.402	0.026	1857
138.000	4' ICE SHIELDS	12	43.261	3.125	0.023	1570
132.000	SRL-235-2	12	39.365	2.970	0.021	1794
124.000	DB205-A	12	34.541	2.770	0.019	2251
116.000	VHLP2.5-10W	12	30.061	2.570	0.017	2372
100.000	742 213	12	22.129	2.144	0.012	2235
98.000	4' ICE SHIELDS	12	21.241	2.091	0.012	2287
90.000	HP2-102	12	17.896	1.889	0.010	2219
87.000	GPS_A	12	16.732	1.814	0.009	2287
70.000	SRL-235-2	12	10.953	1.423	0.006	2798
58.000	DB583	12	7.631	1.189	0.005	2932
43.000	DB909XVTE-M	12	4.307	0.912	0.003	3030

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	190 - 180 (1)	P18x3/8	10.000	0.000	0.0	25.200	20.764	-3.334	523.252	0.006
L2	180 - 140 (2)	P24x3/8	40.000	0.000	0.0	25.200	27.833	-12.612	701.380	0.018
L3	140 - 120 (3)	P36x3/8	20.000	0.000	0.0	23.696	41.970	-16.637	994.507	0.017
L4	120 - 104.33 (4)	P42x3/8	15.670	0.000	0.0	22.711	49.038	-22.337	1113.690	0.020
L5	104.33 - 100 (5)	P42x3/8 [0.449926]	4.330	0.000	0.0	23.061	58.730	-23.454	1354.400	0.017
L6	100 - 89.08 (6)	P48x3/8	10.920	0.000	0.0	21.972	56.107	-26.822	1232.770	0.022
L7	89.08 - 80 (7)	P48x3/8 [0.466244]	9.080	0.000	0.0	22.320	69.625	-29.597	1554.040	0.019
L8	80 - 60 (8)	P54x3/8 [0.486321]	20.000	0.000	0.0	21.755	81.759	-36.530	1778.650	0.021
L9	60 - 40 (9)	P60x3/8 [0.516129]	20.000	0.000	0.0	21.332	96.451	-44.498	2057.470	0.022
L10	40 - 20 (10)	P60x1/2 [0.600147]	20.000	0.000	0.0	22.629	111.994	-53.408	2534.310	0.021
L11	20 - 4.33 (11)	P60x5/8	15.670	0.000	0.0	23.696	116.583	-60.763	2762.520	0.022
L12	4.33 - 0 (12)	P60x5/8 [0.67691]	4.330	0.000	0.0	23.872	126.155	-62.933	3011.580	0.021

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	190 - 180 (1)	P18x3/8	11.153	1.493	27.720	0.054	0.000	0.000	27.720	0.000
L2	180 - 140 (2)	P24x3/8	405.987	30.099	27.720	1.086	0.000	0.000	27.720	0.000
L3	140 - 120 (3)	P36x3/8	792.825	25.717	23.696	1.085	0.000	0.000	23.696	0.000
L4	120 - 104.33 (4)	P42x3/8	1165.400	27.650	22.711	1.217	0.000	0.000	22.711	0.000
L5	104.33 - 100 (5)	P42x3/8 [0.449926]	1276.200	25.372	23.061	1.100	0.000	0.000	23.061	0.000
L6	100 - 89.08 (6)	P48x3/8	1573.483	28.486	21.972	1.296	0.000	0.000	21.972	0.000
L7	89.08 - 80 (7)	P48x3/8 [0.466244]	1835.325	26.877	22.320	1.204	0.000	0.000	22.320	0.000
L8	80 - 60 (8)	P54x3/8 [0.486321]	2450.542	27.127	21.755	1.247	0.000	0.000	21.755	0.000
L9	60 - 40 (9)	P60x3/8 [0.516129]	3116.342	26.297	21.332	1.233	0.000	0.000	21.332	0.000
L10	40 - 20 (10)	P60x1/2 [0.600147]	3826.075	27.883	22.629	1.232	0.000	0.000	22.629	0.000
L11	20 - 4.33 (11)	P60x5/8	4407.175	30.879	23.696	1.303	0.000	0.000	23.696	0.000
L12	4.33 - 0 (12)	P60x5/8 [0.67691]	4571.342	29.650	23.872	1.242	0.000	0.000	23.872	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	190 - 180 (1)	P18x3/8	4.312	0.415	16.800	0.025	1.010	0.068	16.800	0.004
L2	180 - 140 (2)	P24x3/8	18.005	1.294	16.800	0.077	3.581	0.133	16.800	0.008
L3	140 - 120 (3)	P36x3/8	20.689	0.986	16.800	0.059	5.829	0.095	11.901	0.008
L4	120 - 104.33 (4)	P42x3/8	25.361	1.034	16.800	0.062	9.320	0.111	9.619	0.011
L5	104.33 - 100 (5)	P42x3/8 [0.449926]	25.807	0.879	15.970	0.055	9.308	0.093	12.412	0.007
L6	100 - 89.08 (6)	P48x3/8	28.222	1.006	16.800	0.060	10.067	0.091	8.021	0.011
L7	89.08 - 80 (7)	P48x3/8 [0.466244]	29.403	0.845	15.890	0.053	10.460	0.077	10.716	0.007
L8	80 - 60 (8)	P54x3/8 [0.486321]	32.087	0.785	15.793	0.050	11.871	0.066	10.162	0.006
L9	60 - 40 (9)	P60x3/8 [0.516129]	34.555	0.717	15.637	0.046	11.135	0.047	10.115	0.005
L10	40 - 20 (10)	P60x1/2 [0.600147]	36.426	0.650	16.007	0.041	11.041	0.040	12.213	0.003
L11	20 - 4.33 (11)	P60x5/8	37.762	0.648	16.800	0.039	10.968	0.038	12.848	0.003
L12	4.33 - 0 (12)	P60x5/8 [0.67691]	38.114	0.604	16.404	0.037	10.949	0.036	14.196	0.003

Pole Interaction Design Data

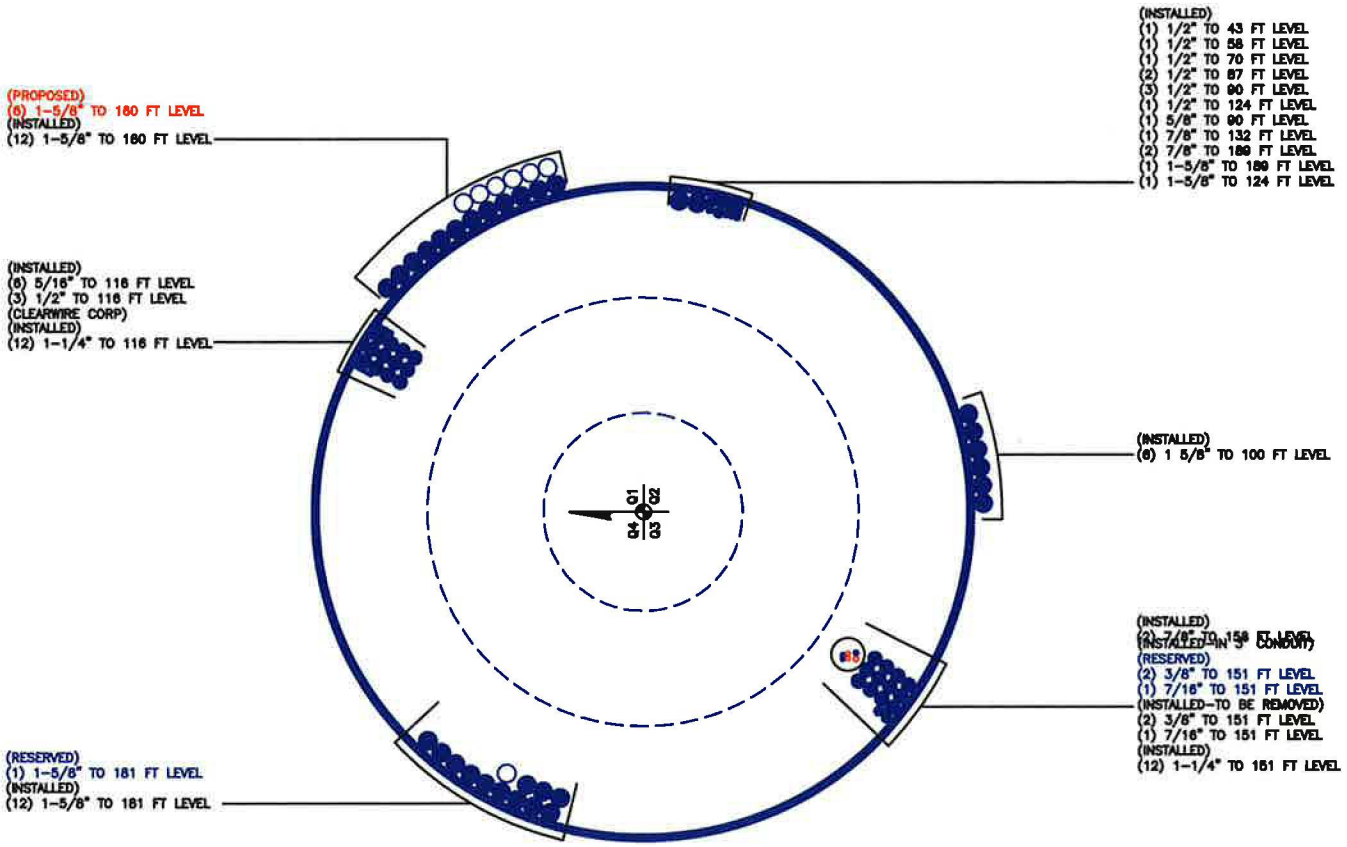
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	190 - 180 (1)	0.006	0.054	0.000	0.025	0.004	0.061 ✔	1.333	H1-3+VT ✔
L2	180 - 140 (2)	0.018	1.086	0.000	0.077	0.008	1.111 ✔	1.333	H1-3+VT ✔
L3	140 - 120 (3)	0.017	1.085	0.000	0.059	0.008	1.106 ✔	1.333	H1-3+VT ✔
L4	120 - 104.33 (4)	0.020	1.217	0.000	0.062	0.011	1.243 ✔	1.333	H1-3+VT ✔
L5	104.33 - 100 (5)	0.017	1.100	0.000	0.055	0.007	1.121 ✔	1.333	H1-3+VT ✔
L6	100 - 89.08 (6)	0.022	1.296	0.000	0.060	0.011	1.323 ✔	1.333	H1-3+VT ✔
L7	89.08 - 80 (7)	0.019	1.204	0.000	0.053	0.007	1.227 ✔	1.333	H1-3+VT ✔
L8	80 - 60 (8)	0.021	1.247	0.000	0.050	0.006	1.271 ✔	1.333	H1-3+VT ✔
L9	60 - 40 (9)	0.022	1.233	0.000	0.046	0.005	1.257 ✔	1.333	H1-3+VT ✔
L10	40 - 20 (10)	0.021	1.232	0.000	0.041	0.003	1.255 ✔	1.333	H1-3+VT ✔
L11	20 - 4.33 (11)	0.022	1.303	0.000	0.039	0.003	1.327 ✔	1.333	H1-3+VT ✔
L12	4.33 - 0 (12)	0.021	1.242	0.000	0.037	0.003	1.264 ✔	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	190 - 180	Pole	P18x3/8	1	-3.334	697.495	4.5	Pass
L2	180 - 140	Pole	P24x3/8	2	-12.612	934.940	82.8	Pass
L3	140 - 120	Pole	P36x3/8	3	-16.637	1325.678	82.6	Pass
L4	120 - 104.33	Pole	P42x3/8	4	-22.337	1484.549	92.3	Pass
L5	104.33 - 100	Pole	P42x3/8 [0.449926]	5	-23.454	1805.415	85.2	Pass
L6	100 - 89.08	Pole	P48x3/8	6	-26.822	1643.282	97.9	Pass
L7	89.08 - 80	Pole	P48x3/8 [0.466244]	7	-29.597	2071.535	93.3	Pass
L8	80 - 60	Pole	P54x3/8 [0.486321]	8	-36.530	2370.940	96.8	Pass
L9	60 - 40	Pole	P60x3/8 [0.516129]	9	-44.498	2742.607	96.0	Pass
L10	40 - 20	Pole	P60x1/2 [0.600147]	10	-53.408	3378.235	95.4	Pass
L11	20 - 4.33	Pole	P60x5/8	11	-60.763	3682.439	99.2	Pass
L12	4.33 - 0	Pole	P60x5/8 [0.67691]	12	-62.933	4014.436	95.4	Pass
							Summary	
						Pole (L11)	99.2	Pass
						RATING =	**99.2**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 826217 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

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

Site Data

BU#: *826217*
Site Name: *Newington ,CT*
App #: *178224: Rev:9*

Pole Manufacturer:	Pirod

Bolt Data			
Qty:	16		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	Bolt Fty: 44.00
N/A:		<-- Disregard	
Circle (in.):	21		

Plate Data		
Diam:	24	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	3.53	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	18	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Reactions		
Moment:	11.153	ft-kips
Axial:	3.334	kips
Shear:	4.312	kips
Elevation:	180	feet

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

Flange Bolt Results

Bolt Tension Capacity, **B**:	46.07	kips	Rigid
Max Bolt directly applied T:	1.38	Kips	Service, ASD
Min. PL "tc" for **B** cap. **w/o** Pry:	1.474	in	Fty*ASIF
Min PL "treq" for actual **T w/ Pry**:	0.196	in	
Min PL "t1" for actual **T w/o Pry**:	0.256	in	
T allowable with Prying:	41.75	kips	0≤α'≤1 case
Prying Force, Q:	0.00	kips	
Total Bolt Tension=T+Q:	1.38	kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	3.0%	**Pass**	

Exterior Flange Plate Results — Flexural Check

Compression Side Plate Stress:	Rohn/Pirod, OK	Rigid
Allowable Plate Stress:	36.0 ksi	Service ASD
Compression Plate Stress Ratio:	Rohn/Pirod, OK	0.75*Fy*ASIF
No Prying		Comp. Y.L. Length: 10.82
Tension Side Stress Ratio, (treq/t)^2:	2.5% **Pass**	

n/a

Stiffener Results	N/A for Rohn / Pirod
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A
Pole Results	
Pole Punching Shear Check:	N/A

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

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

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

Site Data

BU#: *826217*
Site Name: *Newington ,CT*
App #: *178224: Rev:9*

Pole Manufacturer:	Pirod

Bolt Data			
Qty:	24		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	Bolt Fty: 44.00
N/A:		<-- Disregard	
Circle (in.):	27		

Plate Data		
Diam:	36.375	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	-17.00	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	36	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Reactions		
Moment:	405.978	ft-kips
Axial:	12.612	kips
Shear:	18.005	kips
Elevation:	140	feet

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

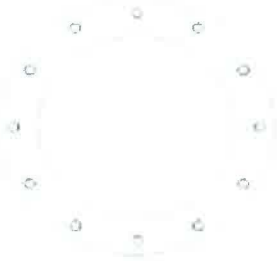
Flange Bolt Results

		Non-Rigid
Bolt Tension Capacity, **B**:	46.07 kips	Service, ASD
Max Bolt directly applied T:	29.55 Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	1.503 in	
Min PL "treq" for actual **T w/ Pry**:	0.838 in	
Min PL "t1" for actual **T w/o Pry**:	1.204 in	
T allowable with Prying:	39.05 kips	0≤α'≤1 case
Prying Force, Q:	0.00 kips	
Total Bolt Tension=T+Q:	29.55 kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	64.1% **Pass**	

Exterior Flange Plate Results	Flexural Check	Non-Rigid
Compression Side Plate Stress:	Rohn/Pirod, OK	Service ASD
Allowable Plate Stress:	36.0 ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	Rohn/Pirod, OK	Comp. Y.L. Length:
No Prying		#NUM!
Tension Side Stress Ratio, (treq/t)^2:	45.0% **Pass**	

n/a

Stiffener Results	N/A for Rohn / Pirod
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A
Pole Results	
Pole Punching Shear Check:	N/A



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

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

PROJECT	**87581.002.01 - Newington, CT - Crown Castle**				
SUBJECT	**Sabre - Bridge Stiffeners @ 120 ft**				
DATE	**05/05/13**	PAGE	1	OF	1

B&T Engineering, Inc.
1325 E. 15th St., Suite 202
Tulsa, OK 74120
(918) 587-4630

SSC

Global Section Properties:

Step Width	3.00 in		Axial Load	16.64 k
Pole Thickness	0.38 in		Number of BS	3
Pole Grade	42.00 ksi		Bolt Circle	39
BS Material Grade	65.00 ksi		Number of Bolts	28
BS Width	4.50 in		Bolt Size	1
BS Thickness	1.00 in			
BS Height	128.00 in			
Gap	6.00 in		Distance Between BS Welded Sections	
I	7314.58 in^4		Global MOI, Taken from AutoCAD	
Moment	792.83 k-ft		Moment at Flange Under Consideration	
Ybar	21.50 in		Dist. CL Pole to CL BS	
S	340.21 in^3		Global Section Modulus; I/Ybar	
fb	27.96 ksi		M/S	
Area	4.50 in^2		BS Cross Sectional Area Below Flange	
P	125.84 k		Load to BS	

Check Bridge Stiffener Span:

Lu	16.00 in
Iy	0.38 in^4
A	4.50 in^2
ry	0.2887 in
Cc	93.84414701
kl/r	55.42562584
Fa	28.81 ksi
Fa w/ 1/3 Increase	38.42 ksi
fb	27.96 ksi

72.79%

Moment to Existing Bolt Group:

S_{BG} =	375.11 in^3	# Bolts Acting	7
ft =	25.36 ksi		
Ab =	.785 in^2		
T =	139.44 k		
Arm =	39.00 ksi		
M_{EQ} =	453.2 k-ft	**<-------Insert into Crown Spreadsheet**	

