Crown Castle
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065

November 3, 2021

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

RE: **Notice of Exempt Modification for T-Mobile**
Crown#828257; T-Mobile Site ID CT11307C
82 Mechanic Street, Pawcatuck (Stonington), CT 06379
Latitude: 41° 22′ 18.91" / Longitude: -71° 49′ 58.01″

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antennas at the 150-foot mount on the existing 150-foot monopole tower located at 82 Mechanic Street, Pawcatuck (Stonington), CT. The property is owned by Whittaker Technical Products, Inc and the tower is owned by Crown Castle. T-Mobile now intends to replace three (3) antennas and ancillary equipment at the 150ft level. This modification/proposal includes hardware that is both 4G (LTE) and 5G capable through remote software configuration and either or both services may be turned on or off at various times.

Panned Modification:

Tower:

Installed New:

(3) Rosenberger – D2WC-21 Antennas
(6) Comscope – TWIN LB/MIDBAND CBC426T-DS-43 Diplexers
(3) Ericsson- Radio 4480 B71+B85
(3) Hybrid 1-5/8" Cables
(3) New Antenna Mounts

Remove:

(3) RFS-APXV18-206516S-C-A20 Antennas
(3) RFS APXV18-209014-C-A20 Antennas
(6) RRU Radios
(3) Twin Style 1B-AWS TMA
(3) Twin Style 1A-PCS TMA

Ground:

Install New:

(3) 4449 B71+B85 Radios
(6.) Twin Style TMAT1921B68-21-43

(6.) Twin LB/MIDBAND CBC426T-DS-43
(1.) BB 6630
(1) DUW30

Remove:
(1.) DUW30

The facility was approved by the Town of Stonington Planning and Zoning Commission in Application Number PZ0028SPA on June 20, 2000.

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.C.S.A. § 16-50j-73, a copy of this letter is being sent to Ms. Danielle Chesebrough, First Selectwoman, Town of Stonington, Mr. Keith Brynes AICP, CZET, Town Planner, Town of Stonington and Whittaker Technical Products, Inc, property owner. Crown Castle is the tower owner.

1. The proposed modifications will not result in an increase in the height of the existing tower.

2. The proposed modifications 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-reference telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Please send approval/rejection letter to Attn: Jeffrey Barbadora.

Sincerely,

Jeffrey Barbadora
Site Acquisition Specialist
1800 W. Park Drive
Westborough, MA 01581
(781) 970-0053
Jeff.Barbadora@crowncastle.com

Attachments
cc:

Danielle Chesebrough, First Selectwoman
Town of Stonington
Selectman's Office
152 Elm Street
Stonington, CT 06378
860-535-5050

Keith Brynes AICP, CZET, Town Planner
Town of Stonington
Planning Department
152 Elm Street
Stonington, CT 06378
860-535-5095

Whittaker Technical Products, Inc
ATTN: Eric Lardiere
1995 N Surveyor Avenue
Simi Valley, CA 93063

Crown Castle, Tower Owner

The Planning and Zoning Commission
152 Elm Street, P.O. Box 352
Stonington, Connecticut 06378
(860) 535-5095

June 22, 2000

Omnipoint Communications, Inc.
100 Filley St.
Bloomfield, CT 06002

Dear Sir:

The Planning and Zoning Commission at their meeting of June 20, 2000 voted to APPROVE your application - **#PZ0028SPA OMNIPOINT COMMUNICATIONS, INC.** - Application for Site Plan Approval to construct a 150' flag pole telecommunications tower. Property located at 82 Mechanics St., Pawcatuck. Assessor's Map 4 Block 7 Lot 15 Zone M-1. Your application was approved with the following stipulations:

1) The flag pole shall be similar to the flag pole at Valenti's Auto Mall without the cross arm.
2) The flag be raised and lowered at the appropriate time each day so no lighting will be required (no lighting is permitted).
3) The flag should be of the appropriate size for the flag pole.

Please bring to the Planning and Zoning Office for the Chairman's signature one (1) set of bluelines. If you require a signed copy of the site plan for your files, please provide the Planning office with the additional copy.

If you have any questions, please feel free to contact the Planning Office.

Sincerely,

Edward C. Donnelly

Edward Donnelly, AICP
Planning Director

TOWN OF STONINGTON
Planning & Zoning Commission

COMMENT SHEET

Department: BOARD OF POLICE COMMISSIONERS Date: 4/24/00

APPLICATION: **#PZ0028SPA OMNIPOINT COMMUNICATIONS, INC.** - Application for Site Plan Approval to construct a 150' flag pole telecommunications tower. Property located at 82 Mechanics St., Pawcatuck. Assessor's Map 4 Block 7 Lot 15 Zone M-1.

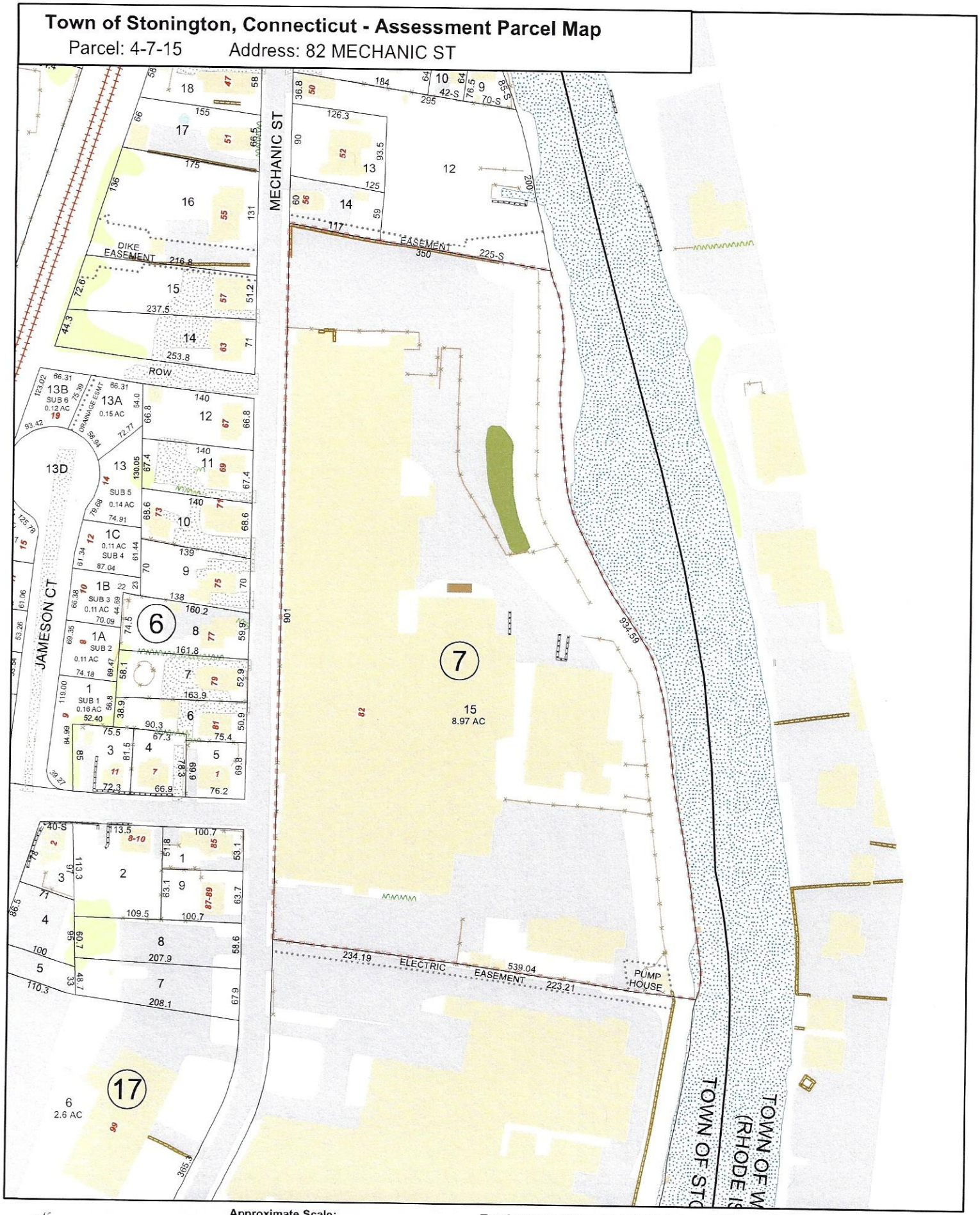
Return Comments By: **5/12/00**

Note:

5/8/00
"NO comment"
Michele Crowley,
Secretary

Town of Stonington, Connecticut - Assessment Parcel Map

Parcel: 4-7-15 Address: 82 MECHANIC ST



Approximate Scale:

1 inch = 150 feet

0 90 180 270 360 Feet

Revised To Grand List: October 2019 **Map Produced: May 2020**

Town of Stonington, CT

Property Listing Report

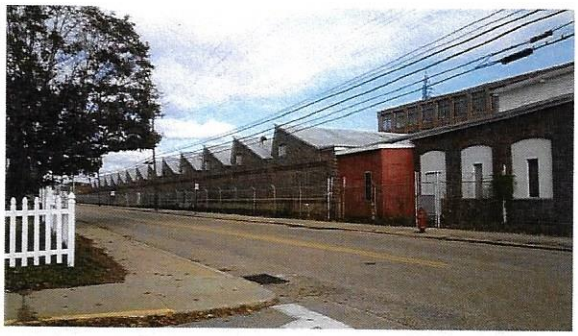
Map Block Lot 4-7-15 | Building # 1 | Section # 1 | Account 00902700

Property Information

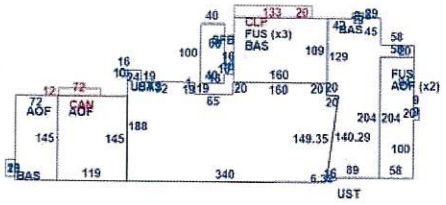
Property Location	82 MECHANIC ST
Owner	WHITTAKER TECHNICAL PRODUCTS INC
Co-Owner	ATTN: ERIC LARDIERE
Mailing Address	1955 N SURVEYOR AVE SIMI VALLEY CA 93063
Land Use	4000 INDUSTRIAL M-96
Land Class	I
Zoning Code	HM
Census Tract	7051

Street Index	3000
Acreage	8.97
Utilities	
Lot Setting/Desc	Suburban Level
Survey Map #	NA
School District	
Fire District	Pawcatuck
Trash Day	F
Polling Place (District)	2

Photo



Sketch



Primary Construction Details

Year Built	1896
Stories	4
Building Style	Mill bldg.
Building Use	Ind/Comm
Building Condition	P
Occupancy	2
Extra Fixtures	
Bath Style	NA
Kitchen Style	NA
AC Type	None
Heating Type	Steam
Heating Fuel	Gas

Bedrooms	0
Full Bathrooms	0
Half Bathrooms	0
Total Rooms	0
Roof Style	Flat
Roof Cover	Tar & Gravel
Interior Floors 1	Pine/Soft Wood
Interior Floors 2	Concr Abv Grad
Exterior Walls	Brick/Masonry
Exterior Walls 2	Concr/Cinder
Interior Walls	Minim/Masonry
Interior Walls 2	Wall Brd/Wood

(*Industrial / Commercial Details)

Building Desc.	INDUSTRIAL M-96
Building Grade	Average
Heat / AC	NONE
Frame Type	MASONRY
Baths / Plumbing	AVERAGE
Ceiling / Wall	NONE
Rooms / Prtns	AVERAGE
Wall Height	14
First Floor Use	4000

Report Created On 11/16/2020

Town of Stonington, CT

Property Listing Report

Map Block Lot 4-7-15 | Building # 1 | Section # 1 | Account 00902700

Valuation Summary

(Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings	455900	319200
Extras	15100	10700
Improvements		
Outbuildings	139400	97600
Land	285900	200100
Total	896300	627600

Outbuilding and Extra Features

Type	Description
PAVING-ASPHALT	200000.00 S.F.
FENCE-6' CHAIN	1800.00 L.F.
W/LIGHTS ETC	64.00 S.F.
SHED FRAME	616.00 S.F.
ELEV PASS	3.00 STOPS
ELEV PASS	4.00 STOPS
ELEV PASS	3.00 STOPS
DRY	218202.00 S.F.
AIR CONDITION	46000.00 UNITS
CELL TOWER	1.00 UNIT

Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
Office, (Average)	51719	51719
First Floor	99832	99832
Canopy	864	0
Loading Platform, Finished	2660	0
Upper Story, Finished	64332	64332
Base, Semi-Finished	4256	4256
Utility, Storage, Unfinished	256	128
Total Area	223919	220267

Sales History

Owner of Record	Book/ Page	Sale Date	Sale Price
WHITTAKER TECHNICAL PRODUCTS INC	0757/0684	11/4/2016	0
WHITTAKER TECHNICAL PRODUCTS INC	0128/0386	1/27/1961	0
YARDNEY ELECTRIC CORP	0133/0568	1/1/1950	0
YARDNEY ELECTRIC CORP	0133/0401	1/1/1949	0

Report Created On 11/16/2020

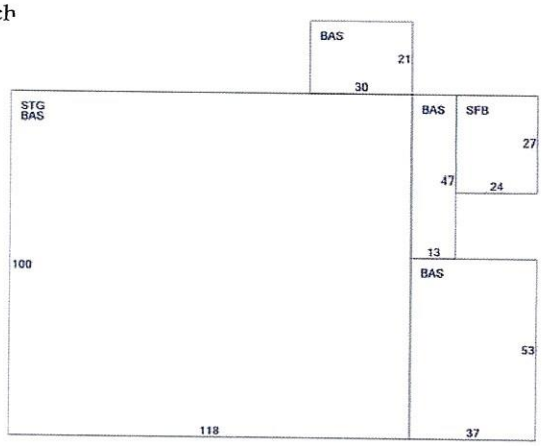
Town of Stonington, CT

Property Listing Report

Map Block Lot	4-7-15	Building #	2	Section #	1	Account	00902700

Photo

Sketch



Primary Construction Details

Year Built	1920
Stories	2
Building Style	Mill bldg.
Building Use	Ind/Comm
Building Condition	P
Occupancy	1
Extra Fixtures	
Bath Style	NA
Kitchen Style	NA
AC Type	None
Heating Type	Hot Air-no Duc
Heating Fuel	Gas

Bedrooms	0
Full Bathrooms	0
Half Bathrooms	0
Total Rooms	0
Roof Style	Flat
Roof Cover	Tar & Gravel
Interior Floors 1	Concr-Finished
Interior Floors2	
Exterior Walls	Brick/Masonry
Exterior Walls 2	Pre-finsh Metl
Interior Walls	Minim/Masonry
Interior Walls 2	NA

(*Industrial / Commercial Details)

Building Desc.	INDUSTRIAL M-96
Building Grade	Average
Heat / AC	NONE
Frame Type	MASONRY
Baths / Plumbing	AVERAGE
Ceiling / Wall	NONE
Rooms / Prtns	AVERAGE
Wall Height	14
First Floor Use	4000

Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
First Floor	15002	15002
Base, Semi-Finished	648	648
Storage Area	11800	11800

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
Total Area	27450	27450

Report Created On

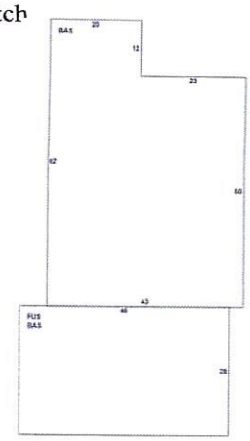
Town of Stonington, CT

Property Listing Report

Map Block Lot	4-7-15	Building #	3	Section #	1	Account	00902700

Photo

Sketch



Primary Construction Details

Year Built	1896
Stories	2
Building Style	Mill bldg.
Building Use	Ind/Comm
Building Condition	P
Occupancy	1
Extra Fixtures	
Bath Style	NA
Kitchen Style	NA
AC Type	None
Heating Type	None
Heating Fuel	None

Bedrooms	0
Full Bathrooms	0
Half Bathrooms	0
Total Rooms	0
Roof Style	Flat
Roof Cover	Tar & Gravel
Interior Floors 1	Concr-Finished
Interior Floors2	
Exterior Walls	Brick/Masonry
Exterior Walls 2	NA
Interior Walls	Minim/Masonry
Interior Walls 2	NA

(*Industrial / Commercial Details)

Building Desc.	INDUSTRIAL M-96
Building Grade	Average
Heat / AC	NONE
Frame Type	MASONRY
Baths / Plumbing	AVERAGE
Ceiling / Wall	NONE
Rooms / Prtns	AVERAGE
Wall Height	14
First Floor Use	4000

Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
First Floor	3678	3678
Upper Story, Finished	1288	1288

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
Total Area	4966	4966

Report Created On

Barbadora, Jeff

From: TrackingUpdates@fedex.com
Sent: Thursday, November 4, 2021 12:17 PM
To: Barbadora, Jeff
Subject: FedEx Shipment 775111434728: Your package has been delivered

Hi. Your package was delivered Thu, 11/04/2021 at 12:15pm.

Delivered to 152 ELM ST PLANNING, STONINGTON, CT 06378
Received by L.CAMELIO

OBTAIN PROOF OF DELIVERY

TRACKING NUMBER 775111434728

FROM	Jeff Barbadora 1800 W. Park Drive WESTBOROUGH, MA, US, 01581
TO	Town of Stonington - Selectman Off Keith Brynes, Town Planner 152 Elm Street STONINGTON, CT, US, 06378
REFERENCE	799001.7680
SHIPPER REFERENCE	799001.7680
SHIP DATE	Wed 11/03/2021 06:14 PM
DELIVERED TO	Receptionist/Front Desk
PACKAGING TYPE	FedEx Envelope
ORIGIN	WESTBOROUGH, MA, US, 01581
DESTINATION	STONINGTON, CT, US, 06378
SPECIAL HANDLING	Deliver Weekday
NUMBER OF PIECES	1
TOTAL SHIPMENT WEIGHT	1.00 LB
SERVICE TYPE	FedEx Priority Overnight

Barbadora, Jeff

From: TrackingUpdates@fedex.com
Sent: Thursday, November 4, 2021 12:13 PM
To: Barbadora, Jeff
Subject: FedEx Shipment 775111410135: Your package has been delivered

Hi. Your package was delivered Thu, 11/04/2021 at 12:11pm.

Delivered to 152 ELM ST, STONINGTON, CT 06378
Received by S.HASKELL

OBTAIN PROOF OF DELIVERY

TRACKING NUMBER 775111410135

FROM	Jeff Barbadora 1800 W. Park Drive WESTBOROUGH, MA, US, 01581
TO	Town of Stonington - Selectman Off Danielle CheseBrough, First Select 152 Elm Street STONINGTON, CT, US, 06378
REFERENCE	799001.7680
SHIPPER REFERENCE	799001.7680
SHIP DATE	Wed 11/03/2021 06:14 PM
DELIVERED TO	Receptionist/Front Desk
PACKAGING TYPE	FedEx Envelope
ORIGIN	WESTBOROUGH, MA, US, 01581
DESTINATION	STONINGTON, CT, US, 06378
SPECIAL HANDLING	Deliver Weekday
NUMBER OF PIECES	1
TOTAL SHIPMENT WEIGHT	1.00 LB
SERVICE TYPE	FedEx Priority Overnight

TRACK ANOTHER SHIPMENT

775111497722

ADD NICKNAME

Sign up for Status Updates to get updated as we have more information.

DELAYED

Updated delivery:
Thursday, 11/4/2021

Initially expected: Thursday, 11/4/2021

OPERATIONAL DELAY

NORTH HILLS, CA

GET STATUS UPDATES

FROM

Jeff Barbadora

1800 W. Park Drive
WESTBOROUGH, MA US 01581
781-970-0053

TO

Eric Landiere
Wittaker Technical Products, Inc

1955 N SURVEYOR AVENUE
SIMI VALLEY, CA US 93063
781-970-0053

MANAGE DELIVERY

Travel History

TIME ZONE
Local Scan Time

Thursday, November 4, 2021

10:08 AM	NORTH HILLS, CA	Operational Delay Incorrect Address
9:02 AM	NORTH HILLS, CA	On FedEx vehicle for delivery
8:55 AM	NORTH HILLS, CA	At local FedEx facility

5:58 AM	LOS ANGELES, CA	At destination sort facility
4:31 AM	MEMPHIS, TN	Departed FedEx hub
12:15 AM	MEMPHIS, TN	Arrived at FedEx hub
Wednesday, November 3, 2021		
8:10 PM	FRAMINGHAM, MA	Left FedEx origin facility
6:14 PM	FRAMINGHAM, MA	Picked up
3:33 PM		Shipment information sent to FedEx

Expand History

Shipment Facts

TRACKING NUMBER
775111497722

SERVICE
FedEx Priority Overnight

WEIGHT
1 lbs / 0.45 kgs

TOTAL PIECES
1

TOTAL SHIPMENT WEIGHT
1 lbs / 0.45 kgs

TERMS
Shipper

SHIPPER REFERENCE
799001.7680

PACKAGING
FedEx Envelope

SPECIAL HANDLING SECTION
Deliver Weekday

SHIP DATE
11/3/21

STANDARD TRANSIT
11/4/21 before 11:30 am

SHIPMENT-DATES-DISPLAY.UPDATED-DELIVERY
11/4/21 by end of day

Date: **August 23, 2021**

GPD Engineering and Architecture
Professional Corporation
520 South Main Street Suite 2531
Akron, Ohio 44311
(216) 927-8663

Subject:	**Structural Modification Report**	
Carrier Designation:	***T-Mobile* Co-Locate**	
	Site Number:	CT11307C
	Site Name:	STONINGTON
Crown Castle Designation:	**BU Number:**	828257
	Site Name:	STONINGTON
	JDE Job Number:	559257
	Work Order Number:	2002920
	Order Number:	479826 Rev. 9
Engineering Firm Designation:	**GPD Project Number:**	2021777.828257.06
Site Data:	**82 Mechanic Street, Pawcatuck, CT 06379, New London County** **Latitude *41° 22' 18.91"*, Longitude *-71° 49' 58.01"*** **150 Foot – Modified PiROD Concealment Tower**	

We are pleased to submit this **"Structural Modification Report"** to determine the structural integrity of the above mentioned tower.

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: Proposed Equipment Configuration with Proposed Modifications **Sufficient Capacity – 94.2%**

This analysis utilizes an ultimate 3-second gust wind speed of 140 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

All modifications designed by GPD (Project #: 2021777.828257.06, dated 8/23/2021, see Appendix D) and equipment proposed in this report shall be installed in accordance with the attached design drawings for the determined available structural capacity to be effective.

Structural analysis prepared by: Brendan Kelly

Respectfully submitted by:

8/23/2021

Christopher J. Scheks, P.E.
Connecticut #: 0030026

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 150 ft concealment tower designed by PiROD, Inc. in October of 2000 and mapped by TEP in June of 2015.

The tower has been modified multiple times in the past to support additional loading.

Proposed modifications designed by GPD (Project #: 2021777.828257.06, dated 8/23/2021, see Appendix D) consist of adding reinforcement to the tower shaft around the existing 30’ and 60' flange connections, and adding anchor rods on bracket assemblies to the tower base. These modifications have been considered in this analysis

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	140 mph
Exposure Category:	C
Topographic Factor:	1
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
145.0	148.0	3	Rosenberger Leoni	D2WC-21	12	1-5/8
	145.0	3	Commscope	CBC426T-DS-43		
	144.0	3	Ericsson	KRY 115 032/4		

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
144.0	144.0	1	-	36"ø x 12' Concealment Canister	-	-
133.0	135.0	3	CCI Antennas	OPA-65R-LCUU-H6	12	1-1/4
	129.0	6	CCI Antennas	TMABPDB7823VG12A		
132.0	132.0	1	-	36"ø x 12' Concealment Canister	-	-

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
TOWER MAPPING REPORT	3487587	CCISITES
TOWER MANUFACTURER DRAWINGS	3487587	CCISITES
TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	3946752	CCISITES
GEOTECHNICAL REPORTS	3487586	CCISITES
TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	5876049	CCISITES
POST-MODIFICATION INSPECTION	6269721	CCISITES
TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	-	GPD

3.1) Analysis Method

tnxTower (version 8.1.1.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A. Additional calculations were performed to determine the stresses in the pole and in the reinforced elements. These calculations are presented in Appendix C. When applicable, Crown Castle has calculated and provided the effective area for panel antennas using approved methods following the intent of the TIA-222 standard.

3.2) Assumptions

1) Tower and structures were maintained in accordance with the TIA-222 Standard.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

This analysis may be affected if any assumptions or items in Table 3 are not valid or have been made in error. GPD 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 - 145	Pole	P10.75x0.465	Pole	-0.35	-	4.6	Pass
L2	145 - 140	Pole	P10.75x0.465	Pole	-0.93	-	10.1	Pass
L3	140 - 135	Pole	P10.75x0.465	Pole	-1.54	-	18.5	Pass
L4	135 - 130	Pole	P10.75x0.465	Pole	-2.32	-	29.4	Pass
L5	130 - 126	Pole	P10.75x0.465	Pole	-2.65	-	38.6	Pass
L6	126 - 121	Pole	P24x0.375	Pole	-3.58	-	13.4	Pass
L7	121 - 116	Pole	P24x0.375	Pole	-4.21	-	17.4	Pass
L8	116 - 111	Pole	P24x0.375	Pole	-4.85	-	21.8	Pass
L9	111 - 110	Pole	P24x0.375	Pole	-4.98	-	22.7	Pass
L10	110 - 105	Pole	P24x0.375	Pole	-5.62	-	27.5	Pass
L11	105 - 100	Pole	P24x0.375	Pole	-6.27	-	32.7	Pass
L12	100 - 95	Pole	P24x0.375	Pole	-6.92	-	38.3	Pass
L13	95 - 90	Pole	P24x0.375	Pole	-7.58	-	44.2	Pass
L14	90 - 85	Pole	P24x0.375	Pole	-8.25	-	50.5	Pass
L15	85 - 80	Pole	P24x0.375	Pole	-8.93	-	57.1	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L16	80 - 75	Pole	P24x0.375	Pole	-9.61	-	64.0	Pass
L17	75 - 70	Pole	P24x0.375	Pole	-10.31	-	71.2	Pass
L18	70 - 65	Pole	P24x0.375	Pole	-11.02	-	78.7	Pass
L19	65 - 61	Pole	P24x0.375	Pole	-11.59	-	84.9	Pass
L20	61 - 60.75	Pole + Reinf.	P24x0.7125	Reinf.	-11.65	-	54.9	Pass
L21	60.75 - 60.5	Pole + Reinf.	P24x0.7125	Reinf.	-11.71	-	55.1	Pass
L22	60.5 - 60.25	Pole + Reinf.	P24x0.75	Reinf.	-11.77	-	52.4	Pass
L23	60.25 - 60	Pole + Reinf.	P24x0.75	Reinf.	-11.83	-	52.7	Pass
L24	60 - 58.5	Pole + Reinf.	P24x0.75	Reinf.	-12.21	-	54.1	Pass
L25	58.5 - 58.25	Pole + Reinf.	P24x0.675	Reinf.	-12.27	-	57.3	Pass
L26	58.25 - 53.25	Pole + Reinf.	P24x0.675	Reinf.	-13.34	-	62.6	Pass
L27	53.25 - 48.25	Pole + Reinf.	P24x0.675	Reinf.	-14.41	-	68.0	Pass
L28	48.25 - 43.25	Pole + Reinf.	P24x0.675	Reinf.	-15.50	-	73.6	Pass
L29	43.25 - 38.25	Pole + Reinf.	P24x0.675	Reinf.	-16.59	-	79.4	Pass
L30	38.25 - 33.25	Pole + Reinf.	P24x0.675	Reinf.	-17.70	-	85.3	Pass
L31	33.25 - 30	Pole + Reinf.	P24x0.675	Reinf.	-19.95	-	89.4	Pass
L32	30 - 29.75	Pole + Reinf.	P30x0.6	Reinf.	-20.54	-	62.5	Pass
L33	29.75 - 24.75	Pole + Reinf.	P30x0.6	Reinf.	-21.96	-	67.0	Pass
L34	24.75 - 19.75	Pole + Reinf.	P30x0.6	Reinf.	-23.19	-	71.7	Pass
L35	19.75 - 14.75	Pole + Reinf.	P30x0.6	Reinf.	-24.44	-	76.5	Pass
L36	14.75 - 9.75	Pole + Reinf.	P30x0.6	Reinf.	-25.69	-	81.4	Pass
L37	9.75 - 4.75	Pole + Reinf.	P30x0.6	Reinf.	-26.87	-	86.4	Pass
L38	4.75 - 2.5	Pole + Reinf.	P30x0.6	Reinf.	-27.39	-	88.7	Pass
L39	2.5 - 2.25	Pole + Reinf.	P30x0.625	Pole	-27.47	-	81.6	Pass
L40	2.25 - 0	Pole + Reinf.	P30x0.625	Pole	-28.05	-	83.7	Pass
						Summary	ELC:	Load Case 4.5
						Pole =	84.9	Pass
						Reinf. =	89.4	Pass
						Rating =	89.4	Pass

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

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Flange Connection	126.0	30.3	Pass
1,2	Flange Connection	110.0	43.9	Pass
1,2	Flange Connection	90.0	85.7	Pass
1,2	Flange Connection	60.0	80.2	Pass
1,2	Flange Connection	30.0	54.7	Pass
1,2	Jump Plates	30.0	66.2	Pass
1,2	Anchor Rods	0	80.6	Pass
1,2	Base Plate	0	0.0	Pass
1,2	Anchor Rod Bracket	0	49.2	Pass
1,2	Base Foundation (Soil Interaction)	0	94.2	Pass
1,2	Base Foundation (Structure)	0	37.8	Pass

Structure Rating (max from all components) =	94.2%

Notes:
1) See additional documentation in “Appendix C – Additional Calculations” for calculations supporting the % capacity consumed.
2) Rating per TIA-222-H Section 15.5

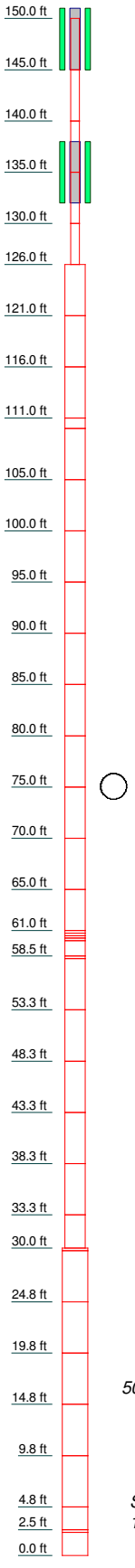
4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the proposed load configuration once the proposed modifications are installed.

