ROBINSON & COLE LLP

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

April 10, 2014

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

Re: **Request of Cellco Partnership d/b/a Verizon Wireless for an Order to Approve the Shared Use of an Existing Tower at 2365 Long Hill Road, Guilford, Connecticut**

Dear Ms. Bachman:

Pursuant to Connecticut General Statutes ("C.G.S.") §16-50aa, as amended, Cellco Partnership d/b/a Verizon Wireless ("Cellco") hereby requests an order from the Connecticut Siting Council ("Council") to approve the shared use by Cellco of an existing telecommunications tower, owned by Crown Castle ("Crown"), at 2365 Long Hill Road in Guilford, Connecticut (the "Property"). Cellco requests that the Council find that the proposed shared use of the Crown tower satisfies the criteria of C.G.S § 16-50aa and issue an order approving the proposed shared use. A copy of this letter is being sent to Guilford's First Selectman, Joseph S. Mazza. The Property is owned by James J. and Janice M. Ward.

Background

The existing Crown facility was approved by the Council in Docket No. 238 and consists of a 180-foot self-supporting monopole tower. The tower is currently being shared by Sprint at the 178-foot level, AT&T at the 167-foot level, and T-Mobile at the 155-foot level. Equipment associated with the wireless carriers' antennas is located on the ground within a 40' x 60' fenced compound and a 100' x 100' leased area.

Cellco is licensed by the Federal Communications Commission ("FCC") to provide wireless services throughout the State of Connecticut. Cellco and Crown have agreed to the proposed shared use of the 2365 Long Hill Road tower pursuant to mutually acceptable terms and conditions, and Crown has authorized Cellco to apply for all necessary permits and approvals that may be required to share the existing tower. (*See* Owner's authorization letter included in Attachment 1).

Cellco proposes to install twelve (12) antennas at the 145-foot level on the tower. Cellco will also install three (3) remote radio heads (RRHs) behind its 2100 MHz antennas. Equipment associated with Cellco's antennas and an emergency generator will be located inside Cellco's 12' x 30' shelter located within the existing fenced-compound. Included in Attachment 2 are Cellco's Project Plans showing limits of the facility compound and Leased Area, the location of all proposed site improvements, and a tower elevation drawing.

C.G.S. § 16-50aa(c)(1) provides that, upon written request for approval of a proposed shared use, "if the council finds that the proposed shared use of the facility is technically, legally, environmentally and economically feasible and meets public safety concerns, the council shall issue an order approving such shared use." Cellco respectfully submits that the shared use of the tower satisfies these criteria.

A. Technical Feasibility. The existing tower with certain structural modifications is capable of supporting Cellco's antennas and related equipment. The proposed shared use of this tower is, therefore, technically feasible. A Structural Modification Analysis Report is included in Attachment 3.

B. Legal Feasibility. Under C.G.S. § 16-50aa, the Council has been authorized to issue orders approving the shared use of an existing tower such as the Crown tower in Guilford. This authority complements the Council's prior-existing authority under C.G.S. § 16-50p to issue orders approving the construction of new towers that are subject to the Council's jurisdiction. In addition, § 16-50x(a) directs the Council to "give such consideration to other state laws and municipal regulations as it shall deem appropriate" in ruling on requests for the shared use of existing tower facilities. Under the statutory authority vested in the Council, an order by the Council approving the requested shared use would permit the Applicant to obtain a building permit for the proposed installations.

C. Environmental Feasibility. The proposed shared use of the Crown tower would have a minimal environmental effect, for the following reasons:

1. The proposed installation of twelve (12) antennas and RRHs at the 145-foot level on the existing 180-foot tower would have an insignificant incremental visual impact on the area around the existing tower. Cellco would be the fourth wireless carrier to share this tower.

   All of Cellco's improvements will occur within the existing facility compound. Cellco's equipment shelter will be located in the easterly portion of the compound. Ground disturbance, for the installation of the concrete pad associated with the shelter, will be minimal and would not require the removal of any trees. Cellco's shared use of this tower would therefore, not cause any significant change or alteration in the physical or environmental characteristics of the Property.

2. Noise associated with the equipment shelter's air conditioning ("A/C") units was evaluated for compliance with State and/or local noise standards. According to the Noise Compliance Study included in Attachment 4, noise from the shelter's A/C units will not exceed State and/or local noise limits. Noise associated with Cellco's emergency back-up generator is exempt from State and local noise standards.

3. Operation of Cellco's antennas at this site would not exceed the Maximum Permissible Exposure ("MPE") standards adopted by the Federal Communications Commission ("FCC"). Included in Attachment 5 of this filing is a worst-case Radio Frequency ("RF") emissions calculation that demonstrates that the existing Sprint, AT&T and T-Mobile antennas together with the proposed Cellco antennas will operate well within the FCC's standards.

4. Under ordinary operating conditions, the proposed installation would not require the use of any water or sanitary facilities and would not generate air emissions or discharges to water bodies or sanitary facilities. After construction is complete the proposed installations would not generate any increased traffic to the Crown facility other than periodic (monthly) maintenance visits to the cell site.

The proposed shared use of the Crown facility would, therefore, have a minimal environmental effect, and is environmentally feasible.

D. Economic Feasibility. As previously mentioned, Crown and Cellco have entered into a lease for the shared use of the existing tower on mutually agreeable terms. The proposed tower sharing is, therefore, economically feasible. (*See* Attachment 1).

E. Public Safety Concerns. As discussed above, the tower is structurally capable of supporting Cellco's full array of twelve (12) antennas, RRHs and related equipment. Cellco is not aware of any public safety concerns relative to the proposed sharing of the existing Crown tower. In fact, the provision of new and improved wireless service through shared use of the existing tower is expected to enhance the safety and welfare of area residents and members of the general public traveling in and through the Town of Guilford.

Conclusion

For the reasons discussed above, the proposed shared use of the existing Crown tower at 2365 Long Hill Road in Guilford satisfies the criteria stated in C.G.S. § 16-50aa and advances the General Assembly's and the Council's goal of preventing the unnecessary proliferation of towers in Connecticut. The Applicant, therefore, respectfully requests that the Council issue an order approving the proposed shared use of the Crown tower.

Thank you for your consideration of this matter.

Very truly yours,

Kenneth C. Baldwin

Enclosures
Copy to:
Joseph S. Mazza, First Selectman
James J. and Janice M. Ward
Sandy M. Carter

ATTACHMENT 1

CROWN CASTLE

3530 Toringdon Way
Suite 300
Charlotte, NC 28277

Tel: 704-405-6623
Fax: 724-416-6591

April 3, 2014

RE: Crown Castle Letter of Authorization (LOA)

Crown Castle, does hereby authorize **Verizon Wireless ("Verizon")** and its authorized contractors/agents to act as "Applicant" in the processing of all applications, permits, research and other related activities associated with the processing, planning, design review, permitting, entitlement and construction of additional equipment, antennas and site improvements for the Crown Castle existing wireless communications facility described as follows:

Customer Site Name:	**Guilford 4**	**Crown Castle Site ID Number:**	**876381**
Site Address:	**2365 Long Hill Road Guilford, CT 06437**	**Crown Castle Site Name:**	**WARD**

This authorization is fully contingent upon **Verizon's** authorized contractors/agents' compliance with the following conditions:

1. Crown Castle must review the application prior to submittal. Crown Castle must be provided all applications, narratives, drawings and attachments at least 72 hours in advance of their submittal to the locality. Use of email and electronic attachments is encouraged. A Crown Castle Zoning Subject Matter Expert (SME) will review and provide written comment to the customer within 48 hours of receipt of a complete set of application materials. If Crown Castle indicates that changes are required, submissions shall be altered in accordance with Crown Castle comments prior to submission to the locality. Verification of corrections should also be accomplished via emails and attachments.
2. In no event may **Verizon** encourage, suggest, participate in, or permit the imposition of any restrictions or additional obligations whatsoever on the tower site or Crown Castle's current or future use or ability to license space at the tower site as part of or in exchange for obtaining any approval, permit, exception or variance.
3. A copy of the final permit and/or a written summary of the zoning/entitlement decision rendered by the locality and any/all conditions placed on that decision shall be communicated in detail to Crown Castle well within the appeal period provided by the locality (typically 10-15 days).
4. All conditions of approval pertinent to the construction of the proposed project must be included in the construction drawings for the project. The conditions of approval pertinent to the construction of the project shall be copied verbatim from the zoning permit approval language, and shall be present in the drawings prior to submission for building permits and contractor bidding. Crown Castle shall verify the inclusion of appropriate conditions of approval in the construction drawing redline process.
5. Crown Castle will provide a Notice To Proceed (NTP) to construction to the customer upon receipt of the final approved zoning permit and the approved Building Permit.

By Crown Castle:

Signature: Sarah Brown

Printed Name: **Sarah Brown**

Title: **Real Estate Specialist**

Date: **April 3, 2014**

ATTACHMENT 2

Cellco Partnership

d.b.a. verizon wireless

WIRELESS COMMUNICATIONS FACILITY

GUILFORD 4

2365 LONG HILL ROAD

GUILFORD, CT 06437

SITE DIRECTIONS

FROM: 99 EAST RIVER DRIVE
EAST HARTFORD, CONNECTICUT

TO: 2365 LONG HILL ROAD
GUILFORD, CONNECTICUT

1. Head Southeast on E River Dr toward Pitkin St	0.9 mi
2. Continue onto E River Dr Extension	0.3 mi
3. Turn right onto US-5 S/CT-15 S ramp to New Haven/I-91 S	0.2 mi
4. Merge onto US-5 S	0.8 mi
5. Take exit 86 to merge onto I-91 S toward New Haven/New York City	8.9 mi
6. Take exit 22S on the left to merge onto CT-9 S toward Middletown/Old Saybrook	5.5 mi
7. Continue onto CT-17 S/CT-9 S	0.8 mi
8. Take exit 13 for CT-17 S toward New Haven	0.2 mi
9. Slight right onto CT-17 S	0.3 mi
10. Turn left onto CT-17 S/S Main St	6.6 mi
11. Slight left onto CT-77 S/Guilford Rd	8.4 mi
12. Turn right onto CT-80 W/Old Toll Rd	0.5 mi
13. Turn left onto Long Hill Rd and the destination will be on the left	0.3 mi

GENERAL NOTES

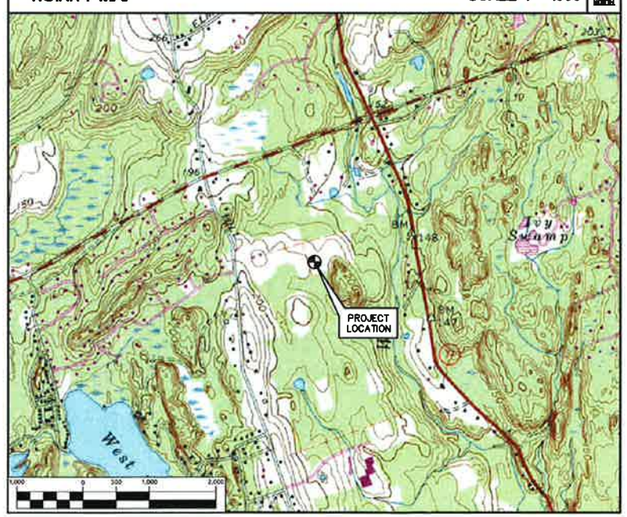
1. PROPOSED ANTENNA LOCATIONS AND HEIGHTS PROVIDED BY CELLCO PARTNERSHIP.

PROJECT SCOPE

1. THE PROPOSED SCOPE OF WORK GENERALLY INCLUDES THE INSTALLATION OF A 12'x30' PREFABRICATED WIRELESS EQUIPMENT SHELTER ON A CONCRETE FOUNDATION, LOCATED WITHIN THE EXISTING WIRELESS COMMUNICATIONS LEASE AREA.
2. A TOTAL OF TWELVE (12) DIRECTIONAL PANEL ANTENNAS ARE PROPOSED TO BE MOUNTED ON AN EXISTING 178' TALL MONOPOLE TOWER AT A CENTERLINE ELEVATION OF 145' ABOVE FINISHED GRADE.
3. ELECTRIC AND TELCO UTILITIES SHALL BE ROUTED UNDERGROUND TO THE PROPOSED EQUIPMENT SHELTER FROM AN EXISTING UTILITY BACKBOARD LOCATED ADJACENT TO FENCED COMPOUND.

VICINITY MAP

SCALE: 1" = 1000'



PROJECT SUMMARY

SITE NAME:	GUILFORD 4
SITE ADDRESS:	2365 LONG HILL ROAD GUILFORD, CT 06437
LESSEE/TENANT:	CELLCO PARTNERSHIP d.b.a. VERIZON WIRELESS 99 EAST RIVER DRIVE EAST HARTFORD, CT 06108
CONTACT PERSON:	SANDY CARTER CELLCO PARTNERSHIP (860) 803-8219
TOWER COORDINATES:	LATITUDE: 41°-20'-47.32" LONGITUDE: 72°-43'-23.2" GROUND ELEVATION: 180'± A.M.S.L. COORDINATES & GROUND ELEVATION ARE BASED ON CONNECTICUT SITING COUNCIL DATABASE.

SHEET INDEX

SHT. NO.	DESCRIPTION	REV. NO.
T-1	TITLE SHEET	0
C-1	COMPOUND PLAN AND ELEVATION	0

PROFESSIONAL ENGINEER SEAL

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	04/09/14	HAR	DMD	ISSUED FOR CSC - CLIENT REVIEW

Cellco Partnership d.b.a. verizon wireless

CENTEK engineering
Centered on Solutions℠
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

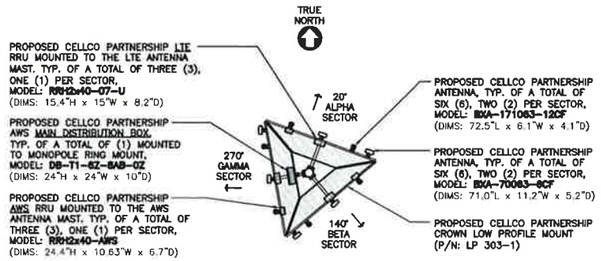
Cellco Partnership d/b/a Verizon Wireless
WIRELESS COMMUNICATIONS FACILITY
GUILFORD 4
2365 LONG HILL ROAD
GUILFORD, CT 06437

DATE: 04/09/14
SCALE: AS NOTED
JOB NO. 13284.000

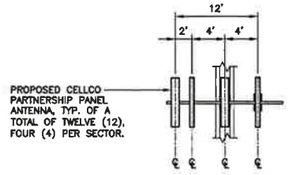
TITLE SHEET

T-1

Sheet No. 1 of 2



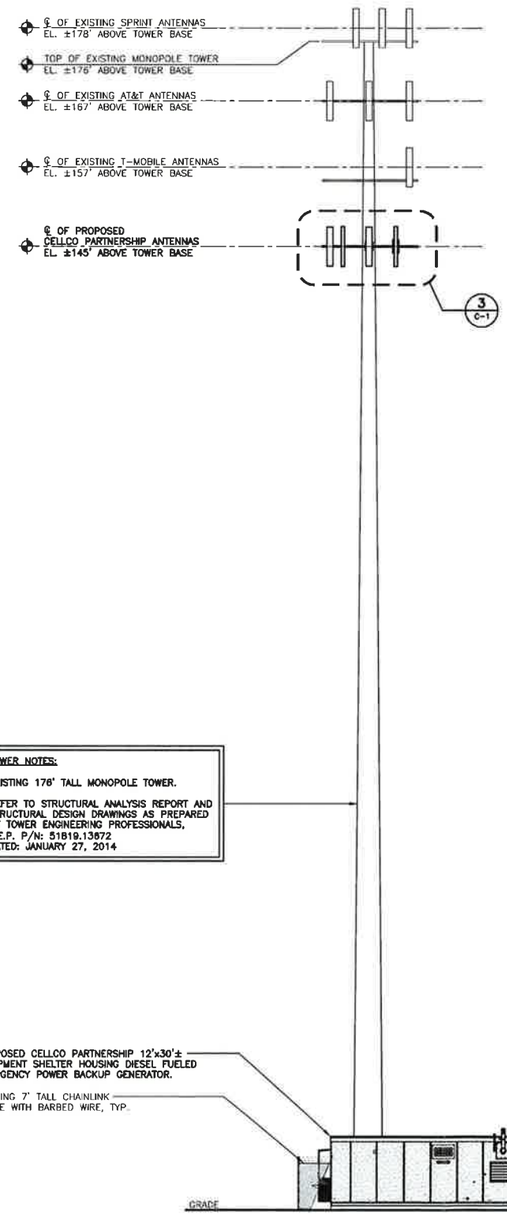
PLAN

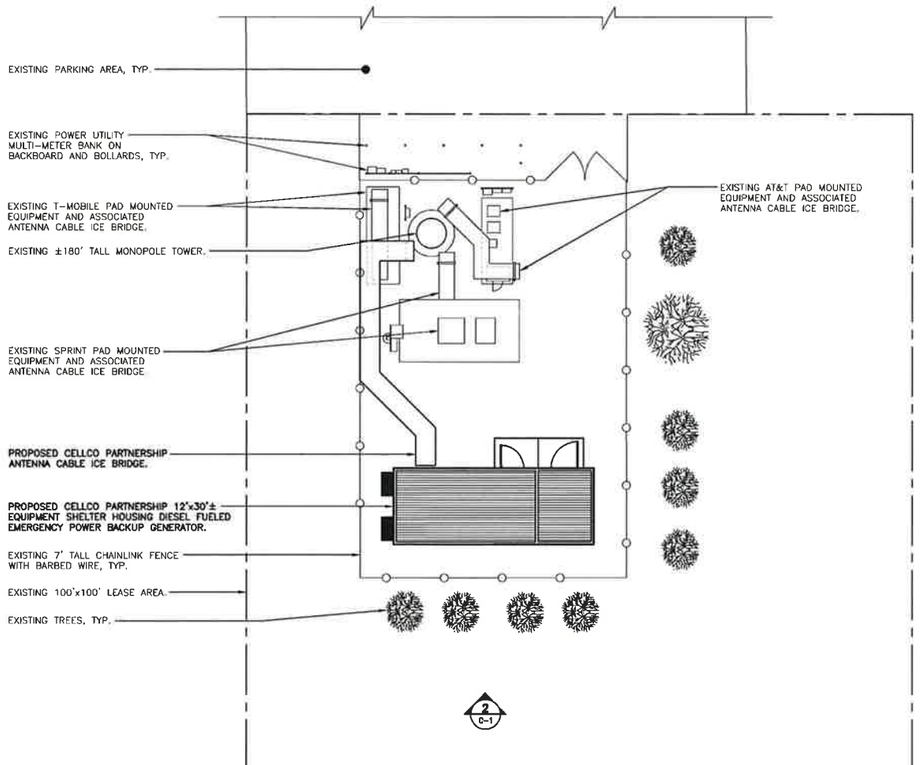


ELEVATION

3 / C-1 ANTENNA MOUNTING CONFIGURATION

NOT TO SCALE





1 / C-1 COMPOUND PLAN

SCALE: 1" = 10'

APPROXIMATE NORTH

GRAPHIC SCALE
(IN FEET)
1 inch = 10 ft.

2 / C-1 SOUTH ELEVATION

SCALE: 1" = 10'

GRAPHIC SCALE
(IN FEET)
1 inch = 10 ft.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	04/09/14	HMR	DMD	ISSUED FOR CSC - CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

Cellco Partnership d.b.a. verizonwireless

CENTEK engineering
Centered on Solutions℠
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

Cellco Partnership d/b/a Verizon Wireless

WIRELESS COMMUNICATIONS FACILITY

GUILFORD 4

22865 LONG HILL ROAD
GUILFORD, CT 06437

DATE:	04/08/14
SCALE:	AS NOTED
JOB NO.	13284.000

COMPOUND PLAN AND ELEVATION

C-1

Sheet No. 2 of 2

ATTACHMENT 3

Date: **January 27, 2014**

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

Tower Engineering Professionals
3703 Junction Blvd.
Raleigh, NC 27603
(919) 661-6351
crown@tepgroup.net

Subject: Structural Modification Analysis Report

Carrier Designation:	***Verizon Wireless* Co-Locate**	
	Carrier Site Number:	278464
	Carrier Site Name:	Guilford 4
Crown Castle Designation:	**Crown Castle BU Number:**	876381
	Crown Castle Site Name:	WARD
	Crown Castle JDE Job Number:	245146
	Crown Castle Work Order Number:	700181
	Crown Castle Application Number:	198834 Rev. 3
Engineering Firm Designation:	**TEP Project Number:**	51819.13672
Site Data:	**2365 Long Hill Rd, Guilford, New Haven County, CT 06437**	
	Latitude *41° 20' 47.34"*, Longitude *-72° 43' 23.15"*	
	176 Foot - Monopole Tower	

Dear Steve Tuttle,

Tower Engineering Professionals is pleased to submit this **"Structural Modification Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 609242, in accordance with application 198834, revision 3.

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

LC4.7: Existing + Reserved + Proposed Equipment with Proposed Modifications **Sufficient Capacity**
Note: See Table I and Table II 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 Connecticut State Building Code (2006 International Building Code) with 2009 amendment based upon a wind speed of 85 mph fastest mile.

All modifications and equipment proposed in this report shall be installed in accordance with the appurtenances listed in Tables 1 and 2 and the attached drawings for the determined available structural capacity to be effective.

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

Structural analysis prepared by: Matthew Lee, E.I. / JSC

Respectfully submitted by:

William H. Martin, P.E., S.E., C.W.I.

STATE OF CONNECTICUT
WILLIAM H. MARTIN
0029484
LICENSED
PROFESSIONAL ENGINEER
1/27/14

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1) INTRODUCTION

This tower is a 176-ft monopole tower designed by Engineered Endeavors, Inc. in July of 2003. The tower was originally designed for a wind speed of 90 mph per EIA-222-F for the appurtenances listed in Table 3. TEP did not visit the site. All information provided to TEP was assumed to be accurate and complete.

2) ANALYSIS CRITERIA

The analysis has been performed in accordance with the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and ASCE 7-05 Minimum Design Loads for Buildings and Other Structures using a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 inch escalating 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
145.0	145.0	3	Alcatel Lucent	RRH2X40-07-U	14	1-5/8	1
		3	Alcatel Lucent	RRH2X40-AWS			
		6	Amphenol	BXA-171063-12CF-EDIN-X w/ Mount Pipe			
		6	Amphenol	BXA-70063-6CF-EDIN-X w/ Mount Pipe			
		1	RFS Celwave	DB-B1-6C-8AB-0Z			
		1	Tower Mounts	Platform Mount [LP 303-1]			

Notes:
1) See "Appendix B – Base Level Drawing" for assumed feed line configuration.

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
176.0	178.0	3	Alcatel Lucent	800 External Notch Filter	3	1/2	1
		9	RFS Celwave	ACU-A20-N			
		3	RFS Celwave	APXVSPP18-C-A20 w/ Mount Pipe			
	176.0	1	Tower Mounts	Platform Mount [LP 712-1]	-	-	2
174.0	176.0	3	Alcatel Lucent	PCS 1900MHz 4x45W-65MHz w/ Mount Pipe	-	-	1
		3	Alcatel Lucent	TME-800MHz RRH			
	174.0	1	Tower Mounts	Side Arm Mount [SO 102-3]			
169.0	169.0	3	Ericsson	TME-RRUS-11 w/ Mount Pipe	-	-	2
		1	Tower Mounts	Side Arm Mount [SO 701-3]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
167.0	167.0	3	KMW Communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe	1 2 12	3/8 7/16 1-5/8	2
		6	Powerwave Technologies	7770.00 w/ Mount Pipe			
		6	Powerwave Technologies	LGP21401			
		6	Powerwave Technologies	LGP21901			
		1	Raycap	DC6-48-60-18-8F			
		1	Tower Mounts	Platform Mount [LP 304-1]			
155.0	157.0	3	RFS Celwave	APX16DWV-16DWV-S-E-A20	-	-	1
		3	RFS Celwave	ATMAA1412D-1A20			
		3	RFS Celwave	ATMPP1412D-1CWA			
	155.0	1	Tower Mounts	Platform Mount [LP 301-1]	12	1-5/8	2
50.0	51.0	1	Lucent	KS24019-L112A	1	1/2	2
	50.0	1	Tower Mounts	Side Arm Mount [SO 701-1]			
10.0	12.0	1	Kathrein	OG-860/1920/GPS-A	1	1/2	2
	10.0	1	Tower Mounts	Side Arm Mount [SO 701-1]			

Notes:
1) Reserved equipment
2) Existing equipment

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
177.5	177.5	12	DAPA	48000	-	-
167.5	167.5	12	DAPA	48000	-	-
157.5	157.5	12	DAPA	48000	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Geotechnical Report	Jaworski Geotech, Inc.	1532993	CCISites
Tower Foundation Drawings	Engineered Endeavors, Inc.	1614617	CCISites
Tower Manufacturer Drawings	Engineered Endeavors, Inc.	1613550	CCISites
Previous Structural Analysis	GPD Group	4009918	CCISites

3.1) Analysis Method

tnxTower (version 6.1.4.1), 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.

For analysis of monopole shaft reinforcements, the plates are modeled as linear appurtenances along the exterior of the pole. The loads calculated from tnxTower are then exported to a proprietary calculation sheet created by Tower Engineering Professionals, Inc. that analyzes each reinforcing element along each critical axis and presents percent capacities for each element and the pole shaft along each critical axis. The actual percent capacity of the tower structure including the reinforcing elements is reported in Table 5 - Section Capacity (Summary).

3.2) Assumptions

1) The tower and foundation were built in accordance with the manufacturer's specifications.
2) The tower and foundation 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 "Appendix B – Base Level Drawing".
4) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by the standard.
5) All tower components are in sufficient condition to carry their full design capacity.
6) Serviceability with respect to antenna twist, tilt, roll, or lateral translation, is not checked and is left to the carrier or tower owner to ensure conformance.
7) All antenna mounts and mounting hardware are structurally sufficient to carry the full design capacity requirements of appurtenance wind area and weight as provided by the original manufacturer specifications. It is the carrier's responsibility to ensure compliance to the structural limitations of the existing and/or proposed antenna mounts. TEP did not perform a site visit to verify the size, condition or capacity of the antenna mounts and did not analyze antennas supporting mounts as part of this structural analysis report.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_{allow} (K)	% Capacity	Pass / Fail
L1	176.00-144.25	Pole	TP23.65x16.5x0.1875	1	Note 1	Note 1	83.1	Pass
L2	147.75-94.58	Pole	TP34.33x22.4868x0.3125	2	Note 1	Note 1	98.7	Pass
L3	99.41-46.95	Pole	TP44.3x32.6292x0.375	3	Note 1	Note 1	76.7	Pass
L4	53.03-0.00	Pole	TP54x42.1974x0.375	4	Note 1	Note 1	76.2	Pass
M1	35.00-0.00	Mod	CCI-WSFP-065125	5	Note 1	Note 1	88.9	Pass
M2	64.25-29.25	Mod	CCI-SFP-065125	6	Note 1	Note 1	93.7	Pass
M3	89.25-64.25	Mod	CCI-SFP-060100	7	Note 1	Note 1	95.6	Pass
M4	119.25-89.25	Mod	CCI-SFP-060100	8	Note 1	Note 1	87.5	Pass
							Summary	
						Pole (L2)	98.7	Pass
						Mod (M3)	95.6	Pass
						RATING =	**98.7**	**Pass**

Table 6 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	-	98.1	Pass
1	Base Plate	-	80.8	Pass
1	Base Foundation Soil Interaction	-	51.5	Pass
1	Base Foundation Structural	-	92.7	Pass

Structure Rating (max from all components) =	98.7%

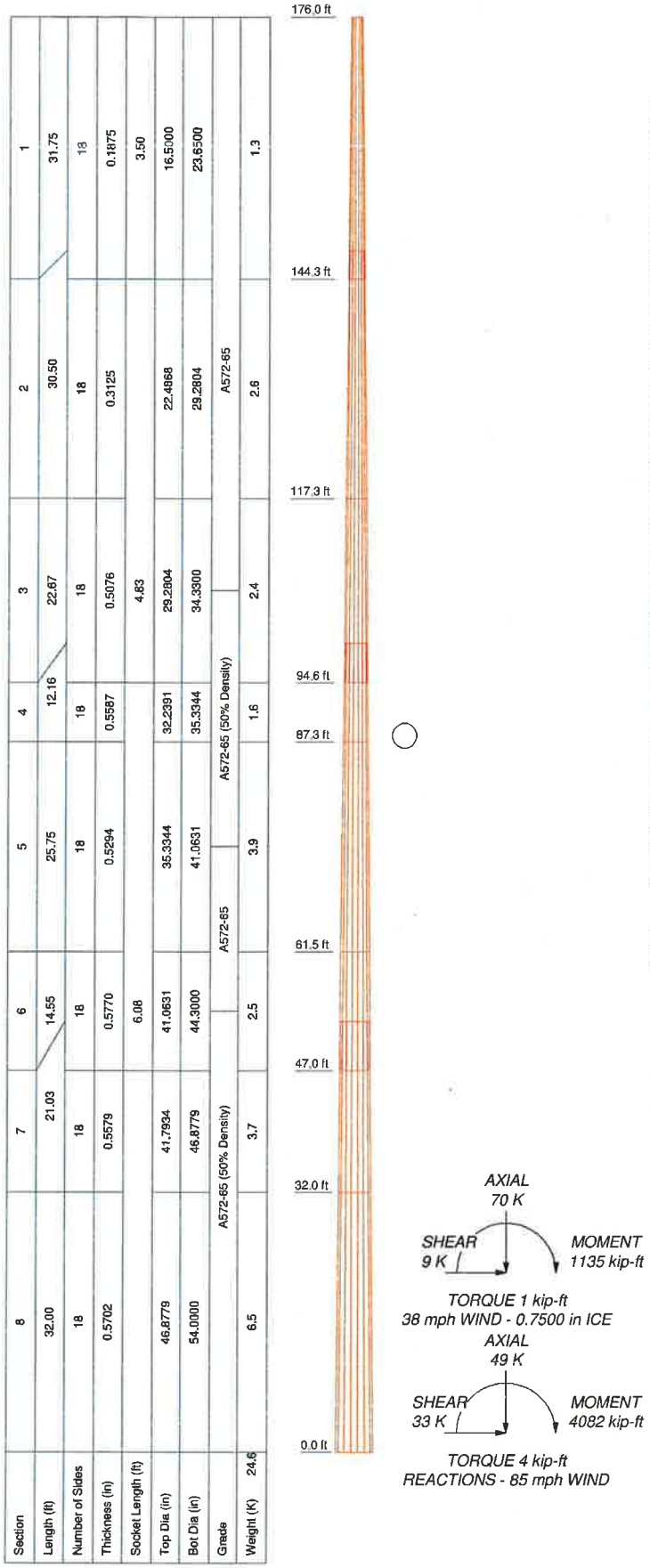
Notes:
1) See additional documentation in "Appendix C - Additional Calculations" for calculations supporting the % capacity listed.

4.1) Recommendations

1) If the load differs from that described in Tables 1 and 2 of this report, "Appendix B – Base Level Drawing" or the provisions of this analysis are found to be invalid, another structural analysis should be performed.
2) The modifications depicted in "Appendix D – Structural Modification Drawings" shall be installed and, upon completion, inspected. The tower and its foundation have sufficient capacity to carry the existing, reserved, and proposed loads once the proposed modifications are installed.

