

December 14, 2015

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

RE: Notice of Exempt Modification for T-Mobile / L700 Crown Site BU: 876327
T-Mobile Site ID: CT11883C
Located at: 59 McGuire Road, South Windsor, CT 06074
Latitude: 41° 48' 10.77" / Longitude: -72° 37' 1.96"

Dear Ms. Bachman,

T-Mobile currently maintains six (6) antennas at the 138 foot level of the existing 150 foot monopole at 59 McGuire Road, South Windsor, CT. The tower is owned by Crown Castle. The property is owned by McGuire Road Associates. T-Mobile now intends to install three (3) new antennas; three (3) RRU's; remove six (6) lines of coaxial cable; and, remove Metro equipment installed at the 112 foot level. The antennas would be installed at the 138 foot level of the tower.

This facility was approved by the Town of South Windsor Planning and Zoning Commission, Application Number 96-73P on November 22, 1996. This approval included the condition(s) that:

1. No building permit will be issued until the final mylars have been filed in the Town Clerk's Office.
2. A landscape bond in the amount of \$1,000 is required and must be submitted prior to filing of mylars.
3. All plans used in the field by the developer must bear the stamp and authorized signature of the Town of South Windsor.
4. Monopole must be made available to two other co-locaters, if needed.
5. Specification needed on the plans (i.e., quantities, size) for barberry plantings.

6. Monopole must be painted an unobtrusive color such as non-contrasting blue, grey or black. The proposed galvanized steel is acceptable.
7. Routine maintenance must be performed to prevent deterioration of appearance (such as rust, peeling paint, etc.).
8. Drainage of site low spots must be addressed.

This modification complies with the aforementioned condition(s).

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. §16-50j-72(b)(2). In accordance with R.S.C.A. § 16-50j-73, a copy of this letter is being sent to Thomas Delnicki, Mayor for the Town of South Windsor, as well as the property owner and the tower owner.

1. The proposed modifications will not result in an increase in the height of the existing tower.
2. The proposed modification will not require the extension of the site boundary.
3. The proposed modification will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.


For the foregoing reasons, T-Mobile respectfully submits that the proposed modifications to the above-referenced telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Please send approval/rejection letter to Attn: Amanda Goodall.

Melanie A. Bachman

December 14, 2015

Page 3

Sincerely,



Amanda Goodall

Real Estate Specialist

12 Gill Street, Suite 5800, Woburn, MA 01801

339-205-7017

Amanda.Goodall@crowncastle.com

Attachments:

Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes

Tab 2: Exhibit-2: Structural Modification Report

Tab 4: Exhibit-3: General Power Density Table report (RF Emissions Analysis Report)

cc: Thomas Delnicki, Mayor
Town of South Windsor
1540 Sullivan Avenue
South Windsor, CT 06074

Crown Castle (Tower Owner)
12 Gill Street, Suite 5800
Woburn, Ma 01801

McGuire Road Associates (Property Owner)
111 Farm Brook Lane
South Windsor, CT 06074

Goodall, Amanda

From: Trahan, Lori <Lori.Trahan@southwindsor.org>
Sent: Thursday, December 10, 2015 4:03 PM
To: Goodall, Amanda
Attachments: appvl letter for sprint pc.pdf; map2365a.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Per your conversation with my clerk, I am sending what I have found in regards to an approval from the Town of South Windsor. Planning and Zoning has a file under application 96-73p for any further information you may be looking for. The map has been filed in our office. A copy is attached. If you have any further questions, please contact Michele Lipe in the planning dept. at michele.lipe@southwindsor.org. If I can be any further assistance, please feel free to contact me.

Best Regards,

Lori Trahan
South Windsor Town Clerk
lori.trahan@southwindsor.org
860-644-2511 ext 226



Town of South Windsor

1540 SULLIVAN AVENUE • SOUTH WINDSOR, CONN. 06074
AREA CODE 860 / 644-2511

November 22, 1996

CERTIFIED MAIL

Thomas A. Cookingham, AICP
300 Research Parkway
Third Floor
Meriden, CT 06045

Dear Mr. Cookingham:

Re: Appl #96-73P, Monopole located at: 59 McGuire Road
South Windsor, CT

We are pleased to advise you that the Planning & Zoning Commission voted on November 19, 1996 to approve with modifications the above-referenced application for a Site Plan of Development on property located at 59 McGuire Road zone as shown on plans prepared by URS Greiner, Job No. 23224 and revised through October 25, 1996. This approval is subject to the following modifications:

1. No building permit will be issued until the final mylars have been filed in the Town Clerk's Office.
2. A landscape bond in the amount of \$1,000 is required and must be submitted prior to filing of mylars.
3. All plans used in the field by the developer must bear the stamp and authorized signature of the Town of South Windsor.
4. Monopole must be made available to two other co-locaters, if needed.
5. Specification needed on the plans (i.e., quantities, size) for barberry plantings.
6. Monopole must be painted an unobtrusive color such as noncontrasting blue, grey or black. The proposed galvanized steel is acceptable.
7. Routine maintenance must be performed to prevent deterioration of appearance (such as rust, peeling paint, etc.).
8. Drainage of site low spots must be addressed.

Black and white transparent mylars of Drawing #YHA066C1 with the above modifications, together with three blueprint copies of the entire set of plans (including architectural elevations) must be submitted to this Commission within 30 days to be stamped and signed. The letters of approval of this Commission must be reproduced on the mylars.

After the mylars have been signed by the Commission, they will be returned to you for filing in the Office of the Town Clerk within 90 days. After filing these plans, a copy of the receipt must be submitted to the Planning Department.

Very truly yours,

PLANNING & ZONING COMMISSION

Russell G. Levack

Russell G. Levack, Chairman

RGL/pmm

cc: Town Engineer
Chief Building Official
Assessor
Superintendent of Pollution Control
Fire Marshal
SPRINT PCS, 9 Barnes Industrial Road, Wallingford, CT 06492

This drawing and the design it covers are the property of BECHTEL. They are merely loaned and on the borrower's express agreement that they will not be reproduced, copied, loaned, exhibited, or used except in the limited way and private use permitted by any written consent given by the lender to the borrower.

This Plan of Development
APPROVED
 Date: *12/23/96*
Wally Wood
 Chairman
 South Windsor Planning
 & Zoning Commission

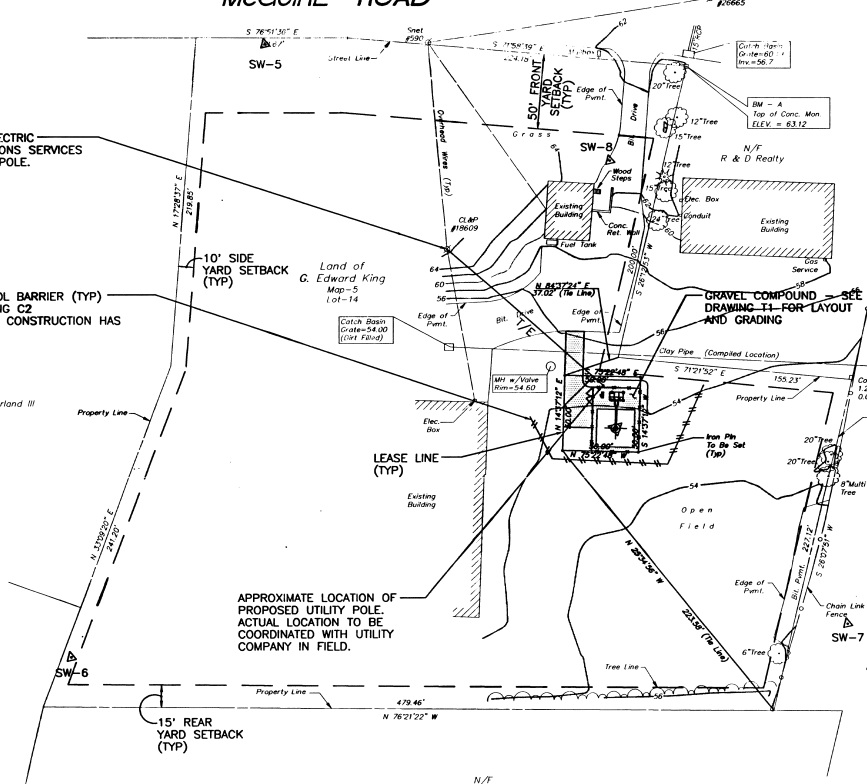
**THIS PLAN APPROVED SMALL
 LOTS AND VARIATIONS
 COMPLETED PER CHAPTER 6-80
 OF THE CONSTRUCTION STATUTES**

McGUIRE ROAD

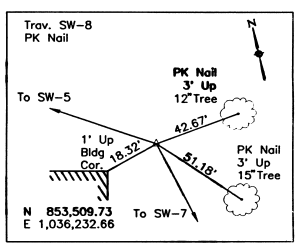
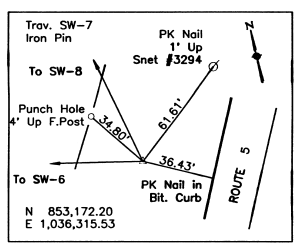
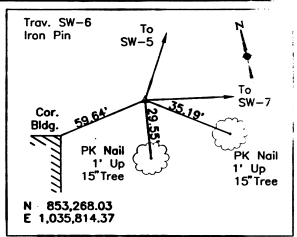
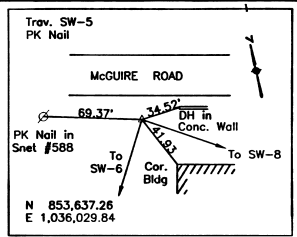
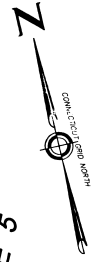
BEGIN OVERHEAD ELECTRIC AND TELECOMMUNICATIONS SERVICES AT EXISTING UTILITY POLE.

SEDIMENTATION CONTROL BARRIER (TYP) SEE DETAIL ON DRAWING C2 TO BE REMOVED ONCE CONSTRUCTION HAS BEEN COMPLETED.

APPROXIMATE LOCATION OF PROPOSED UTILITY POLE. ACTUAL LOCATION TO BE COORDINATED WITH UTILITY COMPANY IN FIELD.



SITE DETAIL
 SCALE: 1" = 40'



SURVEY TIES
 SCALE: NTS



Town of South Windsor
 1540 BULLIVANT AVENUE • SOUTH WINDSOR, CONN. 06074
 AREA CODE 860 / 644-2511

November 22, 1996

CERTIFIED MAIL

Thomas A. Cookingham, AICP
 300 Research Parkway
 Third Floor
 Meriden, CT 06045

Dear Mr. Cookingham:

Re: Appl #96-73P, Monopole located at: 59 McGuire Road, South Windsor, CT

We are pleased to advise you that the Planning & Zoning Commission voted on November 19, 1996 to approve with modifications the above-referenced application for a Site Plan of Development on property located at 59 McGuire Road as shown on plans prepared by URS Greiner, Job No. 23224 and revised through October 25, 1996. This approval is subject to the following modifications:

1. No building permit will be issued until the final mylars have been filed in the Town Clerk's Office.
2. A landscape bond in the amount of \$1,000 is required and must be submitted prior to filing of mylars.
3. All plans used in the field by the developer must bear the stamp and authorized signature of the Town of South Windsor.
4. Monopole must be made available to two other co-locators, if needed.
5. Specification needed on the plans (i.e., quantities, size) for barberry plantings.
6. Monopole must be painted an unobtrusive color such as noncontrasting blue, grey or black. The proposed galvanized steel is acceptable.
7. Routine maintenance must be performed to prevent deterioration of appearance (such as rust, peeling paint, etc.).
8. Drainage of site low spots must be addressed.

Black and white transparent mylars of Drawing #YHA066C1 with the above modifications, together with three blueprints copies of the entire set of plans (including architectural elevations) must be submitted to this Commission within 30 days to be stamped and signed. The letters of approval of this Commission must be reproduced on the mylars.

After the mylars have been signed by the Commission, they will be returned to you for filing in the Office of the Town Clerk within 90 days. After filing these plans, a copy of the receipt must be submitted to the Planning Department.



2365-A
 Rec'd for Filing
 12/23/96 at 10:15 AM.
William E. Bielgard,
 A.T.C.

URS Greiner
 500 ENTERPRISE DRIVE
 ROCKY HILL, CONNECTICUT
 (860) 529-8882

KING LOT
 59 MCGUIRE ROAD
 SOUTH WINDSOR, CONNECTICUT 06074

Sprint PCS
 HARTFORD MTA
 SITE NO. C103XC066E

12-1-96	ISSUED FOR TOWN OF SOUTH WINDSOR FILE COMMENTS	PLN	2/2	PCS
11-11-96	REQUIRED FOR CONSTRUCTION	PLN	2/2	PCS
10-25-96	ISSUED FOR CONSTRUCTION	PLN	2/2	PCS
NO DATE	REVISION	BY	CHK	APPD
SCALE AS SHOWN	REVISION	DRAWN	BY	DATE



LUCENT TECHNOLOGIES/BECHTEL ALLIANCE
 SSLP PROJECT

UTILITY PLAN
 JOB NO. 23224
 DRAWING NO. YHA066C1





T-MOBILE NORTHEAST LLC

T-MOBILE SITE #: CT11883C
 CROWN CASTLE BU #: 876327
 SITE NAME: KINGS LOT
 59 McGUIRE ROAD
 SOUTH WINDSOR, CT 06074
 HARTFORD COUNTY



T-MOBILE NORTHEAST LLC
 35 GRIFFIN RD SOUTH
 BLOOMFIELD, CT 06002



CROWN CASTLE
 3 CORPORATE PARK DRIVE, SUITE 101
 CLIFTON PARK, NY 12065

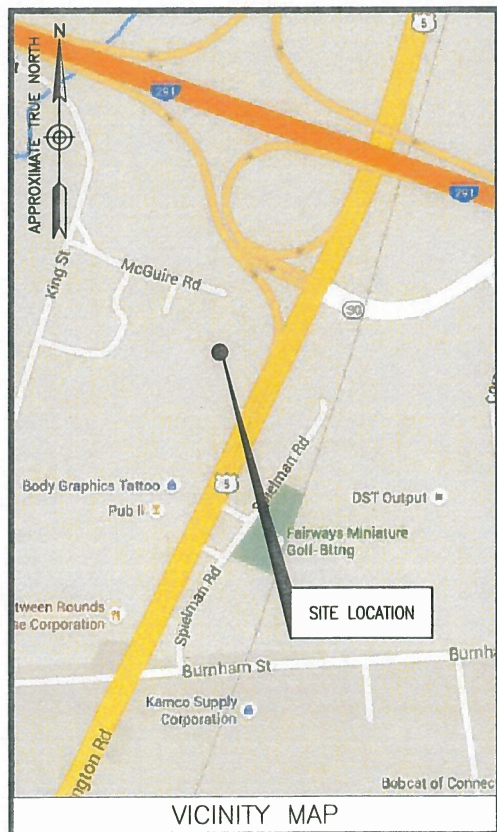
CT11883C
 KINGS LOT

CONSTRUCTION DRAWINGS

0	11/24/15 ISSUED AS FINAL



Dewberry Engineers Inc.
 600 PARSIPPANY ROAD
 SUITE 301
 PARSIPPANY, NJ 07054
 PHONE: 973.739.9400
 FAX: 973.739.9710

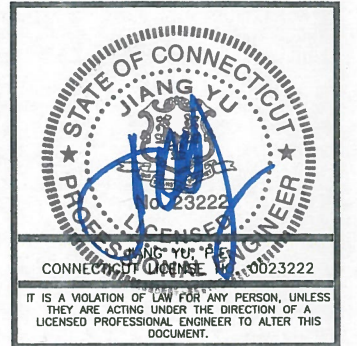


<p>ENGINEER DEWBERRY ENGINEERS INC. 600 PARSIPPANY ROAD SUITE 301 PARSIPPANY, NJ 07054 CONTACT: BRYAN HUFF PHONE #: (973) 576-0147</p> <p>CONSTRUCTION CROWN CASTLE 3 CORPORATE PARK DRIVE, SUITE 101 CLIFTON PARK, NY 12065 CONTACT: PATRICIA PELON PHONE #: (518) 373-3507</p>

<p>SITE NAME: KINGS LOT</p> <p>SITE NUMBER: CT11883C</p> <p>TOWER OWNER: CROWN CASTLE 3 CORPORATE PARK DRIVE, SUITE 101 CLIFTON PARK, NY 12065</p> <p>APPLICANT/DEVELOPER: T-MOBILE NORTHEAST LLC 35 GRIFFIN RD SOUTH BLOOMFIELD, CT 06002</p> <p>COORDINATES: LATITUDE: 41°-48'-10.77" N (NAD83) LONGITUDE: 72°-37'-1.96" W (NAD83) (PER CROWN CASTLE)</p> <p>CONFIGURATION 702Cu</p>

<p>SITE ADDRESS: 59 McGUIRE ROAD SOUTH WINDSOR, CT 06074 HARTFORD COUNTY</p>
<p>PROJECT DIRECTORY</p>
<ul style="list-style-type: none"> INSTALL (3) NEW ANTENNAS. INSTALL (3) NEW RRU'S. REMOVE (6) EXISTING LINES OF COAX. REMOVE EXISTING METROPCS ANTENNAS, MOUNTS AND COAX AT A CENTERLINE ELEVATION OF 112'-0"± A.G.L.
<p>SCOPE OF WORK</p>
<p>THIS DOCUMENT WAS DEVELOPED TO REFLECT A SPECIFIC SITE AND ITS SITE CONDITIONS AND IS NOT TO BE USED FOR ANOTHER SITE OR WHEN OTHER CONDITIONS PERTAIN. REUSE OF THIS DOCUMENT IS AT THE SOLE RISK OF THE USER.</p> <p>A.D.A. COMPLIANCE: FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION.</p>

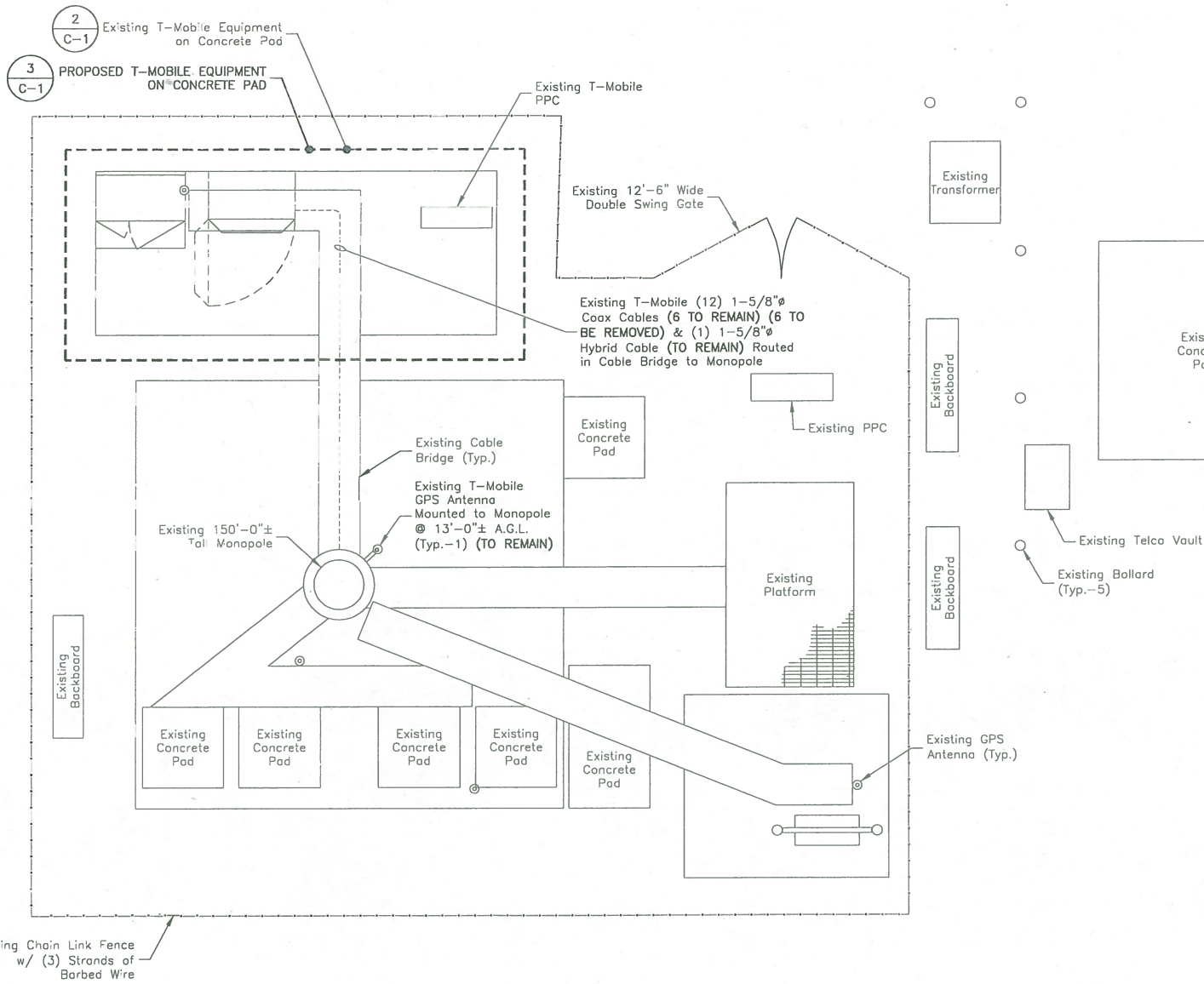
SHT. NO.	DESCRIPTION
T-1	TITLE SHEET
G-1	GENERAL NOTES
C-1	COMPOUND PLAN & EQUIPMENT PLANS
C-2	ANTENNA LAYOUTS & ELEVATIONS
C-3	CONSTRUCTION DETAILS
E-1	GROUNDING NOTES & DETAILS



DRAWN BY:	RA
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50078107
SITE ADDRESS:	
59 McGUIRE ROAD S. WINDSOR, CT 06074 HARTFORD COUNTY	

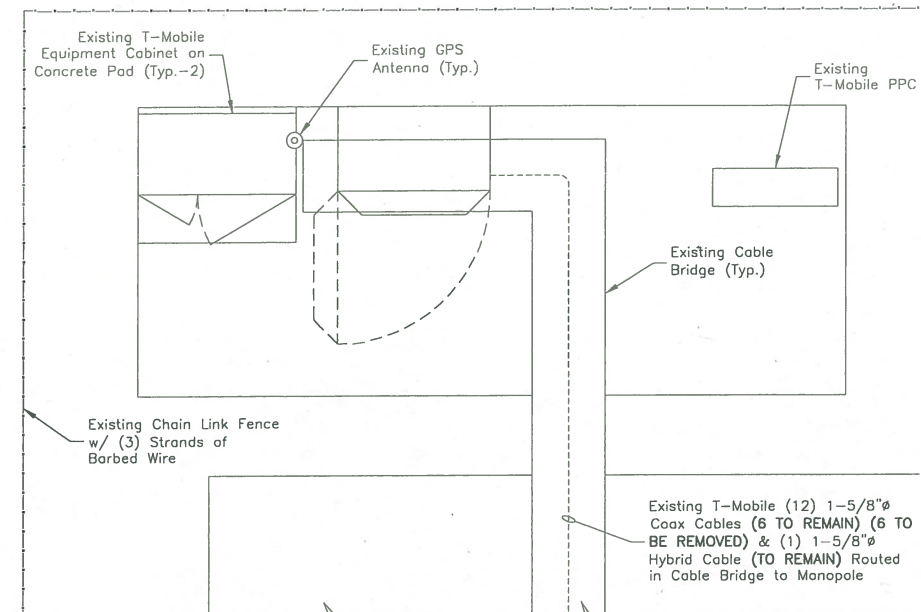
FROM BLOOMFIELD, CT:
 HEAD NORTHEAST ON GRIFFIN RD S. TOWARD WEST NEWBERRY RD. TURN RIGHT ONTO DAY HILL RD. MERGE ONTO I-91 S. CONTINUE ON I-91 S AND TAKE EXIT 35A FOR I-291 TOWARD MANCHESTER. CONTINUE ONTO I-291 E AND TAKE EXIT 4 TO MERGE ONTO US-5 S. TURN RIGHT ONTO BURNHAM ST AND TURN RIGHT ONTO KING ST. TURN RIGHT ONTO MCGUIRE RD. DESTINATION WILL BE ON THE RIGHT.

SHEET TITLE	TITLE SHEET
SHEET NUMBER	T-1

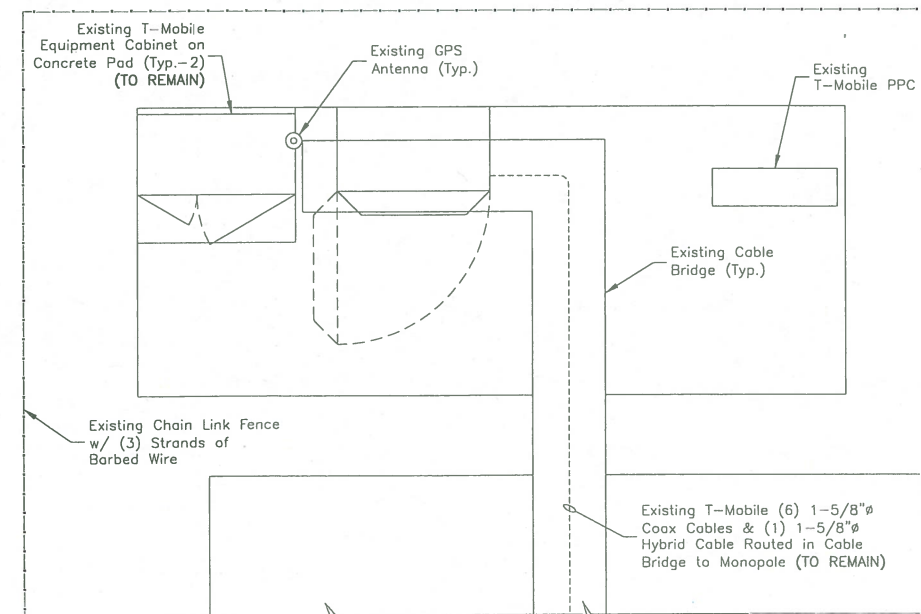


COMPOUND PLAN
SCALE: 1/8"=1' FOR 11"x17"
1/4"=1' FOR 22"x34"
0' 2' 4' 8'

- NOTES:
1. NORTH ARROW SHOWN AS APPROXIMATE.
 2. NOT ALL INFORMATION IS SHOWN FOR CLARITY.
 3. ALL PROPOSED EQUIPMENT, INCLUDING ANTENNAS, RRU'S, COAX, ETC., SHALL BE MOUNTED IN ACCORDANCE WITH THE STRUCTURAL MODIFICATION REPORT BY PAUL J. FORD AND COMPANY DATED OCTOBER 23, 2015.



EXISTING EQUIPMENT PLAN
SCALE: 3/16"=1' FOR 11"x17"
3/8"=1' FOR 22"x34"
0' 2' 4' 6'



PROPOSED EQUIPMENT PLAN
SCALE: 3/16"=1' FOR 11"x17"
3/8"=1' FOR 22"x34"
0' 2' 4' 6'

- NOTE:
1. NO EQUIPMENT IS PROPOSED AT GRADE



T-MOBILE NORTHEAST LLC
35 GRIFFIN RD SOUTH
BLOOMFIELD, CT 06002



CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

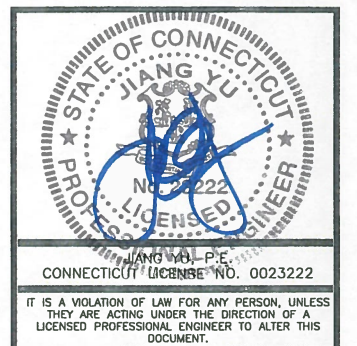
**CT11883C
KINGS LOT**

CONSTRUCTION DRAWINGS

NO.	DATE	DESCRIPTION
0	11/24/15	ISSUED AS FINAL



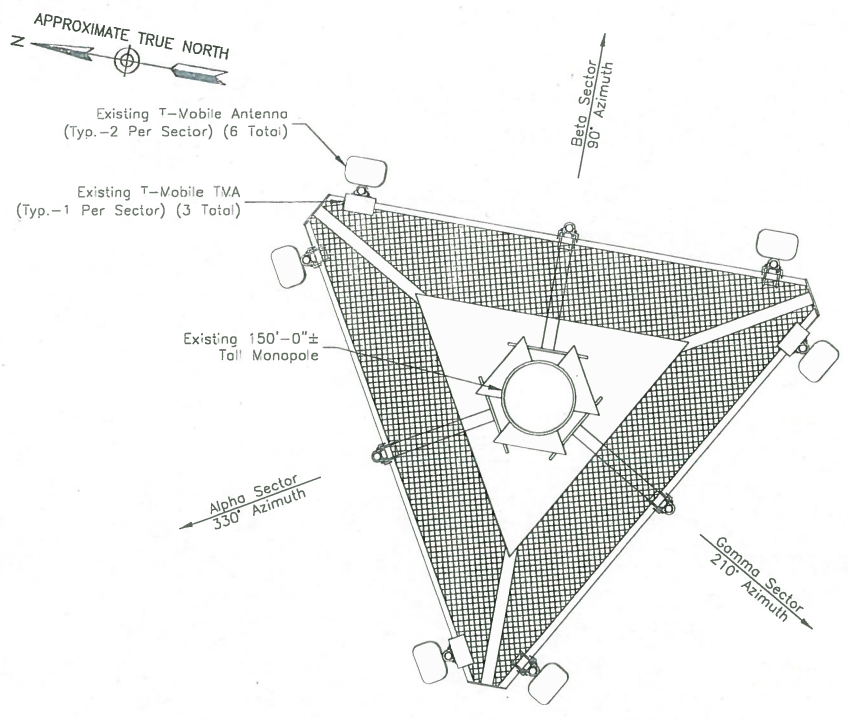
Dewberry Engineers Inc.
600 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054
PHONE: 973.739.9400
FAX: 973.739.9710



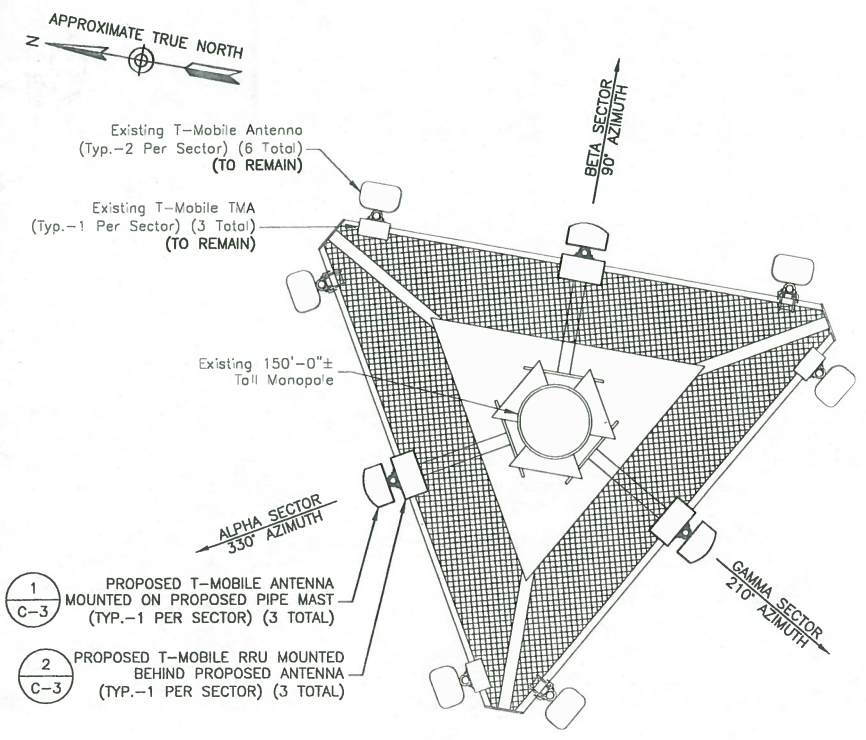
DRAWN BY:	RA
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50078107
SITE ADDRESS:	

59 McGUIRE ROAD
S. WINDSOR, CT 06074
HARTFORD COUNTY

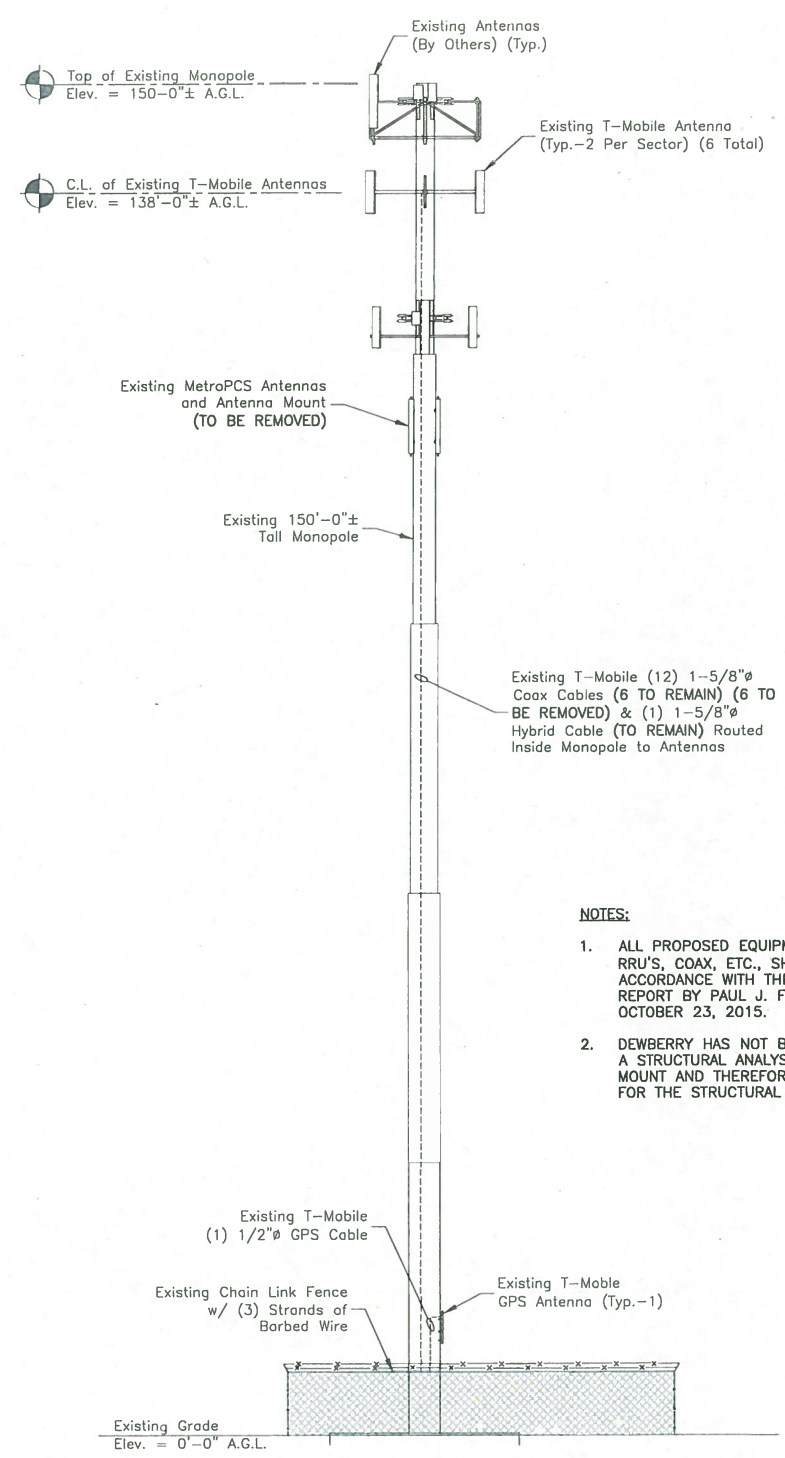
SHEET TITLE	COMPOUND PLAN & EQUIPMENT PLANS
SHEET NUMBER	C-1



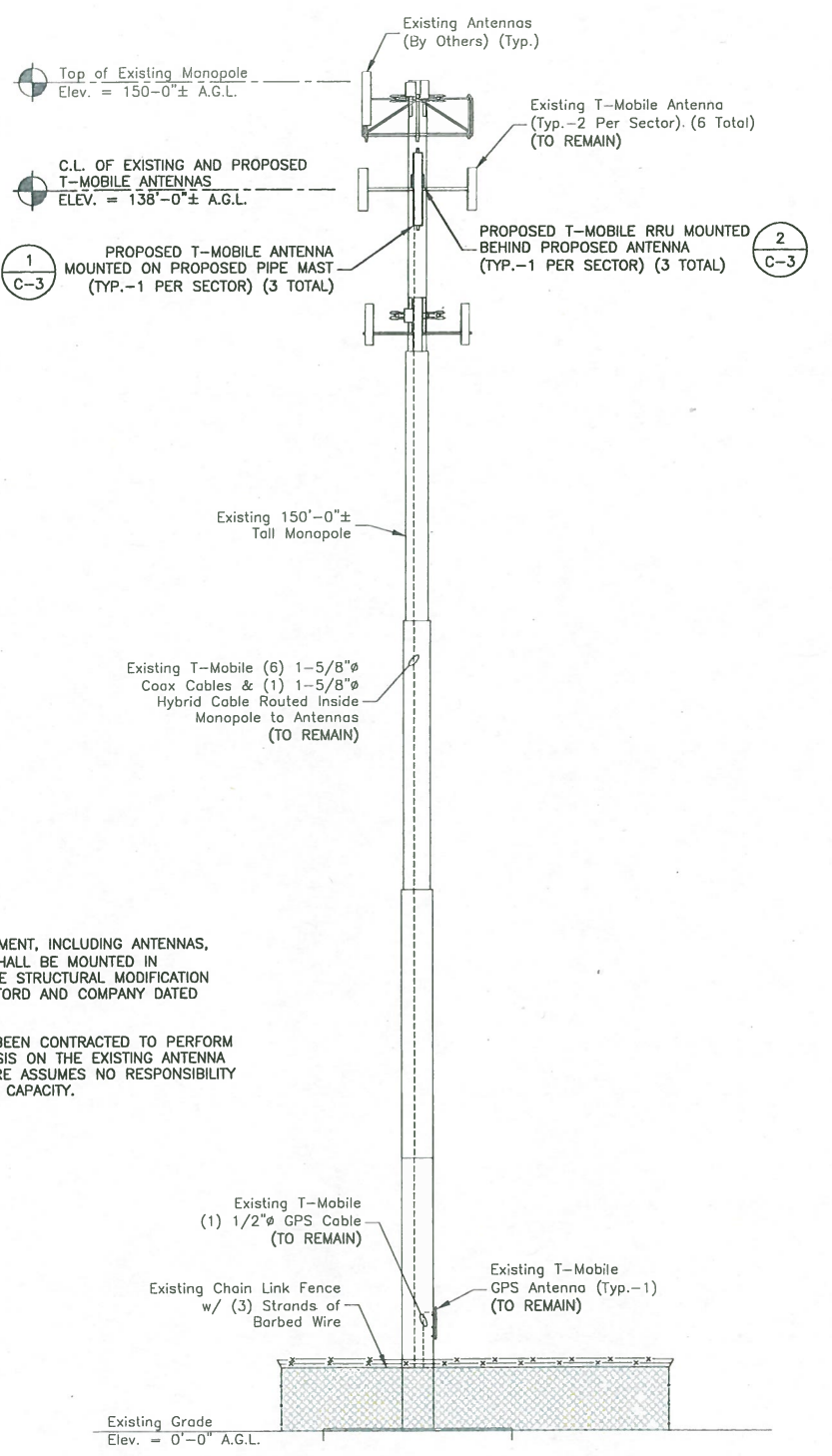
EXISTING ANTENNA LAYOUT ①
SCALE: N.T.S.



PROPOSED ANTENNA LAYOUT ②
SCALE: N.T.S.



EXISTING ELEVATION ③
SCALE: 3/64"=1' FOR 11"x17"
3/32"=1' FOR 22"x34"



PROPOSED ELEVATION ④
SCALE: 3/64"=1' FOR 11"x17"
3/32"=1' FOR 22"x34"



- NOTES:**
1. ALL PROPOSED EQUIPMENT, INCLUDING ANTENNAS, RRU'S, COAX, ETC., SHALL BE MOUNTED IN ACCORDANCE WITH THE STRUCTURAL MODIFICATION REPORT BY PAUL J. FORD AND COMPANY DATED OCTOBER 23, 2015.
 2. DEWBERRY HAS NOT BEEN CONTRACTED TO PERFORM A STRUCTURAL ANALYSIS ON THE EXISTING ANTENNA MOUNT AND THEREFORE ASSUMES NO RESPONSIBILITY FOR THE STRUCTURAL CAPACITY.

**CT11883C
KINGS LOT**

CONSTRUCTION DRAWINGS

01/24/15 ISSUED AS FINAL

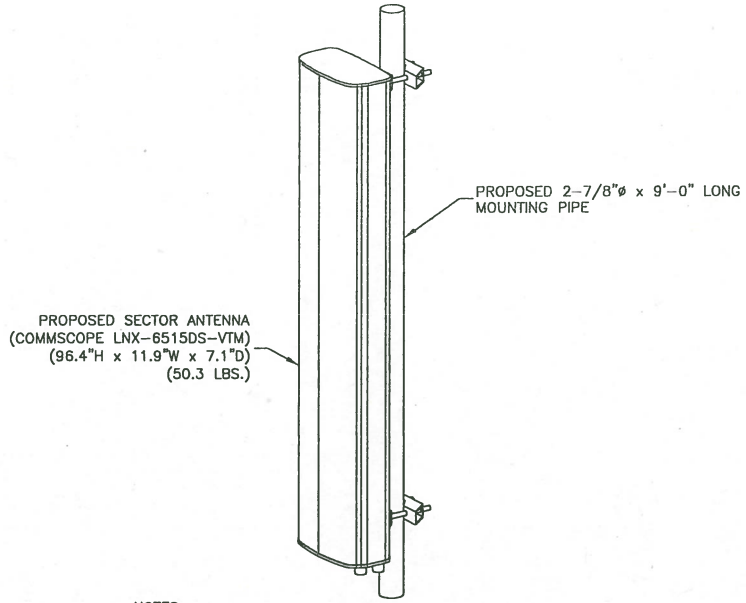
600 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054
PHONE: 973.739.9400
FAX: 973.739.9710

JIANG YU, P.E.
CONNECTICUT LICENSE NO. 0023222

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

DRAWN BY:	RA
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50078107
SITE ADDRESS:	

59 McGUIRE ROAD
S. WINDSOR, CT 06074
HARTFORD COUNTY

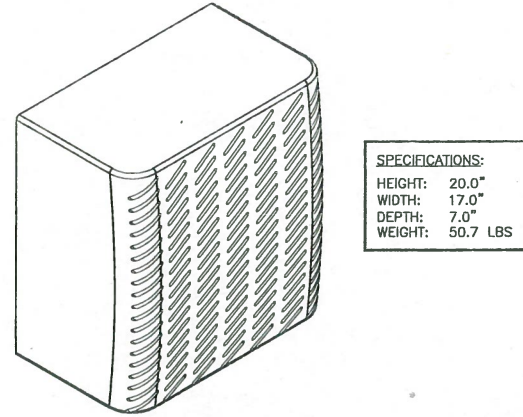


NOTES:

1. MOUNT ANTENNAS PER MANUFACTURER'S RECOMMENDATIONS.
2. GROUND ANTENNAS AND MOUNTS PER MANUFACTURER'S RECOMMENDATIONS AND T-MOBILE STANDARDS.
3. CONFIRM REQUIRED ANTENNAS WITH THE LATEST RFDS.

ISOMETRIC ANTENNA DETAIL
SCALE: N.T.S.