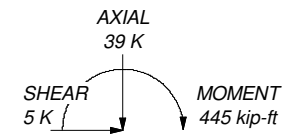
APPENDIX A

TNXTOWER OUTPUT

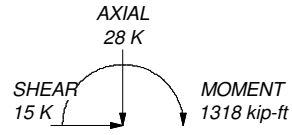
Section	Size	Length (ft)	Grade	Weight (K)
1	P30x0.675xP24x0.465	5.00	A500-42	0.3
2	P30x0.675xP24x0.465	5.00		0.3
3	P30x0.675xP24x0.465	5.00		0.3
4	P30x0.675xP24x0.465	5.00		0.3
5	P30x0.675xP24x0.375	4.00		0.2
6	P30x0.675xP24x0.375	5.00	A53-B-42	0.5
7	P30x0.675xP24x0.375	5.00		0.5
8	P30x0.675xP24x0.375	5.00		0.5
9	P30x0.675xP24x0.375	1.00		0.1
10	P30x0.675xP24x0.375	5.00		0.5
11	P30x0.675xP24x0.375	5.00		0.5
12	P30x0.675xP24x0.375	5.00		0.5
13	P30x0.675xP24x0.375	5.00		0.5
14	P30x0.675xP24x0.375	5.00		0.5
15	P30x0.675xP24x0.375	5.00		0.5
16	P30x0.675xP24x0.375	5.00		0.5
17	P30x0.675xP24x0.375	5.00		0.5
18	P30x0.675xP24x0.375	5.00		0.5
19	P30x0.675xP24x0.375	5.00		0.4
20	P30x0.675xP24x0.375	5.00		0.4
21	P30x0.675xP24x0.375	5.00		0.4
22	P30x0.675xP24x0.375	5.00		0.4
23	P30x0.675xP24x0.375	5.00		0.4
24	P30x0.675xP24x0.375	5.00		0.4
25	P30x0.675xP24x0.375	5.00		0.4
26	P30x0.675xP24x0.375	5.00		0.8
27	P30x0.675xP24x0.675	5.00		0.8
28	P30x0.675xP24x0.675	5.00		0.8
29	P30x0.675xP24x0.675	5.00		0.8
30	P30x0.675xP24x0.675	5.00		0.8
31	P30x0.675xP24x0.675	3.25		0.5
32	P30x0.675xP24x0.675	1.75		0.3
33	P30x0.675xP24x0.675	5.00		0.9
34	P30x0.675xP24x0.675	5.00		0.9
35	P30x0.675xP24x0.675	5.00		0.9
36	P30x0.675xP24x0.675	5.00		0.9
37	P30x0.675xP24x0.675	5.00		0.9
38	P30x0.675xP24x0.675	2.50		0.4
39	P30x0.675xP24x0.675	2.50		0.4
40	P30x0.675xP24x0.675	2.50		0.4
				17.80 K



ALL REACTIONS ARE FACTORED



TORQUE 1 kip-ft
50 mph WIND - 1.500 in ICE



TORQUE 1 kip-ft
REACTIONS - 140 mph WIND

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A500-42	42 ksi	58 ksi	A53-B-42	42 ksi	63 ksi

TOWER DESIGN NOTES

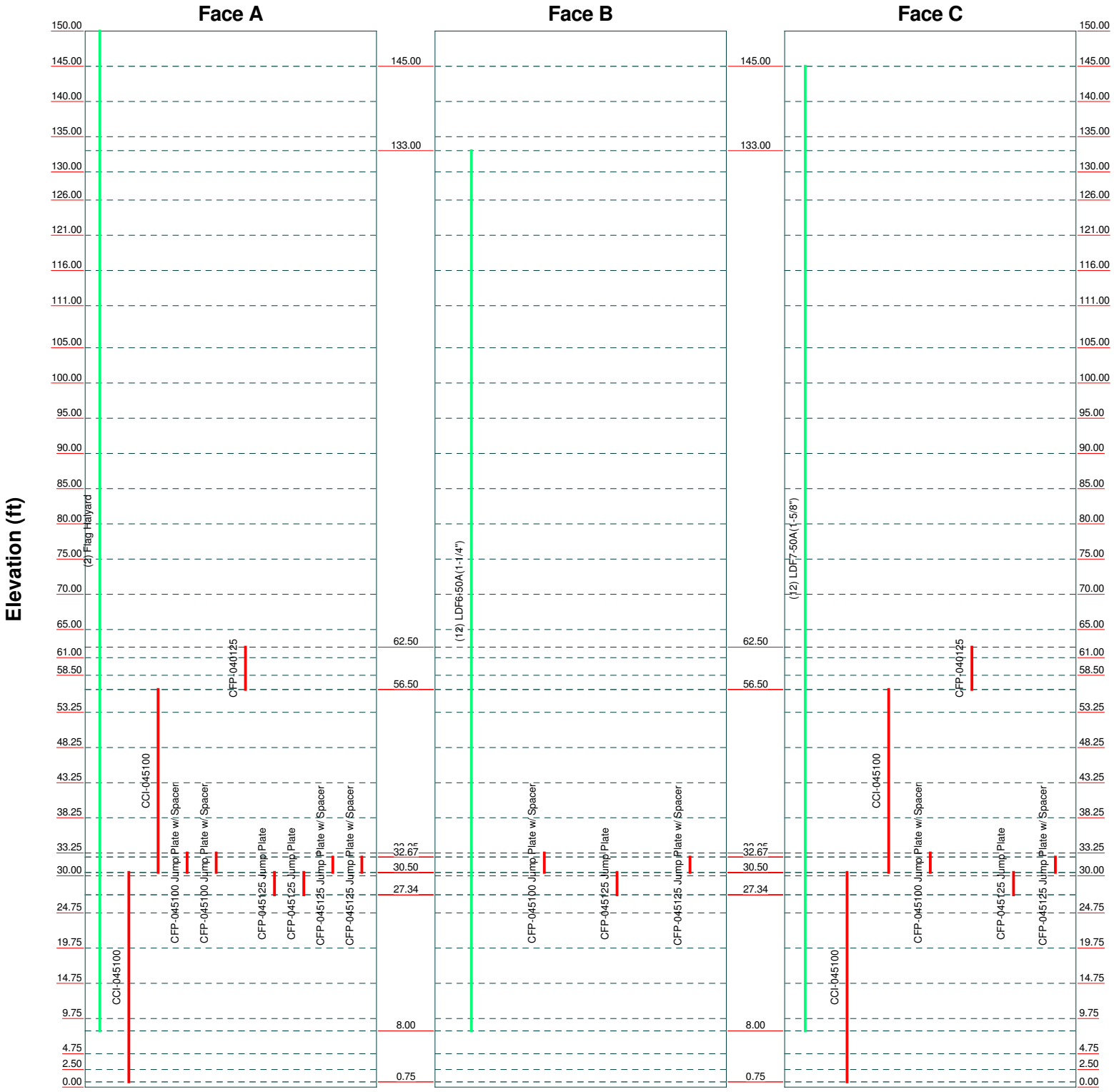
1. Tower is located in New London County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 140 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 89.4%

GPD
520 South Main Street Suite 2531
Akron, Ohio 44311
Phone: (330) 572-2100
FAX: (330) 572-2101

Job: **Stonington (BU #: 828257)**			
Project: **2021777.828257.06**			
Client: Crown Castle	Drawn by: bkelly	App'd:	
Code: TIA-222-H	Date: 08/23/21	Scale: NTS	
Path: T:\Crown\828257.06 MODS\5_Structural\02_Modification\00_Rev 0.01_Calcs\2 CCI Pole\828257 modified.eri		Dwg No. E-1	

Feed Line Distribution Chart
0' - 150'

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



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Code: TIA-222-H	Date: 08/23/21	Scale: NTS	
Path: T:\Crown\828257.06 MODS\5_Structural\02_Modification\00_Rev 0.01_Calcs\2 CCI Pole\828257 modified.eri		Dwg No. E-7	

Tower Input Data

The tower is a monopole.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

Tower is located in New London County, Connecticut.
Tower base elevation above sea level: 7.00 ft.
Basic wind speed of 140 mph.
Risk Category II.
Exposure Category C.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0.00 ft.
Nominal ice thickness of 1.500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Tower analysis based on target reliabilities in accordance with Annex S.
Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
Maximum demand-capacity ratio is: 1.05.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Horizontals		Assume Legs Pinned		Calculate Redundant Bracing Forces
	Consider Moments - Diagonals	√	Assume Rigid Index Plate		Ignore Redundant Members in FEA
	Use Moment Magnification	√	Use Clear Spans For Wind Area		SR Leg Bolts Resist Compression
√	Use Code Stress Ratios		Use Clear Spans For KL/r		All Leg Panels Have Same Allowable
√	Use Code Safety Factors - Guys		Retension Guys To Initial Tension		Offset Girt At Foundation
	Escalate Ice	√	Bypass Mast Stability Checks	√	Consider Feed Line Torque
	Always Use Max Kz	√	Use Azimuth Dish Coefficients		Include Angle Block Shear Check
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Use TIA-222-H Bracing Resist. Exemption
	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Use TIA-222-H Tension Splice Exemption
	Leg Bolts Are At Top Of Section		Add IBC .6D+W Combination		Poles
	Secondary Horizontal Braces Leg		Sort Capacity Reports By Component	√	Include Shear-Torsion Interaction
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Always Use Sub-Critical Flow
	SR Members Have Cut Ends		Treat Feed Line Bundles As Cylinder		Use Top Mounted Sockets
	SR Members Are Concentric		Ignore KL/ry For 60 Deg. Angle Legs		Pole Without Linear Attachments
				√	Pole With Shroud Or No Appurtenances
					Outside and Inside Corner Radii Are Known

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
***										
CCI-045100	A	No	Surface Af (CaAa)	30.50 - 0.75	1	1	0.500 0.500	4.500	11.000	0.000
CCI-045100	C	No	Surface Af (CaAa)	30.50 - 0.75	1	1	0.000 0.000	4.500	11.000	0.000
***										
CCI-045100	A	No	Surface Af (CaAa)	56.50 - 30.50	1	1	0.500 0.500	4.500	11.000	0.000
CCI-045100	C	No	Surface Af (CaAa)	56.50 - 30.50	1	1	0.000 0.000	4.500	11.000	0.000
***										
CFP-045100 Jump Plate w/ Spacer	A	No	Surface Af (CaAa)	33.25 - 30.50	1	1	-0.250 -0.250	0.000	0.000	57.422
CFP-045100 Jump Plate w/ Spacer	A	No	Surface Af (CaAa)	33.25 - 30.50	1	1	0.500 0.500	4.500	15.500	57.422
CFP-045100 Jump Plate w/ Spacer	B	No	Surface Af (CaAa)	33.25 - 30.50	1	1	0.250 0.250	0.000	0.000	57.422
CFP-045100 Jump Plate w/ Spacer	C	No	Surface Af (CaAa)	33.25 - 30.50	1	1	0.000 0.000	4.500	15.500	57.422
***										
CFP-040125	A	No	Surface Af (CaAa)	62.50 - 56.50	1	1	0.500 0.500	4.000	10.500	0.000
CFP-040125	C	No	Surface Af (CaAa)	62.50 - 56.50	1	1	0.000 0.000	4.000	10.500	0.000
***										
CFP-045125 Jump Plate	A	No	Surface Af (CaAa)	30.50 - 27.34	1	1	-0.250 -0.250	0.000	0.000	17.014
CFP-045125 Jump Plate	A	No	Surface Af (CaAa)	30.50 - 27.34	1	1	0.500 0.500	4.000	10.500	17.014
CFP-045125 Jump Plate	B	No	Surface Af (CaAa)	30.50 - 27.34	1	1	0.250 0.250	0.000	0.000	17.014
CFP-045125 Jump Plate	C	No	Surface Af (CaAa)	30.50 - 27.34	1	1	0.000 0.000	4.000	10.500	17.014
*										
CFP-045125 Jump Plate w/ Spacer	A	No	Surface Af (CaAa)	32.67 - 30.50	1	1	-0.250 -0.250	0.000	0.000	72.309
CFP-045125 Jump Plate w/ Spacer	A	No	Surface Af (CaAa)	32.67 - 30.50	1	1	0.500 0.500	4.000	17.000	72.309
CFP-045125 Jump Plate w/ Spacer	B	No	Surface Af (CaAa)	32.67 - 30.50	1	1	0.250 0.250	0.000	0.000	72.309
CFP-045125 Jump Plate w/ Spacer	C	No	Surface Af (CaAa)	32.67 - 30.50	1	1	0.000 0.000	4.000	17.000	72.309
***										

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
Flag Halyard	A	No	No	CaAa (Out Of Face)	150.00 - 8.00	2	No Ice	0.04	0.110
							1/2" Ice	0.14	0.375
							1" Ice	0.24	0.640
							2" Ice	0.44	1.170
***									
LDF7-50A(1-5/8")	C	No	No	Inside Pole	145.00 - 8.00	12	No Ice	0.00	0.820
							1/2" Ice	0.00	0.820
							1" Ice	0.00	0.820
							2" Ice	0.00	0.820
***									
LDF6-50A(1-1/4")	B	No	No	Inside Pole	133.00 - 8.00	12	No Ice	0.00	0.660
							1/2" Ice	0.00	0.660
							1" Ice	0.00	0.660
							2" Ice	0.00	0.660
***									

User Defined Loads

Description	Elevation ft	Offset From Centroid ft	Azimuth Angle °		Weight K	F_x K	F_z K	Wind Force K	C_AA_C ft^2
Flag (12'x20')	150.00	0.000	0.000	No Ice	0.03	0.00	0.00	0.67	**9.24**
				Ice	0.69	0.00	0.00	0.09	**9.55**
				Service	0.03	0.00	0.00	0.12	**10.33**

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
*									
D2WC-21 w/ Mount Pipe	A	From Leg	1.00 0.000 3.000	0.000	145.00	No Ice	0.00	0.00	0.06
						1/2" Ice	0.00	0.00	0.11
						1" Ice	0.00	0.00	0.17
						2" Ice	0.00	0.00	0.30
D2WC-21 w/ Mount Pipe	B	From Leg	1.00 0.000 3.000	0.000	145.00	No Ice	0.00	0.00	0.06
						1/2" Ice	0.00	0.00	0.11
						1" Ice	0.00	0.00	0.17
						2" Ice	0.00	0.00	0.30
D2WC-21 w/ Mount Pipe	C	From Leg	1.00 0.000 3.000	0.000	145.00	No Ice	0.00	0.00	0.06
						1/2" Ice	0.00	0.00	0.11
						1" Ice	0.00	0.00	0.17
						2" Ice	0.00	0.00	0.30
KRC 115 032/4	A	From Leg	1.00 0.000 -1.000	0.000	145.00	No Ice	0.00	0.00	0.00
						1/2" Ice	0.00	0.00	0.00
						1" Ice	0.00	0.00	0.01
						2" Ice	0.00	0.00	0.01
KRC 115 032/4	B	From Leg	1.00	0.000	145.00	No Ice	0.00	0.00	0.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.000			1/2" Ice	0.00	0.00	0.00
			-1.000			1" Ice	0.00	0.00	0.01
						2" Ice	0.00	0.00	0.01
KRC 115 032/4	C	From Leg	1.00	0.000	145.00	No Ice	0.00	0.00	0.00
			0.000			1/2" Ice	0.00	0.00	0.00
			-1.000			1" Ice	0.00	0.00	0.01
						2" Ice	0.00	0.00	0.01
CBC426T-DS-43	A	From Leg	1.00	0.000	145.00	No Ice	0.00	0.00	0.01
			0.000			1/2" Ice	0.00	0.00	0.01
			0.000			1" Ice	0.00	0.00	0.01
						2" Ice	0.00	0.00	0.02
CBC426T-DS-43	B	From Leg	1.00	0.000	145.00	No Ice	0.00	0.00	0.01
			0.000			1/2" Ice	0.00	0.00	0.01
			0.000			1" Ice	0.00	0.00	0.01
						2" Ice	0.00	0.00	0.02
CBC426T-DS-43	C	From Leg	1.00	0.000	145.00	No Ice	0.00	0.00	0.01
			0.000			1/2" Ice	0.00	0.00	0.01
			0.000			1" Ice	0.00	0.00	0.01
						2" Ice	0.00	0.00	0.02
***									
OPA-65R-LCUU-H6	A	From Leg	1.00	0.000	133.00	No Ice	0.00	0.00	0.07
			0.000			1/2" Ice	0.00	0.00	0.13
			2.000			1" Ice	0.00	0.00	0.20
						2" Ice	0.00	0.00	0.36
OPA-65R-LCUU-H6	B	From Leg	1.00	0.000	133.00	No Ice	0.00	0.00	0.07
			0.000			1/2" Ice	0.00	0.00	0.13
			2.000			1" Ice	0.00	0.00	0.20
						2" Ice	0.00	0.00	0.36
OPA-65R-LCUU-H6	C	From Leg	1.00	0.000	133.00	No Ice	0.00	0.00	0.07
			0.000			1/2" Ice	0.00	0.00	0.13
			2.000			1" Ice	0.00	0.00	0.20
						2" Ice	0.00	0.00	0.36
(2) TMABPDB7823VG12A	A	From Leg	1.00	0.000	133.00	No Ice	0.00	0.00	0.02
			0.000			1/2" Ice	0.00	0.00	0.03
			-4.000			1" Ice	0.00	0.00	0.04
						2" Ice	0.00	0.00	0.06
(2) TMABPDB7823VG12A	B	From Leg	1.00	0.000	133.00	No Ice	0.00	0.00	0.02
			0.000			1/2" Ice	0.00	0.00	0.03
			-4.000			1" Ice	0.00	0.00	0.04
						2" Ice	0.00	0.00	0.06
(2) TMABPDB7823VG12A	C	From Leg	1.00	0.000	133.00	No Ice	0.00	0.00	0.02
			0.000			1/2" Ice	0.00	0.00	0.03
			-4.000			1" Ice	0.00	0.00	0.04
						2" Ice	0.00	0.00	0.06
***									
828257 Bridge Stiffeners	A	From Leg	0.25	0.000	30.00	No Ice	0.35	1.34	0.07
			0.000			1/2" Ice	0.00	0.00	0.09
			0.000			1" Ice	0.00	0.00	0.11
						2" Ice	0.00	0.00	0.15
828257 Bridge Stiffeners	A	From Face	0.25	0.000	30.00	No Ice	0.35	1.34	0.07
			0.000			1/2" Ice	0.00	0.00	0.09
			0.000			1" Ice	0.00	0.00	0.11
						2" Ice	0.00	0.00	0.15
828257 Bridge Stiffeners	B	From Leg	0.25	0.000	30.00	No Ice	0.35	1.34	0.07
			0.000			1/2" Ice	0.00	0.00	0.09
			0.000			1" Ice	0.00	0.00	0.11
						2" Ice	0.00	0.00	0.15

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
828257 Bridge Stiffeners	B	From Face	0.25 0.000 0.000	0.000	30.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.35 0.00 0.00 0.00	1.34 0.00 0.00 0.00	0.07 0.09 0.11 0.15
828257 Bridge Stiffeners	C	From Leg	0.25 0.000 0.000	0.000	30.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.35 0.00 0.00 0.00	1.34 0.00 0.00 0.00	0.07 0.09 0.11 0.15
828257 Bridge Stiffeners	C	From Face	0.25 0.000 0.000	0.000	30.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.35 0.00 0.00 0.00	1.34 0.00 0.00 0.00	0.07 0.09 0.11 0.15
***									
Truck Ball	C	None		0.000	150.75	No Ice 1/2" Ice 1" Ice 2" Ice	0.88 1.38 1.53 1.85	0.88 1.38 1.53 1.85	0.05 0.07 0.09 0.13
Canister Load1	C	None		0.000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.10 20.35 20.90 22.00	8.10 20.35 20.90 22.00	0.11 0.25 0.38 0.67
Canister Load2	C	None		0.000	138.00	No Ice 1/2" Ice 1" Ice 2" Ice	16.20 40.70 41.80 44.00	16.20 40.70 41.80 44.00	0.33 0.60 0.87 1.45
Canister Load3	C	None		0.000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.10 20.35 20.90 22.00	8.10 20.35 20.90 22.00	0.30 0.43 0.57 0.86
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Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 145	21.302	50	1.180	0.001
L2	145 - 140	20.067	50	1.176	0.001
L3	140 - 135	18.843	50	1.161	0.001
L4	135 - 130	17.641	50	1.133	0.001
L5	130 - 126	16.478	50	1.085	0.001
L6	126 - 121	15.591	50	1.030	0.001
L7	121 - 116	14.517	50	1.021	0.001
L8	116 - 111	13.454	50	1.008	0.001
L9	111 - 110	12.407	50	0.992	0.001
L10	110 - 105	12.200	50	0.988	0.001
L11	105 - 100	11.175	50	0.968	0.001
L12	100 - 95	10.174	50	0.943	0.001
L13	95 - 90	9.201	50	0.914	0.001
L14	90 - 85	8.260	50	0.881	0.001
L15	85 - 80	7.358	50	0.843	0.001
L16	80 - 75	6.498	50	0.799	0.001
L17	75 - 70	5.686	50	0.750	0.001
L18	70 - 65	4.929	50	0.696	0.001
L19	65 - 61	4.231	50	0.635	0.000

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L20	61 - 60.75	3.721	50	0.582	0.000
L21	60.75 - 60.5	3.691	50	0.581	0.000
L22	60.5 - 60.25	3.660	50	0.579	0.000
L23	60.25 - 60	3.630	50	0.577	0.000
L24	60 - 58.5	3.600	50	0.575	0.000
L25	58.5 - 58.25	3.421	50	0.564	0.000
L26	58.25 - 53.25	3.391	50	0.562	0.000
L27	53.25 - 48.25	2.825	50	0.519	0.000
L28	48.25 - 43.25	2.307	50	0.471	0.000
L29	43.25 - 38.25	1.840	50	0.420	0.000
L30	38.25 - 33.25	1.428	50	0.365	0.000
L31	33.25 - 30	1.076	50	0.306	0.000
L32	30 - 29.75	0.882	50	0.265	0.000
L33	29.75 - 24.75	0.868	50	0.263	0.000
L34	24.75 - 19.75	0.612	50	0.226	0.000
L35	19.75 - 14.75	0.397	50	0.185	0.000
L36	14.75 - 9.75	0.225	50	0.142	0.000
L37	9.75 - 4.75	0.100	50	0.097	0.000
L38	4.75 - 2.5	0.024	50	0.048	0.000
L39	2.5 - 2.25	0.007	50	0.025	0.000
L40	2.25 - 0	0.005	50	0.023	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.75	Truck Ball	50	21.302	1.180	0.001	30364
150.00	Canister Load1	50	21.302	1.180	0.001	30364
145.00	D2WC-21 w/ Mount Pipe	50	20.067	1.176	0.001	30364
138.00	Canister Load2	50	18.359	1.151	0.001	10918
133.00	OPA-65R-LCUU-H6	50	17.169	1.118	0.001	5975
126.00	Canister Load3	50	15.591	1.030	0.001	7324
30.00	828257 Bridge Stiffeners	50	0.882	0.265	0.000	5740

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 145	125.014	2	6.894	0.007
L2	145 - 140	117.821	2	6.868	0.007
L3	140 - 135	110.684	2	6.785	0.007
L4	135 - 130	103.669	2	6.627	0.007
L5	130 - 126	96.877	2	6.354	0.006
L6	126 - 121	91.689	2	6.042	0.006
L7	121 - 116	85.400	2	5.989	0.006
L8	116 - 111	79.176	2	5.917	0.006
L9	111 - 110	73.037	2	5.825	0.005
L10	110 - 105	71.822	2	5.804	0.005
L11	105 - 100	65.814	2	5.686	0.005
L12	100 - 95	59.941	2	5.545	0.005
L13	95 - 90	54.228	2	5.378	0.005
L14	90 - 85	48.704	2	5.183	0.005
L15	85 - 80	43.398	2	4.960	0.004
L16	80 - 75	38.340	2	4.707	0.004

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L17	75 - 70	33.564	2	4.421	0.004
L18	70 - 65	29.103	2	4.102	0.003
L19	65 - 61	24.994	2	3.748	0.003
L20	61 - 60.75	21.984	2	3.438	0.003
L21	60.75 - 60.5	21.805	2	3.427	0.003
L22	60.5 - 60.25	21.626	2	3.416	0.003
L23	60.25 - 60	21.447	2	3.405	0.003
L24	60 - 58.5	21.269	2	3.395	0.003
L25	58.5 - 58.25	20.214	2	3.329	0.003
L26	58.25 - 53.25	20.040	2	3.317	0.003
L27	53.25 - 48.25	16.700	24	3.063	0.002
L28	48.25 - 43.25	13.638	24	2.785	0.002
L29	43.25 - 38.25	10.879	24	2.484	0.002
L30	38.25 - 33.25	8.448	24	2.159	0.002
L31	33.25 - 30	6.369	24	1.808	0.001
L32	30 - 29.75	5.220	24	1.567	0.001
L33	29.75 - 24.75	5.138	24	1.556	0.001
L34	24.75 - 19.75	3.623	24	1.335	0.001
L35	19.75 - 14.75	2.349	24	1.097	0.001
L36	14.75 - 9.75	1.332	24	0.843	0.001
L37	9.75 - 4.75	0.590	24	0.572	0.000
L38	4.75 - 2.5	0.141	24	0.284	0.000
L39	2.5 - 2.25	0.039	24	0.149	0.000
L40	2.25 - 0	0.032	24	0.134	0.000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.75	Truck Ball	2	125.014	6.894	0.007	5503
150.00	Canister Load1	2	125.014	6.894	0.007	5503
145.00	D2WC-21 w/ Mount Pipe	2	117.821	6.868	0.007	5503
138.00	Canister Load2	2	107.859	6.731	0.007	1984
133.00	OPA-65R-LCUU-H6	2	100.916	6.541	0.006	1079
126.00	Canister Load3	2	91.689	6.042	0.006	1317
30.00	828257 Bridge Stiffeners	24	5.220	1.567	0.001	973