APPENDIX A

TNXTOWER OUTPUT



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
800 EXTERNAL NOTCH FILTER	176	(2) LGP21901	167
800 EXTERNAL NOTCH FILTER	176	(2) LGP21901	167
800 EXTERNAL NOTCH FILTER	176	(2) LGP21901	167
(3) ACU-A20-N	176	DC6-48-60-18-8F	167
(3) ACU-A20-N	176	Platform Mount [LP 304-1]	167
(3) ACU-A20-N	176	APX16DWV-16DWV-S-E-A20	155
APXVSPP18-C-A20 w/ Mount Pipe	176	APX16DWV-16DWV-S-E-A20	155
APXVSPP18-C-A20 w/ Mount Pipe	176	APX16DWV-16DWV-S-E-A20	155
APXVSPP18-C-A20 w/ Mount Pipe	176	ATMAA1412D-1A20	155
(3) 2.4" Dia. x 6' Mount Pipe	176	ATMAA1412D-1A20	155
(3) 2.4" Dia. x 6' Mount Pipe	176	ATMAA1412D-1A20	155
(3) 2.4" Dia. x 6' Mount Pipe	176	ATMPP1412D-1CWA	155
Platform Mount [LP 712-1]	176	ATMPP1412D-1CWA	155
PCS 1900MHz 4x45W-65MHz w/ Mount Pipe	174	ATMPP1412D-1CWA	155
		Platform Mount [LP 301-1]	155
PCS 1900MHz 4x45W-65MHz w/ Mount Pipe	174	RRH2X40-07-U	145
		RRH2X40-07-U	145
PCS 1900MHz 4x45W-65MHz w/ Mount Pipe	174	RRH2X40-07-U	145
		RRH2X40-AWS	145
TME-800MHZ RRH	174	RRH2X40-AWS	145
TME-800MHZ RRH	174	RRH2X40-AWS	145
TME-800MHZ RRH	174	(2) BXA-171063-12CF-EDIN-X w/ Mount Pipe	145
Side Arm Mount [SO 102-3]	174		
RRUS-11 w/ Mount Pipe	169	(2) BXA-171063-12CF-EDIN-X w/ Mount Pipe	145
RRUS-11 w/ Mount Pipe	169		
RRUS-11 w/ Mount Pipe	169	(2) BXA-171063-12CF-EDIN-X w/ Mount Pipe	145
2.4" x 4' Pipe (Horizontal)	169		
2.4" x 4' Pipe (Horizontal)	169	(2) BXA-70063-6CF-EDIN-X w/ Mount Pipe	145
2.4" x 4' Pipe (Horizontal)	169		
Side Arm Mount [SO 701-3]	169	(2) BXA-70063-6CF-EDIN-X w/ Mount Pipe	145
AM-X-CD-16-65-00T-RET w/ Mount Pipe	167	(2) BXA-70063-6CF-EDIN-X w/ Mount Pipe	145
AM-X-CD-16-65-00T-RET w/ Mount Pipe	167	DB-B1-6C-8AB-0Z	145
AM-X-CD-16-65-00T-RET w/ Mount Pipe	167	Platform Mount [LP 303-1]	145
		KS24019-L112A	50
(2) 7770.00 w/ Mount Pipe	167	1.9" x 3' Pipe	50
(2) 7770.00 w/ Mount Pipe	167	Side Arm Mount [SO 701-1]	50
(2) 7770.00 w/ Mount Pipe	167	OG-860/1920/GPS-A	10
(2) LGP21401	167	1.9" x 3' Pipe	10
(2) LGP21401	167	Side Arm Mount [SO 701-1]	10
(2) LGP21401	167		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi	A572-65 (50% Density)	65 ksi	80 ksi

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.

Tower Engineering Professionals
3703 Junction Boulevard
Raleigh, NC 27603
Phone: (919) 661-6351
FAX: (919) 661-6350

Job: WARD (BU 876381)		
Project: TEP No. 51819.13672		
Client: Crown Castle	Drawn by: mlee	App'd:
Code: TIA/EIA-222-F	Date: 01/24/14	Scale: NTS
Path: \\tepvm-file01\Towers\51819\13672_SDD - 876381 - WARD\mlee\Tower\CROWN_876381_LC4.7.gr		Dwg No. E-1

Tower Input Data

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

Tower is located in New Haven County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50 °F.
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, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Treat Feedline Bundles As Cylinder
Consider Moments - Horizontals	Assume Legs Pinned	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Calculate Redundant Bracing Forces
Use Moment Magnification	√ Use Clear Spans For Wind Area	Ignore Redundant Members in FEA
√ Use Code Stress Ratios	Use Clear Spans For KL/r	SR Leg Bolts Resist Compression
√ Use Code Safety Factors - Guys	Retension Guys To Initial Tension	All Leg Panels Have Same Allowable
√ Escalate Ice	√ Bypass Mast Stability Checks	Offset Girt At Foundation
Always Use Max Kz	√ Use Azimuth Dish Coefficients	√ Consider Feedline Torque
Use Special Wind Profile	√ Project Wind Area of Appurt.	Include Angle Block Shear Check
Include Bolts In Member Capacity	Autocalc Torque Arm Areas	Poles
Leg Bolts Are At Top Of Section	SR Members Have Cut Ends	√ Include Shear-Torsion Interaction
Secondary Horizontal Braces Leg	√ Sort Capacity Reports By Component	Always Use Sub-Critical Flow
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Use Top Mounted Sockets
Add IBC .6D+W Combination	Use TIA-222-G Tension Splice Capacity Exemption	

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	176.00-144.25	31.75	3.50	18	16.5000	23.6500	0.1875	0.7500	A572-65 (65 ksi)
L2	144.25-117.25	30.50	0.00	18	22.4868	29.2804	0.3125	1.2500	A572-65 (65 ksi)
L3	117.25-94.58	22.67	4.83	18	29.2804	34.3300	0.5076	2.0302	A572-65 (50% Density) (65 ksi)
L4	94.58-87.25	12.16	0.00	18	32.2391	35.3344	0.5587	2.2349	A572-65 (50% Density)

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L5	87.25-61.50	25.75	0.00	18	35.3344	41.0631	0.5294	2.1176	(65 ksi) A572-65
L6	61.50-46.95	14.55	6.08	18	41.0631	44.3000	0.5770	2.3079	(65 ksi) A572-65 (50% Density)
L7	46.95-32.00	21.03	0.00	18	41.7934	46.8779	0.5579	2.2317	(65 ksi) A572-65 (50% Density)
L8	32.00-0.00	32.00		18	46.8779	54.0000	0.5702	2.2808	(65 ksi) A572-65 (50% Density) (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	16.7545	9.7080	326.3677	5.7909	8.3820	38.9367	653.1649	4.8549	2.5740	13.728
	24.0148	13.9631	971.1102	8.3292	12.0142	80.8302	1943.4981	6.9829	3.8324	20.439
L2	23.6253	21.9941	1366.2960	7.8719	11.4233	119.6061	2734.3898	10.9992	3.4077	10.905
	29.7321	28.7326	3046.1201	10.2836	14.8745	204.7886	6096.2485	14.3690	4.6034	14.731
L3	29.7321	46.3522	4848.1365	10.2144	14.8745	325.9369	9702.6522	23.1805	4.2601	8.393
	34.8596	54.4869	7874.8043	12.0070	17.4396	451.5463	15759.9704	27.2486	5.1488	10.144
L4	33.9849	56.1815	7123.7733	11.2465	16.3774	434.9748	14256.9202	28.0961	4.6907	8.395
	35.8795	61.6708	9422.5701	12.3454	17.9499	524.9373	18857.5386	30.8413	5.2355	9.37
L5	35.8795	58.4847	8950.8327	12.3558	17.9499	498.6565	17913.4431	29.2479	5.2871	9.987
	41.6965	68.1107	14137.8821	14.3894	20.8600	677.7498	28294.3672	34.0618	6.2953	11.891
L6	41.6965	74.1423	15353.7799	14.3726	20.8600	736.0382	30727.7626	37.0782	6.2116	10.766
	44.9834	80.0702	19338.7640	15.5217	22.5044	859.3326	38702.9745	40.0427	6.7813	11.753
L7	43.9308	73.0212	15686.6300	14.6386	21.2311	738.8526	31393.9008	36.5176	6.3737	11.424
	47.6011	82.0250	22234.1882	16.4436	23.8140	933.6608	44497.6327	41.0203	7.2686	13.028
L8	47.6011	83.8095	22705.8290	16.4392	23.8140	953.4660	45441.5349	41.9127	7.2470	12.709
	54.8330	96.6992	34876.0640	18.9676	27.4320	1271.3642	69798.0188	48.3588	8.5004	14.908

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 176.00-144.25				1	1	1		
L2 144.25-117.25				1	1	1		
L3 117.25-94.58				1	1	1.2385		
L4 94.58-87.25				1	1	1.34944		
L5 87.25-61.50				1	1	0.71103		
L6 61.50-46.95				1	1	1.3059		
L7 46.95-32.00				1	1	1.3496		
L8 32.00-0.00				1	1	1.32012		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
*** 176' ***								
HYBRIFLEX RRH 1-SECTOR(1/2")	C	No	CaAa (Out Of Face)	119.25 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.83
						1" Ice	0.00	2.13
						2" Ice	0.00	6.55
						4" Ice	0.00	22.73
HYBRIFLEX RRH 1-SECTOR(1/2")	C	No	CaAa (Out Of Face)	176.00 - 119.25	1	No Ice	0.06	0.15
						1/2" Ice	0.16	0.83
						1" Ice	0.26	2.13
						2" Ice	0.46	6.55
						4" Ice	0.86	22.73
HYBRIFLEX RRH 1-SECTOR(1/2")	C	No	CaAa (Out Of Face)	176.00 - 0.00	2	No Ice	0.00	0.15
						1/2" Ice	0.00	0.83
						1" Ice	0.00	2.13
						2" Ice	0.00	6.55
						4" Ice	0.00	22.73
*** 167' ***								
LDF7-50A(1-5/8")	B	No	Inside Pole	167.00 - 0.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
FB-L98B-002-75000(3/8")	A	No	Inside Pole	167.00 - 0.00	1	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
						2" Ice	0.00	0.06
						4" Ice	0.00	0.06
WR-VG122ST-BRDA(7/ 16)	A	No	Inside Pole	167.00 - 0.00	2	No Ice	0.00	0.14
						1/2" Ice	0.00	0.14
						1" Ice	0.00	0.14
						2" Ice	0.00	0.14
						4" Ice	0.00	0.14
2" Flexible Conduit	A	No	Inside Pole	167.00 - 0.00	1	No Ice	0.00	0.34
						1/2" Ice	0.00	0.34
						1" Ice	0.00	0.34
						2" Ice	0.00	0.34
						4" Ice	0.00	0.34
*** 155' ***								
LDF7-50A(1-5/8")	C	No	Inside Pole	155.00 - 0.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
*** 145' ***								
HB158-1-08U8-S8J18(1-5/8)	A	No	CaAa (Out Of Face)	145.00 - 0.00	2	No Ice	0.20	1.30
						1/2" Ice	0.30	2.81
						1" Ice	0.40	4.94
						2" Ice	0.60	11.02
						4" Ice	1.00	30.52
LCF158-50JA(1 5/8")	A	No	CaAa (Out Of Face)	145.00 - 0.00	12	No Ice	0.00	0.92
						1/2" Ice	0.00	2.45
						1" Ice	0.00	4.60
						2" Ice	0.00	10.72
						4" Ice	0.00	30.29
*** 50' ***								
LDF4-50A(1/2")	C	No	Inside Pole	50.00 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
						2" Ice	0.00	0.15
						4" Ice	0.00	0.15

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
*** 10' ***								
LDF4-50A(1/2")	C	No	Inside Pole	10.00 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
						2" Ice	0.00	0.15
						4" Ice	0.00	0.15
*****								
Step Pegs (5/8" SR) 7-in. w/30" step	C	No	CaAa (Out Of Face)	176.00 - 0.00	1	No Ice	0.01	0.24
						1/2" Ice	0.11	0.64
						1" Ice	0.21	1.64
						2" Ice	0.41	5.49
						4" Ice	0.81	20.51
Safety Line 3/8	C	No	CaAa (Out Of Face)	176.00 - 0.00	1	No Ice	0.04	0.22
						1/2" Ice	0.14	0.75
						1" Ice	0.24	1.28
						2" Ice	0.44	2.34
						4" Ice	0.84	4.46
*****								
CCI-65FP-065125	A	No	CaAa (Out Of Face)	35.00 - 0.00	1	No Ice	0.21	27.65
						1/2" Ice	0.32	28.73
						1" Ice	0.43	30.15
						2" Ice	0.65	34.04
						4" Ice	1.10	45.97
CCI-65FP-065125	B	No	CaAa (Out Of Face)	35.00 - 0.00	1	No Ice	0.00	27.65
						1/2" Ice	0.00	28.73
						1" Ice	0.00	30.15
						2" Ice	0.00	34.04
						4" Ice	0.00	45.97
CCI-65FP-065125	B	No	CaAa (Out Of Face)	35.00 - 0.00	1	No Ice	0.00	27.65
						1/2" Ice	0.00	28.73
						1" Ice	0.00	30.15
						2" Ice	0.00	34.04
						4" Ice	0.00	45.97
CCI-65FP-065125	C	No	CaAa (Out Of Face)	35.00 - 0.00	1	No Ice	0.00	27.65
						1/2" Ice	0.00	28.73
						1" Ice	0.00	30.15
						2" Ice	0.00	34.04
						4" Ice	0.00	45.97
*****								
CCI-65FP-065125	A	No	CaAa (Out Of Face)	64.25 - 35.00	1	No Ice	0.21	27.65
						1/2" Ice	0.32	28.73
						1" Ice	0.43	30.15
						2" Ice	0.65	34.04
						4" Ice	1.10	45.97
CCI-65FP-065125	A	No	CaAa (Out Of Face)	35.00 - 29.25	1	No Ice	0.00	27.65
						1/2" Ice	0.00	28.73
						1" Ice	0.00	30.15
						2" Ice	0.00	34.04
						4" Ice	0.00	45.97
CCI-65FP-065125	B	No	CaAa (Out Of Face)	64.25 - 29.25	1	No Ice	0.00	27.65
						1/2" Ice	0.00	28.73
						1" Ice	0.00	30.15
						2" Ice	0.00	34.04
						4" Ice	0.00	45.97
CCI-65FP-065125	C	No	CaAa (Out Of Face)	64.25 - 29.25	1	No Ice	0.00	27.65
						1/2" Ice	0.00	28.73
						1" Ice	0.00	30.15
						2" Ice	0.00	34.04
						4" Ice	0.00	45.97
*****								
CCI-65FP-060100	A	No	CaAa (Out Of	89.25 - 64.25	1	No Ice	0.17	20.42

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
			Face)			1/2" Ice	0.28	21.37
						1" Ice	0.39	22.66
						2" Ice	0.61	26.29
						4" Ice	1.06	37.70
CCI-65FP-060100	B	No	CaAa (Out Of Face)	89.25 - 64.25	1	No Ice	0.00	20.42
						1/2" Ice	0.00	21.37
						1" Ice	0.00	22.66
						2" Ice	0.00	26.29
						4" Ice	0.00	37.70
CCI-65FP-060100	C	No	CaAa (Out Of Face)	89.25 - 64.25	1	No Ice	0.00	20.42
						1/2" Ice	0.00	21.37
						1" Ice	0.00	22.66
						2" Ice	0.00	26.29
						4" Ice	0.00	37.70
*****								
CCI-65FP-060100	A	No	CaAa (Out Of Face)	119.25 - 89.25	1	No Ice	0.17	20.42
						1/2" Ice	0.28	21.37
						1" Ice	0.39	22.66
						2" Ice	0.61	26.29
						4" Ice	1.06	37.70
CCI-65FP-060100	B	No	CaAa (Out Of Face)	119.25 - 89.25	1	No Ice	0.00	20.42
						1/2" Ice	0.00	21.37
						1" Ice	0.00	22.66
						2" Ice	0.00	26.29
						4" Ice	0.00	37.70
CCI-65FP-060100	C	No	CaAa (Out Of Face)	119.25 - 89.25	1	No Ice	0.00	20.42
						1/2" Ice	0.00	21.37
						1" Ice	0.00	22.66
						2" Ice	0.00	26.29
						4" Ice	0.00	37.70

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	176.00-144.25	A	0.000	0.000	0.000	0.297	0.03
		B	0.000	0.000	0.000	0.000	0.22
		C	0.000	0.000	0.000	3.623	0.13
L2	144.25-117.25	A	0.000	0.000	0.000	11.025	0.43
		B	0.000	0.000	0.000	0.000	0.31
		C	0.000	0.000	0.000	2.957	0.33
L3	117.25-94.58	A	0.000	0.000	0.000	12.756	0.79
		B	0.000	0.000	0.000	0.000	0.69
		C	0.000	0.000	0.000	1.181	0.71
L4	94.58-87.25	A	0.000	0.000	0.000	4.124	0.25
		B	0.000	0.000	0.000	0.000	0.22
		C	0.000	0.000	0.000	0.382	0.23
L5	87.25-61.50	A	0.000	0.000	0.000	14.603	0.91
		B	0.000	0.000	0.000	0.000	0.80
		C	0.000	0.000	0.000	1.342	0.82
L6	61.50-46.95	A	0.000	0.000	0.000	8.793	0.61
		B	0.000	0.000	0.000	0.000	0.55
		C	0.000	0.000	0.000	0.758	0.56
L7	46.95-32.00	A	0.000	0.000	0.000	9.035	0.71
		B	0.000	0.000	0.000	0.000	0.73
		C	0.000	0.000	0.000	0.779	0.66
L8	32.00-0.00	A	0.000	0.000	0.000	19.339	1.42

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
		B	0.000	0.000	0.000	0.000	2.16
		C	0.000	0.000	0.000	1.667	1.31

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	176.00-144.25	A	0.906	0.000	0.000	0.000	0.569	0.06
		B		0.000	0.000	0.000	0.000	0.22
		C		0.000	0.000	0.000	20.881	0.37
L2	144.25-117.25	A	0.884	0.000	0.000	0.000	21.212	1.67
		B		0.000	0.000	0.000	0.000	0.31
		C		0.000	0.000	0.000	17.271	0.53
L3	117.25-94.58	A	0.862	0.000	0.000	0.000	24.920	1.81
		B		0.000	0.000	0.000	0.000	0.73
		C		0.000	0.000	0.000	9.001	0.91
L4	94.58-87.25	A	0.847	0.000	0.000	0.000	8.057	0.58
		B		0.000	0.000	0.000	0.000	0.24
		C		0.000	0.000	0.000	2.910	0.29
L5	87.25-61.50	A	0.826	0.000	0.000	0.000	27.844	2.02
		B		0.000	0.000	0.000	0.000	0.85
		C		0.000	0.000	0.000	9.853	1.04
L6	61.50-46.95	A	0.796	0.000	0.000	0.000	15.999	1.21
		B		0.000	0.000	0.000	0.000	0.57
		C		0.000	0.000	0.000	5.390	0.68
L7	46.95-32.00	A	0.766	0.000	0.000	0.000	16.438	1.33
		B		0.000	0.000	0.000	0.000	0.77
		C		0.000	0.000	0.000	5.538	0.79
L8	32.00-0.00	A	0.750	0.000	0.000	0.000	34.272	2.65
		B		0.000	0.000	0.000	0.000	2.28
		C		0.000	0.000	0.000	11.267	1.56

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	176.00-144.25	-0.1380	0.0644	-0.5718	0.3090
L2	144.25-117.25	-0.1145	-0.4308	-0.4817	-0.4096
L3	117.25-94.58	-0.0549	-0.6534	-0.3186	-0.8346
L4	94.58-87.25	-0.0557	-0.6628	-0.3281	-0.8594
L5	87.25-61.50	-0.0567	-0.6798	-0.3307	-0.8884
L6	61.50-46.95	-0.0571	-0.7323	-0.3318	-0.9455
L7	46.95-32.00	-0.0576	-0.7384	-0.3373	-0.9613
L8	32.00-0.00	-0.0585	-0.7503	-0.3343	-0.9811

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
*** 176' ***									
800 EXTERNAL NOTCH FILTER	A	From Centroid-Leg	4.00 -2.00 2.00	20.0000	176.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.77 0.89 1.02 1.30 1.97	0.37 0.46 0.56 0.79 1.34	0.01 0.02 0.02 0.04 0.11
800 EXTERNAL NOTCH FILTER	B	From Centroid-Leg	4.00 -2.00 2.00	40.0000	176.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.77 0.89 1.02 1.30 1.97	0.37 0.46 0.56 0.79 1.34	0.01 0.02 0.02 0.04 0.11
800 EXTERNAL NOTCH FILTER	C	From Centroid-Leg	4.00 -2.00 2.00	30.0000	176.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.77 0.89 1.02 1.30 1.97	0.37 0.46 0.56 0.79 1.34	0.01 0.02 0.02 0.04 0.11
(3) ACU-A20-N	A	From Centroid-Leg	4.00 -2.00 2.00	20.0000	176.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.08 0.12 0.17 0.30 0.67	0.14 0.19 0.25 0.40 0.80	0.00 0.00 0.00 0.01 0.04
(3) ACU-A20-N	B	From Centroid-Leg	4.00 -2.00 2.00	40.0000	176.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.08 0.12 0.17 0.30 0.67	0.14 0.19 0.25 0.40 0.80	0.00 0.00 0.00 0.01 0.04
(3) ACU-A20-N	C	From Centroid-Leg	4.00 -2.00 2.00	30.0000	176.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.08 0.12 0.17 0.30 0.67	0.14 0.19 0.25 0.40 0.80	0.00 0.00 0.00 0.01 0.04
APXVSPP18-C-A20 w/ Mount Pipe	A	From Centroid-Leg	4.00 -2.00 2.00	20.0000	176.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.95 8.13 9.02 10.84 14.85	0.08 0.15 0.23 0.41 0.91
APXVSPP18-C-A20 w/ Mount Pipe	B	From Centroid-Leg	4.00 -2.00 2.00	40.0000	176.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.95 8.13 9.02 10.84 14.85	0.08 0.15 0.23 0.41 0.91
APXVSPP18-C-A20 w/ Mount Pipe	C	From Centroid-Leg	4.00 -2.00 2.00	30.0000	176.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.95 8.13 9.02 10.84 14.85	0.08 0.15 0.23 0.41 0.91
(3) 2.4" Dia. x 6' Mount Pipe	A	From Centroid-Leg	4.00 0.67 0.00	0.0000	176.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.93 2.32 3.15 5.06	1.43 1.93 2.32 3.15 5.06	0.02 0.04 0.06 0.10 0.25
(3) 2.4" Dia. x 6' Mount Pipe	A	From Centroid-Leg	4.00 0.67 0.00	0.0000	176.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.93 2.32 3.15 5.06	1.43 1.93 2.32 3.15 5.06	0.02 0.04 0.06 0.10 0.25
(3) 2.4" Dia. x 6' Mount Pipe	A	From	4.00	0.0000	176.00	No Ice	1.43	1.43	0.02

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
		Centroid-Leg	0.67 0.00			1/2" Ice 1" Ice 2" Ice 4" Ice	1.93 2.32 3.15 5.06	1.93 2.32 3.15 5.06	0.04 0.06 0.10 0.25
Platform Mount [LP 712-1]	C	None		0.0000	176.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	24.53 29.94 35.35 46.17 67.81	24.53 29.94 35.35 46.17 67.81	1.34 1.65 1.96 2.58 3.82
*** 174' ***									
PCS 1900MHz 4x45W-65MHz w/ Mount Pipe	A	From Leg	1.50 0.00 2.00	20.0000	174.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.90 3.21 3.52 4.19 5.70	3.22 3.65 4.09 5.06 7.34	0.07 0.10 0.14 0.23 0.48
PCS 1900MHz 4x45W-65MHz w/ Mount Pipe	B	From Leg	1.50 0.00 2.00	40.0000	174.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.90 3.21 3.52 4.19 5.70	3.22 3.65 4.09 5.06 7.34	0.07 0.10 0.14 0.23 0.48
PCS 1900MHz 4x45W-65MHz w/ Mount Pipe	C	From Leg	1.50 0.00 2.00	30.0000	174.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.90 3.21 3.52 4.19 5.70	3.22 3.65 4.09 5.06 7.34	0.07 0.10 0.14 0.23 0.48
TME-800MHZ RRH	A	From Leg	1.50 0.00 2.00	20.0000	174.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.49 2.71 2.93 3.41 4.46	2.07 2.27 2.48 2.93 3.93	0.05 0.07 0.10 0.16 0.32
TME-800MHZ RRH	B	From Leg	1.50 0.00 2.00	40.0000	174.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.49 2.71 2.93 3.41 4.46	2.07 2.27 2.48 2.93 3.93	0.05 0.07 0.10 0.16 0.32
TME-800MHZ RRH	C	From Leg	1.50 0.00 2.00	30.0000	174.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.49 2.71 2.93 3.41 4.46	2.07 2.27 2.48 2.93 3.93	0.05 0.07 0.10 0.16 0.32
Side Arm Mount [SO 102-3]	C	None		0.0000	174.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 3.48 3.96 4.92 6.84	3.00 3.48 3.96 4.92 6.84	0.08 0.11 0.14 0.20 0.32
*** 169' ***									
RRUS-11 w/ Mount Pipe	A	From Leg	3.00 -2.00 0.00	30.0000	169.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.49 3.87 4.27 5.11 7.05	2.11 2.52 2.95 3.86 6.05	0.07 0.10 0.13 0.22 0.47
RRUS-11 w/ Mount Pipe	B	From Leg	3.00 -2.00 0.00	40.0000	169.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.49 3.87 4.27 5.11 7.05	2.11 2.52 2.95 3.86 6.05	0.07 0.10 0.13 0.22 0.47
RRUS-11 w/ Mount Pipe	C	From Leg	3.00	40.0000	169.00	No Ice	3.49	2.11	0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			-2.00			1/2" Ice	3.87	2.52	0.10
			0.00			1" Ice	4.27	2.95	0.13
						2" Ice	5.11	3.86	0.22
						4" Ice	7.05	6.05	0.47
2.4" x 4' Pipe (Horizontal)	A	From Leg	3.00	0.0000	169.00	No Ice	1.12	0.06	0.01
			0.00			1/2" Ice	1.45	0.09	0.02
			0.00			1" Ice	1.79	0.14	0.04
						2" Ice	2.50	0.25	0.07
						4" Ice	4.01	0.58	0.20
2.4" x 4' Pipe (Horizontal)	B	From Leg	3.00	0.0000	169.00	No Ice	1.12	0.06	0.01
			0.00			1/2" Ice	1.45	0.09	0.02
			0.00			1" Ice	1.79	0.14	0.04
						2" Ice	2.50	0.25	0.07
						4" Ice	4.01	0.58	0.20
2.4" x 4' Pipe (Horizontal)	C	From Leg	3.00	0.0000	169.00	No Ice	1.12	0.06	0.01
			0.00			1/2" Ice	1.45	0.09	0.02
			0.00			1" Ice	1.79	0.14	0.04
						2" Ice	2.50	0.25	0.07
						4" Ice	4.01	0.58	0.20
Side Arm Mount [SO 701-3]	C	None		0.0000	169.00	No Ice	2.83	2.83	0.20
						1/2" Ice	3.92	3.92	0.24
						1" Ice	5.01	5.01	0.28
						2" Ice	7.19	7.19	0.36
						4" Ice	11.55	11.55	0.53
*** 167' ***									
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Centroid-Leg	4.00	30.0000	167.00	No Ice	8.50	6.30	0.07
			0.00			1/2" Ice	9.15	7.48	0.14
			0.00			1" Ice	9.77	8.37	0.21
						2" Ice	11.03	10.18	0.38
						4" Ice	13.68	14.02	0.87
AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Centroid-Leg	4.00	40.0000	167.00	No Ice	8.50	6.30	0.07
			0.00			1/2" Ice	9.15	7.48	0.14
			0.00			1" Ice	9.77	8.37	0.21
						2" Ice	11.03	10.18	0.38
						4" Ice	13.68	14.02	0.87
AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Centroid-Leg	4.00	40.0000	167.00	No Ice	8.50	6.30	0.07
			0.00			1/2" Ice	9.15	7.48	0.14
			0.00			1" Ice	9.77	8.37	0.21
						2" Ice	11.03	10.18	0.38
						4" Ice	13.68	14.02	0.87
(2) 7770.00 w/ Mount Pipe	A	From Centroid-Leg	4.00	30.0000	167.00	No Ice	6.12	4.25	0.06
			0.00			1/2" Ice	6.63	5.01	0.10
			0.00			1" Ice	7.13	5.71	0.16
						2" Ice	8.16	7.16	0.29
						4" Ice	10.36	10.41	0.66
(2) 7770.00 w/ Mount Pipe	B	From Centroid-Leg	4.00	40.0000	167.00	No Ice	6.12	4.25	0.06
			0.00			1/2" Ice	6.63	5.01	0.10
			0.00			1" Ice	7.13	5.71	0.16
						2" Ice	8.16	7.16	0.29
						4" Ice	10.36	10.41	0.66
(2) 7770.00 w/ Mount Pipe	C	From Centroid-Leg	4.00	40.0000	167.00	No Ice	6.12	4.25	0.06
			0.00			1/2" Ice	6.63	5.01	0.10
			0.00			1" Ice	7.13	5.71	0.16
						2" Ice	8.16	7.16	0.29
						4" Ice	10.36	10.41	0.66
(2) LGP21401	A	From Centroid-Le	4.00	30.0000	167.00	No Ice	1.29	0.23	0.01
			-7.00			1/2" Ice	1.45	0.31	0.02

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
		g	0.00			1" Ice	1.61	0.40	0.03
						2" Ice	1.97	0.61	0.05
						4" Ice	2.79	1.12	0.14
(2) LGP21401	B	From Centroid-Le g	4.00 -7.00 0.00	40.0000	167.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.23 0.31 0.40 0.61 1.12	0.01 0.02 0.03 0.05 0.14
(2) LGP21401	C	From Centroid-Le g	4.00 -7.00 0.00	40.0000	167.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.23 0.31 0.40 0.61 1.12	0.01 0.02 0.03 0.05 0.14
(2) LGP21901	A	From Centroid-Le g	4.00 7.00 0.00	30.0000	167.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.27 0.34 0.43 0.62 1.10	0.18 0.25 0.32 0.49 0.94	0.01 0.01 0.01 0.02 0.07
(2) LGP21901	B	From Centroid-Le g	4.00 7.00 0.00	40.0000	167.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.27 0.34 0.43 0.62 1.10	0.18 0.25 0.32 0.49 0.94	0.01 0.01 0.01 0.02 0.07
(2) LGP21901	C	From Centroid-Le g	4.00 7.00 0.00	40.0000	167.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.27 0.34 0.43 0.62 1.10	0.18 0.25 0.32 0.49 0.94	0.01 0.01 0.01 0.02 0.07
DC6-48-60-18-8F	B	From Centroid-Le g	4.00 0.00 0.00	40.0000	167.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.27 1.46 1.66 2.09 3.10	1.27 1.46 1.66 2.09 3.10	0.02 0.04 0.05 0.10 0.21
Platform Mount [LP 304-1]	C	None		0.0000	167.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	17.46 22.44 27.42 37.38 57.30	17.46 22.44 27.42 37.38 57.30	1.35 1.62 1.90 2.45 3.55
*** 155' ***									
APX16DWV-16DWV-S-E-A 20	A	From Centroid-Le g	4.00 -6.00 2.00	30.0000	155.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.23 7.68 8.14 9.09 11.09	2.15 2.49 2.84 3.55 5.08	0.04 0.07 0.11 0.20 0.46
APX16DWV-16DWV-S-E-A 20	B	From Centroid-Le g	4.00 -6.00 2.00	30.0000	155.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.23 7.68 8.14 9.09 11.09	2.15 2.49 2.84 3.55 5.08	0.04 0.07 0.11 0.20 0.46
APX16DWV-16DWV-S-E-A 20	C	From Centroid-Le g	4.00 -6.00 2.00	30.0000	155.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.23 7.68 8.14 9.09 11.09	2.15 2.49 2.84 3.55 5.08	0.04 0.07 0.11 0.20 0.46
ATMAA1412D-1A20	A	From Centroid-Le g	4.00 -6.00 2.00	30.0000	155.00	No Ice 1/2" Ice 1" Ice	1.17 1.31 1.47	0.47 0.57 0.69	0.01 0.02 0.03