1



SPECIFICATIONS:
HEIGHT: 20.0"
WIDTH: 17.0"
DEPTH: 7.0"
WEIGHT: 50.7 LBS

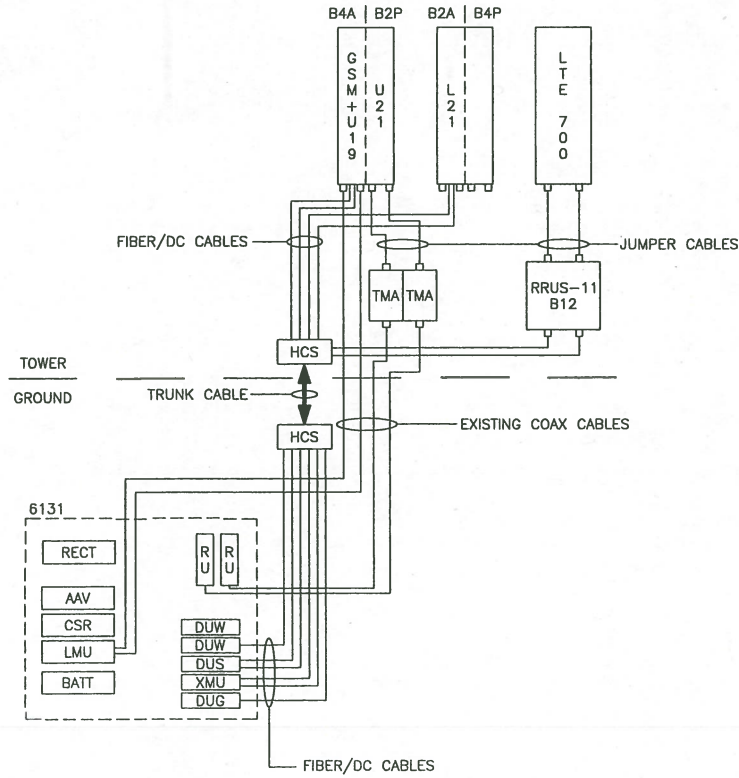
ERICSSON RRUS-11 B12

RRU NOTES:

1. MOUNT EQUIPMENT WITH MANUFACTURER PROVIDED MOUNTING BRACKETS.
2. GROUND EQUIPMENT AND MOUNTS PER MANUFACTURER'S RECOMMENDATIONS AND T-MOBILE STANDARDS.
3. CONFIRM REQUIRED EQUIPMENT WITH THE LATEST RFDS.

RRUS-11 - REMOTE RADIO UNIT
SCALE: N.T.S.

2



SITE CONFIGURATION 702Cu
SCALE: N.T.S.

3

DESIGN CONFIGURATION							
ANTENNAS	COAX		HYBRID	COAX/HYBRID LENGTH	TMA		RRU
	EXISTING	PROPOSED			EXISTING	PROPOSED	
ALPHA	ERICSSON AIR 21 B2A B4P	EXISTING TO REMAIN	(2) 1-5/8"	-	-	(1) KRY 112 144/1	-
	-	COMMSCOPE LNX-6515DS-VTM	-	-	-	-	(1) RRUS-11 B12
	ERICSSON AIR 21 B4A B2P	EXISTING TO REMAIN	-	-	-	-	-
BETA	ERICSSON AIR 21 B2A B4P	EXISTING TO REMAIN	(2) 1-5/8"	-	(1) 1-5/8"	(1) KRY 112 144/1	-
	-	COMMSCOPE LNX-6515DS-VTM	-	-	-	-	(1) RRUS-11 B12
	ERICSSON AIR 21 B4A B2P	EXISTING TO REMAIN	-	-	-	-	-
GAMMA	ERICSSON AIR 21 B2A B4P	EXISTING TO REMAIN	(2) 1-5/8"	-	-	(1) KRY 112 144/1	-
	-	COMMSCOPE LNX-6515DS-VTM	-	-	-	-	(1) RRUS-11 B12
	ERICSSON AIR 21 B4A B2P	EXISTING TO REMAIN	-	-	-	-	-



CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

CT11883C
KINGS LOT

CONSTRUCTION DRAWINGS

0 11/24/15 ISSUED AS FINAL



Dewberry Engineers Inc.
600 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054
PHONE: 973.739.9400
FAX: 973.739.9710

JIANG YU, P.E.
CONNECTIONS ENGINEER, NO. 0023222

DRAWN BY: RA
REVIEWED BY: BSH
CHECKED BY: GHN
PROJECT NUMBER: 50066258
JOB NUMBER: 50078107
SITE ADDRESS:
59 McGUIRE ROAD
S. WINDSOR, CT 06074
HARTFORD COUNTY

SHEET TITLE: CONSTRUCTION DETAILS
SHEET NUMBER: C-3

C-3



Date: October 23, 2015

Timothy Howell
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

Paul J Ford and Company
250 E. Broad Street, Suite 600
Columbus, OH 43215
614.221.6679
jwoolley@pjfweb.com

Subject: Structural Modification Report

Carrier Designation: *T-Mobile Co-Locate*
Carrier Site Number: CT11883C
Carrier Site Name: CT883/Sprint S. Windsor

Crown Castle Designation:
Crown Castle BU Number: 876327
Crown Castle Site Name: KINGS LOT
Crown Castle JDE Job Number: 343222
Crown Castle Work Order Number: 1134424
Crown Castle Application Number: 306606 Rev. 0

Engineering Firm Designation: Paul J Ford and Company Project Number: 37515-2506.002.7700

Site Data: 59 McGuire Road, SOUTH WINDSOR, Hartford County, CT
Latitude 41° 48' 10.77", Longitude -72° 37' 1.96"
150 Foot - Monopole Tower

Dear Timothy Howell,

Paul J Ford and Company is pleased to submit this "Structural Modification Report" to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 834425, in accordance with application 306606, revision 0.

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

LC4.5: Modified Structure w/ Existing + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

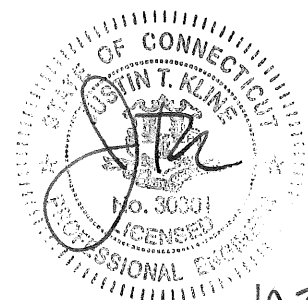
The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut Building Code and the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 37.6 mph with 1 inch ice thickness and 50 mph under service loads.

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

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

Respectfully submitted by:

John J. Woolley, E.I.
Structural Designer BKK



10-30-15

Date: **October 23, 2015**

Timothy Howell
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

Paul J Ford and Company
250 E. Broad Street, Suite 600
Columbus, OH 43215
614.221.6679
jwoolley@pjfweb.com

Subject: Structural Modification Report

Carrier Designation: *T-Mobile Co-Locate*
Carrier Site Number: CT11883C
Carrier Site Name: CT883/Sprint S. Windsor

Crown Castle Designation:
Crown Castle BU Number: 876327
Crown Castle Site Name: KINGS LOT
Crown Castle JDE Job Number: 343222
Crown Castle Work Order Number: 1134424
Crown Castle Application Number: 306606 Rev. 0

Engineering Firm Designation: **Paul J Ford and Company Project Number:** 37515-2506.002.7700

Site Data: **59 McGuire Road, SOUTH WINDSOR, Hartford County, CT**
Latitude 41° 48' 10.77", Longitude -72° 37' 1.96"
150 Foot - Monopole Tower

Dear Timothy Howell,

Paul J Ford and Company is pleased to submit this “**Structural Modification Report**” to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural ‘Statement of Work’ and the terms of Crown Castle Purchase Order Number 834425, in accordance with application 306606, revision 0.

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

LC4.5: Modified Structure w/ Existing + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut Building Code and the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 37.6 mph with 1 inch ice thickness and 50 mph under service loads.

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

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

Respectfully submitted by:

John J. Woolley, E.I.
Structural Designer

TABLE OF CONTENTS

1) INTRODUCTION

2) ANALYSIS CRITERIA

Table 1 - Proposed Antenna and Cable Information

Table 2 - Existing Antenna and Cable Information

Table 3 - Design Antenna and Cable Information

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

3.1) Analysis Method

3.2) Assumptions

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Table 6 – Tower Components vs. Capacity

4.1) Recommendations

5) APPENDIX A

tnxTower Output

6) APPENDIX B

Base Level Drawing

7) APPENDIX C

Additional Calculations

1) INTRODUCTION

This tower is a 150 ft Monopole tower designed by ROHN in December of 1996. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-E.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut Building Code and the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 37.6 mph with 1 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
138.0	138.0	3	commscope	LNx-6515DS-VTM w/ Mount Pipe	-	-	-
		3	ericsson	RRUS 11 B12			

Table 2 - Existing Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
148.0	149.0	3	alcatel lucent	800MHz 2X50W RRH W/FILTER	-	-	1
		3	alcatel lucent	PCS 1900MHz 4x45W-65MHz			
	148.0	1	tower mounts	Side Arm Mount [SO 102-3]			
146.0	148.0	1	rfs celwave	APXV9ERR18-C-A20 w/ Mount Pipe	3	1-1/4	1
		2	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe			
	146.0	1	tower mounts	Platform Mount [LP 502-1]			
138.0	138.0	3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	7	1-5/8	1
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
		3	ericsson	KRY 112 144/1			
		1	tower mounts	Platform Mount [LP 1201-1]			
	-	-	-	-	6	1-5/8	2
124.0	124.0	3	ericsson	RRUS 11	-	-	1
		1	tower mounts	Side Arm Mount [SO 102-3]			
122.0	123.0	1	kmw communications	AM-X-CD-14-65-00T-RET w/ Mount Pipe	2 1 12	3/4 3/8 7/8	1
		1	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
		6	powerwave technologies	7770.00 w/ Mount Pipe			
		12	powerwave technologies	LGP2140X			
		1	powerwave technologies	P65-17-XLH-RR w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8F			
	122.0	1	tower mounts	T-Arm Mount [TA 602-3]			
112.0	112.0	3	rfs celwave	APX18-206517-CT2 w/ Mount Pipe	6	1-5/8	2
		1	tower mounts	Pipe Mount [PM 601-3]			
13.0	14.0	1	lucent	KS24019-L112A	1	1/2	1
	13.0	1	tower mounts	Pipe Mount [PM 601-1]			
12.0	13.0	1	lucent	KS24019-L112A	1	1/2	1
	12.0	1	tower mounts	Pipe Mount [PM 601-1]			

- Notes:
 1) Existing Equipment
 2) Equipment to be Removed.

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH, 07-11433G, 09/30/2009	2192521	CCISITES
4-POST-MODIFICATION INSPECTION	Vertical Solutions, 080627.06, 11/11/2008	2366960	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Rohn, 34738SW, 12/18/1996	1620564	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Rohn, 34738SW, 12/15/1996	1619441	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.

3.2) Assumptions

- 1) Tower and structures were built in accordance with the manufacturer's specifications.
- 2) The tower and structures have been maintained in accordance with the manufacturer's specification.
- 3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
- 4) Monopole was reinforced in conformance with the referenced modification drawings.
- 5) Monopole will be reinforced in conformance with the attached modification drawings.
- 6) The existing post-installed anchor rods found in Doc ID 2366960 do not appear to be properly tightened per photos on CCISITES and given the lack of available clearance between stiffeners. They have been assumed to be ineffective.
- 7) In accordance with discussions with CCI Corporate Engineering: Based on the assumption that the monopole manufacturer (ROHN) has designed the flange plates at splices to adequately develop the full capacity of the unreinforced shaft section using unpublished and/or proprietary methodologies, we are assuming that if our analysis shows that both the existing shaft and the existing flange bolts are at a usage capacity of 100% or less, then the existing flange plates are at a usage capacity of 100% or less and no additional analysis of the flange plate is required.

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	150 - 120	Pole	P24x0.25	1	-8.06	589.19	76.7	Pass
L2	120 - 90	Pole	30" x 0.375"	2	-12.20	1166.57	93.2	Pass
L3	90 - 78.75	Pole	36" x 0.375"	3	-14.04	1325.68	86.9	Pass
L4	78.75 - 60	Pole	RPS 36" x 0.51087"	4	-18.08	1634.98	89.5	Pass
L5	60 - 30	Pole	RPS 42" x 0.58495"	5	-27.03	2092.73	90.7	Pass
L6	30 - 13.75	Pole	RPS 42" x 0.65547"	6	-32.70	2545.31	90.1	Pass
L7	13.75 - 7	Pole	RPS 42" x 0.76406"	7	-35.29	2823.83	87.6	Pass
L8	7 - 4	Pole	RPS 42" x 0.78444"	8	-36.41	2894.46	88.1	Pass
L9	4 - 0	Pole	RPS 42" x 0.93531"	9	-38.16	3411.49	78.3	Pass
							Summary	
						Pole (L2)	93.2	Pass
						RATING =	93.2	Pass

Table 5 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	95.8	Pass
1	Base Plate	0	61.4	Pass
1	Base Foundation Structural Steel	0	30.1	Pass
1	Base Foundation Soil Interaction	0	84.1	Pass
1	Flange Connection	30	89.9	Pass
1	Flange Connection	60	81.4	Pass
1, 2	Flange Connection	90	93.2	Pass
1, 2	Flange Connection	120	76.7	Pass

Structure Rating (max from all components) =	95.8%
---	--------------

Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
- 2) See assumption #6.

4.1) Recommendations

See the attached reinforcing drawings.

APPENDIX A
TNXTOWER OUTPUT

Tower Input Data

There is a pole section.

This tower is designed using the TIA/EIA-222-F standard.

The following design criteria apply:

- 1) Tower is located in Hartford County, Connecticut.
- 2) Basic wind speed of 80 mph.
- 3) Nominal ice thickness of 1.000 in.
- 4) Ice thickness is considered to increase with height.
- 5) Ice density of 56.00 pcf.
- 6) A wind speed of 38 mph is used in combination with ice.
- 7) Temperature drop of 50 °F.
- 8) Deflections calculated using a wind speed of 50 mph.
- 9) A non-linear (P-delta) analysis was used.
- 10) Pressures are calculated at each section.
- 11) Stress ratio used in pole design is 1.333.
- 12) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification ✓ Use Code Stress Ratios ✓ Use Code Safety Factors - Guys ✓ Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) Add IBC .6D+W Combination	Distribute Leg Loads As Uniform Assume Legs Pinned ✓ Assume Rigid Index Plate ✓ Use Clear Spans For Wind Area Use Clear Spans For KL/r Retension Guys To Initial Tension ✓ Bypass Mast Stability Checks ✓ Use Azimuth Dish Coefficients ✓ Project Wind Area of Appurt. Autocalc Torque Arm Areas SR Members Have Cut Ends Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Use TIA-222-G Tension Splice Capacity Exemption	Treat Feedline Bundles As Cylinder Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation ✓ Consider Feedline Torque Include Angle Block Shear Check <div style="text-align: center; background-color: #e0e0e0; padding: 2px;">Poles</div> ✓ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets
--	--	--

Pole Section Geometry

Section	Elevation <i>ft</i>	Section Length <i>ft</i>	Pole Size	Pole Grade	Socket Length <i>ft</i>
L1	150.000-120.000	30.000	P24x0.25	A53-B-42 (42 ksi)	
L2	120.000-90.000	30.000	30" x 0.375"	A53-B-42 (42 ksi)	
L3	90.000-78.750	11.250	36" x 0.375"	A53-B-42 (42 ksi)	
L4	78.750-60.000	18.750	RPS 36" x 0.51087"	Reinf 35.89 ksi (36 ksi)	
L5	60.000-30.000	30.000	RPS 42" x 0.58495"	Reinf 34.38 ksi (34 ksi)	
L6	30.000-13.750	16.250	RPS 42" x 0.65547"	Reinf 37.38 ksi (37 ksi)	
L7	13.750-7.000	6.750	RPS 42" x	Reinf 35.67	

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L8	7.000-4.000	3.000	0.76406" RPS 42" x 0.78444"	ksi (36 ksi) Reinf 35.63 ksi (36 ksi)	
L9	4.000-0.000	4.000	RPS 42" x 0.93531"	Reinf 35.35 ksi (35 ksi)	

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	Gusset Grade	Adjust. Factor A _r	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 150.000-120.000				1	1	1		
L2 120.000-90.000				1	1	1		
L3 90.000-78.750				1	1	1		
L4 78.750-60.000				1	1	1		
L5 60.000-30.000				1	1	1		
L6 30.000-13.750				1	1	1		
L7 13.750-7.000				1	1	1		
L8 7.000-4.000				1	1	1		
L9 4.000-0.000				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight plf
HB114-1-08U4-M5J(1 1/4")	C	No	CaAa (Out Of Face)	146.000 - 0.000	2	No Ice	0.000	1.08
						1/2" Ice	0.000	2.33
						1" Ice	0.000	4.18
						2" Ice	0.000	9.73
						4" Ice	0.000	28.15
HB114-1-08U4-M5J(1 1/4")	C	No	CaAa (Out Of Face)	146.000 - 0.000	1	No Ice	0.154	1.08
						1/2" Ice	0.254	2.33
						1" Ice	0.354	4.18
						2" Ice	0.554	9.73
						4" Ice	0.954	28.15

MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	C	No	CaAa (Out Of Face)	138.000 - 0.000	1	No Ice	0.163	1.07
						1/2" Ice	0.263	2.37
						1" Ice	0.362	4.28
						2" Ice	0.562	9.93
						4" Ice	0.962	28.56
AL7-50(1 5/8)	C	No	Inside Pole	138.000 - 0.000	6	No Ice	0.000	0.52
						1/2" Ice	0.000	0.52
						1" Ice	0.000	0.52
						2" Ice	0.000	0.52
						4" Ice	0.000	0.52

LDF5-50A(7/8")	C	No	Inside Pole	122.000 - 0.000	12	No Ice	0.000	0.33
						1/2" Ice	0.000	0.33
						1" Ice	0.000	0.33

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C _A A _A		Weight
						ft ² /ft	plf	
FB-L98B-002-75000(3/8")	C	No	Inside Pole	122.000 - 0.000	1	2" Ice	0.000	0.33
						4" Ice	0.000	0.33
						No Ice	0.000	0.06
						1/2" Ice	0.000	0.06
						1" Ice	0.000	0.06
WR-VG86ST-BRD(3/4)	C	No	Inside Pole	122.000 - 0.000	2	2" Ice	0.000	0.06
						4" Ice	0.000	0.06
						No Ice	0.000	0.59
						1/2" Ice	0.000	0.59
						1" Ice	0.000	0.59
2" Conduit	C	No	Inside Pole	122.000 - 0.000	2	2" Ice	0.000	0.59
						4" Ice	0.000	0.59
						No Ice	0.000	1.16
						1/2" Ice	0.000	1.16
						1" Ice	0.000	1.16
***** LDF4-50A(1/2")	C	No	Inside Pole	13.000 - 0.000	1	2" Ice	0.000	1.16
						4" Ice	0.000	1.16
						No Ice	0.000	0.15
						1/2" Ice	0.000	0.15
						1" Ice	0.000	0.15
***** LDF4-50A(1/2")	C	No	Inside Pole	12.000 - 0.000	1	2" Ice	0.000	0.15
						4" Ice	0.000	0.15
						No Ice	0.000	0.15
						1/2" Ice	0.000	0.15
						1" Ice	0.000	0.15
***** 1" Flat Reinforcement	C	No	CaAa (Out Of Face)	80.250 - 60.000	1	2" Ice	0.611	0.00
						4" Ice	1.056	0.00
						No Ice	0.167	0.00
						1/2" Ice	0.278	0.00
						1" Ice	0.389	0.00
***** 1" Flat Reinforcement	C	No	CaAa (Out Of Face)	30.000 - 0.000	1	2" Ice	0.611	0.00
						4" Ice	1.056	0.00
						No Ice	0.167	0.00
						1/2" Ice	0.278	0.00
						1" Ice	0.389	0.00
***** 1 1/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	60.000 - 30.000	1	2" Ice	0.653	0.00
						4" Ice	1.097	0.00
						No Ice	0.208	0.00
						1/2" Ice	0.319	0.00
						1" Ice	0.431	0.00

Feed Line/Linear Appurtenances Section Areas

Tower Sectio n	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	150.000-120.000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	6.929	0.17
L2	120.000-90.000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	9.495	0.45
L3	90.000-78.750	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.811	0.17
L4	78.750-60.000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	9.059	0.28
L5	60.000-30.000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation	Face	A_R	A_F	C_{AA} In Face	C_{AA} Out Face	Weight
n	ft		ft ²	ft ²	ft ²	ft ²	K
L6	30.000-13.750	C	0.000	0.000	0.000	15.745	0.45
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
L7	13.750-7.000	C	0.000	0.000	0.000	7.851	0.24
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
L8	7.000-4.000	C	0.000	0.000	0.000	3.261	0.10
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
L9	4.000-0.000	C	0.000	0.000	0.000	1.449	0.05
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.933	0.06

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation	Face or Leg	Ice Thickness	A_R	A_F	C_{AA} In Face	C_{AA} Out Face	Weight
n	ft		in	ft ²	ft ²	ft ²	ft ²	K
L1	150.000-120.000	A	1.184	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	17.350	0.57
L2	120.000-90.000	A	1.149	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	23.283	0.92
L3	90.000-78.750	A	1.119	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	9.220	0.34
L4	78.750-60.000	A	1.093	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	21.814	0.55
L5	60.000-30.000	A	1.038	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	35.120	0.85
L6	30.000-13.750	A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	17.963	0.45
L7	13.750-7.000	A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	7.461	0.19
L8	7.000-4.000	A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	3.316	0.08
L9	4.000-0.000	A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	4.422	0.11

Feed Line Center of Pressure

Section	Elevation	CP_x	CP_z	CP_x Ice	CP_z Ice
	ft	in	in	in	in
L1	150.000-120.000	-0.269	0.155	-0.541	0.313
L2	120.000-90.000	-0.365	0.211	-0.727	0.420
L3	90.000-78.750	-0.395	0.228	-0.797	0.460
L4	78.750-60.000	-0.541	0.312	-1.043	0.602
L5	60.000-30.000	-0.593	0.342	-1.099	0.634
L6	30.000-13.750	-0.552	0.318	-1.053	0.608
L7	13.750-7.000	-0.552	0.318	-1.053	0.608
L8	7.000-4.000	-0.552	0.318	-1.053	0.608
L9	4.000-0.000	-0.552	0.318	-1.053	0.608

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
800MHz 2X50W RRH W/FILTER	A	From Leg	2.000	0.00	148.000	No Ice	2.401	2.254	0.06
			0.00			1/2"	2.613	2.460	0.09
			1.00			Ice	2.833	2.675	0.11
						1" Ice	3.300	3.132	0.17
						2" Ice	4.337	4.148	0.34
800MHz 2X50W RRH W/FILTER	B	From Leg	2.000	0.00	148.000	No Ice	2.401	2.254	0.06
			0.00			1/2"	2.613	2.460	0.09
			1.00			Ice	2.833	2.675	0.11
						1" Ice	3.300	3.132	0.17
						2" Ice	4.337	4.148	0.34
800MHz 2X50W RRH W/FILTER	C	From Leg	2.000	0.00	148.000	No Ice	2.401	2.254	0.06
			0.00			1/2"	2.613	2.460	0.09
			1.00			Ice	2.833	2.675	0.11
						1" Ice	3.300	3.132	0.17
						2" Ice	4.337	4.148	0.34
PCS 1900MHz 4x45W- 65MHz	A	From Leg	2.000	0.00	148.000	No Ice	2.709	2.611	0.06
			0.00			1/2"	2.948	2.847	0.08
			1.00			Ice	3.195	3.092	0.11
						1" Ice	3.716	3.608	0.17
						2" Ice	4.862	4.744	0.35
PCS 1900MHz 4x45W- 65MHz	B	From Leg	2.000	0.00	148.000	No Ice	2.709	2.611	0.06
			0.00			1/2"	2.948	2.847	0.08
			1.00			Ice	3.195	3.092	0.11
						1" Ice	3.716	3.608	0.17
						2" Ice	4.862	4.744	0.35
PCS 1900MHz 4x45W- 65MHz	C	From Leg	2.000	0.00	148.000	No Ice	2.709	2.611	0.06
			0.00			1/2"	2.948	2.847	0.08
			1.00			Ice	3.195	3.092	0.11
						1" Ice	3.716	3.608	0.17
						2" Ice	4.862	4.744	0.35
Side Arm Mount [SO 102- 3]	C	None		0.00	148.000	No Ice	3.000	3.000	0.08
						1/2"	3.480	3.480	0.11
						Ice	3.960	3.960	0.14
						1" Ice	4.920	4.920	0.20
						2" Ice	6.840	6.840	0.32
					4" Ice				
***** APXV9ERR18-C-A20 w/ Mount Pipe	A	From Leg	4.000	0.00	146.000	No Ice	8.498	7.471	0.09
			0.00			1/2"	9.149	8.656	0.16
			2.00			Ice	9.767	9.556	0.24
						1" Ice	11.031	11.388	0.42
						2" Ice	13.679	15.527	0.94
APXVSP18-C-A20 w/ Mount Pipe	B	From Leg	4.000	0.00	146.000	No Ice	8.498	6.946	0.08
			0.00			1/2"	9.149	8.127	0.15
			2.00			Ice	9.767	9.021	0.23
						1" Ice	11.031	10.844	0.41
						2" Ice	13.679	14.851	0.91
APXVSP18-C-A20 w/ Mount Pipe	C	From Leg	4.000	0.00	146.000	No Ice	8.498	6.946	0.08
			0.00			1/2"	9.149	8.127	0.15
			2.00			Ice	9.767	9.021	0.23
						1" Ice	11.031	10.844	0.41

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
			Horz Lateral ft	Vert ft						
							2" Ice 4" Ice	13.679	14.851	0.91
(2) 2.375" OD x 5' Mount Pipe	A	From Leg	4.000	0.00	0.00	146.000	No Ice	1.188	1.188	0.02
							1/2" Ice	1.496	1.496	0.03
							1" Ice	1.807	1.807	0.04
							2" Ice	2.458	2.458	0.08
							4" Ice	3.919	3.919	0.20
(2) 2.375" OD x 5' Mount Pipe	B	From Leg	4.000	0.00	0.00	146.000	No Ice	1.188	1.188	0.02
							1/2" Ice	1.496	1.496	0.03
							1" Ice	1.807	1.807	0.04
							2" Ice	2.458	2.458	0.08
							4" Ice	3.919	3.919	0.20
(2) 2.375" OD x 5' Mount Pipe	C	From Leg	4.000	0.00	0.00	146.000	No Ice	1.188	1.188	0.02
							1/2" Ice	1.496	1.496	0.03
							1" Ice	1.807	1.807	0.04
							2" Ice	2.458	2.458	0.08
							4" Ice	3.919	3.919	0.20
Platform Mount [LP 502-1]	C	None			0.00	146.000	No Ice	32.347	32.347	0.93
							1/2" Ice	45.668	45.668	1.19
							1" Ice	58.988	58.988	1.46
							2" Ice	85.629	85.629	2.00
							4" Ice	138.911	138.911	3.07

ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.000	0.00	0.00	138.000	No Ice	6.825	5.642	0.11
							1/2" Ice	7.347	6.480	0.17
							1" Ice	7.863	7.257	0.23
							2" Ice	8.926	8.864	0.38
							4" Ice	11.175	12.293	0.81
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.000	0.00	0.00	138.000	No Ice	6.825	5.642	0.11
							1/2" Ice	7.347	6.480	0.17
							1" Ice	7.863	7.257	0.23
							2" Ice	8.926	8.864	0.38
							4" Ice	11.175	12.293	0.81
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.000	0.00	0.00	138.000	No Ice	6.825	5.642	0.11
							1/2" Ice	7.347	6.480	0.17
							1" Ice	7.863	7.257	0.23
							2" Ice	8.926	8.864	0.38
							4" Ice	11.175	12.293	0.81
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.000	0.00	0.00	138.000	No Ice	6.815	5.633	0.11
							1/2" Ice	7.337	6.472	0.17
							1" Ice	7.853	7.248	0.23
							2" Ice	8.916	8.854	0.38
							4" Ice	11.165	12.280	0.81
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	4.000	0.00	0.00	138.000	No Ice	6.815	5.633	0.11
							1/2" Ice	7.337	6.472	0.17
							1" Ice	7.853	7.248	0.23
							2" Ice	8.916	8.854	0.38
							4" Ice	11.165	12.280	0.81
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	4.000	0.00	0.00	138.000	No Ice	6.815	5.633	0.11
							1/2" Ice	7.337	6.472	0.17
							1" Ice	7.853	7.248	0.23
							2" Ice	8.916	8.854	0.38
							4" Ice	11.165	12.280	0.81
KRY 112 144/1	A	From Leg	4.000	0.00	0.00	138.000	No Ice	0.408	0.204	0.01
							1/2" Ice	0.497	0.273	0.01

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K	
			0.00			Ice	0.594	0.351	0.02
						1" Ice	0.815	0.533	0.03
						2" Ice	1.359	0.999	0.08
						4" Ice			
KRY 112 144/1	B	From Leg	4.000	0.00	138.000	No Ice	0.408	0.204	0.01
			0.00			1/2"	0.497	0.273	0.01
			0.00			Ice	0.594	0.351	0.02
						1" Ice	0.815	0.533	0.03
						2" Ice	1.359	0.999	0.08
						4" Ice			
KRY 112 144/1	C	From Leg	4.000	0.00	138.000	No Ice	0.408	0.204	0.01
			0.00			1/2"	0.497	0.273	0.01
			0.00			Ice	0.594	0.351	0.02
						1" Ice	0.815	0.533	0.03
						2" Ice	1.359	0.999	0.08
						4" Ice			
LNx-6515DS-VTM w/ Mount Pipe	A	From Leg	4.000	0.00	138.000	No Ice	11.683	9.842	0.08
			0.00			1/2"	12.404	11.366	0.17
			0.00			Ice	13.135	12.914	0.27
						1" Ice	14.601	15.267	0.51
						2" Ice	17.875	20.139	1.15
						4" Ice			
LNx-6515DS-VTM w/ Mount Pipe	B	From Leg	4.000	0.00	138.000	No Ice	11.683	9.842	0.08
			0.00			1/2"	12.404	11.366	0.17
			0.00			Ice	13.135	12.914	0.27
						1" Ice	14.601	15.267	0.51
						2" Ice	17.875	20.139	1.15
						4" Ice			
LNx-6515DS-VTM w/ Mount Pipe	C	From Leg	4.000	0.00	138.000	No Ice	11.683	9.842	0.08
			0.00			1/2"	12.404	11.366	0.17
			0.00			Ice	13.135	12.914	0.27
						1" Ice	14.601	15.267	0.51
						2" Ice	17.875	20.139	1.15
						4" Ice			
RRUS 11 B12	A	From Leg	4.000	0.00	138.000	No Ice	3.306	1.361	0.05
			0.00			1/2"	3.550	1.540	0.07
			0.00			Ice	3.802	1.728	0.10
						1" Ice	4.334	2.130	0.15
						2" Ice	5.501	3.038	0.31
						4" Ice			
RRUS 11 B12	B	From Leg	4.000	0.00	138.000	No Ice	3.306	1.361	0.05
			0.00			1/2"	3.550	1.540	0.07
			0.00			Ice	3.802	1.728	0.10
						1" Ice	4.334	2.130	0.15
						2" Ice	5.501	3.038	0.31
						4" Ice			
RRUS 11 B12	C	From Leg	4.000	0.00	138.000	No Ice	3.306	1.361	0.05
			0.00			1/2"	3.550	1.540	0.07
			0.00			Ice	3.802	1.728	0.10
						1" Ice	4.334	2.130	0.15
						2" Ice	5.501	3.038	0.31
						4" Ice			
Platform Mount [LP 1201-1]	C	None		0.00	138.000	No Ice	23.100	23.100	2.10
						1/2"	26.800	26.800	2.50
						Ice	30.500	30.500	2.90
						1" Ice	37.900	37.900	3.70
						2" Ice	52.700	52.700	5.30
						4" Ice			

RRUS 11	A	From Leg	2.000	0.00	124.000	No Ice	3.256	1.379	0.05
			0.00			1/2"	3.498	1.558	0.07
			0.00			Ice	3.749	1.745	0.10
						1" Ice	4.277	2.146	0.15
						2" Ice	5.435	3.050	0.31
						4" Ice			

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
RRUS 11	B	From Leg	2.000 0.00 0.00	0.00	124.000	No Ice	3.256	1.379	0.05
						1/2" Ice	3.498	1.558	0.07
						Ice	3.749	1.745	0.10
						1" Ice	4.277	2.146	0.15
						2" Ice	5.435	3.050	0.31
						4" Ice			
RRUS 11	C	From Leg	2.000 0.00 0.00	0.00	124.000	No Ice	3.256	1.379	0.05
						1/2" Ice	3.498	1.558	0.07
						Ice	3.749	1.745	0.10
						1" Ice	4.277	2.146	0.15
						2" Ice	5.435	3.050	0.31
						4" Ice			
Side Arm Mount [SO 102-3]	C	None		0.00	124.000	No Ice	3.000	3.000	0.08
						1/2" Ice	3.480	3.480	0.11
						Ice	3.960	3.960	0.14
						1" Ice	4.920	4.920	0.20
						2" Ice	6.840	6.840	0.32
						4" Ice			

(2) 7770.00 w/ Mount Pipe	A	From Leg	4.000 0.00 1.00	0.00	122.000	No Ice	6.221	4.820	0.09
						1/2" Ice	6.714	5.508	0.14
						Ice	7.218	6.213	0.21
						1" Ice	8.257	7.672	0.36
						2" Ice	10.476	11.061	0.76
						4" Ice			
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.000 0.00 1.00	0.00	122.000	No Ice	6.221	4.820	0.09
						1/2" Ice	6.714	5.508	0.14
						Ice	7.218	6.213	0.21
						1" Ice	8.257	7.672	0.36
						2" Ice	10.476	11.061	0.76
						4" Ice			
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.000 0.00 1.00	0.00	122.000	No Ice	6.221	4.820	0.09
						1/2" Ice	6.714	5.508	0.14
						Ice	7.218	6.213	0.21
						1" Ice	8.257	7.672	0.36
						2" Ice	10.476	11.061	0.76
						4" Ice			
AM-X-CD-14-65-00T-RET w/ Mount Pipe	A	From Leg	4.000 0.00 1.00	0.00	122.000	No Ice	5.744	4.015	0.05
						1/2" Ice	6.198	4.633	0.10
						Ice	6.661	5.276	0.15
						1" Ice	7.618	6.678	0.27
						2" Ice	9.668	9.744	0.63
						4" Ice			
P65-17-XLH-RR w/ Mount Pipe	B	From Leg	4.000 0.00 1.00	0.00	122.000	No Ice	11.823	9.056	0.09
						1/2" Ice	12.594	10.619	0.18
						Ice	13.375	12.205	0.28
						1" Ice	14.940	14.697	0.51
						2" Ice	18.334	19.643	1.14
						4" Ice			
AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Leg	4.000 0.00 1.00	0.00	122.000	No Ice	8.498	6.304	0.07
						1/2" Ice	9.149	7.479	0.14
						Ice	9.767	8.368	0.21
						1" Ice	11.031	10.179	0.38
						2" Ice	13.679	14.024	0.87
						4" Ice			
(4) LGP2140X	A	From Leg	4.000 0.00 1.00	0.00	122.000	No Ice	1.260	0.378	0.01
						1/2" Ice	1.416	0.493	0.02
						Ice	1.581	0.617	0.03
						1" Ice	1.936	0.890	0.05
						2" Ice	2.750	1.541	0.13
						4" Ice			
(4) LGP2140X	B	From Leg	4.000 0.00 1.00	0.00	122.000	No Ice	1.260	0.378	0.01
						1/2" Ice	1.416	0.493	0.02
						Ice	1.581	0.617	0.03
						1" Ice	1.936	0.890	0.05
						2" Ice			
						4" Ice			

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
(4) LGP2140X	C	From Leg	4.000 0.00 1.00	0.00	122.000	2" Ice	2.750	1.541	0.13
						4" Ice			
						No Ice	1.260	0.378	0.01
						1/2" Ice	1.416	0.493	0.02
						1" Ice	1.581	0.617	0.03
DC6-48-60-18-8F	A	From Leg	4.000 0.00 1.00	0.00	122.000	2" Ice	2.750	1.541	0.13
						4" Ice			
						No Ice	1.467	1.467	0.02
						1/2" Ice	1.667	1.667	0.04
						1" Ice	1.878	1.878	0.06
T-Arm Mount [TA 602-3]	C	None		0.00	122.000	1" Ice	2.333	2.333	0.11
						2" Ice	3.378	3.378	0.24
						4" Ice			
						No Ice	11.590	11.590	0.77
						1/2" Ice	15.440	15.440	0.99
***** KS24019-L112A	A	From Leg	1.000 0.00 1.00	0.00	13.000	Ice	19.290	19.290	1.21
						1" Ice	26.990	26.990	1.64
						2" Ice	42.390	42.390	2.50
						4" Ice			
						No Ice	0.156	0.156	0.01
Pipe Mount [PM 601-1]	A	None		0.00	13.000	1/2" Ice	0.225	0.225	0.01
						Ice	0.302	0.302	0.01
						1" Ice	0.484	0.484	0.02
						2" Ice	0.951	0.951	0.06
						4" Ice			
***** KS24019-L112A	A	From Leg	1.000 0.00 1.00	0.00	12.000	No Ice	3.000	0.900	0.07
						1/2" Ice	3.740	1.120	0.08
						Ice	4.480	1.340	0.09
						1" Ice	5.960	1.780	0.12
						2" Ice	8.920	2.660	0.18
Pipe Mount [PM 601-1]	A	None		0.00	12.000	4" Ice			
						No Ice	3.000	0.900	0.07
						1/2" Ice	3.740	1.120	0.08
						Ice	4.480	1.340	0.09
						1" Ice	5.960	1.780	0.12
*** Bridge Stiffener (138.5" x 15.5" x 1.25")	C	None		0.00	30.000	2" Ice	8.920	2.660	0.18
						4" Ice			
						No Ice	2.405	21.833	0.55
						1/2" Ice	3.705	22.711	0.63
						Ice	5.017	23.597	0.72
Bridge Stiffener (138.5" x 15.5" x 1.25")	C	None		0.00	60.000	1" Ice	7.679	25.390	0.94
						2" Ice	12.461	29.133	1.50
						4" Ice			
						No Ice	2.405	21.833	0.55
						1/2" Ice	3.705	22.711	0.63
	Ice	5.017	23.597	0.72					
	1" Ice	7.679	25.390	0.94					
	2" Ice	12.461	29.133	1.50					
	4" Ice								

Tower Pressures - No Ice

$G_H = 1.690$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft ²	Face	A_F ft ²	A_R ft ²	A_{leg} ft ²	Leg %	C_{AA} In Face ft ²	C_{AA} Out Face ft ²
L1 150.000-120.000	135.000	1.496	24.50	60.000	A	0.000	60.000	60.000	100.00	0.000	0.000
					B	0.000	60.000	100.00	0.000	0.000	
					C	0.000	60.000	100.00	0.000	6.929	
L2 120.000-90.000	105.000	1.392	22.81	75.000	A	0.000	75.000	75.000	100.00	0.000	0.000
					B	0.000	75.000	100.00	0.000	0.000	
					C	0.000	75.000	100.00	0.000	9.495	
L3 90.000-78.750	84.375	1.308	21.42	33.750	A	0.000	33.750	33.750	100.00	0.000	0.000
					B	0.000	33.750	100.00	0.000	0.000	
					C	0.000	33.750	100.00	0.000	3.811	
L4 78.750-60.000	69.375	1.237	20.26	56.250	A	0.000	56.250	56.250	100.00	0.000	0.000
					B	0.000	56.250	100.00	0.000	0.000	
					C	0.000	56.250	100.00	0.000	9.059	
L5 60.000-30.000	45.000	1.093	17.90	105.000	A	0.000	105.000	105.000	100.00	0.000	0.000
					B	0.000	105.000	100.00	0.000	0.000	
					C	0.000	105.000	100.00	0.000	15.745	
L6 30.000-13.750	21.875	1	16.38	56.875	A	0.000	56.875	56.875	100.00	0.000	0.000
					B	0.000	56.875	100.00	0.000	0.000	
					C	0.000	56.875	100.00	0.000	7.851	
L7 13.750-7.000	10.375	1	16.38	23.625	A	0.000	23.625	23.625	100.00	0.000	0.000
					B	0.000	23.625	100.00	0.000	0.000	
					C	0.000	23.625	100.00	0.000	3.261	
L8 7.000-4.000	5.500	1	16.38	10.500	A	0.000	10.500	10.500	100.00	0.000	0.000
					B	0.000	10.500	100.00	0.000	0.000	
					C	0.000	10.500	100.00	0.000	1.449	
L9 4.000-0.000	2.000	1	16.38	14.000	A	0.000	14.000	14.000	100.00	0.000	0.000
					B	0.000	14.000	100.00	0.000	0.000	
					C	0.000	14.000	100.00	0.000	1.933	

Tower Pressure - With Ice

$G_H = 1.690$

Section Elevation ft	z ft	K_Z	q_z psf	t_z in	A_G ft ²	Face	A_F ft ²	A_R ft ²	A_{leg} ft ²	Leg %	C_{AA} In Face ft ²	C_{AA} Out Face ft ²
L1 150.000-120.000	135.000	1.496	5.41	1.184	65.921	A	0.000	65.921	65.921	100.00	0.000	0.000
						B	0.000	65.921	100.00	0.000	0.000	
						C	0.000	65.921	100.00	0.000	17.350	
L2 120.000-90.000	105.000	1.392	5.04	1.149	80.745	A	0.000	80.745	80.745	100.00	0.000	0.000
						B	0.000	80.745	100.00	0.000	0.000	
						C	0.000	80.745	100.00	0.000	23.283	
L3 90.000-78.750	84.375	1.308	4.73	1.119	35.849	A	0.000	35.849	35.849	100.00	0.000	0.000
						B	0.000	35.849	100.00	0.000	0.000	
						C	0.000	35.849	100.00	0.000	9.220	
L4 78.750-60.000	69.375	1.237	4.48	1.093	59.666	A	0.000	59.666	59.666	100.00	0.000	0.000
						B	0.000	59.666	100.00	0.000	0.000	
						C	0.000	59.666	100.00	0.000	21.814	
L5 60.000-30.000	45.000	1.093	3.95	1.038	110.190	A	0.000	110.190	110.190	100.00	0.000	0.000
						B	0.000	110.190	100.00	0.000	0.000	
						C	0.000	110.190	100.00	0.000	35.120	
L6 30.000-13.750	21.875	1	3.62	1.000	59.583	A	0.000	59.583	59.583	100.00	0.000	0.000
						B	0.000	59.583	100.00	0.000	0.000	
						C	0.000	59.583	100.00	0.000	17.963	
L7 13.750-7.000	10.375	1	3.62	1.000	24.750	A	0.000	24.750	24.750	100.00	0.000	0.000
						B	0.000	24.750	100.00	0.000	0.000	
						C	0.000	24.750	100.00	0.000	7.461	
L8 7.000-4.000	5.500	1	3.62	1.000	11.000	A	0.000	11.000	100.00	0.000	0.000	

Section Elevation ft	z ft	K _z	q _z psf	t _z in	A _G ft ²	F a c e A B C	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _{AA} In Face ft ²	C _{AA} Out Face ft ²
L9 4.000-0.000	2.000	1	3.62	1.000	14.667	B	0.000	11.000	14.667	100.00	0.000	0.000
						C	0.000	11.000		100.00	0.000	3.316
						A	0.000	14.667		100.00	0.000	0.000
						B	0.000	14.667		100.00	0.000	0.000
						C	0.000	14.667	100.00	0.000	4.422	