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

Site Data

BU#: *826217*
Site Name: *Newington ,CT*
App #: *178224: Rev:9*

Pole Manufacturer:	Other

Reactions		
Moment:	453.2	ft-kips
Axial:	16.637	kips
Shear:	20.689	kips
Elevation:	120	feet

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

Bolt Data			
Qty:	28		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	Bolt Fty: 44.00
N/A:		<-- Disregard	
Circle (in.):	39		

Plate Data		
Diam:	42	in
Thick, t:	1	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	4.04	in

Stiffener Data (Welding at Both Sides)		
Config:	2	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	3	in
Height:	6	in
Thick:	0.5	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	36	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Flange Bolt Results

			Rigid
Bolt Tension Capacity, **B**:	46.07	kips	Service, ASD
Max Bolt directly applied T:	19.33	Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	1.379	in	
Min PL "treq" for actual **T w/ Pry**:	0.678	in	
Min PL "t1" for actual **T w/o Pry**:	0.893	in	
T allowable with Prying:	38.79	kips	0≤α'≤1 case
Prying Force, Q:	0.00	kips	
Total Bolt Tension=T+Q:	19.33	kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	42.0%	**Pass**	

Exterior Flange Plate Results Flexural Check

			Rigid
Compression Side Plate Stress:	28.8	ksi	Service ASD
Allowable Plate Stress:	36.0	ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	79.9%	**Pass**	Comp. Y.L. Length:
No Prying			15.00
Tension Side Stress Ratio, (treq/t)^2:	45.9%	**Pass**	

b/Le>2, Stiffeners are not fully effective

Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a

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

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

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

Site Data

BU#: *826217*
Site Name: *Newington ,CT*
App #: *178224: Rev:9*

Manufacturer:	Other

Reactions		
Moment:	453.2	ft-kips
Axial:	16.637	kips
Shear:	20.689	kips
Exterior Flange Run, T+Q:	19.33	kips

Elevation: 120 feet

Bolt Data			
Qty:	28		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	Bolt Fty: 44.00
N/A:		<-- Disregard	
Circle:	39	in	

Interior Flange Bolt Results

Maximum Bolt Tension:	19.3	Kips, Ext. Flange T+Q
Allowable Tension:	46.1	Kips
Bolt Stress Ratio:	42.0%	**Pass**

Plate Data		
Plate Outer Diam:	41.25	in
Plate Inner Diam:	36	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	4.63	in

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	20.5	Kips, Ext. C= Interior C
Plate Stress:	19.1	ksi
Allowable Plate Stress:	36.0	ksi
Plate Stress Ratio:	53.2%	**Pass**

Stiffener Data (Welding at Both Sides)		
Config:	2	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	3	in
Height:	6	in
Thick:	0.5	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

b/Le>2, Stiffeners are not fully effective

Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a

Pole Data		
Pole OuterDiam:	42	in
Thick:	0.375	in
Pole Inner Diam:	41.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi

Stress Increase Factor		
ASIF:	1.333	

* 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

PROJECT	**87581.002.01 - Newington, CT - Crown Castle**				
SUBJECT	**Sabre - Bridge Stiffeners @ 100 ft**				
DATE	**05/05/13**	PAGE	1	OF	1

B&T Engineering, Inc.
1325 E. 15th St., Suite 202
Tulsa, OK 74120
(918) 587-4630

SSC

Global Section Properties:

Step Width	3.00 in		Axial Load	23.45 k
Pole Thickness	0.38 in		Number of BS	3
Pole Grade	42.00 ksi		Bolt Circle	45
BS Material Grade	65.00 ksi		Number of Bolts	32
BS Width	4.50 in		Bolt Size	1
BS Thickness	1.00 in			
BS Height	128.00 in			
Gap	6.00 in		Distance Between BS Welded Sections	
I	10426.97 in^4		Global MOI, Taken from AutoCAD	
Moment	1276.20 k-ft		Moment at Flange Under Consideration	
Ybar	24.50 in		Dist. CL Pole to CL BS	
S	425.59 in^3		Global Section Modulus; I/Ybar	
fb	35.98 ksi		M/S	
Area	4.50 in^2		BS Cross Sectional Area Below Flange	
P	161.93 k		Load to BS	

Check Bridge Stiffener Span:

Lu	16.00 in
Iy	0.38 in^4
A	4.50 in^2
ry	0.2887 in
Cc	93.84414701
kl/r	55.42562584
Fa	28.81 ksi
Fa w/ 1/3 Increase	38.42 ksi
fb	35.98 ksi

93.66%

Moment to Existing Bolt Group:

S_{BG} =	463.42 in^3	# Bolts Actin	8
ft =	33.05 ksi		
Ab =	.785 in^2		
T =	207.64 k		
Arm =	45.00 ksi		
M_{EQ} =	778.6 k-ft	**<-------Insert into Crown Spreadsheet**	

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

Site Data

BU#: *826217*
Site Name: *Newington ,CT*
App #: *178224: Rev:9*

Pole Manufacturer:	Pirod

Bolt Data			
Qty:	32		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	Bolt Fty: 44.00
N/A:		<-- Disregard	
Circle (in.):	45		

Plate Data		
Diam:	48	in
Thick, t:	1	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	4.12	in

Stiffener Data (Welding at Both Sides)		
Config:	2	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	3	in
Height:	6	in
Thick:	0.5	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	42	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Reactions		
Moment:	778.6	ft-kips
Axial:	23.454	kips
Shear:	25.807	kips
Elevation:	100	feet

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

Flange Bolt Results

		Rigid
Bolt Tension Capacity, **B**:	46.07 kips	Service, ASD
Max Bolt directly applied T:	25.22 Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	1.365 in	
Min PL "treq" for actual **T w/ Pry**:	0.765 in	
Min PL "t1" for actual **T w/o Pry**:	1.010 in	
T allowable with Prying:	38.95 kips	0≤α'≤1 case
Prying Force, Q:	0.24 kips	
Total Bolt Tension=T+Q:	25.46 kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	55.3% **Pass**	

Exterior Flange Plate Results	Flexural Check	Rigid
Compression Side Plate Stress:	Rohn/Pirod, OK	Service ASD
Allowable Plate Stress:	36.0 ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	Rohn/Pirod, OK	Comp. Y.L. Length:
Prying Occurs, Plate Check:		16.16
Tension Side Stress Ratio, (treq/t)^2:	58.5% **Pass**	

b/Le>2, Stiffeners are not fully effective

Stiffener Results	N/A for Rohn / Pirod
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A
Pole Results	
Pole Punching Shear Check:	N/A

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

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

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

Site Data	
BU#:	826217
Site Name:	Newington ,CT
App #:	178224: Rev:9

Manufacturer:	Other

Reactions		
Moment:	778.6	ft-kips
Axial:	23.454	kips
Shear:	25.807	kips
Exterior Flange Run, T+Q:	25.46	kips

Elevation: 100 feet

Bolt Data			
Qty:	32		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	Bolt Fty:
N/A:		<-- Disregard	44.00
Circle:	45	in	

Plate Data		
Plate Outer Diam:	47.25	in
Plate Inner Diam:	42	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	4.64	in

Stiffener Data (Welding at Both Sides)		
Config:	2	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	3	in
Height:	6	in
Thick:	0.5	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Pole OuterDiam:	48	in
Thick:	0.375	in
Pole Inner Diam:	47.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi

Stress Increase Factor		
ASIF:	1.333	

Interior Flange Bolt Results

Maximum Bolt Tension:	25.5 Kips, Ext. Flange T+Q
Allowable Tension:	46.1 Kips
Bolt Stress Ratio:	55.3% **Pass**

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	26.7 Kips, Ext. C= Interior C
Plate Stress:	24.9 ksi
Allowable Plate Stress:	36.0 ksi
Plate Stress Ratio:	69.1% **Pass**

b/Le>2, Stiffeners are not fully effective

Stiffener Results

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

Pole Results

Pole Punching Shear Check:	n/a

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

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

PROJECT	**87581.002.01 - Newington, CT - Crown Castle**				
SUBJECT	**Sabre - Bridge Stiffeners @ 80 ft**				
DATE	**05/05/13**	PAGE	1	OF	1

B&T Engineering, Inc.
1325 E. 15th St., Suite 202
Tulsa, OK 74120
(918) 587-4630

SSC

Global Section Properties:

Step Width	3.00 in		Axial Load	29.60 k
Pole Thickness	0.38 in		Number of BS	3
Pole Grade	42.00 ksi		Bolt Circle	51
BS Material Grade	65.00 ksi		Number of Bolts	32
BS Width	6.50 in		Bolt Size	1
BS Thickness	1.25 in			
BS Height	128.00 in			
Gap	6.00 in		Distance Between BS Welded Sections	
I	17518.13 in^4		Global MOI, Taken from AutoCAD	
Moment	1835.33 k-ft		Moment at Flange Under Consideration	
Ybar	27.63 in		Dist. CL Pole to CL BS	
S	634.14 in^3		Global Section Modulus; I/Ybar	
fb	34.73 ksi		M/S	
Area	8.13 in^2		BS Cross Sectional Area Below Flange	
P	282.18 k		Load to BS	

Check Bridge Stiffener Span:

Lu	16.00 in
Iy	1.06 in^4
A	8.13 in^2
ry	0.3608 in
Cc	93.84414701
kl/r	44.34050067
Fa	31.54 ksi
Fa w/ 1/3 Increase	42.06 ksi
fb	34.73 ksi

82.58%

Moment to Existing Bolt Group:

S_{BG} =	686.99 in^3	# Bolts Actinç	8
ft =	32.06 ksi		
Ab =	.785 in^2		
T =	201.43 k		
Arm =	51.00 ksi		
M_{EQ} =	856.1 k-ft	**<-------Insert into Crown Spreadsheet**	

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

Site Data

BU#: *826217*
Site Name: *Newington ,CT*
App #: *178224: Rev:9*

Pole Manufacturer:	Other

Reactions		
Moment:	856.1	ft-kips
Axial:	29.597	kips
Shear:	29.403	kips
Elevation:	80	feet

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

Bolt Data			
Qty:	36		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	Bolt Fty: 44.00
N/A:		<-- Disregard	
Circle (in.):	51		

Plate Data		
Diam:	54	in
Thick, t:	1	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	4.19	in

Stiffener Data (Welding at Both Sides)		
Config:	2	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	3	in
Height:	6	in
Thick:	0.5	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	48	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Flange Bolt Results

Bolt Tension Capacity, **B**:	46.07	kips	Rigid
Max Bolt directly applied T:	21.56	Kips	Service, ASD
Min. PL "tc" for **B** cap. **w/o** Pry:	1.354	in	Fty*ASIF
Min PL "treq" for actual **T w/ Pry**:	0.701	in	
Min PL "t1" for actual **T w/o Pry**:	0.926	in	
T allowable with Prying:	39.09	kips	0≤α'≤1 case
Prying Force, Q:	0.00	kips	
Total Bolt Tension=T+Q:	21.56	kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	46.8%	**Pass**	

Exterior Flange Plate Results Flexural Check

Compression Side Plate Stress:	32.4	ksi	Rigid
Allowable Plate Stress:	36.0	ksi	Service ASD
Compression Plate Stress Ratio:	90.2%	**Pass**	0.75*Fy*ASIF
No Prying			Comp. Y.L. Length:
Tension Side Stress Ratio, (treq/t)^2:	49.1%	**Pass**	17.23

b/Le>2, Stiffeners are not fully effective

Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a

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

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

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

Site Data

BU#: *826217*
Site Name: *Newington ,CT*
App #: *178224: Rev:9*

Manufacturer:	Other

Reactions		
Moment:	856.1	ft-kips
Axial:	29.597	kips
Shear:	29.403	kips
Exterior Flange Run, T+Q:	21.56	kips

Elevation: 80 feet

Bolt Data			
Qty:	32		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	Bolt Fty: 44.00
N/A:		<-- Disregard	
Circle:	51	in	

Plate Data		
Plate Outer Diam:	53.25	in
Plate Inner Diam:	48	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	5.23	in

Stiffener Data (Welding at Both Sides)		
Config:	2	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	3	in
Height:	6	in
Thick:	0.5	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Pole OuterDiam:	54	in
Thick:	0.375	in
Pole Inner Diam:	53.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi

Stress Increase Factor		
ASIF:	1.333	

Interior Flange Bolt Results

Maximum Bolt Tension:	24.3	Kips, Ext. T=Interior T
Allowable Tension:	46.1	Kips
Bolt Stress Ratio:	52.7%	**Pass**

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	26.1	Kips, Ext. C= Interior C
Plate Stress:	21.6	ksi
Allowable Plate Stress:	36.0	ksi
Plate Stress Ratio:	59.9%	**Pass**

b/Le>2, Stiffeners are not fully effective

Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a

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

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

PROJECT	**87581.002.01 - Newington, CT - Crown Castle**				
SUBJECT	**Sabre - Bridge Stiffeners @ 60 ft**				
DATE	**05/05/13**	PAGE	1	OF	1

B&T Engineering, Inc.
1325 E. 15th St., Suite 202
Tulsa, OK 74120
(918) 587-4630

SSC

Global Section Properties:

Step Width	3.00 in		Axial Load	36.53 k
Pole Thickness	0.38 in		Number of BS	6
Pole Grade	42.00 ksi		Bolt Circle	57
BS Material Grade	65.00 ksi		Number of Bolts	48
BS Width	8.50 in		Bolt Size	1
BS Thickness	1.25 in			
BS Height	128.00 in			
Gap	6.00 in		Distance Between BS Welded Sections	
I	45404.24 in^4		Global MOI, Taken from AutoCAD	
Moment	2450.54 k-ft		Moment at Flange Under Consideration	
Ybar	30.63 in		Dist. CL Pole to CL BS	
S	1482.59 in^3		Global Section Modulus; I/Ybar	
fb	19.83 ksi		M/S	
Area	10.63 in^2		BS Cross Sectional Area Below Flange	
P	210.74 k		Load to BS	

Check Bridge Stiffener Span:

Lu	16.00 in
Iy	1.38 in^4
A	10.63 in^2
ry	0.3608 in
Cc	93.84414701
kl/r	44.34050067
Fa	31.54 ksi
Fa w/ 1/3 Increase	42.06 ksi
fb	19.83 ksi

47.16%

Moment to Existing Bolt Group:

S_{BG} =	1593.13 in^3	# Bolts Actinç	12
ft =	18.46 ksi		
Ab =	.785 in^2		
T =	173.97 k		
Arm =	57.00 ksi		
M_{EQ} =	826.3 k-ft	**<-------Insert into Crown Spreadsheet**	

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

Site Data

BU#: *826217*
Site Name: *Newington ,CT*
App #: *178224: Rev:9*

Pole Manufacturer:	Other

Reactions		
Moment:	826.3	ft-kips
Axial:	36.53	kips
Shear:	32.087	kips
Elevation:	60	feet

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

Bolt Data			
Qty:	48		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	Bolt Fty:
N/A:		<-- Disregard	44.00
Circle (in.):	57		

Plate Data		
Diam:	60	in
Thick, t:	1	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	3.53	in

Stiffener Data (Welding at Both Sides)		
Config:	2	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	3	in
Height:	6	in
Thick:	0.5	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	54	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Flange Bolt Results

			Stiffened
Bolt Tension Capacity, **B**:	46.07	kips	Service, ASD
Max Bolt directly applied T:	13.74	Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	Stiffened	in	
Min PL "treq" for actual **T w/ Pry**:	Stiffened	in	
Min PL "t1" for actual **T w/o Pry**:	Stiffened	in	
T allowable	46.07	kips	<-- B, Stiffened
Prying Force, Q:	0.00	kips	Stiffened
Total Bolt Tension=T+Q:	13.74	kips	
Non-Prying Bolt Stress Ratio, T/B:	29.8%	**Pass**	

Exterior Flange Plate Results Flexural Check

			Stiffened
Compression Side Plate Stress:	29.9	ksi	Service, ASD
Allowable Plate Stress:	36.0	ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	83.1%	**Pass**	Comp. Y.L. Length:
Stiffened			N/A, Roark
Tension Side Stress Ratio, (treq/t)^2:	N/A		

Stiffener Results

Horizontal Weld :	37.5%	**Pass**
Vertical Weld:	20.0%	**Pass**
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	14.8%	**Pass**
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	33.3%	**Pass**
Plate Comp. (AISC Bracket):	42.7%	**Pass**

Pole Results

Pole Punching Shear Check:	9.2%	**Pass**

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

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

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

Site Data

BU#: *826217*
Site Name: *Newington ,CT*
App #: *178224: Rev:9*

Manufacturer:	Other

Reactions		
Moment:	826.3	ft-kips
Axial:	36.53	kips
Shear:	32.087	kips
Exterior Flange Run, T+Q:	13.74	kips

Elevation: 60 feet

Bolt Data			
Qty:	48		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	Bolt Fty: 44.00
N/A:		<-- Disregard	
Circle:	57	in	

Interior Flange Bolt Results

Maximum Bolt Tension:	13.7	Kips, Ext. Flange T+Q
Allowable Tension:	46.1	Kips
Bolt Stress Ratio:	29.8%	**Pass**

Plate Data		
Plate Outer Diam:	59.25	in
Plate Inner Diam:	54	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	3.88	in

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	15.3	Kips, Ext. C= Interior C
Plate Stress:	17.0	ksi
Allowable Plate Stress:	36.0	ksi
Plate Stress Ratio:	47.2%	**Pass**

Stiffener Data (Welding at Both Sides)		
Config:	2	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	3	in
Height:	6	in
Thick:	0.5	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

b/Le>2, Stiffeners are not fully effective

Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a

Pole Data		
Pole OuterDiam:	60	in
Thick:	0.375	in
Pole Inner Diam:	59.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi

Stress Increase Factor		
ASIF:	1.333	

* 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

PROJECT	**87581.002.01 - Newington**		
SUBJECT	**Bridge Stiffener @ 40 ft**		
DATE	**05/06/13**	PAGE 1 OF 3	