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" Ice	1.81	0.95	0.06
						4" Ice	2.58	1.57	0.14
ATMAA1412D-1A20	B	From Centroid-Leg	4.00 -6.00 2.00	30.0000	155.00	No Ice	1.17	0.47	0.01
						1/2" Ice	1.31	0.57	0.02
						1" Ice	1.47	0.69	0.03
						2" Ice	1.81	0.95	0.06
						4" Ice	2.58	1.57	0.14
ATMAA1412D-1A20	C	From Centroid-Leg	4.00 -6.00 2.00	30.0000	155.00	No Ice	1.17	0.47	0.01
						1/2" Ice	1.31	0.57	0.02
						1" Ice	1.47	0.69	0.03
						2" Ice	1.81	0.95	0.06
						4" Ice	2.58	1.57	0.14
ATMPP1412D-1CWA	A	From Centroid-Leg	4.00 -6.00 2.00	30.0000	155.00	No Ice	1.17	0.42	0.01
						1/2" Ice	1.32	0.53	0.02
						1" Ice	1.48	0.65	0.03
						2" Ice	1.82	0.92	0.05
						4" Ice	2.61	1.57	0.13
ATMPP1412D-1CWA	B	From Centroid-Leg	4.00 -6.00 2.00	30.0000	155.00	No Ice	1.17	0.42	0.01
						1/2" Ice	1.32	0.53	0.02
						1" Ice	1.48	0.65	0.03
						2" Ice	1.82	0.92	0.05
						4" Ice	2.61	1.57	0.13
ATMPP1412D-1CWA	C	From Centroid-Leg	4.00 -6.00 2.00	30.0000	155.00	No Ice	1.17	0.42	0.01
						1/2" Ice	1.32	0.53	0.02
						1" Ice	1.48	0.65	0.03
						2" Ice	1.82	0.92	0.05
						4" Ice	2.61	1.57	0.13
Platform Mount [LP 301-1]	C	None		0.0000	155.00	No Ice	30.10	30.10	1.59
						1/2" Ice	40.80	40.80	2.03
						1" Ice	51.50	51.50	2.47
						2" Ice	72.90	72.90	3.35
						4" Ice	115.70	115.70	5.11
*** 145' ***									
RRH2X40-07-U	A	From Centroid-Leg	4.00 -6.00 0.00	20.0000	145.00	No Ice	2.25	1.23	0.05
						1/2" Ice	2.45	1.39	0.07
						1" Ice	2.66	1.55	0.09
						2" Ice	3.10	1.91	0.13
						4" Ice	4.10	2.73	0.27
RRH2X40-07-U	B	From Centroid-Leg	4.00 -6.00 0.00	20.0000	145.00	No Ice	2.25	1.23	0.05
						1/2" Ice	2.45	1.39	0.07
						1" Ice	2.66	1.55	0.09
						2" Ice	3.10	1.91	0.13
						4" Ice	4.10	2.73	0.27
RRH2X40-07-U	C	From Centroid-Leg	4.00 -6.00 0.00	30.0000	145.00	No Ice	2.25	1.23	0.05
						1/2" Ice	2.45	1.39	0.07
						1" Ice	2.66	1.55	0.09
						2" Ice	3.10	1.91	0.13
						4" Ice	4.10	2.73	0.27
RRH2X40-AWS	A	From Centroid-Leg	4.00 2.00 0.00	20.0000	145.00	No Ice	2.52	1.59	0.04
						1/2" Ice	2.75	1.80	0.06
						1" Ice	2.99	2.01	0.08
						2" Ice	3.50	2.46	0.13
						4" Ice	4.61	3.48	0.28
RRH2X40-AWS	B	From Centroid-Leg	4.00 2.00 0.00	20.0000	145.00	No Ice	2.52	1.59	0.04
						1/2" Ice	2.75	1.80	0.06
						1" Ice	2.99	2.01	0.08
						2" Ice	3.50	2.46	0.13

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	4.61	3.48	0.28
RRH2X40-AWS	C	From Centroid-Leg	4.00 2.00 0.00	30.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.52 2.75 2.99 3.50 4.61	1.59 1.80 2.01 2.46 3.48	0.04 0.06 0.08 0.13 0.28
(2) BXA-171063-12CF-EDIN-X w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 0.00	20.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.03 5.58 6.10 7.17 9.44	5.29 6.46 7.35 9.15 12.95	0.04 0.09 0.14 0.27 0.68
(2) BXA-171063-12CF-EDIN-X w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 0.00	20.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.03 5.58 6.10 7.17 9.44	5.29 6.46 7.35 9.15 12.95	0.04 0.09 0.14 0.27 0.68
(2) BXA-171063-12CF-EDIN-X w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 0.00	30.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.03 5.58 6.10 7.17 9.44	5.29 6.46 7.35 9.15 12.95	0.04 0.09 0.14 0.27 0.68
(2) BXA-70063-6CF-EDIN-X w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 0.00	20.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.97 8.61 9.22 10.46 13.07	5.80 6.95 7.82 9.60 13.37	0.04 0.10 0.17 0.34 0.80
(2) BXA-70063-6CF-EDIN-X w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 0.00	20.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.97 8.61 9.22 10.46 13.07	5.80 6.95 7.82 9.60 13.37	0.04 0.10 0.17 0.34 0.80
(2) BXA-70063-6CF-EDIN-X w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 0.00	30.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.97 8.61 9.22 10.46 13.07	5.80 6.95 7.82 9.60 13.37	0.04 0.10 0.17 0.34 0.80
DB-B1-6C-8AB-0Z	A	From Centroid-Leg	4.00 -2.00 0.00	20.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.60 5.92 6.24 6.91 8.37	2.33 2.56 2.79 3.28 4.37	0.04 0.08 0.12 0.21 0.45
Platform Mount [LP 303-1]	C	None		0.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	14.66 18.87 23.08 31.50 48.34	14.66 18.87 23.08 31.50 48.34	1.25 1.48 1.71 2.18 3.10
*** 50' ***									
KS24019-L112A	A	From Leg	3.00 0.00 1.00	0.0000	50.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.09 0.15 0.22 0.40 0.89	0.09 0.15 0.22 0.40 0.89	0.01 0.01 0.01 0.02 0.04
1.9" x 3' Pipe	A	From Leg	3.00 0.00 0.00	0.0000	50.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.51 0.69 0.89 1.31 2.42	0.51 0.69 0.89 1.31 2.42	0.01 0.01 0.02 0.04 0.11

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
Side Arm Mount [SO 701-1]	A	From Leg	1.50 0.00 0.00	0.0000	50.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.85 1.14 1.43 2.01 3.17	1.67 2.34 3.01 4.35 7.03	0.07 0.08 0.09 0.12 0.18
*** 10' ***									
OG-860/1920/GPS-A	A	From Leg	3.00 0.00 2.00	0.0000	10.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.14 0.23 0.33 0.57 1.17	0.14 0.23 0.33 0.57 1.17	0.00 0.00 0.01 0.02 0.05
1.9" x 3' Pipe	A	From Leg	3.00 0.00 0.00	0.0000	10.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.51 0.69 0.89 1.31 2.42	0.51 0.69 0.89 1.31 2.42	0.01 0.01 0.02 0.04 0.11
Side Arm Mount [SO 701-1]	A	From Leg	1.50 0.00 0.00	0.0000	10.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.85 1.14 1.43 2.01 3.17	1.67 2.34 3.01 4.35 7.03	0.07 0.08 0.09 0.12 0.18
*****									

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice
9	Dead+Wind 210 deg - No Ice
10	Dead+Wind 240 deg - No Ice
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice
13	Dead+Wind 330 deg - No Ice
14	Dead+Ice+Temp
15	Dead+Wind 0 deg+Ice+Temp
16	Dead+Wind 30 deg+Ice+Temp
17	Dead+Wind 60 deg+Ice+Temp
18	Dead+Wind 90 deg+Ice+Temp
19	Dead+Wind 120 deg+Ice+Temp
20	Dead+Wind 150 deg+Ice+Temp
21	Dead+Wind 180 deg+Ice+Temp
22	Dead+Wind 210 deg+Ice+Temp
23	Dead+Wind 240 deg+Ice+Temp
24	Dead+Wind 270 deg+Ice+Temp

Comb. No.	Description
25	Dead+Wind 300 deg+Ice+Temp
26	Dead+Wind 330 deg+Ice+Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	176 - 144.25	Pole	Max Tension	27	0.00	0.00	-0.00
			Max. Compression	14	-13.54	-0.32	1.91
			Max. Mx	5	-6.35	-263.78	-0.02
			Max. My	2	-6.30	0.49	269.05
			Max. Vy	5	13.46	-263.78	-0.02
			Max. Vx	2	-13.68	0.49	269.05
			Max. Torque	5			2.55
L2	144.25 - 117.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-23.88	0.15	4.27
			Max. Mx	5	-12.14	-853.61	-0.20
			Max. My	2	-12.08	1.33	869.11
			Max. Vy	5	21.18	-853.61	-0.20
			Max. Vx	2	-21.51	1.33	869.11
			Max. Torque	5			2.58
L3	117.25 - 94.58	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-29.07	0.32	5.66
			Max. Mx	5	-15.92	-1247.44	-0.31
			Max. My	2	-15.88	1.82	1269.06
			Max. Vy	5	23.01	-1247.44	-0.31
			Max. Vx	2	-23.34	1.82	1269.06
			Max. Torque	5			2.67
L4	94.58 - 87.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-33.73	0.44	6.66
			Max. Mx	5	-19.39	-1535.69	-0.38
			Max. My	2	-19.35	2.16	1561.50
			Max. Vy	5	24.36	-1535.69	-0.38
			Max. Vx	2	-24.69	2.16	1561.50
			Max. Torque	5			2.74
L5	87.25 - 61.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-42.60	0.71	8.93
			Max. Mx	5	-26.26	-2195.24	-0.47
			Max. My	2	-26.23	2.88	2229.98
			Max. Vy	5	26.93	-2195.24	-0.47
			Max. Vx	2	-27.25	2.88	2229.98
			Max. Torque	5			2.88
L6	61.5 - 46.95	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-45.82	0.81	9.73
			Max. Mx	5	-28.82	-2426.62	-0.48

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	2	-28.80	3.11	2464.30
			Max. Vy	5	27.74	-2426.62	-0.48
			Max. Vx	2	-28.06	3.11	2464.30
			Max. Torque	5			2.94
L7	46.95 - 32	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-55.82	0.90	12.02
			Max. Mx	5	-36.82	-3033.15	-0.31
			Max. My	2	-36.81	3.55	3077.67
			Max. Vy	5	29.79	-3033.15	-0.31
			Max. Vx	2	-30.08	3.55	3077.67
			Max. Torque	5			3.36
L8	32 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-70.41	-0.43	14.60
			Max. Mx	5	-48.85	-4030.34	-0.89
			Max. My	2	-48.85	2.81	4082.41
			Max. Vy	5	32.53	-4030.34	-0.89
			Max. Vx	2	-32.78	2.81	4082.41
			Max. Torque	5			3.87

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	15	70.41	-0.00	8.66
	Max. H_x	11	48.87	32.50	0.03
	Max. H_z	2	48.87	0.03	32.76
	Max. M_x	2	4082.41	0.03	32.76
	Max. M_z	5	4030.34	-32.50	-0.03
	Max. Torsion	5	3.87	-32.50	-0.03
	Min. Vert	1	48.87	0.00	0.00
	Min. H_x	5	48.87	-32.50	-0.03
	Min. H_z	8	48.87	-0.03	-32.76
	Min. M_x	8	-4075.17	-0.03	-32.76
	Min. M_z	11	-4026.99	32.50	0.03
	Min. Torsion	11	-3.86	32.50	0.03

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	48.87	0.00	-0.00	-3.53	-1.66	0.00
Dead+Wind 0 deg - No Ice	48.87	-0.03	-32.76	-4082.41	2.81	-0.17
Dead+Wind 30 deg - No Ice	48.87	16.23	-28.36	-3533.80	-2012.04	-2.08
Dead+Wind 60 deg - No Ice	48.87	28.14	-16.36	-2039.23	-3488.33	-3.44
Dead+Wind 90 deg - No Ice	48.87	32.50	0.03	0.89	-4030.34	-3.87
Dead+Wind 120 deg - No Ice	48.87	28.16	16.40	2039.77	-3492.76	-3.26
Dead+Wind 150 deg - No Ice	48.87	16.27	28.38	3531.02	-2019.78	-1.78
Dead+Wind 180 deg - No Ice	48.87	0.03	32.76	4075.17	-6.17	0.17
Dead+Wind 210 deg - No Ice	48.87	-16.23	28.36	3526.57	2008.67	2.07
Dead+Wind 240 deg - No Ice	48.87	-28.14	16.36	2032.02	3484.96	3.43
Dead+Wind 270 deg - No Ice	48.87	-32.50	-0.03	-8.09	4026.99	3.86

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 300 deg - No Ice	48.87	-28.16	-16.40	-2046.99	3489.43	3.26
Dead+Wind 330 deg - No Ice	48.87	-16.27	-28.38	-3538.25	2016.44	1.79
Dead+Ice+Temp	70.41	-0.00	-0.00	-14.60	-0.43	0.00
Dead+Wind 0 deg+Ice+Temp	70.41	0.00	-8.66	-1135.04	-0.51	-0.10
Dead+Wind 30 deg+Ice+Temp	70.41	4.31	-7.50	-984.99	-556.32	-0.75
Dead+Wind 60 deg+Ice+Temp	70.41	7.47	-4.33	-574.95	-963.19	-1.20
Dead+Wind 90 deg+Ice+Temp	70.41	8.62	-0.00	-14.79	-1112.09	-1.33
Dead+Wind 120 deg+Ice+Temp	70.41	7.47	4.33	545.39	-963.11	-1.10
Dead+Wind 150 deg+Ice+Temp	70.41	4.31	7.50	955.48	-556.19	-0.58
Dead+Wind 180 deg+Ice+Temp	70.41	-0.00	8.66	1105.62	-0.35	0.10
Dead+Wind 210 deg+Ice+Temp	70.41	-4.31	7.50	955.56	555.46	0.75
Dead+Wind 240 deg+Ice+Temp	70.41	-7.47	4.33	545.52	962.33	1.20
Dead+Wind 270 deg+Ice+Temp	70.41	-8.62	0.00	-14.63	1111.23	1.33
Dead+Wind 300 deg+Ice+Temp	70.41	-7.47	-4.33	-574.81	962.25	1.10
Dead+Wind 330 deg+Ice+Temp	70.41	-4.31	-7.50	-984.91	555.33	0.58
Dead+Wind 0 deg - Service	48.87	-0.01	-11.33	-1417.73	-0.12	-0.06
Dead+Wind 30 deg - Service	48.87	5.62	-9.81	-1227.51	-698.64	-0.73
Dead+Wind 60 deg - Service	48.87	9.74	-5.66	-709.35	-1210.41	-1.20
Dead+Wind 90 deg - Service	48.87	11.25	0.01	-2.09	-1398.29	-1.36
Dead+Wind 120 deg - Service	48.87	9.74	5.68	704.76	-1211.96	-1.15
Dead+Wind 150 deg - Service	48.87	5.63	9.82	1221.78	-701.33	-0.63
Dead+Wind 180 deg - Service	48.87	0.01	11.33	1410.44	-3.23	0.06
Dead+Wind 210 deg - Service	48.87	-5.62	9.81	1220.22	695.28	0.73
Dead+Wind 240 deg - Service	48.87	-9.74	5.66	702.06	1207.05	1.20
Dead+Wind 270 deg - Service	48.87	-11.25	-0.01	-5.20	1394.94	1.36
Dead+Wind 300 deg - Service	48.87	-9.74	-5.68	-712.05	1208.61	1.15
Dead+Wind 330 deg - Service	48.87	-5.63	-9.82	-1229.07	697.98	0.63

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-48.87	0.00	0.00	48.87	0.00	0.000%
2	-0.03	-48.87	-32.76	0.03	48.87	32.76	0.000%
3	16.23	-48.87	-28.36	-16.23	48.87	28.36	0.000%
4	28.14	-48.87	-16.36	-28.14	48.87	16.36	0.000%
5	32.50	-48.87	0.03	-32.50	48.87	-0.03	0.000%
6	28.16	-48.87	16.40	-28.16	48.87	-16.40	0.000%
7	16.27	-48.87	28.38	-16.27	48.87	-28.38	0.000%
8	0.03	-48.87	32.76	-0.03	48.87	-32.76	0.000%
9	-16.23	-48.87	28.36	16.23	48.87	-28.36	0.000%
10	-28.14	-48.87	16.36	28.14	48.87	-16.36	0.000%
11	-32.50	-48.87	-0.03	32.50	48.87	0.03	0.000%
12	-28.16	-48.87	-16.40	28.16	48.87	16.40	0.000%
13	-16.27	-48.87	-28.38	16.27	48.87	28.38	0.000%
14	0.00	-70.41	0.00	0.00	70.41	0.00	0.000%
15	0.00	-70.41	-8.66	-0.00	70.41	8.66	0.000%
16	4.31	-70.41	-7.50	-4.31	70.41	7.50	0.000%
17	7.47	-70.41	-4.33	-7.47	70.41	4.33	0.000%
18	8.62	-70.41	-0.00	-8.62	70.41	0.00	0.000%
19	7.47	-70.41	4.33	-7.47	70.41	-4.33	0.000%
20	4.31	-70.41	7.50	-4.31	70.41	-7.50	0.000%
21	-0.00	-70.41	8.66	0.00	70.41	-8.66	0.000%
22	-4.31	-70.41	7.50	4.31	70.41	-7.50	0.000%
23	-7.47	-70.41	4.33	7.47	70.41	-4.33	0.000%
24	-8.62	-70.41	0.00	8.62	70.41	-0.00	0.000%
25	-7.47	-70.41	-4.33	7.47	70.41	4.33	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
26	-4.31	-70.41	-7.50	4.31	70.41	7.50	0.000%
27	-0.01	-48.87	-11.33	0.01	48.87	11.33	0.000%
28	5.62	-48.87	-9.81	-5.62	48.87	9.81	0.000%
29	9.74	-48.87	-5.66	-9.74	48.87	5.66	0.000%
30	11.25	-48.87	0.01	-11.25	48.87	-0.01	0.000%
31	9.74	-48.87	5.68	-9.74	48.87	-5.68	0.000%
32	5.63	-48.87	9.82	-5.63	48.87	-9.82	0.000%
33	0.01	-48.87	11.33	-0.01	48.87	-11.33	0.000%
34	-5.62	-48.87	9.81	5.62	48.87	-9.81	0.000%
35	-9.74	-48.87	5.66	9.74	48.87	-5.66	0.000%
36	-11.25	-48.87	-0.01	11.25	48.87	0.01	0.000%
37	-9.74	-48.87	-5.68	9.74	48.87	5.68	0.000%
38	-5.63	-48.87	-9.82	5.63	48.87	9.82	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00076361
3	Yes	6	0.00000001	0.00013966
4	Yes	6	0.00000001	0.00014885
5	Yes	5	0.00000001	0.00022296
6	Yes	6	0.00000001	0.00013777
7	Yes	6	0.00000001	0.00014630
8	Yes	4	0.00000001	0.00067833
9	Yes	6	0.00000001	0.00014618
10	Yes	6	0.00000001	0.00013709
11	Yes	5	0.00000001	0.00024332
12	Yes	6	0.00000001	0.00014900
13	Yes	6	0.00000001	0.00014038
14	Yes	4	0.00000001	0.00018245
15	Yes	6	0.00000001	0.00009610
16	Yes	6	0.00000001	0.00012473
17	Yes	6	0.00000001	0.00012704
18	Yes	6	0.00000001	0.00009454
19	Yes	6	0.00000001	0.00011997
20	Yes	6	0.00000001	0.00012228
21	Yes	6	0.00000001	0.00009314
22	Yes	6	0.00000001	0.00012254
23	Yes	6	0.00000001	0.00012003
24	Yes	6	0.00000001	0.00009462
25	Yes	6	0.00000001	0.00012713
26	Yes	6	0.00000001	0.00012502
27	Yes	4	0.00000001	0.00028349
28	Yes	5	0.00000001	0.00025833
29	Yes	5	0.00000001	0.00028994
30	Yes	4	0.00000001	0.00092150
31	Yes	5	0.00000001	0.00024975
32	Yes	5	0.00000001	0.00027973
33	Yes	4	0.00000001	0.00027901
34	Yes	5	0.00000001	0.00027868
35	Yes	5	0.00000001	0.00024681
36	Yes	4	0.00000001	0.00094671
37	Yes	5	0.00000001	0.00029082
38	Yes	5	0.00000001	0.00026119

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	176 - 174.513	TP23.65x16.5x0.1875	31.75	0.00	0.0	39.000	9.9072	-1.37	386.38	0.004
	174.513 - 173.026					39.000	10.1065	-1.72	394.15	0.004
	173.026 - 171.539					39.000	10.3058	-1.78	401.93	0.004
	171.539 - 170.053					39.000	10.5050	-1.84	409.70	0.004
	170.053 - 168.566					39.000	10.7043	-2.24	417.47	0.005
	168.566 - 167.079					39.000	10.9036	-2.30	425.24	0.005
	167.079 - 165.592					39.000	11.1028	-3.82	433.01	0.009
	165.592 - 164.105					39.000	11.3021	-3.89	440.78	0.009
	164.105 - 162.618					39.000	11.5014	-3.97	448.55	0.009
	162.618 - 161.132					39.000	11.7006	-4.05	456.32	0.009
	161.132 - 159.645					39.000	11.8999	-4.12	464.10	0.009
	159.645 - 158.158					39.000	12.0992	-4.21	471.87	0.009
	158.158 - 156.671					39.000	12.2984	-4.29	479.64	0.009
	156.671 - 155.184					39.000	12.4977	-4.37	487.41	0.009
	155.184 - 153.697					39.000	12.6970	-5.90	495.18	0.012
	153.697 - 152.211					39.000	12.8962	-6.00	502.95	0.012
	152.211 - 150.724					39.000	13.0955	-6.10	510.73	0.012
	150.724 - 149.237					39.000	13.2948	-6.20	518.50	0.012
	149.237 - 147.75					39.000	13.4940	-6.30	526.27	0.012
	147.75 - 144.25					39.000	13.9631	-3.79	544.56	0.007
L2	147.75 - 144.25	TP29.2804x22.4868x0.3125	30.50	0.00	0.0	39.000	22.7674	-4.41	887.93	0.005
	144.25 - 142.829					39.000	23.0814	-8.39	900.17	0.009
	142.829 - 141.408					39.000	23.3953	-8.57	912.42	0.009
	141.408 - 139.987					39.000	23.7093	-8.76	924.66	0.009
	139.987 - 138.566					39.000	24.0232	-8.95	936.91	0.010
	138.566 - 137.145					39.000	24.3372	-9.14	949.15	0.010

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 $\frac{P}{P_a}$
	137.145 - 135.724					39.000	24.6511	-9.34	961.39	0.010
	135.724 - 134.303					39.000	24.9651	-9.53	973.64	0.010
	134.303 - 132.882					39.000	25.2791	-9.73	985.88	0.010
	132.882 - 131.461					39.000	25.5930	-9.94	998.13	0.010
	131.461 - 130.039					39.000	25.9070	-10.14	1010.37	0.010
	130.039 - 128.618					39.000	26.2209	-10.35	1022.62	0.010
	128.618 - 127.197					39.000	26.5349	-10.56	1034.86	0.010
	127.197 - 125.776					39.000	26.8488	-10.77	1047.10	0.010
	125.776 - 124.355					39.000	27.1628	-10.98	1059.35	0.010
	124.355 - 122.934					39.000	27.4767	-11.20	1071.59	0.010
	122.934 - 121.513					39.000	27.7907	-11.41	1083.84	0.011
	121.513 - 120.092					39.000	28.1047	-11.63	1096.08	0.011
	120.092 - 118.671					39.000	28.4186	-11.86	1108.33	0.011
	118.671 - 117.25					39.000	28.7326	-12.08	1120.57	0.011
L3	117.25 - 116.201	TP34.33x29.2804x0.5076	22.67	0.00	0.0	39.000	46.7288	-12.31	1822.42	0.007
	116.201 - 115.151					39.000	47.1054	-12.52	1837.11	0.007
	115.151 - 114.102					39.000	47.4819	-12.74	1851.79	0.007
	114.102 - 113.052					39.000	47.8585	-12.96	1866.48	0.007
	113.052 - 112.003					39.000	48.2350	-13.18	1881.17	0.007
	112.003 - 110.954					39.000	48.6116	-13.40	1895.85	0.007
	110.954 - 109.904					39.000	48.9882	-13.62	1910.54	0.007
	109.904 - 108.855					39.000	49.3647	-13.84	1925.22	0.007
	108.855 - 107.805					39.000	49.7413	-14.06	1939.91	0.007
	107.805 - 106.756					39.000	50.1178	-14.29	1954.60	0.007
	106.756 - 105.706					39.000	50.4944	-14.51	1969.28	0.007
	105.706 - 104.657					39.000	50.8710	-14.74	1983.97	0.007
	104.657 - 103.608					39.000	51.2475	-14.96	1998.65	0.007
	103.608 - 102.558					39.000	51.6241	-15.19	2013.34	0.008
	102.558 - 101.509					39.000	52.0006	-15.42	2028.03	0.008
	101.509 - 100.459					39.000	52.3772	-15.65	2042.71	0.008

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 $\frac{P}{P_a}$
	100.459 - 99.41					39.000	52.7538	-15.88	2057.40	0.008
	99.41 - 94.58					39.000	54.4869	-8.57	2124.99	0.004
L4	99.41 - 94.58	TP35.3344x32.2391x0.5587	12.16	0.00	0.0	39.000	58.3619	-8.95	2276.11	0.004
	94.58 - 93.5329					39.000	58.8346	-17.79	2294.55	0.008
	93.5329 - 92.4857					39.000	59.3073	-18.05	2312.98	0.008
	92.4857 - 91.4386					39.000	59.7800	-18.31	2331.42	0.008
	91.4386 - 90.3914					39.000	60.2527	-18.57	2349.86	0.008
	90.3914 - 89.3443					39.000	60.7254	-18.83	2368.29	0.008
	89.3443 - 88.2971					39.000	61.1981	-19.09	2386.73	0.008
	88.2971 - 87.25					39.000	61.6708	-19.35	2405.16	0.008
L5	87.25 - 85.9625	TP41.0631x35.3344x0.5294	25.75	0.00	0.0	39.000	58.9660	-19.68	2299.67	0.009
	85.9625 - 84.675					39.000	59.4473	-20.01	2318.44	0.009
	84.675 - 83.3875					39.000	59.9286	-20.34	2337.21	0.009
	83.3875 - 82.1					39.000	60.4099	-20.67	2355.99	0.009
	82.1 - 80.8125					39.000	60.8912	-21.01	2374.76	0.009
	80.8125 - 79.525					39.000	61.3725	-21.35	2393.53	0.009
	79.525 - 78.2375					39.000	61.8538	-21.68	2412.30	0.009
	78.2375 - 76.95					39.000	62.3351	-22.02	2431.07	0.009
	76.95 - 75.6625					39.000	62.8164	-22.37	2449.84	0.009
	75.6625 - 74.375					39.000	63.2977	-22.71	2468.61	0.009
	74.375 - 73.0875					39.000	63.7790	-23.06	2487.38	0.009
	73.0875 - 71.8					39.000	64.2603	-23.40	2506.15	0.009
	71.8 - 70.5125					39.000	64.7416	-23.75	2524.92	0.009
	70.5125 - 69.225					39.000	65.2229	-24.10	2543.69	0.009
	69.225 - 67.9375					39.000	65.7042	-24.45	2562.46	0.010
	67.9375 - 66.65					39.000	66.1855	-24.81	2581.24	0.010
	66.65 - 65.3625					39.000	66.6668	-25.16	2600.01	0.010
	65.3625 - 64.075					39.000	67.1481	-25.52	2618.78	0.010
	64.075 - 62.7875					39.000	67.6294	-25.88	2637.55	0.010
	62.7875 - 61.5					39.000	68.1107	-26.23	2656.32	0.010
L6	61.5 - 60.4413	TP44.3x41.0631x0.577	14.55	0.00	0.0	39.000	74.5737	-26.55	2908.37	0.009
	60.4413 - 59.3825					39.000	75.0050	-26.87	2925.20	0.009
	59.3825 - 58.3238					39.000	75.4364	-27.19	2942.02	0.009
	58.3238 - 57.265					39.000	75.8677	-27.51	2958.84	0.009
	57.265 - 56.2063					39.000	76.2991	-27.83	2975.66	0.009
	56.2063 - 55.1475					39.000	76.7304	-28.15	2992.49	0.009
	55.1475 - 54.0887					39.000	77.1618	-28.47	3009.31	0.009
	54.0887 - 53.03					39.000	77.5931	-28.80	3026.13	0.010
	53.03 - 46.95					39.000	80.0702	-16.50	3122.74	0.005

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 $\frac{P}{P_a}$
L7	53.03 - 46.95	TP46.8779x41.7934x0.5579	21.03	0.00	0.0	39.000	73.0212	-14.17	2847.83	0.005
	46.95 - 45.8821					39.000	75.6243	-31.75	2949.35	0.011
	45.8821 - 44.8143					39.000	76.0815	-32.11	2967.18	0.011
	44.8143 - 43.7464					39.000	76.5387	-32.47	2985.01	0.011
	43.7464 - 42.6786					39.000	76.9959	-32.82	3002.84	0.011
	42.6786 - 41.6107					39.000	77.4531	-33.18	3020.67	0.011
	41.6107 - 40.5429					39.000	77.9103	-33.54	3038.50	0.011
	40.5429 - 39.475					39.000	78.3675	-33.90	3056.33	0.011
	39.475 - 38.4071					39.000	78.8247	-34.27	3074.16	0.011
	38.4071 - 37.3393					39.000	79.2819	-34.63	3091.99	0.011
	37.3393 - 36.2714					39.000	79.7391	-34.99	3109.82	0.011
	36.2714 - 35.2036					39.000	80.1963	-35.36	3127.65	0.011
	35.2036 - 34.1357					39.000	80.6535	-35.73	3145.49	0.011
	34.1357 - 33.0679					39.000	81.1107	-36.09	3163.32	0.011
	33.0679 - 32					39.000	81.5678	-36.46	3181.15	0.011
L8	32 - 30.4	TP54x46.8779x0.5702	32.00	0.00	0.0	39.000	84.4539	-37.38	3293.70	0.011
	30.4 - 28.8					39.000	85.0984	-37.96	3318.84	0.011
	28.8 - 27.2					39.000	85.7429	-38.54	3343.97	0.012
	27.2 - 25.6					39.000	85.7429	-38.85	3343.97	0.012
	25.6 - 24					39.000	86.3874	-39.43	3369.11	0.012
	24 - 22.4					39.000	87.0319	-40.02	3394.24	0.012
	22.4 - 20.8					39.000	87.6764	-40.61	3419.38	0.012
	20.8 - 19.2					39.000	88.3209	-41.20	3444.51	0.012
	19.2 - 17.6					39.000	88.9654	-41.79	3469.65	0.012
	17.6 - 16					39.000	89.6099	-42.39	3494.78	0.012
	16 - 14.4					39.000	90.2543	-42.99	3519.92	0.012
	14.4 - 12.8					39.000	90.8988	-43.59	3545.05	0.012
	12.8 - 11.2					39.000	91.5433	-44.19	3570.19	0.012
	11.2 - 9.6					39.000	92.1878	-44.51	3595.32	0.012
	9.6 - 8					39.000	92.8323	-45.48	3620.46	0.013
	8 - 6.4					39.000	93.4768	-46.09	3645.59	0.013
	6.4 - 4.8					39.000	94.1213	-46.70	3670.73	0.013
	4.8 - 3.2					39.000	94.7658	-47.32	3695.87	0.013
	3.2 - 1.6					39.000	95.4103	-47.94	3721.00	0.013
	1.6 - 0					39.000	96.0547	-48.56	3746.14	0.013

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	176 - 174.513	TP23.65x16.5x0.1875	8.56	2.533	39.000	0.065	0.00	0.000	39.000	0.000
	174.513 - 173.026		16.45	4.675	39.000	0.120	0.00	0.000	39.000	0.000