Tower Pressure - Service

$G_H = 1.690$

Section Elevation ft	z ft	K _z	q _z psf	A _G ft ²	F a c e A B C	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _{AA} In Face ft ²	C _{AA} Out Face ft ²
L1 150.000-120.000	135.000	1.496	9.57	60.000	A	0.000	60.000	60.000	100.00	0.000	0.000
					B	0.000	60.000	100.00	0.000	0.000	
					C	0.000	60.000	100.00	0.000	6.929	
L2 120.000-90.000	105.000	1.392	8.91	75.000	A	0.000	75.000	75.000	100.00	0.000	0.000
					B	0.000	75.000	100.00	0.000	0.000	
					C	0.000	75.000	100.00	0.000	9.495	
L3 90.000-78.750	84.375	1.308	8.37	33.750	A	0.000	33.750	33.750	100.00	0.000	0.000
					B	0.000	33.750	100.00	0.000	0.000	
					C	0.000	33.750	100.00	0.000	3.811	
L4 78.750-60.000	69.375	1.237	7.91	56.250	A	0.000	56.250	56.250	100.00	0.000	0.000
					B	0.000	56.250	100.00	0.000	0.000	
					C	0.000	56.250	100.00	0.000	9.059	
L5 60.000-30.000	45.000	1.093	6.99	105.000	A	0.000	105.000	105.000	100.00	0.000	0.000
					B	0.000	105.000	100.00	0.000	0.000	
					C	0.000	105.000	100.00	0.000	15.745	
L6 30.000-13.750	21.875	1	6.40	56.875	A	0.000	56.875	56.875	100.00	0.000	0.000
					B	0.000	56.875	100.00	0.000	0.000	
					C	0.000	56.875	100.00	0.000	7.851	
L7 13.750-7.000	10.375	1	6.40	23.625	A	0.000	23.625	23.625	100.00	0.000	0.000
					B	0.000	23.625	100.00	0.000	0.000	
					C	0.000	23.625	100.00	0.000	3.261	
L8 7.000-4.000	5.500	1	6.40	10.500	A	0.000	10.500	10.500	100.00	0.000	0.000
					B	0.000	10.500	100.00	0.000	0.000	
					C	0.000	10.500	100.00	0.000	1.449	
L9 4.000-0.000	2.000	1	6.40	14.000	A	0.000	14.000	14.000	100.00	0.000	0.000
					B	0.000	14.000	100.00	0.000	0.000	
					C	0.000	14.000	100.00	0.000	1.933	

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

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	150 - 120	Pole	Max Tension	5	0.00	0.00	0.00
			Max. Compression	14	-17.40	0.13	-0.42
			Max. Mx	11	-8.06	215.70	-0.01
			Max. My	8	-8.07	-0.01	-215.01
			Max. Vy	11	-13.51	215.70	-0.01
			Max. Vx	8	13.46	-0.01	-215.01
			Max. Torque	9			0.56
L2	120 - 90	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-23.19	0.78	-0.80
			Max. Mx	11	-12.20	653.55	0.21
			Max. My	8	-12.20	-0.18	-651.17
			Max. Vy	11	-15.63	653.55	0.21
			Max. Vx	8	15.57	-0.18	-651.17
			Max. Torque	9			0.56
L3	90 - 78.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-25.71	1.07	-0.96
			Max. Mx	11	-14.04	834.18	0.29
			Max. My	8	-14.04	-0.24	-831.16
			Max. Vy	11	-16.48	834.18	0.29
			Max. Vx	8	16.42	-0.24	-831.16
			Max. Torque	10			0.53
L4	78.75 - 60	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-30.83	1.52	-1.23
			Max. Mx	11	-18.08	1156.59	0.42
			Max. My	8	-18.08	-0.33	-1152.50
			Max. Vy	11	-17.89	1156.59	0.42
			Max. Vx	8	17.84	-0.33	-1152.50
			Max. Torque	10			0.53
L5	60 - 30	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-41.82	2.32	-1.68
			Max. Mx	11	-27.03	1749.60	0.61
			Max. My	8	-27.03	-0.44	-1743.80
			Max. Vy	11	-20.86	1749.60	0.61
			Max. Vx	8	20.80	-0.44	-1743.80
			Max. Torque	10			0.52
L6	30 - 13.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-48.55	2.72	-1.92
			Max. Mx	11	-32.70	2106.28	0.71

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L7	13.75 - 7	Pole	Max. My	8	-32.70	-0.50	-2099.56
			Max. Vy	11	-22.41	2106.28	0.71
			Max. Vx	8	22.36	-0.50	-2099.56
			Max. Torque	11			0.54
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-51.57	2.89	-1.96
			Max. Mx	11	-35.29	2259.79	0.78
			Max. My	8	-35.29	-0.52	-2252.67
			Max. Vy	11	-22.96	2259.79	0.78
			Max. Vx	8	22.91	-0.52	-2252.67
L8	7 - 4	Pole	Max. Torque	11			0.54
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-52.85	2.97	-2.01
			Max. Mx	11	-36.41	2328.90	0.80
			Max. My	8	-36.41	-0.53	-2321.61
			Max. Vy	11	-23.12	2328.90	0.80
			Max. Vx	8	23.06	-0.53	-2321.61
			Max. Torque	11			0.53
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-54.82	3.07	-2.06
L9	4 - 0	Pole	Max. Mx	11	-38.16	2421.79	0.83
			Max. My	8	-38.16	-0.54	-2414.28
			Max. Vy	11	-23.33	2421.79	0.83
			Max. Vx	8	23.28	-0.54	-2414.28
			Max. Torque	11			0.54

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	54.82	-0.00	0.00
	Max. H _x	11	38.16	23.32	0.01
	Max. H _z	2	38.16	0.01	23.27
	Max. M _x	2	2413.39	0.01	23.27
	Max. M _z	5	2420.34	-23.32	-0.01
	Max. Torsion	11	0.54	23.32	0.01
	Min. Vert	11	38.16	23.32	0.01
	Min. H _x	5	38.16	-23.32	-0.01
	Min. H _z	8	38.16	-0.01	-23.27
	Min. M _x	8	-2414.28	-0.01	-23.27
	Min. M _z	11	-2421.79	23.32	0.01
	Min. Torsion	5	-0.54	-23.32	-0.01

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturing Moment, M _x kip-ft	Overturing Moment, M _z kip-ft	Torque kip-ft
Dead Only	38.16	-0.00	0.00	0.43	0.70	0.00
Dead+Wind 0 deg - No Ice	38.16	-0.01	-23.27	-2413.39	1.99	0.07
Dead+Wind 30 deg - No Ice	38.16	11.65	-20.15	-2089.58	-1208.84	0.33
Dead+Wind 60 deg - No Ice	38.16	20.19	-11.63	-1205.50	-2095.57	0.50
Dead+Wind 90 deg - No Ice	38.16	23.32	0.01	1.71	-2420.34	0.54
Dead+Wind 120 deg - No Ice	38.16	20.20	11.64	1208.57	-2096.83	0.44
Dead+Wind 150 deg - No Ice	38.16	11.67	20.16	2091.73	-1211.04	0.21
Dead+Wind 180 deg - No Ice	38.16	0.01	23.27	2414.28	-0.54	-0.07
Dead+Wind 210 deg - No Ice	38.16	-11.65	20.15	2090.46	1210.29	-0.33
Dead+Wind 240 deg - No Ice	38.16	-20.19	11.63	1206.38	2097.01	-0.50
Dead+Wind 270 deg - No Ice	38.16	-23.32	-0.01	-0.83	2421.79	-0.54
Dead+Wind 300 deg - No Ice	38.16	-20.20	-11.64	-1207.69	2098.27	-0.44

Load Combination	Vertical	Shear _x	Shear _z	Overturning Moment, M _x	Overturning Moment, M _z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 330 deg - No Ice	38.16	-11.67	-20.16	-2090.85	1212.48	-0.21
Dead+Ice+Temp	54.82	0.00	-0.00	2.06	3.07	0.00
Dead+Wind 0 deg+Ice+Temp	54.82	0.00	-6.88	-741.65	3.09	-0.08
Dead+Wind 30 deg+Ice+Temp	54.82	3.44	-5.96	-642.07	-369.13	0.05
Dead+Wind 60 deg+Ice+Temp	54.82	5.96	-3.44	-369.86	-641.56	0.17
Dead+Wind 90 deg+Ice+Temp	54.82	6.88	-0.00	2.05	-741.23	0.24
Dead+Wind 120 deg+Ice+Temp	54.82	5.96	3.44	373.99	-641.42	0.24
Dead+Wind 150 deg+Ice+Temp	54.82	3.44	5.96	646.31	-368.87	0.19
Dead+Wind 180 deg+Ice+Temp	54.82	-0.00	6.88	746.04	3.38	0.08
Dead+Wind 210 deg+Ice+Temp	54.82	-3.44	5.96	646.45	375.59	-0.05
Dead+Wind 240 deg+Ice+Temp	54.82	-5.96	3.44	374.24	648.03	-0.17
Dead+Wind 270 deg+Ice+Temp	54.82	-6.88	0.00	2.34	747.70	-0.24
Dead+Wind 300 deg+Ice+Temp	54.82	-5.96	-3.44	-369.60	647.89	-0.24
Dead+Wind 330 deg+Ice+Temp	54.82	-3.44	-5.96	-641.92	375.34	-0.19
Dead+Wind 0 deg - Service	38.16	-0.00	-9.09	-942.88	1.22	0.03
Dead+Wind 30 deg - Service	38.16	4.55	-7.87	-816.37	-471.99	0.13
Dead+Wind 60 deg - Service	38.16	7.89	-4.54	-470.86	-818.54	0.20
Dead+Wind 90 deg - Service	38.16	9.11	0.00	0.94	-945.43	0.21
Dead+Wind 120 deg - Service	38.16	7.89	4.55	472.60	-819.04	0.17
Dead+Wind 150 deg - Service	38.16	4.56	7.87	817.75	-472.85	0.08
Dead+Wind 180 deg - Service	38.16	0.00	9.09	943.76	0.23	-0.03
Dead+Wind 210 deg - Service	38.16	-4.55	7.87	817.25	473.44	-0.13
Dead+Wind 240 deg - Service	38.16	-7.89	4.54	471.74	819.99	-0.20
Dead+Wind 270 deg - Service	38.16	-9.11	-0.00	-0.05	946.87	-0.21
Dead+Wind 300 deg - Service	38.16	-7.89	-4.55	-471.72	820.48	-0.17
Dead+Wind 330 deg - Service	38.16	-4.56	-7.87	-816.87	474.30	-0.08

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-38.16	0.00	0.00	38.16	-0.00	0.000%
2	-0.01	-38.16	-23.27	0.01	38.16	23.27	0.005%
3	11.65	-38.16	-20.15	-11.65	38.16	20.15	0.000%
4	20.19	-38.16	-11.63	-20.19	38.16	11.63	0.000%
5	23.32	-38.16	0.01	-23.32	38.16	-0.01	0.005%
6	20.20	-38.16	11.64	-20.20	38.16	-11.64	0.000%
7	11.67	-38.16	20.16	-11.67	38.16	-20.16	0.000%
8	0.01	-38.16	23.27	-0.01	38.16	-23.27	0.005%
9	-11.65	-38.16	20.15	11.65	38.16	-20.15	0.000%
10	-20.19	-38.16	11.63	20.19	38.16	-11.63	0.000%
11	-23.32	-38.16	-0.01	23.32	38.16	0.01	0.005%
12	-20.20	-38.16	-11.64	20.20	38.16	11.64	0.000%
13	-11.67	-38.16	-20.16	11.67	38.16	20.16	0.000%
14	0.00	-54.82	0.00	-0.00	54.82	0.00	0.001%

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
15	0.00	-54.82	-6.88	-0.00	54.82	6.88	0.000%
16	3.44	-54.82	-5.96	-3.44	54.82	5.96	0.000%
17	5.96	-54.82	-3.44	-5.96	54.82	3.44	0.000%
18	6.88	-54.82	-0.00	-6.88	54.82	0.00	0.000%
19	5.96	-54.82	3.44	-5.96	54.82	-3.44	0.000%
20	3.44	-54.82	5.96	-3.44	54.82	-5.96	0.000%
21	-0.00	-54.82	6.88	0.00	54.82	-6.88	0.000%
22	-3.44	-54.82	5.96	3.44	54.82	-5.96	0.000%
23	-5.96	-54.82	3.44	5.96	54.82	-3.44	0.000%
24	-6.88	-54.82	0.00	6.88	54.82	-0.00	0.000%
25	-5.96	-54.82	-3.44	5.96	54.82	3.44	0.000%
26	-3.44	-54.82	-5.96	3.44	54.82	5.96	0.000%
27	-0.00	-38.16	-9.09	0.00	38.16	9.09	0.005%
28	4.55	-38.16	-7.87	-4.55	38.16	7.87	0.002%
29	7.89	-38.16	-4.54	-7.89	38.16	4.54	0.002%
30	9.11	-38.16	0.00	-9.11	38.16	-0.00	0.005%
31	7.89	-38.16	4.55	-7.89	38.16	-4.55	0.002%
32	4.56	-38.16	7.87	-4.56	38.16	-7.87	0.002%
33	0.00	-38.16	9.09	-0.00	38.16	-9.09	0.005%
34	-4.55	-38.16	7.87	4.55	38.16	-7.87	0.002%
35	-7.89	-38.16	4.54	7.89	38.16	-4.54	0.002%
36	-9.11	-38.16	-0.00	9.11	38.16	0.00	0.005%
37	-7.89	-38.16	-4.55	7.89	38.16	4.55	0.002%
38	-4.56	-38.16	-7.87	4.56	38.16	7.87	0.002%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	14	0.00006318	0.00007255
3	Yes	17	0.00000001	0.00014879
4	Yes	17	0.00000001	0.00014490
5	Yes	14	0.00006317	0.00008238
6	Yes	17	0.00000001	0.00014877
7	Yes	17	0.00000001	0.00014741
8	Yes	14	0.00006318	0.00007381
9	Yes	17	0.00000001	0.00014535
10	Yes	17	0.00000001	0.00014963
11	Yes	14	0.00006317	0.00008032
12	Yes	17	0.00000001	0.00014655
13	Yes	17	0.00000001	0.00014753
14	Yes	6	0.00000001	0.00001632
15	Yes	16	0.00000001	0.00010132
16	Yes	16	0.00000001	0.00011538
17	Yes	16	0.00000001	0.00011518
18	Yes	16	0.00000001	0.00010136
19	Yes	16	0.00000001	0.00011609
20	Yes	16	0.00000001	0.00011594
21	Yes	16	0.00000001	0.00010203
22	Yes	16	0.00000001	0.00011683
23	Yes	16	0.00000001	0.00011714
24	Yes	16	0.00000001	0.00010224
25	Yes	16	0.00000001	0.00011610
26	Yes	16	0.00000001	0.00011615
27	Yes	13	0.00014752	0.00007699
28	Yes	14	0.00000001	0.00011407
29	Yes	14	0.00000001	0.00010501
30	Yes	13	0.00014752	0.00007849
31	Yes	14	0.00000001	0.00011311
32	Yes	14	0.00000001	0.00011015
33	Yes	13	0.00014752	0.00007714
34	Yes	14	0.00000001	0.00010608
35	Yes	14	0.00000001	0.00011577
36	Yes	13	0.00014751	0.00007848

37	Yes	14	0.00000001	0.00010804
38	Yes	14	0.00000001	0.00011037

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 120	26.86	36	1.59	0.00
L2	120 - 90	17.23	36	1.39	0.00
L3	90 - 78.75	9.48	36	1.01	0.00
L4	78.75 - 60	7.25	36	0.87	0.00
L5	60 - 30	4.25	36	0.64	0.00
L6	30 - 13.75	1.08	36	0.35	0.00
L7	13.75 - 7	0.22	36	0.15	0.00
L8	7 - 4	0.05	36	0.08	0.00
L9	4 - 0	0.02	36	0.04	0.00

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
148.000	800MHz 2X50W RRH W/FILTER	36	26.20	1.58	0.00	30415
146.000	APXV9ERR18-C-A20 w/ Mount Pipe	36	25.53	1.57	0.00	30415
138.000	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	36	22.89	1.52	0.00	12672
124.000	RRUS 11	36	18.43	1.42	0.00	5849
122.000	(2) 7770.00 w/ Mount Pipe	36	17.83	1.41	0.00	5454
60.000	Bridge Stiffener (138.5" x 15.5" x 1.25")	36	4.25	0.64	0.00	5490
30.000	Bridge Stiffener (138.5" x 15.5" x 1.25")	36	1.08	0.35	0.00	5302
13.000	KS24019-L112A	36	0.20	0.15	0.00	4713
12.000	KS24019-L112A	36	0.17	0.13	0.00	4759

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 120	68.64	11	4.05	0.00
L2	120 - 90	44.03	11	3.55	0.00
L3	90 - 78.75	24.24	11	2.59	0.00
L4	78.75 - 60	18.55	11	2.23	0.00
L5	60 - 30	10.87	11	1.64	0.00
L6	30 - 13.75	2.77	11	0.89	0.00
L7	13.75 - 7	0.56	11	0.40	0.00
L8	7 - 4	0.14	11	0.20	0.00
L9	4 - 0	0.04	11	0.11	0.00

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
148.000	800MHz 2X50W RRH W/FILTER	11	66.94	4.03	0.00	12008
146.000	APXV9ERR18-C-A20 w/ Mount Pipe	11	65.24	4.00	0.00	12008
138.000	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	11	58.49	3.89	0.00	5002
124.000	RRUS 11	11	47.12	3.64	0.00	2307
122.000	(2) 7770.00 w/ Mount Pipe	11	45.56	3.60	0.00	2151
60.000	Bridge Stiffener (138.5" x 15.5" x 1.25")	11	10.87	1.64	0.00	2151
30.000	Bridge Stiffener (138.5" x 15.5" x 1.25")	11	2.77	0.89	0.00	2074
13.000	KS24019-L112A	11	0.50	0.37	0.00	1843
12.000	KS24019-L112A	11	0.42	0.34	0.00	1861

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	150 - 120 (1)	P24x0.25	30.000	0.000	0.0	23.70	18.653	-8.06	442.00	0.018
L2	120 - 90 (2)	30" x 0.375"	30.000	0.000	0.0	25.07	34.901	-12.20	875.15	0.014
L3	90 - 78.75 (3)	36" x 0.375"	11.250	0.000	0.0	23.70	41.970	-14.04	994.51	0.014
L4	78.75 - 60 (4)	RPS 36" x 0.51087"	18.750	0.000	0.0	21.53	56.958	-18.08	1226.54	0.015
L5	60 - 30 (5)	RPS 42" x 0.58495"	30.000	0.000	0.0	20.63	76.107	-27.03	1569.94	0.017
L6	30 - 13.75 (6)	RPS 42" x 0.65547"	16.250	0.000	0.0	22.43	85.137	-32.70	1909.46	0.017
L7	13.75 - 7 (7)	RPS 42" x 0.76406"	6.750	0.000	0.0	21.40	98.981	-35.29	2118.40	0.017
L8	7 - 4 (8)	RPS 42" x 0.78444"	3.000	0.000	0.0	21.38	101.571	-36.41	2171.39	0.017
L9	4 - 0 (9)	RPS 42" x 0.93531"	4.000	0.000	0.0	21.21	120.663	-38.16	2559.26	0.015

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	150 - 120 (1)	P24x0.25	215.70	23.61	23.70	0.997	0.00	0.00	23.70	0.000
L2	120 - 90 (2)	30" x 0.375"	653.55	30.72	25.07	1.225	0.00	0.00	25.07	0.000
L3	90 - 78.75 (3)	36" x 0.375"	834.18	27.06	23.70	1.142	0.00	0.00	23.70	0.000
L4	78.75 - 60 (4)	RPS 36" x 0.51087"	1156.5 9	27.85	23.69	1.176	0.00	0.00	23.69	0.000
L5	60 - 30 (5)	RPS 42" x 0.58495"	1749.6 0	27.01	22.69	1.191	0.00	0.00	22.69	0.000
L6	30 - 13.75 (6)	RPS 42" x 0.65547"	2106.2 8	29.17	24.67	1.182	0.00	0.00	24.67	0.000
L7	13.75 - 7 (7)	RPS 42" x 0.76406"	2259.7 9	27.06	23.54	1.149	0.00	0.00	23.54	0.000
L8	7 - 4 (8)	RPS 42" x 0.78444"	2328.9 0	27.20	23.52	1.157	0.00	0.00	23.52	0.000
L9	4 - 0 (9)	RPS 42" x 0.93531"	2421.7 8	23.98	23.33	1.028	0.00	0.00	23.33	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	150 - 120 (1)	P24x0.25	13.51	1.45	16.80	0.086	0.35	0.02	11.90	0.002
L2	120 - 90 (2)	30" x 0.375"	15.63	0.90	16.80	0.053	0.39	0.01	15.64	0.001
L3	90 - 78.75 (3)	36" x 0.375"	16.48	0.79	16.80	0.047	0.41	0.01	11.90	0.001
L4	78.75 - 60 (4)	RPS 36" x 0.51087"	17.89	0.63	14.36	0.044	0.44	0.01	14.36	0.000
L5	60 - 30 (5)	RPS 42" x 0.58495"	20.86	0.55	13.75	0.040	0.51	0.00	13.75	0.000
L6	30 - 13.75 (6)	RPS 42" x 0.65547"	22.41	0.53	14.95	0.035	0.54	0.00	14.95	0.000
L7	13.75 - 7 (7)	RPS 42" x 0.76406"	22.96	0.46	14.27	0.033	0.53	0.00	14.27	0.000
L8	7 - 4 (8)	RPS 42" x 0.78444"	23.12	0.46	14.25	0.032	0.53	0.00	14.25	0.000
L9	4 - 0 (9)	RPS 42" x 0.93531"	23.33	0.39	14.14	0.027	0.54	0.00	14.14	0.000

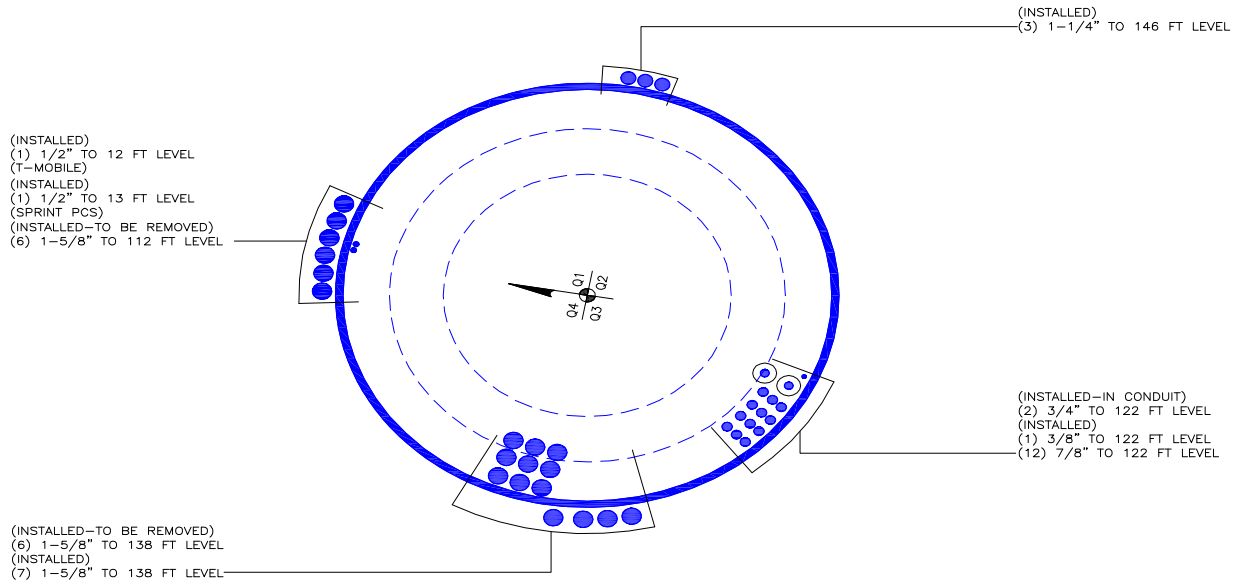
Pole Interaction Design Data

Section No.	Elevation ft	Ratio P	Ratio f_{bx}	Ratio f_{by}	Ratio f_v	Ratio f_{vt}	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		P_a	F_{bx}	F_{by}	F_v	F_{vt}			
L1	150 - 120 (1)	0.018	0.997	0.000	0.086	0.002	1.023	1.333	H1-3+VT ✓
L2	120 - 90 (2)	0.014	1.225	0.000	0.053	0.001	1.242	1.333	H1-3+VT ✓
L3	90 - 78.75 (3)	0.014	1.142	0.000	0.047	0.001	1.158	1.333	H1-3+VT ✓
L4	78.75 - 60 (4)	0.015	1.176	0.000	0.044	0.000	1.193	1.333	H1-3+VT ✓
L5	60 - 30 (5)	0.017	1.191	0.000	0.040	0.000	1.209	1.333	H1-3+VT ✓
L6	30 - 13.75 (6)	0.017	1.182	0.000	0.035	0.000	1.201	1.333	H1-3+VT ✓
L7	13.75 - 7 (7)	0.017	1.149	0.000	0.033	0.000	1.167	1.333	H1-3+VT ✓
L8	7 - 4 (8)	0.017	1.157	0.000	0.032	0.000	1.175	1.333	H1-3+VT ✓
L9	4 - 0 (9)	0.015	1.028	0.000	0.027	0.000	1.044	1.333	H1-3+VT ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF* P_{allow} K	% Capacity	Pass Fail	
L1	150 - 120	Pole	P24x0.25	1	-8.06	589.19	76.7	Pass	
L2	120 - 90	Pole	30" x 0.375"	2	-12.20	1166.57	93.2	Pass	
L3	90 - 78.75	Pole	36" x 0.375"	3	-14.04	1325.68	86.9	Pass	
L4	78.75 - 60	Pole	RPS 36" x 0.51087"	4	-18.08	1634.98	89.5	Pass	
L5	60 - 30	Pole	RPS 42" x 0.58495"	5	-27.03	2092.73	90.7	Pass	
L6	30 - 13.75	Pole	RPS 42" x 0.65547"	6	-32.70	2545.31	90.1	Pass	
L7	13.75 - 7	Pole	RPS 42" x 0.76406"	7	-35.29	2823.83	87.6	Pass	
L8	7 - 4	Pole	RPS 42" x 0.78444"	8	-36.41	2894.46	88.1	Pass	
L9	4 - 0	Pole	RPS 42" x 0.93531"	9	-38.16	3411.49	78.3	Pass	
							Summary		
							Pole (L2)	93.2	Pass
							RATING =	93.2	Pass

APPENDIX B
BASE LEVEL DRAWING

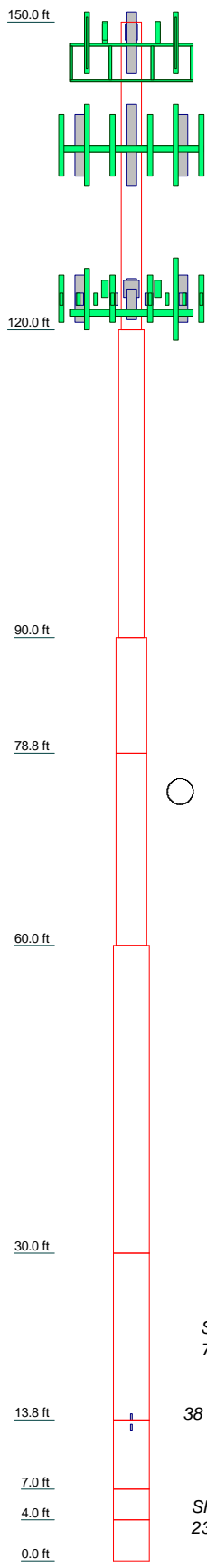


APPENDIX C

ADDITIONAL CALCULATIONS

Program Version 6.1.4.1 - 12/17/2013 File:G:/TOWER/375_Crown_Castle/2015/37515-2506_876327_KINGS LOT/37515-2506.002.7700_SDD_1134424/37515-2506.002.7700_Reinforced.eri

Section	1								
Size	P24x0.25								
Length (ft)	30.000								
Grade	A53-B-42								
Weight (K)	1.9								
Section	2								
Size	30" x 0.375"								
Length (ft)	30.000								
Grade	A53-B-42								
Weight (K)	3.6								
Section	3								
Size	36" x 0.375"								
Length (ft)	11.250								
Grade	A53-B-42								
Weight (K)	1.6								
Section	4								
Size	RPS 36" x 0.51087"								
Length (ft)	18.750								
Grade	Reinf 35.89 ksi								
Weight (K)	3.6								
Section	5								
Size	RPS 42" x 0.58495"								
Length (ft)	30.000								
Grade	Reinf 34.38 ksi								
Weight (K)	7.8								
Section	6								
Size	RPS 42" x 0.65547"								
Length (ft)	16.250								
Grade	Reinf 37.38 ksi								
Weight (K)	4.7								
Section	7								
Size	RPS 42" x 0.76406"								
Length (ft)	6.750								
Grade	Reinf 35.89 ksi								
Weight (K)	2.3								
Section	8								
Size	RPS 42" x 0.87265"								
Length (ft)	3.000								
Grade	Reinf 35.89 ksi								
Weight (K)	1.0								
Section	9								
Size	RPS 42" x 0.98124"								
Length (ft)	4.000								
Grade	Reinf 35.89 ksi								
Weight (K)	1.6								
Section	10								
Size	RPS 42" x 1.08983"								
Length (ft)	3.000								
Grade	Reinf 35.89 ksi								
Weight (K)	1.6								



DESIGNED APPURTENANCE LOADING

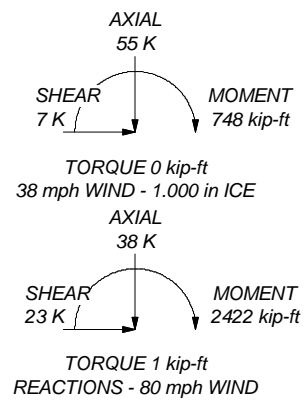
TYPE	ELEVATION	TYPE	ELEVATION
800MHz 2X50W RRH W/FILTER	148	LNx-6515DS-VTM w/ Mount Pipe	138
800MHz 2X50W RRH W/FILTER	148	LNx-6515DS-VTM w/ Mount Pipe	138
800MHz 2X50W RRH W/FILTER	148	RRUS 11 B12	138
PCS 1900MHz 4x45W-65MHz	148	RRUS 11 B12	138
PCS 1900MHz 4x45W-65MHz	148	RRUS 11 B12	138
PCS 1900MHz 4x45W-65MHz	148	Platform Mount [LP 1201-1]	138
Side Arm Mount [SO 102-3]	148	RRUS 11	124
APXV9ERR18-C-A20 w/ Mount Pipe	146	RRUS 11	124
APXVSP18-C-A20 w/ Mount Pipe	146	RRUS 11	124
APXVSP18-C-A20 w/ Mount Pipe	146	Side Arm Mount [SO 102-3]	124
(2) 2.375" OD x 5' Mount Pipe	146	(2) 7770.00 w/ Mount Pipe	122
(2) 2.375" OD x 5' Mount Pipe	146	(2) 7770.00 w/ Mount Pipe	122
(2) 2.375" OD x 5' Mount Pipe	146	(2) 7770.00 w/ Mount Pipe	122
Platform Mount [LP 502-1]	146	AM-X-CD-14-65-00T-RET w/ Mount Pipe	122
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	138	P65-17-XLH-RR w/ Mount Pipe	122
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	138	AM-X-CD-16-65-00T-RET w/ Mount Pipe	122
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	138	(4) LGP2140X	122
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	138	(4) LGP2140X	122
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	138	(4) LGP2140X	122
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	138	DC6-48-60-18-8F	122
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	138	T-Arm Mount [TA 602-3]	122
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	138	Bridge Stiffener (138.5" x 15.5" x 1.25")	60
KRY 112 144/1	138	Bridge Stiffener (138.5" x 15.5" x 1.25")	30
KRY 112 144/1	138	Pipe Mount [PM 601-1]	13
KRY 112 144/1	138	KS24019-L112A	13
KRY 112 144/1	138	KS24019-L112A	12
LNx-6515DS-VTM w/ Mount Pipe	138	Pipe Mount [PM 601-1]	12

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-42	42 ksi	63 ksi	Reinf 35.67 ksi	36 ksi	45 ksi
Reinf 35.89 ksi	36 ksi	45 ksi	Reinf 35.63 ksi	36 ksi	45 ksi
Reinf 34.38 ksi	34 ksi	43 ksi	Reinf 35.35 ksi	35 ksi	45 ksi
Reinf 37.38 ksi	37 ksi	47 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 93.2%



Paul J Ford and Company
 250 E. Broad Street, Suite 600
 Columbus, OH 43215
 Phone: 614.221.6679
 FAX: 614.448.4105

Job: **150 ft Monopole / South Windsor, CT**
 Project: **PJF 37515-2506.001 / BU 876327**
 Client: CCI
 Code: TIA/EIA-222-F
 Path:
 Drawn by: John J Woolley
 Date: 10/27/15
 App'd:
 Scale: NTS
 Dwg No. E-1

G:\TOWER\37515-2506-001\37515-2506-001-001.dwg 10/27/15 10:27:15 AM



v4.4 - Effective 7-12-13

Asymmetric Anchor Rod Analysis

Moment = 2422 k-ft
Axial = 38.0 kips
Shear = 23.0 kips
Anchor Qty = 25

TIA Ref. = F
ASIF = 1.3333
Max Ratio = 100.0%

Location = Base Plate
η = N/A for BP, Rev. G Sect. 4.9.9
Threads = N/A for FP, Rev. G

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

Item	Nominal Anchor Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Anchor Circle, in	Area Override, in ²	Area, in ²	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	1.500	A354 Gr BC	109	125	0.0	47.00	0.00	1.77	64.59	62.00	62.00	0.00	97.19	63.8%
2	1.500	A354 Gr BC	109	125	20.0	47.00	0.00	1.77	60.89	58.29	58.29	0.00	97.19	60.0%
3	1.500	A354 Gr BC	109	125	40.0	47.00	0.00	1.77	57.34	54.74	54.74	0.00	97.19	56.3%
4	1.500	A354 Gr BC	109	125	60.0	47.00	0.00	1.77	55.18	52.58	52.58	0.00	97.19	54.1%
5	1.500	A354 Gr BC	109	125	80.0	47.00	0.00	1.77	55.37	52.77	52.77	0.00	97.19	54.3%
6	1.500	A354 Gr BC	109	125	100.0	47.00	0.00	1.77	57.92	55.32	55.32	0.00	97.19	56.9%
7	1.500	A354 Gr BC	109	125	120.0	47.00	0.00	1.77	61.88	59.29	59.29	0.00	97.19	61.0%
8	1.500	A354 Gr BC	109	125	140.0	47.00	0.00	1.77	65.97	63.38	63.38	0.00	97.19	65.2%
9	1.500	A354 Gr BC	109	125	160.0	47.00	0.00	1.77	69.19	66.59	66.59	0.00	97.19	68.5%
10	1.500	A354 Gr BC	109	125	180.0	47.00	0.00	1.77	71.05	68.45	68.45	0.00	97.19	70.4%
11	1.500	A354 Gr BC	109	125	200.0	47.00	0.00	1.77	71.60	69.00	69.00	0.00	97.19	71.0%
12	1.500	A354 Gr BC	109	125	220.0	47.00	0.00	1.77	71.26	68.66	68.66	0.00	97.19	70.6%
13	1.500	A354 Gr BC	109	125	240.0	47.00	0.00	1.77	70.64	68.05	68.05	0.00	97.19	70.0%
14	1.500	A354 Gr BC	109	125	260.0	47.00	0.00	1.77	70.23	67.63	67.63	0.00	97.19	69.6%
15	1.500	A354 Gr BC	109	125	280.0	47.00	0.00	1.77	70.12	67.52	67.52	0.00	97.19	69.5%
16	1.500	A354 Gr BC	109	125	300.0	47.00	0.00	1.77	69.98	67.38	67.38	0.00	97.19	69.3%
17	1.500	A354 Gr BC	109	125	320.0	47.00	0.00	1.77	69.27	66.67	66.67	0.00	97.19	68.6%
18	1.500	A354 Gr BC	109	125	340.0	47.00	0.00	1.77	67.52	64.92	64.92	0.00	97.19	66.8%
19							0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0%
20							0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0%
21	2.250	A193 Gr B7	105	125	20.0	64.50	0.00	3.98	191.03	185.19	185.19	0.00	218.68	84.7%
22	2.250	A193 Gr B7	105	125	70.0	64.50	0.00	3.98	175.05	169.20	169.20	0.00	218.68	77.4%
23	2.250	A193 Gr B7	105	125	110.0	64.50	0.00	3.98	187.48	181.64	181.64	0.00	218.68	83.1%
24	2.250	A193 Gr B7	105	125	197.0	64.50	0.00	3.98	215.34	209.50	209.50	0.00	218.68	95.8%
25	2.250	A193 Gr B7	105	125	302.0	64.50	0.00	3.98	211.20	205.35	205.35	0.00	218.68	93.9%

51.69

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

TIA Rev F

Site Data

BU#: 876327
Site Name: Kings Lot
App #:
Pole Manufacturer: <i>Other</i>

Reactions

Moment:	1239	ft-kips
Axial:	23.4	kips
Shear:	14.2	kips

Reactions adjusted to account for additional anchor rods.

Anchor Rod Data

Qty:	18	
Diam:	1.5	in
Rod Material:	Other	
Strength (Fu):	125	ksi
Yield (Fy):	109	ksi
Bolt Circle:	47	in

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

Anchor Rod Results

Maximum Rod Tension: 69.0 Kips
 Allowable Tension: 97.2 Kips
 Anchor Rod Stress Ratio: 71.0% **Pass**

Stiffened

Service, ASD
Fty*ASIF

Plate Data

Diam:	53	in
Thick:	2	in
Grade:	36	ksi
Single-Rod B-eff:	7.42	in

Base Plate Results

Base Plate Stress: 22.1 ksi
 Allowable Plate Stress: 36.0 ksi
 Base Plate Stress Ratio: 61.4% **Pass**

Flexural Check

Stiffened

Service, ASD
0.75*Fy*ASIF
Y.L. Length:
N/A, Roark

Stiffener Data (Welding at both sides)

Config:	1	*
Weld Type:	Both	
Groove Depth:	0.25	in **
Groove Angle:	45	degrees
Fillet H. Weld:	0.25	in
Fillet V. Weld:	0.25	in
Width:	5.75	in
Height:	14.25	in
Thick:	0.5	in
Notch:	0.75	in
Grade:	50	ksi
Weld str.:	70	ksi

Stiffener Results

Horizontal Weld : 37.0% **Pass**
 Vertical Weld: 27.1% **Pass**
 Plate Flex+Shear, fb/Fb+(fv/Fv)^2: 9.9% **Pass**
 Plate Tension+Shear, ft/Ft+(fv/Fv)^2: 37.3% **Pass**
 Plate Comp. (AISC Bracket): 39.1% **Pass**

Pole Results

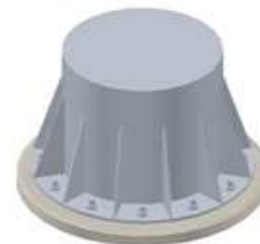
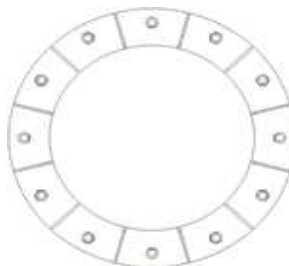
Pole Punching Shear Check: 6.2% **Pass**

Pole Data

Diam:	42.5	in
Thick:	0.5	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor

ASIF:	1.333
-------	-------



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

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

foundation loads

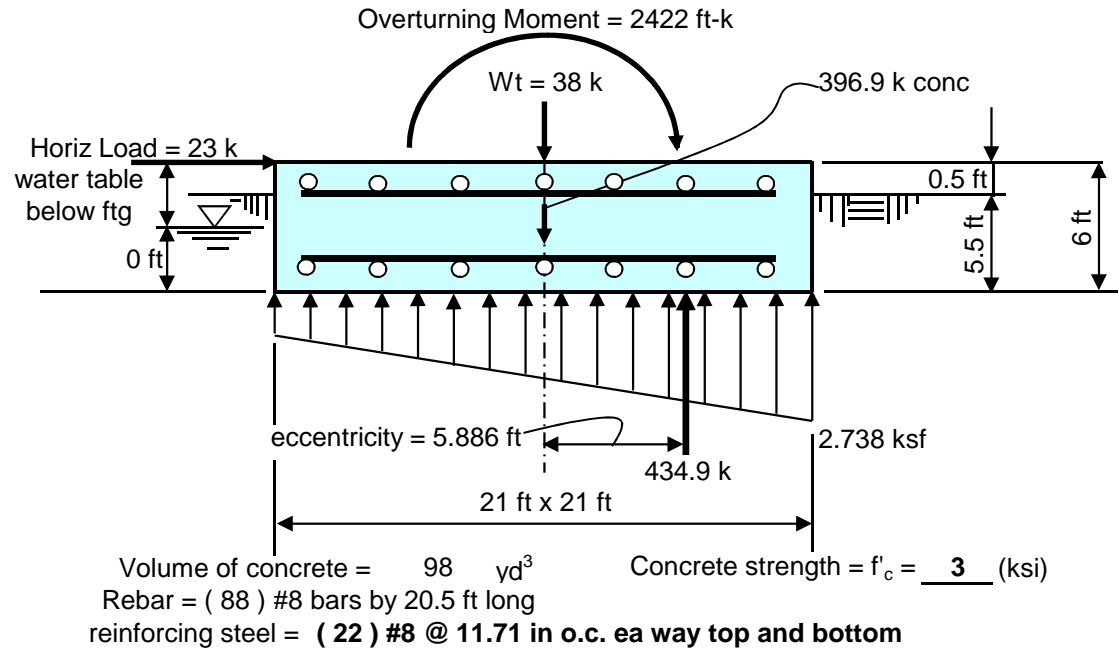
Tower or Pole Weight = 38 kips
 Total Horizontal Force = 23 kips
 Overturning Moment = 2422 ft-kips

soil properties

Safety factor against overturning = 1.5
 Soil density = 115 pcf
 Allowable soil bearing = 8 ksf
 Depth to water table = 99 ft

mat dimensions

depth to bottom of footing = 5.5 ft
 Footing thickness = 6 ft
 Footing Width = 21 ft
 Footing Length = 21 ft
 Tower/Pole Center Offset = 0 ft



Summary of analysis results

Overturning Moment: (Stress Ratio = 0.841) **< CONTROLLING CRITERIA**
 Calculated Overturning Moment = 2560 ft-kips
 Resisting Moment = 4566.5 ft-kips
 Factor of Safety against overturning = 1.784 **> 1.5 okay**

Rebar strength = F_v = 60 (ksi)
 minimum cover over rebar = 3 inches

Soil Bearing (Stress Ratio = 0.342)
 Net Soil Bearing Resistance = 8 ksf
 Calculated Soil Bearing Pressure = 2.738 **ksf < 8 ksf okay**

Bending Moment (Stress Ratio = 0.301)
 Ultimate Bending Moment Resistance = 5216 ft-kips
 Calculated Ultimate Bending Moment = 1572 **ft-kips < 5216 ft-kips okay**

Bending Shear (Stress Ratio = 0.182)
 Ultimate Bending Shear Resistance = 1398 kips
 Calculated Ultimate Bending Shear = 254 **kips < 1398 kips okay**

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

Site Data

BU#: 876327
 Site Name: Kings Lot
 App #:

Reactions		
Moment:	215.7	ft-kips
Axial:	8.06	kips
Shear:	13.51	kips
Elevation:	120	feet

Pole Manufacturer: Rohn

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

Flange Bolt Results

Bolt Data		
Qty:	12	
Diameter (in.):	1.5	Bolt Fu: 105
Bolt Material:	A325	Bolt Fy: 81
N/A:	0	<-- Disregard Bolt Fty: 44.00
N/A:	0	<-- Disregard
Circle (in.):	35	