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K
L1	150 - 145 (1)	P10.75x0.465	5.00	0.00	0.0	15.025	-0.35
L2	145 - 140 (2)	P10.75x0.465	5.00	0.00	0.0	15.025	-0.93
L3	140 - 135 (3)	P10.75x0.465	5.00	0.00	0.0	15.025	-1.54
L4	135 - 130 (4)	P10.75x0.465	5.00	0.00	0.0	15.025	-2.32
L5	130 - 126 (5)	P10.75x0.465	4.00	0.00	0.0	15.025	-2.65
L6	126 - 121 (6)	P24x0.375	5.00	0.00	0.0	27.833	-3.58
L7	121 - 116 (7)	P24x0.375	5.00	0.00	0.0	27.833	-4.21
L8	116 - 111 (8)	P24x0.375	5.00	0.00	0.0	27.833	-4.85
L9	111 - 110 (9)	P24x0.375	1.00	0.00	0.0	27.833	-4.98
L10	110 - 105 (10)	P24x0.375	5.00	0.00	0.0	27.833	-5.62

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u
	ft		ft	ft		in^2	K
L11	105 - 100 (11)	P24x0.375	5.00	0.00	0.0	27.833	-6.27
L12	100 - 95 (12)	P24x0.375	5.00	0.00	0.0	27.833	-6.92
L13	95 - 90 (13)	P24x0.375	5.00	0.00	0.0	27.833	-7.58
L14	90 - 85 (14)	P24x0.375	5.00	0.00	0.0	27.833	-8.25
L15	85 - 80 (15)	P24x0.375	5.00	0.00	0.0	27.833	-8.93
L16	80 - 75 (16)	P24x0.375	5.00	0.00	0.0	27.833	-9.61
L17	75 - 70 (17)	P24x0.375	5.00	0.00	0.0	27.833	-10.31
L18	70 - 65 (18)	P24x0.375	5.00	0.00	0.0	27.833	-11.02
L19	65 - 61 (19)	P24x0.375	4.00	0.00	0.0	27.833	-11.59
L20	61 - 60.75 (20)	P24x0.7125	0.25	0.00	0.0	52.126	-11.65
L21	60.75 - 60.5 (21)	P24x0.7125	0.25	0.00	0.0	52.126	-11.71
L22	60.5 - 60.25 (22)	P24x0.75	0.25	0.00	0.0	54.782	-11.77
L23	60.25 - 60 (23)	P24x0.75	0.25	0.00	0.0	54.782	-11.83
L24	60 - 58.5 (24)	P24x0.75	1.50	0.00	0.0	54.782	-12.21
L25	58.5 - 58.25 (25)	P24x0.675	0.25	0.00	0.0	49.462	-12.27
L26	58.25 - 53.25 (26)	P24x0.675	5.00	0.00	0.0	49.462	-13.34
L27	53.25 - 48.25 (27)	P24x0.675	5.00	0.00	0.0	49.462	-14.41
L28	48.25 - 43.25 (28)	P24x0.675	5.00	0.00	0.0	49.462	-15.50
L29	43.25 - 38.25 (29)	P24x0.675	5.00	0.00	0.0	49.462	-16.59
L30	38.25 - 33.25 (30)	P24x0.675	5.00	0.00	0.0	49.462	-17.70
L31	33.25 - 30 (31)	P24x0.675	3.25	0.00	0.0	49.462	-19.95
L32	30 - 29.75 (32)	P30x0.6	0.25	0.00	0.0	55.418	-20.54
L33	29.75 - 24.75 (33)	P30x0.6	5.00	0.00	0.0	55.418	-21.96
L34	24.75 - 19.75 (34)	P30x0.6	5.00	0.00	0.0	55.418	-23.19
L35	19.75 - 14.75 (35)	P30x0.6	5.00	0.00	0.0	55.418	-24.44
L36	14.75 - 9.75 (36)	P30x0.6	5.00	0.00	0.0	55.418	-25.69
L37	9.75 - 4.75 (37)	P30x0.6	5.00	0.00	0.0	55.418	-26.87
L38	4.75 - 2.5 (38)	P30x0.6	2.25	0.00	0.0	55.418	-27.39
L39	2.5 - 2.25 (39)	P30x0.625	0.25	0.00	0.0	57.678	-27.47
L40	2.25 - 0 (40)	P30x0.625	2.25	0.00	0.0	57.678	-28.05

Pole Bending Design Data

Section No.	Elevation	Size	M_{ux}	M_{uy}
	ft		kip-ft	kip-ft
L1	150 - 145 (1)	P10.75x0.465	7.36	0.00
L2	145 - 140 (2)	P10.75x0.465	16.11	0.00
L3	140 - 135 (3)	P10.75x0.465	29.72	0.00
L4	135 - 130 (4)	P10.75x0.465	47.10	0.00
L5	130 - 126 (5)	P10.75x0.465	61.97	0.00
L6	126 - 121 (6)	P24x0.375	85.29	0.00
L7	121 - 116 (7)	P24x0.375	111.13	0.00
L8	116 - 111 (8)	P24x0.375	139.46	0.00
L9	111 - 110 (9)	P24x0.375	145.43	0.00
L10	110 - 105 (10)	P24x0.375	176.69	0.00
L11	105 - 100 (11)	P24x0.375	210.36	0.00
L12	100 - 95 (12)	P24x0.375	246.37	0.00
L13	95 - 90 (13)	P24x0.375	284.67	0.00
L14	90 - 85 (14)	P24x0.375	325.19	0.00
L15	85 - 80 (15)	P24x0.375	367.88	0.00
L16	80 - 75 (16)	P24x0.375	412.64	0.00
L17	75 - 70 (17)	P24x0.375	459.39	0.00
L18	70 - 65 (18)	P24x0.375	508.03	0.00
L19	65 - 61 (19)	P24x0.375	548.25	0.00
L20	61 - 60.75 (20)	P24x0.7125	550.80	0.00
L21	60.75 - 60.5 (21)	P24x0.7125	553.35	0.00
L22	60.5 - 60.25 (22)	P24x0.75	555.91	0.00

Section No.	Elevation	Size	M_{ux}	M_{uy}
	ft		kip-ft	kip-ft
L23	60.25 - 60 (23)	P24x0.75	558.48	0.00
L24	60 - 58.5 (24)	P24x0.75	573.98	0.00
L25	58.5 - 58.25 (25)	P24x0.675	576.58	0.00
L26	58.25 - 53.25 (26)	P24x0.675	629.59	0.00
L27	53.25 - 48.25 (27)	P24x0.675	684.42	0.00
L28	48.25 - 43.25 (28)	P24x0.675	740.96	0.00
L29	43.25 - 38.25 (29)	P24x0.675	799.07	0.00
L30	38.25 - 33.25 (30)	P24x0.675	858.62	0.00
L31	33.25 - 30 (31)	P24x0.675	899.09	0.00
L32	30 - 29.75 (32)	P30x0.6	902.33	0.00
L33	29.75 - 24.75 (33)	P30x0.6	968.18	0.00
L34	24.75 - 19.75 (34)	P30x0.6	1035.73	0.00
L35	19.75 - 14.75 (35)	P30x0.6	1105.42	0.00
L36	14.75 - 9.75 (36)	P30x0.6	1176.40	0.00
L37	9.75 - 4.75 (37)	P30x0.6	1248.54	0.00
L38	4.75 - 2.5 (38)	P30x0.6	1281.34	0.00
L39	2.5 - 2.25 (39)	P30x0.625	1285.00	0.00
L40	2.25 - 0 (40)	P30x0.625	1318.02	0.00

Pole Shear Design Data

Section No.	Elevation	Size	Actual V_u	Actual T_u
	ft		K	kip-ft
L1	150 - 145 (1)	P10.75x0.465	1.59	0.01
L2	145 - 140 (2)	P10.75x0.465	1.88	0.01
L3	140 - 135 (3)	P10.75x0.465	3.32	0.02
L4	135 - 130 (4)	P10.75x0.465	3.62	0.02
L5	130 - 126 (5)	P10.75x0.465	3.81	0.03
L6	126 - 121 (6)	P24x0.375	4.92	0.04
L7	121 - 116 (7)	P24x0.375	5.42	0.05
L8	116 - 111 (8)	P24x0.375	5.91	0.07
L9	111 - 110 (9)	P24x0.375	6.01	0.07
L10	110 - 105 (10)	P24x0.375	6.50	0.08
L11	105 - 100 (11)	P24x0.375	6.97	0.09
L12	100 - 95 (12)	P24x0.375	7.44	0.11
L13	95 - 90 (13)	P24x0.375	7.89	0.12
L14	90 - 85 (14)	P24x0.375	8.33	0.13
L15	85 - 80 (15)	P24x0.375	8.75	0.14
L16	80 - 75 (16)	P24x0.375	9.16	0.15
L17	75 - 70 (17)	P24x0.375	9.55	0.17
L18	70 - 65 (18)	P24x0.375	9.92	0.18
L19	65 - 61 (19)	P24x0.375	10.20	0.19
L20	61 - 60.75 (20)	P24x0.7125	10.21	0.19
L21	60.75 - 60.5 (21)	P24x0.7125	10.23	0.19
L22	60.5 - 60.25 (22)	P24x0.75	10.25	0.19
L23	60.25 - 60 (23)	P24x0.75	10.27	0.19
L24	60 - 58.5 (24)	P24x0.75	10.40	0.19
L25	58.5 - 58.25 (25)	P24x0.675	10.42	0.19
L26	58.25 - 53.25 (26)	P24x0.675	10.79	0.20
L27	53.25 - 48.25 (27)	P24x0.675	11.15	0.43
L28	48.25 - 43.25 (28)	P24x0.675	11.48	0.45
L29	43.25 - 38.25 (29)	P24x0.675	11.78	0.47
L30	38.25 - 33.25 (30)	P24x0.675	12.05	0.49
L31	33.25 - 30 (31)	P24x0.675	12.76	0.50
L32	30 - 29.75 (32)	P30x0.6	12.99	0.50
L33	29.75 - 24.75 (33)	P30x0.6	13.35	0.52
L34	24.75 - 19.75 (34)	P30x0.6	13.81	0.27

Section No.	Elevation ft	Size	Actual V_u K	Actual T_u kip-ft
L35	19.75 - 14.75 (35)	P30x0.6	14.08	0.28
L36	14.75 - 9.75 (36)	P30x0.6	14.33	0.29
L37	9.75 - 4.75 (37)	P30x0.6	14.55	0.30
L38	4.75 - 2.5 (38)	P30x0.6	14.64	0.30
L39	2.5 - 2.25 (39)	P30x0.625	14.64	0.30
L40	2.25 - 0 (40)	P30x0.625	14.74	0.30

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	150 - 145	Pole	P10.75x0.465	Pole	-0.35	-	4.6	Pass
L2	145 - 140	Pole	P10.75x0.465	Pole	-0.93	-	10.1	Pass
L3	140 - 135	Pole	P10.75x0.465	Pole	-1.54	-	18.5	Pass
L4	135 - 130	Pole	P10.75x0.465	Pole	-2.32	-	29.4	Pass
L5	130 - 126	Pole	P10.75x0.465	Pole	-2.65	-	38.6	Pass
L6	126 - 121	Pole	P24x0.375	Pole	-3.58	-	13.4	Pass
L7	121 - 116	Pole	P24x0.375	Pole	-4.21	-	17.4	Pass
L8	116 - 111	Pole	P24x0.375	Pole	-4.85	-	21.8	Pass
L9	111 - 110	Pole	P24x0.375	Pole	-4.98	-	22.7	Pass
L10	110 - 105	Pole	P24x0.375	Pole	-5.62	-	27.5	Pass
L11	105 - 100	Pole	P24x0.375	Pole	-6.27	-	32.7	Pass
L12	100 - 95	Pole	P24x0.375	Pole	-6.92	-	38.3	Pass
L13	95 - 90	Pole	P24x0.375	Pole	-7.58	-	44.2	Pass
L14	90 - 85	Pole	P24x0.375	Pole	-8.25	-	50.5	Pass
L15	85 - 80	Pole	P24x0.375	Pole	-8.93	-	57.1	Pass
L16	80 - 75	Pole	P24x0.375	Pole	-9.61	-	64.0	Pass
L17	75 - 70	Pole	P24x0.375	Pole	-10.31	-	71.2	Pass
L18	70 - 65	Pole	P24x0.375	Pole	-11.02	-	78.7	Pass
L19	65 - 61	Pole	P24x0.375	Pole	-11.59	-	84.9	Pass
L20	61 - 60.75	Pole + Reinf.	P24x0.7125	Reinf.	-11.65	-	54.9	Pass
L21	60.75 - 60.5	Pole + Reinf.	P24x0.7125	Reinf.	-11.71	-	55.1	Pass
L22	60.5 - 60.25	Pole + Reinf.	P24x0.75	Reinf.	-11.77	-	52.4	Pass
L23	60.25 - 60	Pole + Reinf.	P24x0.75	Reinf.	-11.83	-	52.7	Pass
L24	60 - 58.5	Pole + Reinf.	P24x0.75	Reinf.	-12.21	-	54.1	Pass
L25	58.5 - 58.25	Pole + Reinf.	P24x0.675	Reinf.	-12.27	-	57.3	Pass
L26	58.25 - 53.25	Pole + Reinf.	P24x0.675	Reinf.	-13.34	-	62.6	Pass
L27	53.25 - 48.25	Pole + Reinf.	P24x0.675	Reinf.	-14.41	-	68.0	Pass
L28	48.25 - 43.25	Pole + Reinf.	P24x0.675	Reinf.	-15.50	-	73.6	Pass
L29	43.25 - 38.25	Pole + Reinf.	P24x0.675	Reinf.	-16.59	-	79.4	Pass
L30	38.25 - 33.25	Pole + Reinf.	P24x0.675	Reinf.	-17.70	-	85.3	Pass
L31	33.25 - 30	Pole + Reinf.	P24x0.675	Reinf.	-19.95	-	89.4	Pass
L32	30 - 29.75	Pole + Reinf.	P30x0.6	Reinf.	-20.54	-	62.5	Pass
L33	29.75 - 24.75	Pole + Reinf.	P30x0.6	Reinf.	-21.96	-	67.0	Pass
L34	24.75 - 19.75	Pole + Reinf.	P30x0.6	Reinf.	-23.19	-	71.7	Pass
L35	19.75 - 14.75	Pole + Reinf.	P30x0.6	Reinf.	-24.44	-	76.5	Pass
L36	14.75 - 9.75	Pole + Reinf.	P30x0.6	Reinf.	-25.69	-	81.4	Pass
L37	9.75 - 4.75	Pole + Reinf.	P30x0.6	Reinf.	-26.87	-	86.4	Pass
L38	4.75 - 2.5	Pole + Reinf.	P30x0.6	Reinf.	-27.39	-	88.7	Pass
L39	2.5 - 2.25	Pole + Reinf.	P30x0.625	Pole	-27.47	-	81.6	Pass
L40	2.25 - 0	Pole + Reinf.	P30x0.625	Pole	-28.05	-	83.7	Pass
						Summary	ELC:	Load Case 4.5
						Pole =	84.9	Pass
						Reinf. =	89.4	Pass
						Rating =	89.4	Pass

CCIpole

per TIA-222- H

Site BU: 828257

Work Order: 2002920

Pole Geometry

	Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
1	150	24		0	10.75	10.75	0.465		A500-42
2	126	16		0	24.00	24	0.375		A53-B-42
3	110	20		0	24.00	24	0.375		A53-B-42
4	90	30		0	24.00	24	0.375		A53-B-42
5	60	30		0	24.00	24	0.375		A53-B-42
6	30	30		0	30.00	30	0.375		A53-B-42

Reinforcement Configuration

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	0	2.5	plate	TS 6"x1.25"	4	59	122	237	302														
2	2.5	30	plate	CFP (#1) 4.5x1	4					44	137	222	317										
3	30	58.5	plate	CFP (#2) 4.5x1	4					44	137	222	317										
4	58.5	60.5	plate	CFP (#2) 4.5x1	2					44		222											
5																							
6	58.5	61	plate	CCI-SFP-040125	4									71	161	251	341						
7																							
8																							
9																							
10																							

Reinforcement Details

	B (in)	H (in)	Gross Area (in^2)	Pole Face to Centroid (in)	Bottom Termination Type	Bottom Termination Length (in)	Top Termination Type	Top Termination Length (in)	Lu (in)	Net Area (in2)	Bolt Hole Size (in)	Reinforcement Material
1	1.25	5.25	6.5625	3	Welded	n/a	None	n/a	0.000	6.563	0.0000	A572-65
2	4.5	1	4.5	0.5	NexGen2 - M20	18	NexGen2 - M20	30.000	20.000	3.250	1.1875	A572-65
3	4.5	1	4.5	0.5	NexGen2 - M20	30	NexGen2 - M20	18.000	20.000	3.250	1.1875	A572-65
4	4.5	1	4.5	0.5	NexGen2 - M20	30	NexGen2 - M20	18.000	20.000	3.250	1.1875	A572-65
6	4	1.25	5	0.625	PC 8.8 - M20 (100)	18	PC 8.8 - M20 (100)	18.000	27.000	3.438	1.1875	A572-65

Connection Details for Custom Reinforcements

Reinforcement	End	# Bolts	N or X	Bolt Spacing (in)	Edge Dist (in)	Weld Grade (ksi)	Transverse (Horiz.) Weld Type	Horiz. Weld Length (in)	Horiz. Groove Depth (in)	Horiz. Groove Angle (deg)	Horiz. Fillet Size (in)	Vertical Weld Length (in)	Vertical Fillet Size (in)	Rev H Connection Capacity (kip)
TS 6"x1.25"	Top					-	-	-	-	-	-	-	-	-
	Bottom	-	-	-	-	80	CJP Groove	5.25	0.625	45	0.625	54	0.375	-
CFP (#1) 4.5x1	Top	10	N	3	3	-	-	-	-	-	-	-	-	-
	Bottom	6	N	3	3	-	-	-	-	-	-	-	-	-
CFP (#2) 4.5x1	Top	6	N	3	3	-	-	-	-	-	-	-	-	-
	Bottom	10	N	3	3	-	-	-	-	-	-	-	-	-

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
150 - 145	Pole	TP10.75x10.75x0.465	Pole	4.6%	Pass
145 - 140	Pole	TP10.75x10.75x0.465	Pole	10.1%	Pass
140 - 135	Pole	TP10.75x10.75x0.465	Pole	18.5%	Pass
135 - 130	Pole	TP10.75x10.75x0.465	Pole	29.4%	Pass
130 - 126	Pole	TP10.75x10.75x0.465	Pole	38.6%	Pass
126 - 121	Pole	TP24x24x0.375	Pole	13.4%	Pass
121 - 116	Pole	TP24x24x0.375	Pole	17.4%	Pass
116 - 111	Pole	TP24x24x0.375	Pole	21.8%	Pass
111 - 110	Pole	TP24x24x0.375	Pole	22.7%	Pass
110 - 105	Pole	TP24x24x0.375	Pole	27.5%	Pass
105 - 100	Pole	TP24x24x0.375	Pole	32.7%	Pass
100 - 95	Pole	TP24x24x0.375	Pole	38.3%	Pass
95 - 90	Pole	TP24x24x0.375	Pole	44.2%	Pass
90 - 85	Pole	TP24x24x0.375	Pole	50.5%	Pass
85 - 80	Pole	TP24x24x0.375	Pole	57.1%	Pass
80 - 75	Pole	TP24x24x0.375	Pole	64.0%	Pass
75 - 70	Pole	TP24x24x0.375	Pole	71.2%	Pass
70 - 65	Pole	TP24x24x0.375	Pole	78.7%	Pass
65 - 61	Pole	TP24x24x0.375	Pole	84.9%	Pass
61 - 60.75	Pole + Reinf.	TP24x24x0.7125	Reinf. 6 Tension Rupture	54.9%	Pass
60.75 - 60.5	Pole + Reinf.	TP24x24x0.7125	Reinf. 6 Tension Rupture	55.1%	Pass
60.5 - 60.25	Pole + Reinf.	TP24x24x0.75	Reinf. 6 Tension Rupture	52.4%	Pass
60.25 - 60	Pole + Reinf.	TP24x24x0.75	Reinf. 6 Tension Rupture	52.7%	Pass
60 - 58.5	Pole + Reinf.	TP24x24x0.75	Reinf. 6 Tension Rupture	54.1%	Pass
58.5 - 58.25	Pole + Reinf.	TP24x24x0.675	Reinf. 3 Tension Rupture	57.3%	Pass
58.25 - 53.25	Pole + Reinf.	TP24x24x0.675	Reinf. 3 Tension Rupture	62.6%	Pass
53.25 - 48.25	Pole + Reinf.	TP24x24x0.675	Reinf. 3 Tension Rupture	68.0%	Pass
48.25 - 43.25	Pole + Reinf.	TP24x24x0.675	Reinf. 3 Tension Rupture	73.6%	Pass
43.25 - 38.25	Pole + Reinf.	TP24x24x0.675	Reinf. 3 Tension Rupture	79.4%	Pass
38.25 - 33.25	Pole + Reinf.	TP24x24x0.675	Reinf. 3 Tension Rupture	85.3%	Pass
33.25 - 30	Pole + Reinf.	TP24x24x0.675	Reinf. 3 Tension Rupture	89.4%	Pass
30 - 29.75	Pole + Reinf.	TP30x30x0.6	Reinf. 2 Tension Rupture	62.5%	Pass
29.75 - 24.75	Pole + Reinf.	TP30x30x0.6	Reinf. 2 Tension Rupture	67.0%	Pass
24.75 - 19.75	Pole + Reinf.	TP30x30x0.6	Reinf. 2 Tension Rupture	71.7%	Pass
19.75 - 14.75	Pole + Reinf.	TP30x30x0.6	Reinf. 2 Tension Rupture	76.5%	Pass
14.75 - 9.75	Pole + Reinf.	TP30x30x0.6	Reinf. 2 Tension Rupture	81.4%	Pass
9.75 - 4.75	Pole + Reinf.	TP30x30x0.6	Reinf. 2 Tension Rupture	86.4%	Pass
4.75 - 2.5	Pole + Reinf.	TP30x30x0.6	Reinf. 2 Tension Rupture	88.7%	Pass
2.5 - 2.25	Pole + Reinf.	TP30x30x0.625	Pole	81.6%	Pass
2.25 - 0	Pole + Reinf.	TP30x30x0.625	Pole	83.7%	Pass
				Summary	
			Pole	84.9%	Pass
			Reinforcement	89.4%	Pass
			Overall	89.4%	Pass

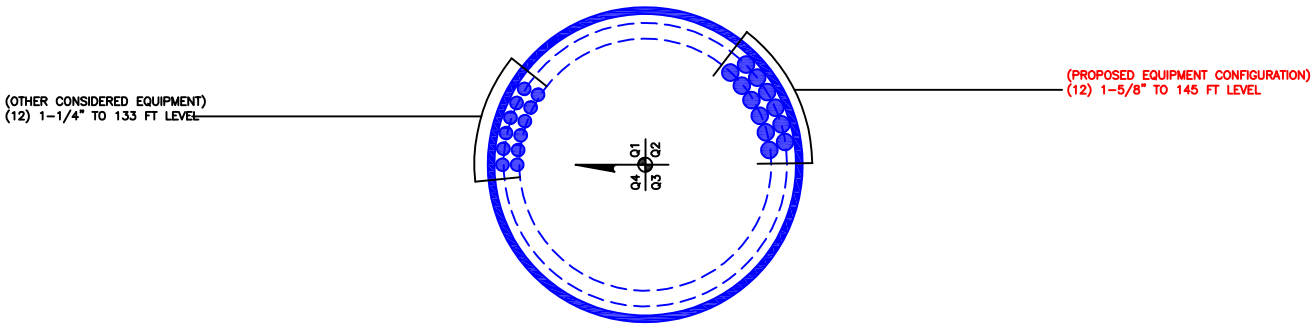
Additional Calculations

Section Elevation (ft)	Moment of Inertia (in^4)			Area (in^2)			% Capacity*					
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3	R4	R6
150 - 145	199	n/a	199	15.02	n/a	15.02	4.6%					
145 - 140	199	n/a	199	15.02	n/a	15.02	10.1%					
140 - 135	199	n/a	199	15.02	n/a	15.02	18.6%					
135 - 130	199	n/a	199	15.02	n/a	15.02	29.4%					
130 - 126	199	n/a	199	15.02	n/a	15.02	38.6%					
126 - 121	1942	n/a	1942	27.83	n/a	27.83	13.4%					
121 - 116	1942	n/a	1942	27.83	n/a	27.83	17.4%					
116 - 111	1942	n/a	1942	27.83	n/a	27.83	21.8%					
111 - 110	1942	n/a	1942	27.83	n/a	27.83	22.7%					
110 - 105	1942	n/a	1942	27.83	n/a	27.83	27.5%					
105 - 100	1942	n/a	1942	27.83	n/a	27.83	32.7%					
100 - 95	1942	n/a	1942	27.83	n/a	27.83	38.3%					
95 - 90	1942	n/a	1942	27.83	n/a	27.83	44.2%					
90 - 85	1942	n/a	1942	27.83	n/a	27.83	50.5%					
85 - 80	1942	n/a	1942	27.83	n/a	27.83	57.1%					
80 - 75	1942	n/a	1942	27.83	n/a	27.83	64.0%					
75 - 70	1942	n/a	1942	27.83	n/a	27.83	71.2%					
70 - 65	1942	n/a	1942	27.83	n/a	27.83	78.7%					
65 - 61	1942	n/a	1942	27.83	n/a	27.83	84.9%					
61 - 60.75	1942	1609	3551	27.83	20.00	47.83	46.6%					54.9%
60.75 - 60.5	1942	1609	3551	27.83	20.00	47.83	46.8%					55.1%
60.5 - 60.25	1942	1743	3685	27.83	29.00	56.83	45.4%				37.5%	52.4%
60.25 - 60	1942	1743	3685	27.83	29.00	56.83	45.6%				37.6%	52.7%
60 - 58.5	1942	1743	3685	27.83	29.00	56.83	46.8%				38.7%	54.1%
58.5 - 58.25	1942	1422	3365	27.83	18.00	45.83	51.7%			57.3%		
58.25 - 53.25	1942	1422	3365	27.83	18.00	45.83	56.4%			62.6%		
53.25 - 48.25	1942	1422	3365	27.83	18.00	45.83	61.3%			68.0%		
48.25 - 43.25	1942	1422	3365	27.83	18.00	45.83	66.4%			73.6%		
43.25 - 38.25	1942	1422	3365	27.83	18.00	45.83	71.6%			79.4%		
38.25 - 33.25	1942	1422	3365	27.83	18.00	45.83	76.9%			85.3%		
33.25 - 30	1942	1422	3365	27.83	18.00	45.83	80.6%			89.4%		
30 - 29.75	3830	2179	6008	34.90	18.00	52.90	58.9%		62.5%			
29.75 - 24.75	3830	2179	6008	34.90	18.00	52.90	63.2%		67.0%			
24.75 - 19.75	3830	2179	6008	34.90	18.00	52.90	67.6%		71.7%			
19.75 - 14.75	3830	2179	6008	34.90	18.00	52.90	72.1%		76.5%			
14.75 - 9.75	3830	2179	6008	34.90	18.00	52.90	76.8%		81.4%			
9.75 - 4.75	3830	2179	6008	34.90	18.00	52.90	81.4%		86.4%			
4.75 - 2.5	3830	2179	6008	34.90	18.00	52.90	83.6%		88.7%			
2.5 - 2.25	3830	2408	6238	34.90	26.25	61.15	81.6%	58.0%				
2.25 - 0	3830	2408	6238	34.90	26.25	61.15	83.7%	59.5%				

Note: Section capacity checked using 5 degree increments.
Rating per TIA-222-H Section 15.5.