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 $\frac{f_{by}}{F_{by}}$
	173.026 - 171.539		23.38	6.391	39.000	0.164	0.00	0.000	39.000	0.000
	171.539 - 170.053		30.45	8.008	39.000	0.205	0.00	0.000	39.000	0.000
	170.053 - 168.566		37.96	9.612	39.000	0.246	0.00	0.000	39.000	0.000
	168.566 - 167.079		46.35	11.310	39.000	0.290	0.00	0.000	39.000	0.000
	167.079 - 165.592		60.73	14.289	39.000	0.366	0.00	0.000	39.000	0.000
	165.592 - 164.105		75.62	17.166	39.000	0.440	0.00	0.000	39.000	0.000
	164.105 - 162.618		90.64	19.866	39.000	0.509	0.00	0.000	39.000	0.000
	162.618 - 161.132		105.79	22.401	39.000	0.574	0.00	0.000	39.000	0.000
	161.132 - 159.645		121.08	24.783	39.000	0.635	0.00	0.000	39.000	0.000
	159.645 - 158.158		136.51	27.024	39.000	0.693	0.00	0.000	39.000	0.000
	158.158 - 156.671		152.08	29.134	39.000	0.747	0.00	0.000	39.000	0.000
	156.671 - 155.184		167.78	31.122	39.000	0.798	0.00	0.000	39.000	0.000
	155.184 - 153.697		188.84	33.932	39.000	0.870	0.00	0.000	39.000	0.000
	153.697 - 152.211		208.69	36.343	39.000	0.932	0.00	0.000	39.000	0.000
	152.211 - 150.724		228.67	38.616	39.000	0.990	0.00	0.000	39.000	0.000
	150.724 - 149.237		248.79	40.758	39.000	1.045	0.00	0.000	39.000	0.000
	149.237 - 147.75		269.05	42.780	39.000	1.097	0.00	0.000	39.000	0.000
	147.75 - 144.25		127.03	18.858	39.000	0.484	0.00	0.000	39.000	0.000
L2	147.75 - 144.25	TP29.2804x22.4868x0.3125	194.39	18.192	39.000	0.466	0.00	0.000	39.000	0.000
	144.25 - 142.829		348.65	31.742	39.000	0.814	0.00	0.000	39.000	0.000
	142.829 - 141.408		376.06	33.318	39.000	0.854	0.00	0.000	39.000	0.000
	141.408 - 139.987		403.64	34.815	39.000	0.893	0.00	0.000	39.000	0.000
	139.987 - 138.566		431.39	36.236	39.000	0.929	0.00	0.000	39.000	0.000
	138.566 - 137.145		459.31	37.586	39.000	0.964	0.00	0.000	39.000	0.000
	137.145 - 135.724		487.41	38.870	39.000	0.997	0.00	0.000	39.000	0.000
	135.724 - 134.303		515.69	40.091	39.000	1.028	0.00	0.000	39.000	0.000
	134.303 - 132.882		544.14	41.252	39.000	1.058	0.00	0.000	39.000	0.000
	132.882 - 131.461		572.77	42.358	39.000	1.086	0.00	0.000	39.000	0.000
	131.461 - 130.039		601.58	43.410	39.000	1.113	0.00	0.000	39.000	0.000
	130.039 - 128.618		630.57	44.413	39.000	1.139	0.00	0.000	39.000	0.000

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 $\frac{f_{by}}{F_{by}}$
	128.618 - 127.197		659.74	45.368	39.000	1.163	0.00	0.000	39.000	0.000
	127.197 - 125.776		689.10	46.278	39.000	1.187	0.00	0.000	39.000	0.000
	125.776 - 124.355		718.63	47.147	39.000	1.209	0.00	0.000	39.000	0.000
	124.355 - 122.934		748.36	47.975	39.000	1.230	0.00	0.000	39.000	0.000
	122.934 - 121.513		778.27	48.765	39.000	1.250	0.00	0.000	39.000	0.000
	121.513 - 120.092		808.36	49.520	39.000	1.270	0.00	0.000	39.000	0.000
	120.092 - 118.671		838.64	50.240	39.000	1.288	0.00	0.000	39.000	0.000
	118.671 - 117.25		869.12	50.928	39.000	1.306	0.00	0.000	39.000	0.000
L3	117.25 - 116.201	TP34.33x29.2804x0.5076	891.75	32.300	39.000	0.828	0.00	0.000	39.000	0.000
	116.201 - 115.151		914.48	32.592	39.000	0.836	0.00	0.000	39.000	0.000
	115.151 - 114.102		937.33	32.874	39.000	0.843	0.00	0.000	39.000	0.000
	114.102 - 113.052		960.30	33.147	39.000	0.850	0.00	0.000	39.000	0.000
	113.052 - 112.003		983.37	33.411	39.000	0.857	0.00	0.000	39.000	0.000
	112.003 - 110.954		1006.55	33.666	39.000	0.863	0.00	0.000	39.000	0.000
	110.954 - 109.904		1029.85	33.914	39.000	0.870	0.00	0.000	39.000	0.000
	109.904 - 108.855		1053.26	34.153	39.000	0.876	0.00	0.000	39.000	0.000
	108.855 - 107.805		1076.78	34.385	39.000	0.882	0.00	0.000	39.000	0.000
	107.805 - 106.756		1100.41	34.609	39.000	0.887	0.00	0.000	39.000	0.000
	106.756 - 105.706		1124.16	34.827	39.000	0.893	0.00	0.000	39.000	0.000
	105.706 - 104.657		1148.02	35.037	39.000	0.898	0.00	0.000	39.000	0.000
	104.657 - 103.608		1171.99	35.241	39.000	0.904	0.00	0.000	39.000	0.000
	103.608 - 102.558		1196.08	35.439	39.000	0.909	0.00	0.000	39.000	0.000
	102.558 - 101.509		1220.29	35.630	39.000	0.914	0.00	0.000	39.000	0.000
	101.509 - 100.459		1244.62	35.816	39.000	0.918	0.00	0.000	39.000	0.000
	100.459 - 99.41		1269.06	35.996	39.000	0.923	0.00	0.000	39.000	0.000
	99.41 - 94.58		689.72	18.329	39.000	0.470	0.00	0.000	39.000	0.000
L4	99.41 - 94.58	TP35.3344x32.2391x0.5587	693.54	17.719	39.000	0.454	0.00	0.000	39.000	0.000
	94.58 - 93.5329		1408.38	35.401	39.000	0.908	0.00	0.000	39.000	0.000
	93.5329 - 92.4857		1433.63	35.459	39.000	0.909	0.00	0.000	39.000	0.000
	92.4857 - 91.4386		1458.97	35.513	39.000	0.911	0.00	0.000	39.000	0.000
	91.4386 - 90.3914		1484.44	35.563	39.000	0.912	0.00	0.000	39.000	0.000

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 $\frac{f_{by}}{F_{by}}$
	90.3914 - 89.3443		1510.02	35.611	39.000	0.913	0.00	0.000	39.000	0.000
	89.3443 - 88.2971		1535.70	35.655	39.000	0.914	0.00	0.000	39.000	0.000
	88.2971 - 87.25		1561.51	35.696	39.000	0.915	0.00	0.000	39.000	0.000
L5	87.25 - 85.9625	TP41.0631x35.3344x0.5294	1593.38	37.716	39.000	0.967	0.00	0.000	39.000	0.000
	85.9625 - 84.675		1625.42	37.849	39.000	0.970	0.00	0.000	39.000	0.000
	84.675 - 83.3875		1657.62	37.977	39.000	0.974	0.00	0.000	39.000	0.000
	83.3875 - 82.1		1689.97	38.100	39.000	0.977	0.00	0.000	39.000	0.000
	82.1 - 80.8125		1722.49	38.217	39.000	0.980	0.00	0.000	39.000	0.000
	80.8125 - 79.525		1755.17	38.329	39.000	0.983	0.00	0.000	39.000	0.000
	79.525 - 78.2375		1788.01	38.437	39.000	0.986	0.00	0.000	39.000	0.000
	78.2375 - 76.95		1821.01	38.540	39.000	0.988	0.00	0.000	39.000	0.000
	76.95 - 75.6625		1854.18	38.639	39.000	0.991	0.00	0.000	39.000	0.000
	75.6625 - 74.375		1887.51	38.733	39.000	0.993	0.00	0.000	39.000	0.000
	74.375 - 73.0875		1921.01	38.824	39.000	0.995	0.00	0.000	39.000	0.000
	73.0875 - 71.8		1954.67	38.910	39.000	0.998	0.00	0.000	39.000	0.000
	71.8 - 70.5125		1988.49	38.993	39.000	1.000	0.00	0.000	39.000	0.000
	70.5125 - 69.225		2022.48	39.073	39.000	1.002	0.00	0.000	39.000	0.000
	69.225 - 67.9375		2056.65	39.149	39.000	1.004	0.00	0.000	39.000	0.000
	67.9375 - 66.65		2090.97	39.222	39.000	1.006	0.00	0.000	39.000	0.000
	66.65 - 65.3625		2125.47	39.292	39.000	1.007	0.00	0.000	39.000	0.000
	65.3625 - 64.075		2160.14	39.358	39.000	1.009	0.00	0.000	39.000	0.000
	64.075 - 62.7875		2194.97	39.422	39.000	1.011	0.00	0.000	39.000	0.000
	62.7875 - 61.5		2229.98	39.483	39.000	1.012	0.00	0.000	39.000	0.000
L6	61.5 - 60.4413	TP44.3x41.0631x0.577	2258.90	36.400	39.000	0.933	0.00	0.000	39.000	0.000
	60.4413 - 59.3825		2287.93	36.442	39.000	0.934	0.00	0.000	39.000	0.000
	59.3825 - 58.3238		2317.05	36.482	39.000	0.935	0.00	0.000	39.000	0.000
	58.3238 - 57.265		2346.28	36.521	39.000	0.936	0.00	0.000	39.000	0.000
	57.265 - 56.2063		2375.63	36.558	39.000	0.937	0.00	0.000	39.000	0.000
	56.2063 - 55.1475		2405.07	36.593	39.000	0.938	0.00	0.000	39.000	0.000
	55.1475 - 54.0887		2434.63	36.627	39.000	0.939	0.00	0.000	39.000	0.000
	54.0887 - 53.03		2464.30	36.660	39.000	0.940	0.00	0.000	39.000	0.000
	53.03 - 46.95		1390.93	19.424	39.000	0.498	0.00	0.000	39.000	0.000
L7	53.03 - 46.95	TP46.8779x41.7934x0.5579	1164.63	18.915	39.000	0.485	0.00	0.000	39.000	0.000
	46.95 - 45.8821		2637.51	39.920	39.000	1.024	0.00	0.000	39.000	0.000

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 $\frac{f_{by}}{F_{by}}$
	45.8821 - 44.8143		2668.32	39.900	39.000	1.023	0.00	0.000	39.000	0.000
	44.8143 - 43.7464		2699.23	39.878	39.000	1.023	0.00	0.000	39.000	0.000
	43.7464 - 42.6786		2730.23	39.855	39.000	1.022	0.00	0.000	39.000	0.000
	42.6786 - 41.6107		2761.33	39.832	39.000	1.021	0.00	0.000	39.000	0.000
	41.6107 - 40.5429		2792.53	39.807	39.000	1.021	0.00	0.000	39.000	0.000
	40.5429 - 39.475		2823.82	39.782	39.000	1.020	0.00	0.000	39.000	0.000
	39.475 - 38.4071		2855.21	39.757	39.000	1.019	0.00	0.000	39.000	0.000
	38.4071 - 37.3393		2886.69	39.730	39.000	1.019	0.00	0.000	39.000	0.000
	37.3393 - 36.2714		2918.28	39.702	39.000	1.018	0.00	0.000	39.000	0.000
	36.2714 - 35.2036		2949.96	39.674	39.000	1.017	0.00	0.000	39.000	0.000
	35.2036 - 34.1357		2981.73	39.646	39.000	1.017	0.00	0.000	39.000	0.000
	34.1357 - 33.0679		3013.62	39.616	39.000	1.016	0.00	0.000	39.000	0.000
	33.0679 - 32		3045.59	39.587	39.000	1.015	0.00	0.000	39.000	0.000
L8	32 - 30.4	TP54x46.8779x0.5702	3125.88	38.739	39.000	0.993	0.00	0.000	39.000	0.000
	30.4 - 28.8		3174.28	38.742	39.000	0.993	0.00	0.000	39.000	0.000
	28.8 - 27.2		3222.90	38.743	39.000	0.993	0.00	0.000	39.000	0.000
	27.2 - 25.6		3222.90	38.743	39.000	0.993	0.00	0.000	39.000	0.000
	25.6 - 24		3271.72	38.742	39.000	0.993	0.00	0.000	39.000	0.000
	24 - 22.4		3320.76	38.739	39.000	0.993	0.00	0.000	39.000	0.000
	22.4 - 20.8		3370.00	38.734	39.000	0.993	0.00	0.000	39.000	0.000
	20.8 - 19.2		3419.46	38.728	39.000	0.993	0.00	0.000	39.000	0.000
	19.2 - 17.6		3469.12	38.720	39.000	0.993	0.00	0.000	39.000	0.000
	17.6 - 16		3518.99	38.710	39.000	0.993	0.00	0.000	39.000	0.000
	16 - 14.4		3569.07	38.699	39.000	0.992	0.00	0.000	39.000	0.000
	14.4 - 12.8		3619.37	38.687	39.000	0.992	0.00	0.000	39.000	0.000
	12.8 - 11.2		3669.88	38.673	39.000	0.992	0.00	0.000	39.000	0.000
	11.2 - 9.6		3720.59	38.659	39.000	0.991	0.00	0.000	39.000	0.000
	9.6 - 8		3771.84	38.646	39.000	0.991	0.00	0.000	39.000	0.000
	8 - 6.4		3823.07	38.630	39.000	0.991	0.00	0.000	39.000	0.000
	6.4 - 4.8		3874.51	38.612	39.000	0.990	0.00	0.000	39.000	0.000
	4.8 - 3.2		3926.16	38.594	39.000	0.990	0.00	0.000	39.000	0.000
	3.2 - 1.6		3978.03	38.574	39.000	0.989	0.00	0.000	39.000	0.000
	1.6 - 0		4030.12	38.554	39.000	0.989	0.00	0.000	39.000	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	176 - 174.513	TP23.65x16.5x0.1875	3.52	0.356	26.000	0.027	0.52	0.074	26.000	0.003
	174.513 - 173.026		4.62	0.457	26.000	0.035	0.52	0.072	26.000	0.003
	173.026 - 171.539		4.71	0.457	26.000	0.035	0.52	0.069	26.000	0.003

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 $\frac{f_{vt}}{F_{vt}}$
	171.539 - 170.053		4.80	0.457	26.000	0.035	0.52	0.066	26.000	0.003
	170.053 - 168.566		5.60	0.523	26.000	0.040	0.52	0.064	26.000	0.002
	168.566 - 167.079		5.69	0.522	26.000	0.040	0.51	0.061	26.000	0.002
	167.079 - 165.592		9.97	0.898	26.000	0.069	0.72	0.082	26.000	0.003
	165.592 - 164.105		10.06	0.890	26.000	0.068	0.72	0.079	26.000	0.003
	164.105 - 162.618		10.15	0.882	26.000	0.068	0.72	0.076	26.000	0.003
	162.618 - 161.132		10.24	0.875	26.000	0.067	0.72	0.074	26.000	0.003
	161.132 - 159.645		10.33	0.868	26.000	0.067	0.71	0.071	26.000	0.003
	159.645 - 158.158		10.43	0.862	26.000	0.066	0.71	0.069	26.000	0.003
	158.158 - 156.671		10.52	0.855	26.000	0.066	0.71	0.066	26.000	0.003
	156.671 - 155.184		10.61	0.849	26.000	0.065	0.71	0.064	26.000	0.002
	155.184 - 153.697		13.31	1.048	26.000	0.081	0.71	0.062	26.000	0.002
	153.697 - 152.211		13.40	1.039	26.000	0.080	0.71	0.060	26.000	0.002
	152.211 - 150.724		13.49	1.030	26.000	0.079	0.71	0.058	26.000	0.002
	150.724 - 149.237		13.59	1.022	26.000	0.079	0.71	0.056	26.000	0.002
	149.237 - 147.75		13.68	1.014	26.000	0.078	0.71	0.055	26.000	0.002
	147.75 - 144.25		10.25	0.734	26.000	0.056	0.42	0.030	26.000	0.001
L2	147.75 - 144.25	TP29.2804x22.4868x0.3125	8.84	0.388	26.000	0.030	0.33	0.015	26.000	0.001
	144.25 - 142.829		19.22	0.833	26.000	0.064	0.09	0.004	26.000	0.000
	142.829 - 141.408		19.34	0.827	26.000	0.064	0.09	0.004	26.000	0.000
	141.408 - 139.987		19.46	0.821	26.000	0.063	0.09	0.004	26.000	0.000
	139.987 - 138.566		19.58	0.815	26.000	0.063	0.09	0.004	26.000	0.000
	138.566 - 137.145		19.71	0.810	26.000	0.062	0.09	0.004	26.000	0.000
	137.145 - 135.724		19.83	0.804	26.000	0.062	0.10	0.004	26.000	0.000
	135.724 - 134.303		19.95	0.799	26.000	0.061	0.10	0.004	26.000	0.000
	134.303 - 132.882		20.08	0.794	26.000	0.061	0.10	0.004	26.000	0.000
	132.882 - 131.461		20.21	0.790	26.000	0.061	0.10	0.004	26.000	0.000
	131.461 - 130.039		20.33	0.785	26.000	0.060	0.10	0.004	26.000	0.000
	130.039 - 128.618		20.46	0.780	26.000	0.060	0.10	0.003	26.000	0.000
	128.618 - 127.197		20.59	0.776	26.000	0.060	0.10	0.003	26.000	0.000

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 $\frac{f_{vt}}{F_{vt}}$
	127.197 - 125.776		20.72	0.772	26.000	0.059	0.10	0.003	26.000	0.000
	125.776 - 124.355		20.85	0.768	26.000	0.059	0.11	0.003	26.000	0.000
	124.355 - 122.934		20.98	0.763	26.000	0.059	0.11	0.003	26.000	0.000
	122.934 - 121.513		21.11	0.760	26.000	0.058	0.11	0.003	26.000	0.000
	121.513 - 120.092		21.24	0.756	26.000	0.058	0.11	0.003	26.000	0.000
	120.092 - 118.671		21.37	0.752	26.000	0.058	0.11	0.003	26.000	0.000
	118.671 - 117.25		21.51	0.749	26.000	0.058	0.11	0.003	26.000	0.000
L3	117.25 - 116.201	TP34.33x29.2804x0.5076	21.61	0.462	26.000	0.036	0.11	0.002	26.000	0.000
	116.201 - 115.151		21.71	0.461	26.000	0.035	0.11	0.002	26.000	0.000
	115.151 - 114.102		21.82	0.459	26.000	0.035	0.11	0.002	26.000	0.000
	114.102 - 113.052		21.92	0.458	26.000	0.035	0.11	0.002	26.000	0.000
	113.052 - 112.003		22.03	0.457	26.000	0.035	0.11	0.002	26.000	0.000
	112.003 - 110.954		22.13	0.455	26.000	0.035	0.11	0.002	26.000	0.000
	110.954 - 109.904		22.24	0.454	26.000	0.035	0.12	0.002	26.000	0.000
	109.904 - 108.855		22.35	0.453	26.000	0.035	0.12	0.002	26.000	0.000
	108.855 - 107.805		22.46	0.451	26.000	0.035	0.12	0.002	26.000	0.000
	107.805 - 106.756		22.57	0.450	26.000	0.035	0.12	0.002	26.000	0.000
	106.756 - 105.706		22.67	0.449	26.000	0.035	0.12	0.002	26.000	0.000
	105.706 - 104.657		22.78	0.448	26.000	0.034	0.12	0.002	26.000	0.000
	104.657 - 103.608		22.89	0.447	26.000	0.034	0.12	0.002	26.000	0.000
	103.608 - 102.558		23.00	0.446	26.000	0.034	0.12	0.002	26.000	0.000
	102.558 - 101.509		23.11	0.444	26.000	0.034	0.12	0.002	26.000	0.000
	101.509 - 100.459		23.23	0.443	26.000	0.034	0.12	0.002	26.000	0.000
	100.459 - 99.41		23.34	0.442	26.000	0.034	0.12	0.002	26.000	0.000
	99.41 - 94.58		12.07	0.221	26.000	0.017	0.06	0.001	26.000	0.000
L4	99.41 - 94.58	TP35.3344x32.2391x0.5587	11.88	0.204	26.000	0.016	0.06	0.001	26.000	0.000
	94.58 - 93.5329		24.04	0.409	26.000	0.031	0.12	0.001	26.000	0.000
	93.5329 - 92.4857		24.15	0.407	26.000	0.031	0.12	0.001	26.000	0.000
	92.4857 - 91.4386		24.25	0.406	26.000	0.031	0.12	0.001	26.000	0.000
	91.4386 - 90.3914		24.36	0.404	26.000	0.031	0.12	0.001	26.000	0.000
	90.3914 - 89.3443		24.47	0.403	26.000	0.031	0.12	0.001	26.000	0.000

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 $\frac{f_{vt}}{F_{vt}}$
	89.3443 - 88.2971		24.58	0.402	26.000	0.031	0.13	0.001	26.000	0.000
	88.2971 - 87.25		24.69	0.400	26.000	0.031	0.13	0.001	26.000	0.000
L5	87.25 - 85.9625	TP41.0631x35.3344x0.5294	24.81	0.421	26.000	0.032	0.13	0.001	26.000	0.000
	85.9625 - 84.675		24.94	0.419	26.000	0.032	0.13	0.001	26.000	0.000
	84.675 - 83.3875		25.06	0.418	26.000	0.032	0.13	0.001	26.000	0.000
	83.3875 - 82.1		25.18	0.417	26.000	0.032	0.13	0.001	26.000	0.000
	82.1 - 80.8125		25.31	0.416	26.000	0.032	0.13	0.001	26.000	0.000
	80.8125 - 79.525		25.44	0.414	26.000	0.032	0.13	0.001	26.000	0.000
	79.525 - 78.2375		25.56	0.413	26.000	0.032	0.13	0.001	26.000	0.000
	78.2375 - 76.95		25.69	0.412	26.000	0.032	0.13	0.001	26.000	0.000
	76.95 - 75.6625		25.82	0.411	26.000	0.032	0.13	0.001	26.000	0.000
	75.6625 - 74.375		25.94	0.410	26.000	0.032	0.13	0.001	26.000	0.000
	74.375 - 73.0875		26.07	0.409	26.000	0.031	0.13	0.001	26.000	0.000
	73.0875 - 71.8		26.20	0.408	26.000	0.031	0.13	0.001	26.000	0.000
	71.8 - 70.5125		26.33	0.407	26.000	0.031	0.13	0.001	26.000	0.000
	70.5125 - 69.225		26.46	0.406	26.000	0.031	0.13	0.001	26.000	0.000
	69.225 - 67.9375		26.59	0.405	26.000	0.031	0.13	0.001	26.000	0.000
	67.9375 - 66.65		26.72	0.404	26.000	0.031	0.14	0.001	26.000	0.000
	66.65 - 65.3625		26.85	0.403	26.000	0.031	0.14	0.001	26.000	0.000
	65.3625 - 64.075		26.98	0.402	26.000	0.031	0.14	0.001	26.000	0.000
	64.075 - 62.7875		27.12	0.401	26.000	0.031	0.14	0.001	26.000	0.000
	62.7875 - 61.5		27.25	0.400	26.000	0.031	0.14	0.001	26.000	0.000
L6	61.5 - 60.4413	TP44.3x41.0631x0.577	27.35	0.367	26.000	0.028	0.14	0.001	26.000	0.000
	60.4413 - 59.3825		27.45	0.366	26.000	0.028	0.14	0.001	26.000	0.000
	59.3825 - 58.3238		27.55	0.365	26.000	0.028	0.14	0.001	26.000	0.000
	58.3238 - 57.265		27.65	0.364	26.000	0.028	0.14	0.001	26.000	0.000
	57.265 - 56.2063		27.75	0.364	26.000	0.028	0.14	0.001	26.000	0.000
	56.2063 - 55.1475		27.86	0.363	26.000	0.028	0.14	0.001	26.000	0.000
	55.1475 - 54.0887		27.96	0.362	26.000	0.028	0.14	0.001	26.000	0.000
	54.0887 - 53.03		28.06	0.362	26.000	0.028	0.14	0.001	26.000	0.000
	53.03 - 46.95		15.33	0.191	26.000	0.015	0.08	0.001	26.000	0.000
L7	53.03 - 46.95	TP46.8779x41.7934x0.5579	13.49	0.185	26.000	0.014	0.07	0.001	26.000	0.000
	46.95 - 45.8821		28.89	0.382	26.000	0.029	0.15	0.001	26.000	0.000
	45.8821 - 44.8143		28.98	0.381	26.000	0.029	0.15	0.001	26.000	0.000

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 $\frac{f_{vt}}{F_{vt}}$
	44.8143 - 43.7464		29.07	0.380	26.000	0.029	0.15	0.001	26.000	0.000
	43.7464 - 42.6786		29.16	0.379	26.000	0.029	0.15	0.001	26.000	0.000
	42.6786 - 41.6107		29.25	0.378	26.000	0.029	0.15	0.001	26.000	0.000
	41.6107 - 40.5429		29.34	0.377	26.000	0.029	0.15	0.001	26.000	0.000
	40.5429 - 39.475		29.43	0.376	26.000	0.029	0.15	0.001	26.000	0.000
	39.475 - 38.4071		29.53	0.375	26.000	0.029	0.15	0.001	26.000	0.000
	38.4071 - 37.3393		29.62	0.374	26.000	0.029	0.15	0.001	26.000	0.000
	37.3393 - 36.2714		29.71	0.373	26.000	0.028	0.15	0.001	26.000	0.000
	36.2714 - 35.2036		29.80	0.372	26.000	0.028	0.15	0.001	26.000	0.000
	35.2036 - 34.1357		29.89	0.371	26.000	0.028	0.15	0.001	26.000	0.000
	34.1357 - 33.0679		29.99	0.370	26.000	0.028	0.15	0.001	26.000	0.000
	33.0679 - 32		30.08	0.369	26.000	0.028	0.15	0.001	26.000	0.000
L8	32 - 30.4	TP54x46.8779x0.5702	30.21	0.358	26.000	0.028	0.15	0.001	26.000	0.000
	30.4 - 28.8		30.34	0.357	26.000	0.027	0.15	0.001	26.000	0.000
	28.8 - 27.2		30.47	0.355	26.000	0.027	0.16	0.001	26.000	0.000
	27.2 - 25.6		30.60	0.357	26.000	0.027	0.16	0.001	26.000	0.000
	25.6 - 24		30.73	0.356	26.000	0.027	0.16	0.001	26.000	0.000
	24 - 22.4		30.86	0.355	26.000	0.027	0.16	0.001	26.000	0.000
	22.4 - 20.8		31.00	0.354	26.000	0.027	0.16	0.001	26.000	0.000
	20.8 - 19.2		31.13	0.352	26.000	0.027	0.16	0.001	26.000	0.000
	19.2 - 17.6		31.26	0.351	26.000	0.027	0.16	0.001	26.000	0.000
	17.6 - 16		31.39	0.350	26.000	0.027	0.16	0.001	26.000	0.000
	16 - 14.4		31.52	0.349	26.000	0.027	0.16	0.001	26.000	0.000
	14.4 - 12.8		31.66	0.348	26.000	0.027	0.16	0.001	26.000	0.000
	12.8 - 11.2		31.79	0.347	26.000	0.027	0.16	0.001	26.000	0.000
	11.2 - 9.6		31.97	0.347	26.000	0.026	0.16	0.001	26.000	0.000
	9.6 - 8		32.11	0.346	26.000	0.026	0.16	0.001	26.000	0.000
	8 - 6.4		32.24	0.345	26.000	0.026	0.17	0.001	26.000	0.000
	6.4 - 4.8		32.37	0.344	26.000	0.026	0.17	0.001	26.000	0.000
	4.8 - 3.2		32.51	0.343	26.000	0.026	0.17	0.001	26.000	0.000
	3.2 - 1.6		32.64	0.342	26.000	0.026	0.17	0.001	26.000	0.000
	1.6 - 0		32.78	0.341	26.000	0.026	0.17	0.001	26.000	0.000

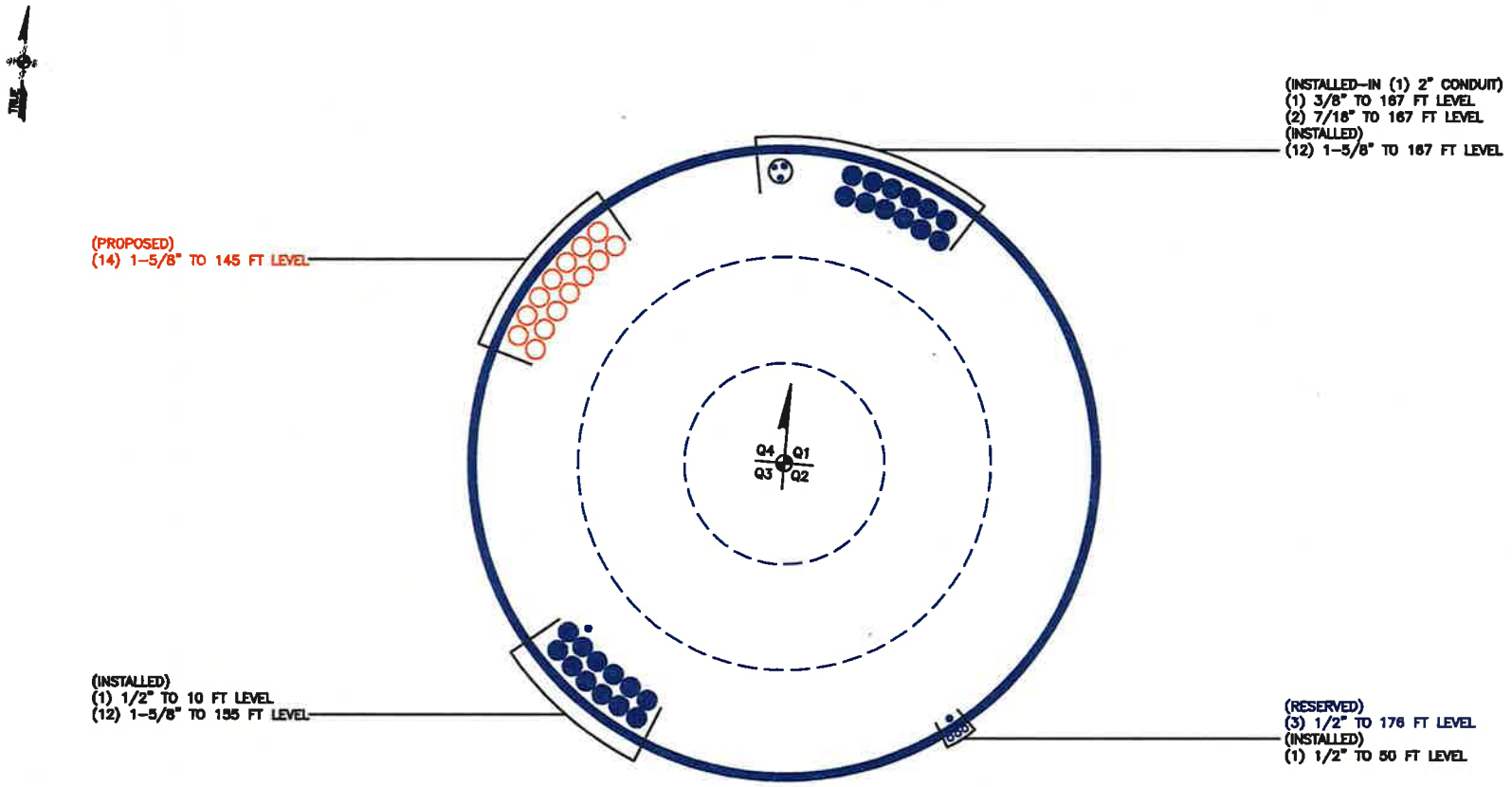
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	176.00-144.25	Pole	TP23.65x16.5x0.1875	1	Note 1	Note 1	83.1	Pass
L2	147.75-94.58	Pole	TP34.33x22.4868x0.3125	2	Note 1	Note 1	98.7	Pass
L3	99.41-46.95	Pole	TP44.3x32.6292x0.375	3	Note 1	Note 1	76.7	Pass
L4	53.03-0.00	Pole	TP54x42.1974x0.375	4	Note 1	Note 1	76.2	Pass
M1	35.00-0.00	Mod	CCI-WSFP-065125	5	Note 1	Note 1	88.9	Pass
M2	64.25-29.25	Mod	CCI-SFP-065125	6	Note 1	Note 1	93.7	Pass
M3	89.25-64.25	Mod	CCI-SFP-060100	7	Note 1	Note 1	95.6	Pass
M4	119.25-89.25	Mod	CCI-SFP-060100	8	Note 1	Note 1	87.5	Pass
							Summary	
						Pole (L2)	98.7	Pass
						Mod (M3)	95.6	Pass
						RATING =	**98.7**	**Pass**

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

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 876381 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Pole (L2)	98.7%
Mod (M3)	95.6%

WARD (BU 876381)