Bolt Tension Capacity, **B**: 103.67 kips
 Max Bolt directly applied T: 23.98 Kips
 Min. PL "tc" for **B** cap. **w/o** Pry: 3.614 in
 Min PL "treq" for actual **T w/ Pry**: 1.313 in
 Min PL "t1" for actual **T w/o Pry**: 1.738 in
 T allowable with Prying: 55.60 kips
 Prying Force, Q: 0.00 kips
 Total Bolt Tension=T+Q: 23.98 kips
 Prying Bolt Stress Ratio=(T+Q)/(B): 23.1% **Pass**

Rigid
Service, ASD
Fty*ASIF

α>1 case

Exterior Flange Plate Results

Flexural Check
 Compression Side Plate Stress: Rohn/Pirod, OK
 Allowable Plate Stress: 36.0 ksi
 Compression Plate Stress Ratio: Rohn/Pirod, OK

Rigid
Service ASD
0.75*Fy*ASIF
Comp. Y.L. Length: 25.48

No Prying

Tension Side Stress Ratio, (treq/t)²: 43.1% **Pass**

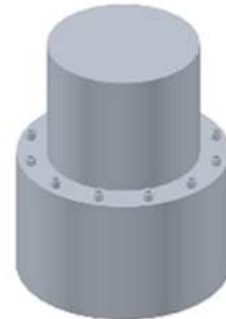
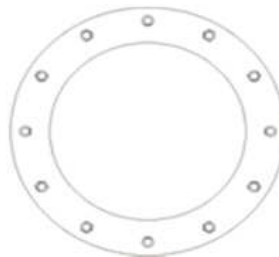
n/a

Stiffener Results

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

Pole Results

Pole Punching Shear Check: N/A



Stiffener Data (Welding at Both Sides)

Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

Pole Data

Diam:	24	in
Thick:	0.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor

ASIF: 1.3333333

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

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

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

Site Data

BU#: 876327
 Site Name: Kings Lot
 App #:

Reactions		
Moment:	215.7	ft-kips
Axial:	8.06	kips
Shear:	13.51	kips
Elevation:	120	feet

Pole Manufacturer: Rohn

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

Flange Bolt Results

Bolt Tension Capacity, **B**: 103.67 kips
 Max Bolt directly applied T: 23.98 Kips
 Min. PL "tc" for **B** cap. **w/o** Pry: 1.962 in
 Min PL "treq" for actual **T w/ Pry**: 0.703 in
 Min PL "t1" for actual **T w/o Pry**: 0.944 in
 T allowable w/o Prying: 103.67 kips
 Prying Force, Q: 0.00 kips
 Total Bolt Tension=T+Q: 23.98 kips
 Non-Prying Bolt Stress Ratio, T/B: 23.1% **Pass**

Rigid
Service, ASD
Fty*ASIF

Exterior Flange Plate Results

Flexural Check
 Compression Side Plate Stress: Rohn/Pirod, OK
 Allowable Plate Stress: 36.0 ksi
 Compression Plate Stress Ratio: Rohn/Pirod, OK

Rigid
Service ASD
0.75*Fy*ASIF
Comp. Y.L. Length: 18.03

No Prying

Tension Side Stress Ratio, (treq/t)^2: 12.4% **Pass**

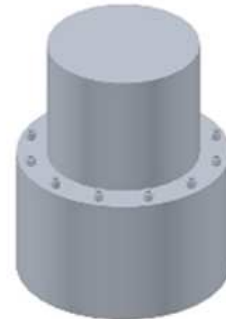
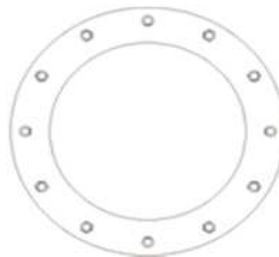
n/a

Stiffener Results

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

Pole Results

Pole Punching Shear Check: N/A



Bolt Data		
Qty:	12	
Diameter (in.):	1.5	Bolt Fu: 105
Bolt Material:	A325	Bolt Fy: 81
N/A:	0	<-- Disregard Bolt Fty: 44.00
N/A:	0	<-- Disregard
Circle (in.):	35	

Plate Data		
Diam:	41	in
Thick, t:	2	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	7.85	in

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

Pole Data		
Diam:	30	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor	
ASIF:	1.3333333

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

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

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

Site Data

BU#: 876327
 Site Name: Kings Lot
 App #:

Reactions

Moment:	653.55	ft-kips
Axial:	12.2	kips
Shear:	15.63	kips
Elevation:	90	feet

Pole Manufacturer: Rohn

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

Bolt Data

Qty:	16		
Diameter (in.):	1.5	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:	0	<-- Disregard	Bolt Fty:
N/A:	0	<-- Disregard	44.00
Circle (in.):	41		

Flange Bolt Results

Bolt Tension Capacity, **B**: 103.67 kips
 Max Bolt directly applied T: 47.06 Kips
 Min. PL "tc" for **B** cap. **w/o** Pry: 3.733 in
 Min PL "treq" for actual **T w/ Pry**: 1.909 in
 Min PL "t1" for actual **T w/o Pry**: 2.515 in
 T allowable with Prying: 51.63 kips
 Prying Force, Q: 21.91 kips
 Total Bolt Tension=T+Q: 68.97 kips
 Prying Bolt Stress Ratio=(T+Q)/(B): 66.5% **Pass**

Rigid
Service, ASD
Fty*ASIF

Plate Data

Diam:	47	in
Thick, t:	2	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	5.89	in

Exterior Flange Plate Results

Flexural Check
 Compression Side Plate Stress: Rohn/Pirod, OK
 Allowable Plate Stress: 36.0 ksi
 Compression Plate Stress Ratio: Rohn/Pirod, OK
Prying Occurs, PL Check:
 Tension Side Stress Ratio, (treq/t)^2: 91.1% **Pass**

Rigid
Service ASD
0.75*Fy*ASIF
Comp. Y.L. Length:
27.95

Stiffener Data (Welding at Both Sides)

Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

n/a

Stiffener Results

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

Pole Results

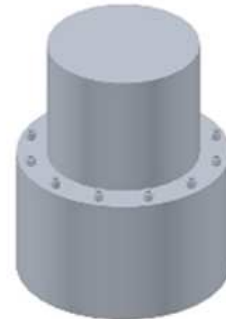
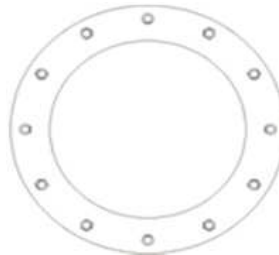
Pole Punching Shear Check: N/A

Pole Data

Diam:	30	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor

ASIF: 1.3333333



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

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

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

Site Data

BU#: 876327
 Site Name: Kings Lot
 App #:

Pole Manufacturer: Rohn

Reactions

Moment:	653.55	ft-kips
Axial:	12.2	kips
Shear:	15.63	kips
Elevation:	90	feet

Bolt Data

Qty:	16	Bolt Fu:	105
Diameter (in.):	1.5	Bolt Fy:	81
Bolt Material:	A325	Bolt Fty:	44.00
N/A:	0	<-- Disregard	
N/A:	0	<-- Disregard	
Circle (in.):	41		

Plate Data

Diam:	47	in
Thick, t:	2	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	7.07	in

Stiffener Data (Welding at Both Sides)

Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

Pole Data

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

Stress Increase Factor

ASIF: 1.3333333

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

Flange Bolt Results

Bolt Tension Capacity, B:	103.67 kips	
Max Bolt <u>directly</u> applied T:	47.06 Kips	
Min. PL "tc" for B cap. <u>w/o</u> Pry:	2.068 in	
Min PL "treq" for actual T <u>w/</u> Pry:	1.045 in	
Min PL "t1" for actual T <u>w/o</u> Pry:	1.393 in	
T allowable with Prying:	101.53 kips	0≤α'≤1 case
Prying Force, Q:	0.00 kips	
Total Bolt Tension=T+Q:	47.06 kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	45.4%	Pass

Exterior Flange Plate Results

Flexural Check	
Compression Side Plate Stress:	Rohn/Pirod, OK
Allowable Plate Stress:	36.0 ksi
Compression Plate Stress Ratio:	Rohn/Pirod, OK
No Prying	
Tension Side Stress Ratio, (treq/t)^2:	27.3% Pass

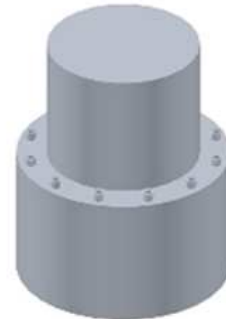
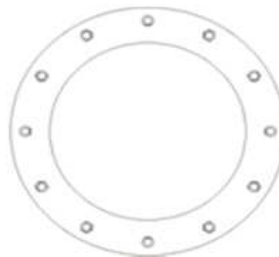
n/a

Stiffener Results

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

Pole Results

Pole Punching Shear Check: N/A



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

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

v2.0, Effective Date: 1-12-12

Welded Bridge Stiffener Analysis per TIA/EIA-222-F & AISC 9th Ed. (Green)

General Parameters and Loading:

Flange Elevation:	60.00	ft
TIA Reference Standard:	TIA/EIA-222-F	
AISC Manual:	9th Ed. (Green)	
Method:	ASD	
ASD Stress Increase, ASIF:	1.333333333	
Moment, Mf:	1156.6	k-ft
Axial, Pf:	18.1	kips
Shear, Vf:	17.9	kips

Pole Parameters:

	Upper Pole	Lower Pole	
Pole Diameter, Dp:	36.00	42.00	in
Pole Thickness, tp:	0.3750	0.3750	in
Pole Fy:	42	42	ksi
Pole Fu:	63	63	ksi
Flange Diameter, Df:	53.00	53.00	in

Bridge Stiffener Parameters:

	Stiffener Type 1	Stiffener Type 2	
Qty. Stiffeners:	3	0	
Upper Weld Length, L1:	66.00	0.00	in
Lower Weld Length, L2:	66.00	0.00	in
Weld Size, w:	0.3750	0.0000	in
Electrode:	E80	E70	
Effective Stiffener Width, Ws:	7.00	0.00	in
Stiffener Thickness, ts:	1.25	0.00	in
Notch, n:	0.50	0.00	in
Stiffener Fy:	65	0	ksi
Stiffener Fu:	80	0	ksi
Unbraced Length, L:	6.00	0.00	in
K:	1.00	0.00	
Stiffener Spacing:	Symmetric	Symmetric	
Start Angle, for Symmetric:	35	0	degrees
Stiffener Circle:	61.00	53.00	in = Df + 2 n + Ws
Upper Eccentricity, e1:	12.50	8.50	in = (Df - Dp) / 2 + n + Ws / 2
Lower Eccentricity, e2:	9.50	5.50	in = (Df - Dp) / 2 + n + Ws / 2

Flange Bolt Parameters:

	(1) Bolt Circle		
	Bolt Circle 1	Bolt Circle 2	
Number of Bolt Circles:	(1) Bolt Circle		
Qty. Bolts:	0	0	
Bolt Diameter:	1.50	0.00	in
Bolt Circle:	47.00	0.00	in
Bolt Spacing:	Symmetric	Symmetric	
Start Angle, for Symmetric:	0	0	degrees
Bolt Area, Ag:	0.0000	0.0000	in
Max. Tension:	0.00	0.00	kips
Max. Net Tension:	0.00	0.00	kips
Max. Net Compression:	0.00	0.00	kips
Moment to Bolt Circle:	0.00	0.00	k-ft
Axial to Bolt Circle:	0.00	0.00	kips
Shear to Bolt Circle:	0.00	0.00	kips
Equivalent Bolt Circle:	0.00	0.00	in

Weld Analysis per AISC Table XIX & pg. 4-72:

Upper Pole	Stiffener Type 1	Stiffener Type 2	
D:	6	0	Num. of Sixteenths in Weld
a:	0.1894	0.0000	= e1 / L1
k:	0	0	
C:	1.4155	0.0000	Tabulated Coefficient
C1:	1.1400	1.0000	Coefficient for Electrode
ASIF:	1.3333	1.3333	
Stiffener Axial, Ps:	309.6	0.0	kips
Allowable Axial, Pa:	852.0	0.0	kips = ASIF C C1 D L
Ratio:	36.3%	0.0%	
Lower Pole			
D:	6	0	Num. of Sixteenths in Weld
a:	0.1439	0.0000	= e2 / L2
k:	0	0	
C:	1.5221	0.0000	Tabulated Coefficient
C1:	1.1400	1.0000	Coefficient for Electrode
ASIF:	1.3333	1.3333	
Stiffener Axial, Ps:	309.6	0.0	kips
Allowable Axial, Pa:	916.2	0.0	kips = ASIF C C1 D L
Ratio:	33.8%	0.0%	

Pole Analysis per AISC Sect. F4:

Upper Pole	Stiffener Type 1	Stiffener Type 2	
Stiffener Axial, P:	309.6	0.0	kips
Effective Throat, te:	0.2651	0.0000	in = 0.707 w
Shear Stress, fv:	2.3	0.0	kips/in = P / (2 L1)
Section Modulus, S:	1452.0	0.0	in ² = L1 ² / 3
Bending Stress, fb:	2.7	0.0	kips/in = P e1 / S
Combined Stress, f:	3.5	0.0	kips/in = (fv ² + fb ²) ^{1/2}
ASIF:	1.3333	0.0000	
Allowable Stress, F:	8.4	0.0	kips/in = ASIF (0.4 Fy) tp
Ratio:	42.3%	0.0%	
Lower Pole			
Stiffener Axial, P:	309.6	0.0	kips
Effective Throat, te:	0.2651	0.0000	in = 0.707 w
Shear Stress, fv:	2.3	0.0	ksi = P / (2 L2)
Section Modulus, S:	1452.0	0.0	in ² = L2 ² / 3
Bending Stress, fb:	2.0	0.0	ksi = P e2 / S
Combined Stress, f:	3.1	0.0	kips/in = (fv ² + fb ²) ^{1/2}
ASIF:	1.3333	0.0000	
Allowable Stress, F:	8.4	0.0	kips/in = ASIF (0.4 Fy) tp
Ratio:	36.9%	0.0%	

Stiffener 1 Analysis per AISC Sect. D1, E2, F1.2 & App. B

	Stiffener Type 1	
Gross Area, Ag:	8.7500	in ²
Net Area, An:	8.7500	in ²
Stiffener Axial, P:	309.6	kips
Stiffener Stress, f:	35.4	ksi = P / Ag
b:	16.0000	in = (Df - Dp) / 2 + n + Ws, Upper Pole
b / ts:	12.8000	in
Q, Where Qa = 1.0:	0.8787	= Qa 1.340 - 0.00447 (b / ts) Fy ^{1/2}
r:	0.3608	in ³
K L / r:	16.6277	
ASIF:	1.3333	
Allowable Axial, Fa:	43.45	ksi = ASIF Q [1 - (K L / r) / 2 Cc ²] Fy / [5/3 + 3(K L / r) / 8 Cc - (K L / r) ³ / 8 Cc ³]
ASIF:	1.3333	
Allowable Bending, Fb:	45.69	ksi = ASIF 0.6 Fy Q
ASIF:	1.3333	
Allowable Net Tension, Ft:	53.33	ksi = ASIF 0.5 Fu
Ratio:	81.4%	

Stiffener 2 Analysis per AISC Sect. D1, E2, F1.2 & App. B

	Stiffener Type 2	
Gross Area, Ag:	0.0000	in ²
Net Area, An:	0.0000	in ²
Stiffener Axial, P:	0.0	kips
Stiffener Stress, f:	0.0	ksi = P / Ag
b:	0.0000	in = (Df - Dp) / 2 + n + Ws, Upper Pole
b / ts:	0.0000	in
Q, Where Qa = 1.0:	0.0000	
r:	0.0000	in ³
K L / r:	0.0000	
ASIF:	0.0000	
Allowable Axial, Fa:	0.00	ksi = ASIF [1 - (K L / r) / 2 Cc ²] Fy / [5/3 + 3(K L / r) / 8 Cc - (K L / r) ³ / 8 Cc ³]
ASIF:	0.0000	
Allowable Bending, Fb:	0.00	ksi = ASIF 0.6 Fy
ASIF:	0.0000	
Allowable Net Tension, Ft:	0.00	ksi = ASIF 0.5 Fu
Ratio:	0.0%	

Analysis

Summary:

Bridge Stiffener Type 1
 Weld Analysis Ratio: 36.3% PASS
 Pole Analysis Ratio: 42.3% PASS
 Stiffener Analysis Ratio: 81.4% PASS

Bridge Stiffener Type 2
 Weld Analysis Ratio: 0.0% PASS
 Pole Analysis Ratio: 0.0% PASS
 Stiffener Analysis Ratio: 0.0% PASS

v2.0, Effective Date: 1-12-12

Welded Bridge Stiffener Analysis per TIA/EIA-222-F & AISC 9th Ed. (Green)

General Parameters and Loading:

Flange Elevation:	30.00	ft
TIA Reference Standard:	TIA/EIA-222-F	
AISC Manual:	9th Ed. (Green)	
Method:	ASD	
ASD Stress Increase, ASIF:	1.333333333	
Moment, Mf:	1749.6	k-ft
Axial, Pf:	27.0	kips
Shear, Vf:	20.9	kips

Pole Parameters:

	Upper Pole	Lower Pole	
Pole Diameter, Dp:	42.00	42.00	in
Pole Thickness, tp:	0.3750	0.5000	in
Pole Fy:	42	42	ksi
Pole Fu:	63	63	ksi
Flange Diameter, Df:	53.00	53.00	in

Bridge Stiffener Parameters:

	Stiffener Type 1	Stiffener Type 2	
Qty. Stiffeners:	3	0	
Upper Weld Length, L1:	66.00	0.00	in
Lower Weld Length, L2:	66.00	0.00	in
Weld Size, w:	0.3750	0.0000	in
Electrode:	E80	E70	
Effective Stiffener Width, Ws:	9.00	0.00	in
Stiffener Thickness, ts:	1.25	0.00	in
Notch, n:	0.50	0.00	in
Stiffener Fy:	65	0	ksi
Stiffener Fu:	80	0	ksi
Unbraced Length, L:	6.00	0.00	in
K:	1.00	0.00	
Stiffener Spacing:	Symmetric	Symmetric	
Start Angle, for Symmetric:	35	0	degrees
Stiffener Circle:	63.00	53.00	in = Df + 2 n + Ws
Upper Eccentricity, e1:	10.50	5.50	in = (Df - Dp) / 2 + n + Ws / 2
Lower Eccentricity, e2:	10.50	5.50	in = (Df - Dp) / 2 + n + Ws / 2

Flange Bolt Parameters:

	(1) Bolt Circle		
	Bolt Circle 1	Bolt Circle 2	
Number of Bolt Circles:	(1) Bolt Circle		
Qty. Bolts:	0	0	
Bolt Diameter:	1.50	0.00	in
Bolt Circle:	47.00	0.00	in
Bolt Spacing:	Symmetric	Symmetric	
Start Angle, for Symmetric:	0	0	degrees
Bolt Area, Ag:	0.0000	0.0000	in
Max. Tension:	0.00	0.00	kips
Max. Net Tension:	0.00	0.00	kips
Max. Net Compression:	0.00	0.00	kips
Moment to Bolt Circle:	0.00	0.00	k-ft
Axial to Bolt Circle:	0.00	0.00	kips
Shear to Bolt Circle:	0.00	0.00	kips
Equivalent Bolt Circle:	0.00	0.00	in

Weld Analysis per AISC Table XIX & pg. 4-72:

Upper Pole	Stiffener Type 1	Stiffener Type 2	
D:	6	0	Num. of Sixteenths in Weld
a:	0.1591	0.0000	= e1 / L1
k:	0	0	
C:	1.4882	0.0000	Tabulated Coefficient
C1:	1.1400	1.0000	Coefficient for Electrode
ASIF:	1.3333	1.3333	
Stiffener Axial, Ps:	453.5	0.0	kips
Allowable Axial, Pa:	895.8	0.0	kips = ASIF C C1 D L
Ratio:	50.6%	0.0%	
Lower Pole			
D:	6	0	Num. of Sixteenths in Weld
a:	0.1591	0.0000	= e2 / L2
k:	0	0	
C:	1.4882	0.0000	Tabulated Coefficient
C1:	1.1400	1.0000	Coefficient for Electrode
ASIF:	1.3333	1.3333	
Stiffener Axial, Ps:	453.5	0.0	kips
Allowable Axial, Pa:	895.8	0.0	kips = ASIF C C1 D L
Ratio:	50.6%	0.0%	

Pole Analysis per AISC Sect. F4:

Upper Pole	Stiffener Type 1	Stiffener Type 2	
Stiffener Axial, P:	453.5	0.0	kips
Effective Throat, te:	0.2651	0.0000	in = 0.707 w
Shear Stress, fv:	3.4	0.0	kips/in = P / (2 L1)
Section Modulus, S:	1452.0	0.0	in ² = L1 ² / 3
Bending Stress, fb:	3.3	0.0	kips/in = P e1 / S
Combined Stress, f:	4.7	0.0	kips/in = (fv ² + fb ²) ^{1/2}
ASIF:	1.3333	0.0000	
Allowable Stress, F:	8.4	0.0	kips/in = ASIF (0.4 Fy) tp
Ratio:	56.5%	0.0%	
Lower Pole			
Stiffener Axial, P:	453.5	0.0	kips
Effective Throat, te:	0.2651	0.0000	in = 0.707 w
Shear Stress, fv:	3.4	0.0	ksi = P / (2 L2)
Section Modulus, S:	1452.0	0.0	in ² = L2 ² / 3
Bending Stress, fb:	3.3	0.0	ksi = P e2 / S
Combined Stress, f:	4.7	0.0	kips/in = (fv ² + fb ²) ^{1/2}
ASIF:	1.3333	0.0000	
Allowable Stress, F:	11.2	0.0	kips/in = ASIF (0.4 Fy) tp
Ratio:	42.4%	0.0%	

Stiffener 1 Analysis per AISC Sect. D1, E2, F1.2 & App. B

	Stiffener Type 1	
Gross Area, Ag:	11.2500	in ²
Net Area, An:	11.2500	in ²
Stiffener Axial, P:	453.5	kips
Stiffener Stress, f:	40.3	ksi = P / Ag
b:	15.0000	in = (Df - Dp) / 2 + n + Ws, Upper Pole
b / ts:	12.0000	in
Q, Where Qa = 1.0:	0.9075	= Qa 1.340 - 0.00447 (b / ts) Fy ^{1/2}
r:	0.3608	in ³
K L / r:	16.6277	
ASIF:	1.3333	
Allowable Axial, Fa:	44.83	ksi = ASIF Q [1 - (K L / r) / 2 Cc ²] Fy / [5/3 + 3(K L / r) / 8 Cc' - (K L / r) ³ / 8 Cc ³]
ASIF:	1.3333	
Allowable Bending, Fb:	47.19	ksi = ASIF 0.6 Fy Q
ASIF:	1.3333	
Allowable Net Tension, Ft:	53.33	ksi = ASIF 0.5 Fu
Ratio:	89.9%	

Stiffener 2 Analysis per AISC Sect. D1, E2, F1.2 & App. B

	Stiffener Type 2	
Gross Area, Ag:	0.0000	in ²
Net Area, An:	0.0000	in ²
Stiffener Axial, P:	0.0	kips
Stiffener Stress, f:	0.0	ksi = P / Ag
b:	0.0000	in = (Df - Dp) / 2 + n + Ws, Upper Pole
b / ts:	0.0000	in
Q, Where Qa = 1.0:	0.0000	
r:	0.0000	in ³
K L / r:	0.0000	
ASIF:	0.0000	
Allowable Axial, Fa:	0.00	ksi = ASIF [1 - (K L / r) / 2 Cc ²] Fy / [5/3 + 3(K L / r) / 8 Cc' - (K L / r) ³ / 8 Cc ³]
ASIF:	0.0000	
Allowable Bending, Fb:	0.00	ksi = ASIF 0.6 Fy
ASIF:	0.0000	
Allowable Net Tension, Ft:	0.00	ksi = ASIF 0.5 Fu
Ratio:	0.0%	

Analysis

Summary:

Bridge Stiffener Type 1
 Weld Analysis Ratio: 50.6% PASS
 Pole Analysis Ratio: 56.5% PASS
 Stiffener Analysis Ratio: 89.9% PASS

Bridge Stiffener Type 2
 Weld Analysis Ratio: 0.0% PASS
 Pole Analysis Ratio: 0.0% PASS
 Stiffener Analysis Ratio: 0.0% PASS

MODIFICATION OF AN EXISTING 150' MONOPOLE

BU #876327; KINGS LOT
 59 MCGUIRE ROAD
 SOUTH WINDSOR, CONNECTICUT 06074
 HARTFORD COUNTY
 LAT: 41° 48' 10.77"; LONG: -72° 37' 1.96"
 APP: 306606 REV. 0; WO: 1134424

PROJECT CONTACTS

STRUCTURE OWNER:
 CROWN CASTLE
 MOD PM: DAN VADNEY AT DAN.VADNEY@CROWNCastle.COM
 PH: (518) 373-3510
 MOD CM: JASON D'AMICO AT JASON.D'AMICO@CROWNCastle.COM
 PH: (860) 209-0104

ENGINEER OF RECORD:
 PJFMOD@PJFWEB.COM

THIS PROJECT INCLUDES THE FOLLOWING ITEMS

REMOVAL OF EXISTING REINFORCING AND CHANNEL JUMPS
EQUIPMENT REMOVAL
WELDED FLANGE BRIDGE STIFFENERS
SHAFT REINFORCING
REMOVAL OF EXISTING STIFFENERS
FIELD WELDED ANCHOR BRACKETS
POST INSTALLED ANCHOR RODS

SHEET INDEX

SHEET NUMBER	DESCRIPTION
T-1	TITLE SHEET
S-1	GENERAL NOTES
S-2A	FORGBOLT™ DETAILS
S-2B	NEXGEN2™ BOLT DETAIL
S-3	MONOPOLE PROFILE
S-4	BASE PLATE DETAILS
S-5	MISC DETAILS
S-6	WELDED BRIDGE STIFFENER DETAILS
S-7	WELDED BRIDGE STIFFENER DETAILS
S-8	MI CHECKLIST

WIND DESIGN DATA

REFERENCE STANDARD	TIA/EIA-222-F
LOCAL CODE	2005 CT BUILDING CODE
BASIC WIND SPEED (FASTEST-MILE)	80 MPH
ICE THICKNESS	1.0 IN
ICE WIND SPEED	38 MPH
SERVICE WIND SPEED	50 MPH

THE ASSOCIATED FAILING SA WO NUMBER FOR THIS PROJECT IS 1104393

ATTENTION ALL CONTRACTORS, ANYTIME YOU ACCESS A CROWN SITE FOR ANY REASON YOU ARE TO CALL THE CROWN NOC UPON ARRIVAL AND DEPARTURE, DAILY AT (800) 788-7011.

© Copyright 2015, by Paul J. Ford and Company, All Rights Reserved. This document and the data contained herein, is proprietary to Paul J. Ford and Company, issued in strict confidence and shall not, without the prior written permission of Paul J. Ford and Company, be reproduced, copied or used for any purpose other than the intended use for this specific project.

PJF PAUL J. FORD & COMPANY
 250 E Broad St, Ste 600 Columbus, OH 43215
 Phone 614.221.6679 www.pauljford.com

CROWN CASTLE
 3530 TORINGDON WAY, SUITE 300, CHARLOTTE, NC 28277
 PH: (724) 416-2000

MODIFICATION OF AN EXISTING 150'
 MONOPOLE
 BU #876327; KINGS LOT
 SOUTH WINDSOR, CONNECTICUT

PROJECT No: 37515-2506.002.7700
 DRAWN BY: B.M.S.
 DESIGNED BY: J.J.W.
 CHECKED BY:
 DATE: 10-23-2015

TITLE SHEET

T-1

1. GENERAL NOTES

- 1.1. THE MONOPOLE STRUCTURE IN ITS EXISTING CONDITION DOES NOT HAVE THE STRUCTURAL CAPACITY TO CARRY ALL OF THE PROPOSED AND EXISTING LOADS FROM THE ATTACHED STRUCTURAL MODIFICATION REPORT AT THE REQUIRED MINIMUM WIND SPEEDS. DO NOT INSTALL ANY NEW LOADS UNTIL THE MONOPOLE REINFORCING SYSTEM IS COMPLETELY AND SUCCESSFULLY INSTALLED.
- 1.2. THESE DRAWINGS WERE PREPARED FROM INFORMATION PROVIDED BY CROWN CASTLE. THE INFORMATION PROVIDED HAS NOT BEEN FIELD VERIFIED BY THE ENGINEER OF RECORD (EOR) FOR ACCURACY AND THEREFORE DISCREPANCIES BETWEEN THESE DRAWINGS AND ACTUAL SITE CONDITIONS SHOULD BE ANTICIPATED. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS. THE CONTRACTOR SHALL COORDINATE WITH THE PROJECT DRAWINGS AND THEIR FIELD VERIFIED CONDITIONS AND DIMENSIONS BEFORE PROCEEDING WITH THE WORK. THE CONTRACTOR SHALL IMMEDIATELY REPORT ANY AND ALL DISCREPANCIES TO THE EOR AND CROWN CASTLE BEFORE PROCEEDING WITH THE WORK.
- 1.3. IF MATERIALS, QUANTITIES, STRENGTHS OR SIZES INDICATED BY THE DRAWINGS OR SPECIFICATIONS ARE NOT IN AGREEMENT WITH THESE NOTES, THE BETTER QUALITY AND/OR GREATER QUANTITY, STRENGTH OR SIZE INDICATED, SPECIFIED OR NOTED SHALL BE PROVIDED.
- 1.4. THIS STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER THE INSTALLATION OF THE REINFORCING REPAIR SYSTEM HAS BEEN SUCCESSFULLY COMPLETED. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO ENSURE THE SAFETY AND STABILITY OF THE MONOPOLE AND ITS COMPONENT PARTS DURING FIELD MODIFICATIONS. THIS INCLUDES, BUT IS NOT LIMITED TO, THE ADDITION OF WHATEVER TEMPORARY BRACING, GUYS OR TIE DOWNS THAT MAY BE NECESSARY. SUCH MATERIAL SHALL BE REMOVED AND SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AFTER THE COMPLETION OF THE PROJECT.
- 1.5. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN AND SHALL MEET ANSI/TIA-1019 (LATEST EDITION), OSHA AND GENERAL INDUSTRY STANDARDS. ALL RIGGING PLANS SHALL ADHERE TO ANSI/TIA-1019 (LATEST EDITION) INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION.
- 1.6. OBSERVATION VISITS TO THE SITE BY CROWN CASTLE AND/OR THE EOR SHALL NOT INCLUDE INSPECTIONS OF THE PROTECTIVE MEASURES OR THE CONSTRUCTION PROCEDURES. ANY SUPPORT SERVICES PERFORMED BY THE EOR DURING CONSTRUCTION ARE SOLELY FOR THE PURPOSE OF ACHIEVING GENERAL CONFORMANCE WITH THE CONTRACT DOCUMENTS. THEY DO NOT GUARANTEE THE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF CONSTRUCTION.
- 1.7. 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 CROWN CASTLE AND EOR PRIOR TO INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF MATERIALS AND EQUIPMENT BEING SUBSTITUTED.
- 1.8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT THIS PROJECT AND RELATED WORK COMPLIES WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY CODES AND REGULATIONS GOVERNING THIS WORK AS WELL AS CROWN CASTLE SAFETY GUIDELINES.
- 1.9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING AND NEW COAXIAL CABLES AND OTHER EQUIPMENT DURING CONSTRUCTION.
- 1.10. ANY EXISTING ATTACHMENTS AND/OR PROJECTIONS ON THE POLE THAT MAY INTERFERE WITH THE INSTALLATION OF THE REINFORCING SYSTEM WILL HAVE TO BE REMOVED AND RELOCATED, REPLACED, OR RE-INSTALLED AS REQUIRED AFTER THE REINFORCING IS SUCCESSFULLY COMPLETED. THE CONTRACTOR SHALL IDENTIFY AND COORDINATE THESE ITEMS PRIOR TO CONSTRUCTION WITH CROWN CASTLE, TESTING AGENCY, AND EOR.
- 1.11. ANY AND ALL EXISTING PLATFORMS THAT ARE LOCATED IN AREAS OF THE POLE SHAFT WHERE SHAFT REINFORCING MUST BE APPLIED SHALL BE TEMPORARILY REMOVED OR OTHERWISE SUPPORTED TO PERMIT NEW CONTINUOUS REINFORCEMENT TO BE ATTACHED. AFTER THE CONTRACTOR HAS SUCCESSFULLY INSTALLED THE MONOPOLE REINFORCEMENT SYSTEM, THE CONTRACTOR SHALL RE-INSTALL THE PLATFORMS.
- 1.12. THE CLIMBING FACILITIES, SAFETY CLIMB AND ALL PARTS THEREOF SHALL NOT BE IMPEDED, MODIFIED OR ALTERED WITHOUT THE EXPRESS APPROVAL OF THE EOR.
- 1.13. FOR STANDARD CROWN PARTS SEE THE MOST RECENT VERSION OF THE "CCI APPROVED REINFORCEMENT COMPONENTS" CATALOG.
- 1.14. ALL SOLUTIONS FOR THE REPLACEMENT, RELOCATION OR MODIFICATION OF THE SAFETY CLIMB AND/OR ANY OF THE MONOPOLE CLIMBING FACILITIES SHALL BE COORDINATED WITH TUF-TUG PRODUCTS. CONTACT DETAILS:
3434 ENCRETE LANE, MORAIN, OHIO 45439
PHONE: 937-299-1213 EMAIL: TUFTUG@AOL.COM

2. STRUCTURAL STEEL

- 2.1. STRUCTURAL STEEL MATERIALS, FABRICATION, DETAILING, AND WORKMANSHIP SHALL CONFORM TO THE LATEST EDITION OF THE FOLLOWING REFERENCE STANDARDS:
 - 2.1.1. BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC):
 - 2.1.1.1. "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS."
 - 2.1.1.2. "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM HIGH STRENGTH BOLTS," AS APPROVED BY THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS.
 - 2.1.1.3. "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES"
 - 2.1.2. BY THE AMERICAN WELDING SOCIETY (AWS):
 - 2.1.2.1. "STRUCTURAL WELDING CODE - STEEL D1.1."
 - 2.1.2.2. "STANDARD SYMBOLS FOR WELDING, BRAZING, AND NONDESTRUCTIVE EXAMINATION"
- 2.2. ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM HIGH STRENGTH BOLTS', DEC. 31, 2009.
- 2.3. ANY MATERIAL OR WORKMANSHIP WHICH IS OBSERVED TO BE DEFECTIVE OR INCONSISTENT WITH THE CONTRACT DOCUMENTS SHALL BE CORRECTED, MODIFIED, OR REPLACED AT THE CONTRACTOR'S EXPENSE.
- 2.4. WELDED CONNECTIONS SHALL CONFORM TO THE LATEST REVISED CODE OF THE AMERICAN WELDING SOCIETY, AWS D1.1. ALL WELD ELECTRODES SHALL BE E80XX UNLESS NOTED OTHERWISE ON THE DRAWINGS.
- 2.5. ALL WELDED CONNECTIONS SHALL BE MADE BY WELDERS CERTIFIED BY AWS. CONTRACTOR SHALL SUBMIT WELDERS' CERTIFICATION AND QUALIFICATION DOCUMENTATION TO CROWN CASTLE'S TESTING AGENCY FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
- 2.6. STRUCTURAL STEEL PLATES SHALL CONFORM TO ASTM A572 GRADE 65(FY = 65 KSI MIN.) UNLESS NOTED OTHERWISE ON THE DRAWINGS.
- 2.7. SURFACES OF EXISTING STEEL SHALL BE PREPARED AS REQUIRED FOR FIELD WELDING PER AWS. SEE SECTION I NOTES REGARDING TOUCH UP OF GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS FIELD WELDING.
- 2.8. NO WELDING SHALL BE DONE TO THE EXISTING STRUCTURE WITHOUT THE PRIOR APPROVAL AND SUPERVISION OF THE TESTING AGENCY.
- 2.9. FIELD CUTTING OF STEEL:
 - 2.9.1. IMPORTANT CUTTING AND WELDING SAFETY GUIDELINES: THE CONTRACTOR SHALL FOLLOW ALL CROWN CASTLE CUTTING, WELDING, FIRE PREVENTION AND SAFETY GUIDELINES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL OBTAIN A COPY OF THE CURRENT CROWN CASTLE GUIDELINES. PER THE 12-01-2005 CROWN CASTLE DIRECTIVE: "ALL CUTTING AND WELDING ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH CROWN CASTLE POLICY 'CUTTING AND WELDING SAFETY PLAN' (DOC # ENG-PLN-10015) ON AN ONGOING BASIS THROUGHOUT THE ENTIRE LIFE OF THE PROJECT." ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE, RESULTING FROM THE CONTRACTOR'S ACTIVITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.
 - 2.9.2. ALL REQUIRED CUTS SHALL BE CUT WITHIN THE DIMENSIONS SHOWN ON THE DRAWINGS. NO CUTS SHALL EXTEND BEYOND THE OUTLINE OF THE DIMENSIONS SHOWN ON THE DRAWINGS. ALL CUT EDGES SHALL BE GROUND SMOOTH AND DE-BURRED. CUT EDGES THAT ARE TO BE FIELD WELDED SHALL BE PREPARED FOR FIELD WELDING PER AWS D1.1 AND AS SHOWN ON THE DRAWINGS. CONTRACTOR TO AVOID 90 DEGREE CORNERS. IT MAY BE NECESSARY TO DRILL STARTER HOLES AS REQUIRED TO MAKE THE CUTS.

3. BASE PLATE GROUT - (NOT REQUIRED)

4. FOUNDATION WORK - (NOT REQUIRED)

5. CAST-IN-PLACE CONCRETE - (NOT REQUIRED)

6. EPOXY GROUTED REINFORCING ANCHOR RODS

- 6.1. UNLESS OTHERWISE NOTED, REINFORCING ANCHOR RODS SHALL BE 150 KSI ALL-THREAD BARS CONFORMING TO ASTM A722. RECOMMENDED MANUFACTURERS/SUPPLIERS OF 150 KSI ALL-THREAD BARS ARE WILLIAMS FORM ENGINEERING CORPORATION AND DYWIDAG SYSTEMS INTERNATIONAL.
- 6.2. ALL REINFORCING ANCHOR RODS SHALL BE HOT DIP GALVANIZED PER ASTM A123.
- 6.3. THE CORE-DRILLED HOLES IN THE CONCRETE FOR THE ANCHOR RODS SHALL BE CLEAN AND DRY, AND OTHERWISE PROPERLY PREPARED ACCORDING TO THE ANCHOR ROD AND EPOXY MANUFACTURERS' INSTRUCTIONS, PRIOR TO PLACEMENT OF ANCHOR RODS AND EPOXY. CONTRACTOR SHALL FOLLOW ALL ANCHOR ROD AND EPOXY MANUFACTURER RECOMMENDATIONS REGARDING HANDLING OF RODS, EPOXY, ACCEPTABLE AMBIENT TEMPERATURE RANGE DURING INSTALLATION AND POST-INSTALLATION CURING, THE EFFECT OF TEMPERATURE ON EPOXY CURING TIME, PREPARATION OF HOLE, ETC.
- 6.4. HILTI HIT RE-500 SD OR ITW RED HEAD EPCON G5 EPOXY SHALL BE USED TO ANCHOR THE BAR IN THE DRILL HOLES. IF THE DESIGNED EMBEDMENT IS GREATER THAN 12 FT, CONTRACTOR HAS THE OPTION TO USE PILE ANCHOR GROUT BY E-CHEM AS AN ALTERNATE. IF CONTRACTOR WISHES TO USE A DIFFERENT EPOXY, A REQUEST INCLUDING THE EPOXY TECHNICAL DATA SHEET(S) SHALL BE SUBMITTED TO THE EOR FOR REVIEW PRIOR TO CONSTRUCTION.
- 6.5. ONCE THE REINFORCING ANCHOR RODS HAVE BEEN INSTALLED AND ALL EPOXY AND GROUT HAVE CURED (IF BASE PLATE AND/OR BEARING PLATES HAVE BEEN GROUTED PRIOR TO TESTING), ALL REINFORCING ANCHORS SHALL BE LOAD TESTED PER CROWN CASTLE ENGINEERING DOCUMENT #ENG-PRC-10119. REFER TO THE NEW ANCHOR & BRACKET DETAIL ON FOLLOWING SHEETS FOR SPECIFIED ANCHOR ROD TARGET TENSION LOAD.
- 6.6. ONCE THE REINFORCING ANCHOR RODS HAVE BEEN SUCCESSFULLY LOAD TESTED AND APPROVED THE CONTRACTOR SHALL TIGHTEN ALL HEAVY HEX ANCHOR NUTS TO SNUG TIGHT PLUS 1/8 TURN OF NUT.

7. TOUCH UP OF GALVANIZING

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

8. HOT-DIP GALVANIZING

- 8.1. HOT-DIP GALVANIZE ALL STRUCTURAL STEEL MEMBERS AND ALL STEEL ACCESSORIES, BOLTS, WASHERS, ETC. PER ASTM A123 OR PER ASTM A153, AS APPROPRIATE.
- 8.2. PROPERLY PREPARE STEEL ITEMS FOR GALVANIZING. DRILL OR PUNCH WEEP AND/OR DRAINAGE HOLES WITH EOR APPROVAL OF LOCATIONS.
- 8.3. ALL GALVANIZING SHALL BE DONE AFTER FABRICATION IS COMPLETED AND PRIOR TO FIELD INSTALLATION.

9. PERPETUAL INSPECTION AND MAINTENANCE BY THE OWNER

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

© Copyright 2015, by Paul J. Ford and Company, All Rights Reserved. This document and the data contained herein, is proprietary to Paul J. Ford and Company, issued in strict confidence and shall not, without the prior written permission of Paul J. Ford and Company, be reproduced, copied or used for any purpose other than the intended use for this specific project.