B+T GRP
1717 S. Boulder, Suite 300
Tulsa, OK 74159
(918) 587-4630

Rev. Type: F

Global Stiffener:

Flange:

I_x = **191828.00** in^4
y_{bar} = **39.50** in

$$S_x = \frac{I_x}{ybar} = \frac{191828}{39.5} = 4856.41 \text{ in}^3$$

$$f_b = \frac{M}{S_x} = \frac{3116}{4856.41} \times 12 = 7.70 \text{ ksi}$$

M	=	**3116.00** k-ft
C_b	=	1
F_y	=	**50** ksi
l_u	=	**24.00** in
b	=	**8.50** in
t	=	**1.75** in
l	=	**42.00** in
I	=	3.796 in^3
A	=	14.875 in^2
r_t	=	0.505

Stress Increase Factor = 1.333

From Steel Construction Manual (ASD); Part 5, Chapter F:

If:

$$\sqrt{\frac{102\text{x}10^3 \times C_b}{F_y}} \le \frac{l_u}{r_t} \le \sqrt{\frac{510\text{x}10^3 \times C_b}{F_y}}$$

$$\sqrt{\frac{102\text{x}10^3 \times 1}{50}} \le \frac{24}{0.51} \le \sqrt{\frac{510\text{x}10^3 \times 1}{50}}$$

45.17 < 48 < 101.00

l_u = 24
$r_t = \sqrt{I/A} = \sqrt{3.8/14.88}$
r_t = 0.51
$\frac{l_u}{r_t}$ = 48

Then:

$$F_b = \left[\frac{2}{3} - \frac{F_y \times (l/r_t)^2}{1530\text{x}10^3 \times C_b}\right] \times F_y \le 0.6\,F_y$$

$$= \left[\frac{2}{3} - \frac{50 \times 48^2}{1530\text{x}10^2 \times 1}\right] \times 50 \le 0.6 \times 50$$

= 29.65 ksi < 30.00 ksi OK

= 39.52 ksi with 1.333 increase

UNITY% = **19.5** %

Bolts:

64 , **1.250** "ϕ, **A325 Grade ;** Ab = 1.227 in^2 Bolt Circle Diameter = **50.000 in**

C = 1/2 x Bolt Circle Dia. = 25.00 in

$$S = \frac{I_x}{C} = \frac{191828}{25.00} = 7673.12 \text{ in}^3$$

$$ft = \frac{M}{S} = \frac{3116}{7673.12} \times 12 = 4.87 \text{ ksi}$$

No. of Bolts Acting = $\frac{64}{4}$ = 16

T = C = ft x No. of bolts acting x Ab = 4.87 x 16 x 1.227 = 95.68 kips

Meq = $\frac{T \times \text{Bolt Circle Dia.}}{12} = \frac{95.68 \times 50.000}{12}$ = **398.68 k-ft** <-------Insert into Flange Spreadsheet

PROJECT	**87581.002.01 - Newington -**		
SUBJECT	**Bridge Stiffener @ 40 ft**		
DATE	**05/06/13**	PAGE 2 OF 3	

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Tulsa, OK 74159
(918) 587-4630

Local Stiffener:

Step Width = **0.00** in
Weld Size = **0.375** in
Weld Strength = **70** ksi

$$S_x = \frac{I_x}{y_{bar}} = \frac{(t^*/^3)/12}{//2} = \frac{(1.75x42\text{^}3)/12}{42/2}$$

$$= 514.50 \text{ in}^3$$

$$f_b = \frac{M}{S_x} \quad ; \quad M = P \times e$$

Now,

$P = f_b \times b \times t$ ..... (fb = From Sheet 1)

$= 7.70 \times 8.5 \times 1.75$

$= 114.53$ kips

$$e = \left[\frac{0+4.25+4.25}{2}\right]$$

$= 4.25$ in

$M = 114.53 \times 4.25$

$= 486.75$ k-in

$$f_b = \frac{486.75}{514.5}$$

$= .95$ ksi

Check 1) ***Shear To Weld***

fa = fb = 7.70 ksi ; P = 114.53 kips

$$I_{REQD} = \frac{P}{(0.928 \text{ k/in/16}^{th}) \times (\#16^{ths}) \times (\text{\# of welds}) \times (1\ 1/3)}$$

$$= \frac{114.53}{\left[0.928 \times 6 \times 2 \times 1\ 1/3\right]}$$

= 7.71 in < 21.00 in Provided OK

UNITY% = **36.7** %

PROJECT	**87581.002.01 - Newington -**				
SUBJECT	**Bridge Stiffener @ 40 ft**				
DATE	**05/06/13**	PAGE	3	OF	3

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Tulsa, OK 74159
(918) 587-4630

Check 2) ***Moment To Weld***

t_{WELD} = Throat = (0.707)x 3/8
= 0.265 in

$$S_{WELD} = \frac{I_{WELD}}{y} = \frac{(t_{WELD} \text{ x } /\text{^}3)/12}{//2}$$

$$= \frac{(0.265\text{x}42\text{^}3)/12}{42/2}$$

= 77.95 in^3

S_{WELD} = 77.95 x 2 = 155.89 in^3 (Weld on 2 Sides)

$$fb_{WELD} = \frac{M}{S_{WELD}} = \frac{486.75}{155.89} = 3.12 \text{ ksi}$$

Fb_{WELD} = 0.5 x Fu x $1^{1/3}$ = 0.5 x 70 x 1 1/3 = 46.67 ksi

Shear:

T = P = 114.53 kips

I_{WELD} = 21.00 in

Area of Weld = A = ($/_{WELD}$ x t_{WELD}) x 2 = 21 x 0.265 x 2 ..... (Weld on 2 Sides)
= 11.14 in^2

$$fv = T/A = \frac{114.53}{11.14} = 10.29 \text{ ksi}$$

Fv = 0.3 x Fu x $1^{1/3}$ = 0.3 x 70 x 1 1/3 = 28.00 ksi

Check:

$$\frac{fb}{Fb} + \frac{fv}{Fv} \leq 1 \quad ; \quad \frac{3.1224}{46.67} + \frac{10.29}{28.00} \leq 1$$

0.434 < 1 OK

UNITY% =	**43.4**	**%**

Overall Stiffener Capactity =	**43.4**	**%**

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

Site Data

BU#: *826217*
Site Name: *Newington ,CT*
App #: *178224: Rev:9*

Manufacturer:	Other

Reactions		
Moment:	171.54	ft-kips
Axial:	41.121	kips
Shear:	34.612	kips
Exterior Flange Run, T+Q:	0	kips

Elevation: 40-47BC feet

Bolt Data			
Qty:	32		
Diam:	1.25	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:		<-- Disregard	Bolt Fty: 44.00
N/A:		<-- Disregard	
Circle:	47	in	

Plate Data		
Plate Outer Diam:	59	in
Plate Inner Diam:	45	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	5.79	in

Stiffener Data (Welding at Both Sides)		
Config:	2	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	3	in
Height:	6	in
Thick:	0.5	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Pole OuterDiam:	60	in
Thick:	0.5	in
Pole Inner Diam:	59	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi

Stress Increase Factor		
ASIF:	1.333	

Interior Flange Bolt Results

Maximum Bolt Tension:	4.2	Kips, Ext. T=Interior T
Allowable Tension:	72.0	Kips
Bolt Stress Ratio:	5.8%	**Pass**

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	6.8	Kips, Ext. C= Interior C
Plate Stress:	26.9	ksi
Allowable Plate Stress:	36.0	ksi
Plate Stress Ratio:	74.7%	**Pass**

b/Le>2, Stiffeners are not fully effective

Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a

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

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

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

Site Data

BU#: *826217*
Site Name: *Newington ,CT*
App #: *178224: Rev:9*

Manufacturer:	Other

Reactions		
Moment:	218.14	ft-kips
Axial:	41.121	kips
Shear:	34.612	kips
Exterior Flange Run, T+Q:	0	kips

Elevation: 40-53BC feet

Bolt Data			
Qty:	32		
Diam:	1.25	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:		<-- Disregard	Bolt Fty: 44.00
N/A:		<-- Disregard	
Circle:	53	in	

Interior Flange Bolt Results

Maximum Bolt Tension:	4.9	Kips, Ext. T=Interior T
Allowable Tension:	72.0	Kips
Bolt Stress Ratio:	6.8%	**Pass**

Plate Data		
Plate Outer Diam:	59	in
Plate Inner Diam:	45	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	5.79	in

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	7.5	Kips, Ext. C= Interior C
Plate Stress:	14.8	ksi
Allowable Plate Stress:	36.0	ksi
Plate Stress Ratio:	41.2%	**Pass**

Stiffener Data (Welding at Both Sides)		
Config:	2	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	3	in
Height:	6	in
Thick:	0.5	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

b/Le>2, Stiffeners are not fully effective

Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a

Pole Data		
Pole OuterDiam:	60	in
Thick:	0.5	in
Pole Inner Diam:	59	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi

Stress Increase Factor		
ASIF:	1.333	

* 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

PROJECT	**87581.002.01 - Newington**		
SUBJECT	**Bridge Stiffener @ 20 ft**		
DATE	**05/06/13**	PAGE 1 OF 3	

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(918) 587-4630

Rev. Type: F

Global Stiffener:

Flange:

I_x = **191828.00** in^4
y_{bar} = **39.50** in

$S_x = \frac{I_x}{ybar} = \frac{191828}{39.5} = 4856.41$ in^3

$f_b = \frac{M}{S_x} = \frac{3826}{4856.41} \times 12 = 9.45$ ksi

M	=	**3826.00**	k-ft
C_b	=	1	
F_y	=	**50**	ksi
l_u	=	**24.00**	in
b	=	**8.50**	in
t	=	**1.75**	in
l	=	**42.00**	in
I	=	3.796	in^3
A	=	14.875	in^2
r_t	=	0.505	

Stress Increase Factor = 1.333

From Steel Construction Manual (ASD); Part 5, Chapter F:

If:

$$\sqrt{\frac{102\text{x}10\text{^}3 \times Cb}{F_y}} \le \frac{l_u}{r_t} \le \sqrt{\frac{510\text{x}10\text{^}3 \times Cb}{F_y}}$$

$$\sqrt{\frac{102\text{x}10\text{^}3 \times 1}{50}} \le \frac{24}{0.51} \le \sqrt{\frac{510\text{x}10\text{^}3 \times 1}{50}}$$

45.17 < 48 < 101.00

l_u = 24
$r_t = \sqrt{I/A} = \sqrt{3.8/14.88}$
r_t = 0.51
$\frac{l_u}{r_t}$ = 48

Then:

$$F_b = \left[\frac{2}{3} - \frac{F_y \times (l/r_t)\text{^}2}{1530\text{x}10\text{^}3 \times C_b}\right] \times F_y \le 0.6\,F_y$$

$$= \left[\frac{2}{3} - \frac{50 \times 48\text{^}2}{1530\text{x}10\text{^}2\text{x} \quad 1}\right] \times 50 \le 0.6 \times 50$$

= 29.65 ksi < 30.00 ksi OK

= 39.52 ksi with 1.333 increase

UNITY% = **23.9** %

Bolts:

64 , **1.250** "ϕ, **A325 Grade ;** Ab = 1.227 in^2 Bolt Circle Diameter = **50.000 in**

C = 1/2 x Bolt Circle Dia. = 25.00 in

$S = \frac{I_x}{C} = \frac{191828}{25.00} = 7673.12$ in^3

$ft = \frac{M}{S} = \frac{3826}{7673.12} \times 12 = 5.98$ ksi

No. of Bolts Acting = $\frac{64}{4}$ = 16

T = C = ft x No. of bolts acting x Ab = 5.98 x 16 x 1.227 = 117.49 kips

Meq = $\frac{T \times \text{Bolt Circle Dia.}}{12} = \frac{117.49 \times 50.000}{12}$ = **489.52 k-ft** <-------Insert into Flange Spreadsheet

PROJECT	**87581.002.01 - Newington -**				
SUBJECT	**Bridge Stiffener @ 20 ft**				
DATE	**05/06/13**	PAGE	2	OF	3

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Local Stiffener:

Step Width = **0.00** in
Weld Size = **0.375** in
Weld Strength = **70** ksi

$$S_x = \frac{I_x}{y_{bar}} = \frac{(t^*/^3)/12}{//2} = \frac{(1.75x42\text{^}3)/12}{42/2}$$

$$= 514.50 \text{ in}^3$$

$$f_b = \frac{M}{S_x} \quad ; \quad M = P \times e$$

Now,

$P = f_b \times b \times t$ ..... (fb = From Sheet 1)

$= 9.45 \times 8.5 \times 1.75$

$= 140.63$ kips

$$e = \left[\frac{0+4.25+4.25}{2}\right]$$

$= 4.25$ in

$M = 140.63 \times 4.25$

$= 597.66$ k-in

$$f_b = \frac{597.66}{514.5}$$

$= 1.16$ ksi

Check 1) ***Shear To Weld***

fa = fb = 9.45 ksi ; P = 140.63 kips

$$I_{REQD} = \frac{P}{(0.928 \text{ k/in/16}^{th}) \times (\#16^{ths}) \times (\text{\# of welds}) \times (1\ 1/3)}$$

$$= \frac{140.63}{\left[0.928 \times 6 \times 2 \times 1\ 1/3\right]}$$

$= 9.47$ in < 21.00 in Provided OK

UNITY% = **45.1** %

PROJECT	**87581.002.01 - Newington -**				
SUBJECT	**Bridge Stiffener @ 20 ft**				
DATE	**05/06/13**	PAGE	3	OF	3

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Check 2) ***Moment To Weld***

t_{WELD} = Throat = (0.707)x 3/8
= 0.265 in

$$S_{WELD} = \frac{I_{WELD}}{y} = \frac{(t_{WELD} \times l^3)/12}{l/2}$$

$$= \frac{(0.265 \times 42^3)/12}{42/2}$$

= 77.95 in^3

S_{WELD} = 77.95 x 2 = 155.89 in^3 (Weld on 2 Sides)

$$fb_{WELD} = \frac{M}{S_{WELD}} = \frac{597.66}{155.89} = 3.83 \text{ ksi}$$

Fb_{WELD} = 0.5 x Fu x $1^{1/3}$ = 0.5 x 70 x 1 1/3 = 46.67 ksi

Shear:

T = P = 140.63 kips

l_{WELD} = 21.00 in

Area of Weld = A = (l_{WELD} x t_{WELD}) x 2 = 21 x 0.265 x 2 ..... (Weld on 2 Sides)
= 11.14 in^2

$$fv = T/A = \frac{140.63}{11.14} = 12.63 \text{ ksi}$$

Fv = 0.3 x Fu x $1^{1/3}$ = 0.3 x 70 x 1 1/3 = 28.00 ksi

Check:

$$\frac{fb}{Fb} + \frac{fv}{Fv} \le 1 \quad ; \quad \frac{3.8338}{46.67} + \frac{12.63}{28.00} \le 1$$

0.533 < 1 OK

UNITY% =	**53.3**	**%**

Overall Stiffener Capactity =	**53.3**	**%**

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

Site Data

BU#: *826217*
Site Name: *Newington ,CT*
App #: *178224: Rev:9*

Manufacturer:	Other

Reactions		
Moment:	215.49	ft-kips
Axial:	48.923	kips
Shear:	36.44	kips
Exterior Flange Run, T+Q:	0	kips

Elevation: 20-47BC feet

Bolt Data			
Qty:	32		
Diam:	1.25	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:		<-- Disregard	Bolt Fty:
N/A:		<-- Disregard	44.00
Circle:	47	in	

Interior Flange Bolt Results

Maximum Bolt Tension:	5.3 Kips, Ext. T=Interior T
Allowable Tension:	72.0 Kips
Bolt Stress Ratio:	7.4% **Pass**

Plate Data		
Plate Outer Diam:	58.75	in
Plate Inner Diam:	45	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	5.77	in

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	8.4 Kips, Ext. C= Interior C
Plate Stress:	32.9 ksi
Allowable Plate Stress:	36.0 ksi
Plate Stress Ratio:	91.4% **Pass**

Stiffener Data (Welding at Both Sides)		
Config:	2	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	3	in
Height:	6	in
Thick:	0.5	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

b/Le>2, Stiffeners are not fully effective

Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a

Pole Data		
Pole OuterDiam:	60	in
Thick:	0.625	in
Pole Inner Diam:	58.75	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi

Stress Increase Factor		
ASIF:	1.333	

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

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

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

Site Data	
BU#:	826217
Site Name:	Newington ,CT
App #:	178224: Rev:9

Manufacturer:	Other

Reactions		
Moment:	274.01	ft-kips
Axial:	48.923	kips
Shear:	36.44	kips
Exterior Flange Run, T+Q:	0	kips

Elevation: 20-53BC feet

Bolt Data			
Qty:	32		
Diam:	1.25	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:		<-- Disregard	Bolt Fty:
N/A:		<-- Disregard	44.00
Circle:	53	in	

Plate Data		
Plate Outer Diam:	58.75	in
Plate Inner Diam:	45	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	5.77	in

Stiffener Data (Welding at Both Sides)		
Config:	2	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	3	in
Height:	6	in
Thick:	0.5	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Pole OuterDiam:	60	in
Thick:	0.625	in
Pole Inner Diam:	58.75	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi

Stress Increase Factor	
ASIF:	1.333

Interior Flange Bolt Results

Maximum Bolt Tension:	6.2 Kips, Ext. T=Interior T
Allowable Tension:	72.0 Kips
Bolt Stress Ratio:	8.7% **Pass**

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	9.3 Kips, Ext. C= Interior C
Plate Stress:	17.8 ksi
Allowable Plate Stress:	36.0 ksi
Plate Stress Ratio:	49.4% **Pass**