TEP #: 51819.13672

Analysis: MHL 1/24/2014

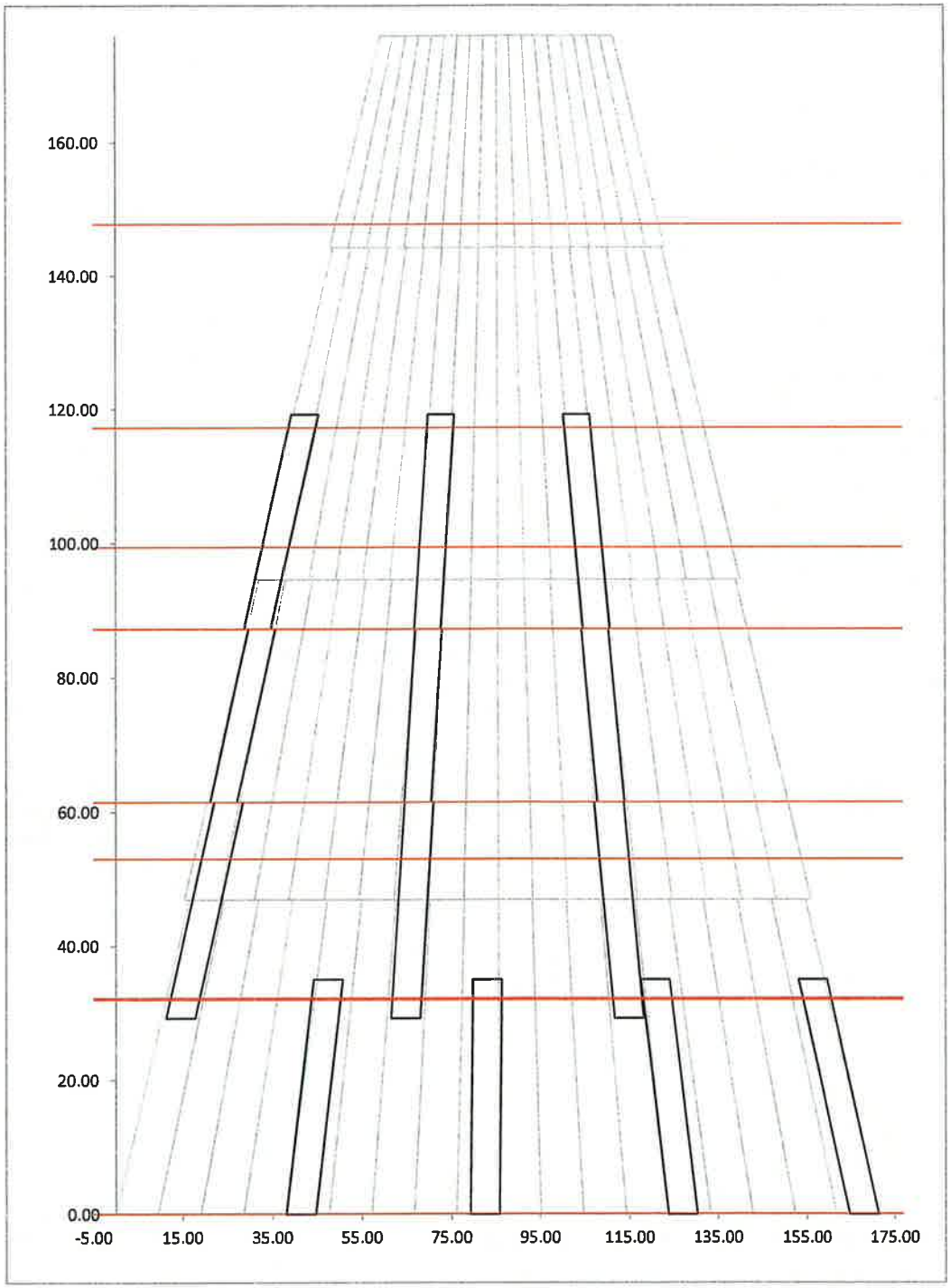
Check: JSC 1/24/2014

Monopole Shaft Reinforcement

Modification	Type	Effective	From (ft)	To (ft)	Effective	Location (° or flat/point #)	Flats/Points	Lateral Offset (in)
1	CCI-WSFP-065125	x	0.00	35.00		5 14	Flats	-1.50
2	CCI-WSFP-065125	x	0.00	35.00		9 18	Flats	1.50
3	CCI-SFP-065125		29.25	61.50	x	1 7 13	Flats	0.00
4	CCI-SFP-060100	x	61.50	87.25	x	1 7 13	Flats	0.00
5	CCI-SFP-060100	x	87.25	119.25		1 7 13	Flats	0.00

Modification Properties									
Modification	Unbraced Length (in)	Bolt Cap (k)	Ixx (in^4)	Iyy (in^4)	k	Drill Hole (in)	A,gross (in^2)	A,net (in^2)	Termination Length (ft)
CCI-WSFP-065125	19.000	30	1.058	28.607	0.8	1.19	8.125	6.563	2.750
CCI-SFP-065125	19.000	30	1.058	28.607	0.8	1.19	8.125	6.563	2.750
CCI-SFP-060100	16.000	30	0.500	18.000	0.8	1.19	6.000	4.750	2.000

Reinforcement Layout



Elevation: 0.00-ft

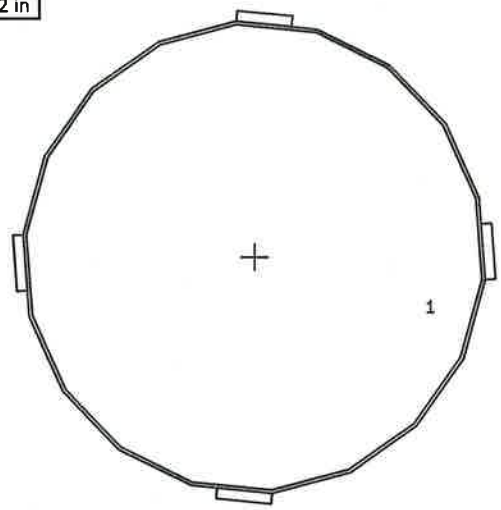
Loads		
Axial:	48.6	k
Moment:	4,030.1	k-ft
Shear:	32.8	k
Torsion:	0.2	k-ft

Equivalent Loads to Pole		
Axial:	32.2	k
Moment:	2,679.4	k-ft
Shear:	21.7	k
Torsion:	0.2	k-ft

Shear Flow		
Controlling Mod:	2	
q:	0.206	k/in
Bolt Capacity:	30.0	k/bolt
Max Spacing:	145.33	in
Capacity:	13.1%	

	(in^4)	Angle
$I_{comp,min}$:	34866.7	150.0°
$I_{comp,cont}$:	35663.8	105.5°

OD:	54.00 in
t:	0.3750 in
t_{eff}:	0.5702 in



	Applied Stress (ksi)		Allowable Stress (ksi)			
Pole Seg.	Axial	Bending	Axial	Bending	Angle	Capacity
4	0.504	38.026	52.000	52.000	149.5°	74.1%

	Applied Stress (ksi)		Allowable Stress (ksi)			
Mod	Axial	Bending	Comp.	Tension	Angle	Capacity
1	0.504	37.483	42.735	43.077	105.5°	88.9%
2	0.504	37.483	42.735	43.077	14.5°	88.9%

Elevation: 32.00-ft

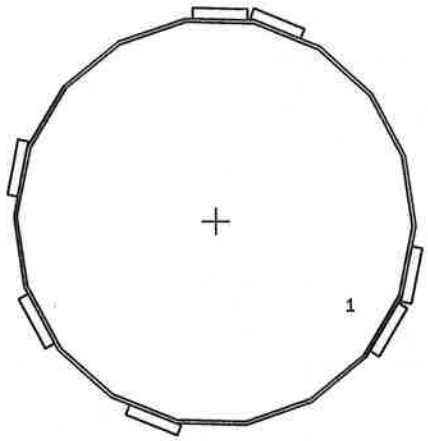
Loads		
Axial:	36.5	k
Moment:	3,045.6	k-ft
Shear:	30.1	k
Torsion:	0.2	k-ft

Equivalent Loads to Pole		
Axial:	18.0	k
Moment:	1,472.7	k-ft
Shear:	14.8	k
Torsion:	0.2	k-ft

Shear Flow		
Controlling Mod:	3	
q:	0.187	k/in
Bolt Capacity:	30.0	k/bolt
Max Spacing:	160.60	in
Capacity:	11.8%	

	(in^4)	Angle
$I_{comp,min}$:	31262.5	150.0°
$I_{comp,cont}$:	31473.2	121.5°

OD:	46.88 in
t:	0.3750 in
t_{eff}:	0.7968 in



	Applied Stress (ksi)		Allowable Stress (ksi)			
Pole Seg.	Axial	Bending	Axial	Bending	Angle	Capacity
4	0.325	27.823	52.000	52.000	149.5°	54.1%

	Applied Stress (ksi)		Allowable Stress (ksi)			
Mod	Axial	Bending	Comp.	Tension	Angle	Capacity
1	0.325	27.766	42.735	43.077	105.0°	65.7%
2	0.325	27.766	42.735	43.077	15.0°	65.7%
3	0.325	27.934	42.735	43.077	121.5°	66.1%

Elevation: 32.25-ft

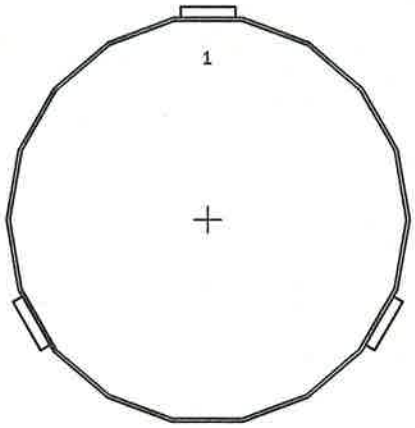
Loads		
Axial:	36.4	k
Moment:	3,039.3	k-ft
Shear:	30.1	k
Torsion:	0.2	k-ft

Equivalent Loads to Pole		
Axial:	25.3	k
Moment:	2,067.0	k-ft
Shear:	20.9	k
Torsion:	0.2	k-ft

Shear Flow		
Controlling Mod:	3	
q:	0.265	k/in
Bolt Capacity:	30.0	k/bolt
Max Spacing:	113.18	in
Capacity:	16.8%	

	(in^4)	Angle
$I_{comp,min}$:	22148.9	170.0°
$I_{comp,cont}$:	22148.9	0.0°

OD:	46.82 in
t:	0.3750 in
t_{eff}:	0.5579 in



	Applied Stress (ksi)		Allowable Stress (ksi)			
Pole Seg.	Axial	Bending	Axial	Bending	Angle	Capacity
4	0.457	39.143	52.000	52.000	39.5°	76.2%

	Applied Stress (ksi)		Allowable Stress (ksi)			
Mod	Axial	Bending	Comp.	Tension	Angle	Capacity
3	0.457	39.579	42.735	43.077	0.0°	93.7%

WARD (BU 876381)

TEP #: 51819.13672

Analysis: MHL 1/24/2014

Check: JSC 1/24/2014

Elevation: 53.03-ft

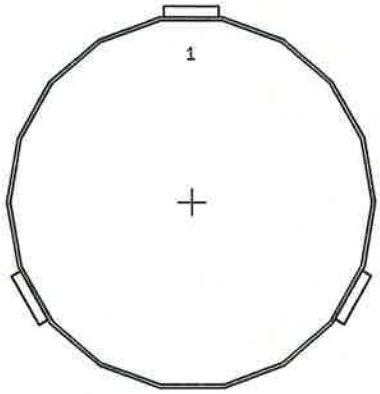
Loads		
Axial:	28.8	k
Moment:	2,464.3	k-ft
Shear:	28.1	k
Torsion:	0.1	k-ft

Equivalent Loads to Pole		
Axial:	19.4	k
Moment:	1,624.5	k-ft
Shear:	18.9	k
Torsion:	0.1	k-ft

Shear Flow		
Controlling Mod:	3	
q:	0.286	k/in
Bolt Capacity:	30.0	k/bolt
Max Spacing:	104.77	in
Capacity:	18.1%	

	(in^4)	Angle
$I_{comp,min}$:	17595.5	147.5°
$I_{comp,cont}$:	17595.5	0.0°

OD:	42.95 in
t:	0.3750 in
t_{eff}:	0.5770 in



	Applied Stress (ksi)		Allowable Stress (ksi)			
Pole Seg.	Axial	Bending	Axial	Bending	Angle	Capacity
3	0.384	36.645	52.000	52.000	89.5°	71.2%

	Applied Stress (ksi)		Allowable Stress (ksi)			
Mod	Axial	Bending	Comp.	Tension	Angle	Capacity
3	0.384	37.140	42.735	43.077	0.0°	87.8%

Elevation: 61.50-ft

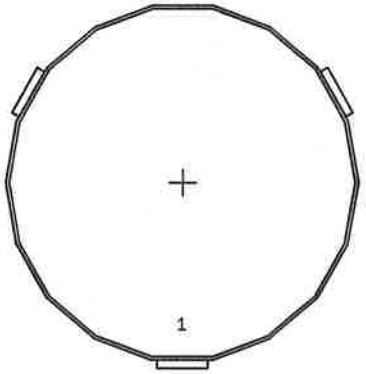
Loads		
Axial:	26.2	k
Moment:	2,230.0	k-ft
Shear:	27.3	k
Torsion:	0.1	k-ft

Equivalent Loads to Pole		
Axial:	19.1	k
Moment:	1,597.6	k-ft
Shear:	19.9	k
Torsion:	0.1	k-ft

Shear Flow		
Controlling Mod:	4	
q:	0.243	k/in
Bolt Capacity:	30.0	k/bolt
Max Spacing:	123.32	in
Capacity:	13.0%	

	(in^4)	Angle
$I_{comp,min}$:	14134.9	117.0°
$I_{comp,cont}$:	14134.9	180.0°

OD:	41.06 in
t:	0.3750 in
t_{eff}:	0.5294 in



	Applied Stress (ksi)		Allowable Stress (ksi)			
Pole Seg.	Axial	Bending	Axial	Bending	Angle	Capacity
3	0.395	39.468	52.000	52.000	9.5°	76.7%

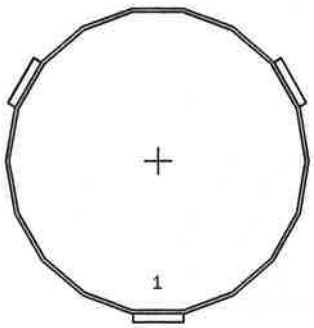
	Applied Stress (ksi)		Allowable Stress (ksi)			
Mod	Axial	Bending	Comp.	Tension	Angle	Capacity
4	0.395	39.816	42.057	42.222	180.0°	95.6%

Elevation: 87.25-ft

Loads		
Axial:	19.4	k
Moment:	1,561.5	k-ft
Shear:	24.7	k
Torsion:	0.1	k-ft

OD:	35.33 in
t:	0.3750 in
t_{eff}:	0.5587 in

Equivalent Loads to Pole		
Axial:	13.5	k
Moment:	1,064.6	k-ft
Shear:	17.2	k
Torsion:	0.1	k-ft



Shear Flow		
Controlling Mod:	5	
q:	0.286	k/in
Bolt Capacity:	30.0	k/bolt
Max Spacing:	105.02	in
Capacity:	15.2%	

	(in^4)	Angle
$I_{comp,min}$:	9421.4	1.0°
$I_{comp,cont}$:	9421.4	180.0°

	Applied Stress (ksi)		Allowable Stress (ksi)			
Pole Seg.	Axial	Bending	Axial	Bending	Angle	Capacity
3	0.325	35.679	52.000	52.000	149.5°	69.2%

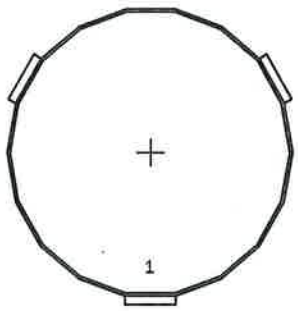
	Applied Stress (ksi)		Allowable Stress (ksi)			
Mod	Axial	Bending	Comp.	Tension	Angle	Capacity
5	0.325	36.133	42.057	42.222	180.0°	86.7%

Elevation: 99.41-ft

Loads		
Axial:	15.9	k
Moment:	1,269.1	k-ft
Shear:	23.3	k
Torsion:	0.1	k-ft

OD:	33.25 in
t:	0.3125 in
t_{eff}:	0.5076 in

Equivalent Loads to Pole		
Axial:	10.2	k
Moment:	795.3	k-ft
Shear:	15.0	k
Torsion:	0.1	k-ft



Shear Flow		
Controlling Mod:	5	
q:	0.336	k/in
Bolt Capacity:	30.0	k/bolt
Max Spacing:	89.38	in
Capacity:	17.9%	

	(in^4)	Angle
$I_{comp,min}$:	7146.0	3.5°
$I_{comp,cont}$:	7146.0	180.0°

	Applied Stress (ksi)		Allowable Stress (ksi)			
Pole Seg.	Axial	Bending	Axial	Bending	Angle	Capacity
2	0.313	35.979	52.000	52.000	159.5°	69.8%

	Applied Stress (ksi)		Allowable Stress (ksi)			
Mod	Axial	Bending	Comp.	Tension	Angle	Capacity
5	0.313	36.499	42.057	42.222	180.0°	87.5%

WARD (BU 876381)

TEP #: 51819.13672

Analysis: MHL 1/24/2014

Check: JSC 1/24/2014

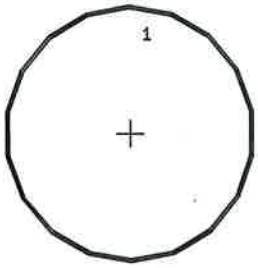
Elevation: 117.25-ft

Loads		
Axial:	12.1	k
Moment:	869.1	k-ft
Shear:	21.5	k
Torsion:	0.1	k-ft

OD:	29.28 in
t:	0.3125 in
t_{eff}:	0.3125 in

Equivalent Loads to Pole		
Axial:	12.1	k
Moment:	869.1	k-ft
Shear:	21.5	k
Torsion:	0.1	k-ft

Shear Flow N/A



	(in^4)	Angle
$I_{comp,min}$:	3045.3	0.0°
$I_{comp,cont}$:	3045.3	9.5°

	Applied Stress (ksi)		Allowable Stress (ksi)			
Pole Seg.	Axial	Bending	Axial	Bending	Angle	Capacity
2	0.420	50.911	52.000	52.000	9.5°	98.7%

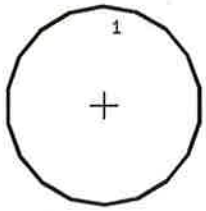
Elevation: 147.75-ft

Loads		
Axial:	6.3	k
Moment:	269.1	k-ft
Shear:	13.7	k
Torsion:	0.7	k-ft

Equivalent Loads to Pole		
Axial:	6.3	k
Moment:	269.1	k-ft
Shear:	13.7	k
Torsion:	0.7	k-ft

Shear Flow N/A

OD:	22.86 in
t:	0.1875 in
t_{eff}:	0.1875 in



	(in^4)	Angle
$I_{comp,min}$:	876.2	0.0°
$I_{comp,cont}$:	876.2	9.5°

	Applied Stress (ksi)		Allowable Stress (ksi)			
Pole Seg.	**Axial**	**Bending**	**Axial**	**Bending**	**Angle**	**Capacity**
1	0.467	42.768	52.000	52.000	9.5°	83.1%

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

TIA Rev F

Site Data

BU#: *876381*
Site Name: *WARD*
App #: *198834 Rev. 3*

Pole Manufacturer:	*Other*

Reactions		
Moment:	4082	ft-kips
Axial:	49	kips
Shear:	33	kips

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

Anchor Rod Data		
Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	63	in

Plate Data		
Diam:	69	in
Thick:	2	in
Grade:	60	ksi
Single-Rod B-eff:	10.71	in

Stiffener Data (Welding at both sides)		
Config:	1	*
Weld Type:	Groove	
Groove Depth:	0.375	in **
Groove Angle:	45	degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:	0.3125	in
Width:	6.5	in
Height:	15	in
Thick:	0.75	in
Notch:	0.75	in
Grade:	65	ksi
Weld str.:	80	ksi

Pole Data		
Diam:	54	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Anchor Rod Results

		Stiffened
Maximum Rod Tension:	191.3 Kips	Service, ASD
Allowable Tension:	195.0 Kips	Fty*ASIF
Anchor Rod Stress Ratio:	98.1% Pass	

Base Plate Results Flexural Check

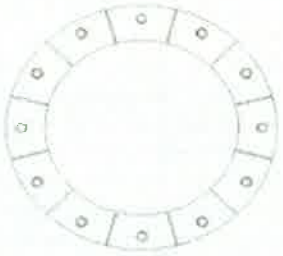
		Stiffened
Base Plate Stress:	48.4 ksi	Service, ASD
Allowable Plate Stress:	60.0 ksi	0.75*Fy*ASIF
Base Plate Stress Ratio:	80.8% Pass	Y.L. Length: N/A, Roark

Stiffener Results

Horizontal Weld :	62.1% Pass
Vertical Weld:	71.1% Pass
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	24.7% Pass
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	60.7% Pass
Plate Comp. (AISC Bracket):	71.0% Pass

Pole Results

Pole Punching Shear Check:	21.9% 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

		PASS	PASS		WARD (BU 876381)
	Results Summary:	LC1	LC2	TEP #:	51819.13672
	Soil Interaction:	51.5%	14.3%	Analysis:	MHL 1/24/2014
Drilled Caisson Tool - Input	Foundation Structural:	92.7%	25.5%	Check:	JSC 1/24/2014

Code Revisions: TIA-222-F ACI 318-05

Tower Type: Monopole

	LC1	LC2	
Moment:	4,082.00	1,135.00	kip-ft
Axial (download):	49.00	70.00	kip
Shear:	33.00	9.00	kip
Axial (uplift):	0.00	0.00	kip

Shaft Information

Diameter:	7.00	ft
Projection:	1.00	ft
Caisson Length:	30.00	ft
f'c:	4.000	ksi
Max εc:	0.003	in/in

Cage 1 Reinforcement

Tie Bar Size:	5	*(fy = 60.0 ksi)*
Clear Cover to Tie:	4.17	*in (Cage Ø = 73.00in)*
Tie Bar Spacing:	12.00	in
Vertical Bar Size:	11	
Vertical Bar Quantity:	24	*(ρ =0.676%)*
fy:	60.0	ksi
E:	29,000	ksi

Design Parameters

Soil Layer	Soil Type	Depth (ft) from	Depth (ft) to	Eff. Unit Weight (pcf)	Cohesion (psf)	Friction Angle ϕ (°)	All. Skin Friction (psf) Download	All. Skin Friction (psf) Uplift
1	Clay	0.00	3.50	130.0	0			
2	Sand	3.50	9.00	130.0		35.0		
3	Sand	9.00	30.00	67.6		35.0		

Notes: 1) Neglect lateral soil strength to a depth of:

i) **1/2 Pier Ø = 7.00ft / 2 = 3.50ft**

ii) ~~Frost Depth = 40.0in / (12in/ft) = 3.33ft~~

iii) **Geotech Recommendation = 3.50ft**

2) Groundwater = 9.00ft

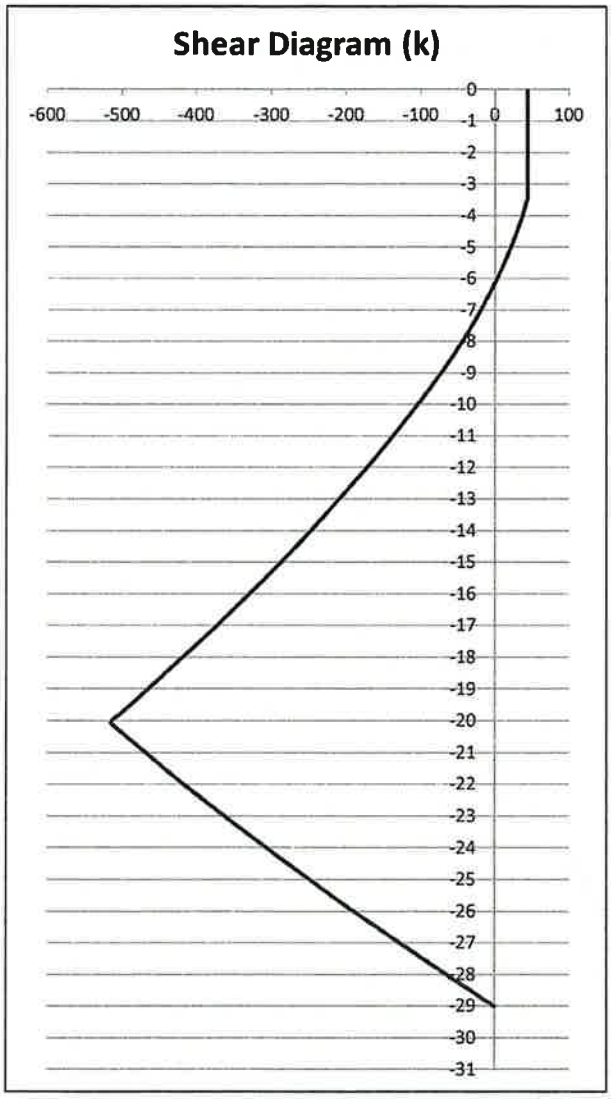
WARD (BU 876381)

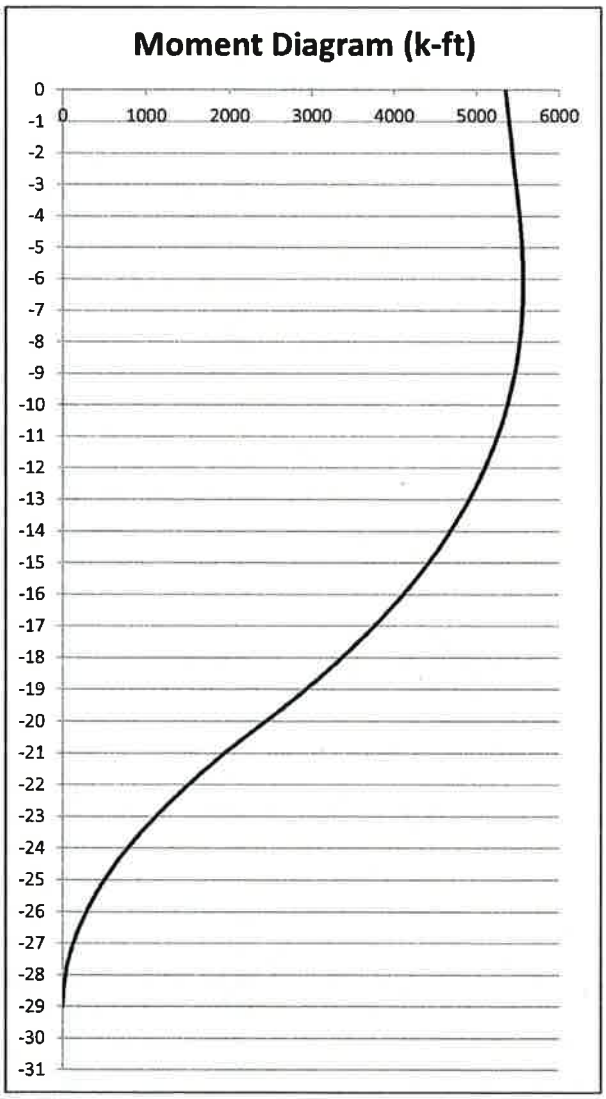
TEP #: 51819.13672

Analysis: MHL 1/24/2014

Check: JSC 1/24/2014

Soil Interaction: LC1





Max Unfactored Moment: 5561.4 kip-ft

@ 6.14 ft below grade

Additional Factor of Safety: 3.88

Capacity = 51.5% PASS

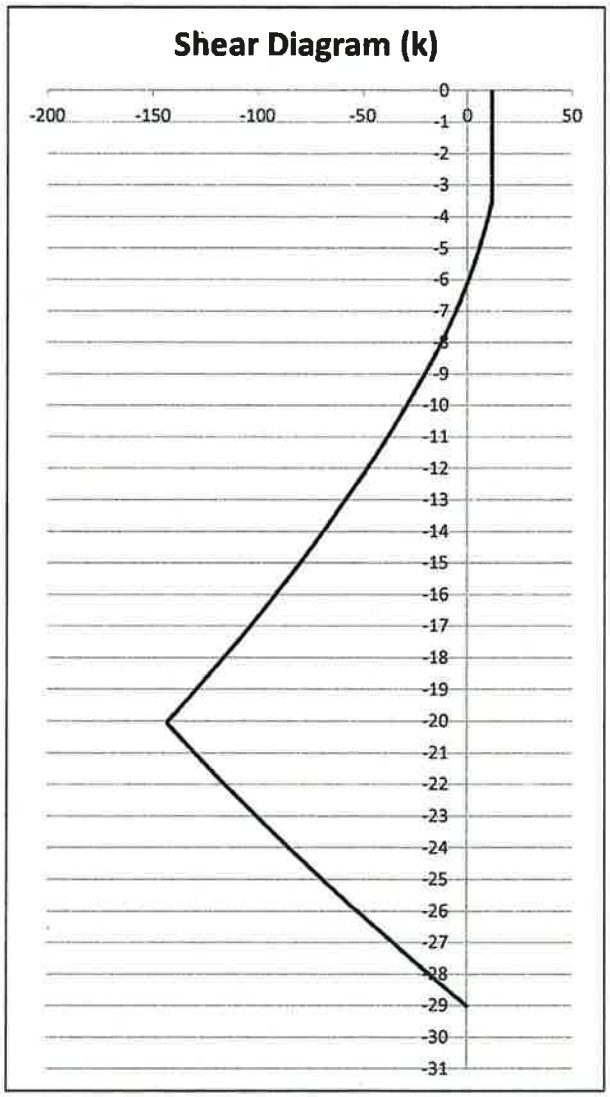
WARD (BU 876381)

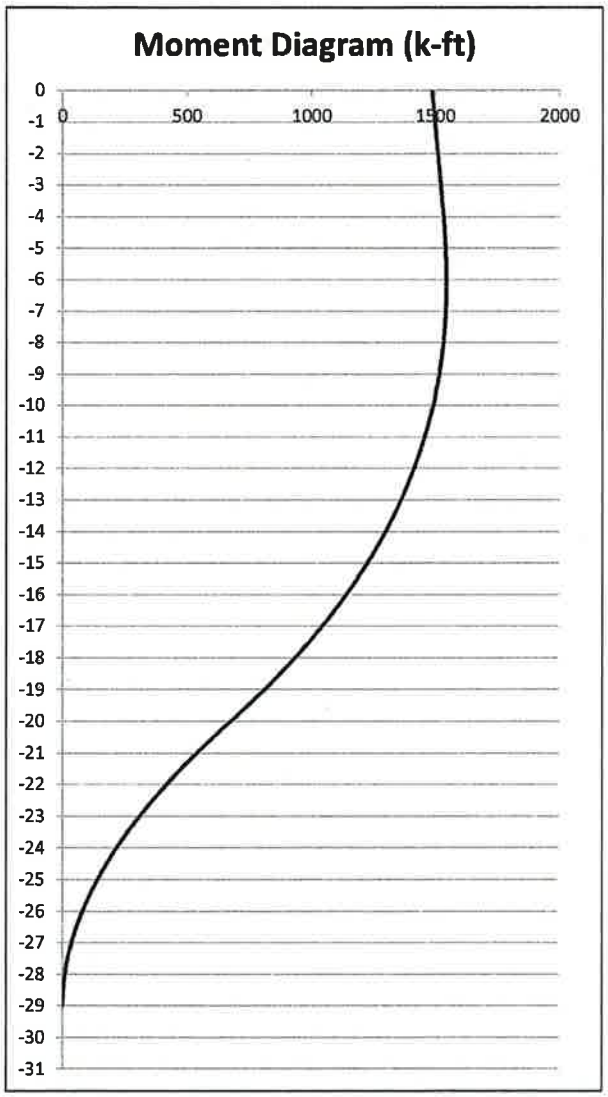
TEP #: 51819.13672

Analysis: MHL 1/24/2014

Check: JSC 1/24/2014

Soil Interaction: LC2





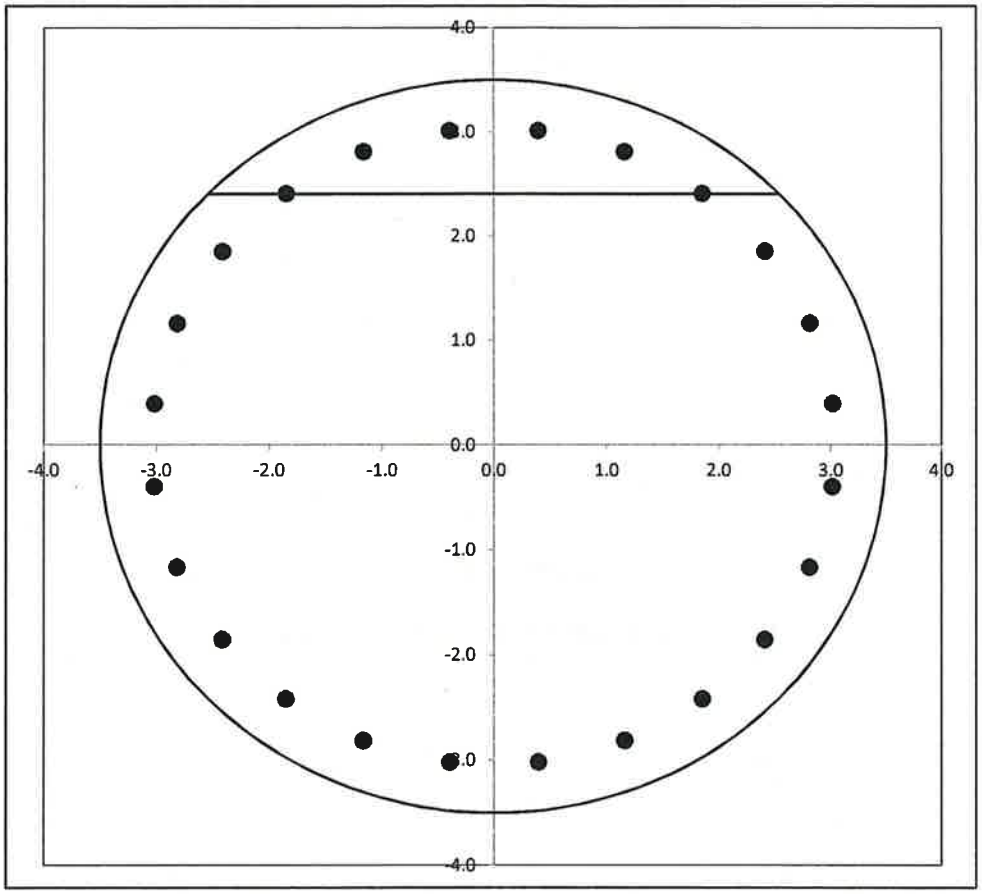
Max Unfactored Moment: 1544.8 kip-ft

@ 6.11 ft below grade

Additional Factor of Safety: 14.01

Capacity = 14.3% **PASS**

Reinforcement Capacity



		LC1	LC2	
	Vu =	515.3	143.0	kip
	Vc =	704.1	705.4	kip
fy,tie = 60.0	Vs =	242.4	242.4	kip
	ϕVn =	709.8	710.8	kip
	Capacity =	72.6%	20.1%	
		PASS	PASS	

		LC1	LC2	
	Mu =	5561.4	1544.8	kip-ft
	ϕMn =	5996.5	6064.6	kip-ft
	Capacity =	92.7%	25.5%	
		PASS	PASS	

APPENDIX D

STRUCTURAL MODIFICATION DRAWINGS

STRUCTURAL DESIGN DRAWINGS

SITE NAME:

WARD

CROWN CASTLE BU NUMBER:

876381

APPLICATION NUMBER:

198834 REV. 3

SITE ADDRESS:

2365 LONG HILL ROAD
GUILFORD, CT 06437
(NEW HAVEN COUNTY)
N 41° 20' 47.34", W 72° 43' 23.15"

MODIFICATION PROVISIONS

THE MODIFICATIONS DEPICTED ON THESE DRAWINGS ARE BASED ON THE RECOMMENDATIONS OUTLINED IN THE STRUCTURAL MODIFICATION ANALYSIS REPORT COMPLETED BY TOWER ENGINEERING PROFESSIONALS (TEP), JOB#: 51819.13672 DATED JANUARY 27, 2014 (REV 0). THIS REPORT IS BASED ON A SPECIFIC ANTENNA LOADING AND COAX CONFIGURATION. SEE THE REPORT FOR THE ANTENNA AND COAX LOADING INFORMATION. ANY OTHER ANTENNA OR COAX CONFIGURATION REQUIRES REVIEW BY TEP. SATISFACTORY COMPLETION OF THE MODIFICATIONS INDICATED ON THESE DRAWINGS WILL RESULT IN THE STRUCTURE MEETING THE REQUIREMENTS OF THE SPECIFICATIONS UNDER WHICH THE STRUCTURAL WAS COMPLETED.