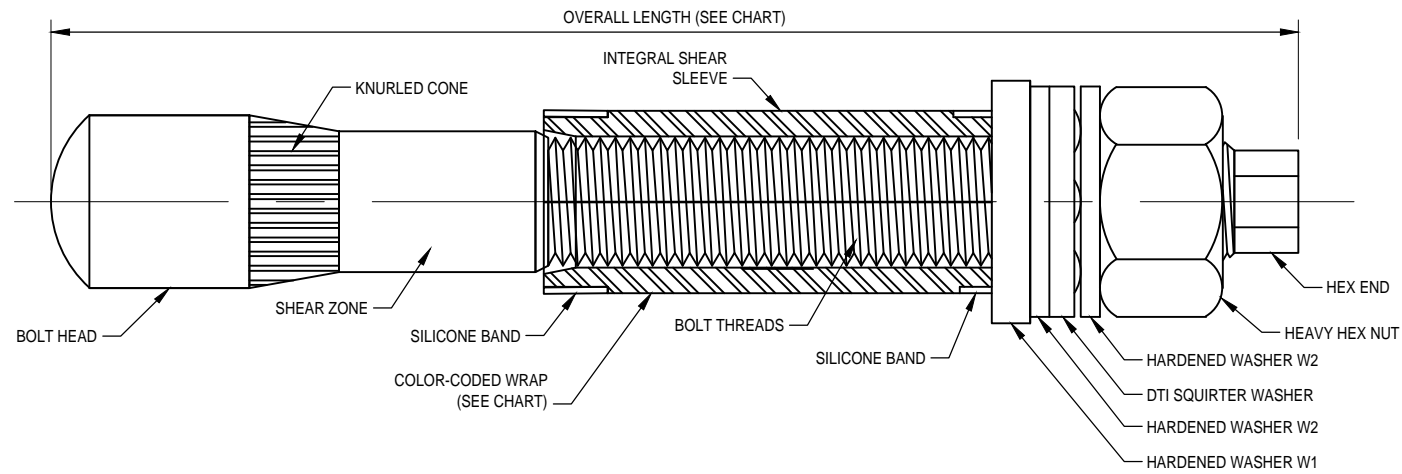
PAUL J. FORD & COMPANY
250 E Broad St, Ste 600, Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com

CROWN CASTLE
3530 TORINGDON WAY, SUITE 300, CHARLOTTE, NC 28277
PH: (724) 416-2000

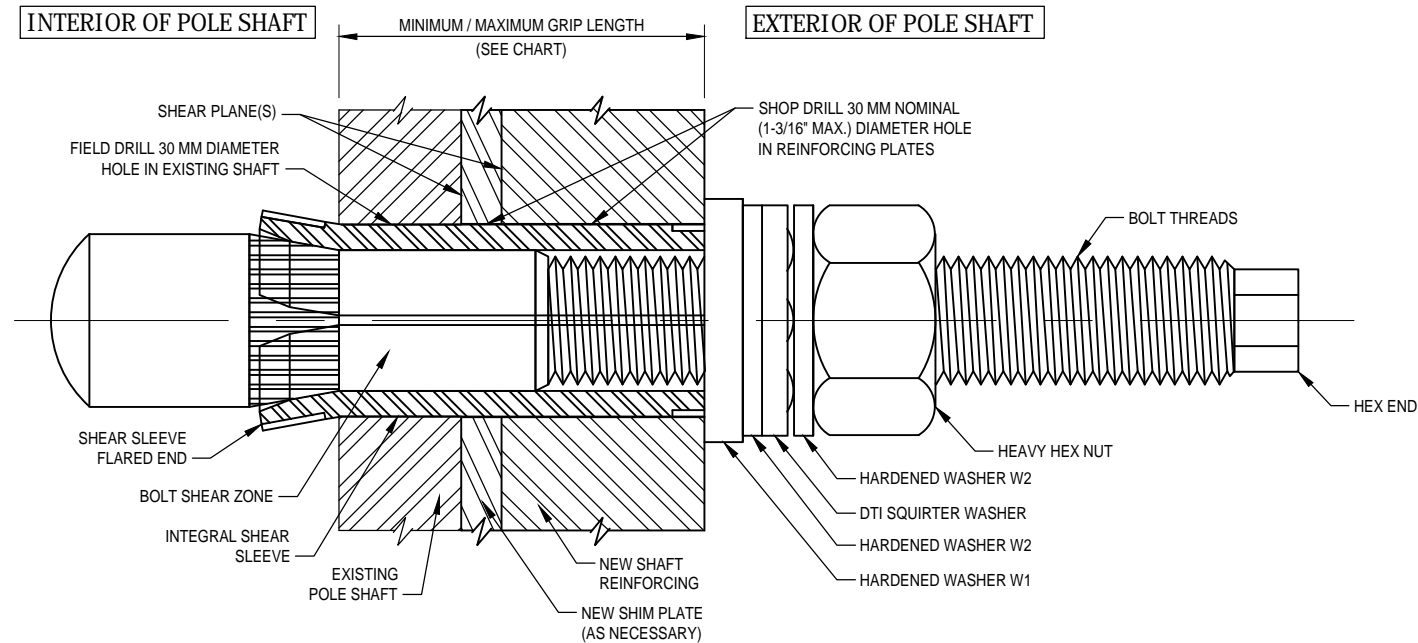
MODIFICATION OF AN EXISTING 150' MONOPOLE
BU #876327, KINGS LOT SOUTH WINDSOR, CONNECTICUT

PROJECT No:	37515-2506.002.7700
DRAWN BY:	B.M.S.
DESIGNED BY:	J.J.W.
CHECKED BY:	
DATE:	10-23-2015

GENERAL NOTES



PRE-INSTALLED FORGBolt™ ASSEMBLY DETAIL 1
S-2A



INSTALLED FORGBolt™ ASSEMBLY DETAIL 2
S-2A

FORGBolt™		AISC Group A Material: ASTM A325 and PC8.8 (Tensile Stress, Fu = 120 ksi minimum)					
GROUP A	FORGBolt™ Size (mm)	Overall Length (inches)	Estimated Weight Each (lbs)	Grip Range (inch)	Comment	Color Code	
FORGBolt™ A325 - PC8.8	1	135	5.31	1.3	3/8" to 1"	--	RED
	2	160	6.30	1.6	3/4" to 1-1/2"	--	GREEN
	3	195	7.68	1.9	1-1/4" to 2-1/4"	--	BLUE
	4	260	10.24	2.6	2" to 3-1/2"	Splice Bolt	YELLOW
	5	365	14.37	3.6	3-1/2" to 5-1/2"	Flange Jump Bolt	ORANGE
	6	440	17.32	4.3	5-1/2" to 8-1/2"	Flange Jump Bolt	BLACK
DTI Note	Each Group A (A325/PC8.8) FORGBolt™ assembly shall have a 'Squirtter' DTI that is compatible with a M20-PC8.8 bolt.						

FOLLOW ALL MANUFACTURER / DISTRIBUTOR RECOMMENDATIONS FOR INSTALLATION, TIGHTENING, AND INSPECTION

- INSTALLATION NOTES:**
1. FIELD DRILL HOLES TO 30 MM DIAMETER.
 2. SELECT CORRECT BOLT SIZE FOR INSTALLATION GRIP (REFER TO PLANS).
 3. INSERT BOLT ASSEMBLY THROUGH HOLES IN SHAFT REINFORCING PLATES AND SEAT THE HARDENED WASHER W1 FLUSH AGAINST OUTSIDE OF PLATE.
 4. HAND TIGHTEN NUT TO FINGER TIGHT.
 5. TIGHTEN NUT TO PRETENSIONED CONDITION AND UNTIL DTI SHOWS PROPER INDICATION.
 6. PROPERLY DOCUMENT AND INSPECT BOLT TIGHTENING PER PLAN REQUIREMENTS.

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

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

**AISC GROUP A MATERIAL: ASTM A325 AND PC8.8
(Fu = 120 KSI MIN. TENSILE STRESS)**

CONTAINS PROPRIETARY INFORMATION PATENT PENDING
© Copyright 2013 to 2015 by PTP, all rights reserved.

DISTRIBUTOR CONTACT:
PRECISION TOWER PRODUCTS
PHONE: 888-926-4857
EMAIL: info@precisiontowerproducts.com
WEB: www.precisiontowerproducts.com

© Copyright 2015, by Paul J. Ford and Company, All Rights Reserved. This document and the data contained herein, is proprietary to Paul J. Ford and Company, issued in strict confidence and shall not, without the prior written permission of Paul J. Ford and Company, be reproduced, copied or used for any purpose other than the intended use for this specific project.

PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com

CROWN CASTLE
3530 TORINGDON WAY, SUITE 300, CHARLOTTE, NC 28277
PH: (724) 416-2000

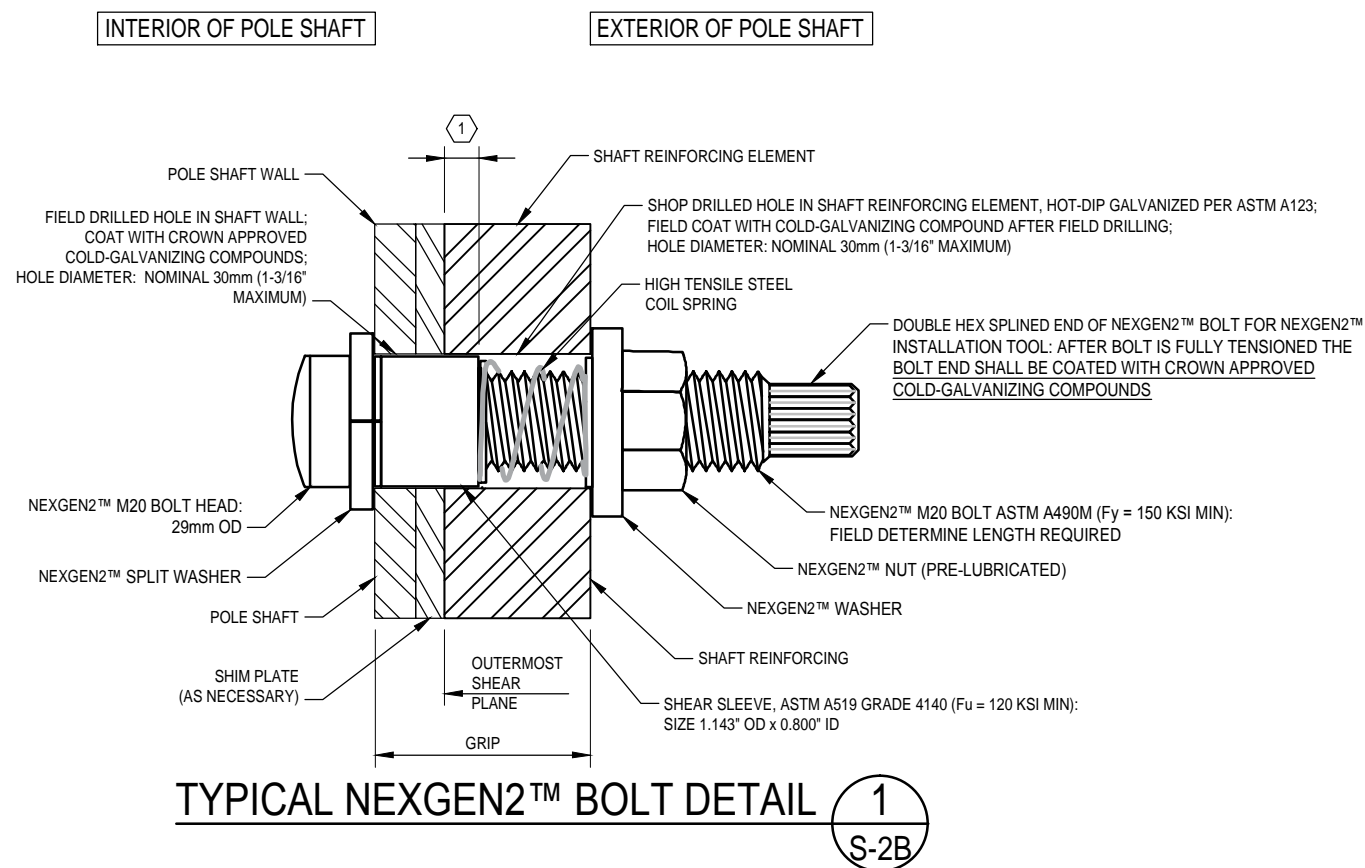
MODIFICATION OF AN EXISTING 150' MONOPOLE
BU #876327; KINGS LOT
SOUTH WINDSOR, CONNECTICUT

PROJECT No:	37515-2506.002.7700
DRAWN BY:	B.M.S.
DESIGNED BY:	J.J.W.
CHECKED BY:	
DATE:	10-23-2015

FORGBolt™
DETAILS

S-2A

1 NOTE: SHEAR SLEEVE LENGTH: THE SHEAR SLEEVE SHALL PROJECT A MINIMUM OF 3/8" BEYOND THE OUTERMOST SHEAR PLANE. THE CONTRACTOR SHALL SUBMIT FABRICATION DRAWINGS SHOWING NEXGEN2™ BOLT LENGTHS AND SHEAR SLEEVE LENGTHS TO THE EOR FOR REVIEW AND APPROVAL.



FOLLOW ALL MANUFACTURER / DISTRIBUTOR RECOMMENDATIONS FOR INSTALLATION, TIGHTENING, AND INSPECTION

BOLT HOLE NOTES:

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

BOLT TIGHTENING AND INSPECTION NOTES:

1. ALL NEXGEN2™ BOLT ASSEMBLIES SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF SECTION 8.2.3 OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009. PER SECTION 8.2.3: ALL FASTENER ASSEMBLIES SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS IN AISC SECTION 8.1 WITHOUT SEVERING THE SPLINED END AND WITH WASHERS POSITIONED AS REQUIRED IN AISC SECTION 6.2. PER REQUIREMENTS IN SECTION 8.1: PRIOR TO BOLT PRETENSIONING, THE JOINT SHALL FIRST BE COMPACTED TO THE SNUG-TIGHT CONDITION. SNUG TIGHT IS THE CONDITION THAT EXISTS WHEN ALL OF THE PLIES IN THE CONNECTION HAVE BEEN PULLED INTO FIRM CONTACT BY THE BOLTS AND THE BOLTS HAVE BEEN TIGHTENED SUFFICIENTLY TO PREVENT THE REMOVAL OF THE NUTS WITHOUT THE USE OF A WRENCH. ONCE THE SNUG TIGHT CONDITION IS ACHIEVED, THEN THE BOLT ASSEMBLY CAN BE TIGHTENED TO THE PRETENSIONED CONDITION.
2. ALL NEXGEN2™ BOLT ASSEMBLIES SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF SECTION 9.2.3 OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009. NOTE THAT COMPLETE INSPECTION OF ALL NEXGEN2™ BOLT ASSEMBLIES IS REQUIRED IN ADDITION TO ROUTINE OBSERVATION.
3. ALL NEXGEN2™ BOLTS SHALL BE INSPECTED BY A QUALIFIED BOLT INSPECTOR PER NOTES 1 AND 2, ABOVE. DURING INSTALLATION, THE BOLT INSPECTOR SHALL VERIFY AND DOCUMENT: THE SHOP-DRILLED AND FIELD-DRILLED HOLE SIZES; THE INSTALLATION OF THE NEXGEN2™ BOLT ASSEMBLY, INCLUDING THE SHEAR SLEEVE PLACEMENT AND NUT LUBRICATION; AND THE CONTRACTOR'S TENSIONING PROCEDURE. THE BOLT INSPECTOR SHALL PROVIDE COMPLETE DOCUMENTATION OF ALL BOLTS AFTER TIGHTENING CLEARLY SHOWING THAT THE DOUBLE HEX SPLINED END OF THE BOLTS HAVE BEEN TWISTED OFF AND COATED WITH CROWN APPROVED COLD-GALVANIZING COMPOUND..

NOTE: NEXGEN2™ BOLT ASSEMBLY SHALL BE MAGNI 565 COATED PER ASTM F2833 AND MANUFACTURER SPECIFICATIONS.

NOTE: INSTALL NEXGEN2™ BOLT ASSEMBLY PER MANUFACTURER'S INSTRUCTIONS.

DISTRIBUTOR CONTACT DETAILS:

ALLFASTENERS
 15401 COMMERCE PARK DR.
 BROOKPARK, OHIO 44142
 PHONE: 440-232-6060
 E-MAIL: SALES@ALLFASTENERS.COM

© Copyright 2015, by Paul J. Ford and Company, All Rights Reserved. This document and the data contained herein, is proprietary to Paul J. Ford and Company, issued in strict confidence and shall not, without the prior written permission of Paul J. Ford and Company, be reproduced, copied or used for any purpose other than the intended use for this specific project.

PAUL J. FORD & COMPANY
 250 E Broad St, Ste 600 Columbus, OH 43215
 Phone 614.221.6679 www.pauljford.com

CROWN CASTLE
 3530 TORINGDON WAY, SUITE 300, CHARLOTTE, NC 28277
 PH: (724) 416-2000

MODIFICATION OF AN EXISTING 150' MONOPOLE
 BU #876327, KINGS LOT
 SOUTH WINDSOR, CONNECTICUT

PROJECT No:	37515-2506.002.7700
DRAWN BY:	B.M.S.
DESIGNED BY:	J.J.W.
CHECKED BY:	
DATE:	10-23-2015

NEXGEN2™ BOLT DETAIL

S-2B

© Copyright 2015, by Paul J. Ford and Company, All Rights Reserved. This document and the data contained herein, is proprietary to Paul J. Ford and Company, issued in strict confidence and shall not, without the prior written permission of Paul J. Ford and Company, be reproduced, copied or used for any purpose other than the intended use for this specific project.

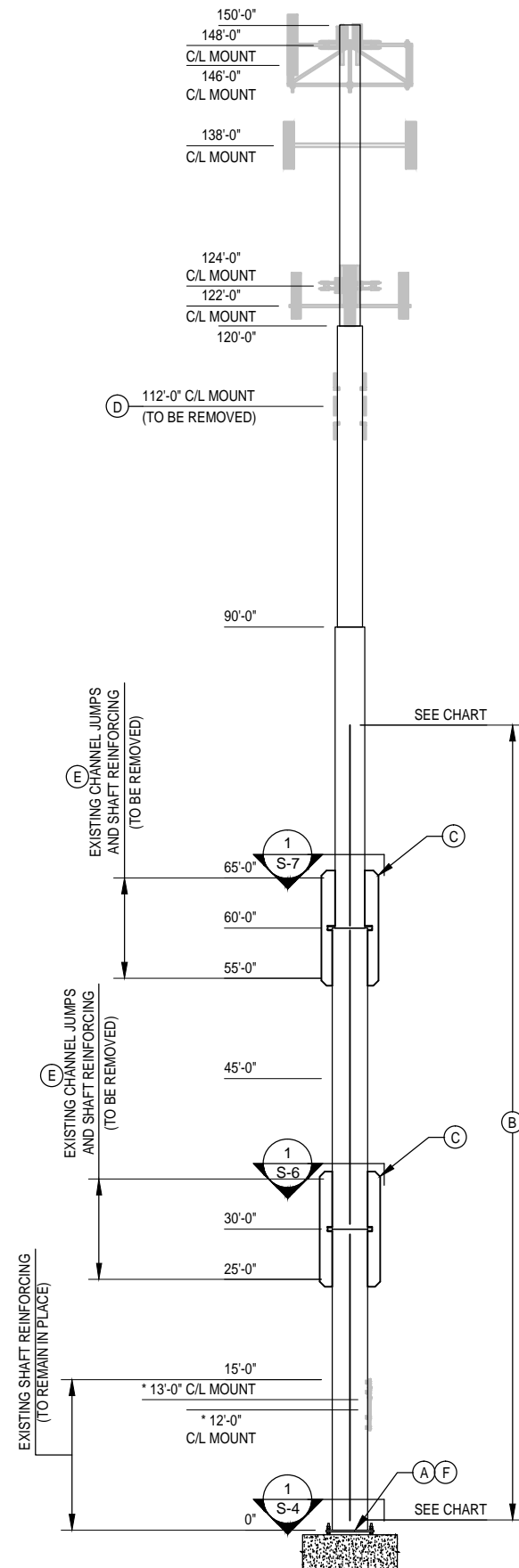
PAUL J. FORD & COMPANY
 250 E Broad St, Ste 600, Columbus, OH 43215
 Phone 614.221.6679 www.pauljford.com

CROWN CASTLE
 3530 TORINGDON WAY, SUITE 300, CHARLOTTE, NC 28277
 PH: (724) 416-2000

SHAFT SECTION DATA							
SHAFT SECTION	SECTION LENGTH (FT)	PLATE THICKNESS (IN)	LAP SPLICE (IN)	DIAMETER ACROSS FLATS (IN)		POLE GRADE (ksi)	POLE SHAPE
				@ TOP	@ BOTTOM		
1	30.00	0.2500		24.000	24.000	42	ROUND
2	30.00	0.3750		30.000	30.000	42	ROUND
3	30.00	0.3750		36.000	36.000	42	ROUND
4	30.00	0.3750		42.000	42.000	42	ROUND
5	30.00	0.5000		42.000	42.000	42	ROUND

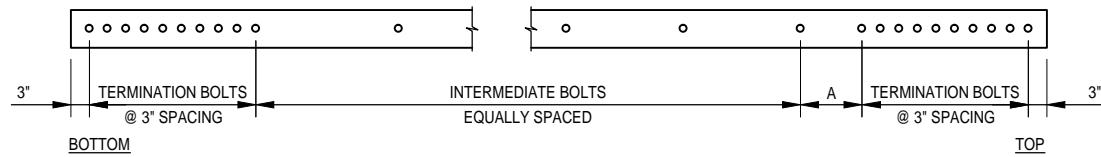
NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

- MODIFICATIONS:
- (A) INSTALL NEW ANCHOR RODS AND BRACKETS AT BASE PLATE. SEE SHEET S-4.
 - (B) INSTALL NEW SHAFT REINFORCING. SEE CHART ON THIS SHEET.
 - (C) INSTALL NEW WELDED BRIDGE STIFFENERS AT EL. 30' & 60'. SEE SHEETS S-6 & S-7.
 - (D) REMOVE EXISTING MOUNT, ANTENNAS AND EQUIPMENT AT EL. 112'.
 - (E) EXISTING CHANNEL JUMPS AND REINFORCING TO BE REMOVED.
 - (F) REMOVE EXISTING STIFFENERS AS REQUIRED. SEE SHEET S-4.



NEW CCI FLAT PLATE (65 KSI) REINFORCING SCHEDULE											
BOTTOM ELEVATION	TOP ELEVATION	FLAT # / DEGREE SEPARATION	ELEMENT	ELEMENT LENGTH	ELEMENT QUANTITY	APPROXIMATE BOLTS PER ELEMENT	APPROXIMATE TOTAL BOLT QUANTITY	TERMINATION BOLTS (BOTTOM)	TERMINATION BOLTS (TOP)	MAXIMUM INTERMEDIATE BOLT SPACING	ESTIMATED TOTAL STEEL WEIGHT
1'-3"	29'-9"	210	1"x6" CFP #1	28'-6"	1	37	37	10	10	16"	582 LBS.
2'-0"	29'-9"	330	1"x6" CFP #2	27'-9"	1	37	37	10	10	16"	567 LBS.
5'-0"	29'-9"	90	1"x6" CFP #3	24'-9"	1	34	34	10	10	16"	505 LBS.
30'-3"	59'-9"	75, 195 & 315	1-1/4"x6-1/2" CFP #4	29'-6"	3	42	126	14	14	19"	2447 LBS.
60'-3"	80'-3"	75, 195 & 315	CCI-SFP-04510020	20'-0"	3	22	66	6	6	20"	919 LBS.
						300	5020 LBS.				

- NOTES:
- ALL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123. ALTERNATIVELY, ALL NEW STIFFENER PLATE STEEL REINFORCING MAY BE COLD GALVANIZED AS FOLLOWS: APPLY A MINIMUM OF TWO COATS OF ZRC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.0 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-831-3275 FOR PRODUCT INFORMATION.
 - ALL REINFORCING SHALL BE ASTM A672 GR. 65.
 - WELDS SHALL BE E80XX OR GREATER. TERMINATION WELDS SHALL BE 3/8" FILLET WELDS.
 - HOLES FOR BOLTS ARE 30mm UNLESS NOTED OTHERWISE.
 - ALL SHIMS SHALL BE ASTM A-36.



CUSTOM BOLTED BAR DETAIL
 NOTE: "A" DIMENSION MAY VARY, NOT TO EXCEED MAXIMUM INTERMEDIATE BOLT SPACING

* EXISTING MOUNTS MAY NEED TO BE ADJUSTED, MOVED AND/OR TEMPORARILY SUPPORTED DURING THE INSTALLATION OF SHAFT REINFORCING

POLE ELEVATION 1 S-3

MODIFICATION OF AN EXISTING 150' MONOPOLE
 BU #876327, KINGS LOT
 SOUTH WINDSOR, CONNECTICUT

PROJECT No: 37515-2506.002.7700
 DRAWN BY: B.M.S.
 DESIGNED BY: J.J.W.
 CHECKED BY:
 DATE: 10-23-2015

MONOPOLE PROFILE

S-3

BASE SPECIFICATIONS	
BASE PLATE:	53"Ø; 2" THK.; Fy=36 KSI
ANCHOR RODS:	(18) 1 1/2"Ø; 47" B.C.

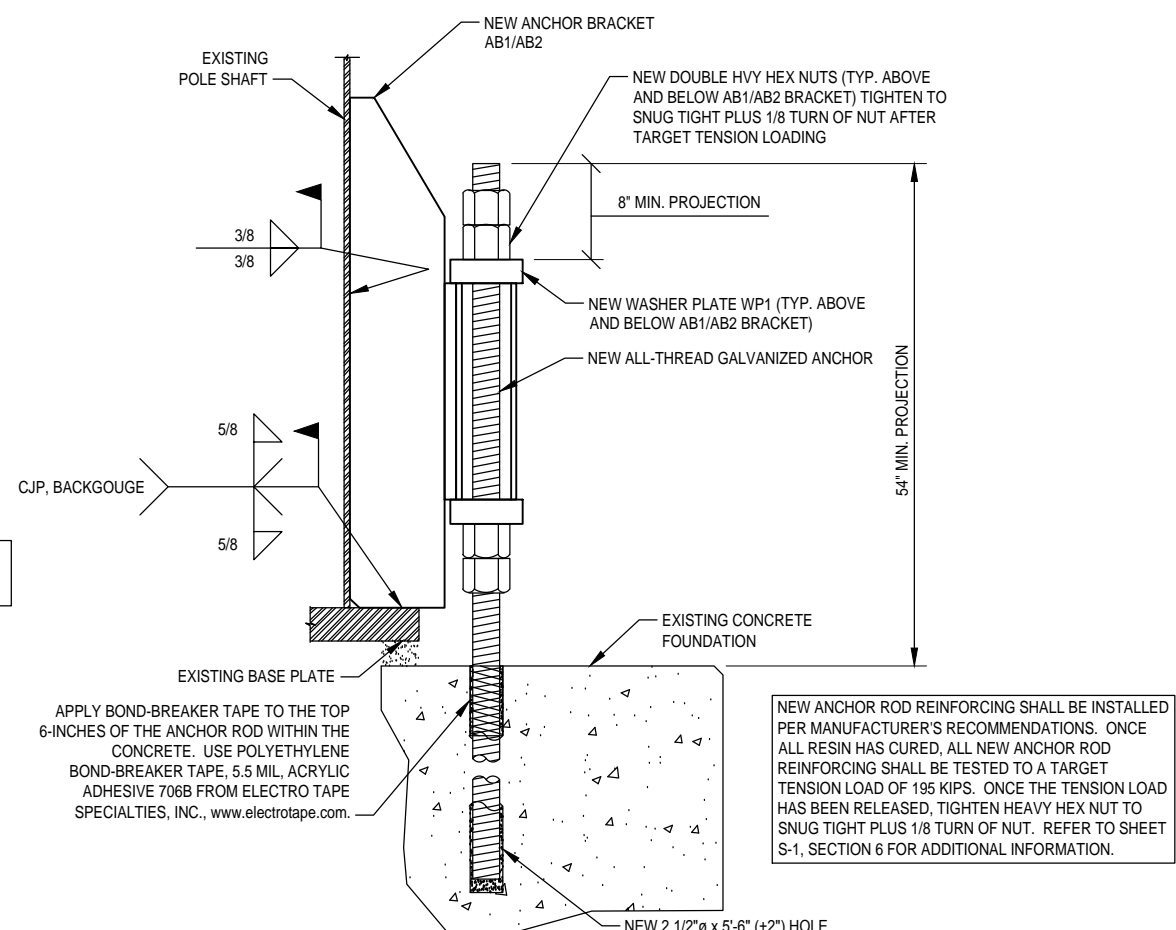
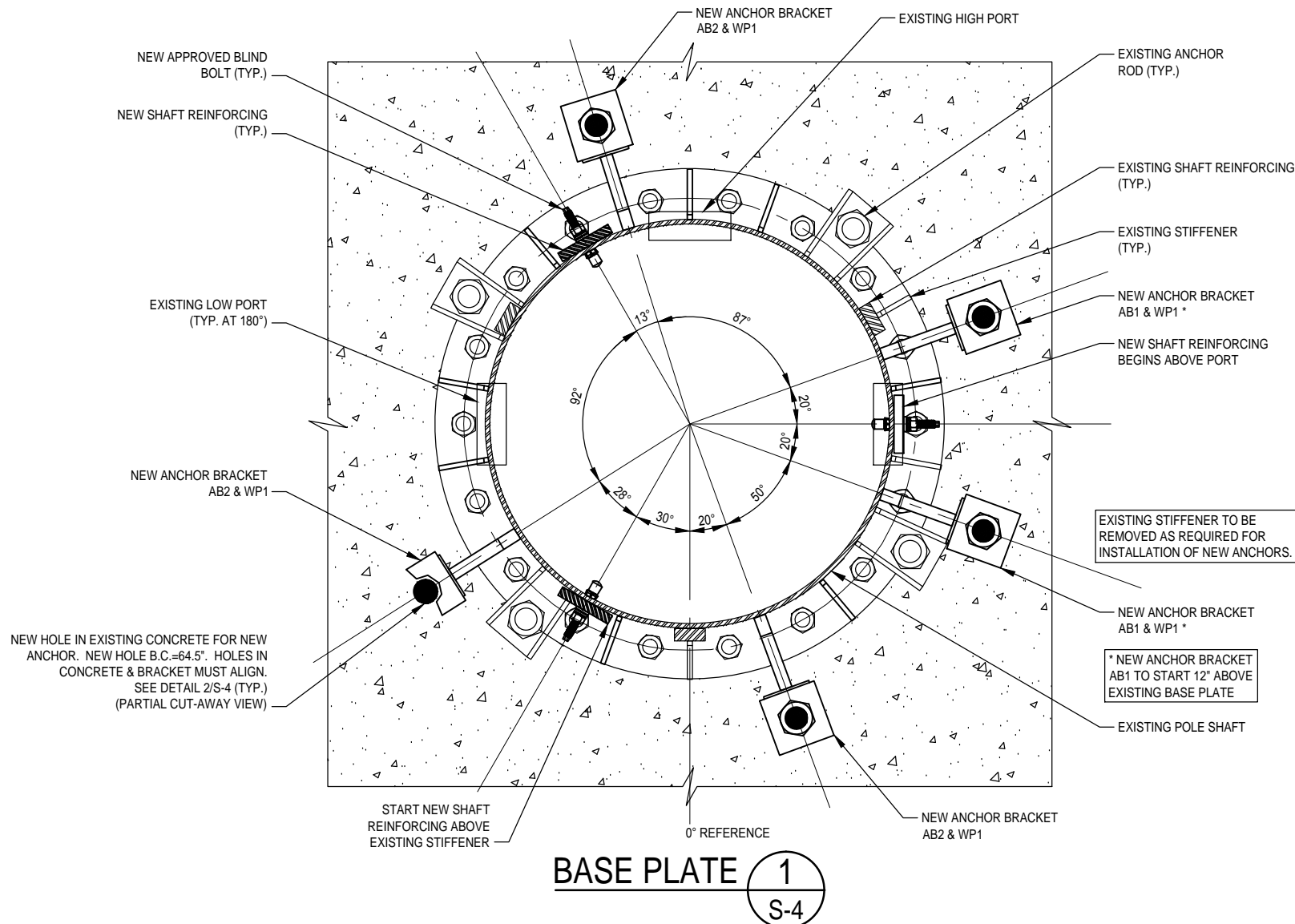
NDE OF THE CIRCUMFERENTIAL WELD OF THE BASE PLATE TO SHAFT CONNECTION IS REQUIRED. SEE CCI DOCUMENTS ENG-SOW-10033 'TOWER BASE PLATE NDE' AND ENG BUL-10051 'NDE REQUIREMENTS FOR MONOPOLE BASE PLATE TO PREVENT CONNECTION FAILURE.' NOTIFY THE EOR AND CROWN CASTLE ENGINEERING IMMEDIATELY IF ANY CRACKS ARE SUSPECTED OR HAVE BEEN IDENTIFIED. THE NDE SHALL INCLUDE ALL EXISTING REINFORCEMENTS THAT HAVE BEEN WELDED TO THE BASE PLATE. ANY FULL PENETRATION WELDING TO THE BASE PLATE REQUIRED AS PART OF THIS ACTIVE REINFORCEMENT DESIGN SHALL BE INCLUDED IN THE NDE SCOPE OF WORK.

© Copyright 2015, by Paul J. Ford and Company, All Rights Reserved. This document and the data contained herein, is proprietary to Paul J. Ford and Company, issued in strict confidence and shall not, without the prior written permission of Paul J. Ford and Company, be reproduced, copied or used for any purpose other than the intended use for this specific project.

PAUL J. FORD & COMPANY
 250 E Broad St, Ste 600
 Columbus, OH 43215
 Phone 614.221.6679
 www.pauljford.com

CROWN CASTLE
 3530 TORINGDON WAY, SUITE 300, CHARLOTTE, NC 28277
 PH: (724) 416-2000

NEW ANCHOR RODS				
PART #	DIAMETER (IN)	LENGTH (IN)	MATERIAL	EMBEDMENT DEPTH (IN)
CUSTOM	2 1/4	123	A193 GR B7	66



MODIFICATION OF AN EXISTING 150' MONOPOLE
 BU #876327, KINGS LOT
 SOUTH WINDSOR, CONNECTICUT

PROJECT No:	37515-2506.002.7700
DRAWN BY:	B.M.S.
DESIGNED BY:	J.J.W.
CHECKED BY:	
DATE:	10-23-2015

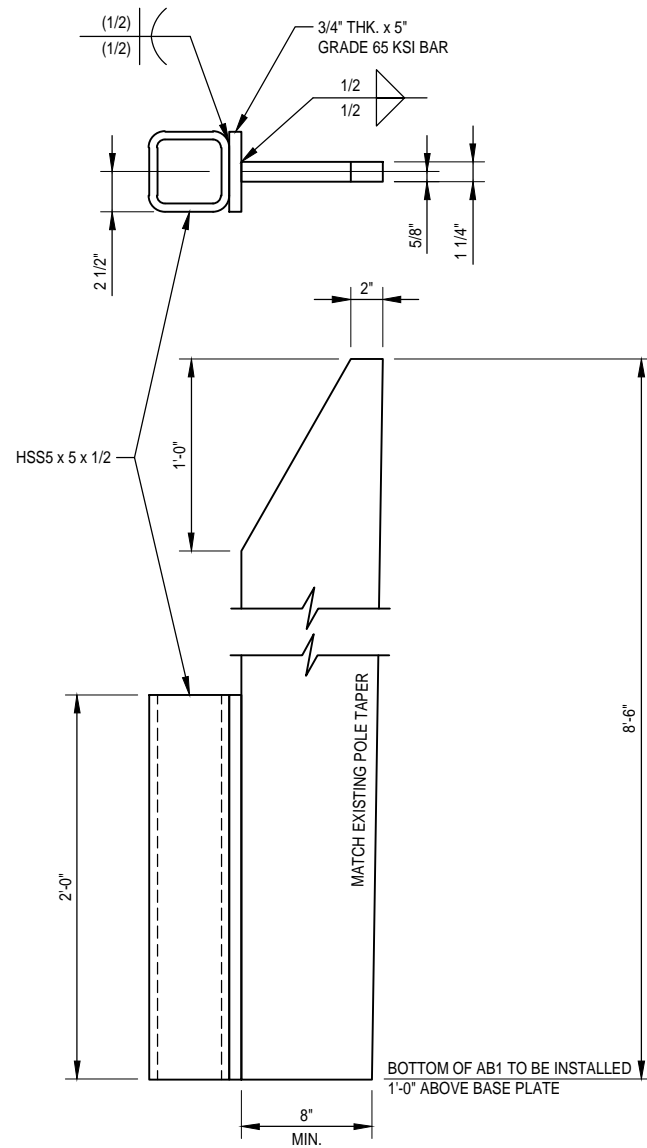
BASE PLATE DETAILS

S-4

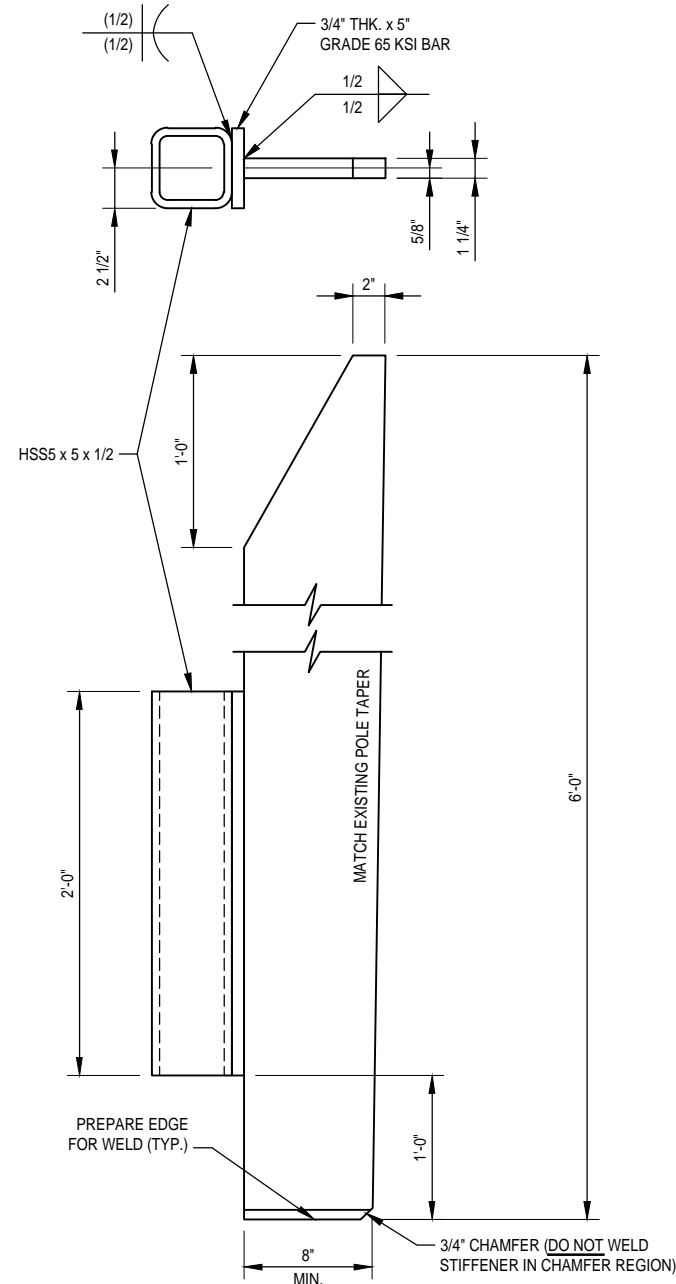
© Copyright 2015, by Paul J. Ford and Company, All Rights Reserved. This document and the data contained herein, is proprietary to Paul J. Ford and Company, issued in strict confidence and shall not, without the prior written permission of Paul J. Ford and Company, be reproduced, copied or used for any purpose other than the intended use for this specific project.