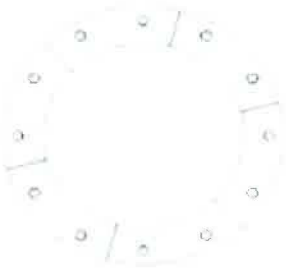
b/Le>2, Stiffeners are not fully effective

Stiffener Results

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

Pole Results

Pole Punching Shear Check:	n/a



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

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

Rein1

Bottom	Top	Qty	Model	Position	T or T&C
0	4.33	3	CCI.75x4	F	T&C
20	40	3	MP305	F	T&C
40	60	3	CCI1.25x6.5	F	T&C
60	80	3	MP305	F	T&C
80	89.08	3	MP304	F	T&C
100	104.33	3	CCI.75x4	F	T&C
				F	T&C
				F	T&C
				F	T&C

Flats (Used for relative orientation only. Actual flat numbers may vary.)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	1	1															
1	1	1															
1	1	1															
1	1	1															
1	1	1															
1	1	1															

Rein2

Bottom	Top	Qty	Model	Position	T or T&C
0				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C

Rein3

Bottom	Top	Qty	Model	Position	T or T&C
0				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C

Reinforcement Capacity

AeroSolutions LLC
5500 Flatirons Parkway, Suite 100
Boulder, CO 80301
720-304-6882

Dimensions and Properties														Compression				Axial				
																		ASD-9			LRFD	
Model	Weight (lb/ft)	Area (in^2)	Moment of Inertia (in^4)	Moment of Inertia (in^4)	Centroid from Mating Edge (in)	Centroid from Bolt Hole Center (in)	Web Thickness (in)	Width (in)	Flange Width (in)	Flange Thickness (in)	Hole Diameter (in)	Yield Stress (ksi)	Ultimate Stress (ksi)	Slender. Ratio Coefficient	Unbraced Length (in)	Slender. Ratio Coefficient	Unbraced Length (in)	Allowable Axial (kip)	Allowable Axial w/ increase (kip)	Governing Axial	Design Axial Strength (kip)	Governing Axial
MP303	9.9	2.92	0.66	6.57	0.59	0	0.30	4.06	1.57	0.64	1.21875	65	80	0.80	18	1.00	18	96.4	128.6	Rupture	144.7	Rupture
MP304	14.1	4.13	0.91	11.86	0.61	0	0.43	4.78	1.61	0.84	1.21875	65	80	0.80	18	1.00	18	137.1	183.1	Rupture	206.0	Rupture
MP305	19.2	5.65	2.15	20.79	0.79	0	0.5	5.33	2.09	0.91	1.21875	65	80	0.80	18	1.00	18	194.5	259.3	Rupture	291.8	Rupture
MP306	28.8	8.47	4.95	52.50	0.93	0	0.64	6.89	2.61	1.01	1.21875	65	80	0.80	24	1.00	24	298.7	398.3	Rupture	448.1	Rupture
CC1.75x4	10.2	3.00	0.14	4.00	0.375	0	0.75	4	0	0	1.21875	65	80	0.80	16	1.00	16	81.5	108.8	Rupture	122.3	Rupture
CC1x4.5	15.3	4.50	0.38	7.59	0.5	0	1	4.5	0	0	1.21875	65	80	0.80	20	1.00	20	128.8	171.7	Rupture	193.1	Rupture
CC1x5	20.4	6.00	0.50	18.00	0.5	0	1	6	0	0	1.21875	65	80	0.80	16	1.00	16	188.8	251.7	Rupture	283.1	Rupture
CC1.25x6.5	27.6	8.13	1.06	28.61	0.625	0	1.25	6.5	0	0	1.21875	65	80	0.80	19	1.00	19	260.4	347.2	Compress.	391.4	Rupture

Base Plate Anchor Rods - Rev. F & G

Site Data	
BU#:	*826217*
Site Name:	*Newington_1*
App #:	

Reactions		
Moment:	4571.342	ft-kips
Axial:	62.9331	kips
Shear:	38.11356	kips

Base Plate Type:	*Circular*

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Original Anchor Rod Data		
Qty:	52	
Diam:	1.25	in
Rod Material:		
Circle:	67	in
Bolt Spacing, D:		in

Original Anchor Rod Results		
Maximum Rod Tension:	30.9	Kips
Allowable Tension:	0.0	Kips
Anchor Rod Stress Ratio:	**0.0%**	Pass

Adding Anchor Rod Data		
Qty:	14	
Diam:	2.25	in
Rod Material:	A193 B7	
Circle:	71.5	in

Adding Anchor Rod Results		
Maximum Rod Tension:	107.1	Kips
Allowable Tension:	218.6	Kips
Anchor Rod Stress Ratio:	**49.0%**	Pass

Additional Anchor Rod Data		
Qty:		
Diam:		in
Rod Material:		
Circle:		in

Additional Anchor Rod Results		
Maximum Rod Tension:	0.0	Kips
Allowable Tension:	0.0	Kips
Anchor Rod Stress Ratio:	**0.0%**	Pass

Shaft Analysis		
ASIF Code:	F	
ASIF Increase:	1.33	
Failure:	100%	

Reactions Seen By Original Anchor Rods		
Moment:	**2293**	**ft-kips**
Axial:	**34**	**kips**
Shear:	**20**	**kips**

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

TIA Rev F

Site Data

BU#: *826217*
Site Name: *Newington_1*
App #: *176116*

Pole Manufacturer:	*Other*

Reactions		
Moment:	2293.2175	ft-kips
Axial:	33.612584	kips
Shear:	20.356463	kips

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

Anchor Rod Data		
Qty:	52	
Diam:	1.25	in
Rod Material:	Other	
Strength (Fu):	150	ksi
Yield (Fy):	105	ksi
Bolt Circle:	67	in

Plate Data		
Diam:	70	in
Thick:	1	in
Grade:	36	ksi
Single-Rod B-eff:	3.62	in

Stiffener Data (Welding at both sides)		
Config:	1	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	3	in
Height:	6	in
Thick:	0.5	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	60	in
Thick:	0.625	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	57	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Anchor Rod Results

		Stiffened
Maximum Rod Tension:	30.9 Kips	Service, ASD
Allowable Tension:	81.0 Kips	Fty*ASIF
Anchor Rod Stress Ratio:	38.2% **Pass**	

Base Plate Results

	Flexural Check	Stiffened
Base Plate Stress:	34.8 ksi	Service, ASD
Allowable Plate Stress:	36.0 ksi	0.75*Fy*ASIF
Base Plate Stress Ratio:	96.6% **Pass**	Y.L. Length: N/A, Roark

Stiffener Results

Horizontal Weld :	46.6% **Pass**
Vertical Weld:	24.9% **Pass**
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	19.6% **Pass**
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	42.4% **Pass**
Plate Comp. (AISC Bracket):	53.1% **Pass**

Pole Results

Pole Punching Shear Check:	6.9% **Pass**

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

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

PROJECT	BU 826217 Newington_1
SUBJECT	87581.002.01
DATE 5/6/13	PAGE 1 OF

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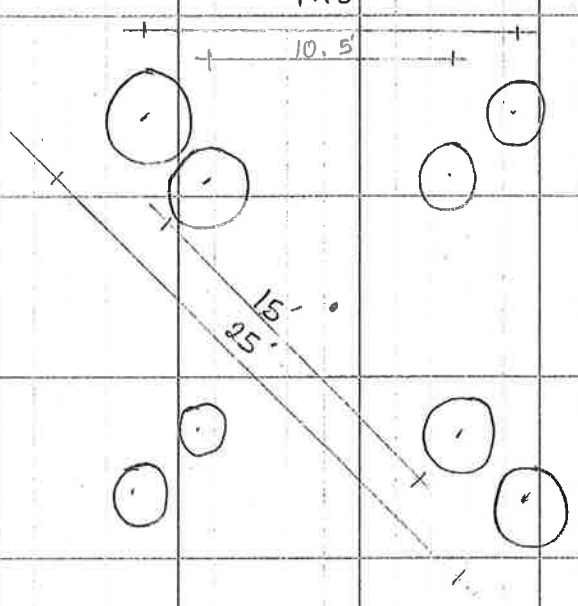
Rock anchor capacity 10' of bond



Allowable soil capacity = 6 k/ft * 10' = 60K/rock anchor

Diagonal axis Moment capacity

M_{all} = 60k (12.5 + 7.5)

= 1200K-ft

Horizontal axis Moment capacity

M_{all} = 60k (5.25 + 8.75) * 2

= 1680 K-ft

Diagonal Axis controls at M_{all} = 1200K-ft for rock Anchors

Moment applied to Existing Foundation 4798K' - 1200K' = 3398K'

PROJECT	**826217 - Newington_1**				JEB
SUBJECT	**178224 REV 9**				
DATE	**05/06/13**	PAGE	**1**	OF	**9**

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(918) 587-4630

87581_002_01_MP_FDN_Monopole Pier and Pad Unified.xls

B&T Proj. No.: 87581.001.01

Monopole Pad & Pier Foundation Analysis

Rev. Type: F

Design Loads:

Input unfactored loads

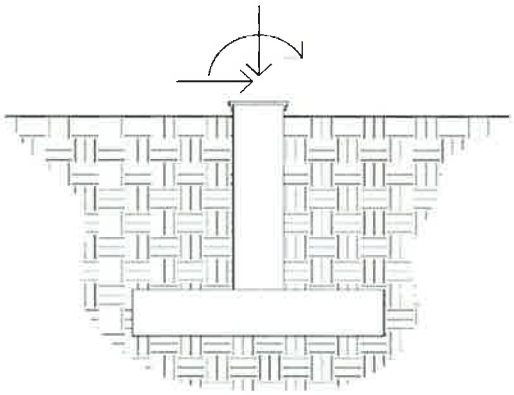
Shear:	38.0	kips
Moment:	3,371.0	ft-kips
Tower Height:	190.0	ft
Tower Weight:	37.9	kips

Plan View

Pad & Pier Dimensions / Properties:

Pole Diameter at Base:	60.00	in
Bearing Depth:	9.0	ft
Pad Width:	20.5	ft
Neglected Depth:	3.3	ft
Thickness:	2.5	ft
Pier Diameter:	7.0	ft
Pier Height Above Grade:	0.5	ft
BP Dist. Above Pier:	3.0	in
Clear Cover:	3.0	in
Pier Rebar Size:	9	
Pier Rebar Quanity:	34	
Pad Rebar Size:	11	
Pad Rebar Quanity:	30	
Pier Tie Size:	4	
Tie Quanity:	11	
Rebar Yield Strength:	60000	psi
Concrete Strength:	3000	psi
Concrete Unit Weight:	0.15	kcf
Seismic Zone:	1	

Elevation Overview



Soil Data:

Allowable Values

Soil Unit Weight:	0.130	kcf
Ult. Bearing Capacity:	16.000	ksf
Angle of Friction:	36.000	deg
Cohesion:	0.000	ksf
Passive Pressure:	0.000	ksf
Base Friction:	0.350	

Summary of Results

Req'd Pier Diam.	OK
Overturning	79.1%
Shear Capacity	29.1%
Bearing	56.2%
Pad Shear - 1-way	90.4%
Pad Shear - 2-way	8.1%
Pad Moment Capacity	47.5%
Pier Moment Capacity	86.6%

** Notes:

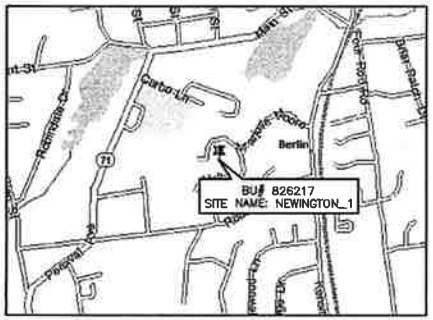
APPENDIX D

TOWER MODIFICATION DRAWINGS

TOWER MODIFICATION DRAWINGS

SITE NAME: NEWINGTON_1
BU NUMBER: 826217

SITE ADDRESS:
240 KENSINGTON ROAD,
BERLIN, CT 06037
HARTFORD COUNTY, USA



MAP

DIRECTIONS

FROM RT 9 TO EXIT 22. TURN RIGHT ON TO MILL ST. RT 372 FOLLOW 3/4 MI AT SET OF LIGHTS TURN LEFT ONTO KENSINGO RD. 1/4 MI ON RIGHT WILL BE TOWN BUILDINGS COMPLEX AND ACCESS RD. FOLLOW TO TOP OF HILL. TOWER IS BEHIND TOWN HALL AND POLICE STATION.

PROJECT CONTACTS:

1. CROWN TOWER STRUCTURAL ANALYST
   STEVE TUTTLE
   (585) 899-3445
   STEVE.TUTTLE@CROWNCASTLE.COM
   THE PIANO WORKS 349 WEST COMMERCIAL STREET
   EAST ROCHESTER, NY 14445

2. B+T GROUP PROJECT ENGINEER
   KIRAN MAROJU
   (918) 587-4630
   KMAROJU@BTGRP.COM
   1717 S BOULDER AVENUE, SUITE 300
   TULSA, OKLA. 74119

3. B+T GROUP ENGINEER (EOR)
   CHAD E TUTTLE, P.E.
   (918) 587-4630
   CTUTTLE@BTGRP.COM
   1717 S BOULDER AVENUE, SUITE 300
   TULSA, OKLA. 74119

TOWER INFORMATION

TOWER MANUFACTURER / DWG #:	PIROD INC. / 204566-B
TOWER HEIGHT / TYPE:	190' MONOPOLE
TOWER LOCATION:	LAT. 41° 37' 34.25"
DATUM: (NAD 1983)	LONG. -72° 46' 32.1"
	ELEV. 133 FT AMSL
STRUCTURAL DESIGN DRAWING REPORT:	B+T GROUP / WO. # 606486
STRUCTURAL ANALYSIS REPORT:	B+T GROUP / WO. # 603885
STRUCTURAL ANALYSIS DATE:	04/30/13
CCISITES DOCUMENT ID:	3820727

CODE COMPLIANCE

THIS REINFORCEMENT DESIGN IS BASED ON THE REQUIREMENTS OF TIA/EIA-222-F STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES USING A FASTEST MILE WIND SPEED OF 80 MPH WITH NO ICE, 37.6 MPH WITH 1 INCH ICE THICKNESS AND 50 MPH UNDER SERVICE LOADS.

DRAWINGS INCLUDED

SHEET NUMBER	DESCRIPTION
S1	TITLE SHEET
S2	MODIFICATION INSPECTION NOTES AND CHECKLIST
S3	GENERAL NOTES, AJAX BOLT NOTES AND DETAIL
S4	TOWER ELEV., SCHEDULES & TX LINE DIST. DIAG.
S5	TOWER SECTION (0'–10.5')
S6	TOWER SECTION (20.5'–39.5')
S7	TOWER SECTION (40.5'–59.5')
S8	TOWER SECTION (60.5'–79.5')
S9	TOWER SECTION (80.5'–90.5')
S10	TOWER SECTION (100.5'–105.5')
S11	FOUNDATION MODIFICATION
D1	DETAILS

B+T GRP
1717 S. BOULDER
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	05/06/13	ISSUED FOR CONSTRUCTION

PROJECT NO:	87581.002.01
PROJECT ENG:	KIRAN MAROJU
DRAWN BY:	UUJ / GLS
CHECKED BY:	SSC / SSV

B+T ENGINEERING, INC.