APPENDIX B

BASE LEVEL DRAWING



CROWN REGION ADDRESS

USA

09/09/13	NEW BUILD PER WORK ORDER # 637905	KT
09/09/13	AS-BUILT INFORMATION ADDED PER WORK ORDER # 622253	KT
10/04/14	UPDATED PER WORK ORDER # 744080	JP
10/04/14	UPDATED PER WORK ORDER # 744652	JP
10/5/2015	UPDATED PER WORK ORDER 1082880 1044455	CRM
10/8/2015	UPDATED PER WORK ORDER 1107284	BMT
21/12/17	UPDATED PER WORK ORDER 1800704	EAB
21/05/21	UPDATED PER WORK ORDER 1977763	MJ

DRAWN BY: JP
CHECKED BY: KT
DRAWING DATE: 09/08/2013

SITE NUMBER:
SITE NAME:

SITE NAME

STONINGTON

BUSINESS UNIT NUMBER

828257

SITE ADDRESS

82 MECHANIC STREET
PAWCATUCK, CT 06379
NEW LONDON COUNTY
USA

SHEET TITLE

BASE LEVEL DRAWING

SHEET NUMBER

N.T.S.

A1-0

PLOT DATE: 10/17/2016

FILE NAME: 828257_BASELEVEL.dwg

APPENDIX C

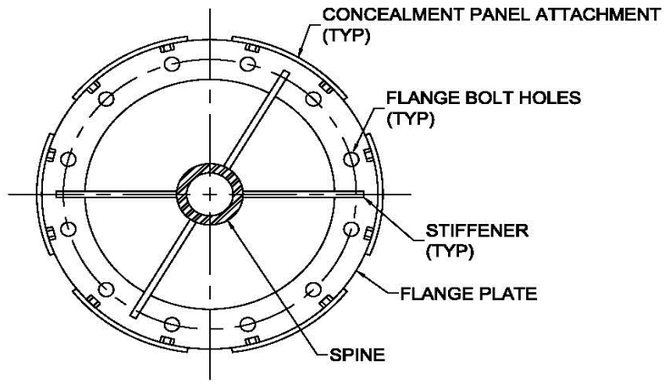
ADDITIONAL CALCULATIONS

CCI Flagpole Tool

Site Data	
BU#:	828257
Site Name:	STONINGTON
Order #:	479826 Rev. 9

Code		
Code:	TIA-222-H	
Ice Thickness:	1.275	in
Windspeed (V):	140	mph
Ice Wind Speed (V):	50	mph
Exposure Category:	C	
Topographic Feature:	N/A	
Risk Category:	II	

Tower Information		
Total Tower Height:	150	ft
Base Tower Height:	126	ft
Total Canister Length:	24	ft
Number of Canister Assembly Sections:	2	



FLANGE PLATE
(TYPE 1: SOLIDITY RATIO 0.45)

Canister Section Number *:	Canister Assembly Length (ft):	Canister Assembly Diameter (in):	Number of Sides Canister Section	Plate Type:	Mating Flange Plate Thickness (in)**:	Mating Flange Plate Diameter (in):	Solidity Ratio	Plate Weight (Kip):	Canister Weight (Kip)	Vent Length (ft):
1	12	36	Round	3	0.38	35.625	0.5	0.106	0.226	0-0
2	12	36	Round	1	1.63	24	0.45	0.188	0.226	0-0

* Sections are numbered from the top of the tower down

** Mating Flange Plate Thickness at the bottom of canister section

Flag on Tower:	Yes	
Flag Width:	20	ft
Flag Height:	12	ft
Flag Elevation(z):	150	ft

Truck Ball on Tower:	Yes	
Diameter of Ball:	18	in

Geometry : Base Tower + Spine

828257.eri *(last saved 08/19 8:31 am)*

Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material	Delete
150	24		0	10.75	10.75	0.465	n/a	A500-42	[x]
126	16		0	24	24	0.375	n/a	A53-B-42	[x]
110	20		0	24	24	0.375	n/a	A53-B-42	[x]
90	30		0	24	24	0.375	n/a	A53-B-42	[x]
60	30		0	24	24	0.375	n/a	A53-B-42	[x]
30	30		0	30	30	0.375	n/a	A53-B-42	[x]

				30				

Discrete Loads: Truck Ball	Apply C_aA_A at Elevation(z) (ft)	C_aA_A No Ice (ft^2)	C_aA_A 1/2" Ice (ft^2)	C_aA_A 1" Ice (ft^2)	C_aA_A 2" Ice (ft^2)	C_aA_A 4" Ice (ft^2)	Weight No Ice (Kip)	Weight 1/2" Ice (Kip)
	150.75	0.884	1.378	1.527	1.848	2.581	0.05	0.067

Discrete Loads : C_FA_F for Canister Assembly								
Canister Loading	Apply C_FA_F at Elevation(z) (ft)	C_FA_F No Ice (ft^2)	C_FA_F 1/2" Ice (ft^2)	C_FA_F 1" Ice (ft^2)	C_FA_F 2" Ice (ft^2)	C_FA_F 4" Ice (ft^2)	Canister Assembly Weight No Ice (Kip)	Canister Assembly Weight 1/2" Ice (Kip)
Canister Load 1	150	8.100	20.350	20.900	22.000	24.200	0.113	0.247
Canister Load 2	138	16.200	40.700	41.800	44.000	48.400	0.332	0.600
Canister Load 3	126	8.100	20.350	20.900	22.000	24.200	0.301	0.434

User Forces: Flag Force Calculation Per ANSI/NAAMM FP 1001-07	
$Wind_{FORCE}$=	0.668 Kip
Weight=	0.025 Kip
$Wind_{FORCE, ICE}$=	0.088 Kip
Weight $_{ICE}$=	0.690 Kip
$W_{FORCE, SERVICE WIND}$=	0.123 Kip
Weight=	0.025 Kip

←Flag force should be included at the top of the flag attachment elevation. If the attachment of the flag to the halyard distributes forces equally to the pole, apply flag forces accordingly in tnx file.

Deflection Check Required:	**Yes**	Import Deflection Results
3% Spine Deflection Check		
Allowable (3%) Horizontal Spine Deflection (inches)	Actual Deflection ***(inches)	Sufficient/ Insufficient
8.640	5.711	Sufficient

*** Relative deflection under service level wind speed

Monopole Flange Plate Connection

Elevation = 126 ft.

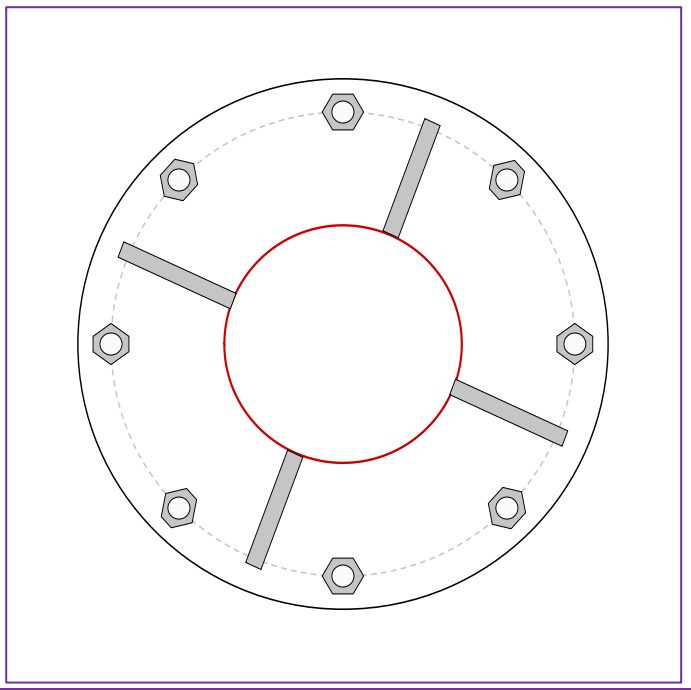
BU #	828257
Site Name	STONINGTON
Order #	479826 Rev. 9

TIA-222 Revision	H

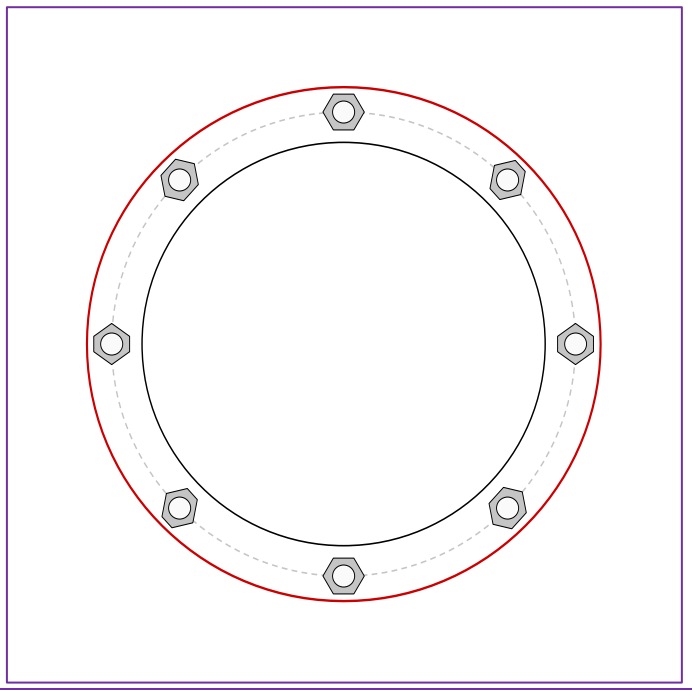
Applied Loads	
Moment (kip-ft)	61.97
Axial Force (kips)	2.65
Shear Force (kips)	3.81

**TIA-222-H Section 15.5 Applied*

Top Plate - External



Bottom Plate - Internal



Connection Properties

Bolt Data

(8) 1" ø bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 21" BC

Top Plate Data

24" OD x 2" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

18.25" ID x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

(4) 11"H x 5.5"W x 0.75"T, Notch: 0"
plate: Fy= 36 ksi ; weld: Fy= 80 ksi
horiz. weld: 0.375" fillet
vert. weld: 0.375" fillet

Bottom Stiffener Data

N/A

Top Pole Data

10.75" x 0.465" round pole (A500-42; Fy=42 ksi, Fu=58 ksi)

Bottom Pole Data

24" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	17.36	
Allowable (kips)	54.54	
Stress Rating:	**30.3%**	**Pass**

Top Plate Capacity

Max Stress (ksi):	-	
Allowable Stress (ksi):	-	
Stress Rating:	**N/A**	
Tension Side Stress Rating:	**N/A**	

Bottom Plate Capacity

Max Stress (ksi):	9.44	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**27.7%**	**Pass**
Tension Side Stress Rating:	**N/A**	

Top Stiffener Capacity

Horizontal Weld:	**N/A**
Vertical Weld:	**N/A**
Plate Flexure+Shear:	**N/A**
Plate Tension+Shear:	**N/A**
Plate Compression:	**N/A**

Bottom Stiffener Capacity

Horizontal Weld:	**N/A**
Vertical Weld:	**N/A**
Plate Flexure+Shear:	**N/A**
Plate Tension+Shear:	**N/A**
Plate Compression:	**N/A**

Top Pole Capacity

Punching Shear:	**N/A**

Bottom Pole Capacity

Punching Shear:	**N/A**

Monopole Flange Plate Connection

Elevation = 110 ft.

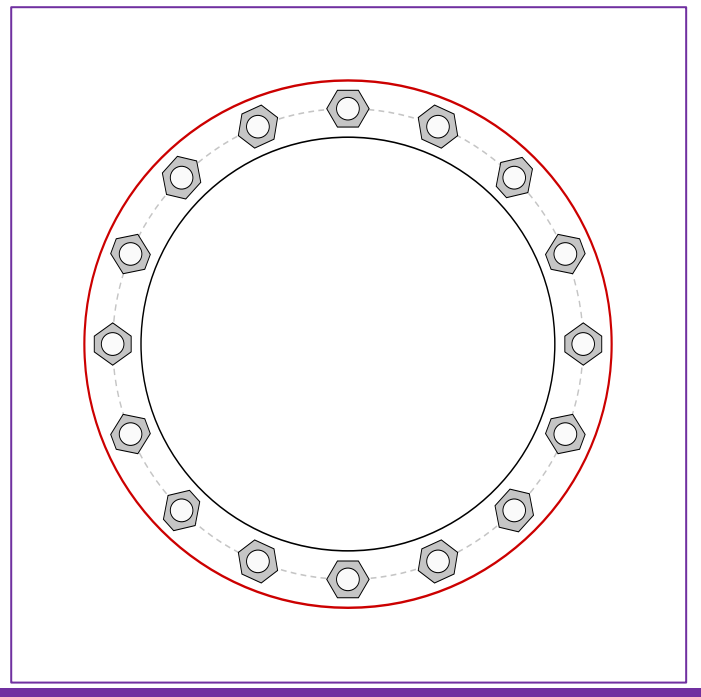
BU #	828257
Site Name	STONINGTON
Order #	479826 Rev. 9

TIA-222 Revision	H

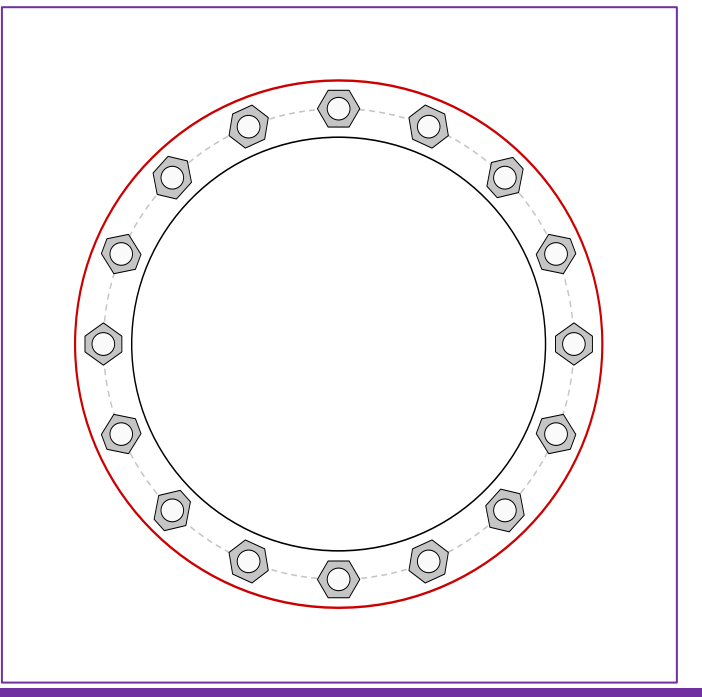
Applied Loads	
Moment (kip-ft)	145.43
Axial Force (kips)	4.98
Shear Force (kips)	6.01

**TIA-222-H Section 15.5 Applied*

Top Plate - Internal



Bottom Plate - Internal



Connection Properties

Bolt Data

(16) 1" ø bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 20.75" BC

Top Plate Data

18.25" ID x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

18.25" ID x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

24" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Pole Data

24" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	20.70	
Allowable (kips)	54.54	
Stress Rating:	**36.1%**	**Pass**

Top Plate Capacity

Max Stress (ksi):	14.94	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**43.9%**	**Pass**
Tension Side Stress Rating:	**9.0%**	**Pass**

Bottom Plate Capacity

Max Stress (ksi):	14.94	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**43.9%**	**Pass**
Tension Side Stress Rating:	**9.0%**	**Pass**

Monopole Flange Plate Connection

Elevation = 90 ft.

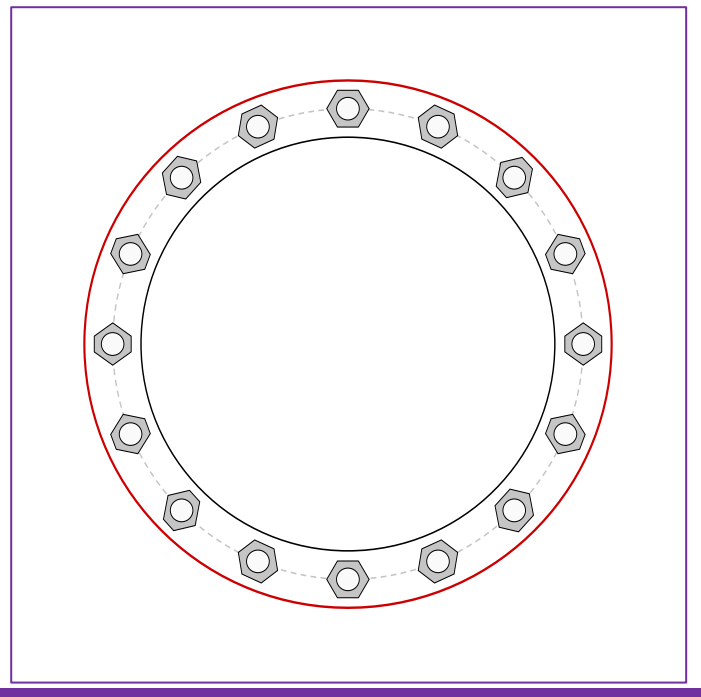
BU #	828257
Site Name	STONINGTON
Order #	479826 Rev. 9

TIA-222 Revision	H

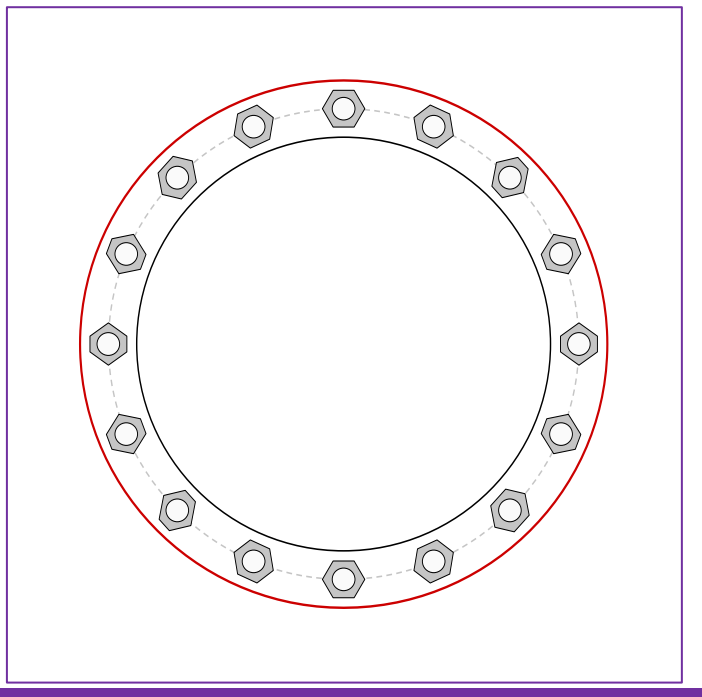
Applied Loads	
Moment (kip-ft)	284.67
Axial Force (kips)	7.58
Shear Force (kips)	7.89

**TIA-222-H Section 15.5 Applied*

Top Plate - Internal



Bottom Plate - Internal



Connection Properties

Bolt Data

(16) 1" ø bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 20.75" BC

Top Plate Data

18.25" ID x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

18.25" ID x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

24" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Pole Data

24" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	40.65	
Allowable (kips)	54.53	
Stress Rating:	**71.0%**	**Pass**

Top Plate Capacity

Max Stress (ksi):	29.16	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**85.7%**	**Pass**
Tension Side Stress Rating:	**17.6%**	**Pass**

Bottom Plate Capacity

Max Stress (ksi):	29.16	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**85.7%**	**Pass**
Tension Side Stress Rating:	**17.6%**	**Pass**

Flange Bolt Information for TIA-222-H

Site Information	
ID #:	828257
Name:	STONINGTON
App. #:	479826 Rev. 9

Pole Geometry		
Upper Pole OD:	24.00	in
Upper Pole Thick:	0.3750	in
Lower Pole OD:	24.00	in
Lower Pole Thick:	0.3750	in
Flange Plate OD:	24.00	in

Outer Bolt Group Data

Quantity:	16	
Diameter:	1	in
Material:	A325	
Bolt Circle:	20.75	in
Bolt Group Area:	12.57	in²
Bolt Group MOIx:	676	in⁴

Reactions Seen by Outer Bolt Group

Moment:	156.8	kip-ft
Axial:	11.8	kip
Shear:	10.3	kip

Flange Height:	60	ft

System Reactions

Moment:	558.48	kip-ft
Axial:	11.83	kip
Shear:	10.27	kip

Design Information

TIA Code:	H
ASIF:	1.00
Failure At:	100%
Apply TIA-222-H Section 15.5?	Yes

Inner Bolt Group Data

Quantity:		
Diameter:		in
Material:		
Bolt Circle:		in
Bolt Group Area:	0.00	in²
Bolt Group MOIx:	0	in⁴

Reactions Seen by Inner Bolt Group

Moment:	0.0	kip-ft
Axial:	0.0	kip
Shear:	0.0	kip

Inner Bolt Capacity Check

Max Tension:	0.0	kip
Design Tension	0.0	kip
Max Shear:	0.0	kip
Design Shear	0.0	kip
Bolt Capacity	**0.0%**	

Bridge Stiffener #1 Data

Quantity:	2	
Type:	Write In	
Circle:	25.50	in
Individual Area:	4.50	in²
BS #1 Group Area:	9.00	in²
BS #1 Group MOIx:	75	in⁴

Reactions Seen by BS #1 Group

Moment:	17.3	kip-ft
Axial:	0.0	kip
Shear:	0.0	kip

BS #1 Max Forces

Max Tension:	39.2	kip
Max Compression:	32.6	kip
Design Axial	195.0	kip
Max Shear:	0.0	kip
Design Shear	158.0	kip
Bolt Capacity	**19.1%**	Pass

BS #1 Upper Weld Capacity

Eccentricity (ex):	0.750	in
Weld Length (l):	N/A	in
Weld Factor (a):	N/A	
Weld Size (D):	N/A	16TH
Weld Coef. (C):	N/A	
Electrode Coef. (C_1):	N/A	
Weld Capacity:	**N/A**	

BS #1 Lower Weld Capacity

Eccentricity (ex):	0.750	in
Weld Length (l):	N/A	in
Weld Factor (a):	N/A	
Weld Size (D):	N/A	16TH
Weld Coef. (C):	N/A	
Electrode Coef. (C_1):	N/A	
Weld Capacity:	**N/A**	

Bridge Stiffener #2 Data

Quantity:	4	
Type:	Write In	
Circle:	25.75	in
Individual Area:	5.00	in²
BS #2 Group Area:	20.00	in²
BS #2 Group MOIx:	1658	in⁴

Reactions Seen by BS #2 Group

Moment:	384.4	kip-ft
Axial:	0.0	kip
Shear:	0.0	kip

BS #2 Capacity Check

Max Tension:	173.7	kip
Max Compression:	172.4	kip
Design Axial	206.3	kip
Max Shear:	0.0	kip
Design Shear	175.5	kip
Bolt Capacity	**80.2%**	Pass

BS #2 Upper Weld Capacity

Eccentricity (ex):	0.875	in
Weld Length (l):	N/A	in
Weld Factor (a):	N/A	
Weld Size (D):	N/A	16TH
Weld Coef. (C):	N/A	
Electrode Coef. (C_1):	N/A	
Weld Capacity:	**N/A**	

BS #2 Lower Weld Capacity

Eccentricity (ex):	0.875	in
Weld Length (l):	N/A	in
Weld Factor (a):	N/A	
Weld Size (D):	N/A	16TH
Weld Coef. (C):	N/A	
Electrode Coef. (C_1):	N/A	
Weld Capacity:	**N/A**	

Bridge Stiffener #3 Data

Quantity:		
Type:		
Circle:	0.00	in
Individual Area:	0.00	in²
BS #3 Group Area:	0.00	in²
BS #3 Group MOIx:	0	in⁴

Reactions Seen by BS #3 Group

Moment:	0.0	kip-ft
Axial:	0.0	kip
Shear:	0.0	kip

BS #3 Capacity Check

Max Tension:	0.0	kip
Max Compression:	0.0	kip
Design Axial	0.0	kip
Max Shear:	0.0	kip
Design Shear	0.0	kip
Bolt Capacity	**0.0%**	

BS #3 Upper Weld Capacity

Eccentricity (ex):	N/A	in
Weld Length (l):	N/A	in
Weld Factor (a):	N/A	
Weld Size (D):	N/A	16TH
Weld Coef. (C):	N/A	
Electrode Coef. (C_1):	N/A	
Weld Capacity:	**N/A**	

BS #3 Lower Weld Capacity

Eccentricity (ex):	N/A	in
Weld Length (l):	N/A	in
Weld Factor (a):	N/A	
Weld Size (D):	N/A	16TH
Weld Coef. (C):	N/A	
Electrode Coef. (C_1):	N/A	
Weld Capacity:	**N/A**	

Monopole Flange Plate Connection

Elevation = 60 ft.