PJF PAUL J. FORD & COMPANY
 250 E Broad St, Ste 600 Columbus, OH 43215
 Phone 614.221.6679 www.pauljford.com

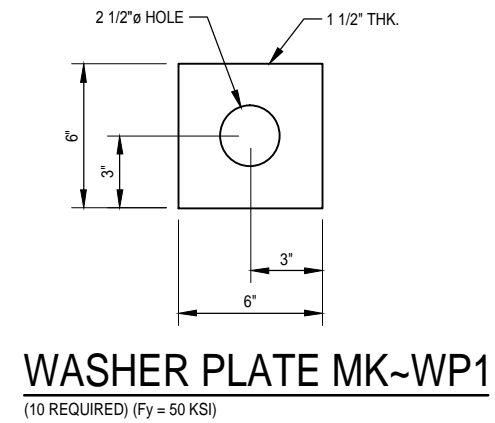
CROWN CASTLE
 3530 TORINGDON WAY, SUITE 300, CHARLOTTE, NC 28277
 PH: (724) 416-2000



ANCHOR BRACKET MK~AB1
 (2 REQUIRED) (TUBE Fy = 46 KSI) (STIFFENER Fy = 65 KSI)



ANCHOR BRACKET MK~AB2
 (3 REQUIRED) (TUBE Fy = 46 KSI) (STIFFENER Fy = 65 KSI)



WASHER PLATE MK~WP1
 (10 REQUIRED) (Fy = 50 KSI)

MODIFICATION OF AN EXISTING 150' MONOPOLE
 BU #876327; KINGS LOT
 SOUTH WINDSOR, CONNECTICUT

PROJECT No: 37515-2506.002.7700
 DRAWN BY: B.M.S.
 DESIGNED BY: J.J.W.
 CHECKED BY:
 DATE: 10-23-2015

MISC DETAILS

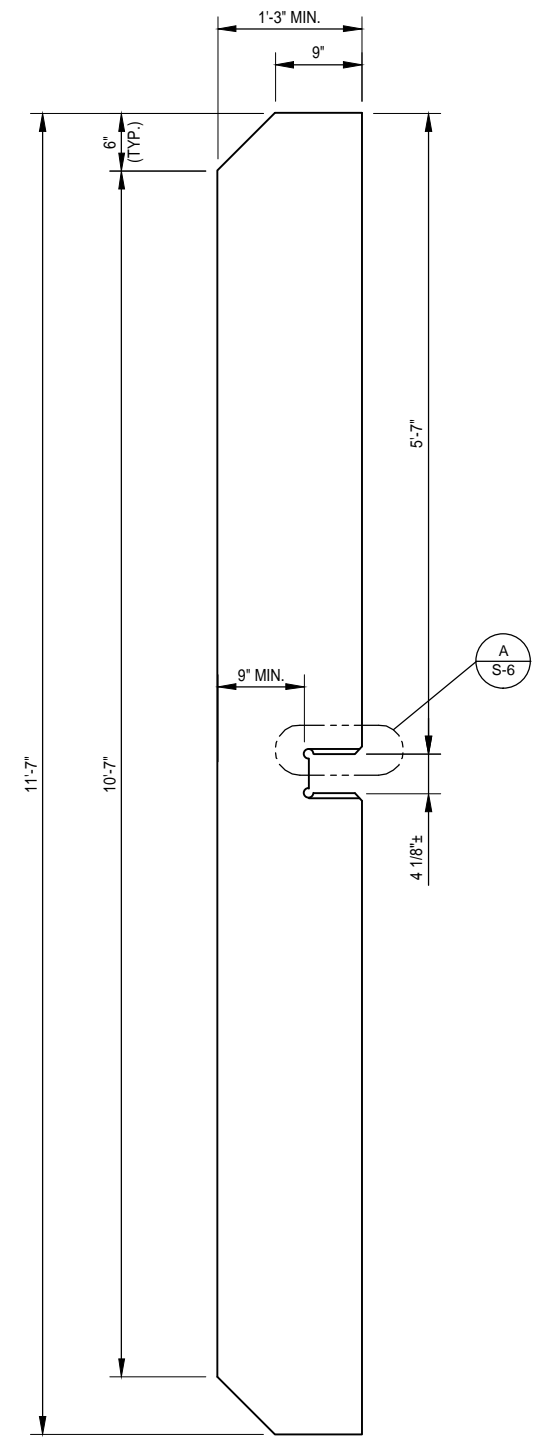
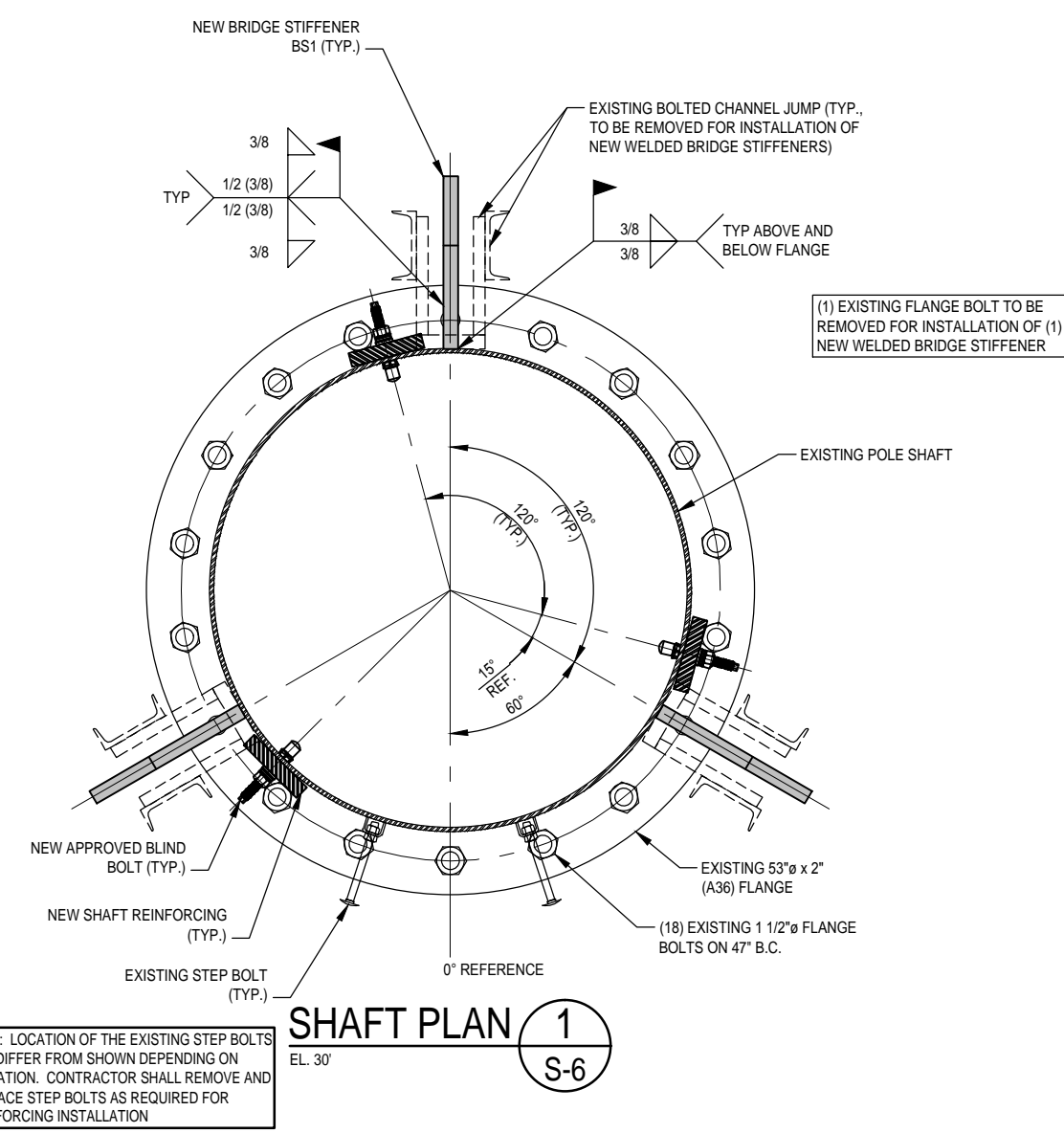
S-5

MODIFICATION OF AN EXISTING 150' MONOPOLE
 BU #876327, KINGS LOT
 SOUTH WINDSOR, CONNECTICUT

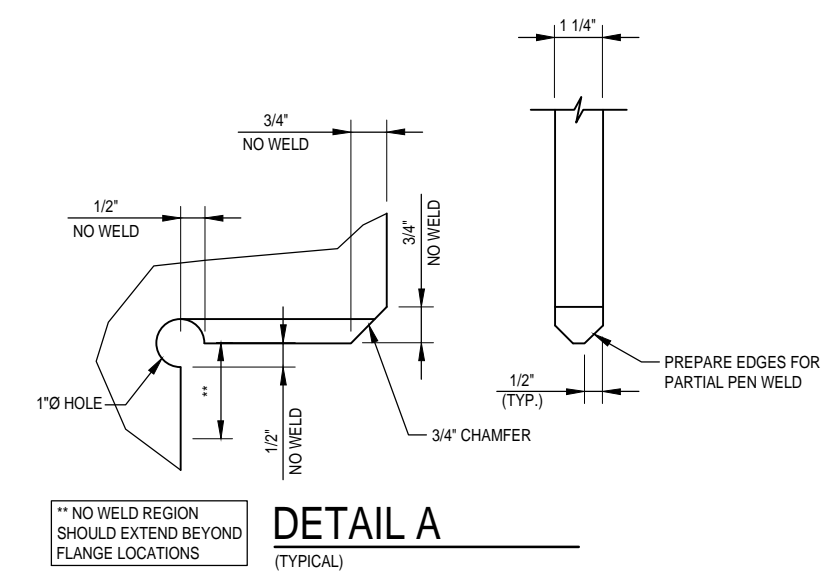
PROJECT No:	37515-2506.002.7700
DRAWN BY:	B.M.S.
DESIGNED BY:	J.J.W.
CHECKED BY:	
DATE:	10-23-2015

WELDED BRIDGE STIFFENER DETAILS

S-6



BRIDGE STIFFENER MK~BS1
 (3 REQUIRED) (Fy = 65 KSI)

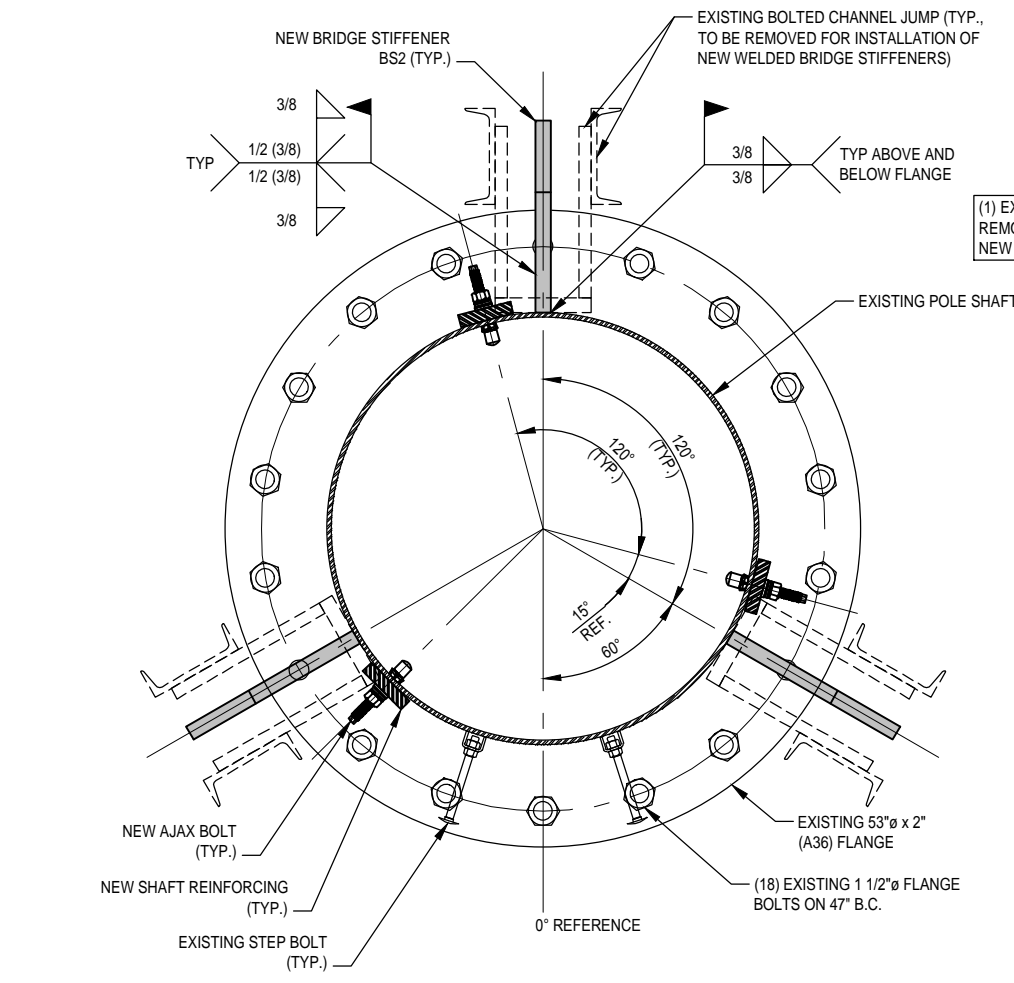


MODIFICATION OF AN EXISTING 150' MONOPOLE
 BU #876327, KINGS LOT
 SOUTH WINDSOR, CONNECTICUT

PROJECT No:	37515-2506.002.7700
DRAWN BY:	B.M.S.
DESIGNED BY:	J.J.W.
CHECKED BY:	
DATE:	10-23-2015

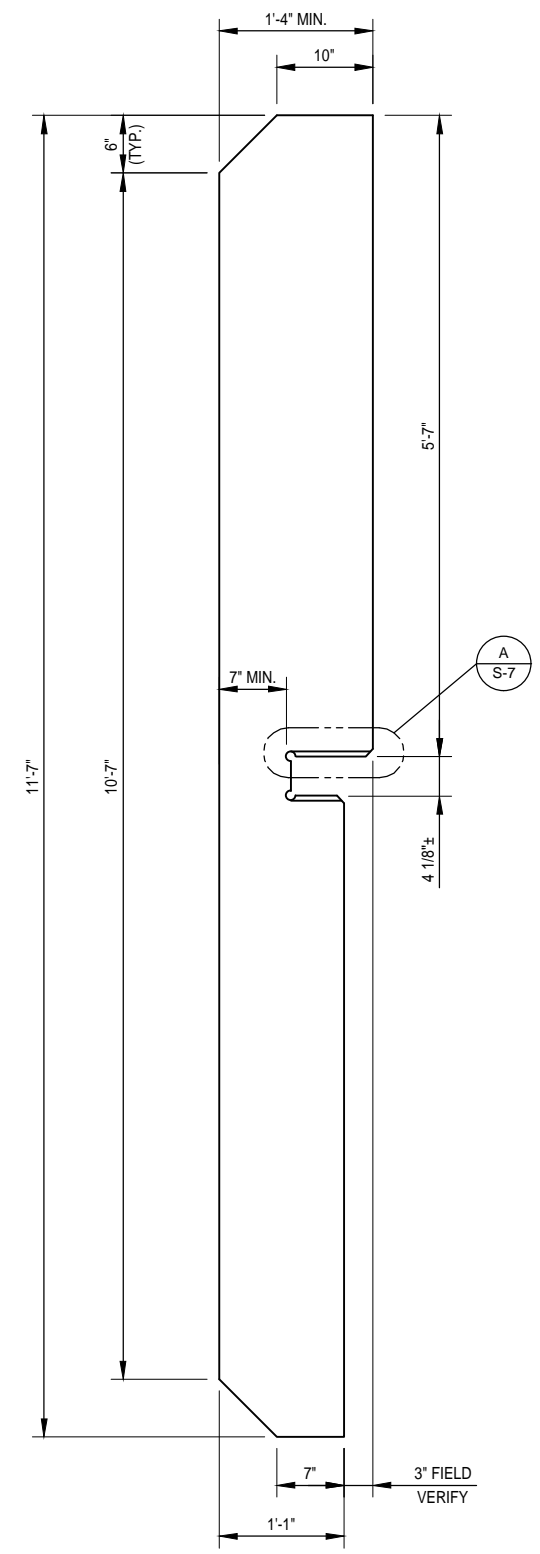
WELDED BRIDGE STIFFENER DETAILS

S-7

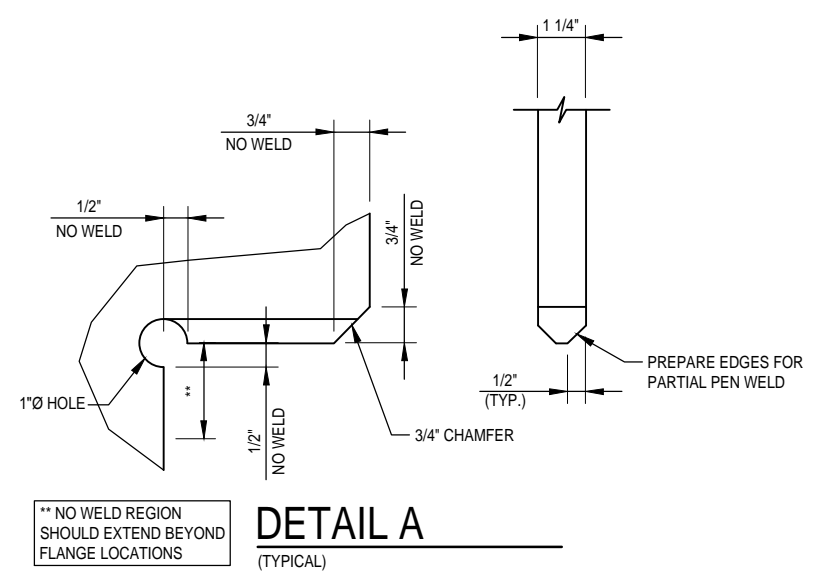


NOTE: LOCATION OF THE EXISTING STEP BOLTS MAY DIFFER FROM SHOWN DEPENDING ON ELEVATION. CONTRACTOR SHALL REMOVE AND REPLACE STEP BOLTS AS REQUIRED FOR REINFORCING INSTALLATION

SHAFT PLAN 1
 EL. 60' **S-7**



BRIDGE STIFFENER MK~BS2
 (3 REQUIRED) (Fy = 65 KSI)



** NO WELD REGION SHOULD EXTEND BEYOND FLANGE LOCATIONS

37515-2506.002.DWG

MODIFICATION INSPECTION NOTES:

- 1. GENERAL**
 - 1.1. 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 EOR.
 - 1.2. 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.
 - 1.3. ALL MI'S SHALL BE CONDUCTED BY A CROWN CASTLE ENGINEERING VENDOR (AEV) OR ENGINEERING SERVICE VENDOR (AESV) THAT IS APPROVED TO PERFORM ELEVATED WORK FOR CROWN CASTLE.
 - 1.4. 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 CASTLE POINT OF CONTACT (POC).
 - 1.5. REFER TO ENG-SOW-10007: MODIFICATION INSPECTION SOW FOR FURTHER DETAILS AND REQUIREMENTS.
- 2. MI INSPECTOR**
 - 2.1. THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO FOR THE MI TO, AT A MINIMUM:
 - 2.1.1. REVIEW THE REQUIREMENTS OF THE MI CHECKLIST.
 - 2.1.2. WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS.
 - 2.1.3. THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL 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 CASTLE.
- 3. GENERAL CONTRACTOR**
 - 3.1. 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:
 - 3.1.1. REVIEW THE REQUIREMENTS OF THE MI CHECKLIST.
 - 3.1.2. WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS.
 - 3.1.3. BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS.
 - 3.1.4. THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST AND ENG-SOW-10007.
- 4. RECOMMENDATIONS**
 - 4.1. THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING AN MI REPORT:
 - 4.1.1. IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLE 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
 - 4.1.2. THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
 - 4.1.3. WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS.
 - 4.1.4. 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.
 - 4.1.5. 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.
- 5. CANCELLATION OR DELAYS IN SCHEDULED MI**
 - 5.1. IF THE GC AND MI INSPECTOR AGREE TO A DATE ON WHICH THE MI WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, CROWN CASTLE 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 CASTLE 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.
- 6. CORRECTION OF FAILING MI'S**
 - 6.1. IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI ("FAILED MI"), THE GC SHALL WORK WITH CROWN CASTLE TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:
 - 6.1.1. CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI.
 - 6.1.2. OR, WITH CROWN CASTLE'S APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION.
- 7. MI VERIFICATION INSPECTIONS**
 - 7.1. CROWN CASTLE 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.
 - 7.2. ALL VERIFICATION INSPECTIONS SHALL BE HELD TO THE SAME SPECIFICATIONS AND REQUIREMENTS IN THE CONTRACT DOCUMENTS AND IN ACCORDANCE WITH ENG-SOW-10007.
 - 7.3. 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.
- 8. PHOTOGRAPHS**
 - 8.1. BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:
 - 8.1.1. PRECONSTRUCTION GENERAL SITE CONDITION
 - 8.1.2. PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION
 - 8.1.3. RAW MATERIALS
 - 8.1.4. PHOTOS OF ALL CRITICAL DETAILS
 - 8.1.5. FOUNDATION MODIFICATIONS
 - 8.1.6. WELD PREPARATION
 - 8.1.7. BOLT INSTALLATION AND TORQUE
 - 8.1.8. FINAL INSTALLED CONDITION
 - 8.1.9. SURFACE COATING REPAIR
 - 8.1.10. POST CONSTRUCTION PHOTOGRAPHS
 - 8.1.11. FINAL INFIELD CONDITION
 - 8.1.12. PHOTOS OF ELEVATED MODIFICATIONS TAKEN FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.
 - 8.1.13. THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS, PLEASE REFER TO ENG-SOW-10007.

9. INSPECTION AND TESTING

- 9.1. ALL WORK SHALL BE SUBJECT TO REVIEW AND OBSERVATION BY CROWN CASTLE'S REPRESENTATIVE AND CROWN CASTLE'S AUTHORIZED INDEPENDENT INSPECTION AND TESTING AGENCY.
- 9.2. INSPECTION SERVICES WHICH ARE FURNISHED BY OTHERS ARE STILL REQUIRED WHEN THE EOR PERFORMS SUPPORT SERVICES DURING CONSTRUCTION.
- 9.3. OBSERVED DISCREPANCIES BETWEEN THE WORK AND THE CONTRACT DOCUMENTS SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST.
- 9.4. AN INDEPENDENT QUALIFIED INSPECTION/TESTING AGENCY SHALL BE SELECTED, RETAINED AND PAID FOR BY CROWN CASTLE FOR THE SOLE PURPOSE OF INSPECTING, TESTING, DOCUMENTING, AND APPROVING ALL WELDING AND FIELD WORK PERFORMED BY THE CONTRACTOR.
 - 9.4.1. ACCESS TO ANY PLACE WHERE WORK IS BEING DONE SHALL BE PERMITTED AT ALL TIMES.
 - 9.4.2. THE INSPECTION AGENCY SHALL SO SCHEDULE THIS WORK AS TO CAUSE A MINIMUM OF INTERRUPTION TO, AND COORDINATE WITH, THE WORK IN PROGRESS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE THE WORK SCHEDULE WITH THE TESTING AGENCY. THE CONTRACTOR SHALL ALLOW FOR ADEQUATE TIME AND ACCESS FOR THE TESTING AGENCY TO PERFORM THEIR DUTIES.
- 9.5. THE INSPECTION AND TESTING AGENCY SHALL BE RESPONSIBLE TO PERFORM THE FOLLOWING SERVICES AND INSPECT THE FOLLOWING ITEMS IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS. THE TESTING AGENCY SHALL INSPECT ITEMS ON THIS LIST AND OTHER ITEMS AS NECESSARY TO FULFILL THEIR RESPONSIBILITY. THE TESTING AGENCY SHALL UTILIZE EXPERIENCED, TRAINED INSPECTORS INCLUDING AWS CERTIFIED WELDING INSPECTORS (CWI). INSPECTORS SHALL HAVE THE TRAINING, CREDENTIALS, AND EXPERIENCE APPROPRIATE FOR AND COMMENSURATE WITH THE SCOPE AND TYPE OF INSPECTION WORK TO BE PERFORMED.
- 9.6. **GENERAL**
 - 9.6.1. PERFORM PERIODIC ON-SITE OBSERVATION, INSPECTION, VERIFICATION, AND TESTING DURING THE TIME THE CONTRACTOR IS WORKING ON-SITE. AGENCY SHALL NOTIFY CROWN CASTLE AND THE EOR IMMEDIATELY WHEN FIELD PROBLEMS OR DISCREPANCIES OCCUR.
- 9.7. **FOUNDATIONS AND SOIL PREPARATION - (NOT REQUIRED)**
- 9.8. **CONCRETE TESTING PER ACI - (NOT REQUIRED)**
- 9.9. **STRUCTURAL STEEL**
 - 9.9.1. CHECK STEEL ON THE JOB WITH THE PLANS.
 - 9.9.2. CHECK MILL CERTIFICATIONS. CALL FOR LABORATORY TEST REPORTS WHEN MILL CERTIFICATION IS IN QUESTION.
 - 9.9.3. CHECK GRADE OF STEEL MEMBERS, AND BOLTS FOR CONFORMANCE WITH DRAWINGS.
 - 9.9.4. INSPECT ALL STRUCTURAL BOLTS SHALL BE FIELD INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.
 - 9.9.5. INSPECT STEEL MEMBERS FOR DISTORTION, EXCESSIVE RUST, FLAWS AND BURNED HOLES.
 - 9.9.6. CHECK STEEL MEMBERS FOR SIZES, SWEEP AND DIMENSIONAL TOLERANCES.
 - 9.9.7. CHECK FOR SURFACE FINISH SPECIFIED, GALVANIZED.
 - 9.9.8. CHECK THAT BOLTS HAVE BEEN TIGHTENED PROPERLY.
 - 9.9.9. PRIOR TO ANY FIELD CUTTING THE CONTRACTOR SHALL MARK THE CUTOUT LINES ON THE STEEL AND THE INSPECTION/TESTING AGENCY SHALL VERIFY PROPOSED LAYOUT, LOCATION, AND DIMENSIONS. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.
- 9.10. **WELDING:**
 - 9.10.1. VERIFY FIELD WELDING PROCEDURES, WELDERS, AND WELDING OPERATORS, NOT DEEMED PREQUALIFIED, IN ACCORDANCE WITH AWS D1.1.
 - 9.10.2. INSPECT FIELD WELDED CONNECTIONS IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED AND WITH AWS D1.1.
 - 9.10.3. APPROVE FIELD WELDING SEQUENCE.
 - 9.10.4. A PROGRAM OF THE APPROVED SEQUENCES SHALL BE SUBMITTED TO CROWN CASTLE BEFORE WELDING BEGINS. NO CHANGE IN APPROVED SEQUENCES MAY BE MADE WITHOUT PERMISSION FROM CROWN CASTLE.
 - 9.10.5. INSPECT WELDED CONNECTIONS AS FOLLOWS AND IN ACCORDANCE WITH AWS D1.1:
 - 9.10.5.1. INSPECT WELDING EQUIPMENT FOR CAPACITY, MAINTENANCE, AND WORKING CONDITIONS.
 - 9.10.5.2. VERIFY SPECIFIED ELECTRODES AND HANDLING AND STORAGE OF ELECTRODES FOR CONFORMANCE TO SPECIFICATIONS.
 - 9.10.5.3. INSPECT PREHEATING AND INTERPASS TEMPERATURES FOR CONFORMANCE WITH AWS D1.1.
 - 9.10.5.4. VISUALLY INSPECT ALL WELDS AND VERIFY THAT QUALITY OF WELDS MEETS THE REQUIREMENTS OF AWS D1.1. OTHER TESTS MAY ALSO BE PERFORMED ON THE WELDS BY THE TESTING AGENCY IN ORDER FOR THEM TO PERFORM THEIR DUTIES FOR THIS PROJECT.
 - 9.10.5.5. SPOT TEST AT LEAST ONE FILLET WELD OF EACH MEMBER USING MAGNETIC PARTICLE.
 - 9.10.5.6. INSPECT FOR SIZE, SPACING, TYPE AND LOCATION AS PER APPROVED DRAWINGS.
 - 9.10.5.7. VERIFY THAT THE BASE METAL CONFORMS TO THE DRAWINGS.
 - 9.10.5.8. REVIEW THE REPORTS BY TESTING LABS.
 - 9.10.5.9. CHECK TO SEE THAT WELDS ARE CLEAN AND FREE FROM SLAG.
 - 9.10.5.10. INSPECT RUST PROTECTION OF WELDS AS PER SPECIFICATIONS.
 - 9.10.5.11. CHECK THAT DEFECTIVE WELDS ARE CLEARLY MARKED AND HAVE BEEN ADEQUATELY REPAIRED.
 - 9.10.5.12. FULL PENETRATION WELDS IN THE VICINITY OF THE BASE OF THE TOWER ARE REQUIRED TO BE 100% NDE INSPECTED BY UT IN ACCORDANCE WITH AWS D1.1.
 - 9.10.5.13. PARTIAL PENETRATION AND FILLET WELDS IN THE VICINITY OF THE BASE OF THE TOWER ARE REQUIRED TO BE 50% NDE INSPECTED BY MP IN ACCORDANCE WITH AWS D1.1.
- 9.11. **REPORTS:**
 - 9.11.1. COMPILER AND PERIODICALLY SUBMIT DAILY INSPECTION REPORTS TO CROWN CASTLE.
 - 9.11.2. THE INSPECTION PLAN OUTLINED HEREIN IS INTENDED AS A DESCRIPTION OF GENERAL AND SPECIFIC ITEMS OF CONCERN. IT IS NOT INTENDED TO BE ALL-INCLUSIVE. IT DOES NOT LIMIT THE TESTING AND INSPECTION AGENCY TO THE ITEMS LISTED. ADDITIONAL TESTING, INSPECTION, AND CHECKING MAY BE REQUIRED AND SHOULD BE ANTICIPATED. THE TESTING AGENCY SHALL USE THEIR PROFESSIONAL JUDGMENT AND KNOWLEDGE OF THE JOB SITE CONDITIONS AND THE CONTRACTOR'S PERFORMANCE TO DECIDE WHAT OTHER ITEMS REQUIRE ADDITIONAL ATTENTION. THE TESTING AGENCY'S JUDGMENT MUST PREVAIL ON ITEMS NOT SPECIFICALLY COVERED. ANY DISCREPANCIES OR PROBLEMS SHALL BE BROUGHT IMMEDIATELY TO CROWN CASTLE'S ATTENTION. RESOLUTIONS ARE NOT TO BE MADE WITHOUT CROWN CASTLE'S REVIEW AND SPECIFIC WRITTEN CONSENT. CROWN CASTLE RESERVES THE RIGHT TO DETERMINE WHETHER OR NOT A RESOLUTION IS ACCEPTABLE.
 - 9.11.3. AFTER EACH INSPECTION, THE TESTING AGENCY WILL PREPARE A WRITTEN ACCEPTANCE OR REJECTION WHICH WILL BE GIVEN TO THE CONTRACTOR AND FILED AS DAILY REPORTS TO CROWN CASTLE. THIS WRITTEN ACTION WILL GIVE THE CONTRACTOR A LIST OF ITEMS TO BE CORRECTED, PRIOR TO CONTINUING CONSTRUCTION, AND/OR LOADING OF STRUCTURAL ITEMS.
 - 9.11.4. THE TESTING AGENCY DOES NOT RELIEVE THE CONTRACTOR'S CONTRACTUAL OR STATUTORY OBLIGATIONS. THE CONTRACTOR HAS THE SOLE RESPONSIBILITY FOR ANY DEVIATIONS FROM THE OFFICIAL CONTRACT DOCUMENTS. THE TESTING AGENCY WILL NOT REPLACE THE CONTRACTOR'S QUALITY CONTROL PERSONNEL.

MI CHECKLIST	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY EOR)	REPORT ITEM
PRE-CONSTRUCTION	
X	MI CHECKLIST DRAWINGS
X	EOR REVIEW
X	FABRICATION INSPECTION
X	FABRICATOR CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT (MTR)
NA	FABRICATOR NDE INSPECTION
X	NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED)
X	PACKING SLIPS
ADDITIONAL TESTING AND INSPECTIONS: _____	
CONSTRUCTION	
X	CONSTRUCTION INSPECTIONS
NA	FOUNDATION INSPECTIONS
NA	CONCRETE COMP. STRENGTH AND SLUMP TESTS
X	POST INSTALLED ANCHOR ROD VERIFICATION
NA	BASE PLATE GROUT VERIFICATION
X	CONTRACTOR'S CERTIFIED WELD INSPECTION
NA	EARTHWORK: PROVIDE PHOTO DOCUMENTATION OF EXCAVATION QUALITY AND COMPACTION
X	ON SITE COLD GALVANIZING VERIFICATION
NA	GUY WIRE TENSION REPORT
X	GC AS-BUILT DOCUMENTS
NA	MICROPILE/ROCK ANCHOR INSTALLER'S DRILLING AND INSTALLATION LOGS AND QA/QC DOCUMENTS
ADDITIONAL TESTING AND INSPECTIONS: _____	
POST-CONSTRUCTION	
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
X	POST INSTALLED ANCHOR ROD TARGET TENSION LOAD TESTING
NA	REFER TO MICROPILE/ROCK ANCHOR NOTES FOR SPECIAL INSPECTION AND TESTING REQUIREMENTS.
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

© Copyright 2015, by Paul J. Ford and Company, All Rights Reserved. This document and the data contained herein, is proprietary to Paul J. Ford and Company, issued in strict confidence and shall not, without the prior written permission of Paul J. Ford and Company, be reproduced, copied or used for any purpose other than the intended use for this specific project.

PAUL J. FORD & COMPANY
 250 E Broad St, Ste 600, Columbus, OH 43215
 Phone 614.221.6679 www.pauljford.com

CROWN CASTLE
 3530 TORINGDON WAY, SUITE 300, CHARLOTTE, NC 28277
 PH: (724) 416-2000

MODIFICATION OF AN EXISTING 150' MONOPOLE
BU #876327, KINGS LOT SOUTH WINDSOR, CONNECTICUT

PROJECT No:	37515-2506.002.7700
DRAWN BY:	B.M.S.
DESIGNED BY:	J.J.W.
CHECKED BY:	
DATE:	10-23-2015

MI CHECKLIST

S-8

MODIFICATION OF AN EXISTING 150' MONOPOLE

BU #876327; KINGS LOT
 59 MCGUIRE ROAD
 SOUTH WINDSOR, CONNECTICUT 06074
 HARTFORD COUNTY
 LAT: 41° 48' 10.77"; LONG: -72° 37' 1.96"
 APP: 306606 REV. 0; WO: 1134424

PROJECT CONTACTS

STRUCTURE OWNER:
 CROWN CASTLE
 MOD PM: DAN VADNEY AT DAN.VADNEY@CROWNCastle.COM
 PH: (518) 373-3510
 MOD CM: JASON D'AMICO AT JASON.D'AMICO@CROWNCastle.COM
 PH: (860) 209-0104

ENGINEER OF RECORD:
 PJFMOD@PJFWEB.COM

THIS PROJECT INCLUDES THE FOLLOWING ITEMS

REMOVAL OF EXISTING REINFORCING AND CHANNEL JUMPS
 EQUIPMENT REMOVAL
 WELDED FLANGE BRIDGE STIFFENERS
 SHAFT REINFORCING
 REMOVAL OF EXISTING STIFFENERS
 FIELD WELDED ANCHOR BRACKETS
 POST INSTALLED ANCHOR RODS

SHEET INDEX

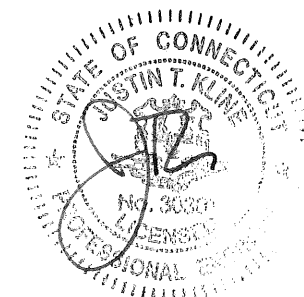
SHEET NUMBER	DESCRIPTION
T-1	TITLE SHEET
S-1	GENERAL NOTES
S-2A	FORGBOLT™ DETAILS
S-2B	NEXGEN2™ BOLT DETAIL
S-3	MONOPOLE PROFILE
S-4	BASE PLATE DETAILS
S-5	MISC DETAILS
S-6	WELDED BRIDGE STIFFENER DETAILS
S-7	WELDED BRIDGE STIFFENER DETAILS
S-8	MI CHECKLIST

WIND DESIGN DATA

REFERENCE STANDARD	TIA/EIA-222-F
LOCAL CODE	2005 CT BUILDING CODE
BASIC WIND SPEED (FASTEST-MILE)	80 MPH
ICE THICKNESS	1.0 IN
ICE WIND SPEED	38 MPH
SERVICE WIND SPEED	50 MPH

THE ASSOCIATED FAILING SA WO NUMBER FOR THIS PROJECT IS 1104393

ATTENTION ALL CONTRACTORS, ANYTIME YOU ACCESS A CROWN SITE FOR ANY REASON YOU ARE TO CALL THE CROWN NOC UPON ARRIVAL AND DEPARTURE, DAILY AT (800) 788-7011.



10-30-15

© Copyright 2015, by Paul J. Ford and Company, All Rights Reserved. This document and the data contained herein, is proprietary to Paul J. Ford and Company, issued in strict confidence and shall not, without the prior written permission of Paul J. Ford and Company, be reproduced, copied or used for any purpose other than the intended use for this specific project.

PJF PAUL J. FORD & COMPANY
 250 E Broad St, Ste 600 • Columbus, OH 43215
 Phone 614-221-6679 www.paujford.com

CROWN CASTLE
 3530 TORINGDON WAY, SUITE 300, CHARLOTTE, NC 28277
 PH: (724) 416-2000

MODIFICATION OF AN EXISTING 150'
 MONOPOLE
 BU #876327; KINGS LOT
 SOUTH WINDSOR, CONNECTICUT

PROJECT No: 37515-2506.002.7700
 DRAWN BY: B.M.S.
 DESIGNED BY: J.J.W.
 CHECKED BY: BKA
 DATE: 10-23-2015

TITLE SHEET

T-1

1. GENERAL NOTES

- 1.1. THE MONOPOLE STRUCTURE IN ITS EXISTING CONDITION DOES NOT HAVE THE STRUCTURAL CAPACITY TO CARRY ALL OF THE PROPOSED AND EXISTING LOADS FROM THE ATTACHED STRUCTURAL MODIFICATION REPORT AT THE REQUIRED MINIMUM WIND SPEEDS. DO NOT INSTALL ANY NEW LOADS UNTIL THE MONOPOLE REINFORCING SYSTEM IS COMPLETELY AND SUCCESSFULLY INSTALLED.
- 1.2. THESE DRAWINGS WERE PREPARED FROM INFORMATION PROVIDED BY CROWN CASTLE. THE INFORMATION PROVIDED HAS NOT BEEN FIELD VERIFIED BY THE ENGINEER OF RECORD (EOR) FOR ACCURACY AND THEREFORE DISCREPANCIES BETWEEN THESE DRAWINGS AND ACTUAL SITE CONDITIONS SHOULD BE ANTICIPATED. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS. THE CONTRACTOR SHALL COORDINATE WITH THE PROJECT DRAWINGS AND THEIR FIELD VERIFIED CONDITIONS AND DIMENSIONS BEFORE PROCEEDING WITH THE WORK. THE CONTRACTOR SHALL IMMEDIATELY REPORT ANY AND ALL DISCREPANCIES TO THE EOR AND CROWN CASTLE BEFORE PROCEEDING WITH THE WORK.
- 1.3. IF MATERIALS, QUANTITIES, STRENGTHS OR SIZES INDICATED BY THE DRAWINGS OR SPECIFICATIONS ARE NOT IN AGREEMENT WITH THESE NOTES, THE BETTER QUALITY AND/OR GREATER QUANTITY, STRENGTH OR SIZE INDICATED, SPECIFIED OR NOTED SHALL BE PROVIDED.
- 1.4. THIS STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER THE INSTALLATION OF THE REINFORCING REPAIR SYSTEM HAS BEEN SUCCESSFULLY COMPLETED. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO ENSURE THE SAFETY AND STABILITY OF THE MONOPOLE AND ITS COMPONENT PARTS DURING FIELD MODIFICATIONS. THIS INCLUDES, BUT IS NOT LIMITED TO, THE ADDITION OF WHATEVER TEMPORARY BRACING, GUYS OR TIE DOWNS THAT MAY BE NECESSARY. SUCH MATERIAL SHALL BE REMOVED AND SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AFTER THE COMPLETION OF THE PROJECT.
- 1.5. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN AND SHALL MEET ANS/ITA-1019 (LATEST EDITION), OSHA AND GENERAL INDUSTRY STANDARDS. ALL RIGGING PLANS SHALL ADHERE TO ANS/ITA-1019 (LATEST EDITION) INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION.
- 1.6. OBSERVATION VISITS TO THE SITE BY CROWN CASTLE AND/OR THE EOR SHALL NOT INCLUDE INSPECTIONS OF THE PROTECTIVE MEASURES OR THE CONSTRUCTION PROCEDURES. ANY SUPPORT SERVICES PERFORMED BY THE EOR DURING CONSTRUCTION ARE SOLELY FOR THE PURPOSE OF ACHIEVING GENERAL CONFORMANCE WITH THE CONTRACT DOCUMENTS. THEY DO NOT GUARANTEE THE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF CONSTRUCTION.
- 1.7. 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 CROWN CASTLE AND EOR PRIOR TO INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF MATERIALS AND EQUIPMENT BEING SUBSTITUTED.
- 1.8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT THIS PROJECT AND RELATED WORK COMPLIES WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY CODES AND REGULATIONS GOVERNING THIS WORK AS WELL AS CROWN CASTLE SAFETY GUIDELINES.
- 1.9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING AND NEW COAXIAL CABLES AND OTHER EQUIPMENT DURING CONSTRUCTION.
- 1.10. ANY EXISTING ATTACHMENTS AND/OR PROJECTIONS ON THE POLE THAT MAY INTERFERE WITH THE INSTALLATION OF THE REINFORCING SYSTEM WILL HAVE TO BE REMOVED AND RELOCATED, REPLACED, OR RE-INSTALLED AS REQUIRED AFTER THE REINFORCING IS SUCCESSFULLY COMPLETED. THE CONTRACTOR SHALL IDENTIFY AND COORDINATE THESE ITEMS PRIOR TO CONSTRUCTION WITH CROWN CASTLE, TESTING AGENCY, AND EOR.
- 1.11. ANY AND ALL EXISTING PLATFORMS THAT ARE LOCATED IN AREAS OF THE POLE SHAFT WHERE SHAFT REINFORCING MUST BE APPLIED SHALL BE TEMPORARILY REMOVED OR OTHERWISE SUPPORTED TO PERMIT NEW CONTINUOUS REINFORCEMENT TO BE ATTACHED. AFTER THE CONTRACTOR HAS SUCCESSFULLY INSTALLED THE MONOPOLE REINFORCEMENT SYSTEM, THE CONTRACTOR SHALL RE-INSTALL THE PLATFORMS.
- 1.12. THE CLIMBING FACILITIES, SAFETY CLIMB AND ALL PARTS THEREOF SHALL NOT BE IMPEDED, MODIFIED OR ALTERED WITHOUT THE EXPRESS APPROVAL OF THE EOR.
- 1.13. FOR STANDARD CROWN PARTS SEE THE MOST RECENT VERSION OF THE "CCI APPROVED REINFORCEMENT COMPONENTS" CATALOG.
- 1.14. ALL SOLUTIONS FOR THE REPLACEMENT, RELOCATION OR MODIFICATION OF THE SAFETY CLIMB AND/OR ANY OF THE MONOPOLE CLIMBING FACILITIES SHALL BE COORDINATED WITH TUF-TUG PRODUCTS. CONTACT DETAILS:
3434 ENCRETE LANE, MORAIN, OHIO 45439
PHONE: 937-299-1213 EMAIL: TUFTUG@AOL.COM

2. STRUCTURAL STEEL

- 2.1. STRUCTURAL STEEL MATERIALS, FABRICATION, DETAILING, AND WORKMANSHIP SHALL CONFORM TO THE LATEST EDITION OF THE FOLLOWING REFERENCE STANDARDS:
 - 2.1.1. BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC):
 - 2.1.1.1. "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS."
 - 2.1.1.2. "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM HIGH STRENGTH BOLTS," AS APPROVED BY THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS.
 - 2.1.1.3. "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES"
 - 2.1.2. BY THE AMERICAN WELDING SOCIETY (AWS):
 - 2.1.2.1. "STRUCTURAL WELDING CODE - STEEL D1.1."
 - 2.1.2.2. "STANDARD SYMBOLS FOR WELDING, BRAZING, AND NONDESTRUCTIVE EXAMINATION"
- 2.2. ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM HIGH STRENGTH BOLTS', DEC. 31, 2009.
- 2.3. ANY MATERIAL OR WORKMANSHIP WHICH IS OBSERVED TO BE DEFECTIVE OR INCONSISTENT WITH THE CONTRACT DOCUMENTS SHALL BE CORRECTED, MODIFIED, OR REPLACED AT THE CONTRACTOR'S EXPENSE.
- 2.4. WELDED CONNECTIONS SHALL CONFORM TO THE LATEST REVISED CODE OF THE AMERICAN WELDING SOCIETY, AWS D1.1. ALL WELD ELECTRODES SHALL BE E80XX UNLESS NOTED OTHERWISE ON THE DRAWINGS.
- 2.5. ALL WELDED CONNECTIONS SHALL BE MADE BY WELDERS CERTIFIED BY AWS. CONTRACTOR SHALL SUBMIT WELDERS' CERTIFICATION AND QUALIFICATION DOCUMENTATION TO CROWN CASTLE'S TESTING AGENCY FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
- 2.6. STRUCTURAL STEEL PLATES SHALL CONFORM TO ASTM A572 GRADE 65 (FY = 65 KSI MIN.) UNLESS NOTED OTHERWISE ON THE DRAWINGS.
- 2.7. SURFACES OF EXISTING STEEL SHALL BE PREPARED AS REQUIRED FOR FIELD WELDING PER AWS. SEE SECTION 1 NOTES REGARDING TOUCH UP OF GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS FIELD WELDING.
- 2.8. NO WELDING SHALL BE DONE TO THE EXISTING STRUCTURE WITHOUT THE PRIOR APPROVAL AND SUPERVISION OF THE TESTING AGENCY.
- 2.9. FIELD CUTTING OF STEEL:
 - 2.9.1. IMPORTANT CUTTING AND WELDING SAFETY GUIDELINES: THE CONTRACTOR SHALL FOLLOW ALL CROWN CASTLE CUTTING, WELDING, FIRE PREVENTION AND SAFETY GUIDELINES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL OBTAIN A COPY OF THE CURRENT CROWN CASTLE GUIDELINES. PER THE 12-01-2005 CROWN CASTLE DIRECTIVE: "ALL CUTTING AND WELDING ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH CROWN CASTLE POLICY 'CUTTING AND WELDING SAFETY PLAN' (DOC # ENG-PLN-10015) ON AN ONGOING BASIS THROUGHOUT THE ENTIRE LIFE OF THE PROJECT". ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE, RESULTING FROM THE CONTRACTOR'S ACTIVITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.
 - 2.9.2. ALL REQUIRED CUTS SHALL BE CUT WITHIN THE DIMENSIONS SHOWN ON THE DRAWINGS. NO CUTS SHALL EXTEND BEYOND THE OUTLINE OF THE DIMENSIONS SHOWN ON THE DRAWINGS. ALL CUT EDGES SHALL BE GROUND SMOOTH AND DE-BURRED. CUT EDGES THAT ARE TO BE FIELD WELDED SHALL BE PREPARED FOR FIELD WELDING PER AWS D1.1 AND AS SHOWN ON THE DRAWINGS. CONTRACTOR TO AVOID 90 DEGREE CORNERS. IT MAY BE NECESSARY TO DRILL STARTER HOLES AS REQUIRED TO MAKE THE CUTS.