STATE OF CONNECTICUT
CHAD TUTTLE
No. 23924
LICENSED PROFESSIONAL ENGINEER
5/6/13

NEWINGTON_1
826217
240 KENSINGTON ROAD,
BERLIN, CT
EXISTING 190' MONOPOLE

SHEET TITLE
TITLE SHEET

SHEET NUMBER:	REVISION:
S1	0

MI CHECKLIST

REQUIRED	REPORT ITEM	BRIEF DESCRIPTION
		PRE-CONSTRUCTION
X	MI CHECKLIST DRAWING	THIS CHECKLIST SHALL BE INCLUDED IN THE MI REPORT.
X	EOR APPROVED SHOP DRAWINGS	FABRICATION DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW. THE CONTRACTOR SHALL PROVIDE APPROVED SHOP DRAWINGS TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	FABRICATION INSPECTION	A LETTER FROM THE FABRICATOR, STATING THAT THE WORK WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THE CONTRACT DOCUMENTS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	FABRICATOR CERTIFIED WELD INSPECTION	A VISUAL OBSERVATION BY A CWI OF A PORTION OF WELDING ON THE PROPOSED STRUCTURAL MEMBERS IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	MATERIAL TEST REPORT (MTR)	MILL CERTIFICATION SHALL BE PROVIDED FOR ALL STEEL AS SPECIFIED IN THE MODIFICATION DRAWINGS AND THIS DOCUMENTATION SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	FABRICATOR NDE INSPECTION	CRITICAL SHOP WELDS THAT REQUIRE TESTING (PER ENG-STD-10069) ARE NOTED ON THESE CONTRACT DRAWINGS. A CERTIFIED WELD INSPECTOR SHALL PERFORM NON-DESTRUCTIVE EXAMINATION AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	NDE REPORT OF MONOPOLE BASE PLATE	A NDE (PER ENG-SOW-10033) OF THE POLE TO BASE PLATE CONNECTION IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	PACKING SLIPS	THE MATERIAL SHIPPING LIST SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
		CONSTRUCTION
X	CONSTRUCTION INSPECTIONS	A LETTER FROM THE GENERAL CONTRACTOR STATING THAT THE WORKMANSHIP WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THESE CONTRACT DRAWINGS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	FOUNDATION INSPECTIONS	A VISUAL OBSERVATION OF THE EXCAVATION AND REBAR SHALL BE PERFORMED BEFORE PLACING THE CONCRETE. A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	CONCRETE COMP. STRENGTH AND SLUMP TESTS	THE CONCRETE MIX DESIGN, SLUMP TEST, AND COMPRESSIVE STRENGTH TESTS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	POST INSTALLED ANCHOR ROD VERIFICATION	POST INSTALLED ANCHOR ROD VERIFICATION SHALL BE PERFORMED IN ACCORDANCE WITH CROWN REQUIREMENTS AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	BASE PLATE GROUT VERIFICATION	THE GENERAL CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE MI INSPECTOR THAT CERTIFIES THAT THE GROUT WAS INSTALLED IN ACCORDANCE WITH CROWN ENG-PRC-10012 FOR INCLUSION IN THE MI REPORT.
X	CONTRACTOR'S CERTIFIED WELD INSPECTION	A CERTIFIED WELD INSPECTOR SHALL INSPECT AND TEST AS NECESSARY ALL FIELD WELDS. A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	EARTHWORK: LIFT AND DENSITY	FOUNDATION SUB-GRADES SHALL BE INSPECTED AND APPROVED BY A GEOTECHNICAL ENGINEER AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	ON SITE COLD GALVANIZING VERIFICATION	THE GENERAL CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE MI INSPECTOR VERIFYING THAT ANY ON-SITE COLD GALVANIZING WAS APPLIED IN ACCORDANCE WITH ENG-BUL-10149.
N/A	GUY WIRE TENSION REPORT	THE GENERAL CONTRACTOR SHALL PROVIDE A REPORT TO THE MI INSPECTOR INDICATING THE TEMPERATURE AND TENSION IN EVERY GUY CABLE AS PART OF PLUMB AND TENSION PROCEDURE FOR INCLUSION IN THE MI REPORT.
X	GC AS-BUILT DOCUMENTS	THE GENERAL CONTRACTOR SHALL SUBMIT A COPY OF THE CONTRACT DRAWINGS EITHER STATING "INSTALLED AS DESIGNED" OR NOTING ANY CHANGES THAT WERE REQUIRED AND APPROVED BY THE ENGINEER OF RECORD DUE TO FIELD CONDITIONS.
		POST-CONSTRUCTION
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)	THE MI INSPECTOR SHALL OBSERVE AND REPORT ANY DISCREPANCIES BETWEEN THE CONTRACTORS REDLINE DRAWING AND THE ACTUAL COMPLETED INSTALLATION.
X	POST INSTALLED ANCHOR ROD PULL-OUT TESTING	POST-INSTALLED ANCHOR RODS SHALL BE TESTED IN ACCORDANCE WITH ENG-PRC-10119 AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	PHOTOGRAPHS	PHOTOGRAPHS SHALL BE SUBMITTED TO THE MI WHICH DOCUMENT ALL PHASES OF THE CONSTRUCTION. THE PHOTOS SHALL BE ORGANIZED IN A MANNER THAT EASILY IDENTIFIES THE EXACT LOCATION OF THE PHOTO.
ADDITIONAL TESTING AND INSPECTIONS:		

NOTE: X DENOTES A DOCUMENT NEEDED FOR THE MI REPORT
N/A DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE MI REPORT

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 MI 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 AND ENG-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, PREFERABLY 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.

REQUIRED PHOTOS

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.

B+T GRP
1717 S. BOULDER
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	05/06/13	ISSUED FOR CONSTRUCTION

PROJECT NO:	87581.002.01
PROJECT ENG:	KIRAN MAROJU
DRAWN BY:	UUJ / GLS
CHECKED BY:	SSC / SSV

B+T ENGINEERING, INC.

STATE OF CONNECTICUT ★ CHAD TUTTLE ★ No. 23924 LICENSED PROFESSIONAL ENGINEER 5/6/13

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

NEWINGTON_1
826217

240 KENSINGTON ROAD,
BERLIN, CT

EXISTING 190' MONOPOLE

SHEET TITLE
MODIFICATION INSPECTION NOTES AND CHECKLIST

SHEET NUMBER:	REVISION:
S2	0

NOTES:

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

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

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

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

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

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

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

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

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

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

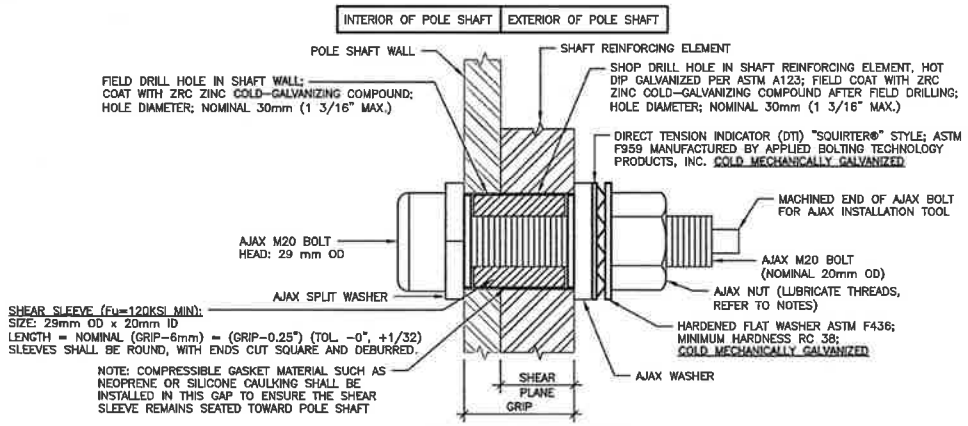
HARDENED WASHERS REQUIRED: USE A HARDENED WASHER FOR A 3/4" NOMINAL BOLT BETWEEN THE TOP OF THE DIRECT TENSION INDICATOR (DTI) WASHER AND THE NUT OF THE AJAX M20 BOLT. HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A MINIMUM HARDNESS OF RE 38 OR HIGHER. THE HARDENED WASHERS SHALL BE MECHANICALLY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

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

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

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

INSPECTION REQUIRED: ALL AJAX BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC "SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 32, 2009, BY A QUALIFIED BOLT INSPECTOR. DURING INSTALLATION, THE BOLT INSPECTOR SHALL VERIFY AND DOCUMENT THE SHOP-DRILLED AND FIELD-DRILLED HOE SIZES; THE INSTALLATION OF THE AJAX BOLT ASSEMBLY, INCLUDING THE SHEAR SLEEVE PLACEMENT AND NUT LUBRICATION AND THE CONTRACTOR'S TENSIONING PROCEDURE. IN ADDITION, ALL AJAX BOLTS AND DTI'S SHALL BE VISUALLY INSPECTED ACCORDING TO THE DTI MANUFACTURER'S INSTRUCTIONS. THE BOLT INSPECTOR SHALL PROVIDE COMPLETE PHOTO DOCUMENTATION OF ALL BOLTS AFTER TIGHTENING CLEARLY SHOWING THE CONDITION OF THE DTI'S.



1 TYPICAL AJAX BOLT DETAIL
SCALE: N.T.S.

GENERAL NOTES

1.1 ALL WORK SHALL COMPLY WITH THE TIA/EIA-222-F STANDARD AS WELL AS ANY OTHER GOVERNING BUILDING CODES.
1.2 FIELD WORK WILL BE DONE AROUND EXISTING COAXIAL CABLE AND EQUIPMENT. ALL WORK SHALL BE DONE IN A MANNER SUCH THAT NO DAMAGE OCCURS TO THE EXISTING EQUIPMENT OR THE STRUCTURE.
1.3 A MINIMUM OF TWO COATS OF ZINGA COLD GALVANIZING COMPOUND (OR APPROVED EQUIVALENT) SHALL BE APPLIED TO ANY FIELD CUTS OR FIELD DRILLED HOLES.
1.4 THE USE OF A GAS TORCH OR WELDER WILL NOT BE PERMITTED ON THE TOWER WITHOUT THE CONSENT OF THE OWNER.
1.5 IN LIEU OF TEMPORARY BRACING CONTRACTOR MAY HAVE A STABILITY ANALYSIS PERFORMED BY AN ENGINEER LICENSED IN THE STATE THE TOWER IS LOCATED. THE ANALYSIS SHALL USE A MINIMUM WIND SPEED OF 45 mph (3-SEC) PER TIA-1019.

FABRICATION

2.1 ALL WORK SHALL BE DONE IN ACCORDANCE WITH A.I.S.C. "SPECIFICATIONS FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS.
2.2 STRUCTURAL STEEL SHALL MEET THE FOLLOWING SPECIFICATIONS:

	YIELD	ASTM SPECS
A. STEEL SHAPES AND PLATES, U.N.O.	65ksi	A572
B. STEEL PIPE	50ksi	A53-B

2.3 ALL NEW MATERIAL INCLUDING STRUCTURAL STEEL AND FASTENERS SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 AND A153.
2.4 WELDING SHALL MEET ANSI/AWS D1.1 STRUCTURAL WELDING CODE (LATEST REVISION). ELECTRODES SHALL BE E80 SERIES.
2.5 CONTRACTOR SHALL PROVIDE SHOP FABRICATION DRAWINGS TO B+T GROUP 2 WEEKS PRIOR TO FABRICATION.

KEY NOTES

(#) TOWER MODIFICATION I.D.

B+T GRP
1717 S. BOULDER
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	05/06/13	ISSUED FOR CONSTRUCTION

PROJECT NO:	87581.002.01
PROJECT ENG:	KIRAN MAROJU
DRAWN BY:	UUJ / GLS
CHECKED BY:	SSC / SSV

B+T ENGINEERING, INC.

STATE OF CONNECTICUT · CHRISTOPHER · No. 23924 · LICENSED PROFESSIONAL ENGINEER · 5/6/13

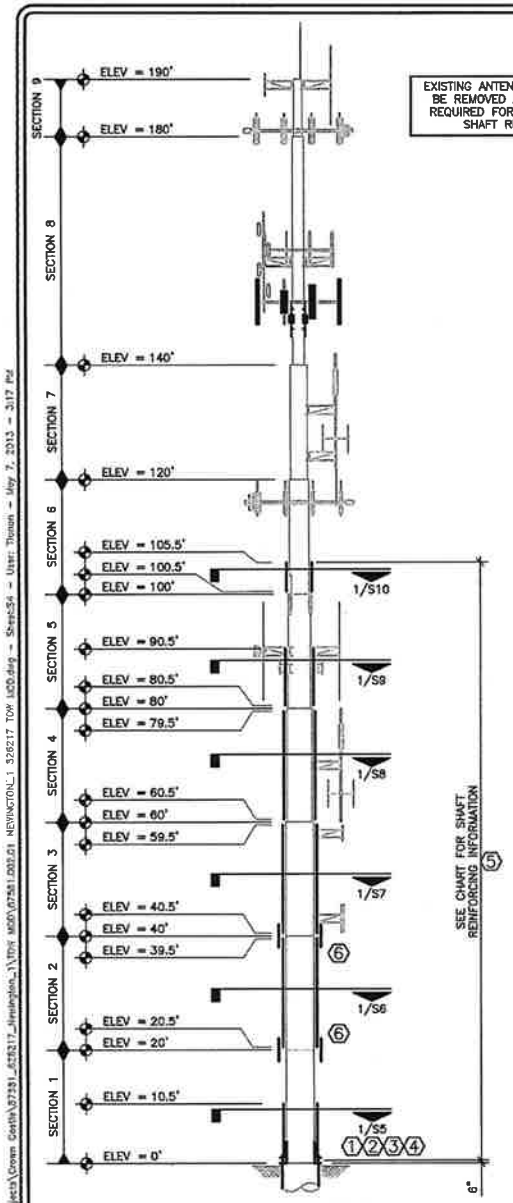
NEWINGTON_1
826217

240 KENSINGTON ROAD,
BERLIN, CT

EXISTING 190' MONOPOLE

SHEET TITLE
GENERAL NOTES, AJAX BOLT NOTES AND DETAILS

SHEET NUMBER: S3
REVISION: 0



1 TOWER ELEVATION
SCALE: N.T.S.

EXISTING ANTENNA MOUNTS SHALL BE REMOVED AND MODIFIED AS REQUIRED FOR INSTALLATION OF SHAFT REINFORCIING.

CCI: FLAT PLATE-BILL OF MATERIALS (65ksi)

BOTTOM ELEVATION	TOP ELEVATION	FLAT PLATE DESIGNATION	FLAT PLATE LENGTH	FLAT PLATE QUANTITY	AJAX BOLTS PER PLATE	TOTAL AJAX BOLT QTY	TERMINATION BOLTS (BOTTOM)	TERMINATION BOLTS (TOP)	MAXIMUM INTERMEDIATE BOLT SPACING	TOTAL STEEL WEIGHT	
0.5'	10.5'	CCI-65FP-040075	5'-0"	3	44	132	15	SPLICE	15"	2587	LBS.
20.5'	39.5'	CCI-65FP-060100	19'-0"	3		132				2587	LBS.
40.5'	59.5'	CCI-65FP-065125	19'-0"	3		132				2587	LBS.
60.5'	79.'5	CCI-65FP-060100	19'-0"	3		132				2587	LBS.
80.5'	90.5'	CCI-65FP-045100	10'-0"	3		132				2587	LBS.
100.5'	105.5'	CCI-65FP-040075	5'-0"	3							
						660				12935	LBS.

NOTES:
1. AJAX BOLTS ARE TO BE 20mm DIAMETER WITH CORRESPONDING 29mm DIAMETER SLEEVE WITH MATCHING STEEL GRADE.
2. ALL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATOR IN ACCORDANCE WITH ASTM A123. ALTERNATIVELY, ALL NEW STIFFENER PLATE STEEL REINFORCING MAY BE COLD GALVANIZED AS FOLLOWS: APPLY A MINIMUM OF TWO COATS OF ZRC-BRAND ZINC-RICH GOLD GALVANIZING COMPOUND. FILM THICKNESS. 1-800-831-3275 FOR PRODUCT INFORMATION.
3. ALL SHIMS SHALL BE ASTM A36.
4. HOLES FOR AJAX BOLTS AND SHEAR SLEEVES ARE 30mm UNLESS NOTED OTHERWISE.
5. SHOP WELDS ARE ASSUMED E80XX OR GREATER, PER STANDARD SPLICE DETAIL.

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

EXISTING MEMBER SCHEDULE

SECTION	DIAMETER
1	60"Ø x 5/8" PIPE
2	60"Ø x 1/2" PIPE
3	60"Ø x 3/8" PIPE
4	54"Ø x 3/8" PIPE
5	48"Ø x 3/8" PIPE
6	42"Ø x 3/8" PIPE
7	36"Ø x 3/8" PIPE
8	24"Ø x 3/8" PIPE
9	18"Ø x 3/8" PIPE

TOWER MODIFICATIONS:

1. CONTRACTOR SHALL BUDGET A SITE VISIT TO CHECK CRITICAL DIMENSIONS AND VERIFY UNKNOWN CONDITIONS PRIOR TO STEEL FABRICATION.
2. THE NEW AND EXISTING TRANSMISSION LINES MUST BE DISTRIBUTED AS SHOWN IN THE TX LINE DIST. DIAGRAM RE: DETAIL 2/S4.
3. MODIFY EXISTING FOUNDATION RE: SHEET S11.
4. INSTALL NEW ANCHOR ROD AND ANCHOR ROD BRACKETS RE: SHEET S5.
5. INSTALL NEW REINFORCING ELEMENTS RE: SHEET S5 THRU S10.
6. INSTALL NEW BRIDGE STIFFENERS RE: SHEET S8 AND S7.
7. RELOCATE EQUIPMENT AND PAD AS REQUIRED TO FOUNDATION MODIFICATION RE: DETAIL 1/S11.

* CONTRACTOR SHALL PROVIDE TEMPORARY BRACING FOR ALL REMOVE AND REPLACE PROCEDURES.
** MODIFICATIONS SHALL BE COMPLETED PRIOR TO ADDING THE PROPOSED APPURTENANCES.

NEW CCI FLAT PLATE (65ksi) REINFORCING ELEMENTS

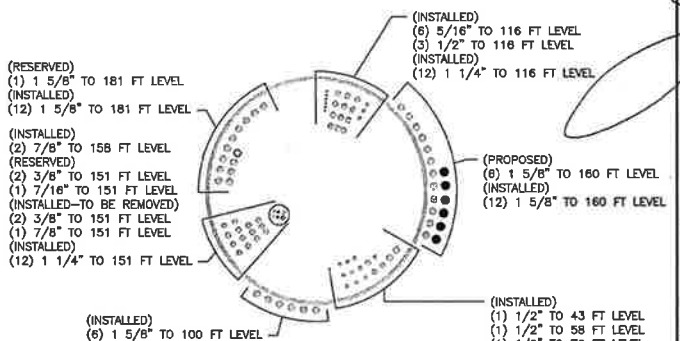
START ELEVATION	END ELEVATION	QTY	FLAT #	FLAT PLATE
0.5'	10.5'	3	---	CCI-65FP-040075
20.5'	39.5'	3	---	CCI-65FP-060100
40.5'	59.5'	3	---	CCI-65FP-065125
60.5'	79.'5	3	---	CCI-65FP-060100
80.5'	90.5'	3	---	CCI-65FP-045100
100.5'	105.5'	3	---	CCI-65FP-040075

ALL BOLTS SHALL BE AJAX M20 BOLTS WITH HIGH STRENGTH SHEAR SLEEVES (ASTM A519 WITH MIN. Fu=105 KSI). CONTACT SUPPLIER FOR MATERIAL (PLATE AND BOLTS) AND INSTALLATION PROCEDURES. LOCATION OF OVERLAPS AND SPLICES TO BE DETERMINED BY AEROSOLUTIONS.

NEW AEROSOLUTIONS MP3 REINFORCING ELEMENTS

START ELEVATION	END ELEVATION	QTY	FLAT #	MP3
0.5'	10.5'	3	---	MP303
20.5'	39.5'	3	---	MP305
40.5'	59.5'	3	---	MP306
60.5'	79.'5	3	---	MP305
80.5'	90.5'	3	---	MP304
100.5'	105.5'	3	---	MP303

ALL BOLTS SHALL BE AJAX M20 BOLTS WITH HIGH STRENGTH SHEAR SLEEVES (ASTM A519 WITH MIN. Fu=105 KSI). CONTACT SUPPLIER FOR MATERIAL (PLATE AND BOLTS) AND INSTALLATION PROCEDURES. LOCATION OF OVERLAPS AND SPLICES TO BE DETERMINED BY AEROSOLUTIONS.