CONTRACTOR SHALL FIELD VERIFY ALL: DIMENSIONS, QUANTITIES, PART NUMBERS AND COAX/ANTENNA PLACEMENTS PRIOR TO: BIDDING ORDERING MATERIALS, AND CONSTRUCTION.

INDEX OF SHEETS

NO.	SHEET TITLE	REV
T-1	TITLE SHEET	0
N-1	MI CHECKLIST AND NOTES	0
N-2	PROJECT NOTES I	0
N-3	PROJECT NOTES II	0
N-4	AJAX BOLT INSTALLATION DETAILS	0
S-1	TOWER ELEVATION AND MODIFICATION SCHEDULE	0
S-2	BASE SECTION DETAILS	0
S-3	CROWN REINFORCEMENT DETAILS	0
S-4	TYP. SHAFT REINFORCEMENT DETAILS I	0
S-5	TYP. SHAFT REINFORCEMENT DETAILS II	0
S-6	BASE PLATE STIFFENER DETAILS	0
S-7	CO-LOCATION HANDHOLE FRAME DETAILS I	0
S-8	CO-LOCATION HANDHOLE FRAME DETAILS II	0

PROJECT TEAM

CCI TOWER STRUCTURAL ANALYST:

NAME	CROWN CASTLE
ADDRESS	8 PARKMEADOW DRIVE
CITY, STATE, ZIP	PITTSFORD, NY 14534
CONTACT	STEVE TUTTLE
PHONE	(585) 899-3445
EMAIL	STEVE.TUTTLE@CROWNCASTLE.COM

CCI MODIFICATION PROJECT MANAGER:

NAME	CROWN CASTLE
ADDRESS	3530 TORINGDON WAY, SUITE 300
CITY, STATE, ZIP	CHARLOTTE, NC 28277
CONTACT	EVA MORALES
PHONE	(704) 405-6612
EMAIL	EVA.MORALES@CROWNCASTLE.COM

ENGINEER OF RECORD (EOR):

NAME	TOWER ENGINEERING PROFESSIONALS, INC.
ADDRESS	3703 JUNCTION BOULEVARD
CITY, STATE, ZIP	RALEIGH, NC 27603
CONTACT	ENGINEERING DEPARTMENT
PHONE	(919) 661-6351
EMAIL	SDD@TEPGROUP.NET

PLANS PREPARED FOR:

CROWN CASTLE

8 PARKMEADOW DRIVE
PITTSFORD, NY 14534
OFFICE: (585) 899-3445

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
3703 JUNCTION BOULEVARD
RALEIGH, NC 27603-5263
OFFICE: (919) 661-6351
www.tepgroup.net

SEAL:

1/31/14

January 27, 2014

REV	DATE	ISSUED FOR:
0	01-27-14	MODIFICATION DRAWINGS

DRAWN BY: RST | CHECKED BY: RJR

SHEET TITLE:

TITLE SHEET

SHEET NUMBER: **T-1**

REVISION: **0**

TEP #: 51819.13672

MI CHECKLIST

CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY EOR)	REPORT ITEM
PRE-CONSTRUCTION	
X	MI CHECKLIST DRAWING
NA	EOR APPROVED SHOP DRAWINGS
X	FABRICATION INSPECTION
NA	FABRICATOR CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT (MTR)
NA	FABRICATOR NDE INSPECTION
X	NDE REPORT OF MONOPOLE BASE PLATE PER ENG-SOW-10033
X	PACKING SLIPS
ADDITIONAL TESTING AND INSPECTIONS:	
CONSTRUCTION	
X	CONSTRUCTION INSPECTIONS
NA	CONTINUOUS FOUNDATION INSPECTIONS
NA	CONCRETE COMP. STRENGTH AND SLUMP TESTS
NA	GROUT COMP. STRENGTH (ASTM C109)
NA	POST INSTALLED ANCHOR ROD VERIFICATION
NA	BASE PLATE GROUT VERIFICATION
X	CONTRACTOR'S CERTIFIED WELD INSPECTION AND NDE REPORTS
NA	EARTHWORK: LIFT AND DENSITY
X	ON SITE COLD GALVANIZING VERIFICATION
NA	GUY WIRE TENSION REPORT
X	GC AS-BUILT DOCUMENTS
X	NON-TENSION CONTROLLED BOLT INSPECTION. SEE SHEET N-4 FOR DETAILS.
ADDITIONAL TESTING AND INSPECTIONS:	
POST-CONSTRUCTION	
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
NA	POST INSTALLED ANCHOR ROD PULL-OUT TESTING
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

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

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 IN FIELD 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.

PLANS PREPARED FOR:
CROWN CASTLE
8 PARKMEADOW DRIVE
PITTSFORD, NY 14534
OFFICE: (585) 899-3445

PROJECT INFORMATION:

WARD
BU #: 876381

2365 LONG HILL ROAD
GUILFORD, CT 06437
(NEW HAVEN COUNTY)

PLANS PREPARED BY:
TOWER ENGINEERING PROFESSIONALS
3703 JUNCTION BOULEVARD
RALEIGH, NC 27603-5263
OFFICE: (919) 661-6351
www.tepgroup.net

SEAL:
STATE OF CONNECTICUT
WILLIAM H. MARTIN
0029484
LICENSED
PROFESSIONAL ENGINEER
1/27/14
January 27, 2014

REV	DATE	ISSUED FOR:
0	01-27-14	MODIFICATION DRAWINGS

DRAWN BY: RST | CHECKED BY: RJR

SHEET TITLE:
MI CHECKLIST AND NOTES

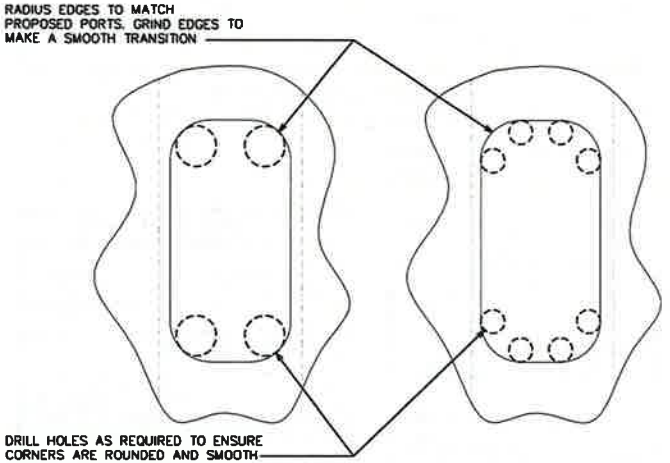
SHEET NUMBER: **N-1**
REVISION: 0
TEP #: 5181.13672

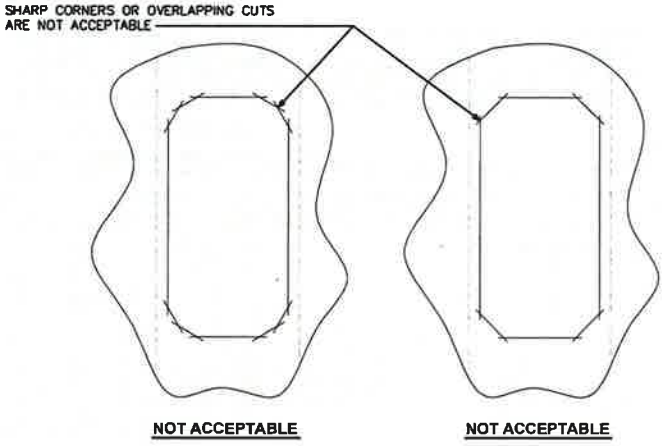
GENERAL NOTES:

1. ALL REFERENCES TO THE OWNER IN THESE DOCUMENTS SHALL BE CONSIDERED CROWN CASTLE OR ITS DESIGNATED REPRESENTATIVE.
2. ALL WORK PRESENTED ON THESE DRAWINGS MUST BE COMPLETED BY THE CONTRACTOR UNLESS NOTED OTHERWISE. THE CONTRACTOR MUST HAVE CONSIDERABLE EXPERIENCE IN PERFORMANCE OF WORK SIMILAR TO THAT DESCRIBED HEREIN. BY ACCEPTANCE OF THIS ASSIGNMENT, THE CONTRACTOR IS ATTESTING THAT HE DOES HAVE SUFFICIENT EXPERIENCE AND ABILITY, THAT HE IS KNOWLEDGEABLE OF THE WORK TO BE PERFORMED AND THAT HE IS PROPERLY LICENSED AND PROPERLY REGISTERED TO DO THIS WORK IN THE STATE OF CONNECTICUT.
3. WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE 2005 CONNECTICUT STATE BUILDING CODE.
4. UNLESS SHOWN OR NOTED OTHERWISE ON THE CONTRACT DRAWINGS, OR IN THE SPECIFICATIONS, THE FOLLOWING NOTES SHALL APPLY TO THE MATERIALS LISTED HEREIN, AND TO THE PROCEDURES TO BE USED ON THIS PROJECT.
5. ALL HARDWARE ASSEMBLY MANUFACTURER'S INSTRUCTIONS SHALL BE FOLLOWED EXACTLY AND SHALL SUPERSEDE ANY CONFLICTING NOTES ENCLOSED HEREIN.
6. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE TO ENSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION AND/OR FIELD MODIFICATIONS. THIS INCLUDES, BUT IS NOT LIMITED TO, THE ADDITION OF TEMPORARY BRACING, GUYS OR TIE DOWNS THAT MAY BE NECESSARY. SUCH MATERIAL SHALL BE REMOVED AND SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AFTER THE COMPLETION OF THE PROJECT.
7. ALL DIMENSIONS, ELEVATIONS, AND EXISTING CONDITIONS SHOWN ON THE DRAWINGS SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO BEGINNING ANY MATERIALS ORDERING, FABRICATION OR CONSTRUCTION WORK ON THIS PROJECT. CONTRACTOR SHALL NOT SCALE CONTRACT DRAWINGS IN LIEU OF FIELD VERIFICATIONS. ANY DISCREPANCIES SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE OWNER AND THE OWNER'S ENGINEER. THE DISCREPANCIES MUST BE RESOLVED BEFORE THE CONTRACTOR IS TO PROCEED WITH THE WORK. THE CONTRACT DOCUMENTS DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES. OBSERVATION VISITS TO THE SITE BY THE OWNER AND/OR THE ENGINEER SHALL NOT INCLUDE INSPECTION OF THE PROTECTIVE MEASURES OR THE PROCEDURES.
8. ALL MATERIALS AND EQUIPMENT FURNISHED SHALL BE NEW AND OF GOOD QUALITY, FREE FROM FAULTS AND DEFECTS AND IN CONFORMANCE WITH THE CONTRACT DOCUMENTS. ANY AND ALL SUBSTITUTIONS MUST BE PROPERLY APPROVED AND AUTHORIZED IN WRITING BY THE OWNER AND ENGINEER PRIOR TO INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF THE MATERIALS AND EQUIPMENT BEING SUBSTITUTED.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT THIS PROJECT AND RELATED WORK COMPLIES WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY CODES AND REGULATIONS GOVERNING THIS WORK.
10. ACCESS TO THE PROPOSED WORK SITE MAY BE RESTRICTED. THE CONTRACTOR SHALL COORDINATE INTENDED CONSTRUCTION ACTIVITY, INCLUDING WORK SCHEDULE AND MATERIALS ACCESS, WITH THE RESIDENT LEASING AGENT FOR APPROVAL.
11. ALL PERMITS THAT MUST BE OBTAINED ARE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE RESPONSIBLE FOR ABIDING BY ALL CONDITIONS AND REQUIREMENTS OF THE PERMITS.
12. IF APPLICABLE, ALL CONCRETE WORK SHALL COMPLY TO LOCAL CODES AND THE ACI 318-05, "BUILDING REQUIREMENTS FOR STRUCTURAL CONCRETE".
13. 24 HOURS PRIOR TO THE BEGINNING OF ANY CONSTRUCTION, THE CONTRACTOR MUST NOTIFY THE APPLICABLE JURISDICTIONAL (STATE, COUNTY OR CITY) ENGINEER.
14. ALL MATERIALS AND WORKMANSHIP SHALL BE WARRANTED FOR ONE YEAR FROM ACCEPTANCE DATE.
15. ALL TOWER DIMENSIONS SHALL BE VERIFIED WITH THE PLANS (LATEST REVISION) PRIOR TO COMMENCING CONSTRUCTION. NOTIFY THE ENGINEER IMMEDIATELY IF ANY DISCREPANCIES ARE DISCOVERED. THE OWNER SHALL HAVE A SET OF APPROVED PLANS AVAILABLE AT THE SITE AT ALL TIMES WHILE WORK IS BEING PERFORMED. A DESIGNATED RESPONSIBLE EMPLOYEE SHALL BE AVAILABLE FOR CONTACT BY GOVERNING AGENCY INSPECTORS.
16. ALL TOWER MODIFICATION WORK SHALL BE IN ACCORDANCE WITH TIA-1019-A STANDARD FOR INSTALLATION, ALTERATION AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS.
17. THE CLIMBING FACILITIES, SAFETY CLIMB AND ALL PARTS THEREOF SHALL NOT BE IMPEDED, MODIFIED OR ALTERED WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE TOWER OWNER OR ENGINEER OF RECORD.

GUIDELINES FOR PORT HOLE CUTTING:

1. PORT HOLES SHALL BE CUT RADIALLY TO MATCH THE PROFILE OF THE PORT. THE USE OF DRILL HOLES AT THE CORNERS OF THE HOLES ARE RECOMMENDED TO ENSURE CORNERS ARE SMOOTH AND ROUNDED. OVERCUT HOLES CAUSING STRESS RISERS IN THE EXISTING TOWER SHAFT ARE NOT ACCEPTABLE. SEE BELOW FOR ACCEPTABLE METHODS OF CUTTING.
2. CONTRACTOR SHALL TAKE NECESSARY STEPS TO ENSURE EXISTING COAX ARE NOT DAMAGED DURING THE HOLE CUTTING PROCESS. TORCH CUTTING IS PROHIBITED.





PLANS PREPARED FOR:

CROWN CASTLE

8 PARKMEADOW DRIVE
PITTSFORD, NY 14534
OFFICE: (585) 899-3445

PROJECT INFORMATION:

WARD
BU #: 876381

2365 LONG HILL ROAD
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3703 JUNCTION BOULEVARD
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www.tepgroup.net

SEAL:

STATE OF CONNECTICUT · WILLIAM H. MARTIN · 0029484 · LICENSED PROFESSIONAL ENGINEER · 1/27/14

January 27, 2014

REV	DATE	ISSUED FOR:
0	01-27-14	MODIFICATION DRAWINGS

DRAWN BY: RST | CHECKED BY: RJR

SHEET TITLE:

PROJECT NOTES I

SHEET NUMBER: **N-2**

REVISION: **0**

TEP #: 51819.13672

STRUCTURAL STEEL NOTES:

1. THE FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AISC SPECIFICATION FOR MANUAL OF STEEL CONSTRUCTION, ALLOWABLE STRESS DESIGN, 9TH EDITION.
2. UNLESS OTHERWISE NOTED, ALL STRUCTURAL ELEMENTS SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:
   STRUCTURAL STEEL:
   - ANGLE: ASTM A36
   - PIPE/TUBE: ASTM A500-50
   - PLATE: ASTM A36 (SELF SUPPORTING AND GUYED TOWERS)
   - PLATE: ASTM A572-65 (MONOPOLE)

   A. ALL BOLTS, ASTM A325 TYPE I GALVANIZED HIGH STRENGTH BOLTS.
   B. ALL U-BOLTS, ASTM A193 GRADE B7
   C. ALL NUTS, ASTM A563 CARBON AND ALLOY STEEL NUTS.
   D. ALL WASHERS, ASTM F436 HARDENED STEEL WASHERS.
3. ALL CONNECTIONS NOT FULLY DETAILED ON THESE PLANS SHALL BE DETAILED BY THE STEEL FABRICATOR IN ACCORDANCE WITH AISC SPECIFICATION FOR MANUAL OF STEEL CONSTRUCTION, ALLOWABLE STRESS DESIGN, 9TH EDITION.
4. HOLES SHALL NOT BE FLAME CUT THROUGH STEEL UNLESS APPROVED BY THE ENGINEER.
5. HOT-DIP GALVANIZE ALL ITEMS UNLESS OTHERWISE NOTED, AFTER FABRICATION WHERE PRACTICABLE. GALVANIZING: ASTM A123, ASTM, A153/A153M OR ASTM A653/A653M, G90, AS APPLICABLE.
6. REPAIR DAMAGED SURFACES WITH GALVANIZING REPAIR METHOD AND PAINT CONFORMING TO ASTM A780 OR BY APPLICATION OF STICK OR THICK PASTED MATERIAL SPECIFICALLY DESIGNED FOR REPAIR OF GALVANIZING. CLEAN AREAS TO BE REPAIRED AND REMOVE SLAG FROM WELDS. HEAT SURFACES TO WHICH STICK OR PASTE MATERIAL IS APPLIED, WITH A TORCH TO A TEMPERATURE SUFFICIENT TO MELT THE METALLICS IN STICK OR PASTED; SPREAD MOLTEN MATERIAL UNIFORMLY OVER SURFACES TO BE COATED AND WIPE OFF EXCESS MATERIAL.
7. A NUT LOCKING DEVICE SHALL BE INSTALLED ON ALL PROPOSED AND/OR REPLACED BOLTS.
8. ALL PROPOSED AND/OR REPLACED BOLTS SHALL BE OF SUFFICIENT LENGTH TO EXCLUDE THE THREADS FROM THE SHEAR PLANE.
9. ALL PROPOSED AND/OR REPLACED BOLTS SHALL BE OF SUFFICIENT LENGTH SUCH THAT THE END OF THE BOLT BE AT LEAST FLUSH WITH THE FACE OF THE NUT. IT IS NOT PERMITTED FOR THE BOLT END TO BE BELOW THE FACE OF THE NUT AFTER TIGHTENING IS COMPLETED.
10. GALVANIZED ASTM A325 BOLTS SHALL NOT BE REUSED.

WELDING NOTES:

1. ALL WELDING SHALL BE IN ACCORDANCE WITH THE AWS D1.1/D1.1M: 2008 "STRUCTURAL WELDING CODE-STEEL".
2. ALL WELDING SHALL BE PERFORMED BY AWS CERTIFIED WELDERS.
3. CONTRACTOR SHALL RETAIN AN AWS CERTIFIED WELD INSPECTOR TO PERFORM VISUAL INSPECTIONS ON FIELD WELDS. A LETTER AND REPORT SHALL BE ISSUED TO THE CONTRACTOR. CONTRACTOR SHALL SUBMIT LETTER AND REPORT TO TOWER ENGINEERING PROFESSIONALS.
4. GRIND THE SURFACE ADJACENT TO THE WELD FOR A DISTANCE OF 2" MINIMUM ALL AROUND. GRIND THE SURFACE OF THE ROD TO BE INSTALLED FOR A DISTANCE OF 2" MINIMUM ALL AROUND THE AREA TO BE WELDED. ENSURE BOTH AREAS ARE 100% FREE OF ALL GALVANIZING. SURFACES TO BE WELDED SHALL BE FREE FROM SCALE, SLAG, RUST, MOISTURE, GREASE OR ANY OTHER FOREIGN MATERIAL THAT WOULD PREVENT PROPER WELDING.
5. DO NOT WELD IF THE TEMPERATURE OF THE STEEL IN THE VICINITY OF THE WELD AREA IS BELOW 0°F. THE MINIMUM PREHEAT AND INTERPASS TEMPERATURE REQUIREMENTS SHALL COMPLY WITH SECTION 3.5.1 AND TABLE 3.2 OF THE AWS D1.1/D1.1M:2010.
6. DO NOT WELD ON WET OR FROST-COVERED SURFACES & PROVIDE ADEQUATE PROTECTION FROM HIGH WINDS.
7. FOR ALL WELDING, USE 80 KSI LOW HYDROGEN ELECTRODES. ELECTRODES SHALL BE APPROPRIATE FOR THE WELDING POSITION REQUIRED TO MAKE THE JOINT.
8. AFTER FINAL INSPECTION, THE AREA OF THE WELDS, THE INSTALLATION AND ALL SURFACES DAMAGED BY WELDING OR GRINDING SHALL RECEIVE A COLD-GALVANIZED COATING. THIS COATING SHALL BE APPLIED BY BRUSH. THE GALVANIZING COMPOUND SHALL CONTAIN A MINIMUM OF 95% ± PURE ZINC. THE FINISHED COATING SHALL BE A MINIMUM THICKNESS OF 3 MILS.
9. FOR MONOPOLE TOWERS FULL PENETRATION WELDS IN THE VICINITY OF THE BASE OF THE TOWER ARE REQUIRED TO BE 100% NDE INSPECTED BY ULTRASONIC TESTING. (UT) IN ACCORDANCE WITH AWS D1.1.
10. FOR MONOPOLE TOWERS PARTIAL PENETRATION AND FILLET WELDS IN THE VICINITY OF THE BASE OF THE TOWER ARE REQUIRED TO BE 50% NDE INSPECTED BY MAGNETIC PARTICLE (MT) IN ACCORDANCE WITH AWS D1.1.

BOLT TIGHTENING PROCEDURE:

1. TIGHTEN CONNECTION BOLTS BY AISC – "TURN OF THE NUT" METHOD, USING THE CHART BELOW.

   BOLT LENGTHS UP TO AND INCLUDING FOUR DIA.

½"	BOLTS UP TO AND INCLUDING 2.0 INCH LENGTH	+⅓ TURN BEYOND SNUG TIGHT
⅝"	BOLTS UP TO AND INCLUDING 2.5 INCH LENGTH	+⅓ TURN BEYOND SNUG TIGHT
¾"	BOLTS UP TO AND INCLUDING 3.0 INCH LENGTH	+⅓ TURN BEYOND SNUG TIGHT
⅞"	BOLTS UP TO AND INCLUDING 3.5 INCH LENGTH	+⅓ TURN BEYOND SNUG TIGHT
1"	BOLTS UP TO AND INCLUDING 4.0 INCH LENGTH	+⅓ TURN BEYOND SNUG TIGHT

   BOLT LENGTHS OVER FOUR DIA. BUT NOT EXCEEDING EIGHT DIA.

½"	BOLTS 2.25 TO 4.0 INCH LENGTH	+½ TURN BEYOND SNUG TIGHT
⅝"	BOLTS 2.75 TO 5.0 INCH LENGTH	+½ TURN BEYOND SNUG TIGHT
¾"	BOLTS 3.25 TO 6.0 INCH LENGTH	+½ TURN BEYOND SNUG TIGHT
⅞"	BOLTS 3.75 TO 7.0 INCH LENGTH	+½ TURN BEYOND SNUG TIGHT
1"	BOLTS 4.25 TO 8.0 INCH LENGTH	+½ TURN BEYOND SNUG TIGHT

2. CONNECTION BOLTS SUBJECT TO DIRECT TENSION SHALL BE INSTALLED AND TIGHTENED AS PER SECTION 8.2.1 OF THE AISC SPECIFICATION FOR STRUCTURAL JOINTS USING A325 OR A490 BOLTS, LOCATED IN THE AISC MANUAL OF STEEL CONSTRUCTION. THE INSTALLATION PROCEDURE IS PARAPHRASED AS FOLLOWS:
3. FASTENERS SHALL BE INSTALLED IN PROPERLY ALIGNED HOLES AND TIGHTENED BY ONE OF THE METHODS DESCRIBED IN SUBSECTION 8.2.1 THROUGH 8.2.4.

   8.2.1 TURN-OF-THE-NUT TIGHTENING

   BOLTS SHALL BE INSTALLED IN ALL HOLES OF THE CONNECTION AND BROUGHT TO A SNUG TIGHT CONDITION AS DEFINED IN SECTION 8.1, UNTIL ALL THE BOLTS ARE SIMULTANEOUSLY SNUG TIGHT AND THE CONNECTION IS FULLY COMPACTED. FOLLOWING THIS INITIAL OPERATION ALL BOLTS IN THE CONNECTION SHALL BE TIGHTENED FURTHER BY THE APPLICABLE AMOUNT OF ROTATION SPECIFIED ABOVE. DURING THE TIGHTENING OPERATION THERE SHALL BE NO ROTATION OF THE PART NOT TURNED BY THE WRENCH. TIGHTENING SHALL PROGRESS SYSTEMATICALLY FROM THE MOST RIGID PART OF THE JOINT IN A MANNER THAT WILL MINIMIZE RELAXATION OF PREVIOUSLY PRETENSIONED BOLTS.
4. ALL OTHER BOLTED CONNECTIONS SHALL BE BROUGHT TO A SNUG TIGHT CONDITION AS DEFINED IN SECTION 8.1 OF THE SPECIFICATION.

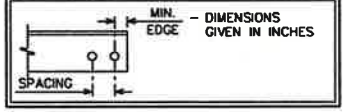
NOMINAL HOLE DIMENSIONS

BOLT DIAMETER	STANDARD HOLE	SHORT SLOT
½	9/16	9/16 X 1/16
⅝	11/16	11/16 X ⅞
¾	13/16	13/16 X 1
⅞	15/16	15/16 X 1⅛
1	1 1/16	1 1/16 X 1 5/16

– DIMENSIONS GIVEN IN INCHES

BOLT EDGE AND SPACING

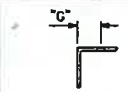
BOLT DIAMETER	MIN. EDGE	SPACING
½	⅞	1½
⅝	1⅛	1⅞
¾	1¼	2¼
⅞	1½	2⅝
1	1¾	3



– DIMENSIONS GIVEN IN INCHES

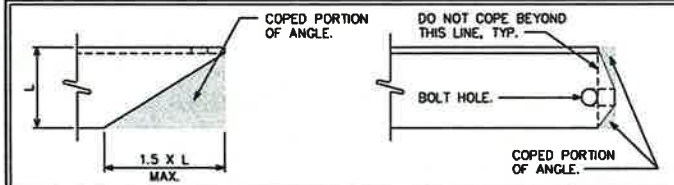
WORKABLE GAGES

LEG	4	3½	3	2½	2	1¾
G	2½	2	1⅜	1⅜	1⅛	1



– WORKABLE GAGES GIVEN IN INCHES
– MATCH EXISTING WHEN APPLICABLE

ALLOWABLE ANGLE COPE



PLANS PREPARED FOR:

CROWN CASTLE

8 PARKMEADOW DRIVE
PITTSFORD, NY 14534
OFFICE: (585) 899-3445

PROJECT INFORMATION:

WARD
BU #: 876381

2365 LONG HILL ROAD
GUILFORD, CT 06437
(NEW HAVEN COUNTY)

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
3703 JUNCTION BOULEVARD
RALEIGH, NC 27603-5263
OFFICE: (919) 661-6351
www.tepgroup.net

SEAL:

January 27, 2014

REV	DATE	ISSUED FOR:
0	01-27-14	MODIFICATION DRAWINGS

DRAWN BY: RST | CHECKED BY: RJR

SHEET TITLE:

PROJECT NOTES II

SHEET NUMBER: **N-3**

REVISION: 0

TEP #: 51819.13672

BOLTS AND COMPONENTS SPECIFICATIONS:

BOLT:
AJAX M20 "ONE SIDE" BLIND BOLT

SHEAR SLEEVE:
Fu = 120 KSI (MINIMUM)
29mm O.D. X 20 mm I.D.
LENGTH = NOMINAL [GRIP-6mm] = [GRIP - 0.25"] (TOLERANCE: -0", +1/32")
SLEEVE SHALL BE ROUND, WITH ENDS CUT SQUARE AND DEBURRED.