3. BASE PLATE GROUT - (NOT REQUIRED)

4. FOUNDATION WORK - (NOT REQUIRED)

5. CAST-IN-PLACE CONCRETE - (NOT REQUIRED)

6. EPOXY GROUTED REINFORCING ANCHOR RODS

- 6.1. UNLESS OTHERWISE NOTED, REINFORCING ANCHOR RODS SHALL BE 150 KSI ALL-THREAD BARS CONFORMING TO ASTM A722. RECOMMENDED MANUFACTURERS/SUPPLIERS OF 150 KSI ALL-THREAD BARS ARE WILLIAMS FORM ENGINEERING CORPORATION AND DYWIDAG SYSTEMS INTERNATIONAL.
- 6.2. ALL REINFORCING ANCHOR RODS SHALL BE HOT DIP GALVANIZED PER ASTM A123.
- 6.3. THE CORE-DRILLED HOLES IN THE CONCRETE FOR THE ANCHOR RODS SHALL BE CLEAN AND DRY, AND OTHERWISE PROPERLY PREPARED ACCORDING TO THE ANCHOR ROD AND EPOXY MANUFACTURERS' INSTRUCTIONS, PRIOR TO PLACEMENT OF ANCHOR RODS AND EPOXY. CONTRACTOR SHALL FOLLOW ALL ANCHOR ROD AND EPOXY MANUFACTURER RECOMMENDATIONS REGARDING HANDLING OF RODS, EPOXY, ACCEPTABLE AMBIENT TEMPERATURE RANGE DURING INSTALLATION AND POST-INSTALLATION CURING, THE EFFECT OF TEMPERATURE ON EPOXY CURING TIME, PREPARATION OF HOLE, ETC.
- 6.4. HILTI HIT RE-500 SD OR ITW RED HEAD EPCON G5 EPOXY SHALL BE USED TO ANCHOR THE BAR IN THE DRILL HOLES. IF THE DESIGNED EMBEDMENT IS GREATER THAN 12 FT, CONTRACTOR HAS THE OPTION TO USE PILE ANCHOR GROUT BY E-CHEM AS AN ALTERNATE. IF CONTRACTOR WISHES TO USE A DIFFERENT EPOXY, A REQUEST INCLUDING THE EPOXY TECHNICAL DATA SHEET(S) SHALL BE SUBMITTED TO THE EOR FOR REVIEW PRIOR TO CONSTRUCTION.
- 6.5. ONCE THE REINFORCING ANCHOR RODS HAVE BEEN INSTALLED AND ALL EPOXY AND GROUT HAVE CURED (IF BASE PLATE AND/OR BEARING PLATES HAVE BEEN GROUTED PRIOR TO TESTING), ALL REINFORCING ANCHORS SHALL BE LOAD TESTED PER CROWN CASTLE ENGINEERING DOCUMENT #ENG-PRC-10119. REFER TO THE NEW ANCHOR & BRACKET DETAIL ON FOLLOWING SHEETS FOR SPECIFIED ANCHOR ROD TARGET TENSION LOAD.
- 6.6. ONCE THE REINFORCING ANCHOR RODS HAVE BEEN SUCCESSFULLY LOAD TESTED AND APPROVED THE CONTRACTOR SHALL TIGHTEN ALL HEAVY HEX ANCHOR NUTS TO SNUG TIGHT PLUS 1/8 TURN OF NUT.

7. TOUCH UP OF GALVANIZING

- 7.1. THE CONTRACTOR SHALL TOUCH UP ANY AND ALL AREAS OF GALVANIZING ON THE EXISTING STRUCTURE OR NEW COMPONENTS THAT ARE DAMAGED OR ABRADED DURING CONSTRUCTION. GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS ANY AND ALL ABRASIONS, CUTS, FIELD DRILLING, AND ALL FIELD WELDING SHALL BE TOUCHED UP WITH TWO (2) COATS OF ZRC COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.0 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-831-3276 FOR PRODUCT INFORMATION.
- 7.2. CONTRACTOR SHALL CLEAN AND PREPARE ALL FIELD WELDS ON GALVANIZED AND PRIME PAINTED SURFACES FOR TOUCH-UP COATING IN ACCORDANCE WITH AWS D1.1. CROWN CASTLE'S TESTING AGENCY SHALL VERIFY THE PREPARED SURFACE PRIOR TO APPLICATION OF THE TOUCH-UP COATING.
- 7.3. CROWN CASTLE'S TESTING AGENCY SHALL TEST AND VERIFY THE COATING THICKNESS AFTER THE CONTRACTOR HAS APPLIED THE ZRC COLD GALVANIZING COMPOUND AND IT HAS SUFFICIENTLY DRIED. AREAS FOUND TO BE ADEQUATELY COATED, SHALL BE RE-COATED BY THE CONTRACTOR AND RE-TESTED BY THE TESTING AGENCY.

8. HOT-DIP GALVANIZING

- 8.1. HOT-DIP GALVANIZE ALL STRUCTURAL STEEL MEMBERS AND ALL STEEL ACCESSORIES, BOLTS, WASHERS, ETC. PER ASTM A123 OR PER ASTM A153, AS APPROPRIATE.
- 8.2. PROPERLY PREPARE STEEL ITEMS FOR GALVANIZING. DRILL OR PUNCH WEEP AND/OR DRAINAGE HOLES WITH EOR APPROVAL OF LOCATIONS.
- 8.3. ALL GALVANIZING SHALL BE DONE AFTER FABRICATION IS COMPLETED AND PRIOR TO FIELD INSTALLATION.

9. PERPETUAL INSPECTION AND MAINTENANCE BY THE OWNER

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

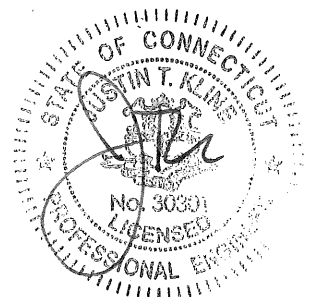
© Copyright 2015, by Paul J. Ford and Company, All Rights Reserved. This document and the data contained herein, is proprietary to Paul J. Ford and Company, issued in strict confidence and shall not, without the prior written permission of Paul J. Ford and Company, be reproduced, copied or used for any purpose other than the intended use for this specific project.

PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 • Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com

CROWN CASTLE
3530 TORINGDON WAY, SUITE 300, CHARLOTTE, NC 28277
PH: (724) 416-2000

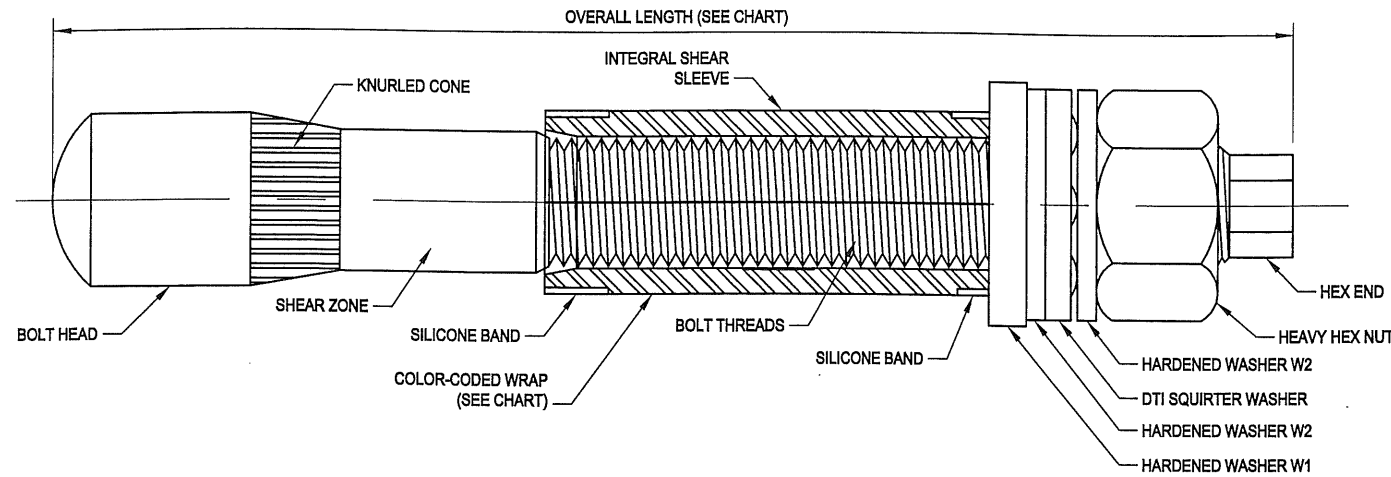
MODIFICATION OF AN EXISTING 150' MONOPOLE
BU #876327; KINGS LOT
SOUTH WINDSOR, CONNECTICUT

PROJECT No:	37515-2506.002.7700
DRAWN BY:	B.M.S.
DESIGNED BY:	J.J.W.
CHECKED BY:	B.K.V.
DATE:	10-23-2015



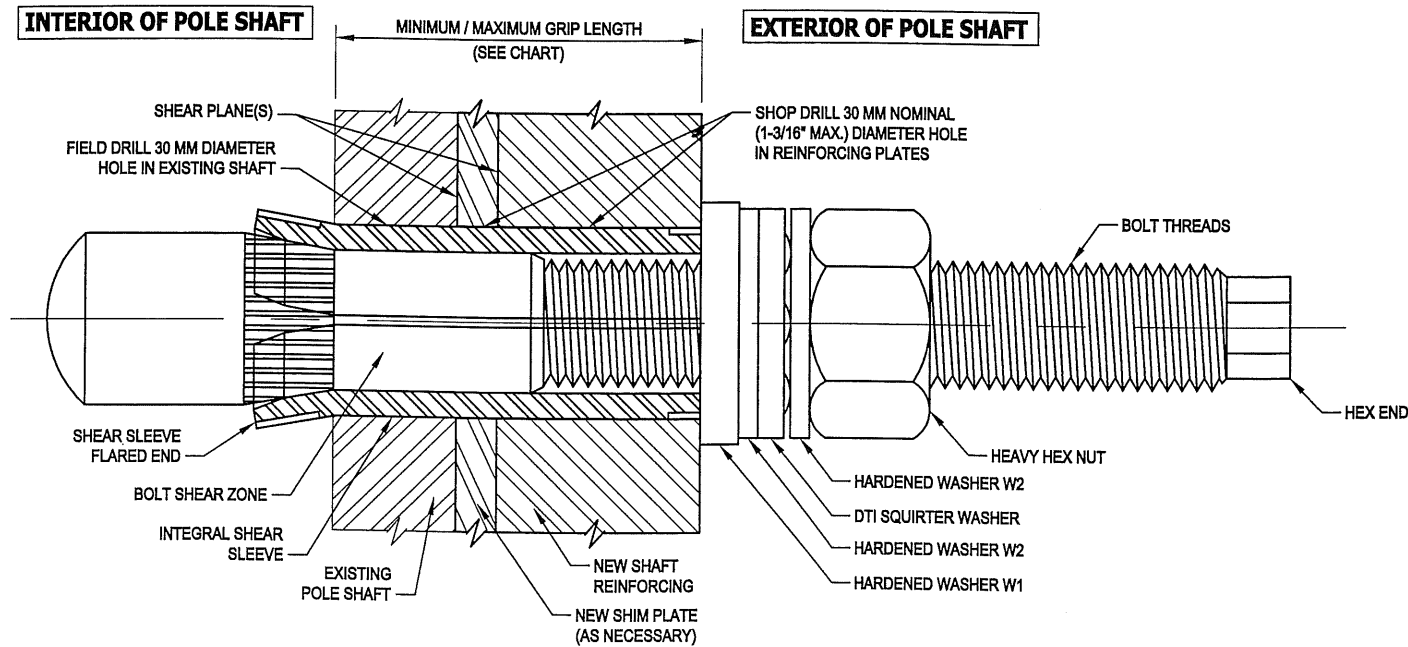
10-30-15

GENERAL NOTES



PRE-INSTALLED FORGBolt™ ASSEMBLY DETAIL

1
S-2A



INSTALLED FORGBolt™ ASSEMBLY DETAIL

2
S-2A

FORGBolt™		AISC Group A Material: ASTM A325 and PC8.8 (Tensile Stress, Fu = 120 ksi minimum)					
GROUP A	FORGBolt™ Size (mm)	Overall Length (inches)	Estimated Weight Each (lbs)	Grip Range (inch)	Comment	Color Code	
FORGBolt™ A325 - PC8.8	1	135	5.31	1.3	3/8" to 1"	--	RED
	2	160	6.30	1.6	3/4" to 1-1/2"	--	GREEN
	3	195	7.68	1.9	1-1/4" to 2-1/4"	--	BLUE
	4	260	10.24	2.6	2" to 3-1/2"	Splice Bolt	YELLOW
	5	365	14.37	3.6	3-1/2" to 5-1/2"	Flange Jump Bolt	ORANGE
	6	440	17.32	4.3	5-1/2" to 8-1/2"	Flange Jump Bolt	BLACK
DTI Note	Each Group A (A325/PC8.8) FORGBolt™ assembly shall have a 'Squirter' DTI that is compatible with a M20-PC8.8 bolt.						

FOLLOW ALL MANUFACTURER / DISTRIBUTOR RECOMMENDATIONS FOR INSTALLATION, TIGHTENING, AND INSPECTION

INSTALLATION NOTES:

1. FIELD DRILL HOLES TO 30 MM DIAMETER.
2. SELECT CORRECT BOLT SIZE FOR INSTALLATION GRIP (REFER TO PLANS).
3. INSERT BOLT ASSEMBLY THROUGH HOLES IN SHAFT REINFORCING PLATES AND SEAT THE HARDENED WASHER W1 FLUSH AGAINST OUTSIDE OF PLATE.
4. HAND TIGHTEN NUT TO FINGER TIGHT.
5. TIGHTEN NUT TO PRETENSIONED CONDITION AND UNTIL DTI SHOWS PROPER INDICATION.
6. PROPERLY DOCUMENT AND INSPECT BOLT TIGHTENING PER PLAN REQUIREMENTS.

BOLT HOLE NOTES:

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

BOLT TIGHTENING AND INSPECTION NOTES:

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

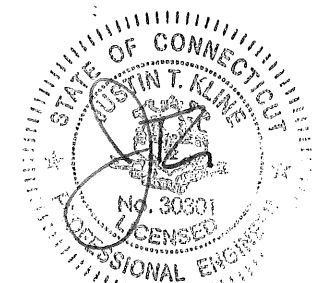
**AISC GROUP A MATERIAL: ASTM A325 AND PC8.8
(Fu = 120 KSI MIN. TENSILE STRESS)**

CONTAINS PROPRIETARY INFORMATION PATENT PENDING

© Copyright 2013 to 2015 by PTP, all rights reserved.

DISTRIBUTOR CONTACT:

PRECISION TOWER PRODUCTS
 PHONE: 888-926-4857
 EMAIL: info@precisiontowerproducts.com
 WEB: www.precisiontowerproducts.com



10-3015

© Copyright 2015, by Paul J. Ford and Company, All Rights Reserved. This document and the data contained herein, is proprietary to Paul J. Ford and Company, issued in strict confidence and shall not, without the prior written permission of Paul J. Ford and Company, be reproduced, copied or used for any purpose other than the intended use for this specific project.

PAUL J. FORD & COMPANY
 250 E Broad St, Ste 600 • Columbus, OH 43215
 Phone 614.221.6679 www.pauljford.com

CROWN CASTLE
 3530 TORINGDON WAY, SUITE 300, CHARLOTTE, NC 28277
 PH: (724) 415-2000

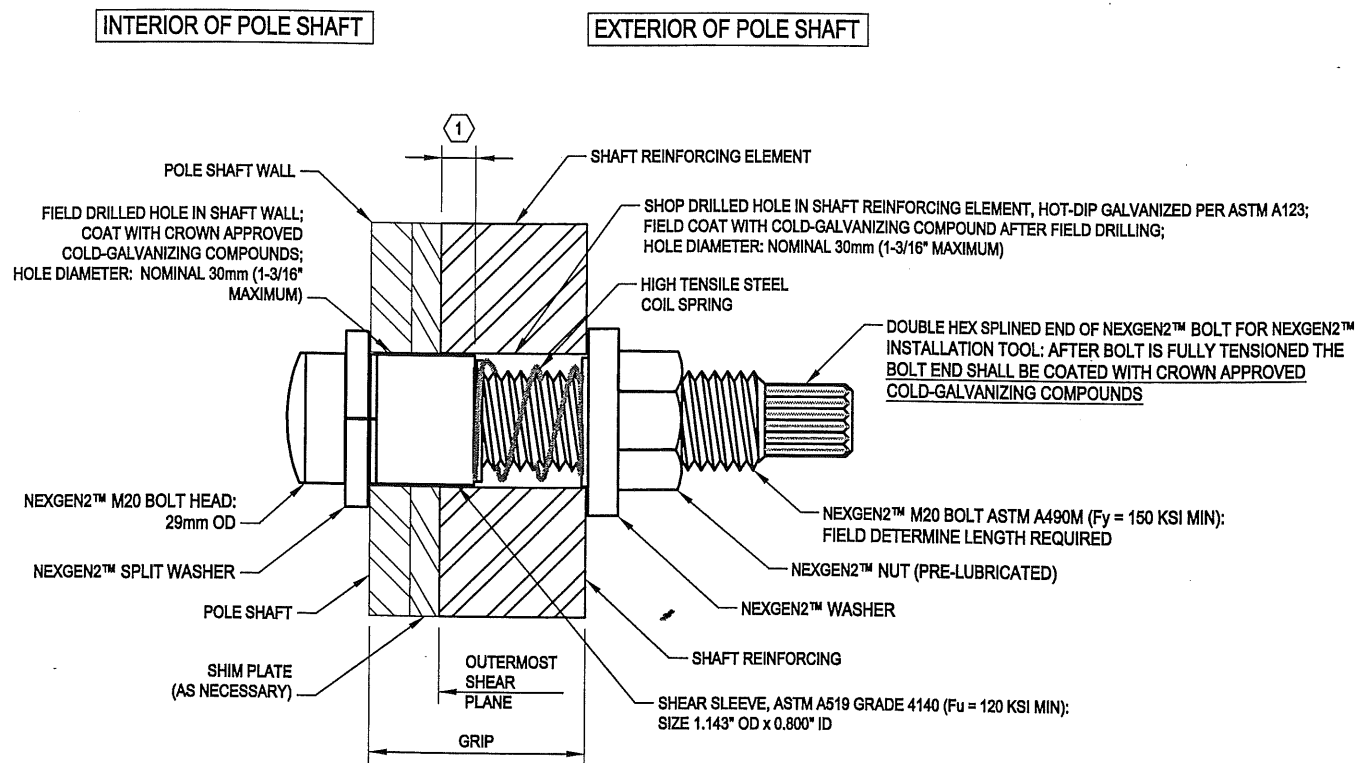
MODIFICATION OF AN EXISTING 150' MONOPOLE
 BU #876327; KINGS LOT
 SOUTH WINDSOR, CONNECTICUT

PROJECT No: 37515-2506.002.7700
 DRAWN BY: B.M.S.
 DESIGNED BY: J.J.W.
 CHECKED BY: B.K.K.
 DATE: 10-23-2015

FORGBolt™
 DETAILS

S-2A

① NOTE: SHEAR SLEEVE LENGTH: THE SHEAR SLEEVE SHALL PROJECT A MINIMUM OF 3/8" BEYOND THE OUTERMOST SHEAR PLANE. THE CONTRACTOR SHALL SUBMIT FABRICATION DRAWINGS SHOWING NEXGEN2™ BOLT LENGTHS AND SHEAR SLEEVE LENGTHS TO THE EOR FOR REVIEW AND APPROVAL.



TYPICAL NEXGEN2™ BOLT DETAIL 1 S-2B

FOLLOW ALL MANUFACTURER / DISTRIBUTOR RECOMMENDATIONS FOR INSTALLATION, TIGHTENING, AND INSPECTION

BOLT HOLE NOTES:

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

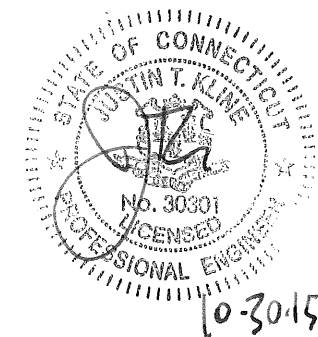
BOLT TIGHTENING AND INSPECTION NOTES:

1. ALL NEXGEN2™ BOLT ASSEMBLIES SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF SECTION 8.2.3 OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009. PER SECTION 8.2.3: ALL FASTENER ASSEMBLIES SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS IN AISC SECTION 8.1 WITHOUT SEVERING THE SPLINED END AND WITH WASHERS POSITIONED AS REQUIRED IN AISC SECTION 6.2. PER REQUIREMENTS IN SECTION 8.1: PRIOR TO BOLT PRETENSIONING, THE JOINT SHALL FIRST BE COMPACTED TO THE SNUG-TIGHT CONDITION. SNUG TIGHT IS THE CONDITION THAT EXISTS WHEN ALL OF THE PLIES IN THE CONNECTION HAVE BEEN PULLED INTO FIRM CONTACT BY THE BOLTS AND THE BOLTS HAVE BEEN TIGHTENED SUFFICIENTLY TO PREVENT THE REMOVAL OF THE NUTS WITHOUT THE USE OF A WRENCH. ONCE THE SNUG TIGHT CONDITION IS ACHIEVED, THEN THE BOLT ASSEMBLY CAN BE TIGHTENED TO THE PRETENSIONED CONDITION.
2. ALL NEXGEN2™ BOLT ASSEMBLIES SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF SECTION 9.2.3 OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009. NOTE THAT COMPLETE INSPECTION OF ALL NEXGEN2™ BOLT ASSEMBLIES IS REQUIRED IN ADDITION TO ROUTINE OBSERVATION.
3. ALL NEXGEN2™ BOLTS SHALL BE INSPECTED BY A QUALIFIED BOLT INSPECTOR PER NOTES 1 AND 2, ABOVE. DURING INSTALLATION, THE BOLT INSPECTOR SHALL VERIFY AND DOCUMENT: THE SHOP-DRILLED AND FIELD-DRILLED HOLE SIZES; THE INSTALLATION OF THE NEXGEN2™ BOLT ASSEMBLY, INCLUDING THE SHEAR SLEEVE PLACEMENT AND NUT LUBRICATION; AND THE CONTRACTOR'S TENSIONING PROCEDURE. THE BOLT INSPECTOR SHALL PROVIDE COMPLETE DOCUMENTATION OF ALL BOLTS AFTER TIGHTENING CLEARLY SHOWING THAT THE DOUBLE HEX SPLINED END OF THE BOLTS HAVE BEEN TWISTED OFF AND COATED WITH CROWN APPROVED COLD-GALVANIZING COMPOUND..

NOTE: NEXGEN2™ BOLT ASSEMBLY SHALL BE MAGNI 565 COATED PER ASTM F2833 AND MANUFACTURER SPECIFICATIONS.

NOTE: INSTALL NEXGEN2™ BOLT ASSEMBLY PER MANUFACTURER'S INSTRUCTIONS.

DISTRIBUTOR CONTACT DETAILS:
 ALLFASTENERS
 15401 COMMERCE PARK DR.
 BROOKPARK, OHIO 44142
 PHONE: 440-232-6060
 E-MAIL: SALES@ALLFASTENERS.COM



© Copyright 2015, by Paul J. Ford and Company, All Rights Reserved. This document and the data contained herein, is proprietary to Paul J. Ford and Company, issued in strict confidence and shall not, without the prior written permission of Paul J. Ford and Company, be reproduced, copied or used for any purpose other than the intended use for this specific project.

RF PAUL J. FORD & COMPANY
 250 E Broad St, Ste 600 · Columbus, OH 43215
 Phone 614.221.6679 www.pauljford.com

CROWN CASTLE
 3550 TORINGDON WAY, SUITE 300, CHARLOTTE, NC 28277
 PH: (724) 416-2000

MODIFICATION OF AN EXISTING 150' MONOPOLE
 BU #876327; KINGS LOT
 SOUTH WINDSOR, CONNECTICUT

PROJECT No: 37515-2506.002.7700
 DRAWN BY: B.M.S.
 DESIGNED BY: J.J.W.
 CHECKED BY: BK
 DATE: 10-23-2015

NEXGEN2™ BOLT DETAIL

S-2B

© Copyright 2015, by Paul J. Ford and Company, All Rights Reserved. This document and the data contained herein, is proprietary to Paul J. Ford and Company, issued in strict confidence and shall not, without the prior written permission of Paul J. Ford and Company, be reproduced, copied or used for any purpose other than the intended use for this specific project.

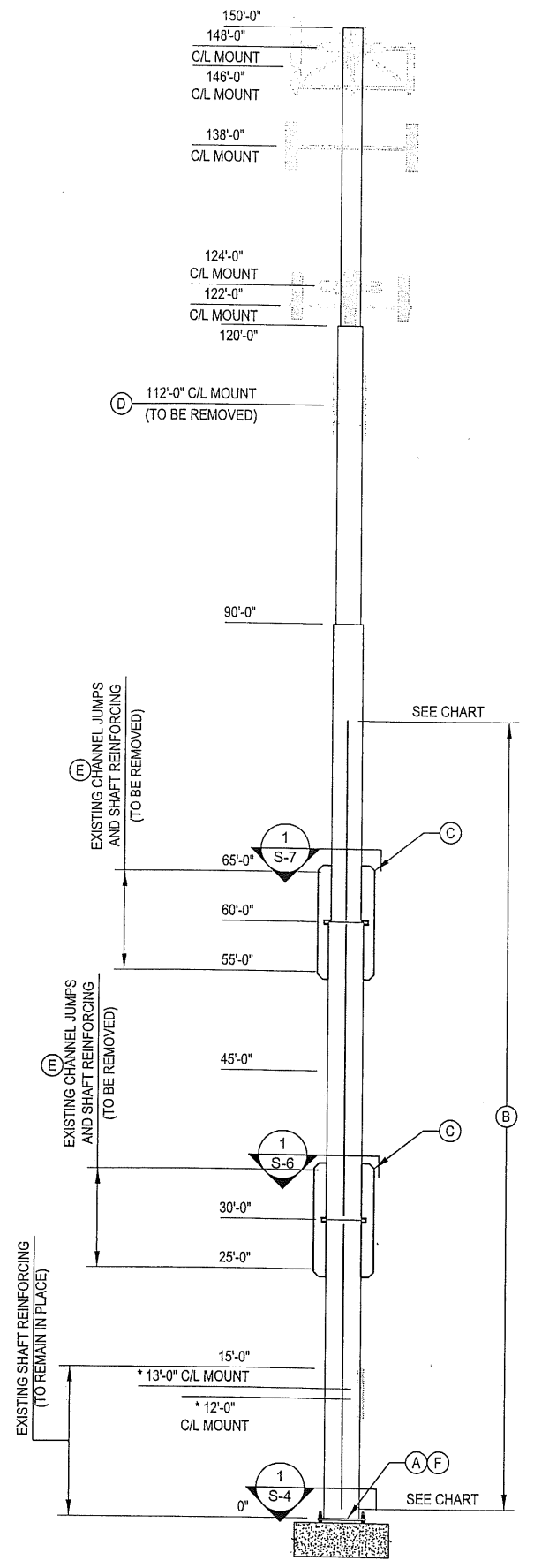
RF PAUL J. FORD & COMPANY
 250 E Broad St, Ste 600· Columbus, OH 43215
 Phone 614.221.6679 www.pauljford.com

CROWN CASTLE
 3530 TORINGDON WAY, SUITE 300, CHARLOTTE, NC 28277
 PH: (724) 416-2000

SHAFT SECTION	SECTION LENGTH (FT)	PLATE THICKNESS (IN)	LAP SPLICE (IN)	DIAMETER ACROSS FLATS (IN)		POLE GRADE (ksi)	POLE SHAPE
				@ TOP	@ BOTTOM		
				1	30.00		
2	30.00	0.3750		30.000	30.000	42	ROUND
3	30.00	0.3750		36.000	36.000	42	ROUND
4	30.00	0.3750		42.000	42.000	42	ROUND
5	30.00	0.5000		42.000	42.000	42	ROUND

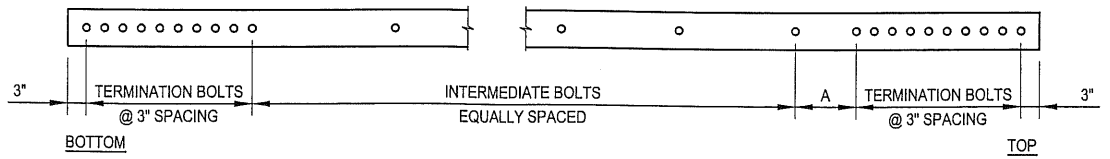
NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

- MODIFICATIONS:**
- (A) INSTALL NEW ANCHOR RODS AND BRACKETS AT BASE PLATE. SEE SHEET S-4.
 - (B) INSTALL NEW SHAFT REINFORCING. SEE CHART ON THIS SHEET.
 - (C) INSTALL NEW WELDED BRIDGE STIFFENERS AT EL. 30' & 60'. SEE SHEETS S-6 & S-7.
 - (D) REMOVE EXISTING MOUNT, ANTENNAS AND EQUIPMENT AT EL. 112'.
 - (E) EXISTING CHANNEL JUMPS AND REINFORCING TO BE REMOVED.
 - (F) REMOVE EXISTING STIFFENERS AS REQUIRED. SEE SHEET S-4.



NEW CCI FLAT PLATE (65 KSI) REINFORCING SCHEDULE											
BOTTOM ELEVATION	TOP ELEVATION	FLAT # / DEGREE SEPARATION	ELEMENT	ELEMENT LENGTH	ELEMENT QUANTITY	APPROXIMATE BOLTS PER ELEMENT	APPROXIMATE TOTAL BOLT QUANTITY	TERMINATION BOLTS (BOTTOM)	TERMINATION BOLTS (TOP)	MAXIMUM INTERMEDIATE BOLT SPACING	ESTIMATED TOTAL STEEL WEIGHT
1'-3"	29'-9"	210	1"x6" CFP #1	28'-6"	1	37	37	10	10	16"	582 LBS.
2'-0"	29'-9"	330	1"x6" CFP #2	27'-9"	1	37	37	10	10	16"	567 LBS.
5'-0"	29'-9"	90	1"x6" CFP #3	24'-9"	1	34	34	10	10	16"	505 LBS.
30'-3"	59'-9"	75, 195 & 315	1-1/4"x6-1/2" CFP #4	29'-6"	3	42	126	14	14	19"	2447 LBS.
60'-3"	80'-3"	75, 195 & 315	CCI-SFP-04510020	20'-0"	3	22	66	6	6	20"	919 LBS.
							300				5020 LBS.

- NOTES:**
- ALL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123. ALTERNATIVELY, ALL NEW STIFFENER PLATE STEEL REINFORCING MAY BE COLD GALVANIZED AS FOLLOWS: APPLY A MINIMUM OF TWO COATS OF ZRC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.0 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-831-3275 FOR PRODUCT INFORMATION.
 - ALL REINFORCING SHALL BE ASTM A572 GR. 65.
 - WELDS SHALL BE E80XX OR GREATER. TERMINATION WELDS SHALL BE 3/8" FILLET WELDS.
 - HOLES FOR BOLTS ARE 30mm UNLESS NOTED OTHERWISE.
 - ALL SHIMS SHALL BE ASTM A-36.

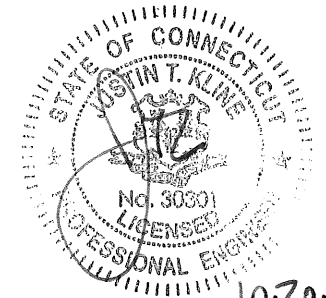


CUSTOM BOLTED BAR DETAIL
 NOTE: "A" DIMENSION MAY VARY, NOT TO EXCEED MAXIMUM INTERMEDIATE BOLT SPACING

* EXISTING MOUNTS MAY NEED TO BE ADJUSTED, MOVED AND/OR TEMPORARILY SUPPORTED DURING THE INSTALLATION OF SHAFT REINFORCING

MODIFICATION OF AN EXISTING 150' MONOPOLE
 BU #876327; KINGS LOT
 SOUTH WINDSOR, CONNECTICUT

PROJECT No: 37515-2506.002.7700
 DRAWN BY: B.M.S.
 DESIGNED BY: J.J.W.
 CHECKED BY: **Blk**
 DATE: 10-23-2015



MONOPOLE PROFILE

S-3

37515-2506.002.DWG

BASE SPECIFICATIONS	
BASE PLATE:	53"Ø; 2" THK.; Fy=36 KSI
ANCHOR RODS:	(18) 1 1/2"Ø; 47" B.C.

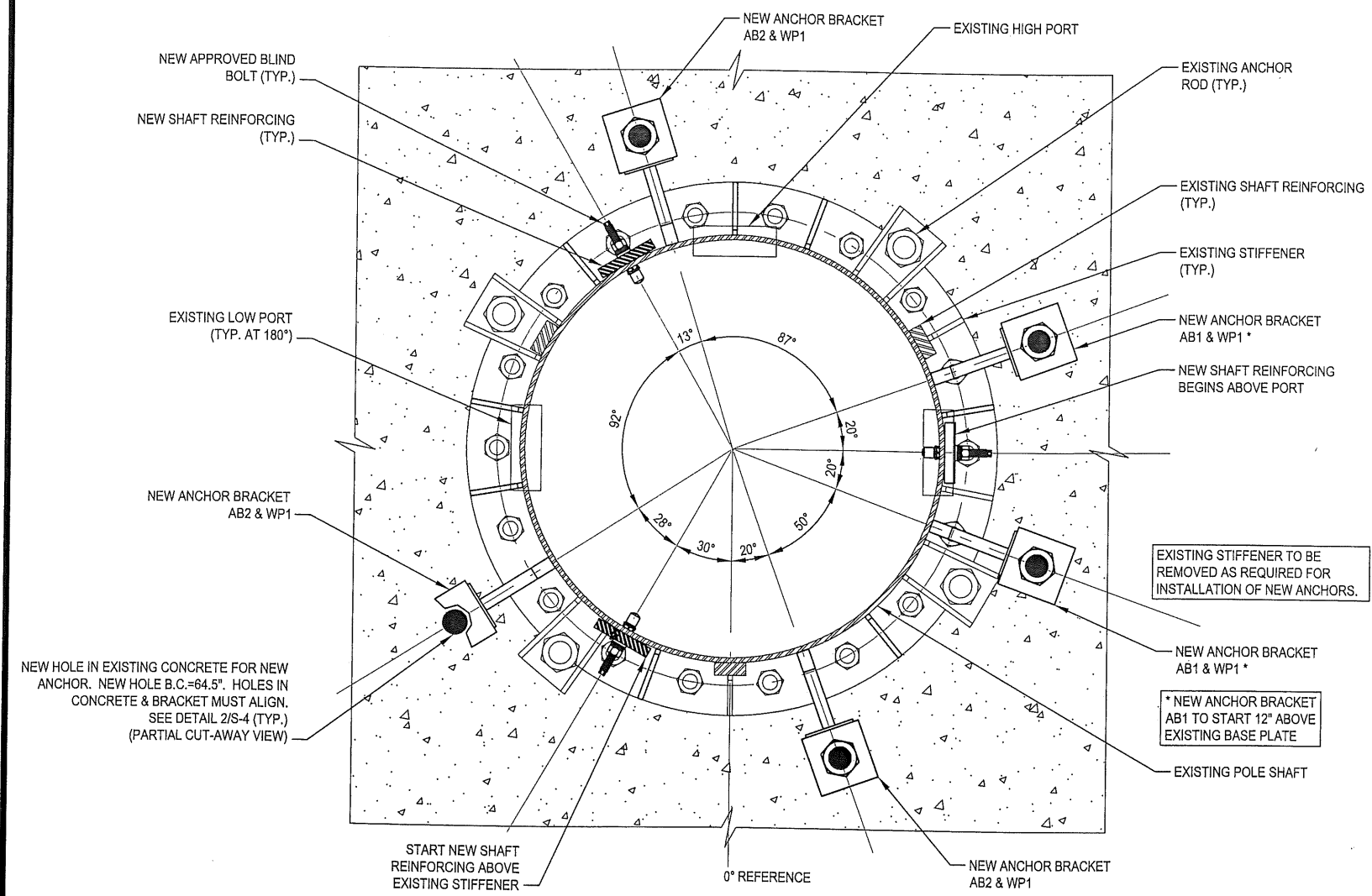
NDE OF THE CIRCUMFERENTIAL WELD OF THE BASE PLATE TO SHAFT CONNECTION IS REQUIRED. SEE CCI DOCUMENTS ENG-SOW-10033 'TOWER BASE PLATE NDE' AND ENG BUL-10051 'NDE REQUIREMENTS FOR MONOPOLE BASE PLATE TO PREVENT CONNECTION FAILURE.' NOTIFY THE EOR AND CROWN CASTLE ENGINEERING IMMEDIATELY IF ANY CRACKS ARE SUSPECTED OR HAVE BEEN IDENTIFIED. THE NDE SHALL INCLUDE ALL EXISTING REINFORCEMENTS THAT HAVE BEEN WELDED TO THE BASE PLATE. ANY FULL PENETRATION WELDING TO THE BASE PLATE REQUIRED AS PART OF THIS ACTIVE REINFORCEMENT DESIGN SHALL BE INCLUDED IN THE NDE SCOPE OF WORK.

© Copyright 2015, by Paul J. Ford and Company, All Rights Reserved. This document and the data contained herein, is proprietary to Paul J. Ford and Company, issued in strict confidence and shall not, without the prior written permission of Paul J. Ford and Company, be reproduced, copied or used for any purpose other than the intended use for this specific project.

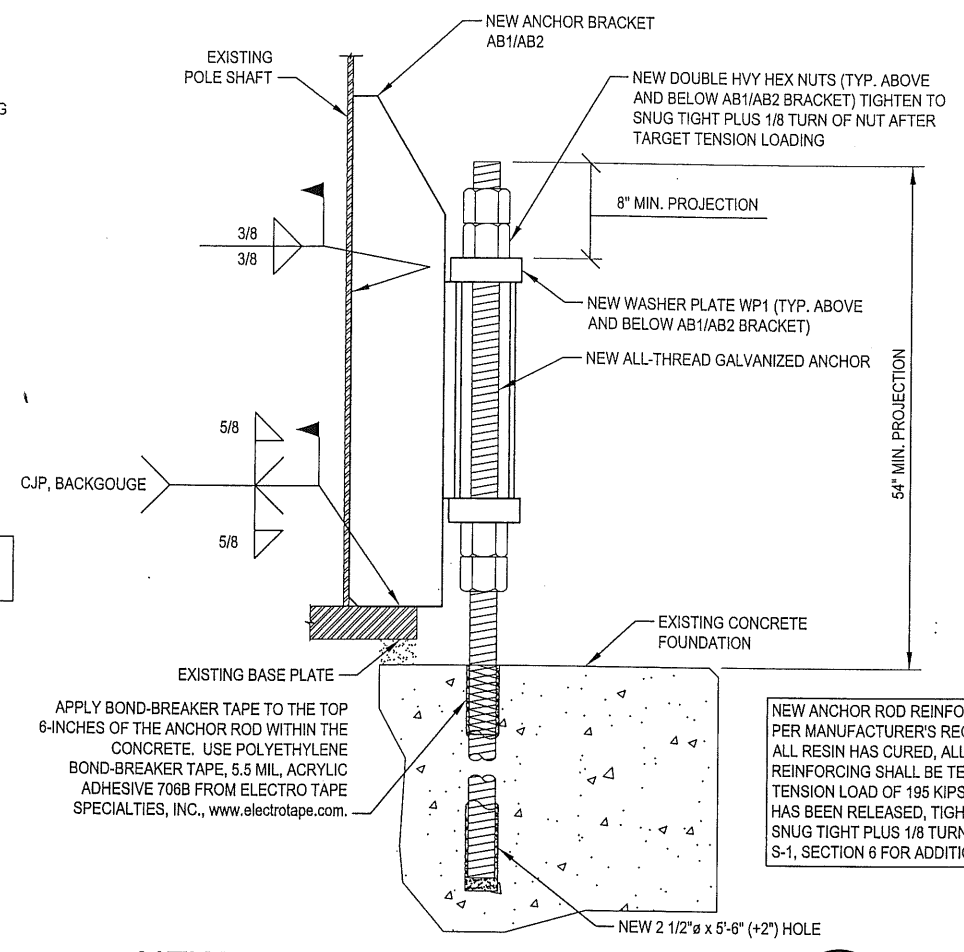
PF PAUL J. FORD & COMPANY
 250 E Broad St, Ste 600- Columbus, OH 43215
 Phone 614.221.6679 www.pauljford.com

CROWN CASTLE
 3530 TORINGDON WAY, SUITE 300, CHARLOTTE, NC 28277
 PH: (724) 416-2000

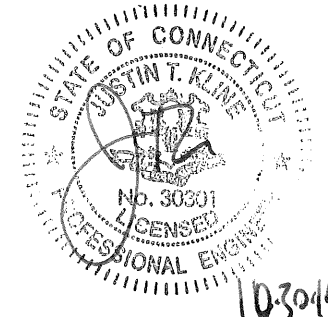
NEW ANCHOR RODS				
PART #	DIAMETER (IN)	LENGTH (IN)	MATERIAL	EMBEDMENT DEPTH (IN)
CUSTOM	2 1/4	123	A193 GR B7	66



BASE PLATE 1
S-4



NEW ANCHOR & BRACKET DETAIL 2
S-4



MODIFICATION OF AN EXISTING 150' MONOPOLE
 BU #876327; KINGS LOT
 SOUTH WINDSOR, CONNECTICUT

PROJECT No:	37515-2506.002.7700
DRAWN BY:	B.M.S.
DESIGNED BY:	J.J.W.
CHECKED BY:	BKA
DATE:	10-23-2015

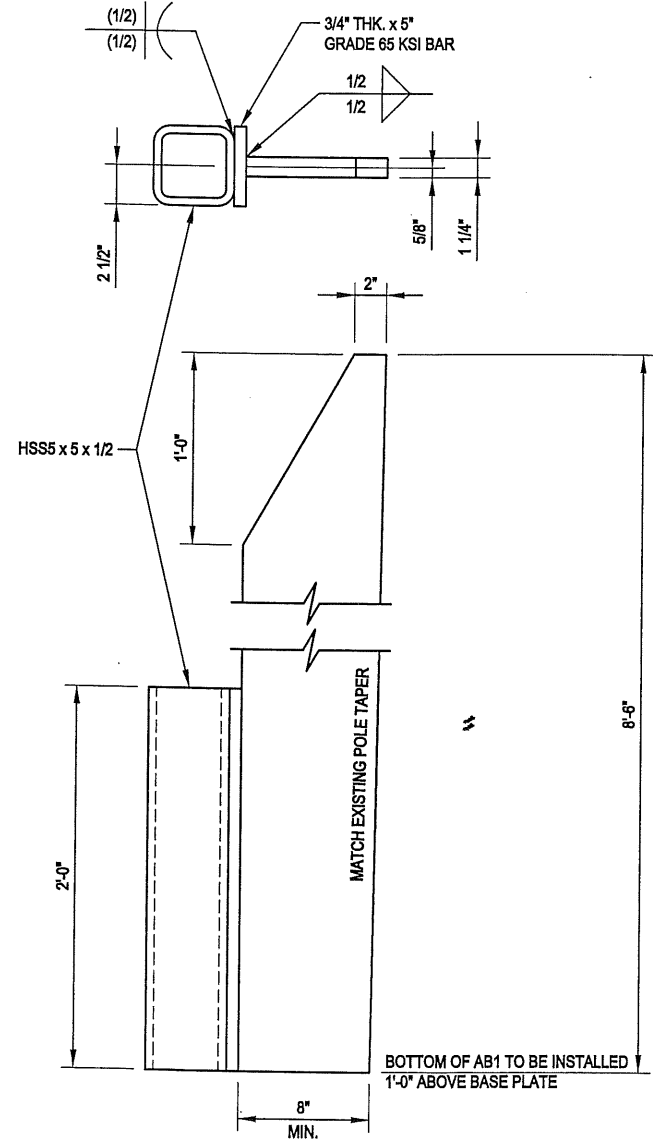
BASE PLATE DETAILS

S-4

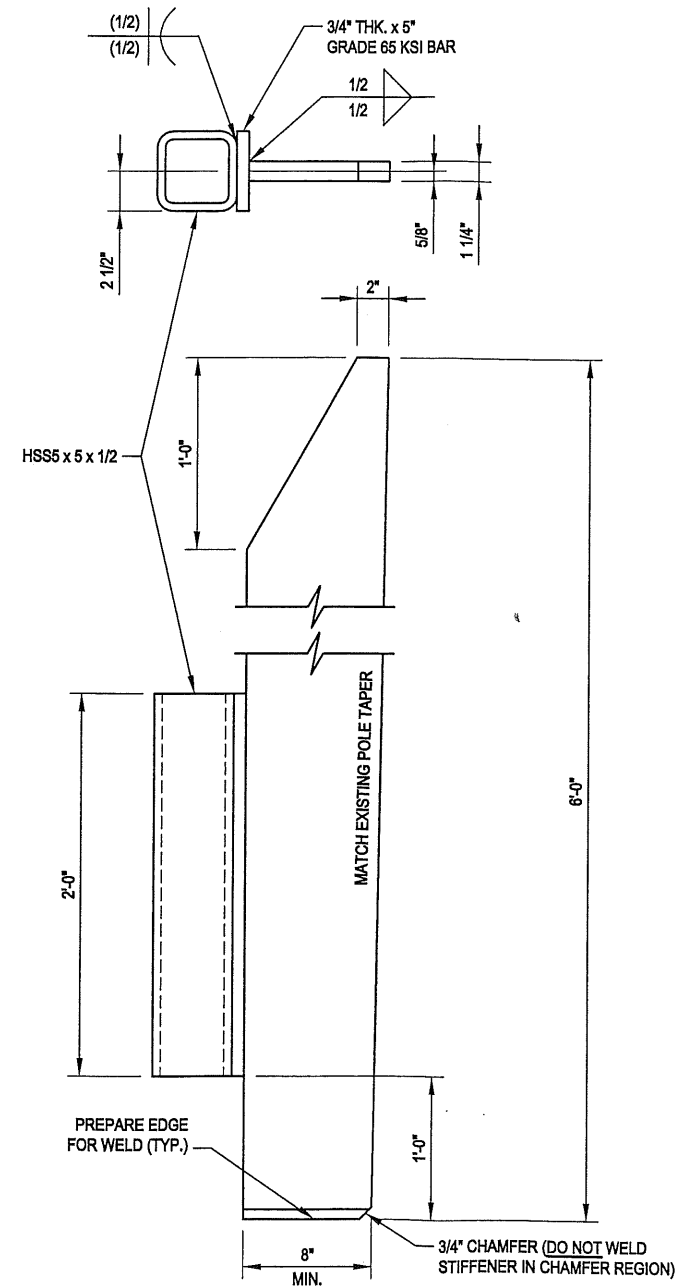
© Copyright 2015, by Paul J. Ford and Company, All Rights Reserved. This document and the data contained herein, is proprietary to Paul J. Ford and Company, issued in strict confidence and shall not, without the prior written permission of Paul J. Ford and Company, be reproduced, copied or used for any purpose other than the intended use for this specific project.