2 TX LINE DISTRIBUTION DIAGRAM
SCALE: N.T.S.

B+T GRP
1717 S. BOULDER
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	05/06/13	ISSUED FOR CONSTRUCTION

PROJECT NO:	87581.002.01
PROJECT ENG:	KIRAN MAROJU
DRAWN BY:	UUJ / GLS
CHECKED BY:	SSC / SSV

B+T ENGINEERING, INC.

STATE OF CONNECTICUT
CHAD TUTTLE
No. 23924
LICENSED
PROFESSIONAL ENGINEER
5/6/13

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

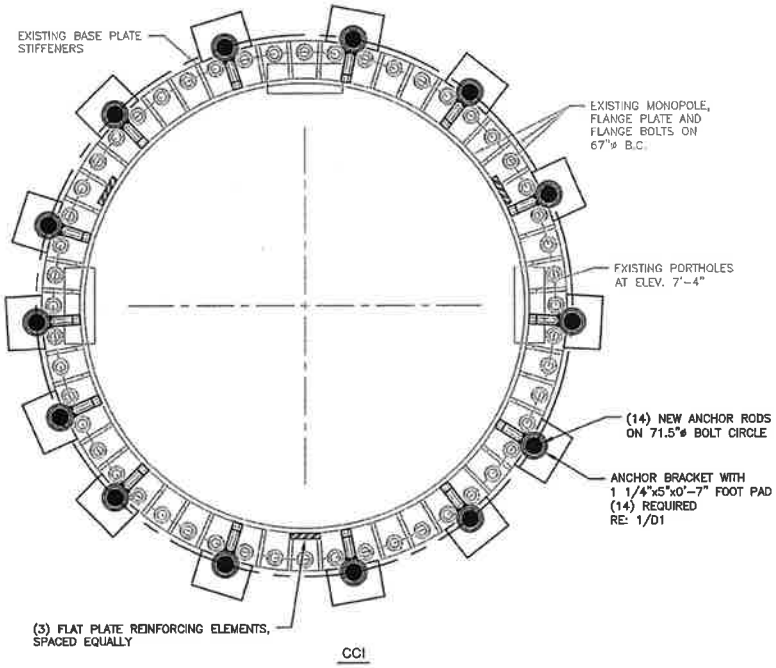
NEWINGTON_1
826217

240 KENSINGTON ROAD,
BERLIN, CT

EXISTING 190' MONOPOLE

SHEET TITLE
TOWER ELEV., SCHEDULES AND TX LINE DIST. DIAGRAM

SHEET NUMBER: S4
REVISION: 0



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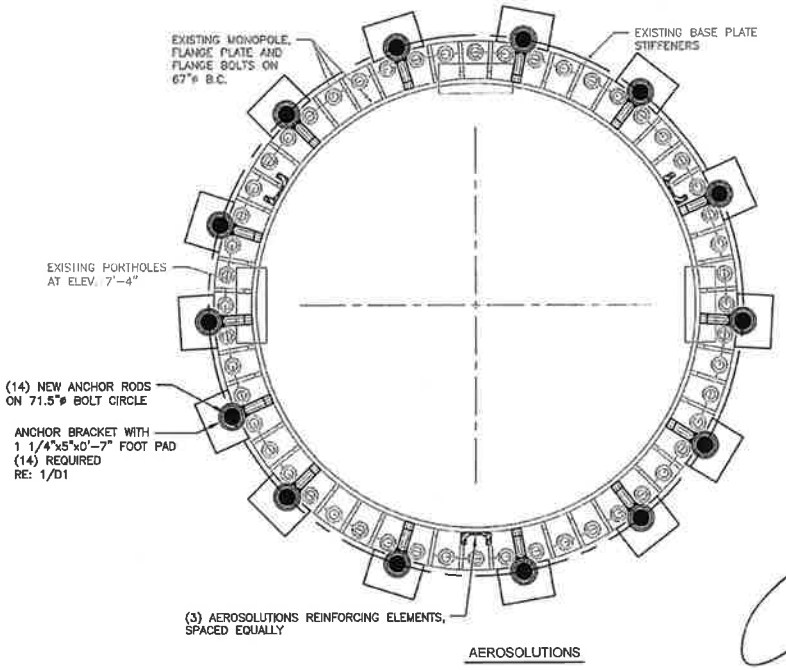


AEROSOLUTIONS

1 TOWER SECTION (0'-10.5')
SCALE: N.T.S.

B+T GRP
1717 S. BOULDER
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	05/06/13	ISSUED FOR CONSTRUCTION

PROJECT NO:	87581.002.01
PROJECT ENG:	KIRAN MAROJU
DRAWN BY:	UJJ / GLS
CHECKED BY:	SSC / SSV

B+T ENGINEERING, INC.

STATE OF CONNECTICUT
DAVID J. KUTTLE
No. 23924
LICENSED
PROFESSIONAL ENGINEER
5/6/13

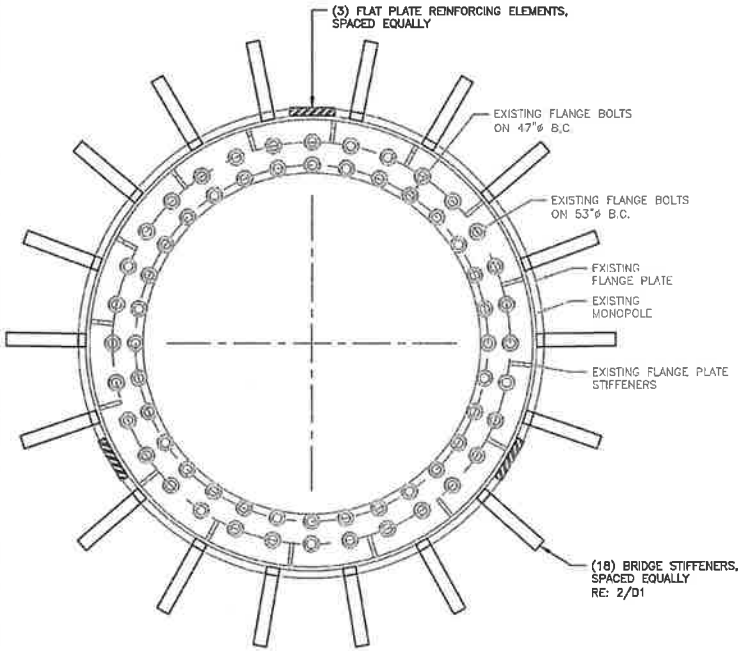
NEWINGTON_1
826217

240 KENSINGTON ROAD,
BERLIN, CT

EXISTING 190' MONOPOLE

SHEET TITLE
TOWER SECTION
0'-10.5'

SHEET NUMBER:	REVISION:
S5	0



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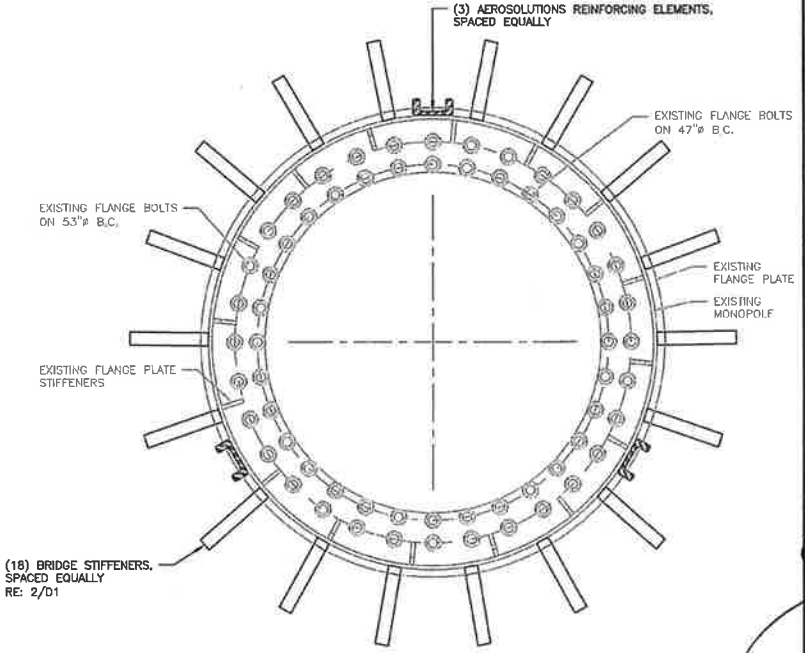


AEROSOLUTIONS

1 TOWER SECTION (20'-39.5')
SCALE: N.T.S.

B+T GRP
1717 S. BOULDER
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	05/06/13	ISSUED FOR CONSTRUCTION

PROJECT NO:	87581.002.01
PROJECT ENG:	KIRAN MAROJU
DRAWN BY:	UUJ / GLS
CHECKED BY:	SSC / SSV

B+T ENGINEERING, INC.

STATE OF CONNECTICUT
SHAD ANTILE
No. 23924
LICENSED
PROFESSIONAL ENGINEER
5/6/13

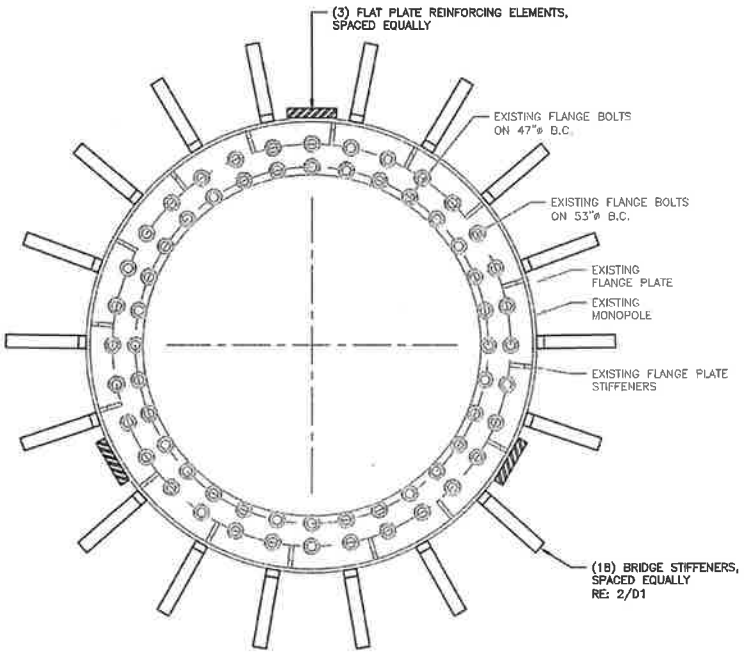
NEWINGTON_1
826217

240 KENSINGTON ROAD,
BERLIN, CT

EXISTING 190' MONOPOLE

SHEET TITLE
TOWER SECTION
20'-39.5'

SHEET NUMBER:	REVISION:
S6	0



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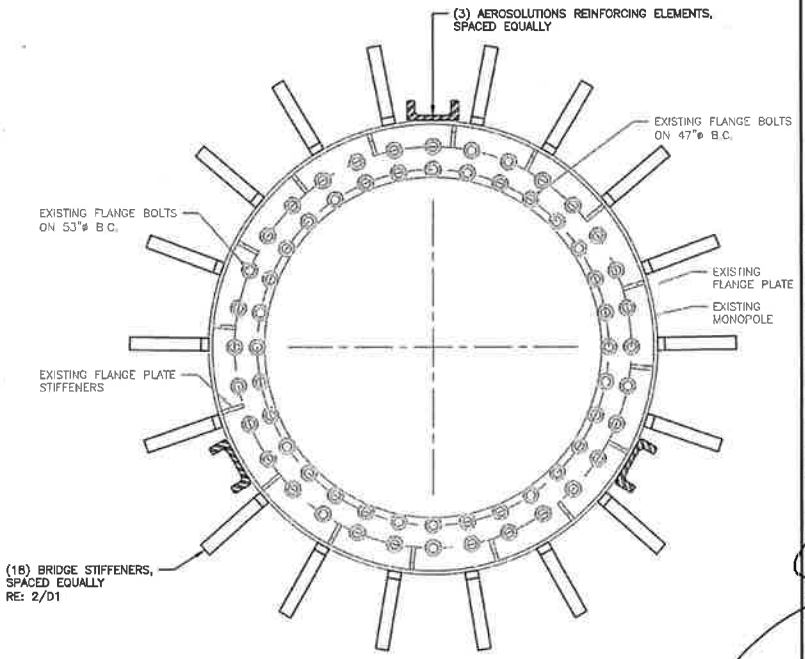


AEROSOLUTIONS

1 TOWER SECTION (40'-59.5')
SCALE: N.T.S.

B+T GRP
1717 S. BOULDER
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	05/06/13	ISSUED FOR CONSTRUCTION

PROJECT NO:	87581.002.01
PROJECT ENG:	KIRAN MAROJU
DRAWN BY:	UUJ / GLS
CHECKED BY:	SSC / SSV

B+T ENGINEERING, INC.

STATE OF CONNECTICUT
GRANT WHITTLE
No. 23924
LICENSED
PROFESSIONAL ENGINEER
5/6/13

NEWINGTON_1
826217

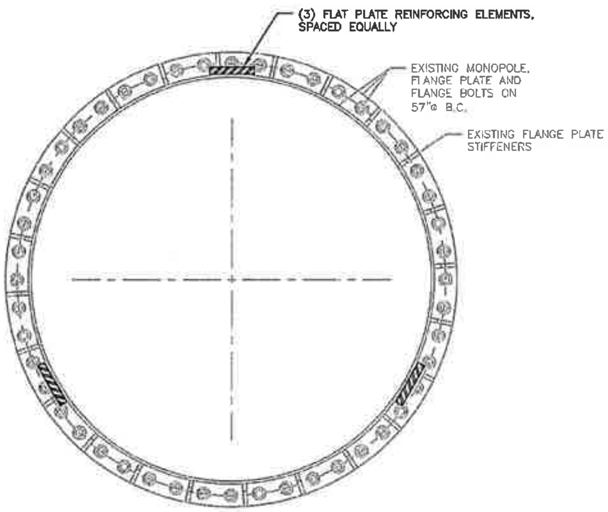
240 KENSINGTON ROAD,
BERLIN, CT

EXISTING 190' MONOPOLE

SHEET TITLE
TOWER SECTION
40'-59.5'

SHEET NUMBER: S7

REVISION: 0



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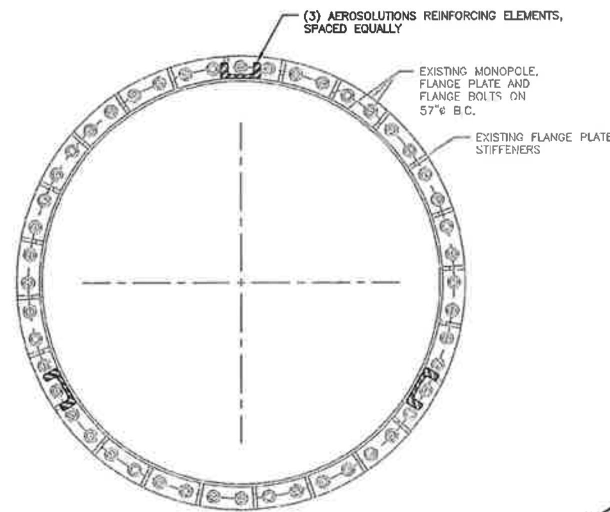

AEROSOLUTIONS

(1) TOWER SECTION (60.5'-79.5')
SCALE: N.T.S.

B+T GRP
1717 S. BOULDER
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	05/06/13	ISSUED FOR CONSTRUCTION

PROJECT NO:	87581.002.01
PROJECT ENG:	KIRAN MAROJU
DRAWN BY:	UIJ / GLS
CHECKED BY:	SSC / SSV

B+T ENGINEERING, INC.

STATE OF CONNECTICUT ★ CHAD TUTTLE No. 23924 LICENSED PROFESSIONAL ENGINEER

5/6/13

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NEWINGTON_1
826217

240 KENSINGTON ROAD,
BERLIN, CT

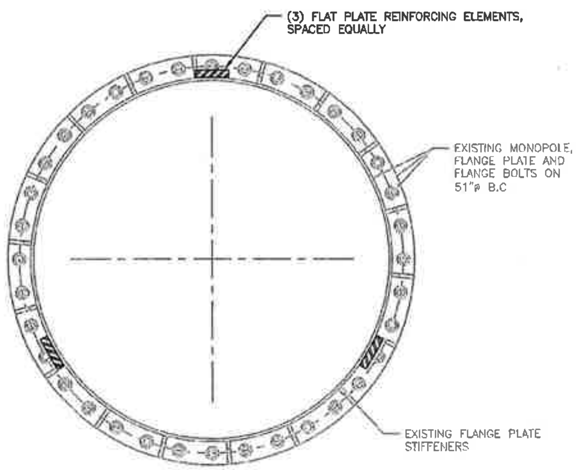
EXISTING 190' MONOPOLE

SHEET TITLE

TOWER SECTION
60.5'-79.5'

SHEET NUMBER: S8

REVISION: 0



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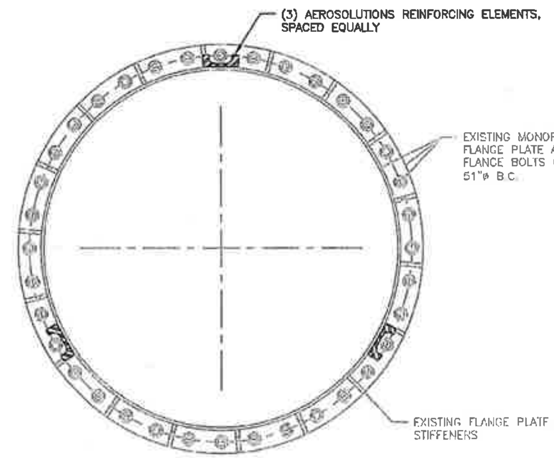

AEROSOLUTIONS

(1) TOWER SECTION (80.5'-90.5')
SCALE: N.T.S.