SPECIAL WASHER:
ASTM F959 SQUIRTER® DTI M20 (EQUIVALENT TO A325 BOLT)
MANUFACTURER:
APPLIED BOLTING TECHNOLOGY PRODUCTS, INC.
1413 ROCKINGHAM ROAD BELLOW FALLS, VERMONT, USA 05101
PHONE: (800) 552-1999
WEBSITE: WWW.APPLIEDBOLTING.COM

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

WASHER:
ASTM F436 HARDENED FLAT WASHER M20

BOLT ASSEMBLY FINISHING:
SHEAR SLEEVE: COLD GALVANIZED AS PER CROWN ENG-BUL-10149 OR CADMIUM PLATED
ALL OTHER PARTS: HOT DIP GALVANIZED

BOLT INSTALLATION ASSEMBLY:
AS SHOWN ON THE DRAWING

INSTALLATION NOTES:
DTI WASHERS MUST BE PLACED DIRECTLY AGAINST THE OUTER AJAX WASHER WITH THE BUMPS FACING AWAY FROM THE AJAX WASHER. PLACE A HARDENED WASHER BETWEEN THE DTI AND THE AJAX NUT. THE DTI BUMPS SHALL BEAR AGAINST THE UNDERSIDE OF A HARDENED FLAT WASHER, NEVER DIRECTLY AGAINST THE NUT.

TIGHTEN THE BOLT ASSEMBLY UNTIL THE ORANGE SILICONE APPEARS FROM UNDER THE DTI'S SQUIRT LOCATIONS, THEN STOP TIGHTENING.

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

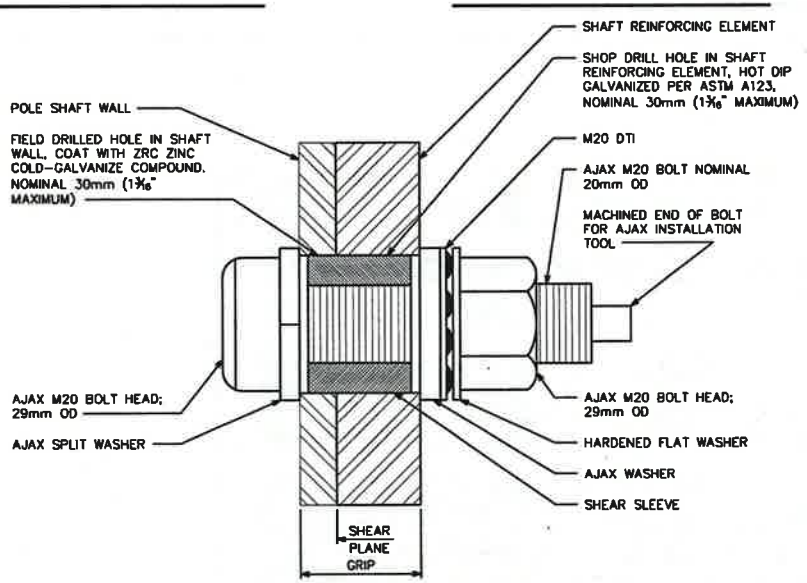
AS AN ALTERNATIVE TO USING THE DTI WASHER THE BOLTS MAY BE PRETENSIONED USING THE TURN-OF-NUT METHOD AS SPECIFIED IN SECTION 8.2.1 TURN-OF-NUT PRETENSIONING OF THE RCSC SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS. ALL FASTENERS SHALL BE INSPECTED PER SECTION 9.2.1 OF THE RCSC SPECIFICATION. THE BOLTS SHALL BE MATCH MARKED WITH A PERMANENT MARKER TO FACILITATE THE INSPECTION.

INSPECTION:
ALL AJAX BOLTS WITH DTI'S SHALL BE VISUALLY INSPECTED ACCORDING TO THE DTI MANUFACTUER'S INSTRUCTIONS BOLT INSPECTOR SHALL PROVIDE PHOTO DOCUMENTATION OF BOLTS AFTER TIGHTENING CLEARLY SHOWING THE CONDITION OF THE DTI'S.

INSPECTION PROCEDURES:
- REVIEW MODIFICATION DESIGN DRAWINGS.
- ENSURE AISC PRE-TENSION REQUIREMENTS ARE INCLUDED.
- PHOTO (PREFERABLY VIDEO) OF THE FOLLOWING:
  - NOTE THE PRESENCE OF ANY LUBRICANT
  - NOTE THE PRESENCE OF ANY NUT/BOLT MARKINGS USED TO APPLY THE AISC 'TURN OF THE NUT' METHOD PRIOR TO APPLYING NEW MARKINGS
  - BE SURE THAT ANY NEW MARKINGS MADE BY THE MI INSPECTOR ARE DISTINGUISHABLE (DIFFERENT COLOR) TO ANY ORIGINAL MARKINGS
  - MARK THE BOLT AND NUT WITH MARKER TO DOCUMENT POSITION UPON ARRIVAL. RUN THE MARK ONTO THE POLE AS WELL.
  - USE YOUR HAND TO FIRST ASSURE THE NUT IS TIGHT, TRYING TO TURN THE NUT IN ANY DIRECTION.
  - BOLT TYPES:
  - FOR AJAX, USING AJAX TOOL TO HOLD THE BOLT AND A SPUD WRENCH (OR SIMILAR) ON THE NUT. APPLY FIRM FORCE TO THE NUT IN THE CLOCKWISE DIRECTION (THIS IS NOT THE FULL EFFORT OF THE PERSON).
  - FOR OTHER STRUCTURAL BOLTS, ENSURE THE BOLT CAN BE HELD WHILECHECKING THE TIGHTNESS OF THE ASSEMBLY.
  - DOCUMENT BOLTS TESTED AND RESULTS, USE THE NUMBER CONVENTION BELOW AND WRITE ON THE POLE AND PHOTOGRAPH:
  - A THREE DIGIT CONVENTION SHALL BE USED (1, 3, 15)
  - THE FIRST DIGIT - THE FLAT NUMBER. ON ROUND POLES, THIS FIRST DIGIT SHALL BE REPLACED WITH THE HEADING (N, NE, E, SE, S, SW, W, N, NW)
  - THE SECOND DIGIT - THE NUMBER OF REINFORCING BARS ON THAT FLAT, STARTING WITH THE LOWEST BAR AS 1
  - THE THIRD DIGIT - THE NUMBER OF BOLTS ON THAT BAR STARTING WITH THE LOWEST BOLT AS 1
  - FLATS AND ROUND POLES ARE TO BE LABELED IN ACCORDANCE WITH THE MONOPOLE FLAT NUMBER PROCEDURE

INTERIOR OF POLE SHAFT

EXTERIOR OF POLE SHAFT



AJAX BOLT DETAILS

PLANS PREPARED FOR:
CROWN CASTLE
8 PARKMEADOW DRIVE
PITTSFORD, NY 14534
OFFICE: (585) 899-3445

PROJECT INFORMATION:
WARD
BU #: 876381
2365 LONG HILL ROAD
GUILFORD, CT 06437
(NEW HAVEN COUNTY)

PLANS PREPARED BY:
TOWER ENGINEERING PROFESSIONALS
3703 JUNCTION BOULEVARD
RALEIGH, NC 27603-5263
OFFICE: (919) 661-6351
www.tepgroup.net

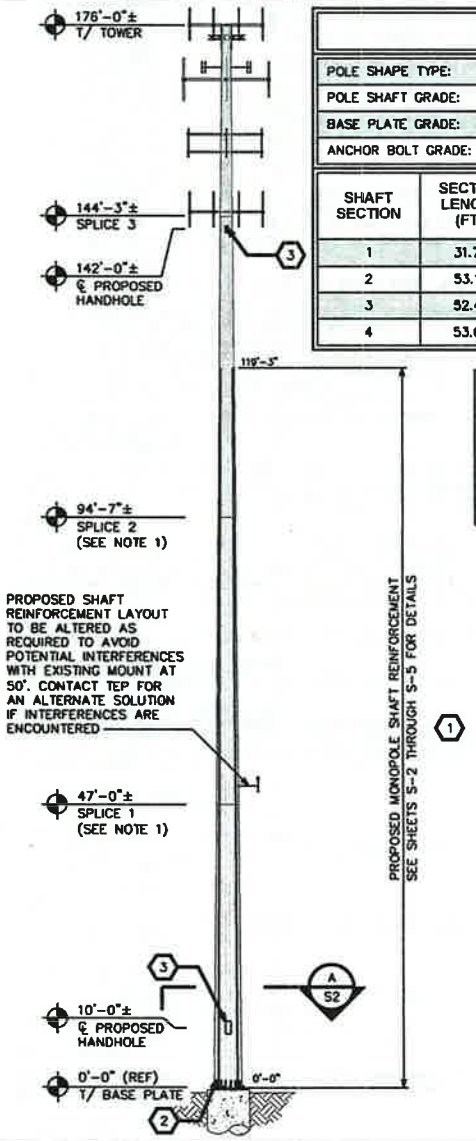
SEAL:
STATE OF CONNECTICUT
WILLIAM H. MARTIN
0029484
LICENSED
PROFESSIONAL ENGINEER
1/27/14
January 27, 2014

REV	DATE	ISSUED FOR:
0	01-27-14	MODIFICATION DRAWINGS

DRAWN BY: RST | CHECKED BY: RJR

SHEET TITLE:
AJAX BOLT INSTALLATION DETAILS

SHEET NUMBER: **N-4**
REVISION: **0**
TEP #: 51819.13672



POLE SPECIFICATIONS

POLE SHAPE TYPE:	18-SIDED POLYGON
POLE SHAFT GRADE:	ASTM A572-65
BASE PLATE GRADE:	ASTM A572-80
ANCHOR BOLT GRADE:	ASTM A615-75

SHAFT SECTION	SECTION LENGTH (FT.)	SHAFT THICKNESS (IN.)	LAP SPLICE (FT.)	OUTER DIAMETER (IN.)	
				TOP	BOTTOM
1	31.75	0.188	3.50	16.500	23.650
2	53.17	0.313	4.83	22.487	34.330
3	52.46	0.375	6.08	32.629	44.300
4	53.03	0.375	-	42.198	54.000

ATTENTION

NO DETAILED INFORMATION REGARDING INTERFERENCES WAS PROVIDED. THEREFORE, CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSION BEFORE FABRICATING MATERIALS AND PROCEEDING WITH THE WORK. REPORT ANY AND ALL DISCREPANCIES TO TOWER ENGINEERING PROFESSIONALS, INC., AND CROWN CASTLE CONSTRUCTION MANAGER IMMEDIATELY.

MODIFICATION SCHEDULE

NO.	MODIFICATION DESCRIPTION	ELEVATION (FT.)
1	INSTALL PROPOSED MONOPOLE SHAFT REINFORCEMENT. SEE SHEETS S-2 THROUGH S-5 FOR DETAILS.	0 - 119.25
2	INSTALL PROPOSED BASE PLATE STIFFENERS. SEE SHEETS S-2 AND S-6 FOR DETAILS.	0
3	INSTALL PROPOSED HANDHOLES. SEE SHEET S-7 AND S-8 FOR DETAILS.	10 142
4	CROWN CASTLE WILL CONTRACT WITH A THIRD PARTY VENDOR TO PERFORM THE MODIFICATION INSPECTION. THE CONTRACTOR SHALL COORDINATE THE INSPECTION WITH THE MODIFICATION INSPECTOR AND CROWN CASTLE PROJECT MANAGER. SEE SHEET N-1 FOR DETAILS.	-

NOTES:

1. CONTRACTOR SHALL FIELD VERIFY SPLICE ELEVATION PRIOR TO INSTALLATION. CONTACT TOWER OWNER AND ENGINEER OF RECORD IF SPLICE ELEVATIONS DIFFER FROM WHAT IS SHOWN. SHAFT REINFORCEMENT ELEVATIONS ARE DEPENDANT ON SPLICE ELEVATIONS AND MAY NEED TO BE ADJUSTED TO ACCOMMODATE ACTUAL SPLICE ELEVATION. CONTRACTOR IS REQUIRED TO ADD ASTM A36 SHIMS AT SPLICES AS REQUIRED TO ENSURE THE SHAFT REINFORCEMENT FITS FLUSH AGAINST THE TOWER SHAFT.
2. IT'S THE CONTRACTOR'S SOLE RESPONSIBILITY TO PROVIDE THE MODIFICATION INSPECTOR/ ENGINEER OF RECORD WITH A SEALED CERTIFIED WELD INSPECTION REPORT. THIS REPORT SHALL DOCUMENT THE ENTIRE WELDING PROCESS (PRE/DURING/POST) WITH PROPER PHOTOS. WELDING SHALL CONFORM TO AWS D1.1/S1.1M: 2008 "STRUCTURAL WELDING CODE-STEEL", FOR ADDITIONAL NOTES, SEE WELDING NOTES.
3. ANTENNAS AND OTHER APPURTENANCES MAY NEED TO BE TEMPORARILY REMOVED OR MOVED DURING THE INSTALLATION OF THE MODIFICATIONS SHOWN ABOVE.
4. NDE OF THE CIRCUMFERENTIAL WELD OF THE BASE PLATE TO SHAFT CONNECTION IS REQUIRED. PLEASE SEE ENG-SOW-10033 : TOWER BASE PLATE NDE AND ENG-BUL-10051 : NDE REQUIREMENTS FOR MONOPOLE BASEPLATE 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 MODIFICATIONS THAT HAVE BEEN WELDED TO THE BASE PLATE. FULL PENETRATION WELDING TO THE BASEPLATE REQUIRED AS PART OF THIS ACTIVE REINFORCEMENT DESIGN SHALL BE INCLUDED IN THE NDE SCOPE OF WORK.
5. PRIOR TO INSTALLATION OF THE REINFORCEMENT PLATES, THE CONTRACTOR SHALL ENSURE THE JOINT OVERLAP HAS BEEN PROPERLY ACHIEVED AT ALL SPLICE JOINTS, PER THE TOWER MANUFACTURER DRAWINGS. IF NOT ACHIEVED, JACKING OF THE TOWER WILL BE REQUIRED. CONTRACTOR SHALL REFERENCE TOWER MANUFACTURER'S INSTALLATION GUIDELINES FOR PREFERRED METHOD FOR JACKING MONOPOLE TUBE SECTION TOGETHER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS IN CONNECTION WITH THIS WORK.
6. DUE TO THE MODIFICATIONS REQUIRED, CONTINUOUS INSPECTIONS AND MATERIAL TESTING WILL NEED TO BE PERFORMED.
7. CONTRACTOR SHALL ORDER AND INSTALL A NEW TOWER TAG IF THE EXISTING TOWER TAG IS MOVED OR DAMAGED DUE TO THE INSTALLATION OF THE MODIFICATION SHOWN ABOVE.
8. THE CLIMBING FACILITIES, SAFETY CLIMB AND ALL PARTS THEREOF SHALL NOT BE IMPEDED, MODIFIED OR ALTERED WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE TOWER OWNER OR ENGINEER OF RECORD.

TOWER ELEVATION

SCALE: 1" = 20'-0"

0 20 40

SCALE IN FEET

PLANS PREPARED FOR:

CROWN CASTLE

8 PARKMEADOW DRIVE
PITTSFORD, NY 14534
OFFICE: (585) 899-3445

PROJECT INFORMATION:

WARD
BU #: 876381

2365 LONG HILL ROAD
GUILFORD, CT 06437
(NEW HAVEN COUNTY)

PLANS PREPARED BY:

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SEAL:

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WILLIAM H. MARTIN
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1/27/14

January 27, 2014

REV	DATE	ISSUED FOR:
0	01-27-14	MODIFICATION DRAWINGS

DRAWN BY: RST | CHECKED BY: RJR

SHEET TITLE:

TOWER ELEVATION AND MODIFICATION SCHEDULE

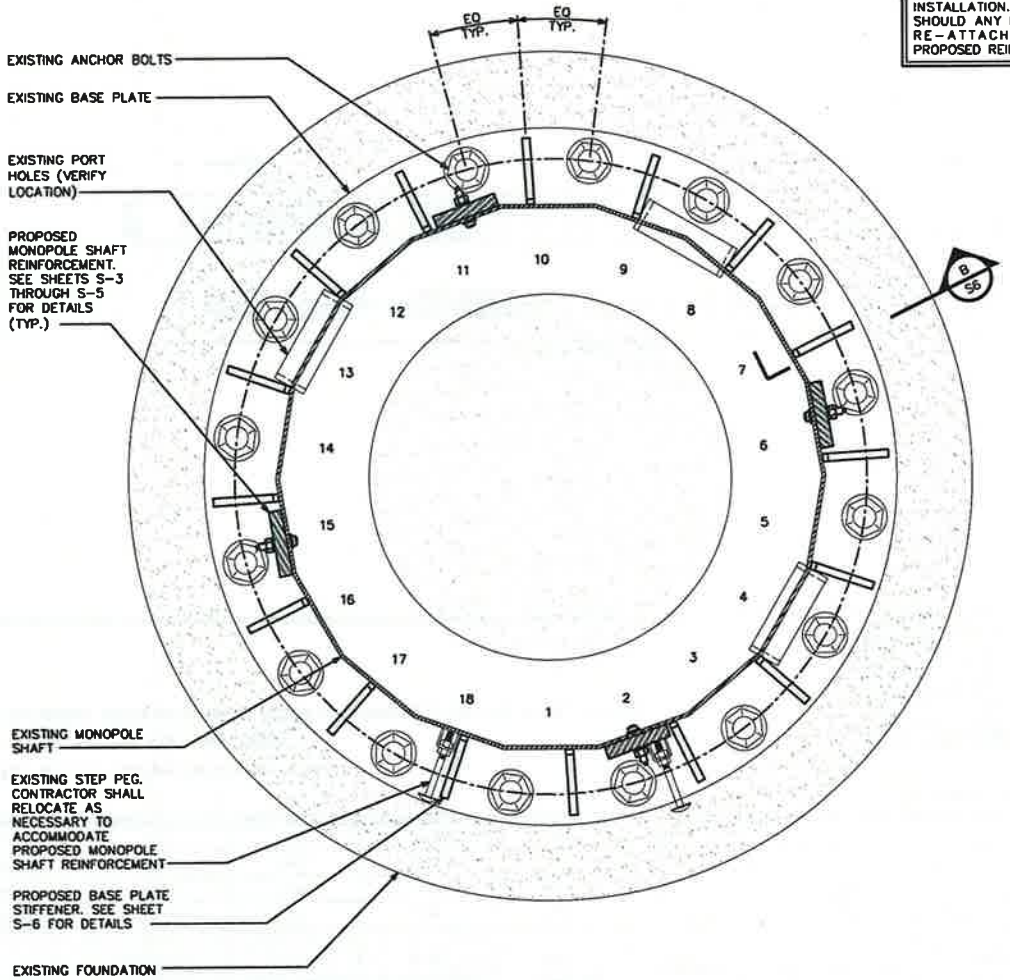
SHEET NUMBER: **S-1**

REVISION: 0

TEP #: 51819.13672

ATTENTION

THE TOWER SAFETY CLIMB WAS ASSUMED TO BE LOCATED OFF FLAT 1. FIELD VERIFY SAFETY CLIMB AND STEP PEG LOCATION PRIOR TO INSTALLATION. CONTACT TOWER OWNER AND ENGINEER OF RECORD SHOULD ANY DISCREPANCIES ARISE. CONTRACTOR TO REMOVE AND RE-ATTACH SAFETY CLIMB AS NECESSARY TO INSTALL PROPOSED REINFORCEMENT.



SECTION (A)
SCALE: 1" = 1'-0"

0 1 2
SCALE IN FEET

PLANS PREPARED FOR:
CROWN CASTLE
8 PARKMEADOW DRIVE
PITTSFORD, NY 14534
OFFICE: (585) 809-3445

PROJECT INFORMATION:

WARD
BU #: 876381

2365 LONG HILL ROAD
GUILFORD, CT 06437
(NEW HAVEN COUNTY)

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REV	DATE	ISSUED FOR:
0	01-27-14	MODIFICATION DRAWINGS

DRAWN BY: RST | CHECKED BY: RJR

SHEET TITLE:
BASE SECTION DETAILS

SHEET NUMBER: **S-2**
REVISION: 0
TEP #: 51819.13672

CROWN CASTLE 65KSI FLAT PLATE REINFORCEMENT SCHEDULE

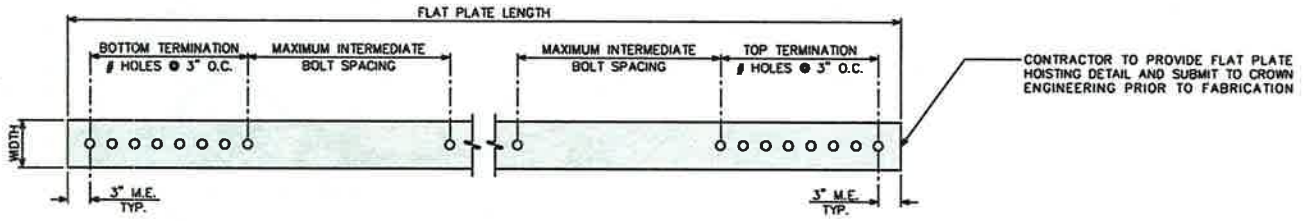
PART NUMBER	FLATS / ANGLES	BOTTOM ELEVATION (FT)	TOP ELEVATION (FT)	FLAT PLATE LENGTH (FT)	FLAT PLATE QUANTITY	MAXIMUM INTERMEDIATE BOLT SPACING (IN)	TERMINATION BOLTS (BOTTOM)	TERMINATION BOLTS (TOP)	TERMINATION DETAIL (BOTTOM)	TERMINATION DETAIL (TOP)
CCI-WSFP-06512535	2 6 11 15	0.00	35.00	35.00	4	19.00	-	11	1	5
CCI-SFP-06512535	1 7 13	29.25	64.25	35.00	3	19.00	11	11	5	4
CCI-SFP-06010025	1 7 13	64.25	89.25	25.00	3	18.00	8	8	4	4
CCI-SFP-06010030	1 7 13	89.25	119.25	30.00	3	18.00	8	8	4	3A

NOTES:

1. REFER TO SHEET N-4 FOR AJAX BOLT INSTALLATION DETAILS.
2. SEE SHEETS S-4 AND S-5 FOR TERMINATION DETAILS.
3. ELEVATIONS ARE NOMINAL. REFERENCE STANDARD DETAILS FOR VARIATIONS IN TOP AND BOTTOM ELEVATIONS

CCI PART NUMBER FORMAT: CCI-|XXX|-|XXX|XXX|XX|

FLAT PLATE STANDARD NOMENCLATURE		NOTES
SFP	STANDARD FLAT PLATE	SEE CMRP 65 KSI PARTS CATALOG - 2ND EDITION AND THIS SHEET FOR DETAILS
WSFP	WELDABLE STANDARD FLAT PLATE	
AFP	AUXILIARY FLAT PLATE	
WAFP	WELDABLE AUXILIARY FLAT PLATE	
CFP	CUSTOM FLAT PLATE	SEE THIS SHEET FOR DETAILS
WCFP	WELDABLE CUSTOM FLAT PLATE	



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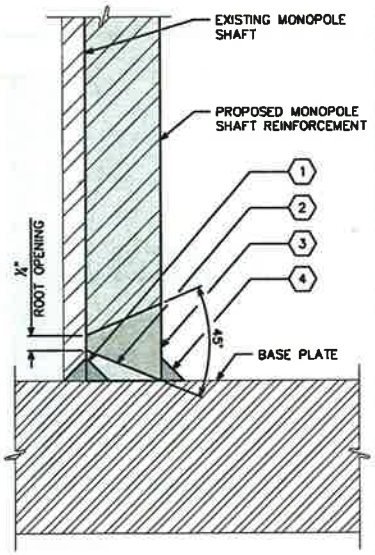
DRAWN BY: RST | CHECKED BY: RJR

SHEET TITLE:
CROWN REINFORCEMENT DETAILS

SHEET NUMBER: **S-3**
REVISION: **0**
TEP #: 51819.13672

NOTES:

1. NDE OF THE CIRCUMFERENTIAL WELD OF THE BASE PLATE TO SHAFT CONNECTION IS REQUIRED. PLEASE SEE ENG-SOW-10033 : TOWER BASE PLATE NDE AND ENG-BUL-10051 : NDE REQUIREMENTS FOR MONOPOLE BASEPLATE TO PREVENT CONNECTION FAILURE. NOTIFY THE EOR AND CROWN ENGINEERING IMMEDIATELY IF ANY CRACKS ARE SUSPECTED ORHAVE BEEN IDENTIFIED. THE NDE SHALL INCLUDE ALL EXISTING MODIFICATIONS 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. SEE AISC 8-39.
2. UNEQUAL LEG FILLET WELD TO CREATE ACCEPTABLE JOINT GEOMETRY FOR A B-U2a OR B-U2A-GF PRE-QUALIFIED JOINT PER AWS D1.1
3. JOIN SHAFT REINFORCEMENT TO BASE PLATE WITH B-U2a OR B-U2A-GF PRE-QUALIFIED WELD. IT'S THE CONTRACTOR'S SOLE RESPONSIBILITY TO PROVIDE THE MODIFICATION INSPECTOR/ ENGINEER OF RECORD WITH A SEALED CERTIFIED WELD INSPECTION REPORT. THIS REPORT SHALL DOCUMENT THE ENTIRE WELDING PROCESS (PRE/DURING/POST) WITH PROPER PHOTOS. WELDING SHALL CONFORM TO AWS D1.1/S1.1M: 2008 "STRUCTURAL WELDING CODE-STEEL". FOR ADDITIONAL NOTES, SEE WELDING NOTES.
4. OPTIONAL 3/16" REINFORCING FILLET WELD.



BASE WELD TERMINATION DETAILS (1)
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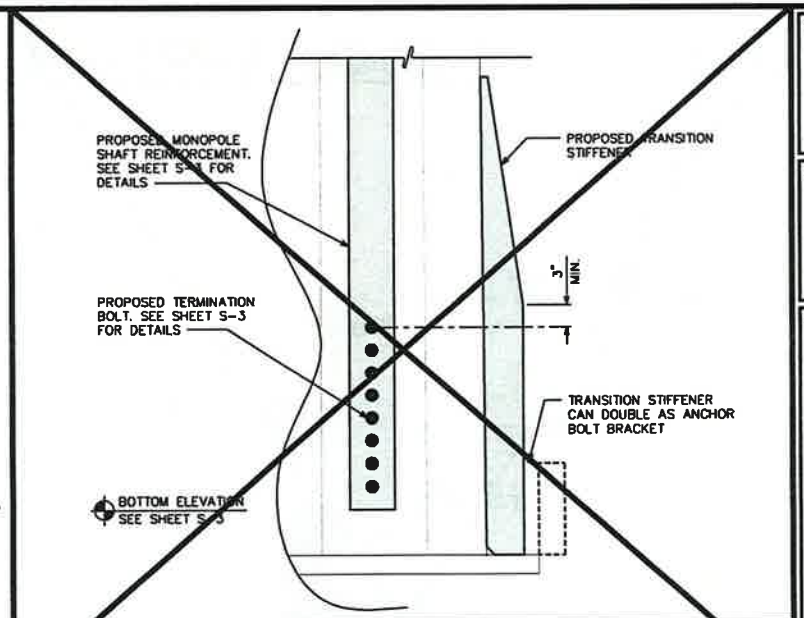
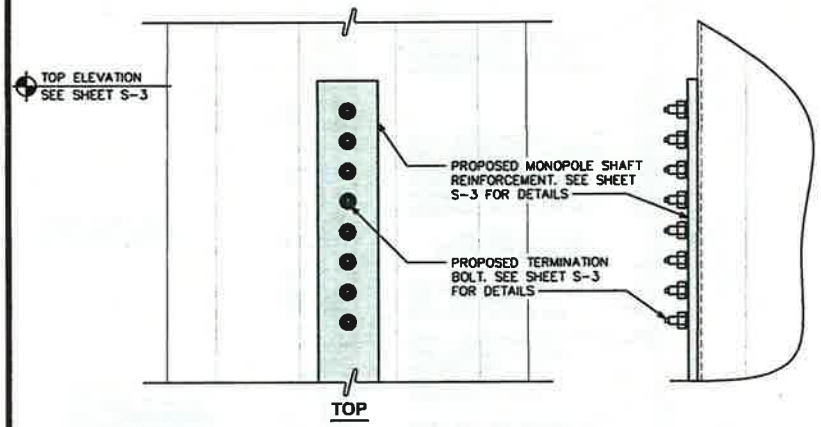
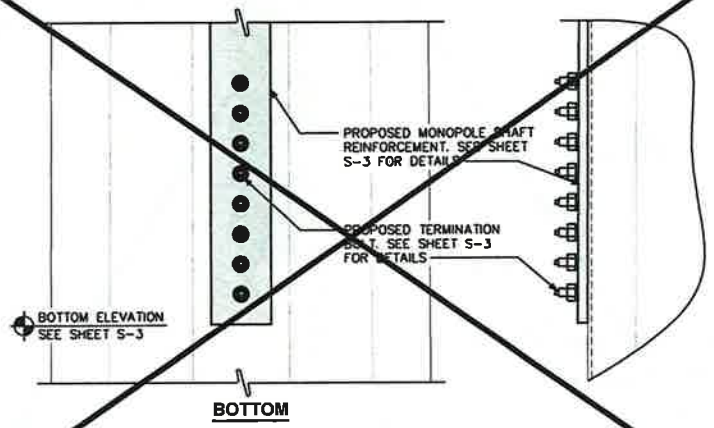


TRANSITION STIFFENER TERMINATION DETAILS (2)
SCALE: N.T.S.



TOP TERMINATION DETAILS (3A)
SCALE: N.T.S.



BOTTOM TERMINATION DETAILS (3B)
SCALE: N.T.S.

PLANS PREPARED FOR:
CROWN CASTLE
8 PARKMEADOW DRIVE
PITTSFORD, NY 14534
OFFICE: (585) 899-3445

PROJECT INFORMATION:
WARD
BU #: 876381
2365 LONG HILL ROAD
GUILFORD, CT 06437
(NEW HAVEN COUNTY)

PLANS PREPARED BY:
TOWER ENGINEERING PROFESSIONALS
3703 JUNCTION BOULEVARD
RALEIGH, NC 27603-5263
OFFICE: (919) 661-6351
www.tepgroup.net

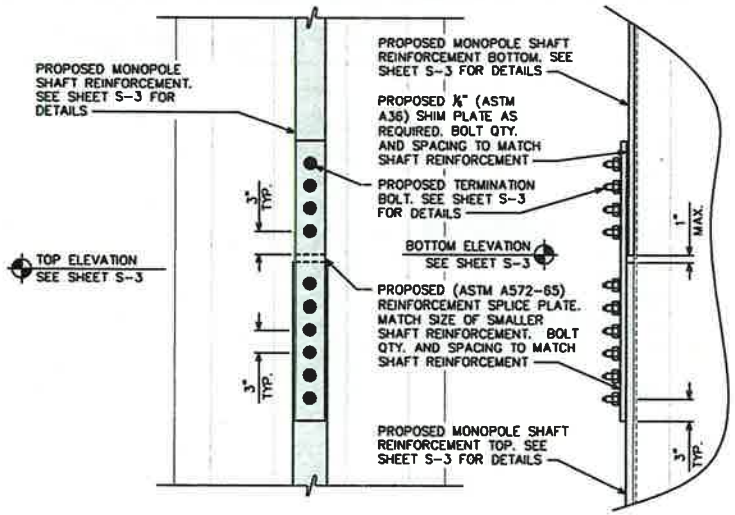
SEAL:
STATE OF CONNECTICUT
WILLIAM H. MARTIN
0029484
LICENSED
PROFESSIONAL ENGINEER
1/27/14
January 27, 2014

REV	DATE	ISSUED FOR:
0	01-27-14	MODIFICATION DRAWINGS

DRAWN BY: RST CHECKED BY: RJR

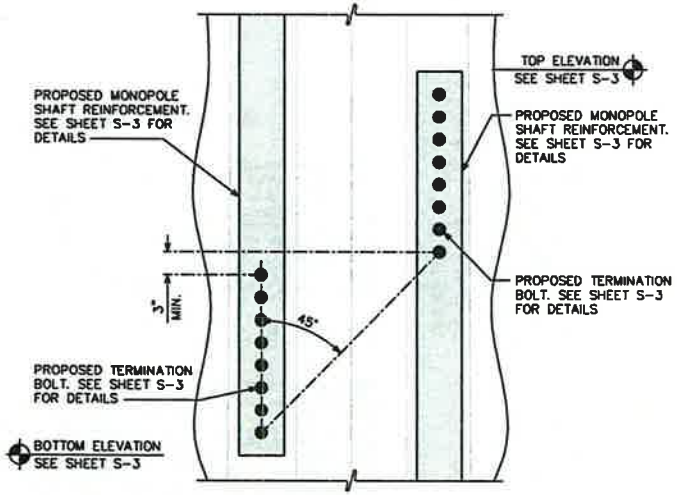
SHEET TITLE:
TYP. SHAFT REINFORCEMENT DETAILS I

SHEET NUMBER: **S-4**
REVISION: 0
TEP #: 51819.13672



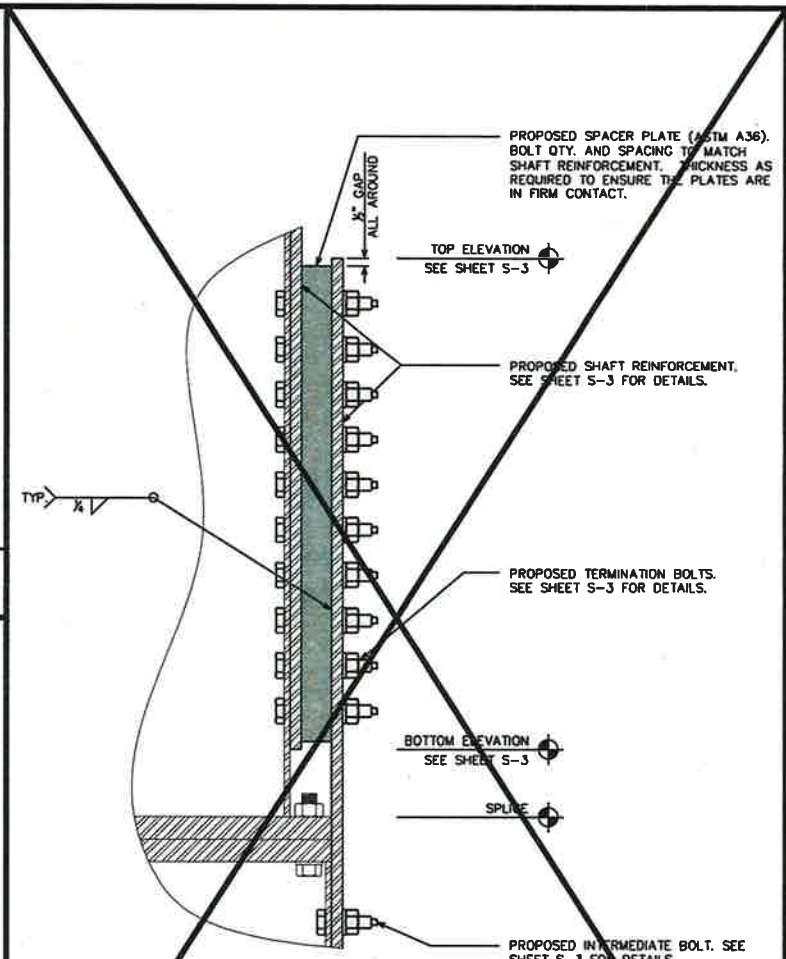
REINFORCEMENT SPLICE DETAILS 4

SCALE: N.T.S.