PAUL J. FORD & COMPANY
 250 E Broad St, Ste 600 - Columbus, OH 43215
 Phone 614.221.6679 www.paujford.com

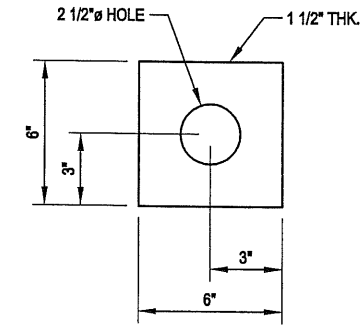
CROWN CASTLE
 3630 TORINGDON WAY, SUITE 300, CHARLOTTE, NC 28277
 PH: (724) 416-2000



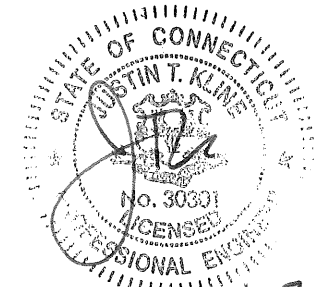
ANCHOR BRACKET MK~AB1
 (2 REQUIRED) (TUBE Fy = 46 KSI) (STIFFENER Fy = 65 KSI)



ANCHOR BRACKET MK~AB2
 (3 REQUIRED) (TUBE Fy = 46 KSI) (STIFFENER Fy = 65 KSI)



WASHER PLATE MK~WP1
 (10 REQUIRED) (Fy = 50 KSI)



MODIFICATION OF AN EXISTING 150' MONOPOLE

BU #876327; KINGS LOT
 SOUTH WINDSOR, CONNECTICUT

PROJECT No:	37515-2506.002.7700
DRAWN BY:	B.M.S.
DESIGNED BY:	J.J.W.
CHECKED BY:	BKK
DATE:	10-23-2015

MISC DETAILS

S-5

© Copyright 2015, by Paul J. Ford and Company, All Rights Reserved. This document and the data contained herein, is proprietary to Paul J. Ford and Company, issued in strict confidence and shall not, without the prior written permission of Paul J. Ford and Company, be reproduced, copied or used for any purpose other than the intended use for this specific project.

PAUL J. FORD & COMPANY
 250 E Broad St, Ste 600, Columbus, OH 43215
 Phone 614.221.6679 www.pauljford.com

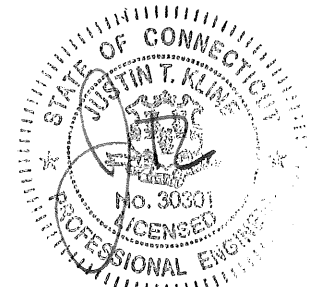
CROWN CASTLE
 3630 TORINGDON WAY, SUITE 300, CHARLOTTE, NC 28277
 PH: (724) 416-2000

MODIFICATION OF AN EXISTING 150' MONOPOLE
 BU #876327; KINGS LOT
 SOUTH WINDSOR, CONNECTICUT

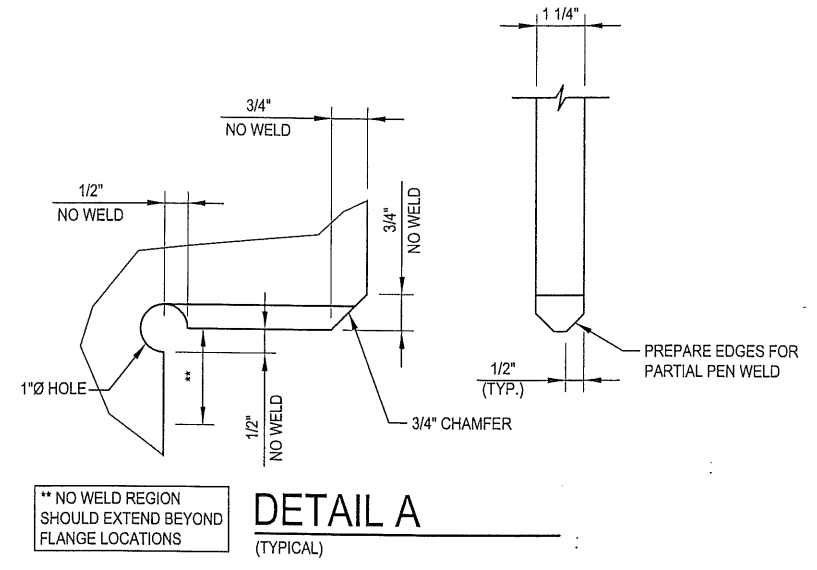
PROJECT No: 37515-2506.002.7700
 DRAWN BY: B.M.S.
 DESIGNED BY: J.J.W.
 CHECKED BY: **DKK**
 DATE: 10-23-2015

WELDED BRIDGE STIFFENER DETAILS

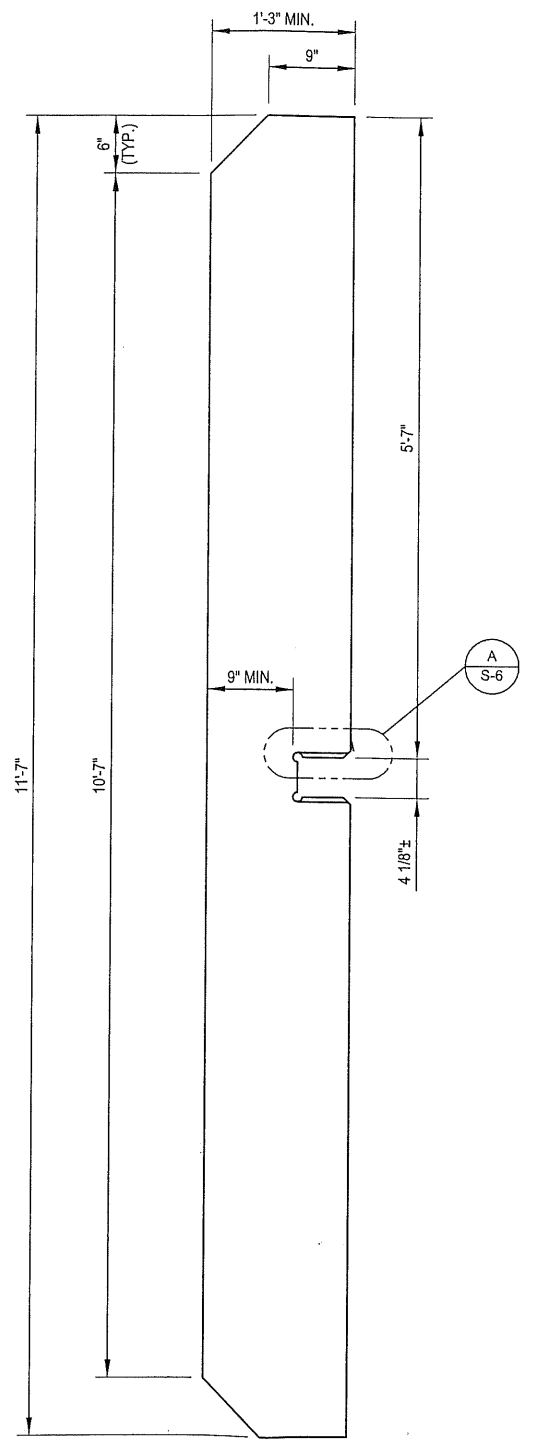
S-6



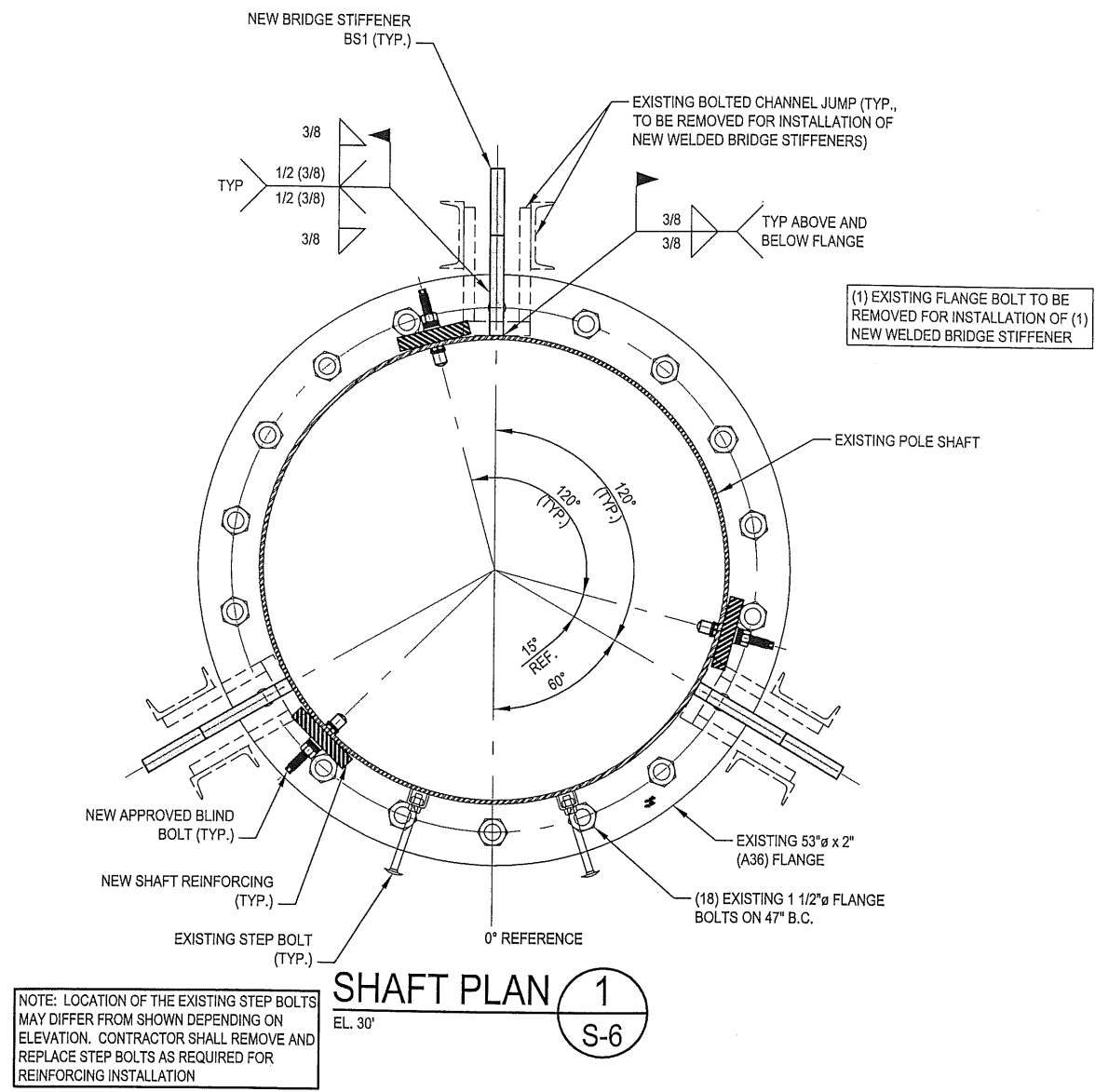
10-30-15



** NO WELD REGION SHOULD EXTEND BEYOND FLANGE LOCATIONS



BRIDGE STIFFENER MK~BS1
 (3 REQUIRED) (Fy = 65 KSI)



NOTE: LOCATION OF THE EXISTING STEP BOLTS MAY DIFFER FROM SHOWN DEPENDING ON ELEVATION. CONTRACTOR SHALL REMOVE AND REPLACE STEP BOLTS AS REQUIRED FOR REINFORCING INSTALLATION

© Copyright 2015, by Paul J. Ford and Company, All Rights Reserved. This document and the data contained herein, is proprietary to Paul J. Ford and Company, issued in strict confidence and shall not, without the prior written permission of Paul J. Ford and Company, be reproduced, copied or used for any purpose other than the intended use for this specific project.

PAUL J. FORD & COMPANY
 250 E Broad St., Ste 600 - Columbus, OH 43215
 Phone 614.221.6679 www.pauljford.com

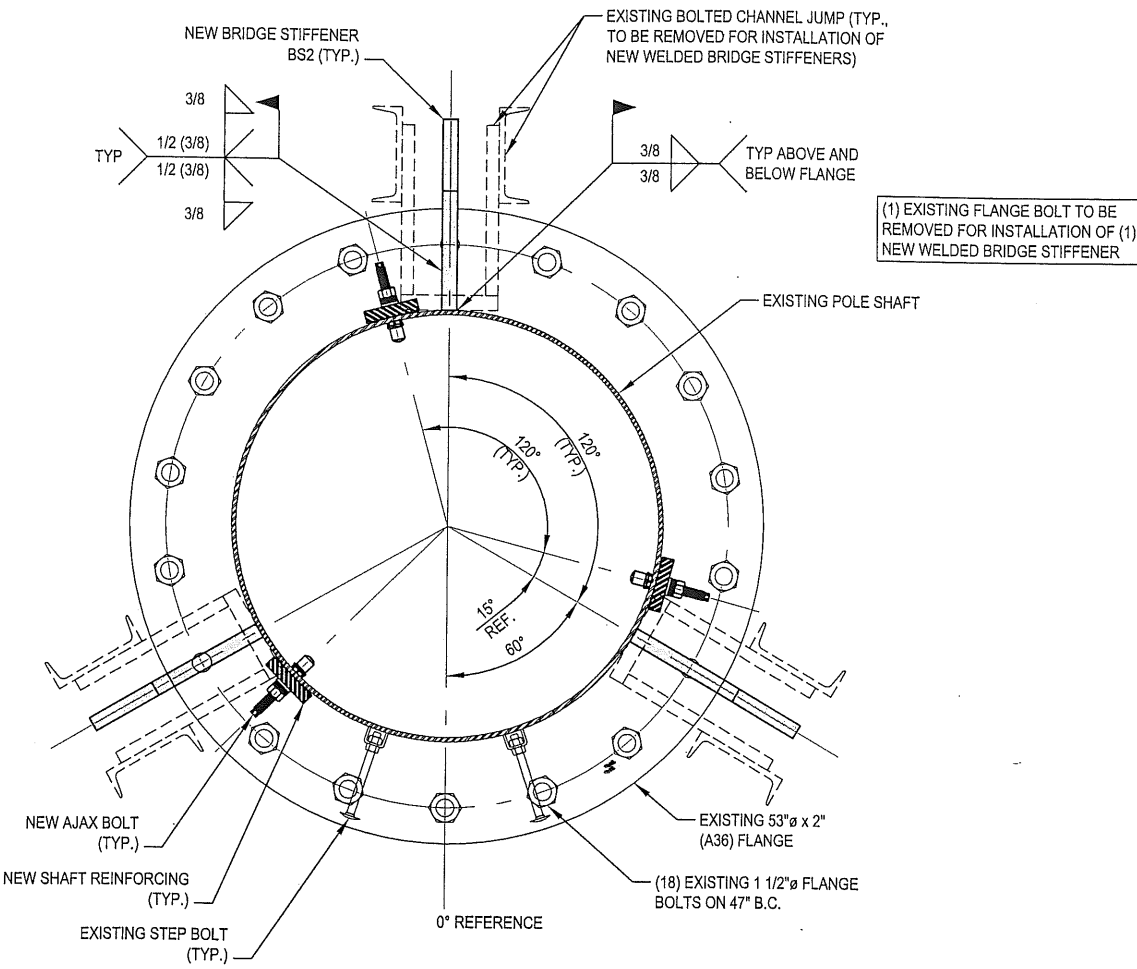
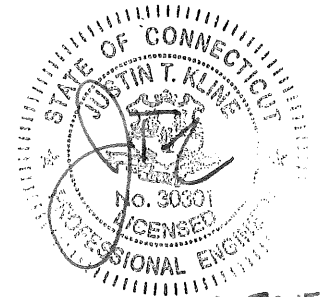
CROWN CASTLE
 3530 TORINGDON WAY, SUITE 300, CHARLOTTE, NC 28277
 PH: (724) 416-2000

MODIFICATION OF AN EXISTING 150' MONOPOLE
 BU #876327; KINGS LOT
 SOUTH WINDSOR, CONNECTICUT

PROJECT No: 37515-2506.002.7700
 DRAWN BY: B.M.S.
 DESIGNED BY: J.J.W.
 CHECKED BY: **BKW**
 DATE: 10-23-2015

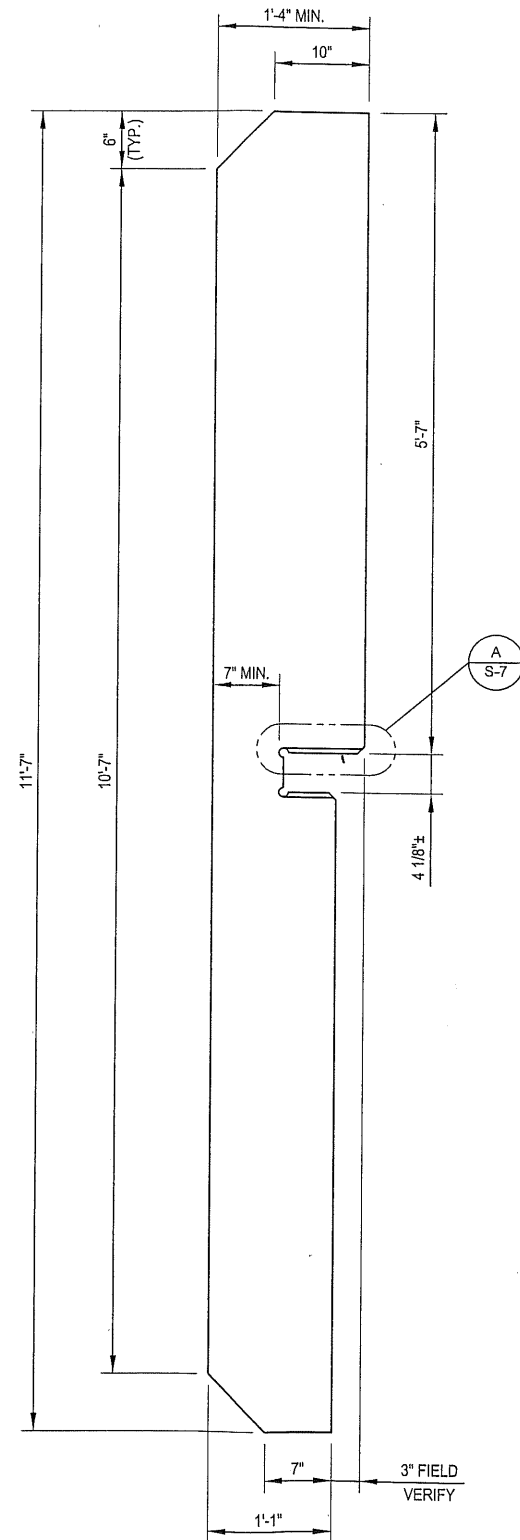
WELDED BRIDGE STIFFENER DETAILS

S-7

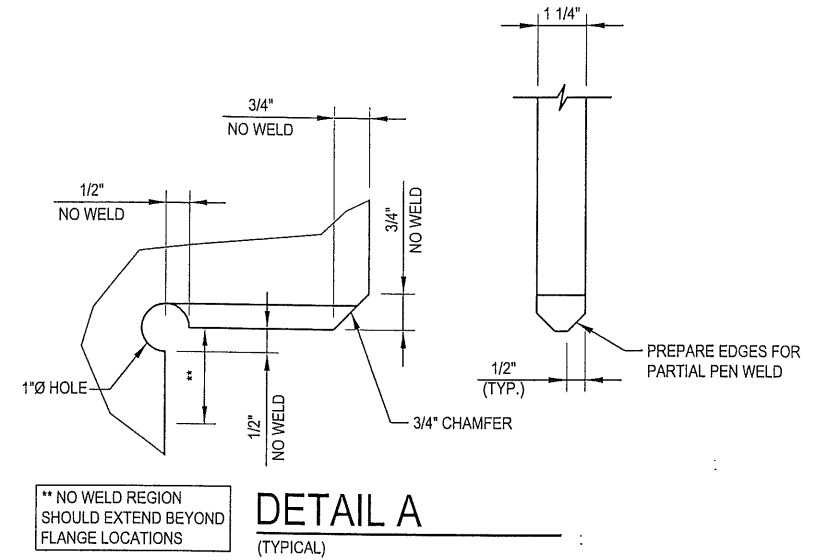


NOTE: LOCATION OF THE EXISTING STEP BOLTS MAY DIFFER FROM SHOWN DEPENDING ON ELEVATION. CONTRACTOR SHALL REMOVE AND REPLACE STEP BOLTS AS REQUIRED FOR REINFORCING INSTALLATION

SHAFT PLAN 1
 EL. 60'
 S-7



BRIDGE STIFFENER MK~BS2
 (3 REQUIRED) (Fy = 65 KSI)



** NO WELD REGION SHOULD EXTEND BEYOND FLANGE LOCATIONS

DETAIL A
 (TYPICAL)

MODIFICATION INSPECTION NOTES:

- 1. GENERAL**
 - 1.1. 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 EOR.
 - 1.2. 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.
 - 1.3. ALL MIs SHALL BE CONDUCTED BY A CROWN CASTLE ENGINEERING VENDOR (AEV) OR ENGINEERING SERVICE VENDOR (AESV) THAT IS APPROVED TO PERFORM ELEVATED WORK FOR CROWN CASTLE.
 - 1.4. 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 CASTLE POINT OF CONTACT (POC).
 - 1.5. REFER TO ENG-SOW-10007: MODIFICATION INSPECTION SOW FOR FURTHER DETAILS AND REQUIREMENTS.
- 2. MI INSPECTOR**
 - 2.1. THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO FOR THE MI TO, AT A MINIMUM:
 - 2.1.1. REVIEW THE REQUIREMENTS OF THE MI CHECKLIST.
 - 2.1.2. WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS.
 - 2.1.3. THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL 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 CASTLE.
- 3. GENERAL CONTRACTOR**
 - 3.1. 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:
 - 3.1.1. REVIEW THE REQUIREMENTS OF THE MI CHECKLIST.
 - 3.1.2. WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS.
 - 3.1.3. BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS.
 - 3.1.4. THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST AND ENG-SOW-10007.
- 4. RECOMMENDATIONS**
 - 4.1. THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING AN MI REPORT:
 - 4.1.1. IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLE 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
 - 4.1.2. THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
 - 4.1.3. WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS.
 - 4.1.4. 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.
 - 4.1.5. 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.
- 5. CANCELLATION OR DELAYS IN SCHEDULED MI**
 - 5.1. IF THE GC AND MI INSPECTOR AGREE TO A DATE ON WHICH THE MI WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, CROWN CASTLE 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 CASTLE 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.
- 6. CORRECTION OF FAILING MIs**
 - 6.1. IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI ("FAILED MI"), THE GC SHALL WORK WITH CROWN CASTLE TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:
 - 6.1.1. CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI.
 - 6.1.2. OR, WITH CROWN CASTLE'S APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION.
- 7. MI VERIFICATION INSPECTIONS**
 - 7.1. CROWN CASTLE 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.
 - 7.2. ALL VERIFICATION INSPECTIONS SHALL BE HELD TO THE SAME SPECIFICATIONS AND REQUIREMENTS IN THE CONTRACT DOCUMENTS AND IN ACCORDANCE WITH ENG-SOW-10007.
 - 7.3. VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT AEA/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.
- 8. PHOTOGRAPHS**
 - 8.1. BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:
 - 8.1.1. PRECONSTRUCTION GENERAL SITE CONDITION
 - 8.1.2. PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION
 - 8.1.3. RAW MATERIALS
 - 8.1.4. PHOTOS OF ALL CRITICAL DETAILS
 - 8.1.5. FOUNDATION MODIFICATIONS
 - 8.1.6. WELD PREPARATION
 - 8.1.7. BOLT INSTALLATION AND TORQUE
 - 8.1.8. FINAL INSTALLED CONDITION
 - 8.1.9. SURFACE COATING REPAIR
 - 8.1.10. POST CONSTRUCTION PHOTOGRAPHS
 - 8.1.11. FINAL INFIELD CONDITION
 - 8.1.12. PHOTOS OF ELEVATED MODIFICATIONS TAKEN FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.
 - 8.1.13. THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS, PLEASE REFER TO ENG-SOW-10007.

9. INSPECTION AND TESTING

- 9.1. ALL WORK SHALL BE SUBJECT TO REVIEW AND OBSERVATION BY CROWN CASTLE'S REPRESENTATIVE AND CROWN CASTLE'S AUTHORIZED INDEPENDENT INSPECTION AND TESTING AGENCY.
- 9.2. INSPECTION SERVICES WHICH ARE FURNISHED BY OTHERS ARE STILL REQUIRED WHEN THE EOR PERFORMS SUPPORT SERVICES DURING CONSTRUCTION.
- 9.3. OBSERVED DISCREPANCIES BETWEEN THE WORK AND THE CONTRACT DOCUMENTS SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST.
- 9.4. AN INDEPENDENT QUALIFIED INSPECTION/TESTING AGENCY SHALL BE SELECTED, RETAINED AND PAID FOR BY CROWN CASTLE FOR THE SOLE PURPOSE OF INSPECTING, TESTING, DOCUMENTING, AND APPROVING ALL WELDING AND FIELD WORK PERFORMED BY THE CONTRACTOR.
 - 9.4.1. ACCESS TO ANY PLACE WHERE WORK IS BEING DONE SHALL BE PERMITTED AT ALL TIMES.
 - 9.4.2. THE INSPECTION AGENCY SHALL SO SCHEDULE THIS WORK AS TO CAUSE A MINIMUM OF INTERRUPTION TO, AND COORDINATE WITH, THE WORK IN PROGRESS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE THE WORK SCHEDULE WITH THE TESTING AGENCY. THE CONTRACTOR SHALL ALLOW FOR ADEQUATE TIME AND ACCESS FOR THE TESTING AGENCY TO PERFORM THEIR DUTIES.
- 9.5. THE INSPECTION AND TESTING AGENCY SHALL BE RESPONSIBLE TO PERFORM THE FOLLOWING SERVICES AND INSPECT THE FOLLOWING ITEMS IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS. THE TESTING AGENCY SHALL INSPECT ITEMS ON THIS LIST AND OTHER ITEMS AS NECESSARY TO FULFILL THEIR RESPONSIBILITY. THE TESTING AGENCY SHALL UTILIZE EXPERIENCED, TRAINED INSPECTORS INCLUDING AWS CERTIFIED WELDING INSPECTORS (CWI). INSPECTORS SHALL HAVE THE TRAINING, CREDENTIALS, AND EXPERIENCE APPROPRIATE FOR AND COMMENSURATE WITH THE SCOPE AND TYPE OF INSPECTION WORK TO BE PERFORMED.
- 9.6. **GENERAL**
 - 9.6.1. PERFORM PERIODIC ON-SITE OBSERVATION, INSPECTION, VERIFICATION, AND TESTING DURING THE TIME THE CONTRACTOR IS WORKING ON-SITE. AGENCY SHALL NOTIFY CROWN CASTLE AND THE EOR IMMEDIATELY WHEN FIELD PROBLEMS OR DISCREPANCIES OCCUR.
- 9.7. **FOUNDATIONS AND SOIL PREPARATION - (NOT REQUIRED)**
- 9.8. **CONCRETE TESTING PER ACI - (NOT REQUIRED)**
- 9.9. **STRUCTURAL STEEL**
 - 9.9.1. CHECK STEEL ON THE JOB WITH THE PLANS.
 - 9.9.2. CHECK MILL CERTIFICATIONS. CALL FOR LABORATORY TEST REPORTS WHEN MILL CERTIFICATION IS IN QUESTION.
 - 9.9.3. CHECK GRADE OF STEEL MEMBERS, AND BOLTS FOR CONFORMANCE WITH DRAWINGS.
 - 9.9.4. INSPECT ALL STRUCTURAL BOLTS SHALL BE FIELD INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.
 - 9.9.5. INSPECT STEEL MEMBERS FOR DISTORTION, EXCESSIVE RUST, FLAWS AND BURNED HOLES.
 - 9.9.6. CHECK STEEL MEMBERS FOR SIZES, SWEEP AND DIMENSIONAL TOLERANCES.
 - 9.9.7. CHECK FOR SURFACE FINISH SPECIFIED, GALVANIZED.
 - 9.9.8. CHECK THAT BOLTS HAVE BEEN TIGHTENED PROPERLY.
 - 9.9.9. PRIOR TO ANY FIELD CUTTING THE CONTRACTOR SHALL MARK THE CUTOUT LINES ON THE STEEL AND THE INSPECTION/TESTING AGENCY SHALL VERIFY PROPOSED LAYOUT, LOCATION, AND DIMENSIONS. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.
- 9.10. **WELDING:**
 - 9.10.1. VERIFY FIELD WELDING PROCEDURES, WELDERS, AND WELDING OPERATORS, NOT DEEMED PREQUALIFIED, IN ACCORDANCE WITH AWS D1.1.
 - 9.10.2. INSPECT FIELD WELDED CONNECTIONS IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED AND WITH AWS D1.1.
 - 9.10.3. APPROVE FIELD WELDING SEQUENCE.
 - 9.10.4. A PROGRAM OF THE APPROVED SEQUENCES SHALL BE SUBMITTED TO CROWN CASTLE BEFORE WELDING BEGINS. NO CHANGE IN APPROVED SEQUENCES MAY BE MADE WITHOUT PERMISSION FROM CROWN CASTLE.
 - 9.10.5. INSPECT WELDED CONNECTIONS AS FOLLOWS AND IN ACCORDANCE WITH AWS D1.1:
 - 9.10.5.1. INSPECT WELDING EQUIPMENT FOR CAPACITY, MAINTENANCE, AND WORKING CONDITIONS.
 - 9.10.5.2. VERIFY SPECIFIED ELECTRODES AND HANDLING AND STORAGE OF ELECTRODES FOR CONFORMANCE TO SPECIFICATIONS.
 - 9.10.5.3. INSPECT PREHEATING AND INTERPASS TEMPERATURES FOR CONFORMANCE WITH AWS D1.1.
 - 9.10.5.4. VISUALLY INSPECT ALL WELDS AND VERIFY THAT QUALITY OF WELDS MEETS THE REQUIREMENTS OF AWS D1.1. OTHER TESTS MAY ALSO BE PERFORMED ON THE WELDS BY THE TESTING AGENCY IN ORDER FOR THEM TO PERFORM THEIR DUTIES FOR THIS PROJECT.
 - 9.10.5.5. SPOT TEST AT LEAST ONE FILLET WELD OF EACH MEMBER USING MAGNETIC PARTICLE.
 - 9.10.5.6. INSPECT FOR SIZE, SPACING, TYPE AND LOCATION AS PER APPROVED DRAWINGS.
 - 9.10.5.7. VERIFY THAT THE BASE METAL CONFORMS TO THE DRAWINGS.
 - 9.10.5.8. REVIEW THE REPORTS BY TESTING LABS.
 - 9.10.5.9. CHECK TO SEE THAT WELDS ARE CLEAN AND FREE FROM SLAG.
 - 9.10.5.10. INSPECT RUST PROTECTION OF WELDS AS PER SPECIFICATIONS.
 - 9.10.5.11. CHECK THAT DEFECTIVE WELDS ARE CLEARLY MARKED AND HAVE BEEN ADEQUATELY REPAIRED.
 - 9.10.5.12. FULL PENETRATION WELDS IN THE VICINITY OF THE BASE OF THE TOWER ARE REQUIRED TO BE 100% NDE INSPECTED BY UT IN ACCORDANCE WITH AWS D1.1.
 - 9.10.5.13. PARTIAL PENETRATION AND FILLET WELDS IN THE VICINITY OF THE BASE OF THE TOWER ARE REQUIRED TO BE 50% NDE INSPECTED BY MP IN ACCORDANCE WITH AWS D1.1.
- 9.11. **REPORTS:**
 - 9.11.1. COMPILE AND PERIODICALLY SUBMIT DAILY INSPECTION REPORTS TO CROWN CASTLE.
 - 9.11.2. THE INSPECTION PLAN OUTLINED HEREIN IS INTENDED AS A DESCRIPTION OF GENERAL AND SPECIFIC ITEMS OF CONCERN. IT IS NOT INTENDED TO BE ALL-INCLUSIVE. IT DOES NOT LIMIT THE TESTING AND INSPECTION AGENCY TO THE ITEMS LISTED. ADDITIONAL TESTING, INSPECTION, AND CHECKING MAY BE REQUIRED AND SHOULD BE ANTICIPATED. THE TESTING AGENCY SHALL USE THEIR PROFESSIONAL JUDGMENT AND KNOWLEDGE OF THE JOB SITE CONDITIONS AND THE CONTRACTOR'S PERFORMANCE TO DECIDE WHAT OTHER ITEMS REQUIRE ADDITIONAL ATTENTION. THE TESTING AGENCY'S JUDGMENT MUST PREVAIL ON ITEMS NOT SPECIFICALLY COVERED. ANY DISCREPANCIES OR PROBLEMS SHALL BE BROUGHT IMMEDIATELY TO CROWN CASTLE'S ATTENTION. RESOLUTIONS ARE NOT TO BE MADE WITHOUT CROWN CASTLE'S REVIEW AND SPECIFIC WRITTEN CONSENT. CROWN CASTLE RESERVES THE RIGHT TO DETERMINE WHETHER OR NOT A RESOLUTION IS ACCEPTABLE.
 - 9.11.3. AFTER EACH INSPECTION, THE TESTING AGENCY WILL PREPARE A WRITTEN ACCEPTANCE OR REJECTION WHICH WILL BE GIVEN TO THE CONTRACTOR AND FILED AS DAILY REPORTS TO CROWN CASTLE. THIS WRITTEN ACTION WILL GIVE THE CONTRACTOR A LIST OF ITEMS TO BE CORRECTED, PRIOR TO CONTINUING CONSTRUCTION, AND/OR LOADING OF STRUCTURAL ITEMS.
 - 9.11.4. THE TESTING AGENCY DOES NOT RELIEVE THE CONTRACTOR'S CONTRACTUAL OR STATUTORY OBLIGATIONS. THE CONTRACTOR HAS THE SOLE RESPONSIBILITY FOR ANY DEVIATIONS FROM THE OFFICIAL CONTRACT DOCUMENTS. THE TESTING AGENCY WILL NOT REPLACE THE CONTRACTOR'S QUALITY CONTROL PERSONNEL.

MI CHECKLIST	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY EOR)	REPORT ITEM
PRE-CONSTRUCTION	
X	MI CHECKLIST DRAWINGS
X	EOB REVIEW
X	FABRICATION INSPECTION
X	FABRICATOR CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT (MTR)
NA	FABRICATOR NDE INSPECTION
X	NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED)
X	PACKING SLIPS
ADDITIONAL TESTING AND INSPECTIONS:	
CONSTRUCTION	
X	CONSTRUCTION INSPECTIONS
NA	FOUNDATION INSPECTIONS
NA	CONCRETE COMP. STRENGTH AND SLUMP TESTS
X	POST INSTALLED ANCHOR ROD VERIFICATION
NA	BASE PLATE GROUT VERIFICATION
X	CONTRACTOR'S CERTIFIED WELD INSPECTION
NA	EARTHWORK: PROVIDE PHOTO DOCUMENTATION OF EXCAVATION QUALITY AND COMPACTION
X	ON SITE COLD GALVANIZING VERIFICATION
NA	GUY WIRE TENSION REPORT
X	GC AS-BUILT DOCUMENTS
NA	MICROPILE/ROCK ANCHOR INSTALLER'S DRILLING AND INSTALLATION LOGS AND QA/QC DOCUMENTS
ADDITIONAL TESTING AND INSPECTIONS:	
POST-CONSTRUCTION	
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
X	POST INSTALLED ANCHOR ROD TARGET TENSION LOAD TESTING
NA	REFER TO MICROPILE/ROCK ANCHOR NOTES FOR SPECIAL INSPECTION AND TESTING REQUIREMENTS.
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

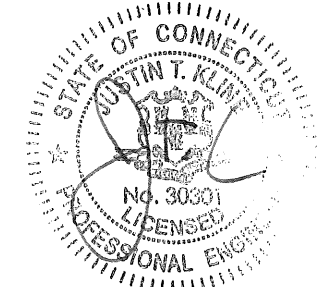
© Copyright 2015, by Paul J. Ford and Company, All Rights Reserved. This document and the data contained herein, is proprietary to Paul J. Ford and Company, issued in strict confidence and shall not, without the prior written permission of Paul J. Ford and Company, be reproduced, copied or used for any purpose other than the intended use for this specific project.

PAUL J. FORD & COMPANY
 250 E Broad St, Ste 400 - Columbus, OH 43215
 Phone 614.221.6679 www.pauljford.com

CROWN CASTLE
 3530 TORINGDON WAY, SUITE 300, CHARLOTTE, NC 28277
 PH: (724) 416-2000

MODIFICATION OF AN EXISTING 150' MONOPOLE
 BU #876327; KINGS LOT SOUTH WINDSOR, CONNECTICUT

PROJECT No:	37515-2506.002.7700
DRAWN BY:	B.M.S.
DESIGNED BY:	J.J.W.
CHECKED BY:	B.K.K.
DATE:	10-23-2015



10-30-15

MI CHECKLIST

S-8

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

T-Mobile Existing Facility

Site ID: CT11883C

**CT883/Sprint S. Windsor
59 McGuire Road
South Windsor, CT 06074**

September 15, 2015

EBI Project Number: 6215004759

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	6.03 %

September 15, 2015

T-Mobile USA
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, CT 06002

Emissions Analysis for Site: **CT11883C – CT883/Sprint S. Windsor**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **59 McGuire Road, South Windsor, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The number of $\mu\text{W}/\text{cm}^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The general population exposure limit for the 700 MHz Band is approximately 467 $\mu\text{W}/\text{cm}^2$, and the general population exposure limit for the PCS and AWS bands is 1000 $\mu\text{W}/\text{cm}^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **59 McGuire Road, South Windsor, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

For all calculations, all equipment was calculated using the following assumptions:

- 1) 2 GSM / UMTS channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel
- 2) 2 UMTS channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 3) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 4) 1 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This channel has a transmit power of 30 Watts.
- 5) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

- 6) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 7) The antennas used in this modeling are the **Ericsson AIR21 (B4A/B2P & B2A/B4P)** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **Commscope LNX-6515DS-VTM** for 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **Ericsson AIR21 (B4A/B2P & B2A/B4P)** have a maximum gain of **15.9 dBd** at their main lobe. The **Commscope LNX-6515DS-VTM** has a maximum gain of **14.6 dBd** at its main lobe. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 8) The antenna mounting height centerline of the proposed antennas is **138 feet** above ground level (AGL).
- 9) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	138	Height (AGL):	138	Height (AGL):	138
Frequency Bands	2100 MHz (AWS)	Frequency Bands	2100 MHz (AWS)	Frequency Bands	2100 MHz (AWS)
Channel Count	2	Channel Count	2	# PCS Channels:	2
Total TX Power:	120	Total TX Power:	120	# AWS Channels:	120
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A1 MPE%	0.96	Antenna B1 MPE%	0.96	Antenna C1 MPE%	0.96
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	Ericsson AIR21 B2A/B4P□	Make / Model:	Ericsson AIR21 B2A/B4P□	Make / Model:	Ericsson AIR21 B2A/B4P□
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	138	Height (AGL):	138	Height (AGL):	138
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power:	120	Total TX Power:	120	Total TX Power:	120
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A2 MPE%	0.96	Antenna B2 MPE%	0.96	Antenna C2 MPE%	0.96
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM
Gain:	14.6 dBd	Gain:	14.6 dBd	Gain:	14.6 dBd
Height (AGL):	138	Height (AGL):	138	Height (AGL):	138
Frequency Bands	700 MHz	Frequency Bands	700 MHz	Frequency Bands	700 MHz
Channel Count	1	Channel Count	1	Channel Count	1
Total TX Power:	30	Total TX Power:	30	Total TX Power:	30
ERP (W):	865.21	ERP (W):	865.21	ERP (W):	865.21
Antenna A3 MPE%	0.38	Antenna B3 MPE%	0.38	Antenna C3 MPE%	0.38

Site Composite MPE%	
Carrier	MPE%
T-Mobile (Per Sector Max)	2.31 %
Sprint	0.44 %
MetroPCS	0.97 %
AT&T	2.31 %
Site Total MPE %:	6.03 %

T-Mobile Sector 1 Total:	2.31 %
T-Mobile Sector 2 Total:	2.31 %
T-Mobile Sector 3 Total:	2.31 %
Site Total:	6.03 %

T-Mobile _per sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu\text{W}/\text{cm}^2$)	Frequency (MHz)	Allowable MPE ($\mu\text{W}/\text{cm}^2$)	Calculated % MPE
T-Mobile 2100 MHz (AWS) LTE	2	2334.27	90	9.63	2100	1000	0.96 %
T-Mobile 700 MHz LTE	1	865.21	90	1.79	700	467	0.38 %
T-Mobile 1900 MHz (PCS) UMTS	2	1167.14	90	4.82	1900	1000	0.48 %
T-Mobile 2100 MHz (AWS) UMTS	2	1167.14	90	4.82	2100	1000	0.48 %
						Total:	2.31%

Summary

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

The anticipated maximum composite contributions from the T-Mobile facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general public exposure to RF Emissions are shown here:

T-Mobile Sector	Power Density Value (%)
Sector 1:	2.31 %
Sector 2:	2.31 %
Sector 3 :	2.31 %
T-Mobile Per Sector Maximum:	2.31 %
Site Total:	6.03 %
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **6.03%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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



Scott Heffernan
RF Engineering Director

EBI Consulting
21 B Street
Burlington, MA 01803