B+T GRP
1717 S. BOULDER
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	05/06/13	ISSUED FOR CONSTRUCTION

PROJECT NO:	87581.002.01
PROJECT ENG:	KIRAN MAROJU
DRAWN BY:	UUJ / GLS
CHECKED BY:	SSC / SSV

B+T ENGINEERING, INC.

STATE OF CONNECTICUT ★ CHAD TUTTLE ★ No. 23924 LICENSED PROFESSIONAL ENGINEER

5/6/13

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NEWINGTON_1
826217

240 KENSINGTON ROAD, BERLIN, CT

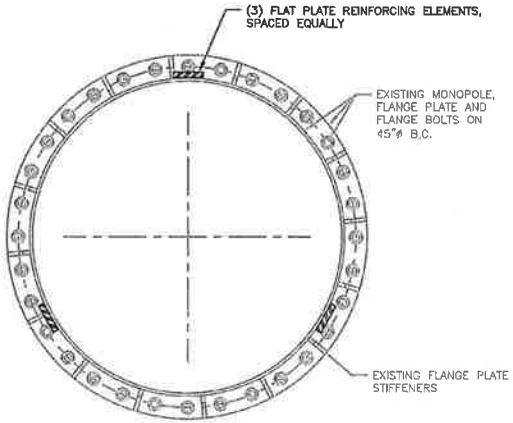
EXISTING 190' MONOPOLE

SHEET TITLE

TOWER SECTION
80.5'-90.5'

SHEET NUMBER: S9

REVISION: 0



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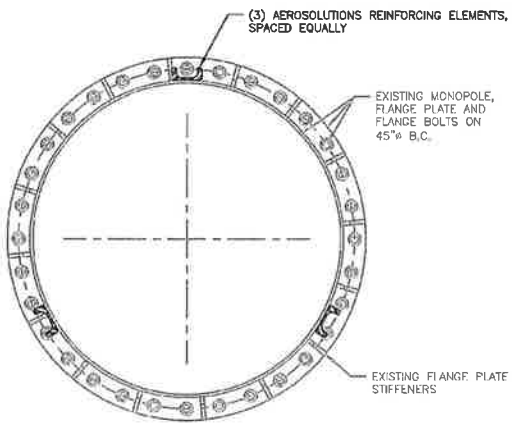

AEROSOLUTIONS

1 TOWER SECTION (100.5'-105.5')
SCALE: N.T.S.

B+T GRP
1717 S. BOULDER
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
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CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	05/06/13	ISSUED FOR CONSTRUCTION

PROJECT NO:	87581.002.01
PROJECT ENG:	KIRAN MAROJU
DRAWN BY:	UUJ / GLS
CHECKED BY:	SSC / SSV

B+T ENGINEERING, INC.

STATE OF CONNECTICUT
CHAD TUTTLE
No. 23924
LICENSED
PROFESSIONAL ENGINEER
5/6/13

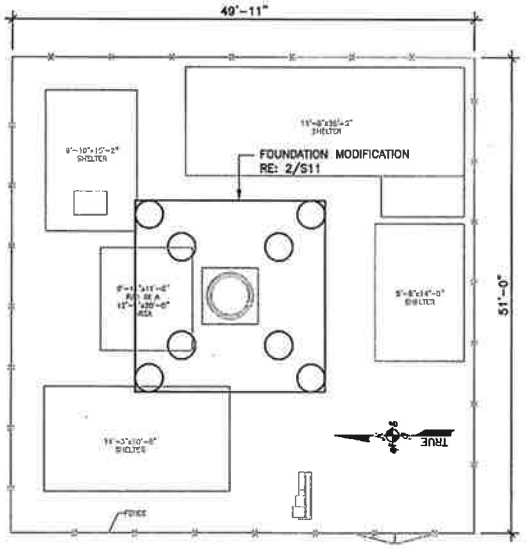
NEWINGTON_1
826217

240 KENSINGTON ROAD,
BERLIN, CT

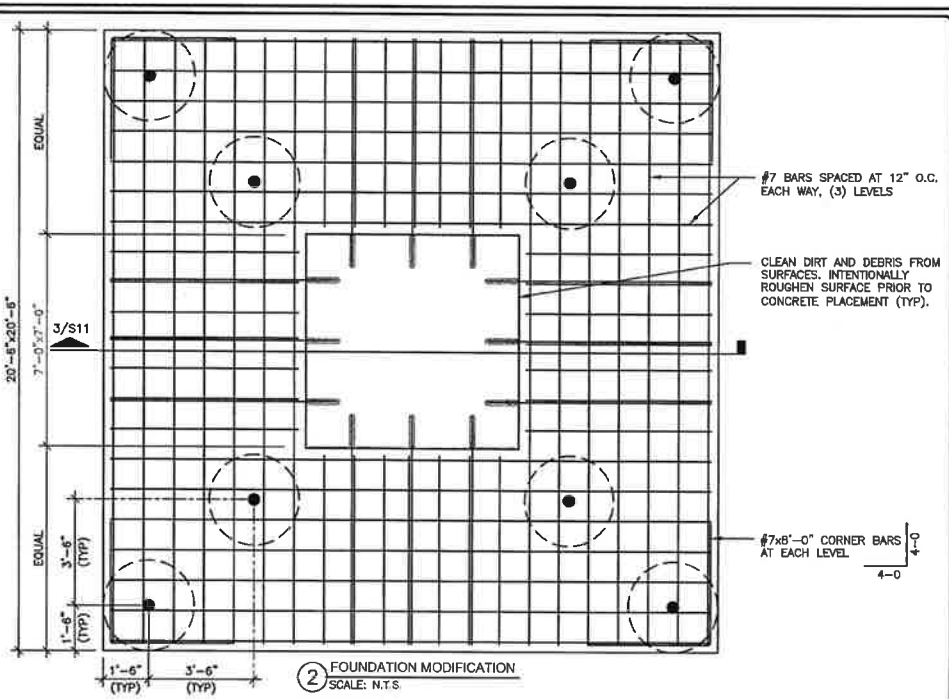
EXISTING 190' MONOPOLE

SHEET TITLE
TOWER SECTION
100.5'-105.5'

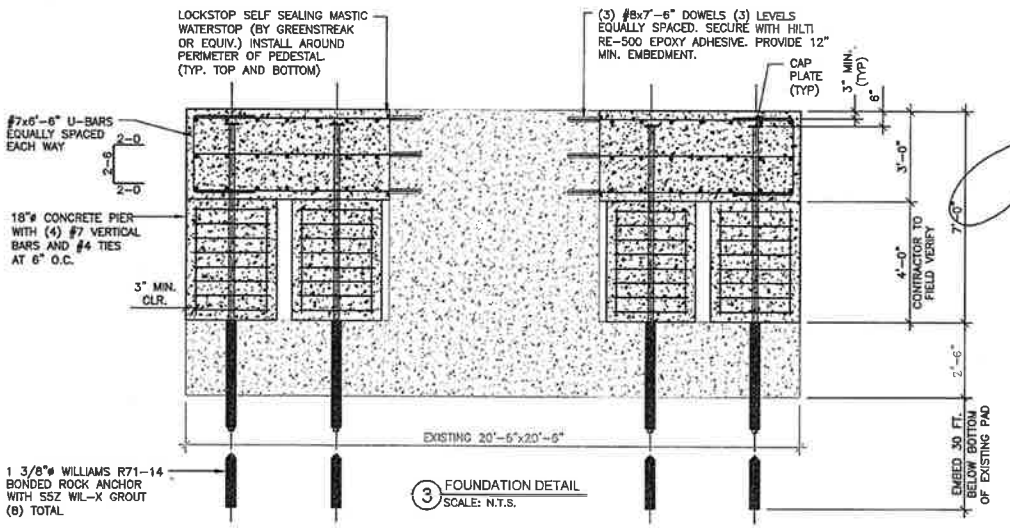
SHEET NUMBER:	REVISION:
S10	0



1 SITE PLAN
SCALE: N.T.S.



2 FOUNDATION MODIFICATION
SCALE: N.T.S.



3 FOUNDATION DETAIL
SCALE: N.T.S.

CONCRETE NOTES:

1. ALL DETAILING, FABRICATION AND PLACING OF REINFORCING BARS SHALL BE IN ACCORDANCE WITH THE ACI DETAILING MANUAL SP-66 (LATEST REVISION).
2. REINFORCING BARS SHALL BE GRADE 60 DEFORMED BARS CONFORMING TO ASTM SPECIFICATION A615, EXCEPT TIES WHICH MAY BE ASTM A615 (GRADE 40). USE CLASS B LAP SPLICES.
3. ALL REINFORCING BARS SHALL BE TIED WITH TIE WIRE AT ALL REINFORCING BAR INTERSECTIONS. THE CONTRACTOR SHALL SUPPORT THE REINFORCING BAR MAT WITH CONTINUOUS STEEL CHAIRS SPACED NO MORE THAN FOUR FEET O.C.
4. ALL WATER SHALL BE REMOVED FROM THE BOTTOM OF THE EXCAVATION BEFORE COMPACTING FILL AND PLACING CONCRETE.
5. CONCRETE SHALL BE NORMAL WEIGHT AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS.
6. CONCRETE SHALL BE PLACED AGAINST UNDISTURBED SOIL WHERE POSSIBLE. FORMS, WHEN REQUIRED SHALL BE REMOVED PRIOR TO BACKFILLING.
7. BACKFILL MATERIAL SHALL BE COMPACTED TO A MINIMUM UNIT WEIGHT OF 100 PCF OR THE NET WEIGHT SPECIFIED IN THE GEOTECH REPORT.
8. FOR THE LESSOR OF 25 C.Y. OR ONE DAY'S PLACEMENT, A MINIMUM OF 4 CONCRETE CYLINDERS SHALL BE TAKEN. CONCRETE SHALL BE TESTED AS REQUIRED BY OWNER'S PROJECT MANAGER.
9. EXISTING SLAB AND FENCING MAY BE DAMAGED DURING INSTALLATION OF FOUNDATION MODIFICATIONS, CONSTRUCTION PRICE SHALL INCLUDE REPLACEMENT OR REPAIR OF THE DAMAGED ITEMS.

B+T GRP
1717 S. BOULDER
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	05/06/13	ISSUED FOR CONSTRUCTION

PROJECT NO:	87581.002.01
PROJECT ENG:	KIRAN MAROJU
DRAWN BY:	UUJ / GLS
CHECKED BY:	SSC / SSV

B+T ENGINEERING, INC.

STATE OF CONNECTICUT
CRAIG TUTTLE
No. 23924
LICENSED
PROFESSIONAL ENGINEER
5/6/13

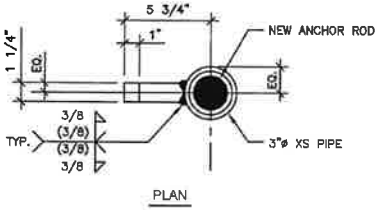
NEWINGTON_1
826217

240 KENSINGTON ROAD,
BERLIN, CT

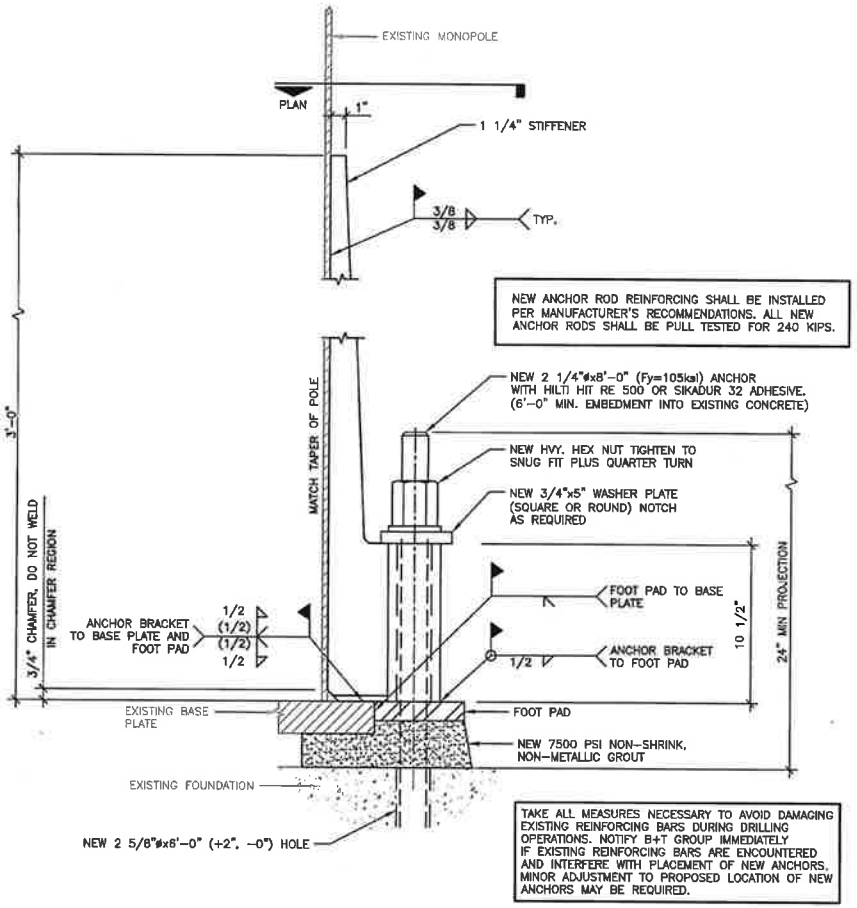
EXISTING 190' MONOPOLE

SHEET TITLE
FOUNDATION MODIFICATION

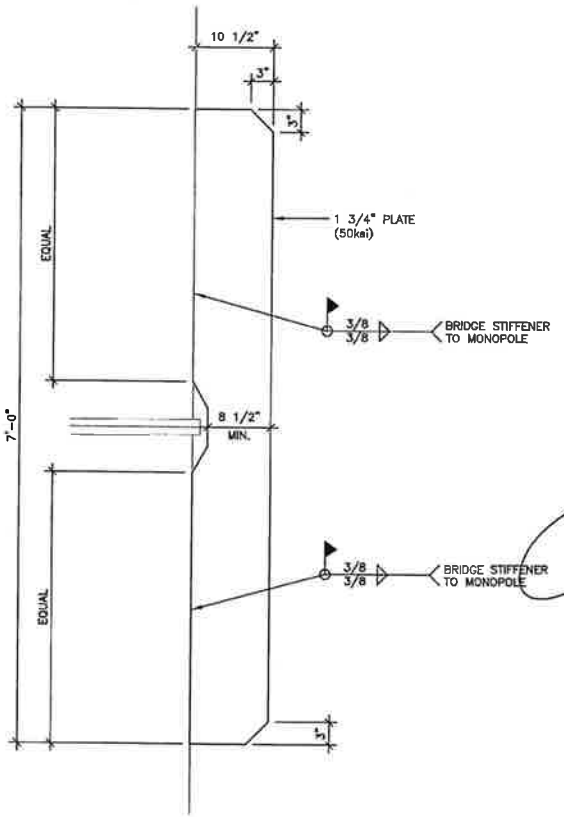
SHEET NUMBER:	REVISION:
S11	0



PLAN



1 ANCHOR ROD BRACKET DETAIL
SCALE: N.T.S.



2 BRIDGE STIFFENER DETAIL
SCALE: N.T.S.

B+T GRP
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SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
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CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	05/06/13	ISSUED FOR CONSTRUCTION

PROJECT NO:	87581.002.01
PROJECT ENG:	KIRAN MAROJU
DRAWN BY:	UUJ / GLS
CHECKED BY:	SSC / SSV

B+T ENGINEERING, INC.