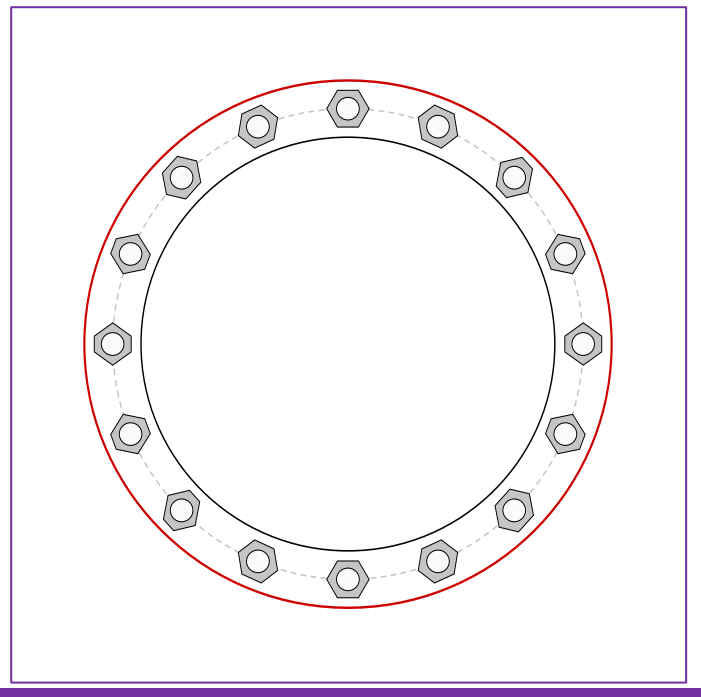
BU #	828257
Site Name	STONINGTON
Order #	479826 Rev. 9

TIA-222 Revision	H

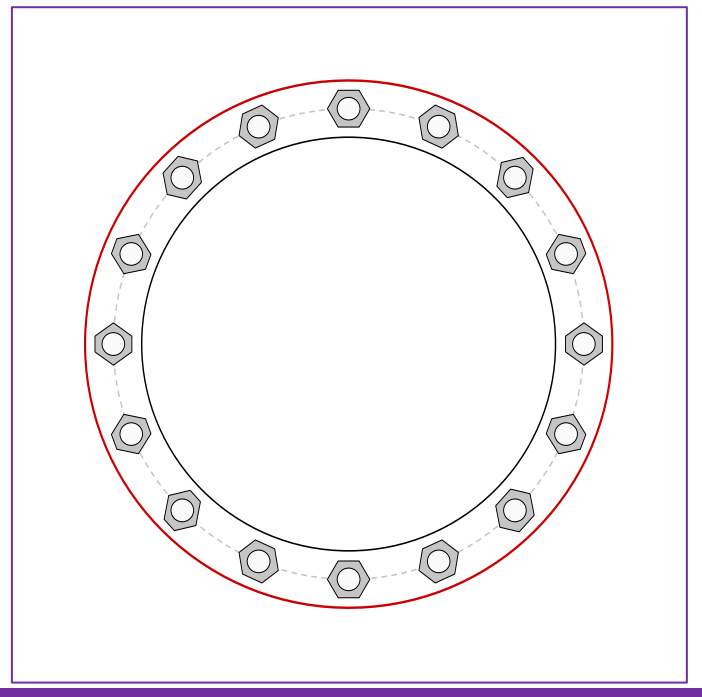
Applied Loads	
Moment (kip-ft)	156.80
Axial Force (kips)	11.80
Shear Force (kips)	10.30

**TIA-222-H Section 15.5 Applied*

Top Plate - Internal



Bottom Plate - Internal



Connection Properties

Bolt Data

(16) 1" ø bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 20.75" BC

Top Plate Data

18.25" ID x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

18.25" ID x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

24" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Pole Data

24" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	21.91	
Allowable (kips)	54.53	
Stress Rating:	**38.3%**	**Pass**

Top Plate Capacity

Max Stress (ksi):	16.39	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**48.2%**	**Pass**
Tension Side Stress Rating:	**9.5%**	**Pass**

Bottom Plate Capacity

Max Stress (ksi):	16.39	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**48.2%**	**Pass**
Tension Side Stress Rating:	**9.5%**	**Pass**

Flange Bolt Information for TIA-222-H

Site Information	
ID #:	828257
Name:	STONINGTON
App. #:	479826 Rev. 9

Pole Geometry		
Upper Pole OD:	24.00	in
Upper Pole Thick:	0.3750	in
Lower Pole OD:	30.00	in
Lower Pole Thick:	0.3750	in
Flange Plate OD:	30.00	in

Outer Bolt Group Data

Quantity:	20	
Diameter:	1	in
Material:	A325	
Bolt Circle:	27.00	in
Bolt Group Area:	15.71	in²
Bolt Group MOIx:	1431	in⁴

Reactions Seen by Outer Bolt Group

Moment:	202.8	kip-ft
Axial:	20.0	kip
Shear:	12.8	kip

Flange Height:	30	ft

System Reactions

Moment:	899.09	kip-ft
Axial:	19.95	kip
Shear:	12.76	kip

Design Information

TIA Code:	H
ASIF:	1.00
Failure At:	100%
Apply TIA-222-H Section 15.5?	Yes

Inner Bolt Group Data

Quantity:		
Diameter:		in
Material:		
Bolt Circle:		in
Bolt Group Area:	0.00	in²
Bolt Group MOIx:	0	in⁴

Reactions Seen by Inner Bolt Group

Moment:	0.0	kip-ft
Axial:	0.0	kip
Shear:	0.0	kip

Inner Bolt Capacity Check

Max Tension:	0.0	kip
Design Tension	0.0	kip
Max Shear:	0.0	kip
Design Shear	0.0	kip
Bolt Capacity	**0.0%**	

Bridge Stiffener #1 Data

Quantity:	4	
Type:	Write In	
Circle:	31.50	in
Individual Area:	4.50	in²
BS #1 Group Area:	18.00	in²
BS #1 Group MOIx:	2078	in⁴

Reactions Seen by BS #1 Group

Moment:	294.4	kip-ft
Axial:	0.0	kip
Shear:	0.0	kip

BS #1 Max Forces

Max Tension:	89.8	kip
Max Compression:	86.4	kip
Design Axial	195.0	kip
Max Shear:	0.0	kip
Design Shear	158.0	kip
Bolt Capacity	**43.8%**	Pass

BS #1 Upper Weld Capacity

Eccentricity (ex):	3.750	in
Weld Length (l):	N/A	in
Weld Factor (a):	N/A	
Weld Size (D):	N/A	16TH
Weld Coef. (C):	N/A	
Electrode Coef. (C_1):	N/A	
Weld Capacity:	**N/A**	

BS #1 Lower Weld Capacity

Eccentricity (ex):	0.750	in
Weld Length (l):	N/A	in
Weld Factor (a):	N/A	
Weld Size (D):	N/A	16TH
Weld Coef. (C):	N/A	
Electrode Coef. (C_1):	N/A	
Weld Capacity:	**N/A**	

Bridge Stiffener #2 Data

Quantity:	4	
Type:	Write In	
Circle:	34.00	in
Individual Area:	5.00	in²
BS #2 Group Area:	20.00	in²
BS #2 Group MOIx:	2838	in⁴

Reactions Seen by BS #2 Group

Moment:	401.9	kip-ft
Axial:	0.0	kip
Shear:	0.0	kip

BS #2 Capacity Check

Max Tension:	143.3	kip
Max Compression:	142.8	kip
Design Axial	206.3	kip
Max Shear:	0.0	kip
Design Shear	175.5	kip
Bolt Capacity	**66.2%**	Pass

BS #2 Upper Weld Capacity

Eccentricity (ex):	5.000	in
Weld Length (l):	N/A	in
Weld Factor (a):	N/A	
Weld Size (D):	N/A	16TH
Weld Coef. (C):	N/A	
Electrode Coef. (C_1):	N/A	
Weld Capacity:	**N/A**	

BS #2 Lower Weld Capacity

Eccentricity (ex):	2.000	in
Weld Length (l):	N/A	in
Weld Factor (a):	N/A	
Weld Size (D):	N/A	16TH
Weld Coef. (C):	N/A	
Electrode Coef. (C_1):	N/A	
Weld Capacity:	**N/A**	

Bridge Stiffener #3 Data

Quantity:		
Type:		
Circle:	0.00	in
Individual Area:	0.00	in²
BS #3 Group Area:	0.00	in²
BS #3 Group MOIx:	0	in⁴

Reactions Seen by BS #3 Group

Moment:	0.0	kip-ft
Axial:	0.0	kip
Shear:	0.0	kip

BS #3 Capacity Check

Max Tension:	0.0	kip
Max Compression:	0.0	kip
Design Axial	0.0	kip
Max Shear:	0.0	kip
Design Shear	0.0	kip
Bolt Capacity	**0.0%**	

BS #3 Upper Weld Capacity

Eccentricity (ex):	N/A	in
Weld Length (l):	N/A	in
Weld Factor (a):	N/A	
Weld Size (D):	N/A	16TH
Weld Coef. (C):	N/A	
Electrode Coef. (C_1):	N/A	
Weld Capacity:	**N/A**	

BS #3 Lower Weld Capacity

Eccentricity (ex):	N/A	in
Weld Length (l):	N/A	in
Weld Factor (a):	N/A	
Weld Size (D):	N/A	16TH
Weld Coef. (C):	N/A	
Electrode Coef. (C_1):	N/A	
Weld Capacity:	**N/A**	

Monopole Flange Plate Connection

Elevation = 30 ft.

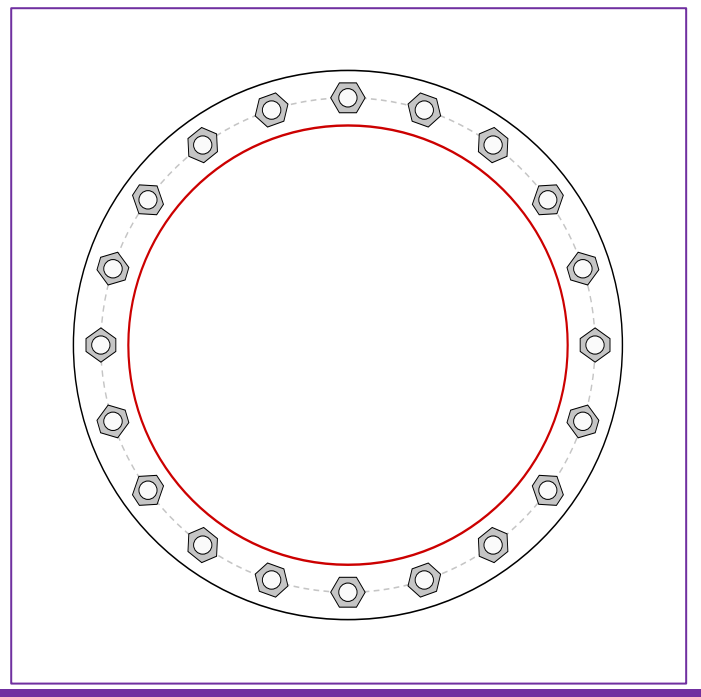
BU #	828257
Site Name	STONINGTON
Order #	479826 Rev. 9

TIA-222 Revision	H

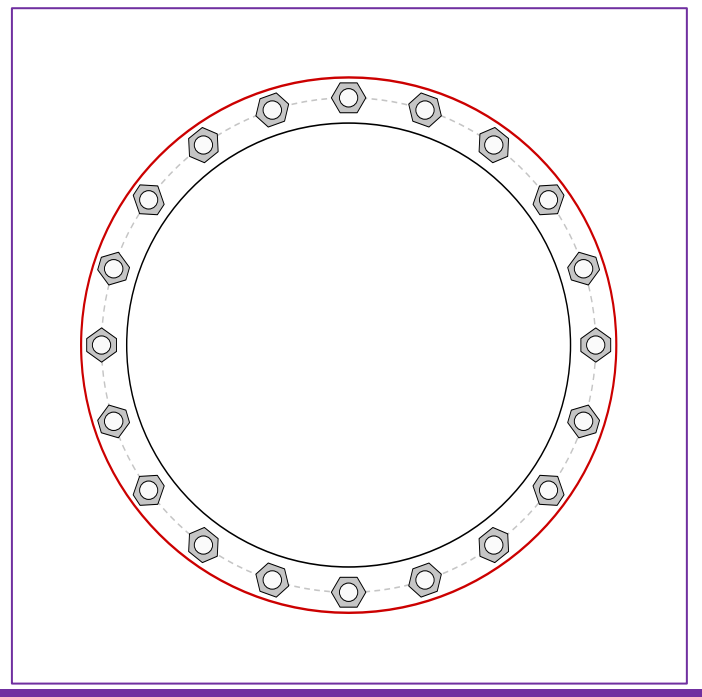
Applied Loads	
Moment (kip-ft)	202.80
Axial Force (kips)	20.00
Shear Force (kips)	12.80

**TIA-222-H Section 15.5 Applied*

Top Plate - External



Bottom Plate - Internal



Connection Properties

Bolt Data

(20) 1" ø bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 27" BC

Top Plate Data

30" OD x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

24.25" ID x 1" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

24" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Pole Data

30" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	17.02	
Allowable (kips)	54.53	
Stress Rating:	**29.7%**	**Pass**

Top Plate Capacity

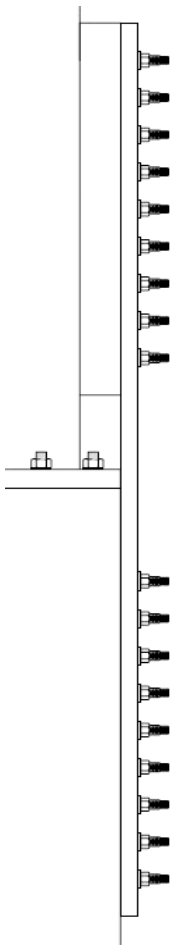
Max Stress (ksi):	12.20	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**35.9%**	**Pass**
Tension Side Stress Rating:	**12.3%**	**Pass**

Bottom Plate Capacity

Max Stress (ksi):	18.63	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**54.7%**	**Pass**
Tension Side Stress Rating:	**N/A**	

BOLTED JUMP PLATE CALCULATIONS - TIA-222-H

Site Name:	**STONINGTON / BU #: 828257**
GPD Project No:	**2021777.828257.06**
Sheet Application:	Analysis
Max Capacity:	100%
Apply TIA-222-H Section 15.5?	Yes
Seismic Design Category:	A



Loading Information		
Elevation =	30	ft
Plate Compression Force =	86.4	kips
Plate Tension Force =	89.8	kips

Tower Information		
Upper Shaft Thickness, t =	0.375	in
Upper Shaft Fu =	63	ksi
Lower Shaft Thickness, t =	0.375	in
Lower Shaft Fu =	63	ksi

Jump Plate Properties		
Width =	4.5	in
Thickness =	1	in
Fy =	65	ksi
Fu =	80	ksi
Eccentricity, e =	3.75	in
Unbraced Length, Lu =	14	in

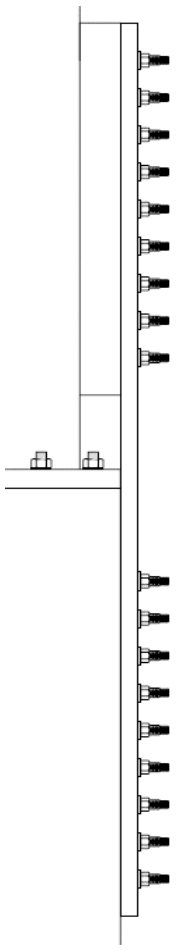
Jump Plate Compression		
Plate K Factor =	1	
Gross Area, A_g =	4.5	in^2
Moment of Inertia, I =	0.375	in^4
Radius of Gyration, r =	0.289	in
KL/r =	48.5	
F_e =	121.7	ksi
F_{cr} =	51.98	ksi
$\phi_{buckling}$ =	0.9	
$\phi P_{n,\ buckling}$ =	210.5	kips
Capacity =	39.1%	OK

Jump Plate Tension		
Gross Area, A_g =	4.50	in^2
Net Area, A_{en} =	3.250	in^2
ϕ_{yield} =	0.9	
$\phi_{rupture}$ =	0.75	
$\phi P_{n,\ yield}$ =	263.3	kips
$\phi P_{n,\ rupture}$ =	195.0	kips
Capacity =	43.9%	OK

Bolted Connection Capacities		
Blind Bolt =	NexGen2	
# Bolts in Upper Connection (Eccentric) =	10	
# Bolts in Lower Connection (Not Eccentric) =	10	
Bolt C-C Spacing =	3	in
Bolts Above Neutral Axis, n' =	5	
Moment Arm, dm =	15	in
Bolt/Shear Sleeve ø =	1.14173	in
Bolt Hole Size =	1.1875	in
Bolt Head Diameter (tip-tip) =	1.142	in
Washer Diameter =	1.65	in
$\phi R_{n,\ shear,\ upper}$ =	50.50	kips/bolt
$\phi R_{n,\ bearing,\ upper}$ =	47.58	kips/bolt
$\phi R_{n,\ shear,\ lower}$ =	50.50	kips/bolt
$\phi R_{n,\ bearing,\ lower}$ =	47.58	kips/bolt
$\phi R_{n,\ tension,\ upper}$ =	42.60	kips/bolt
$\phi R_{n,\ pull\text{-}out,\ upper}$ =	49.23	kips/bolt
$V_{u,\ bolt,\ upper}$ =	8.98	kips/bolt
$T_{u,\ bolt,\ upper}$ =	4.49	kips/bolt
$V_{u,\ bolt,\ lower}$ =	8.98	kips/bolt
Upper Connection Capacity =	18.0%	OK
Lower Connection Capacity =	18.0%	OK

BOLTED JUMP PLATE CALCULATIONS - TIA-222-H

Site Name:	**STONINGTON / BU #: 828257**
GPD Project No:	**2021777.828257.06 (Proposed)**
Sheet Application:	Analysis
Max Capacity:	100%
Apply TIA-222-H Section 15.5?	Yes
Seismic Design Category:	A



Loading Information		
Elevation =	30	ft
Plate Compression Force =	142.8	kips
Plate Tension Force =	143.3	kips

Tower Information		
Upper Shaft Thickness, t =	0.375	in
Upper Shaft Fu =	63	ksi
Lower Shaft Thickness, t =	0.375	in
Lower Shaft Fu =	63	ksi

Jump Plate Properties		
Width =	4	in
Thickness =	1.25	in
Fy =	65	ksi
Fu =	80	ksi
Eccentricity, e =	3.875	in
Unbraced Length, Lu =	18	in

Jump Plate Compression		
Plate K Factor =	1	
Gross Area, A_g =	5	in^2
Moment of Inertia, I =	0.651	in^4
Radius of Gyration, r =	0.361	in
KL/r =	49.9	
F_e =	115.0	ksi
F_{cr} =	51.31	ksi
$\phi_{buckling}$ =	0.9	
$\phi P_{n,\ buckling}$ =	230.9	kips
Capacity =	58.9%	OK

Jump Plate Tension		
Gross Area, A_g =	5.00	in^2
Net Area, A_{en} =	3.438	in^2
ϕ_{yield} =	0.9	
$\phi_{rupture}$ =	0.75	
$\phi P_{n,\ yield}$ =	292.5	kips
$\phi P_{n,\ rupture}$ =	206.3	kips
Capacity =	66.2%	OK

Bolted Connection Capacities		
Blind Bolt =	NexGen2	
# Bolts in Upper Connection (Eccentric) =	7	
# Bolts in Lower Connection (Not Eccentric) =	7	
Bolt C-C Spacing =	3	in
Bolts Above Neutral Axis, n' =	3	
Moment Arm, dm =	12	in
Bolt/Shear Sleeve ø =	1.14173	in
Bolt Hole Size =	1.1875	in
Bolt Head Diameter (tip-tip) =	1.142	in
Washer Diameter =	1.65	in
$\phi R_{n,\ shear,\ upper}$ =	50.50	kips/bolt
$\phi R_{n,\ bearing,\ upper}$ =	47.58	kips/bolt
$\phi R_{n,\ shear,\ lower}$ =	50.50	kips/bolt
$\phi R_{n,\ bearing,\ lower}$ =	47.58	kips/bolt
$\phi R_{n,\ tension,\ upper}$ =	42.60	kips/bolt
$\phi R_{n,\ pull\text{-}out,\ upper}$ =	49.23	kips/bolt
$V_{u,\ bolt,\ upper}$ =	20.47	kips/bolt
$T_{u,\ bolt,\ upper}$ =	15.42	kips/bolt
$V_{u,\ bolt,\ lower}$ =	20.47	kips/bolt
Upper Connection Capacity =	41.0%	OK
Lower Connection Capacity =	41.0%	OK

Anchor Rod Information for TIA-222-H

Site Information	
ID:	828257
Name:	STONINGTON
App. #:	479826 Rev. 9

Base Reactions		
Moment:	1318.02	ft-kip
Axial:	28.05	kip
Shear:	14.74	kip
Base Plate Type:	Circular	

Design Information	
TIA Code:	H
ASIF:	1.000
Failure:	100%
Apply TIA-222-H Section 15.5?	Yes

Original Anchor Rod Data

Quantity:		
Diameter:		in
Material:		
Bolt Circle:		in
Bolt Spacing:		in
Bolt Group Area:	0.00	in²
Bolt Group MOIx:	0	in⁴

Reactions Seen by Original AR Group

Moment:	0.0	kip-ft
Axial:	0.0	kip
Shear:	14.7	kip

Original AR Capacity Check

Combined Load:	0.0	kip
Allowable load:	0.0	kip
AR Capacity:	0.0%	

First Added Anchor Rod Data

Quantity:	4	
Diameter:	1.75	in
Material:	A193 B7	
Bolt Circle:	40.0	in
Bolt Group Area:	9.62	in²
Bolt Group MOIx:	1132	in⁴

Reactions Seen by First Added AR Group

Moment:	99.5	kip-ft
Axial:	11.2	kip
Shear:	0.0	kip

First Added AR Capacity Check

Combined Load:	41.1	kip

Second Added Anchor Rod Data

Quantity:	6	
Diameter:	1.75	in
Material:	A193 B7	
Bolt Circle:	89.0	in
Bolt Group Area:	14.43	in²
Bolt Group MOIx:	13865	in⁴

Reactions Seen by Second Added AR Group

Moment:	1218.5	kip-ft
Axial:	16.8	kip
Shear:	0.0	kip

Second Added AR Capacity Check

Combined Load:	114.2	kip

Third Added Anchor Rod Data

Quantity:		
Diameter:		in
Material:		
Bolt Circle:		in
Bolt Group Area:	0.00	in²
Bolt Group MOIx:	0	in⁴

Reactions Seen by Second Added AR Group

Moment:	0.0	kip-ft
Axial:	0.0	kip
Shear:	0.0	kip

Second Added AR Capacity Check

Combined Load:	0.0	kip

Rev.4.1

Post-Installed Adhesive Anchor Tension Checks (Anchor Group)

Site Number: BU #: 828257 | Code: ACI 2014

Site Name: STONINGTON | GPD Job #: 2021777.828257.06

Anchor Properties			
F_u =	125	ksi	
F_y =	105	ksi	
Diameter =	1.75	in	
Hole Diameter =	2.00	in	

Concrete Properties			
f'_c =	4000	psi	
λ_a =	1		17.2.6
k_c =	17		17.4.2.2
A_{nc} =	23830.07	in^2	
A_{nco} =	11502.56	in^2	17.4.2.1
nA_{nco} =	57512.81	in^2	17.4.5.1
A_{nc} =	23830.07	in^2	
A_{nc} / A_{nco} =	2.0717		
$\Psi_{c,N}$ =	1.4		R17.4.2.6
$\Psi_{ec,N}$ =	0.844		17.4.2.4
$\Psi_{ed,N}$ =	1		17.4.2.5
$\Psi_{cp,N}$ =	1		17.4.2.7
ϕ =	0.65		17.3.3

Steel Strength in Tension			
$A_{se,N}$ =	1.900	in^2	
$1.9F_y$ =	199.50	ksi	
f_{uta} =	125.00	ksi	17.4.1.2
N_{sa} =	237.500	k	17.4.1.2
ϕ =	0.75		17.3.3
ϕN_{sa} =	178.125	k	

Concrete Breakout Strength in Tension			
N_b =	229.823	k	17.4.2.2a
N_{cbg} =	447.580	k	17.4.2.1b
ϕ =	0.65		
ϕN_{cbg} =	290.927	k	

Adhesive Anchor Properties			
h_{ef} =	35.75	in	**See D.4.2.3 ACI 11**
$1.5h_{ef}$ =	53.63	in	
τ_{cr} =	1130	psi	
τ_{uncr} =	1130	psi	
n =	5	# anchors in tension	
Anchor Spacing =	47.8197	in	
e'_N =	9.9224	in	R17.4.2.4
A_{Na} =	2299.05	in^2	
c_{a1} =	57.50	in	
c_{ac} =	71.5	in	17.7.6
c_{Na} =	17.74	in	17.4.5.1d
A_{Nao} =	1258.41	in^2	17.4.5.1c
nA_{Nao} =	6292.05	in^2	17.4.5.1
A_{Na} =	2299.05	in^2	
A_{Na} / A_{Nao} =	1.8269		
$\Psi_{ec,Na}$ =	0.6413		17.4.5.3
$\Psi_{ed,Na}$ =	1		17.4.5.4
$\Psi_{cp,Na}$ =	1		17.4.5.5

Bond Strength in Tension			
Load Type	Wind		
N_{ba} =	222.10	k	17.4.5.2
N_{ag} =	260.214	k	17.4.5.1b
ϕ =	0.65		
ϕN_{ag} =	169.139	k	

Tension Strength / Anchor Summary			
ϕN_{sa} =	178.125	k	
ϕN_a =	144.362956		
N_{ua} =	108.10	k	
Ω_o=	1		
Single Capacity* =	**71.3%**	**Pass**	
ϕNcbg =	290.927	k (group)	
N_{uag} =	246.20	k (group)	
Ω_o=	1		
Group Capacity* =	**80.6%**	**Pass**	

V1.0

*Capacities per TIA-222-H Section 15.5

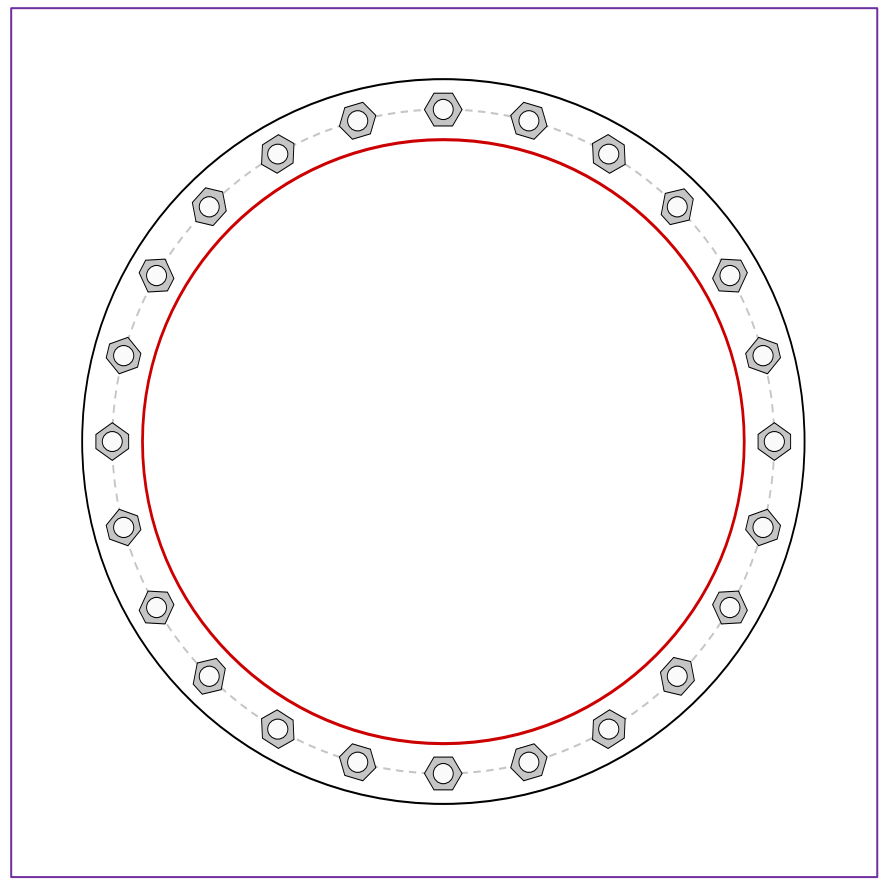
Monopole Base Plate Connection

Site Info	
BU #	828257
Site Name	STONINGTON
Order #	479826 Rev. 9

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	0

Applied Loads	
Moment (kip-ft)	0.00
Axial Force (kips)	0.00
Shear Force (kips)	14.74

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

(24) 1" ø bolts (A687 N; Fy=105 ksi, Fu=125 ksi) on 33" BC

Base Plate Data

36" OD x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Stiffener Data

N/A

Pole Data

30" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Anchor Rod Summary *(units of kips, kip-in)*

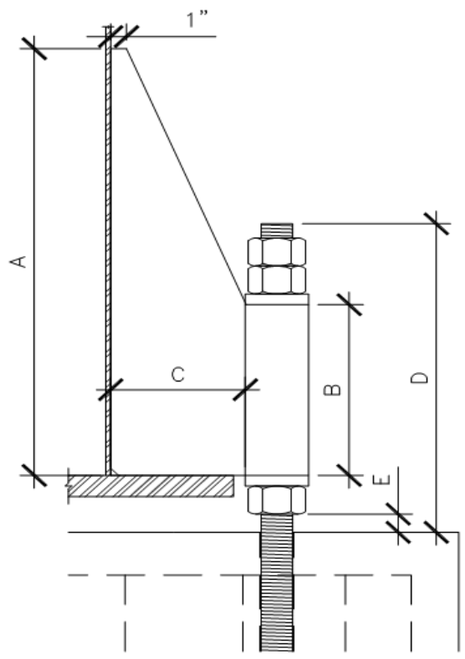
Pu_c = 0	ϕPn_c = 74.22	**Stress Rating**
Vu = 0.61	ϕVn = 33.4	**1.8%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary

Max Stress (ksi):	0	(Flexural)
Allowable Stress (ksi):	32.4	
Stress Rating:	**0.0%**	**Pass**

ANCHOR ROD BRACKET CALCULATIONS - TIA-222-H

Site Name:	STONINGTON / BU #: 828257
GPD Project No:	2021777.828257.06 - 2015 Mods
Sheet Application:	Analysis
Max Capacity:	100%
Apply TIA-222-H Section 15.5?	Yes



Anchor Rod Properties		
F_u =	125	ksi
F_y =	105	ksi
Diameter =	1.75	in
Rod Tension Force =	36.0	kips
Rod Compression Force =	41.1	kips

Bracket Plate Properties		
A =	24	in
B =	24	in
C =	3	in
Unbraced Length of Anchor Rod, E =	4.625	in
Bracket Thickness =	1.25	in
F_y =	65	ksi
Fu =	80	ksi
ARB connected to flat plate?	No	

Anchor Rod Buckling			
Buckling K Factor =	1.2		
Nominal Diameter, d =	1.75	in	
Gross Area, Ag =	2.405	in^2	
Moment of Inertia, I =	0.460	in^4	
Radius of Gyration, r =	0.438	in	
KL/r =	12.69		
F_e =	1778.6	ksi	
F_{cr} =	102.4	ksi	
$\phi_{buckling}$ =	0.9		
Capacity =	lar <= 4d		OK

Tube Yielding			
Tube Size =	HSS4x4x1/2		
Outer Diameter =	4	in	
Inner Diameter =	3	in	
Area =	6.02	in^2	
Yield Stress, F_y =	46	ksi	
Ultimate Stress, F_u =	62	ksi	
ϕ =	0.9		
ϕP_n =	249.23	kips	
Capacity =	15.7%		OK

Flexure and Combined Flexure & Shear (Tube-to-Bracket)		
Plastic Modulus, Z =	180.00	in^3
Elastic Modulus, S =	120.00	in^3
ϕM =	0.9	
ϕV =	1.0	
$\phi M_{n,\ yield,\ LTB}$ =	10471.7	kip-in
ϕV_n =	1170.0	kips
M_u =	82.2	kip-in
V_u =	41.1	kips
Capacity =	0.7%	OK