OVERLAP SPLICE DETAILS 5

SCALE: N.T.S.



PROPOSED FLANGE JUMP DETAILS 6

SCALE: N.T.S.

PLANS PREPARED FOR:
CROWN CASTLE
8 PARKMEADOW DRIVE
PITTSFORD, NY 14534
OFFICE: (585) 899-3445

PROJECT INFORMATION:

WARD
BU #: 876381

2365 LONG HILL ROAD
GUILFORD, CT 06437
(NEW HAVEN COUNTY)

PLANS PREPARED BY:
TOWER ENGINEERING PROFESSIONALS
3703 JUNCTION BOULEVARD
RALEIGH, NC 27603-5263
OFFICE: (919) 661-6351
www.tepgroup.net

SEAL:
STATE OF CONNECTICUT
WILLIAM H. MARTIN
0029484
LICENSED
PROFESSIONAL ENGINEER
1/27/14
January 27, 2014

REV	DATE	ISSUED FOR:
0	01-27-14	MODIFICATION DRAWINGS

DRAWN BY: RST | CHECKED BY: RJR

SHEET TITLE:
TYP. SHAFT REINFORCEMENT DETAILS II

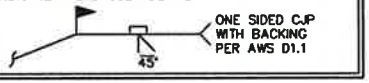
SHEET NUMBER: **S-5**
REVISION: **0**
TEP #: 51819.13672

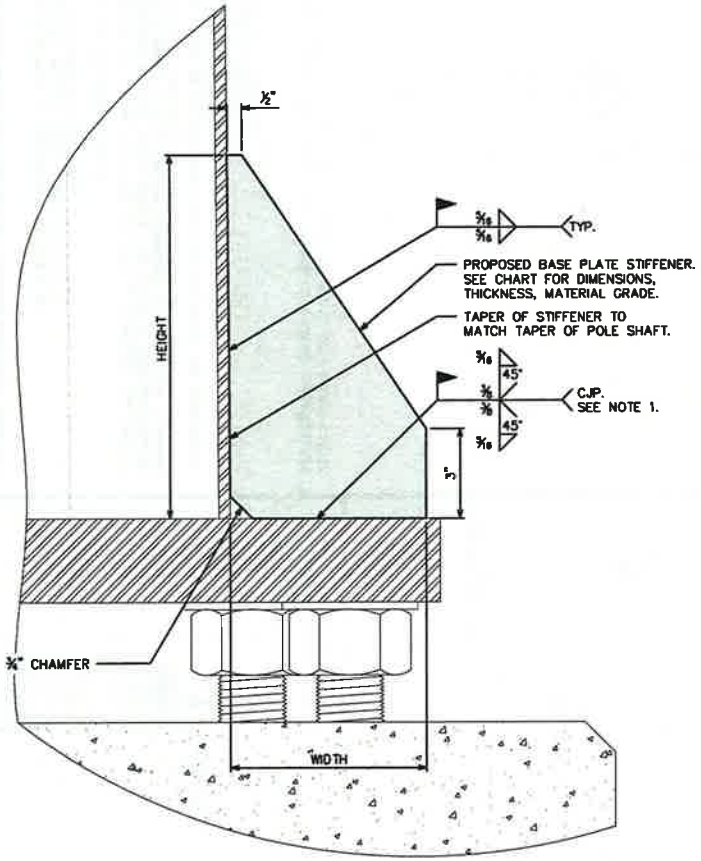
BASE PLATE STIFFENER

DESCRIPTION	MEASUREMENT
HEIGHT	1'-3"
WIDTH	6½"
THICKNESS	¾"
MATERIAL	A572-65
TOTAL QTY.	16

NOTE:

1. WHEN A TWO-SIDED CJP WELD IS UNATTAINABLE DUE TO FIT-UP, THE CONTRACTOR SHALL BE PERMITTED TO USE THE ONE-SIDED CJP WELD DEPCITED BELOW. CONTRACTOR SHALL RED-LINE AS-BUILT DRAWINGS TO INDICATE THE CHOSEN DETAIL.





BASE PLATE STIFFENER DETAILS (B)

SCALE: N.T.S.

PLANS PREPARED FOR:

CROWN CASTLE

8 PARKMEADOW DRIVE
PITTSFORD, NY 14534
OFFICE: (585) 899-3445

PROJECT INFORMATION:

WARD
BU #: 876381

2365 LONG HILL ROAD
GUILFORD, CT 06437
(NEW HAVEN COUNTY)

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
3703 JUNCTION BOULEVARD
RALEIGH, NC 27603-5263
OFFICE: (919) 661-6351
www.tepgroup.net

SEAL:

STATE OF CONNECTICUT
WILLIAM H. MARTIN
0029484
LICENSED
PROFESSIONAL ENGINEER
1/27/14

January 27, 2014

REV	DATE	ISSUED FOR:
0	01-27-14	MODIFICATION DRAWINGS

DRAWN BY: RST | CHECKED BY: RJR

SHEET TITLE:

BASE PLATE STIFFENER DETAILS

SHEET NUMBER: **S-6**

REVISION: **0**

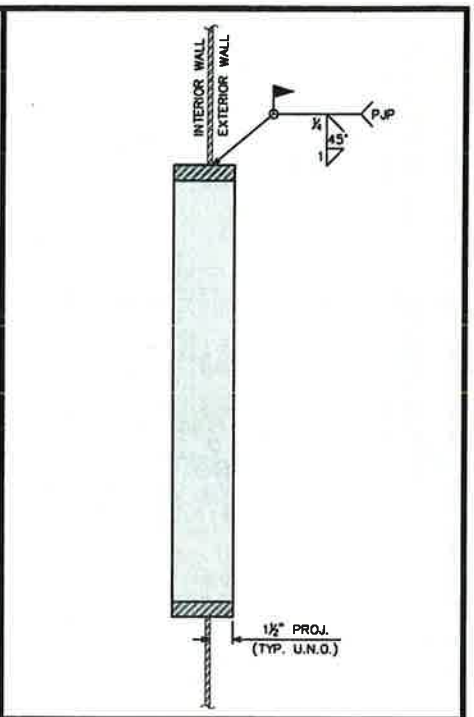
TEP #: 51819.13672

HANDHOLE NOTES:

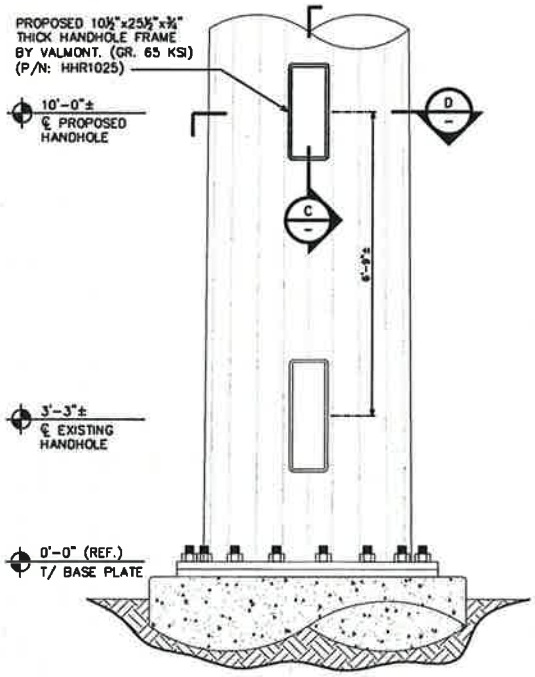
1. EXISTING TOWER INFORMATION:
   - MANUFACTURED BY: ENGINEERED ENDEAVORS INC.
   - DRAWING #: 11561
   - TOWER HEIGHT: 176'
2. CONTRACTOR TO FOLLOW THE BELOW RECOMMENDATIONS FOR INSTALLATION OF ACCESS PORTS. THE INSTALLATION PROCEDURE SHALL FOLLOW ALL, BUT NOT LIMITED TO, THE STEPS BELOW:
   A. AFTER THE HOLE IS CUT IN THE POLE WALL, IMMEDIATELY BEGIN INSTALLATION OF THE HANDHOLE. DO NOT CUT MULTIPLE HOLES INITIALLY AND PERFORM ALL THE WELDING LAST.
   B. BURN OR MECHANICALLY CUT THE OPENING IN THE POLE WALL. USE A FIRE BLANKET TO ENSURE COAX DOES NOT BURN. SEE SHEET N-2 FOR ACCEPTABLE PORT HOLE CUTTING METHODS.
   C. GOUGES AND CORNERS IN THE POLE WALL SHALL BE SMOOTHED AND ROUNDED.
   D. GRIND THE SURFACE ADJACENT TO THE HANDHOLE OPENING FOR A DISTANCE OF 1" MINIMUM ALL AROUND. GRIND THE SURFACE OF THE HANDHOLE FRAME TO BE INSTALLED FOR A DISTANCE OF 1" MINIMUM ALL AROUND THE FRAME IN THE AREA TO BE WELDED. ENSURE BOTH AREAS ARE 100% FREE OF ALL GALVANIZING. SURFACES TO BE WELDED SHALL BE FREE FROM SCALE, SLAG, RUST, MOISTURE, GREASE OR ANY OTHER FOREIGN MATERIAL THAT WOULD PREVENT PROPER WELDING.
   E. DO NOT WELD IF THE TEMPERATURE OF THE STEEL IN THE VICINITY OF THE WELD AREA IS BELOW 0°F. WHEN THE TEMPERATURE IS BETWEEN 0°F AND 32°F, PREHEAT AND MAINTAIN THE STEEL IN THE VICINITY OF THE WELD AREA AT 70°F DURING THE WELDING PROCESS.
   F. DO NOT WELD ON WET OR FROST-COVERED SURFACES AND PROVIDE ADEQUATE PROTECTION FROM HIGH WINDS.
   G. ALL WELDING SHALL MEET AWS ELECTRODE CLASIFICATIONS AS LISTED IN TABLE 3.1 IN THE STRUCTURAL WELDING CODE - STEEL (AWS D1.1). FOR ALL WELDING, USE 80 KSI LOW HYDROGEN ELCTRODES.
3. ALL WELDING TO BE PERFORMED BY AWS CERTIFIED WELDERS.
4. AFTER FINAL INSPECTION, THE AREA OF THE WELDS, THE HANDHOLE AND ALL SURFACES DAMAGED BY WELDING OR GRINDING (INSIDE AND OUTSIDE OF POLE) SHALL RECEIVE TWO COATS OF COLD-GALVANIZING. THESE COATINGS SHALL BE APPLIED BY BRUSH. THE GALVANIZING COMPOUND SHALL CONTAIN A MINIMUM OF 95% PURE ZINC. THE FINISHED COATING SHALL BE A MINIMUM THICKNESS OF 3 MILS.
5. INSTALLATION OF HANDHOLES SHALL BE IN ACCORDANCE WITH THE FOLLOWING CCI DOCUMENTS:
   A. ENG-BUL-10149: COLD GALVANIZING COMPOUNDS
   B. ENG-PLN-10015: CUTTING AND WELDING SAFETY PLAN
   C. ENG-SOW-10066: CWI VERIFICATION INSPECTION SOW
   D. ENG-STD-10069: GC CWI REQUIREMENT STANDARD

NOTES:

1. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL FIELD VERIFY THE LOCATION OF EXISTING APPURTENANCES.
2. THE CONTRACTOR SHALL CONFIRM ORIENTATION OF PROPOSED HANDHOLE PORTS WITH CROWN CASTLE.

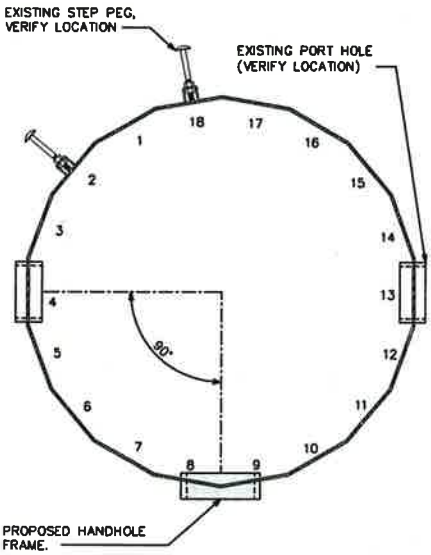


SECTION C
SCALE: 1½" = 1'-0"



CO-LOCATION HANDHOLE ELEVATION

SCALE: ⅜" = 1'-0"



SECTION D
SCALE: ⅜" = 1'-0"

SHEET NUMBER: S-7
REVISION: 0
TEP #: 518191.13672

SHEET TITLE: CO-LOCATION HANDHOLE FRAME DETAILS I

DRAWN BY: RST | CHECKED BY: RJR

REV	DATE	ISSUED FOR:
0	01-27-14	MODIFICATION DRAWINGS

SEAL: WILLIAM H. MARTIN, LICENSED PROFESSIONAL ENGINEER, STATE OF CONNECTICUT, 0123484, January 27, 2014

TOWER ENGINEERING PROFESSIONALS
3703 JUNCTION BOULEVARD
RALEIGH, NC 27603-5263
OFFICE: (919) 661-6351
www.tepgroup.net

PLANS PREPARED BY:

PROJECT INFORMATION:
WARD
BU #: 876381
2365 LONG HILL ROAD
GUILFORD, CT 06437
(NEW HAVEN COUNTY)

PLANS PREPARED FOR:
CROWN CASTLE
6 PARKMEADOW DRIVE
PITTSFORD, NY 14534
OFFICE: (585) 899-3445

HANDHOLE NOTES:

1. EXISTING TOWER INFORMATION:
   - MANUFACTURED BY: ENGINEERED ENDEAVORS, INC.
   - DRAWING #: 11561
   - TOWER HEIGHT: 176'
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   B. ENG-PLN-10015: CUTTING AND WELDING SAFETY PLAN
   C. ENG-SOW-10066: CWI VERIFICATION INSPECTION SOW
   D. ENG-STD-10069: GC CWI REQUIREMENT STANDARD

NOTES:

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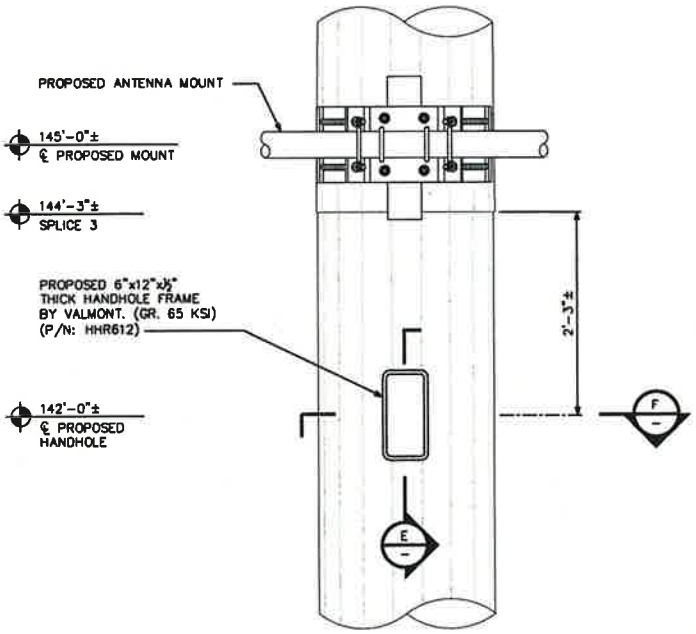
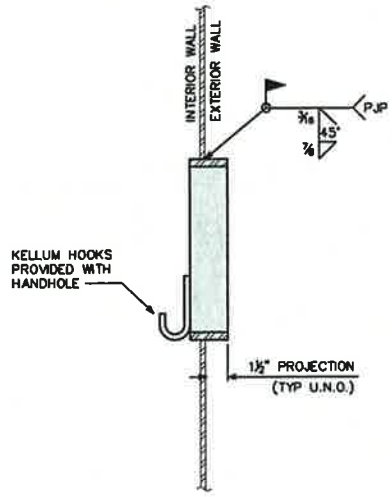
2. THE CONTRACTOR SHALL CONFIRM ORIENTATION OF PROPOSED HANDHOLE PORTS WITH CROWN CASTLE.



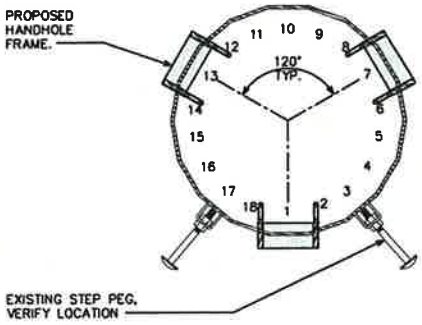
CO-LOCATION HANDHOLE ELEVATION

SCALE: ¾" = 1'-0"



SECTION (E)

SCALE: 1½" = 1'-0"



SECTION (F)

SCALE: 1" = 1'-0"

PLANS PREPARED FOR:
CROWN CASTLE
8 PARKMEADOW DRIVE
PITTSFORD, NY 14534
OFFICE: (585) 899-3445

PROJECT INFORMATION:
WARD
BU #: 876381
2365 LONG HILL ROAD
GUILFORD, CT 06437
(NEW HAVEN COUNTY)

PLANS PREPARED BY:
TOWER ENGINEERING PROFESSIONALS
3703 JUNCTION BOULEVARD
RALEIGH, NC 27603-5263
OFFICE: (919) 661-6351
www.tepgroup.net

SEAL: STATE OF CONNECTICUT — WILLIAM H. MARTIN — 0023484 — LICENSED PROFESSIONAL ENGINEER — 1/21/14
January 27, 2014

REV	DATE	MODIFICATION DRAWINGS ISSUED FOR:
0	01-27-14	

DRAWN BY: PST | CHECKED BY: KJK

SHEET TITLE:
CO-LOCATION HANDHOLE FRAME DETAILS II

SHEET NUMBER: **S-8**
REVISION: 0
TEP #: 5161913672

ATTACHMENT 4

HMB

HMB Acoustics LLC 3 CherryTree Lane, Avon, Ct. 06001 860-677-5955

April 8, 2014

Doug Drost
Project Engineer Wireless
Centek Engineering, Inc.
63-2 North Branford Road
Branford, Ct. 06405

Subject: Guilford 4 - CSC Noise Compliance Study

Dear Mr. Drost;

The noise levels for the V1 and V2 wall mounted HVAC units were calculated while they were operating separately. Typically only one of the two air-conditioner units operates at any one time. The noise level was then projected to each property line. The resultant noise level was compared to the State of Ct. Noise Regulation. The Regulation allows a noise level of 55 dBA (daytime) and 45 dBA (nighttime) when measured at a Residential Receptor's property line. I found that the V1 and V2 units meet the conditions for compliance as set forth in the Regulation at all property lines.

Allan Smardin
HMB Acoustics LLC

PROJECT INFORMATION:	Centek Job #: 13284.000
Applicant:	Cellco Partnership d.b.a. Verizon Wireless
Applicant Site ID:	Guilford 4
Site Owner:	Sprint Spectrum
Site Address:	2365 Long Hill Road, Guilford, CT
Subject Zoning District:	Residential
Abutting Zoning District(s):	Residential

APPLICANT EQUIPMENT:

ID	Noise Emitter	Make/Model	Prop. Line. Dist. (FT)			
			North	South	East	West
V-1	Wall Mounted HVAC	Bard / W61A1-105EPXXXJ	388	175	186	605
V-2	Wall Mounted HVAC	Bard / W61A1-105EPXXXJ	345	168	188	606

EXISTING COLOCATORS:

☒ AT&T	☐ Metro PCS	☐ Other:
☒ Sprint	☒ T Mobile	☐ Other:
☐ Nextel	☐ None	☐ Other:

EXISTING COLOCATOR EQUIPMENT OWNER:

ID	Noise Emitter	Make/Model	Prop. Line. Dist. (FT)			
			North	South	East	West

EXISTING COLOCATOR EQUIPMENT OWNER:

ID	Noise Emitter	Make/Model	Prop. Line. Dist. (FT)			
			North	South	East	West

EXISTING COLOCATOR EQUIPMENT OWNER:						
ID	Noise Emitter	Make/Model	Prop. Line. Dist. (FT)			
			North	South	East	West

EXISTING COLOCATOR EQUIPMENT OWNER:						
ID	Noise Emitter	Make/Model	Prop. Line. Dist. (FT)			
			North	South	East	West

EXISTING COLOCATOR EQUIPMENT OWNER:						
ID	Noise Emitter	Make/Model	Prop. Line. Dist. (FT)			
			North	South	East	West

CONCLUSION:			
Daytime Regulation:	55 dBA	**Nighttime Regulation:**	45 dBA
Compliance:	☒ Yes ☐ No	**Compliance:**	☒ Yes ☐ No

BASIS OF FINDINGS:

V1 North Property Line = 25dBA V1 Sorth Property Line = 42dBA

V1 East Property Line = 21dBA V1 West Property Line = 30dBA

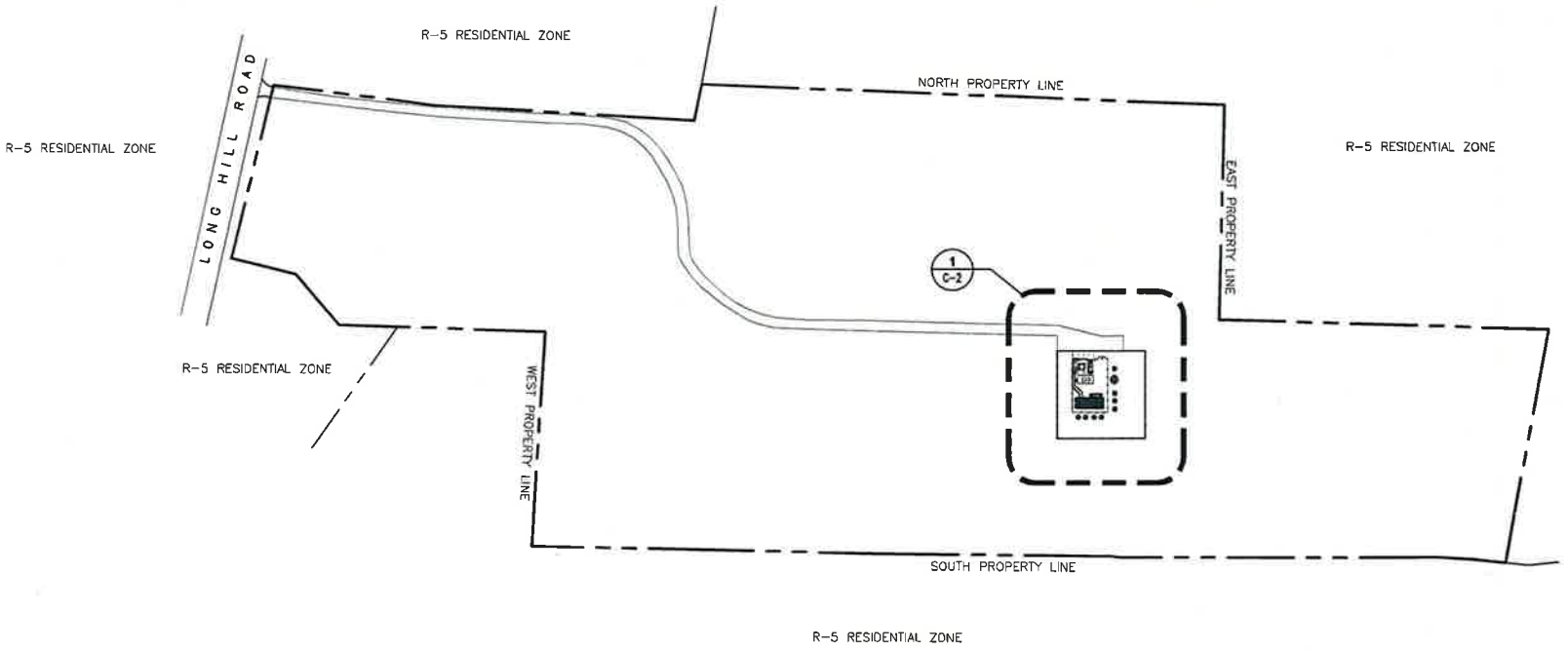
V2 North Property Line = 26dBA V2 South Property Line = 43dBA

V2 East Property Line = 21dBA V2 West Property Line = 30dBA

The dBA levels take into account the accousticalshielding effect provided by other structures on the property.

Existing Sprint, AT&T and T-Mobile pad mounted equipment is inaudible at a distance of 20 feet.

Prepared By: Alan Smardin, HMB ACOUSTICS LLC Date: 04/08/14



1 / C-1 **PARTIAL SITE PLAN**
SCALE: 1" = 200'

TRUE NORTH

GRAPHIC SCALE
0 100 200
(IN FEET)
1 inch = 200 ft.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	04/07/14	DMD	CFC	NOISE EMMITTER INFORMATION

Cellco Partnership d.b.a. verizon wireless

CENTEK engineering
Centered on Solutions℠
www.CentekEng.com
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road, Branford, CT 06405

Cellco Partnership d/b/a Verizon Wireless
GUILFORD 4
2365 LONG HILL ROAD
GUILFORD, CT

DATE: 04/07/14
SCALE: AS NOTED
JOB NO. 13284.000

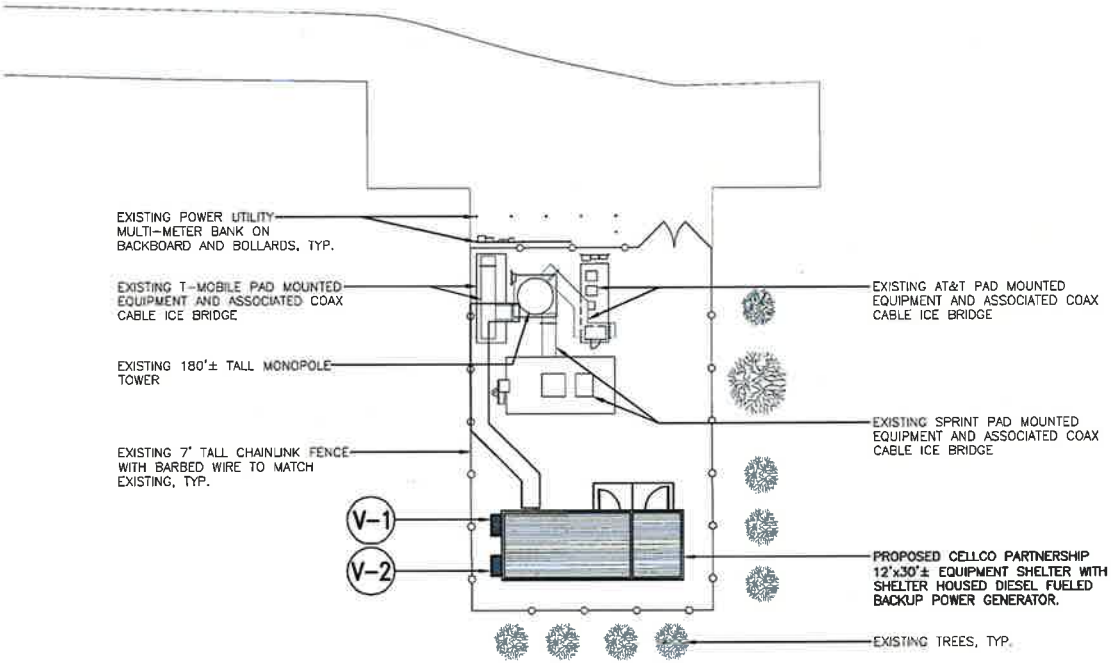
PARTIAL SITE PLAN

C-1
DWG. 1 OF 2

NOISE EMMITTER INFORMATION

(V-1) WALL MOUNTED HVAC UNIT, MAKE: BARD, MODEL: W61A1-A05EPXXXJ

(V-2) WALL MOUNTED HVAC UNIT, MAKE: BARD, MODEL: W61A1-A05EPXXXJ



1 / C-2 COMPOUND PLAN - PROPOSED
SCALE: 1" = 30'-0"

TRUE NORTH

GRAPHIC SCALE
0 15 30
(IN FEET)
1 inch = 30 ft.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	04/07/14	DMD	CFC	NOISE EMMITTER INFORMATION

Cellco Partnership d/b/a verizon wireless

CENTEK engineering
Centered on Solutions℠
www.CentekEng.com
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road, Branford, CT 06405

Cellco Partnership d/b/a Verizon Wireless

GUILFORD 4

2365 LONG HILL ROAD
GUILFORD, CT

DATE: 04/07/14
SCALE: AS NOTED
JOB NO. 13284.000

COMPOUND PLAN

C-2
DWG. 2 OF 2

ATTACHMENT 5

	General	Power	Density					
Site Name: Guilford 4								
Tower Height: 176Ft								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*Sprint CDMA/LTE	2	778	178	0.0177	1900	1.0000	1.77%	
*Sprint CDMA/LTE	1	438	178	0.0050	850	0.5667	0.88%	
*AT&T UMTS	2	565	167	0.0146	880	0.5867	2.48%	
*AT&T UMTS	2	875	167	0.0226	1900	1.0000	2.26%	
*AT&T GSM	1	283	167	0.0036	880	0.5867	0.62%	
*AT&T GSM	4	525	167	0.0271	1900	1.0000	2.71%	
*AT&T LTE	1	1313	167	0.0169	734	0.4893	3.46%	
*T-Mobile GSM	8	173	155	0.0207	1945	1.0000	2.07%	
*T-Mobile UMTS	2	692	155	0.0207	2100	1.0000	2.07%	
Verizon	**7**	**413**	**145**	**0.0494**	**1970**	**1.0000**	**4.94%**	
Verizon	**9**	**389**	**145**	**0.0599**	**869**	**0.5793**	**10.34%**	
Verizon	**1**	**1828**	**145**	**0.0313**	**2145**	**1.0000**	**3.13%**	
Verizon	**1**	**808**	**145**	**0.0138**	**698**	**0.4653**	**2.97%**	
								39.69%
* Source: Siting Council								