STATE OF CONNECTICUT
CHAD TUTTLE
No. 23924
LICENSED
PROFESSIONAL ENGINEER
5/6/13

NEWINGTON_1
826217

240 KENSINGTON ROAD,
BERLIN, CT

EXISTING 160' MONOPOLE

SHEET TITLE
DETAILS

SHEET NUMBER: D1
REVISION: 0

Far Field Approximation
with downtilt variation

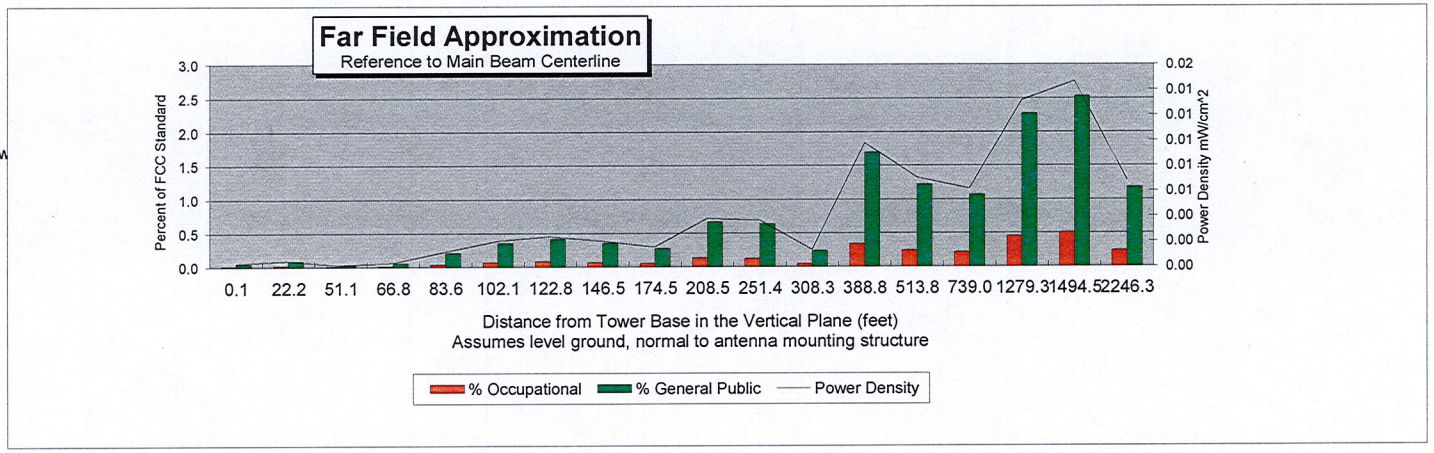
Estimated Radiated Emission

Single Emitter Far Field Model

Dipole / Wire/ Yagi Antenna Types

Location:	Berlin Kensington, CT
Site #:	
Date:	10/22/13
Name:	Mark Brauer
File Name:	Berlin Kensington, CT - FF Pow

Operating Freq. (MHz)	**869.0**
Antenna Height (ft):	**160.0**
Antenna Gain (dBi):	**16.7**
Antenna Size (in.):	**72.0**
Downtilt (degrees):	**2.0**
Feedline Loss (dB):	**0.0**
Power @ J4 (w):	**3422.0**



Calc Angle	90.0	82.0	72.0	67.0	62.0	57.0	52.0	47.0	42.0	37.0	32.0	27.0	22.0	17.0	12.0	7.0	6.0	4.0	
Solve for r, dx to antenna	157.0	158.6	165.1	170.6	177.9	187.3	199.3	214.8	234.7	261.0	296.4	346.0	419.3	537.3	755.5	1288.9	1502.7	2251.8	
Distance from Antenna Structure Base in Horizontal plane	0.1	22.2	51.1	66.8	83.6	102.1	122.8	146.5	174.5	208.5	251.4	308.3	388.8	513.8	739.0	1279.3	1494.5	2246.3	
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	4	2	
dB down from centerline (referenced to centerline)	36.76	34.35	38.52	35.34	29.54	26.8	25.59	25.63	25.99	21.21	20.29	23.24	13.03	12.3	9.92	2	0.2	0	
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	
Power Density (mW/cm^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	
Percent of Occupational Standard	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.3	0.2	0.2	0.5	0.5	0.2	
Percent of General Population Standard	0.1	0.1	0.0	0.1	0.2	0.4	0.4	0.4	0.3	0.7	0.6	0.2	1.7	1.2	1.1	2.3	2.5	1.2	

Antenna Type LPA-80063-6CF
Max% 2.53%

Instructions:

1) Fill in Site Location, Site number, Date, Name of Person Responsible for Date, and enter File Name to ba saved as.
2) References to J4 refer to a point where the transmission line exits the equipment shelter and proceeds to the antenna(s). There is typically a connector located here where power measurements are made.
3) Enter Antenna Height (in feet to bottom of antenna), Antenna Gain (expressed as dBi, add 2.17 to dBd to obtain dBi), Antenna Size (vertical size in inches), Downtilt (in Degrees, enter zero if none), Feedline loss from J4 to Antenna, and J4 Po
4) From manufacturer's plots, or data sheet, input Angle from mainbeam and dB below mainbeam centerline.
5) Enter Reflection coefficient (2.56 would be typical, 1 for free space)
6) Spreadsheet calculates actual power density, then relates as Occupational or General Population percentage of FCC Standard.
7) An odd distance may be entered in the rightmost column of the lower table.

Far Field Approximation
with downtilt variation

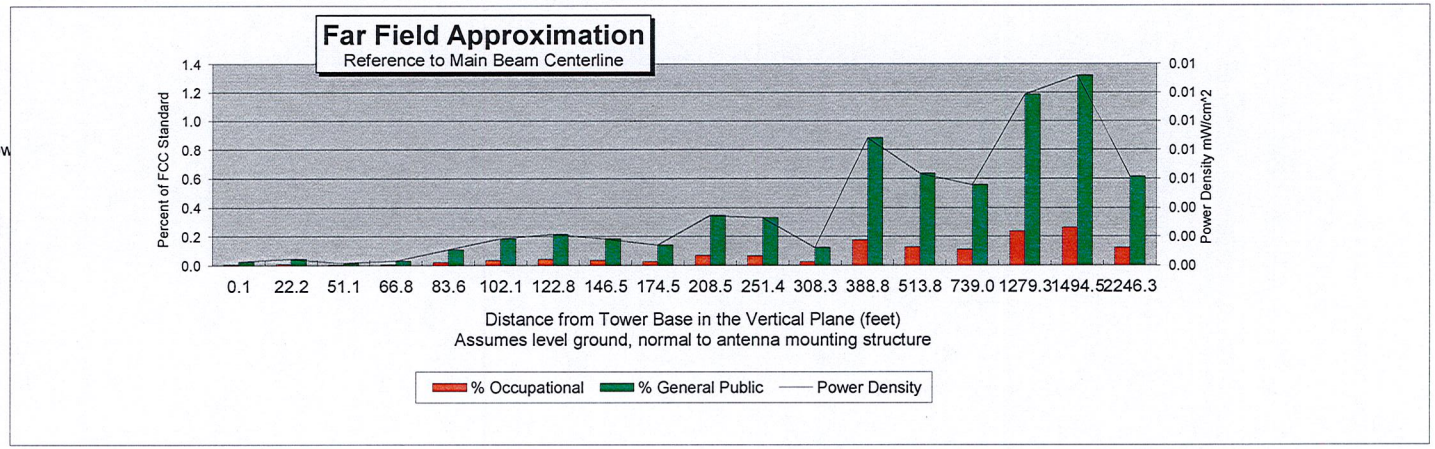
Estimated Radiated Emission

Single Emitter Far Field Model

Dipole / Wire/ Yagi Antenna Types

Location:	Berlin Kensington, CT
Site #:	
Date:	10/22/13
Name:	Mark Brauer
File Name:	Berlin Kensington, CT - FF Pow

Operating Freq. (MHz)	**2130.0**
Antenna Height (ft):	**160.0**
Antenna Gain (dBi):	**19.1**
Antenna Size (in.):	**72.0**
Downtilt (degrees):	**2.0**
Feedline Loss (dB):	**0.0**
Power @ J4 (w):	**1750.0**



Calc Angle	90.0	82.0	72.0	67.0	62.0	57.0	52.0	47.0	42.0	37.0	32.0	27.0	22.0	17.0	12.0	7.0	6.0	4.0
Solve for r, dx to antenna	157.0	158.6	165.1	170.6	177.9	187.3	199.3	214.8	234.7	261.0	296.4	346.0	419.3	537.3	755.5	1288.9	1502.7	2251.8
Distance from Antenna Structure Base in Horizontal plane	0.1	22.2	51.1	66.8	83.6	102.1	122.8	146.5	174.5	208.5	251.4	308.3	388.8	513.8	739.0	1279.3	1494.5	2246.3
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	4	2
dB down from centerline (referenced to centerline)	36.76	34.35	38.52	35.34	29.54	26.8	25.59	25.63	25.99	21.21	20.29	23.24	13.03	12.3	9.92	2	0.2	0
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56
Power Density (mW/cm^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01
Percent of Occupational Standard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.2	0.1	0.1	0.2	0.3	0.1
Percent of General Population Standard	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.1	0.3	0.3	0.1	0.9	0.6	0.6	1.2	1.3	0.6

Antenna Type BXA-171063-12CF
Max% 1.32%

Instructions:

1) Fill in Site Location, Site number, Date, Name of Person Responsible for Date, and enter File Name to ba saved as.
2) References to J4 refer to a point where the transmission line exits the equipment shelter and proceeds to the antenna(s). There is typically a connector located here where power measurements are made.
3) Enter Antenna Height (in feet to bottom of antenna), Antenna Gain (expressed as dBi, add 2.17 to dBd to obtain dBi), Antenna Size (vertical size in inches), Downtilt (in Degrees, enter zero if none), Feedline loss from J4 to Antenna, and J4 Po
4) From manufacturer's plots, or data sheet, input Angle from mainbeam and dB below mainbeam centerline.
5) Enter Reflection coefficient (2.56 would be typical, 1 for free space)
6) Spreadsheet calculates actual power density, then relates as Occupational or General Population percentage of FCC Standard.
7) An odd distance may be entered in the rightmost column of the lower table.

Far Field Approximation
with downtilt variation

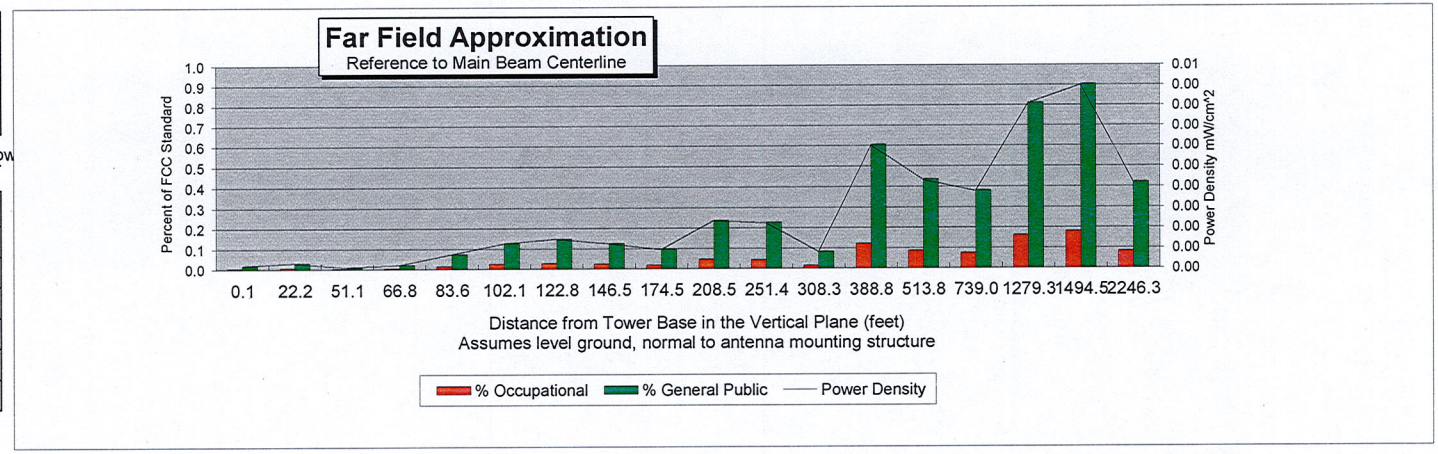
Estimated Radiated Emission

Single Emitter Far Field Model

Dipole / Wire/ Yagi Antenna Types

Location:	Berlin Kensington, CT
Site #:	
Date:	10/22/13
Name:	Mark Brauer
File Name:	Berlin Kensington, CT - FF Pow

Operating Freq. (MHz)	**746.0**
Antenna Height (ft):	**160.0**
Antenna Gain (dBi):	**16.7**
Antenna Size (in.):	**72.0**
Downtilt (degrees):	**2.0**
Feedline Loss (dB):	**0.0**
Power @ J4 (w):	**1050.0**



Calc Angle	90.0	82.0	72.0	67.0	62.0	57.0	52.0	47.0	42.0	37.0	32.0	27.0	22.0	17.0	12.0	7.0	6.0	4.0
Solve for r, dx to antenna	157.0	158.6	165.1	170.6	177.9	187.3	199.3	214.8	234.7	261.0	296.4	346.0	419.3	537.3	755.5	1288.9	1502.7	2251.8
Distance from Antenna Structure Base in Horizontal plane	0.1	22.2	51.1	66.8	83.6	102.1	122.8	146.5	174.5	208.5	251.4	308.3	388.8	513.8	739.0	1279.3	1494.5	2246.3
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	4	2
dB down from centerline (referenced to centerline)	36.76	34.35	38.52	35.34	29.54	26.8	25.59	25.63	25.99	21.21	20.29	23.24	13.03	12.3	9.92	2	0.2	0
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56
Power Density (mW/cm^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Percent of Occupational Standard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.1
Percent of General Population Standard	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.6	0.4	0.4	0.8	0.9	0.4

Antenna Type BXA-70063-6CF
Max% 0.91%

Instructions:

1) Fill in Site Location, Site number, Date, Name of Person Responsible for Date, and enter File Name to ba saved as.
2) References to J4 refer to a point where the transmission line exits the equipment shelter and proceeds to the antenna(s). There is typically a connector located here where power measurements are made.
3) Enter Antenna Height (in feet to bottom of antenna), Antenna Gain (expressed as dBi, add 2.17 to dBd to obtain dBi), Antenna Size (vertical size in inches), Downtilt (in Degrees, enter zero if none), Feedline loss from J4 to Antenna, and J4 Po
4) From manufacturer's plots, or data sheet, input Angle from mainbeam and dB below mainbeam centerline.
5) Enter Reflection coefficient (2.56 would be typical, 1 for free space)
6) Spreadsheet calculates actual power density, then relates as Occupational or General Population percentage of FCC Standard.
7) An odd distance may be entered in the rightmost column of the lower table.

Far Field Approximation
with downtilt variation

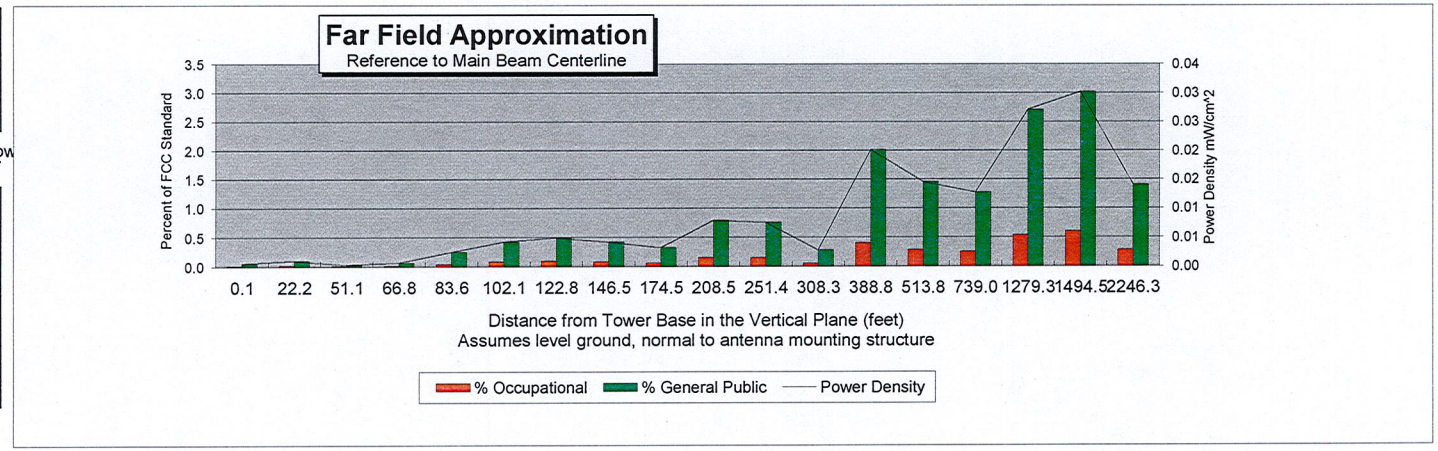
Estimated Radiated Emission

Single Emitter Far Field Model

Dipole / Wire/ Yagi Antenna Types

Location:	Berlin Kensington, CT
Site #:	
Date:	10/22/13
Name:	Mark Brauer
File Name:	Berlin Kensington, CT - FF Pow

Operating Freq. (MHz)	**1970.0**
Antenna Height (ft):	**160.0**
Antenna Gain (dBi):	**18.7**
Antenna Size (in.):	**72.0**
Downtilt (degrees):	**2.0**
Feedline Loss (dB):	**0.0**
Power @ J4 (w):	**4388.0**



Calc Angle	90.0	82.0	72.0	67.0	62.0	57.0	52.0	47.0	42.0	37.0	32.0	27.0	22.0	17.0	12.0	7.0	6.0	4.0
Solve for r, dx to antenna	157.0	158.6	165.1	170.6	177.9	187.3	199.3	214.8	234.7	261.0	296.4	346.0	419.3	537.3	755.5	1288.9	1502.7	2251.8
Distance from Antenna Structure Base in Horizontal plane	0.1	22.2	51.1	66.8	83.6	102.1	122.8	146.5	174.5	208.5	251.4	308.3	388.8	513.8	739.0	1279.3	1494.5	2246.3
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Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56
Power Density (mW/cm^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.02	0.01	0.01	0.03	0.03	0.01
Percent of Occupational Standard	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.4	0.3	0.3	0.5	0.6	0.3
Percent of General Population Standard	0.1	0.1	0.0	0.1	0.3	0.4	0.5	0.4	0.3	0.8	0.8	0.3	2.0	1.5	1.3	2.7	3.0	1.4

Antenna Type BXA-171063-12CF
Max% 3.02%

Instructions:

1) Fill in Site Location, Site number, Date, Name of Person Responsible for Date, and enter File Name to ba saved as.
2) References to J4 refer to a point where the transmission line exits the equipment shelter and proceeds to the antenna(s). There is typically a connector located here where power measurements are made.
3) Enter Antenna Height (in feet to bottom of antenna), Antenna Gain (expressed as dBi, add 2.17 to dBd to obtain dBi), Antenna Size (vertical size in inches), Downtilt (in Degrees, enter zero if none), Feedline loss from J4 to Antenna, and J4 Po
4) From manufacturer's plots, or data sheet, input Angle from mainbeam and dB below mainbeam centerline.
5) Enter Reflection coefficient (2.56 would be typical, 1 for free space)
6) Spreadsheet calculates actual power density, then relates as Occupational or General Population percentage of FCC Standard.
7) An odd distance may be entered in the rightmost column of the lower table.