Shear Strength (Tube-to-Bracket)		
A_w =	30	in^2
F_y =	65	ksi
Fu =	80	ksi
ϕ_{yield} =	1.0	
$\phi_{rupture}$ =	0.75	
$\phi V_{n,\ yield}$ =	1170.0	kips
$\phi V_{n,\ rupture}$ =	1080.0	kips
V_u =	41.1	kips
Capacity =	3.6%	OK

Rupture Strength at Welds (Bracket-to-Tower)		
Pole Thickness =	0.375	in
Pole Fy =	42	ksi
Pole Fu =	60	ksi
Applied Force =	1.29	k/in
Rupture Strength of Pole =	13.5	k/in
Capacity =	9.5%	OK

Tube Punching Shear		
Eccentricity, e =	2	in
Induced Moment, M =	82.18	k-in
ϕ =	0.75	
$\phi M_{n,\ punching}$ =	2678.4	k-in
Capacity =	2.9%	OK

Flexure and Combined Flexure & Shear (Bracket-to-Tower)		
Plastic Modulus, Z =	180.00	in^3
Elastic Modulus, S =	120.00	in^3
ϕM =	0.9	
ϕV =	1.0	
$\phi M_{n,\ yield,\ LTB}$ =	10471.7	kip-in
ϕV_n =	1170	kips
M_u =	205.5	kip-in
V_u =	41.1	kips
Capacity =	1.9%	OK

Shear Strength (Bracket-to-Tower)		
A_w =	30	in^2
F_y =	65	ksi
Fu =	80	ksi
ϕ_{yield} =	1.0	
$\phi_{rupture}$ =	0.75	
$\phi V_{n,\ yield}$ =	1170.0	kips
$\phi V_{n,\ rupture}$ =	1080.0	kips
V_u =	41.1	kips
Capacity =	3.6%	OK

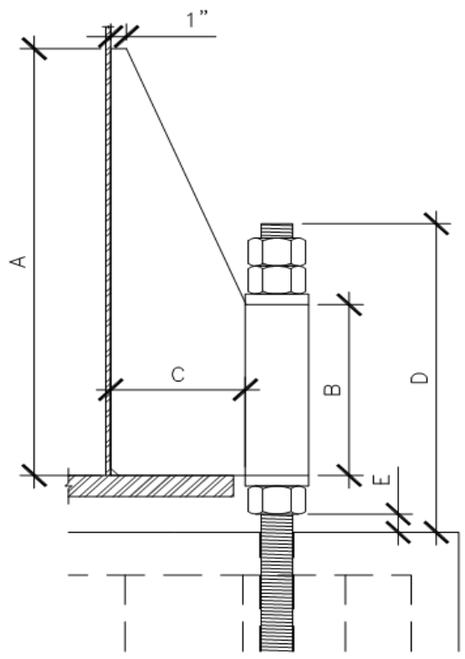
Pole Punching Shear (max per unit length)		
Eccentricity, e =	5	in
Induced Moment, M =	205.45	k-in
Elastic Modulus, S =	120.00	in^3
Shear Force, fv =	2.14	kips
ϕ yield =	1.0	
ϕ rupture =	0.75	
ϕFv, yield =	18.90	kips
ϕFv, rupture =	20.25	kips
Capacity =	10.8%	OK

Weld Check (Tube-to-Bracket)					
Weld Length =	24	in	D =	8	
Fillet Weld Size =	0.5	in	C1 =	1.03	
Weld Strength =	80	ksi	C =	3.72	
e =	2	in	ϕ =	0.75	
a =	0.083		ϕR_n =	551.50	kips
			Capacity =	7.1%	OK

Weld Check (Bracket-to-Tower)					
Weld Length =	24	in	D =	6	
Fillet Weld Size =	0.375	in	C1 =	1.03	
Weld Strength =	80	ksi	C =	3.48	
e =	5	in	ϕ =	0.75	
a =	0.208		ϕR_n =	386.74	kips
			Capacity =	10.1%	OK

ANCHOR ROD BRACKET CALCULATIONS - TIA-222-H

Site Name:	STONINGTON / BU #: 828257
GPD Project No:	2021777.828257.06 - Proposed off Pole
Sheet Application:	Analysis
Max Capacity:	100%
Apply TIA-222-H Section 15.5?	Yes



Anchor Rod Properties		
F_u =	125	ksi
F_y =	105	ksi
Diameter =	1.75	in
Rod Tension Force =	108.1	kips
Rod Compression Force =	114.2	kips

Bracket Plate Properties		
A =	48	in
B =	18	in
C =	27.5	in
Unbraced Length of Anchor Rod, E =	5.25	in
Bracket Thickness =	1.25	in
F_y =	65	ksi
Fu =	80	ksi
ARB connected to flat plate?	No	

Anchor Rod Buckling			
Buckling K Factor =	1.2		
Nominal Diameter, d =	1.75	in	
Gross Area, Ag =	2.405	in^2	
Moment of Inertia, I =	0.460	in^4	
Radius of Gyration, r =	0.438	in	
KL/r =	14.40		
F_e =	1380.3	ksi	
F_{cr} =	101.7	ksi	
$\phi_{buckling}$ =	0.9		
Capacity =	lar <= 4d		OK

Tube Yielding			
Tube Size =	HSS4x4x1/2		
Outer Diameter =	4	in	
Inner Diameter =	3	in	
Area =	6.02	in^2	
Yield Stress, F_y =	50	ksi	
Ultimate Stress, F_u =	65	ksi	
ϕ =	0.9		
ϕP_n =	270.90	kips	
Capacity =	40.1%		OK

Flexure and Combined Flexure & Shear (Tube-to-Bracket)			
Plastic Modulus, Z =	101.25	in^3	
Elastic Modulus, S =	67.50	in^3	
ϕM =	0.9		
ϕV =	1.0		
$\phi M_{n,\ yield,\ LTB}$ =	5233.8	kip-in	
ϕV_n =	877.5	kips	
M_u =	228.4	kip-in	
V_u =	114.2	kips	
Capacity =	4.2%		OK

Shear Strength (Tube-to-Bracket)			
A_w =	22.5	in^2	
F_y =	65	ksi	
Fu =	80	ksi	
ϕ_{yield} =	1.0		
$\phi_{rupture}$ =	0.75		
$\phi V_{n,\ yield}$ =	877.5	kips	
$\phi V_{n,\ rupture}$ =	810.0	kips	
V_u =	114.2	kips	
Capacity =	13.4%		OK

Rupture Strength at Welds (Bracket-to-Tower)		
Pole Thickness =	0.375	in
Pole Fy =	42	ksi
Pole Fu =	60	ksi
Applied Force =	3.17	k/in
Rupture Strength of Pole =	13.5	k/in
Capacity =	23.5%	OK

Tube Punching Shear		
Eccentricity, e =	2	in
Induced Moment, M =	228.38	k-in
ϕ =	0.75	
$\phi M_{n,\ punching}$ =	1579.5	k-in
Capacity =	13.8%	OK

Flexure and Combined Flexure & Shear (Bracket-to-Tower)			
Plastic Modulus, Z =	720.00	in^3	
Elastic Modulus, S =	480.00	in^3	
ϕM =	0.9		
ϕV =	1.0		
$\phi M_{n,\ yield,\ LTB}$ =	28113.0	kip-in	
ϕV_n =	2340	kips	
M_u =	3368.6	kip-in	
V_u =	114.2	kips	
Capacity =	11.4%		OK

Shear Strength (Bracket-to-Tower)			
A_w =	60	in^2	
F_y =	65	ksi	
Fu =	80	ksi	
ϕ_{yield} =	1.0		
$\phi_{rupture}$ =	0.75		
$\phi V_{n,\ yield}$ =	2340.0	kips	
$\phi V_{n,\ rupture}$ =	2160.0	kips	
V_u =	114.2	kips	
Capacity =	5.0%		OK

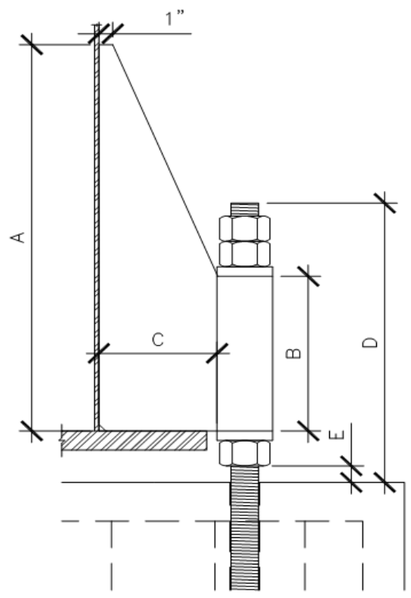
Pole Punching Shear (max per unit length)		
Eccentricity, e =	29.5	in
Induced Moment, M =	3368.61	k-in
Elastic Modulus, S =	480.00	in^3
Shear Force, fv =	8.77	kips
ϕ yield =	1.0	
ϕ rupture =	0.75	
ϕFv, yield =	18.90	kips
ϕFv, rupture =	20.25	kips
Capacity =	44.2%	OK

Weld Check (Tube-to-Bracket)					
Weld Length =	18	in	D =	5	
Fillet Weld Size =	0.3125	in	C1 =	1.03	
Weld Strength =	80	ksi	C =	3.71	
e =	2	in	ϕ =	0.75	
a =	0.111		ϕR_n =	257.86	kips
			Capacity =	42.2%	OK

Weld Check (Bracket-to-Tower)					
Weld Length =	48	in	D =	5	
Fillet Weld Size =	0.3125	in	C1 =	1.03	
Weld Strength =	80	ksi	C =	1.97	
e =	29.5	in	ϕ =	0.75	
a =	0.615		ϕR_n =	364.31	kips
			Capacity =	29.9%	OK

ANCHOR ROD BRACKET CALCULATIONS - TIA-222-H

Site Name:	STONINGTON / BU #: 828257
GPD Project No:	2021777.828257.06 - Proposed off Stiffener
Sheet Application:	Analysis
Max Capacity:	100%
Apply TIA-222-H Section 15.5?	Yes



Anchor Rod Properties		
F_u =	125	ksi
F_y =	105	ksi
Diameter =	1.75	in
Rod Tension Force =	108.1	kips
Rod Compression Force =	114.2	kips

Bracket Plate Properties		
A =	36	in
B =	18	in
C =	21.5	in
Unbraced Length of Anchor Rod, E =	5.25	in
Bracket Thickness =	1.25	in
F_y =	65	ksi
Fu =	80	ksi
ARB connected to flat plate?	Yes	
Flat Plate Width =	1.25	in
Flat Plate Thickness =	6	in
Flat Plate Weld Length =	54	in

Anchor Rod Buckling		
Buckling K Factor =	1.2	
Nominal Diameter, d =	1.75	in
Gross Area, Ag =	2.405	in^2
Moment of Inertia, I =	0.460	in^4
Radius of Gyration, r =	0.438	in
KL/r =	14.40	
F_e =	1380.3	ksi
F_{cr} =	101.7	ksi
$\phi_{buckling}$ =	0.9	
Capacity =	lar <= 4d	OK

Tube Yielding		
Tube Size =	HSS4x4x1/2	
Outer Diameter =	4	in
Inner Diameter =	3	in
Area =	6.02	in^2
Yield Stress, F_y =	50	ksi
Ultimate Stress, F_u =	65	ksi
ϕ =	0.9	
ϕP_n =	270.90	kips
Capacity =	40.1%	OK

Flexure and Combined Flexure & Shear (Tube-to-Bracket)		
Plastic Modulus, Z =	101.25	in^3
Elastic Modulus, S =	67.50	in^3
ϕM =	0.9	
ϕV =	1.0	
$\phi M_{n,\ yield,\ LTB}$ =	5401.5	kip-in
ϕV_n =	877.5	kips
M_u =	228.4	kip-in
V_u =	114.2	kips
Capacity =	4.0%	OK

Shear Strength (Tube-to-Bracket)		
A_w =	22.5	in^2
F_y =	65	ksi
Fu =	80	ksi
ϕ_{yield} =	1.0	
$\phi_{rupture}$ =	0.75	
$\phi V_{n,\ yield}$ =	877.5	kips
$\phi V_{n,\ rupture}$ =	810.0	kips
V_u =	114.2	kips
Capacity =	13.4%	OK

Rupture Strength at Welds (Flat Plate-to-Tower)		
Pole Thickness =	0.375	in
Pole Fy =	42	ksi
Pole Fu =	60	ksi
Applied Force =	2.31	k/in
Rupture Strength of Pole =	13.5	k/in
Capacity =	17.1%	OK

Flexure and Combined Flexure & Shear (Bracket-to-Flat Plate)		
Plastic Modulus, Z =	405.00	in^3
Elastic Modulus, S =	270.00	in^3
ϕM =	0.9	
ϕV =	1.0	
$\phi M_{n,\ yield,\ LTB}$ =	19203.3	kip-in
ϕV_n =	1755	kips
M_u =	2683.5	kip-in
V_u =	114.2	kips
Capacity =	13.3%	OK

Shear Strength (Bracket-to-Flat Plate)		
A_w =	45	in^2
F_y =	65	ksi
Fu =	80	ksi
ϕ_{yield} =	1.0	
$\phi_{rupture}$ =	0.75	
$\phi V_{n,\ yield}$ =	1755.0	kips
$\phi V_{n,\ rupture}$ =	1620.0	kips
V_u =	114.2	kips
Capacity =	6.7%	OK

Tube Punching Shear		
Eccentricity, e =	2	in
Induced Moment, M =	228.38	k-in
ϕ =	0.75	
$\phi M_{n,\ punching}$ =	1579.5	k-in
Capacity =	13.8%	OK

Weld Check (Tube-to-Bracket)					
Weld Length =	18	in	D =	5	
Fillet Weld Size =	0.3125	in	C1 =	1.03	
Weld Strength =	80	ksi	C =	3.71	
e =	2	in	ϕ =	0.75	
a =	0.111		ϕR_n =	257.86	kips
			Capacity =	42.2%	OK

Weld Check (Bracket-to-Flat Plate)					
Weld Length =	36	in	D =	4.24	
Fillet Weld Size =	0.265	in	C1 =	1.03	
Weld Strength =	80	ksi	C =	1.87	
e =	23.5	in	ϕ =	0.75	
a =	0.653		ϕR_n =	220.89	kips
			Capacity =	49.2%	OK

Weld Check (Flat Plate-to-Tower)					
Weld Length =	54	in	D =	6	
Fillet Weld Size =	0.375	in	C1 =	1	
Weld Strength =	70	ksi	C =	2.16	
e =	29.5	in	ϕ =	0.75	
a =	0.546		ϕR_n =	525.15	kips
			Capacity =	20.7%	OK

Pier and Pad Foundation

BU # :	828257
Site Name:	STONINGTON
App. Number:	479826 Rev. 9

TIA-222 Revision:	H
Tower Type:	Monopole

Top & Bot. Pad Rein. Different?:	☐
Block Foundation?:	☑
Rectangular Pad?:	☐

Superstructure Analysis Reactions		
Compression, P_{comp}:	28.05	kips
Base Shear, Vu_comp:	14.74	kips
Moment, M_u:	1318.02	ft-kips
Tower Height, **H**:	150	ft
BP Dist. Above Fdn, bp_{dist}:	2	in
Bolt Circle / Bearing Plate Width, **BC**:	33	in

Foundation Analysis Checks	Capacity	Demand	Rating*	Check
Lateral (Sliding) (kips)	72.15	14.74	**19.5%**	**Pass**
Bearing Pressure (ksf)	5.63	3.96	**70.4%**	**Pass**
*Overturning (kip*ft)*	1471.62	1386.81	**94.2%**	**Pass**
*Pad Flexure (kip*ft)*	2154.32	854.33	**37.8%**	**Pass**
Pad Shear - 1-way (kips)	965.24	146.34	**14.4%**	**Pass**
Pad Shear - 2-way (Comp) (ksi)	0.190	0.000	**0.0%**	**Pass**
*Flexural 2-way (Comp) (kip*ft)*	3378.17	0.00	**0.0%**	**Pass**

**Rating per TIA-222-H Section 15.5*

Structural Rating*:	**37.8%**
Soil Rating*:	**94.2%**

Pad Properties		
Depth, **D**:	4	ft
Pad Width, W_1:	17	ft
Pad Thickness, **T**:	4.5	ft
Pad Rebar Size (Bottom dir. 2), Sp_2:	6	
Pad Rebar Quantity (Bottom dir. 2), mp_2:	22	
Pad Clear Cover, cc_{pad}:	3	in

Material Properties		
Rebar Grade, **Fy**:	60	ksi
Concrete Compressive Strength, **F'c**:	4	ksi
Dry Concrete Density, δ**c**:	150	pcf

Soil Properties		
Total Soil Unit Weight, γ:	125	pcf
Ultimate Gross Bearing, Qult:	7.500	ksf
Cohesion, **Cu**:		ksf
Friction Angle, φ:	34	degrees
SPT Blow Count, N_{blows}:		
Base Friction, μ:		
Neglected Depth, **N**:	3.50	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, **gw**:	7	ft

<--Toggle between Gross and Net

APPENDIX D

MODIFICATION DRAWINGS

MONOPOLE REINFORCEMENT DRAWINGS
PREPARED FOR CROWN CASTLE

SITE NAME: STONINGTON
BU NUMBER: 828257

SITE ADDRESS:
82 MECHANIC STREET
PAWCATUCK, CT 06379
NEW LONDON COUNTY, USA

DIRECTIONS: I-95 N TO EXIT 91, TURN LEFT ONTO TAUGWONK RD.. TAKE THE 1ST RIGHT ONTO CT-234 E/PEQUOT TRAIL, TURN LEFT ONTO W BROAD ST., TURN RIGHT ONTO MECHANIC ST. (SITE WILL BE ON THE LEFT).

SAFETY CLIMB: 'LOOK UP'
THE INTEGRITY OF THE WIRE ROPE SAFETY CLIMB SYSTEM SHALL BE CONSIDERED DURING ALL STAGES OF DESIGN, INSTALLATION, AND INSPECTION. TOWER REINFORCEMENT AND EQUIPMENT INSTALLATION SHALL NOT COMPROMISE THE INTEGRITY OR FUNCTIONAL USE OF ANY WIRE ROPE SAFETY CLIMB ON THE STRUCTURE. THIS SHALL INCLUDE, BUT NOT LIMITED TO: PINCHING OF THE WIRE ROPE, BENDING OF THE WIRE ROPE FROM ITS SUPPORTS, DIRECT CONTACT OR CLOSE PROXIMITY TO THE WIRE ROPE WHICH MAY CAUSE FRICTIONAL WEAR, OR IMPACT THE ANCHORAGE POINTS IN ANY WAY. ANY COMPROMISED SAFETY CLIMB MUST BE REPORTED TO YOUR CROWN POC FOR RESOLUTION, INCLUDING EXISTING CONDITIONS.

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.

QUALIFIED ENGINEERING SERVICES ARE AVAILABLE FROM GPD TO ASSIST CONTRACTORS IN CLASS IV RIGGING PLAN REVIEWS. FOR REQUESTING QUALIFIED ENGINEERING SERVICES PLEASE CONTACT GPD AT CROWNMODS@GPDGROUP.COM.

HOT WORK INCLUDED

NA	BASE GRINDING ONLY
X	BASE WELDING (AND GRINDING)
NA	AERIAL GRINDING ONLY
X	AERIAL WELDING (AND GRINDING)

PROJECT CONTACTS:

1. CROWN PROJECT MANAGER:
JOHN MCGEE
(704) 877-8397
JOHN.MCGEE@CROWNCASTLE.COM
6325 ARDREY KELL ROAD, SUITE 600
CHARLOTTE, NC 28277

2. ENGINEER OF RECORD:
GPD ENGINEERING AND ARCHITECTURE PROFESSIONAL CORPORATION
520 SOUTH MAIN STREET, SUITE 2531
AKRON, OH 44311
(330) 572-2100
FOR QUESTIONS PLEASE EMAIL:
CROWNMODS@GPDGROUP.COM

DRAWINGS INCLUDED

SHEET NUMBER	DESCRIPTION
S-1	TITLE PAGE
S-2	MODIFICATION INSPECTION CHECKLIST
S-3	GENERAL NOTES
S-4	TOWER ELEVATION
S-5	TOWER SECTIONS
S-6	ADDITIONAL SECTIONS
S-7	ADDITIONAL SECTIONS
S-8	ADDITIONAL SECTIONS
S-9	ADDITIONAL SECTIONS
S-10	ADDITIONAL SECTIONS

TOWER INFORMATION

TOWER MAPPING:	DOC ID #: 3487587
TOWER HEIGHT / TYPE:	150 FT MODIFIED CONCEALMENT TOWER
TOWER LOCATION:	LAT: 41° 22' 18.91"
DATUM: (NAD 1983)	LONG: -71° 49' 58.01"
	ELEV: 7 FT AMSL
STRUCTURAL DESIGN DRAWING:	CCI/WO #: 2002920
STRUCTURAL ANALYSIS REPORT:	GPD/WO #: 1977764
STRUCTURAL ANALYSIS DATE:	6/28/2021
CCI ORDER NUMBER:	479826 REV #: 9
CCISITES DOCUMENT ID:	9862531

CODE COMPLIANCE

GOVERNING CODES:	TIA-222-H & 2018 CONNECTICUT STATE BUILDING CODE
WIND SPEEDS:	140 MPH 3 SECOND GUST
	50 MPH 3 SECOND GUST (W/ ICE)
ICE THICKNESS:	1-1/2"
STRUCTURE CLASS:	II
EXPOSURE CATEGORY:	C
TOPO CATEGORY:	1

NO.	DATE	DESCRIPTION	BY

REVISIONS

STATE OF CONNECTICUT
CHRISTOPHER J. SCHEKS
No. 30026
LICENSED PROFESSIONAL ENGINEER

8/23/21

GPD Engineering and Architecture Professional Corporation
520 South Main Street, Suite 2531
Akron, OH 44311
330.572.2100 Fax 330.572.2102

GPD PROJECT NUMBER
2021777.828257.06

SITE NAME: STONINGTON
BU NUMBER: 828257
WO NUMBER: 2002920
SITE ADDRESS:
82 MECHANIC STREET
PAWCATUCK, CT 06379
NEW LONDON COUNTY, USA

ENG/QA BY: BK DATE: 8/23/21
DFT BY: MJS DATE: 8/23/21
DFT/QA BY: DP DATE: 8/23/21
APRV'D BY: CJS DATE: 8/23/21
SCALE: N.T.S.

TITLE PAGE

S-1 REV 0

CED-FRM-10354 MI CHECKLIST

REQUIRED	REPORT ITEM	APPLICABLE CROWN DOC #	BRIEF DESCRIPTION
PRE-CONSTRUCTION			
X	MI CHECKLIST DRAWING	CED-SOW-10007	THIS CHECKLIST SERVES AS A GUIDELINE FOR THE REQUIRED CONSTRUCTION DOCUMENTS AND INSPECTIONS FOR THIS MODIFICATION
X	EOR APPROVED SHOP DRAWINGS	CED-SOW-10007	ONCE THE PRE-MODIFICATION MAPPING IS COMPLETE AND PRIOR TO FABRICATION, THE CONTRACTOR SHALL PROVIDE DETAILED ASSEMBLY DRAWINGS AND/OR SHOP DRAWINGS. THESE ARE TO INCLUDE, BUT ARE NOT LIMITED TO, A VISUAL LAYOUT OF NEW REINFORCEMENT, EXISTING REINFORCEMENT CONFIGURATION, PORTHOLES, MOUNTS, STEP PEGS, SAFETY CLIMBS AND ANY OTHER MISCELLANEOUS ITEMS WHICH MAY AFFECT SUCCESSFUL INSTALLATION OF MODIFICATIONS ON THE TOWER. THESE DRAWINGS SHALL BE SUBMITTED TO THE EOR FOR APPROVAL. SHOP DRAWING SUBMISSION SHALL INCLUDE THE EOR RFI FORM DETAILING ANY CHANGES FROM THE ORIGINAL DESIGN
X	FABRICATION INSPECTION	CED-SOW-10007	A LETTER FROM THE FABRICATOR, STATING THAT THE WORK WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THE CONTRACT DOCUMENTS, SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	FABRICATOR CERTIFIED WELD INSPECTION	CED-SOW-10007 CED-STD-10069	A CWI SHALL INSPECT ALL WELDING PERFORMED ON STRUCTURAL MEMBERS DURING FABRICATION. A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	MATERIAL TEST REPORTS (MTR)	CED-SOW-10007	MATERIAL TEST REPORTS SHALL BE PROVIDED FOR MATERIAL USED AS REQUIRED PER SECTION 9.2.5 OF CED-SOW-10007. MTRS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	FABRICATOR NDE INSPECTION REPORT	CED-SOW-10066 CED-STD-10069	CRITICAL SHOP WELDS THAT REQUIRE TESTING ARE NOTED ON THESE CONTRACT DRAWINGS. A CERTIFIED NDT INSPECTOR SHALL PERFORM NON-DESTRUCTIVE EXAMINATION AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	NDE OF MONOPOLE BASE PLATE	ENG-SOW-10033	A NDE OF THE POLE TO BASE PLATE CONNECTION IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	PACKING SLIPS	CED-SOW-10007	PACKING/SHIPPING LIST FOR ALL MATERIAL USED DURING CONSTRUCTION OF THE MODIFICATION
ADDITIONAL TESTING AND INSPECTIONS:			
NA			
CONSTRUCTION			
NA	FOUNDATION INSPECTIONS	CED-SOW-10144	A VISUAL OBSERVATION OF THE EXCAVATION AND REBAR SHALL BE PERFORMED BEFORE PLACING THE CONCRETE. A VISUAL OBSERVATION OF THE REBAR SHALL BE PERFORMED BEFORE PLACING THE EPOXY. A SEALED WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	CONCRETE COMP. STRENGTH AND SLUMP TEST	CED-SOW-10144	THE CONCRETE MIX DESIGN, SLUMP TEST, AND COMPRESSIVE STRENGTH TESTS SHALL BE PROVIDED AS PART OF THE FOUNDATION REPORT.
NA	EARTHWORK	CED-SOW-10144	FOUNDATION SUB-GRADES SHALL BE INSPECTED AND APPROVED BY AN APPROVED FOUNDATION INSPECTOR AND RESULTS INCLUDED AS PART OF THE FOUNDATION REPORT.
NA	MICROPILE/ROCK ANCHOR	CED-SOW-10144	MICROPILES/ROCK ANCHORS SHALL BE INSPECTED BY THE FOUNDATION INSPECTION VENDOR AND SHALL BE INCLUDED AS PART OF THE FOUNDATION INSPECTION REPORT, ADDITIONAL TESTING AND/OR INSPECTION REQUIREMENTS ARE NOTED IN THESE CONTRACT DOCUMENTS.
X	POST-INSTALLED ANCHOR ROD VERIFICATION	CED-SOW-10007 CED-FRM-10358	POST INSTALLED ANCHOR ROD VERIFICATION SHALL BE PERFORMED IN ACCORDANCE WITH CROWN REQUIREMENTS AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	BASE PLATE GROUT VERIFICATION	ENG-STD-10323	THE GENERAL CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE MI INSPECTOR THAT CERTIFIES THAT THE GROUT WAS REMOVED AND/OR INSTALLED IN ACCORDANCE WITH CROWN REQUIREMENTS FOR INCLUSION IN THE MI REPORT.
X	FIELD CERTIFIED WELD INSPECTION	CED-SOW-10066 CED-STD-10069	A CROWN APPROVED CERTIFIED WELD INSPECTOR SHALL INSPECT AND TEST FIELD WELDS, FOLLOWING ALL PROCEDURES SPECIFIED IN CROWN STANDARD DOCUMENTS APPLICABLE TO WELD INSPECTIONS. A REPORT SHALL BE PROVIDED. NDE OF FIELD WELDS SHALL BE PERFORMED AS REQUIRED BY CROWN STANDARDS AND CONTRACT DOCUMENTS. THE NDE REPORT SHALL BE INCLUDED IN THE CWI REPORT.
X	ON-SITE COLD GALVANIZING VERIFICATION	ENG-STD-10149 CED-FRM-10358	THE GENERAL CONTRACTOR SHALL PROVIDE WRITTEN AND PHOTOGRAPHIC DOCUMENTATION TO THE MI INSPECTOR VERIFYING THAT ANY ON-SITE COLD GALVANIZING WAS APPLIED PER MANUFACTURER SPECIFICATIONS AND APPLICABLE STANDARDS.
NA	TENSION TWIST AND PLUMB	CED-PRC-10182 CED-STD-10261	THE GENERAL CONTRACTOR SHALL PROVIDE A REPORT IN ACCORDANCE WITH APPLICABLE STANDARDS DOCUMENTING TENSION TWIST AND PLUMB.
X	GC AS-BUILT DRAWINGS	CED-SOW-10007	THE GENERAL CONTRACTOR SHALL SUBMIT A LEGIBLE COPY OF THE ORIGINAL DESIGN DRAWINGS EITHER STATING "INSTALLED AS DESIGNED" OR NOTING ANY CHANGES THAT WERE REQUIRED AND APPROVED BY THE ENGINEER OF RECORD. EOR/RFI FORMS APPROVING ALL CHANGES SHALL BE SUBMITTED
ADDITIONAL TESTING AND INSPECTIONS:			
POST-CONSTRUCTION			
X	CONSTRUCTION COMPLIANCE LETTER	CED-SOW-10007 CED-FRM-10358	A LETTER FROM THE GENERAL CONTRACTOR STATING THAT THE WORKMANSHIP WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THESE CONTRACT DRAWINGS, INCLUDING LISTING ADDITIONAL PARTIES TO THE MODIFICATION PROCESS.
X	POST-INSTALLED ANCHOR ROD PULL TESTS	CED-PRC-10119	POST-INSTALLED ANCHOR RODS SHALL BE TESTED BY A CROWN APPROVED PULL TEST INSPECTOR AND A REPORT SHALL BE PROVIDED INDICATING TESTING RESULTS.
X	PHOTOGRAPHS	CED-SOW-10007	PHOTOGRAPHS SHALL BE SUBMITTED TO THE MI. PHOTOS SHALL DOCUMENT ALL PHASES OF THE CONSTRUCTION. THE PHOTOS SHALL BE ORGANIZED IN A MANNER THAT EASILY IDENTIFIES THE EXACT LOCATION OF THE PHOTO.
NA	BOLT HOLE INSTALLATION VERIFICATION REPORT	CED-SOW-10007	THE MI INSPECTOR SHALL VERIFY THE INSTALLATION AND TIGHTNESS 10% OF ALL NON PRE-TENSIONED BOLTS INSTALLED AS PART OF THE MODIFICATION. THE MI INSPECTOR SHALL LOOSEN THE NUT AND VERIFY THE BOLT HOLE SIZE AND CONDITION. THE MI REPORT SHALL CONTAIN THE COMPLETED BOLT INSTALLATION VERIFICATION REPORT, INCLUDING THE SUPPORTING PHOTOGRAPHS.
X	PUNCH LIST DEVELOPMENT AND CORRECTION DOCUMENTATION	CED-PRC-10283 CED-FRM-10285	FINAL PUNCH LIST INDICATING ALL NONCONFORMANCE(S) IDENTIFIED AND THE FINAL RESOLUTION/APPROVAL.
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)	CED-SOW-10007	THE MI INSPECTOR SHALL OBSERVE AND REPORT ANY DISCREPANCIES BETWEEN THE CONTRACTOR'S REDLINE DRAWING AND THE ACTUAL COMPLETED INSTALLATION.
ADDITIONAL TESTING AND INSPECTIONS:			

THE MI CHECKLIST SHALL BE REVIEWED PRIOR TO THE START OF CONSTRUCTION. ALL PARTIES TO THE MODIFICATION SHALL UNDERSTAND CROWN REQUIREMENTS AND INSPECTION/DOCUMENTATION THAT IS APPLICABLE TO THE SCOPE OF WORK THEY ARE PERFORMING. ERRORS ON THE MI CHECKLIST SHALL BE BROUGHT TO THE ATTENTION OF THE CROWN POC AND EOR AS SOON AS POSSIBLE.

MODIFICATION INSPECTION NOTES

GENERAL

THE MI IS AN ON-SITE VISUAL AND HANDS-ON INSPECTION OF TOWER MODIFICATIONS INCLUDING A REVIEW OF CONSTRUCTION REPORTS AND ADDITIONAL PERTINENT DOCUMENTATION PROVIDED BY THE GENERAL CONTRACTOR (GC), AS WELL AS ANY INSPECTION DOCUMENTS PROVIDED BY 3RD PARTY INSPECTORS. THE MI IS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS; IN ACCORDANCE WITH APPLICABLE CROWN STANDARDS; AND AS DESIGNED BY THE ENGINEER OF RECORD (EOR).

NO DOCUMENT, CODE OR POLICY CAN ANTICIPATE EVERY SITUATION THAT MAY ARISE. ACCORDINGLY, THIS CHECKLIST IS INTENDED TO SERVE AS A SOURCE OF GUIDING PRINCIPLES IN ESTABLISHING GUIDELINES FOR MODIFICATION INSPECTION.

THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, AND THE MI INSPECTOR DOES NOT TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES. THE MI INSPECTOR SHALL INSPECT AND NOTE CONFORMANCE/NONCONFORMANCE AND PROVIDE TO THE CROWN POINT OF CONTACT (CROWN POC) FOR EVALUATION.

ALL MI'S SHALL BE CONDUCTED BY A CROWN APPROVED MI INSPECTOR, WORKING FOR A CROWN APPROVED MI VENDOR. SEE CROWN CED-LST-10173, "APPROVED MI VENDORS".

TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PURCHASE ORDER (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 THE GC AND/OR INSPECTOR SHALL CONTACT THE CROWN POINT OF CONTACT (CROWN POC).

REFER TO CROWN CED-SOW-10007, "MODIFICATION INSPECTION SOW", FOR FURTHER DETAILS AND REQUIREMENTS.

SERVICE LEVEL COMMITMENT

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

- THE GC SHALL PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLY 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
- THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY MINOR 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.

REQUIRED PHOTOS

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

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

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

THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS, FOR A COMPLETE LIST OF PHOTOS SEE CROWN DOCUMENT # CED-SOW-10007.

NO.	DATE	DESCRIPTION	BY

REVISIONS

STATE OF CONNECTICUT
CHRISTOPHER J. SCHEKS
No. 30026
PROFESSIONAL ENGINEER

8/23/21

GPD Engineering and Architecture Professional Corporation
520 South Main Street, Suite 2531
Akron, OH 44311
330.572.2100 Fax 330.572.2102

GPD PROJECT NUMBER
2021777.828257.06

SITE NAME: STONINGTON

BU NUMBER: 828257

WO NUMBER: 2002920

SITE ADDRESS:
82 MECHANIC STREET
PAWCATUCK, CT 06379
NEW LONDON COUNTY, USA

ENG/QA BY: BK	DATE: 8/23/21
DFT BY: MJS	DATE: 8/23/21
DFT/QA BY: DP	DATE: 8/23/21
APRV'D BY: CJS	DATE: 8/23/21

SCALE: N.T.S.

MODIFICATION INSPECTION CHECKLIST

S-2

REV 0

GENERAL NOTES:

1. The General Contractor (GC) shall reference CED-STD-10159, "Tower Modification Construction Specifications", as a continuation of the following General Notes. The GC shall keep a copy of this document with the Structural Design Drawings (SDD) at all times, and shall ensure that all Contractor Personnel are aware of the information enclosed within the General Notes and CED-STD-10159.
2. The Contract Documents are the property of Crown Castle (Crown). They are provided to the GC and its Lower Tier Contractors and material suppliers for the limited purpose of use in completing the Work for this Site, and shall be kept in strict confidence and not disclosed to any third parties. The Contract Documents shall not be used for any other purpose whatsoever without the prior written consent of Crown.
3. Detail drawings, including notes and tables, shall govern over general notes and typical details. Contact the Crown Point of Contact (POC) and Engineer of Record (EOR) for clarification as needed.
4. Do not scale drawings.
5. Any Work performed without a prefabrication mapping is done at the risk of the GC and/or fabricator. All dimensions of existing structural elements are assumed based on the available documentation and are preliminary until field-verified by the GC, unless noted otherwise (UNO). Where discrepancies are found, GC shall contact the Crown POC and EOR through RFI.
6. For this analysis and modification, the tower has been assumed to be in good condition without any structural defects, UNO. If the GC discovers any indication of an existing structural defect, contact the Crown POC and EOR immediately.
7. 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 GC responsible for the execution of the Work contained herein, and shall meet ANSI/ASSE A10.48 (latest edition); federal, state, and local regulations; and any applicable industry consensus standards related to the construction activities being performed. All rigging plans shall adhere to ANSI/ASSE A10.48 (latest edition) and Crown standard CED-STD-10253, "Rigging Program", including the required involvement of a qualified engineer for class IV construction to certify the supporting structure(s) in accordance with the ANSI/TIA-322 (latest edition).
8. The structural integrity of the modification design extends to the complete condition only. The GC must be cognizant that the removal of any structural component of an existing tower has the potential to cause the partial or complete collapse of the structure. All necessary precautions must be taken to ensure structural integrity, including, but not limited to, engineering assessment of construction stresses with installation maximum wind speed and/or temporary bracing and shoring.
9. Aerial and underground utilities and facilities may or may not be shown on the drawings. The GC shall take every precaution to preserve and protect these items, which may include aerial or underground power lines, telephone lines, water lines, sewer lines, cable television facilities, pipelines, structures and other public and private improvements within or adjacent to the Work area. The responsibility for determining the actual on-site location of these items shall rest exclusively with the GC.
10. All manufacturer's hardware assembly instructions shall be followed, UNO. Conflicting notes shall be brought to the attention of the EOR and the Crown POC.
11. The GC shall fabricate all required items per the materials specified below, UNO on the detail drawing sheets. If the GC finds for any component that the materials have not been clearly specified, the GC shall submit an RFI to the EOR to confirm the required material.

    All structural elements shall be new and shall conform to the following requirements, UNO:

    Monopoles:
    - Structural shapes and plates: ASTM A572 Grade 65 (FY = 65 KSI)
    - Welding electrodes, SMAW: E80XX
    - Welding electrodes, FCAW: E8XT-XX

    Self-Support and Guyed Towers:
    - Structural shapes and plates: ASTM A572 Grade 50 (FY = 50 KSI)
    - Welding electrodes, SMAW: E70XX
    - Welding electrodes, FCAW: E7XT-XX

    All tower types:
    - Steel angle: ASTM A572 Grade 50 (FY = 50 KSI)
    - Solid rod: ASTM A36 (FY = 36 KSI)
    - Pipe/tube (round): ASTM A500 Grade C (FY = 46 KSI)
    - Pipe/tube (square): ASTM A500 Grade C (FY = 50 KSI)
    - Bolts: ASTM F3125 Grade A325 Type 1
    - U-bolts: ASTM A307 Grade A, or SAE J429 Grade 2
    - Nuts: ASTM A563 Grade DH
    - Washers: ASTM F436 Type 1
    - Guy Wires: ASTM A475 Grade EHS
    - Bridge Strand: ASTM A586 Grade 1
12. After fabrication, hot-dip galvanize all steel items, UNO. Galvanize per ASTM A123, ASTM A153/A153M, or ASTM A653 G90, as applicable. ASTM A490 bolts shall not be hot-dip galvanized, but shall instead be coated with Magni 565 or EOR approved equivalent, per ASTM F2833.
13. Contractor Personnel shall not drill holes in any new or existing structural members, other than those drilled holes shown on structural drawings, without the approval of the EOR.
14. For a list of Crown-approved cold galvanizing compounds, refer to ENG-STD-10149, “Tower Protective Coatings Guidelines”.
15. All exposed structural steel as the result of this scope of Work including welds (after final inspection of the weld by the CWI), field drilled holes, and shaft interiors (where accessible), shall be cleaned and two (2) coats cold galvanizing shall be applied by brush in accordance with ENG-STD-10149, “Tower Protective Coatings Guidelines”. Photo documentation is required to be submitted to the MI Inspector.
16. If removal of existing modifications is required per the modification scope, the GC shall clean and cold galvanize any existing empty bolt holes, UNO. If additional unexpected, oversized, or slotted holes are found, the GC shall contact the EOR and Crown POC for guidance prior to proceeding with the modifications.
17. All Work involving base plate grout scope items or resulting in disturbance of base plate grout shall reference ENG-STD-10323, "Base Plate Grout", and shall follow any Base Plate Grout Removal Notes contained herein.
18. All tower grounding affected by the Work shall be repaired or replaced in accordance with OPS-STD-10090, "Tower Grounding", and OPS-BUL-10133, "Grounding Repair Recommendation".
19. If scope of modification requires removal or covering of tower ID tag, the tag must be replaced.
20. Any hardware removed from the existing tower shall be replaced with new hardware of equal size and quality, UNO. No existing fasteners shall be reused.
21. All joints using ASTM A325 or A490 bolts, U-bolts, V-bolts, and threaded rods shall be snug tightened, UNO.
22. A nut locking device shall be installed on all proposed and/or replaced snug tightened ASTM A325 or A490 bolts, U-bolts, V-bolts, and threaded rods.
23. All joints are bearing type connections UNO. If no bolt length is given in the Bill of Materials, the connection may include threads in the shear planes, and the GC is responsible for sizing the length of the bolt.
24. Blind bolts shall be installed per the installation specifications on the corresponding Approved Fastener sheets contained in CED-CAT-10300, "Monopole Standard Drawings and Approved Reinforcement Components".
25. If ASTM A325 or A490 bolts, and/or threaded rods are specified to be pre-tensioned, these shall be installed and tightened to the pretensioned condition according to the requirements of the RCSC Specification for Structural Joints Using ASTM High Strength Bolts.
26. All proposed and/or replaced bolts shall be of sufficient length such that the end of the bolt be at least flush with the face of the nut. It is not permitted for the bolt end to be below the face of the nut after tightening is completed.

NO.	DATE	DESCRIPTION	BY

REVISIONS

STATE OF CONNECTICUT
CHRISTOPHER J. SCHEKS
No. 30026
LICENSED
PROFESSIONAL ENGINEER

8/23/21

GPD Engineering and Architecture Professional Corporation
520 South Main Street, Suite 2531
Akron, OH 44311
330.572.2100 Fax 330.572.2102

GPD PROJECT NUMBER
2021777.828257.06

SITE NAME: STONINGTON

BU NUMBER: 828257

WO NUMBER: 2002920

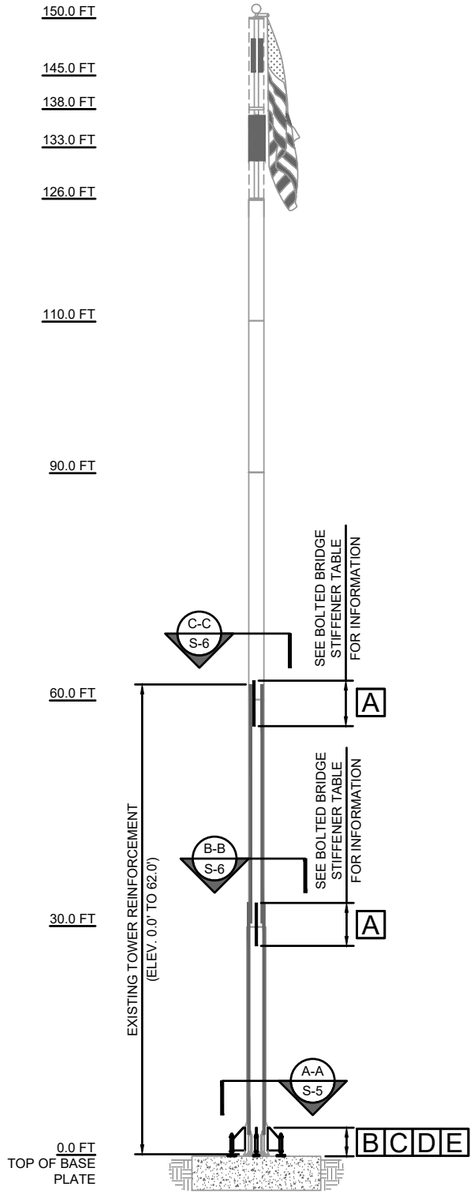
SITE ADDRESS:
82 MECHANIC STREET
PAWCATUCK, CT 06379
NEW LONDON COUNTY, USA

ENG/QA BY: BK	DATE: 8/23/21
DFT BY: MJS	DATE: 8/23/21
DFT/QA BY: DP	DATE: 8/23/21
APRV'D BY: CJS	DATE: 8/23/21

SCALE: N.T.S.

GENERAL NOTES

S-3 REV 0



POLE ELEVATION

POLE MODIFICATION SCHEDULE

	ELEVATION (FT)	MODIFICATION	REFERENCE SHEET
A	56.5 - 62.5	INSTALL NEW FLAT PLATE REINFORCEMENT.	S-6, S-7, & S-8
	27.5 - 32.83		S-6, S-7, & S-8
B	0.0 - 4.5	INSTALL NEW ANCHOR RODS WITH BRACKETS TO THE TOWER BASE.	S-5
C	0.0	RELOCATE EQUIPMENT AT THE BASE OF THE TOWER TO ALLOW FOR INSTALLATION OF NEW ANCHOR RODS. COORDINATE WITH TOWER OWNER.	S-5
D	0.0	REMOVE EXISTING TOP HEX NUTS FROM ANCHOR RODS AND PROVIDE CAULKING AROUND PERIMETER TO PREVENT WATER ENTRY	S-5
E	0.0	REMOVE AND RELOCATE EXISTING GROUNDING WIRE FOR INSTALLATION OF ANCHOR RODS	-
F	VARIES	PAINT NEW/ EXISTING MATERIAL IN MODIFIED REGIONS TO MATCH THE EXISTING TOWER FINISH.	-

FOR PARTS NOT DETAILED WITHIN THE DRAWING AND STARTING WITH "CCI-", SEE THE FOLLOWING CATALOG FOR DETAILS: CED-CAT-10300, MONOPOLE STANDARD DRAWINGS AND APPROVED REINFORCEMENT COMPONENTS.

PRIOR TO FABRICATION AND INSTALLATION, CONTRACTOR SHALL FIELD VERIFY ALL LENGTHS AND QUANTITIES GIVEN. LENGTH AND QUANTITIES PROVIDED ARE FOR QUOTING PURPOSES ONLY AND SHALL NOT BE USED FOR FABRICATION.

NOTE:

1. ALL EXISTING MATERIAL REMOVED FROM THE TOWER SHALL BE DISPOSED OF BY THE CONTRACTOR OFF SITE.

NOTES FOR CROWN (65 KSI) FLAT PLATES INCLUDING BOLTED BRIDGE STIFFENERS:

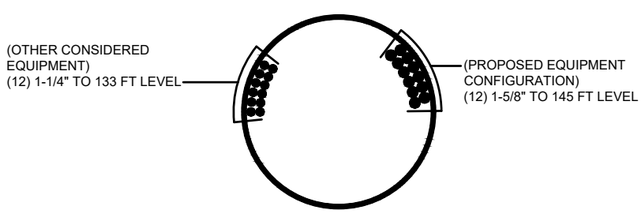
1. APPROVED FASTENERS MAY BE USED ON THIS PROJECT AS INDICATED IN THE FOLLOWING TABLE:

NEXGEN2	APPROVED	SPECIALTY FASTENERS	NA

   ORDERING INFORMATION AND INSTALLATION DETAILS FOR APPROVED FASTENERS CAN BE FOUND IN CED-CAT-10300.
2. ALL FLAT PLATE REINFORCEMENT IS TO BE INSTALLED CENTERED ON ITS DESIGNATED FLAT OR AZIMUTH, UNO, WITH A TOLERANCE FROM CENTER OF THE FLAT OR AZIMUTH AS FOLLOWS:

ALLOWABLE FLAT PLATE CENTERING TOLERANCE	3/8"

   GC SHALL REDLINE ALL DEVIATIONS FROM CENTER, INCLUDING THOSE WITHIN TOLERANCE.
3. GC SHALL REPLACE ANY STEP BOLTS AND STEP BOLT CLIPS THAT INTERFERE WITH THE INSTALLATION OF FLAT PLATE. REFERENCE CED-CAT-10300 FOR APPROVED OPTIONS. CCI-SB-0100 IS THE DEFAULT OPTION; OTHER OPTIONS MAY BE REQUIRED FOR FIT-UP.
4. FOR PLATES STARTING AT 6", THE BOTTOM OF THE FLAT PLATE SHALL BEGIN AT 6" +/- 1". FOR SINGLE PLATES OR MULTIPLE PLATES SPLICED TOGETHER, THE BOTTOM OF THE FLAT PLATE RUN SHALL BEGIN AT THE PROPOSED ELEVATION +/- 3". FOR MULTIPLE PLATES SPLICED TOGETHER, THE TOP OF THE FLAT PLATE IS TO BE PLACED SUCH THAT THERE IS NO MORE THAN 3" DIFFERENCE BETWEEN THE ACTUAL OVERALL LENGTH OF THE SPAN AND THE PROPOSED OVERALL LENGTH OF THE SPAN, FROM THE BOTTOM OF THE BOTTOM PLATE TO THE TOP OF THE TOP PLATE.
5. SHIMS FOR MONOPOLE REINFORCEMENT MEMBER SHALL BE REQUIRED WHERE GAPS BETWEEN THE POLE SHAFT AND REINFORCING MEMBER EXIST AT FASTENER LOCATIONS. FOR INTERMEDIATE CONNECTIONS, THE MINIMUM SHIM LENGTH AND WIDTH SHALL BE THE WIDTH OF THE REINFORCING MEMBER. FOR TERMINATION CONNECTIONS, A CONTINUOUS SHIM PLATE (PREFERRED) OR EQUIVALENT INDIVIDUAL SHIM PLATES THE WIDTH OF THE REINFORCING MEMBER MAY BE USED. SHIM THICKNESSES SHALL BE NO LESS THAN 1/16". STACKING OF SHIMS IS PERMITTED. FINGER SHIMS AND HORSESHOE SHIMS ARE PERMITTED. SINGLE AND STACKED SHIMS IN BOLT TERMINATION REGIONS SHALL BE NO GREATER THAN A TOTAL OF ¼" WITHOUT EOR APPROVAL. SINGLE AND STACKED SHIMS AT INTERMEDIATE CONNECTIONS SHALL BE NO GREATER THAN A TOTAL OF 5/8" WITHOUT EOR APPROVAL.
6. SHIM MATERIAL SHALL BE STEEL GRADE A36 OR GREATER IF WELDED, UNO, AND SHALL REQUIRE MTR; IF SHIMS ARE NOT WELDED, THERE IS NO MINIMUM REQUIRED STEEL GRADE.
7. IF UNEXPECTED HOLES ARE FOUND IN A LOCATION WHERE FLAT PLATE IS PROPOSED TO BE INSTALLED, THE GC SHALL NOT PLACE NEW BOLT HOLES WITHIN A CENTER-TO-CENTER DISTANCE OF 3 TIMES THE DIAMETER OF THE LARGER OF THE TWO HOLES, WITHOUT EOR APPROVAL. EXISTING HOLES MAY INCLUDE BUT ARE NOT LIMITED TO EMPTY BOLT HOLES AND JACKING NUTS WITH CENTER HOLES.



COAX LAYOUT

MANUFACTURER POLE SPECIFICATIONS

TAPER:	ROUND
BASE PL STEEL:	ASTM A36
ANCHOR RODS:	1"Ø ASTM A687 (Fy=105 KSI)

BOLT COUNT BY LENGTH	
LENGTH	**QUANTITY**
SHORT	80
MEDIUM	0
LONG	28
TOTAL	108

MANUFACTURER SHAFT SECTION DATA

SHAFT SECTION	SHAFT SECTION	SECTION LENGTH (FT)	POLE THICKNESS (IN)	SECTION GRADE (KSI)	FLANGE PLATE GRADE (KSI)	LAP SPLICE (IN)	DIAMETER ACROSS FLATS OR OF ROUND SECTION (IN)	
							@TOP	@BOTTOM
1	ROUND	24.00	0.4650	42	36		10.75	10.75
2	ROUND	16.00	0.3750	42	36		24.00	24.00
3	ROUND	20.00	0.3750	42	36		24.00	24.00
4	ROUND	30.00	0.3750	42	36		24.00	24.00
5	ROUND	30.00	0.3750	42	36		24.00	24.00
6	ROUND	30.00	0.3750	42	36		30.00	30.00

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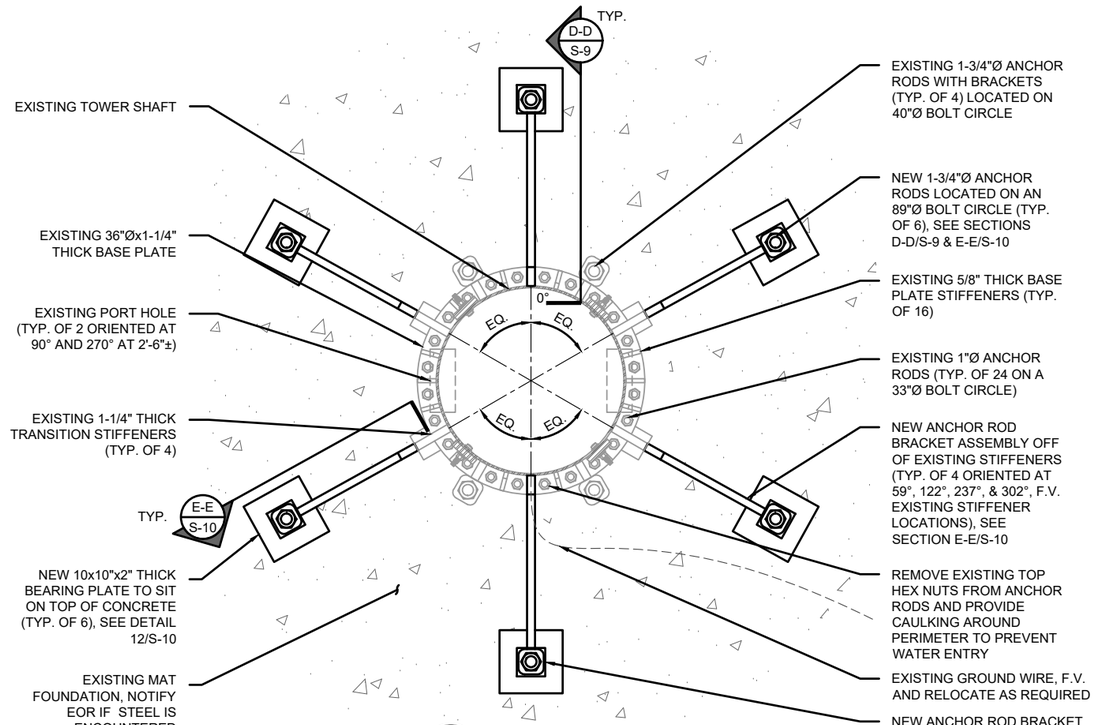
SCALE: N.T.S.

TOWER ELEVATION

S-4

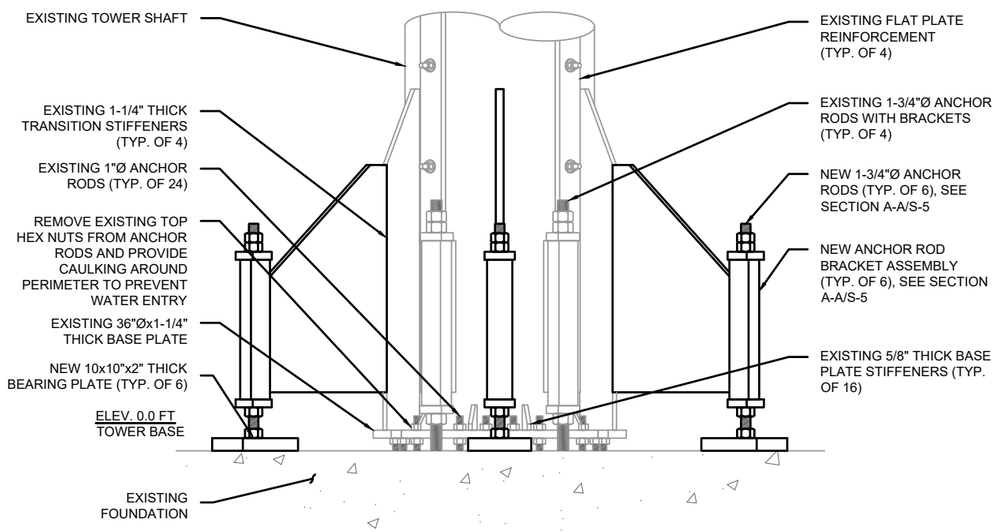
REV 0



A-A / S-5 TOWER SECTION

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

NOTE:
1. CONTRACTOR SHALL F.V. AND RELOCATE EXISTING EQUIPMENT AT BASE OF THE TOWER FOR INSTALLATION OF PROPOSED ANCHOR ROD BRACKETS, COORDINATE WITH TOWER OWNER.



1 / S-5 ELEVATION

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

NOTES:

1. ALL EXPOSED STRUCTURAL STEEL SHALL BE HOT-DIP GALVANIZED PER ASTM A153 / A153M OR A123, AS APPLICABLE. FIELD DRILLED OR CUT MATERIAL TO BE COATED WITH TWO BRUSH COATS OF CROWN APPROVED ZINC RICH PAINT IN ACCORDANCE WITH ENG-BUL-10149 *TOWER PROTECTIVE COATINGS BULLETIN.*

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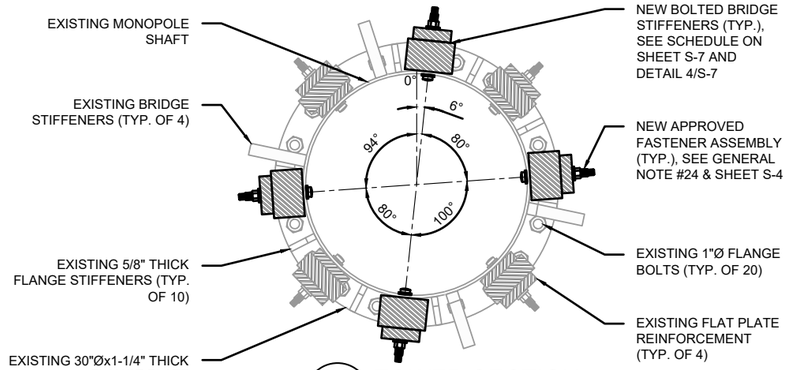
STATE OF CONNECTICUT
CHRISTOPHER J. SCHEKS
No. 30026
LICENSED PROFESSIONAL ENGINEER

8/23/21

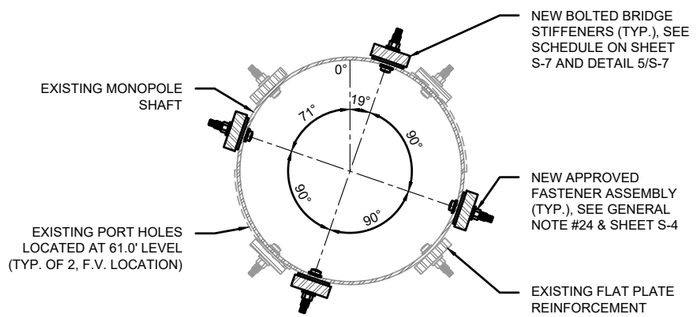
TOWER SECTIONS

S-5

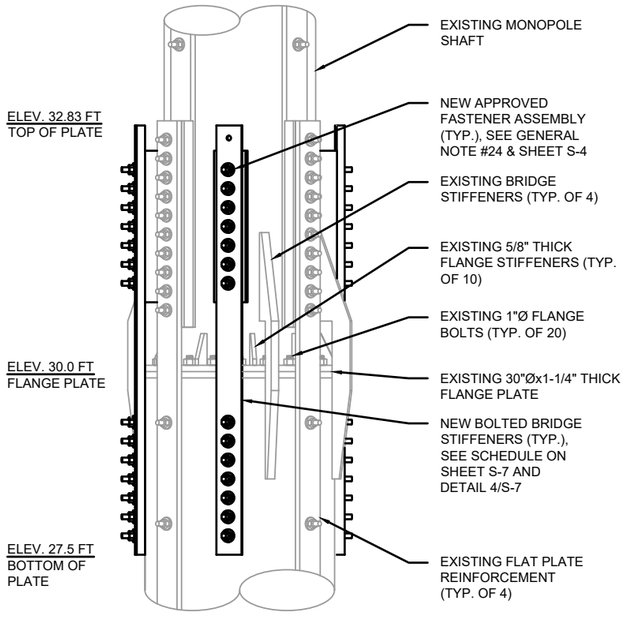
REV 0



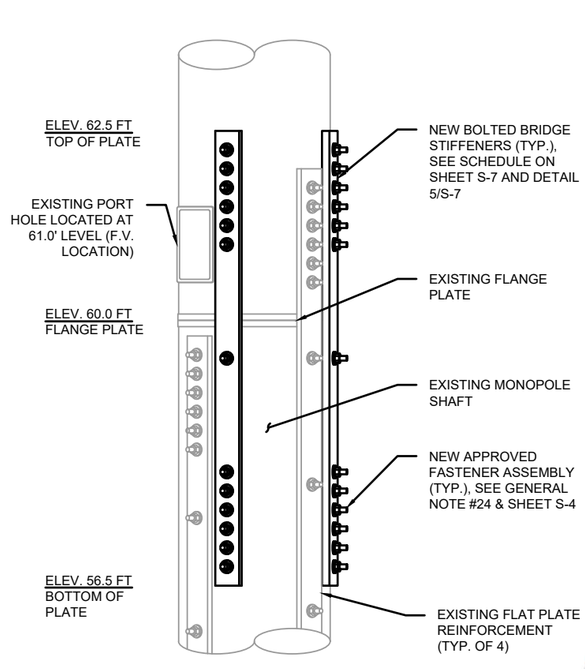
B-B TOWER SECTION
S-6
SCALE: 3/4" = 1'-0"



C-C TOWER SECTION
S-6
SCALE: 3/4" = 1'-0"



2 ELEVATION
S-6
SCALE: 1/2" = 1'-0"



3 ELEVATION
S-6
SCALE: 1/2" = 1'-0"

NOTES:

1. ALL EXPOSED STRUCTURAL STEEL SHALL BE HOT-DIP GALVANIZED PER ASTM A153 / A153M OR A123, AS APPLICABLE. FIELD DRILLED OR CUT MATERIAL TO BE COATED WITH TWO BRUSH COATS OF CROWN APPROVED ZINC RICH PAINT IN ACCORDANCE WITH ENG-BUL-10149 *TOWER PROTECTIVE COATINGS BULLETIN.*

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STATE OF CONNECTICUT
CHRISTOPHER J. SCHEKSNAYER
No. 30026
LICENSED PROFESSIONAL ENGINEER

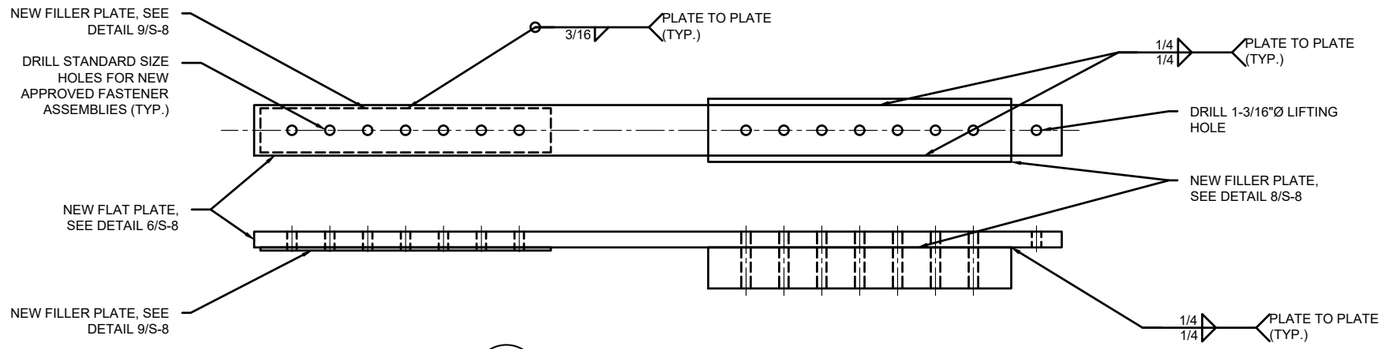
8/23/21

ADDITIONAL SECTIONS

S-6

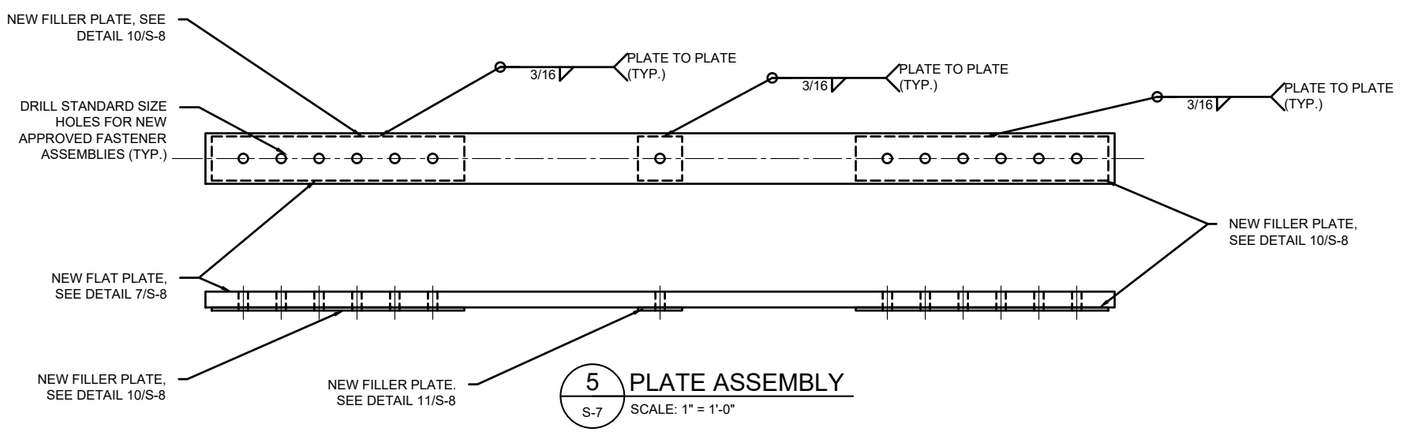
REV 0

BOLTED BRIDGE STIFFENER (65 KSI)									TOP FILLER PLATE					MIDDLE FILLER PLATE					BOTTOM FILLER PLATE					TOTALS		
BOTTOM ELEVATION	TOP ELEVATION	PART NUMBER	FLAT/ DEGREES	TERMINATION BOLTS (BOTTOM)	TERMINATION BOLTS (TOP)	MAX INTERMEDIATE BOLT SPACING	BOLT QTY PER PLATE	STEEL WEIGHT PER PLATE (BLACK)	W	THK	L	TOTAL BOLT HOLE QTY FOR FILLER PLATES	STEEL WEIGHT PER FILLER PLATE (BLACK)	W	THK	L	TOTAL BOLT HOLE QTY FOR FILLER PLATES	STEEL WEIGHT PER FILLER PLATE (BLACK)	W	THK	L	TOTAL BOLT HOLE QTY FOR FILLER PLATES	STEEL WEIGHT PER FILLER PLATE (BLACK)	TOTAL STEEL WEIGHT PER ASSEMBLY (BLACK)	TOTAL BOLT QTY	TOTAL STEEL WEIGHT (BLACK)
27.5'	32.83'	CCI-CFP-04012505.33* REF 4/S-7	94°, 174°, 274°, & 354°	7	7	1'-6"	14	90.7	5"	3.25"	24"	7	88.39	-	-	-	-	-	3.5"	0.25"	23"	7	5.70	184.79	56	739.16
56.5'	62.5'	CCI-CFP-04012506* REF 5/S-7	71°, 161°, 251°, & 341°	6	6	1'-6"	13	102.0	3.5"	0.25"	20"	6	4.96	3.5"	0.25"	3.5"	1	0.87	3.5"	0.25"	20"	6	4.96	112.79	52	451.16
									TOTAL			13		TOTAL			1		TOTAL			13		TOTAL	108	1190.32



4 S-7 PLATE ASSEMBLY
SCALE: 1" = 1'-0"

NOTES
1. DETAIL IS TYPICAL FOR THE BOLTED BRIDGE STIFFENER ASSEMBLIES ORIENTED AT 94°, 174°, 274°, & 354° FROM 27.5' TO 32.83'



5 S-7 PLATE ASSEMBLY
SCALE: 1" = 1'-0"

NOTES
1. DETAIL IS TYPICAL FOR THE BOLTED BRIDGE STIFFENER ASSEMBLIES ORIENTED AT 71°, 161°, 251°, & 341° FROM 56.5' TO 62.5'

NOTE.
1. ALL FILLER PLATES TO BE ASTM A572 GRADE 50 MATERIAL. MATERIAL TEST REPORTS ARE REQUIRED.
2. ALL EXPOSED STRUCTURAL STEEL SHALL BE HOT-DIP GALVANIZED PER ASTM A153 / A153MOR A123, AS APPLICABLE. FIELD DRILLED OR CUT MATERIAL TO BE COATED WITH TWO BRUSH COATS OF CROWN APPROVED ZINC RICH PAINT IN ACCORDANCE WITH ENG-BUL-10149 TOWER PROTECTIVE COATINGS BULLETIN.

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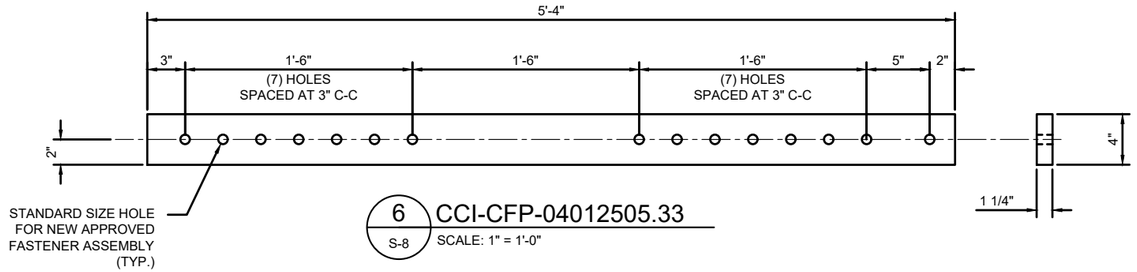
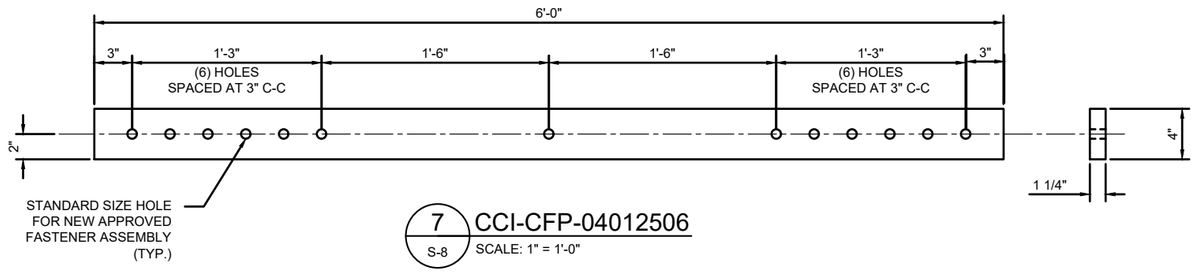
8/23/21

ADDITIONAL SECTIONS

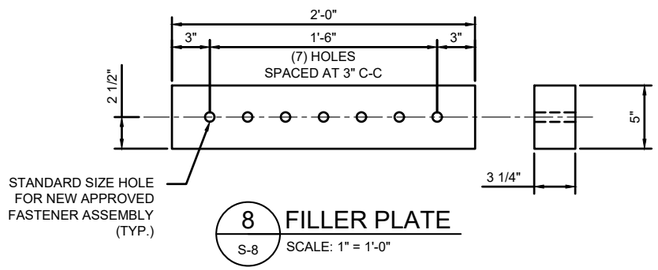
S-7 REV 0



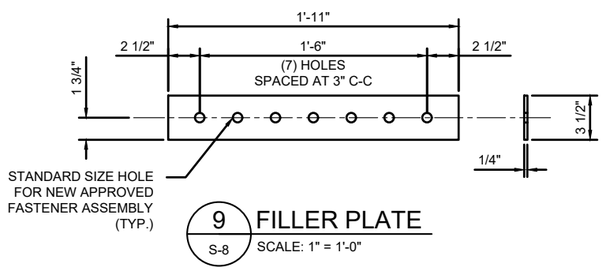
6 S-8 CCI-CFP-04012505.33
SCALE: 1" = 1'-0"



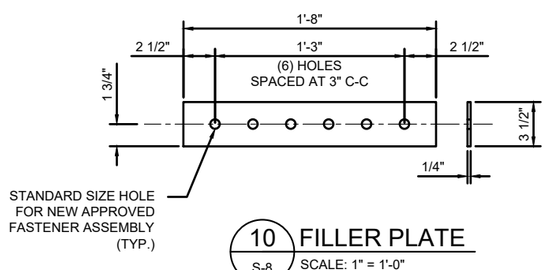
7 S-8 CCI-CFP-04012506
SCALE: 1" = 1'-0"



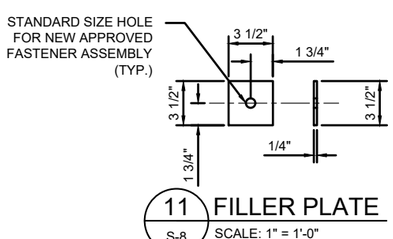
8 S-8 FILLER PLATE
SCALE: 1" = 1'-0"



9 S-8 FILLER PLATE
SCALE: 1" = 1'-0"



10 S-8 FILLER PLATE
SCALE: 1" = 1'-0"



11 S-8 FILLER PLATE
SCALE: 1" = 1'-0"

NOTE.
1. ALL FILLER PLATES TO BE ASTM A572 GRADE 50 MATERIAL. MATERIAL TEST REPORTS ARE REQUIRED.
2. ALL EXPOSED STRUCTURAL STEEL SHALL BE HOT-DIP GALVANIZED PER ASTM A153 / A153MOR A123, AS APPLICABLE. FIELD DRILLED OR CUT MATERIAL TO BE COATED WITH TWO BRUSH COATS OF CROWN APPROVED ZINC RICH PAINT IN ACCORDANCE WITH ENG-BUL-10149 TOWER PROTECTIVE COATINGS BULLETIN.

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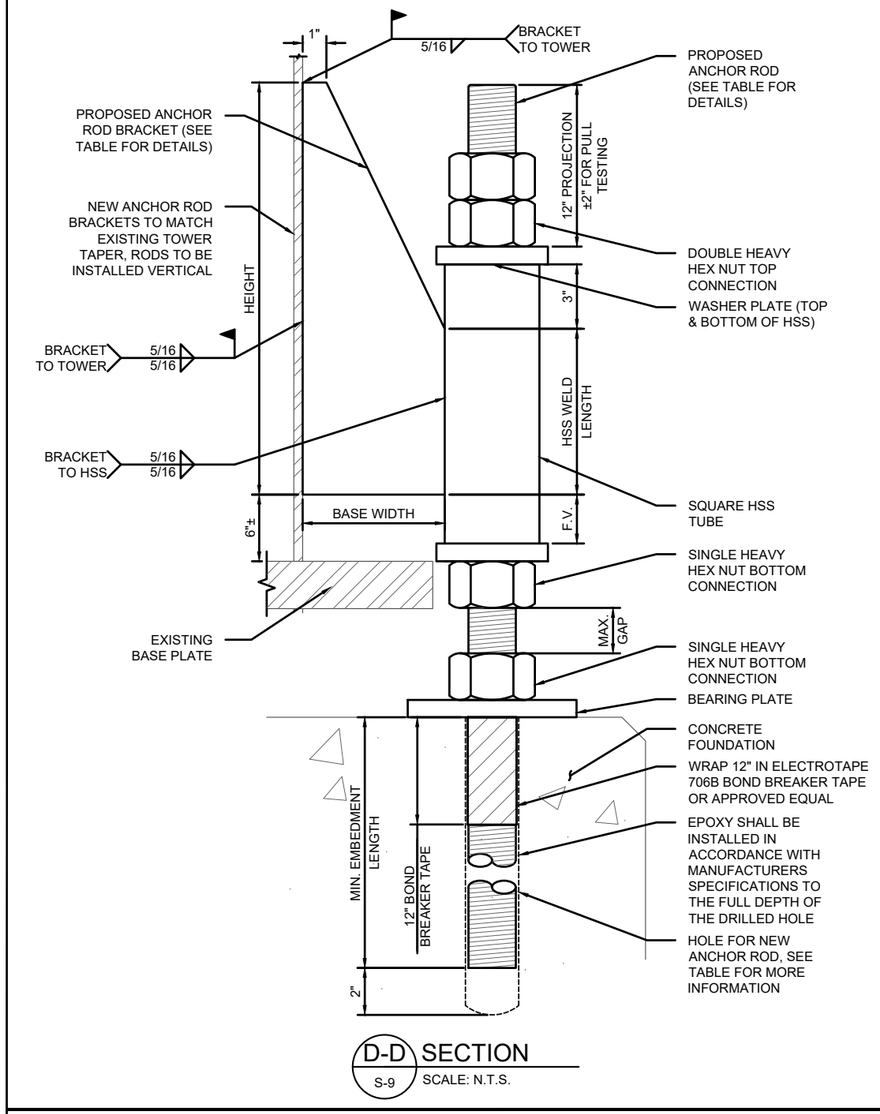
STATE OF CONNECTICUT
CHRISTOPHER J. SCHEKS
No. 30026
PROFESSIONAL ENGINEER
8/23/21

ADDITIONAL SECTIONS

S-8

REV 0



D-D / S-9 SECTION

SCALE: N.T.S.

ANCHOR ROD NOTES

1. THE GC SHALL ATTEMPT TO CENTER THE ROD IN THE BRACKET. HOWEVER, THE ROD MAY BE INSTALLED ANYWHERE WITHIN THE BRACKET SO LONG AS THE PLATE WASHER IS FULLY BEARING ON THE BRACKET.
2. REFERENCE CC APPROVED COMPONENTS (CURRENT VERSION) FOR ANCHOR ROD DIMENSIONS.
3. RODS MUST BE GALVANIZED FROM THE TOP OF THE PROJECTION TO 15" BELOW THE CONCRETE SURFACE AT A MINIMUM.
4. CORED HOLES MUST BE MECHANICALLY ROUGHENED USING A CARBIDE HOLE ROUGHENER OR EQUIVALENT. BRUSHING WITH A NYLON OR WIRE BRUSH SHALL BE USED IN THE PROCESS OF HOLE CLEANING, BUT DOES NOT SATISFY THE HOLE ROUGHENING REQUIREMENT.
5. FOLLOW EPOXY MANUFACTURER'S RECOMMENDATIONS FOR HOLE CLEANING.
6. ALL HOLES MUST BE DRY PRIOR TO PLACING EPOXY.
7. FOLLOW EPOXY MANUFACTURER'S RECOMMENDATIONS REGARDING HANDLING OF THREADED ROD AND EPOXY, AS WELL AS ALL INSTALLATION INSTRUCTIONS AND REQUIREMENTS.
8. TAKE ALL MEASUREMENTS NECESSARY TO AVOID DAMAGING EXISTING REINFORCING BARS DURING CORING OPERATIONS. NOTIFY EOR IMMEDIATELY IF EXISTING REINFORCING BARS ARE ENCOUNTERED AND INTERFERE WITH PLACEMENT OF NEW ANCHORS. MINOR ADJUSTMENT TO PROPOSED LOCATION OF NEW ANCHORS MAY BE REQUIRED.
9. ONCE ALL RESIN AND GROUT HAVE CURED, NEW ANCHOR ROD REINFORCING SHALL BE TARGET TENSIONED TO THE VALUE LISTED IN THE TABLE ON THIS SHEET. SEE ENG-PRC-10119; PULL-OUT TESTING POST-INSTALLED ANCHOR RODS, FOR SPECIFICATIONS.
10. CONTRACTOR TO VERIFY THAT A PULL TEST IS ABLE TO BE PERFORMED USING THE ANCHOR ROD PROJECTION SHOWN.
11. WHEN COMPLETED WITH EPOXY INSTALLATION, THE TOP OF THE EPOXY SHALL BE EQUAL TO OR HIGHER THAN THE TOP OF THE FOUNDATION, SUCH THAT WATER IS NOT ABLE TO COLLECT IN THE ANNULAR AREA AROUND THE EXPOSED PORTION OF THE ANCHOR ROD.
12. CONTRACTOR SHALL INSTALL RODS AND BRACKETS AT LOCATIONS INDICATED ON DRAWINGS.
13. CONTRACTOR SHALL VERIFY THAT TOWER IS PLUMB PRIOR TO THE INSTALLATION OF ANY TOWER MODIFICATIONS.
14. PULL TESTING RESULTS SHALL BE SUPPLIED TO THE TOWER OWNER AND THE MODIFICATION INSPECTOR FOR REFERENCE IN THE POST INSTALLATION OBSERVATION REPORT.
15. INSTALLATION OF GROUT AND/OR BOTTOM NUT FLUSH TO BASE PLATE IS PROHIBITED PRIOR TO COMPLETION OF ANCHOR ROD PULL TEST.
16. THE ADHESIVE ANCHOR SYSTEM USED FOR POST-INSTALLED ANCHORAGE TO CONCRETE SHALL CONFORM TO THE MOST RECENTLY PUBLISHED ACI 355.4, ACCEPTANCE CRITERIA FOR QUALIFICATION OF POST-INSTALLED ADHESIVE ANCHORS IN CONCRETE AND COMMENTARY. THE ANCHOR SYSTEM SHALL BE AS LISTED WITHIN THE ANCHOR ROD SPECIFICATIONS OR AN ENGINEER APPROVED EQUAL MEETING ACI 355.4 AND THE MINIMUM BOND STRESS VALUES BELOW. BULK MIXED ADHESIVES ARE NOT PERMITTED.
17. THE ADHESIVE ANCHORS SELECTED FROM THE PARAGRAPH ABOVE SHALL BE SUPPLIED AS AN ENTIRE SYSTEM. THE SYSTEM SHALL INCLUDE, BUT NOT BE LIMITED TO, THE NEW ADHESIVE CARTRIDGE, A CLEAN MIXING NOZZLE, EXTENSION TUBE, A DISPENSING GUN, AND ALL MANUFACTURER RECOMMENDED SUPPLIES FOR PROPERLY CLEANING THE HOLE. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL EQUIPMENT REQUIRED FOR INSTALLATION OF THE ADHESIVE ANCHOR SYSTEM.
18. ANCHORAGE DESIGN IS IN ACCORDANCE WITH APPENDIX D OF ACI 318-11. FOR ADHESIVE ANCHORS, THE FOLLOWING MINIMUM VALUES FOR BOND STRESS WERE ASSUMED FOR THE DESIGN USING THE ABOVE ADHESIVE ANCHOR ASSEMBLIES:

    A. HILTI RE-500 V3 UNCRACKED CONCRETE BOND STRESS (BASED ON HAMMER DRILLING):
    T_{CR} = 1130 PSI
19. ANCHOR ROD THREADS SHALL BE UNC COARSE THREADS, UNLESS NOTED OTHERWISE. COMPATIBLE NUTS AND WASHERS SHALL BE FURNISHED WITH ALL THE ALL-THREAD ROD AND CONSIDERED PART OF THE ASSEMBLY. THE COST OF HARDWARE SHALL BE CONSIDERED INCIDENTAL TO THE ADHESIVE ANCHOR ASSEMBLY.
20. NUTS, WASHERS, AND OTHER HARDWARE USED WITH AN ALL-THREADED BAR ADHESIVE ANCHOR SYSTEM SHALL HAVE A MATERIAL OR AN ALLOY DESIGNATION THAT MATCHES THE ALL-THREAD MATERIAL/ALLOY. GALVANIZED ASSEMBLIES SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A153 CLASS C. ELECTROPLATE GALVANIZING IS NOT ACCEPTABLE. DISSIMILAR METAL ASSEMBLIES SHALL BE SEPARATED BY NYLON, EPDM, OR OTHER APPROVED NON-METALLIC WASHERS.
21. ADHESIVE ANCHORS SHALL BE INSTALLED BY QUALIFIED PERSONNEL TRAINED TO INSTALL ADHESIVE ANCHORS IN ACCORDANCE WITH THE SPECIFICATIONS. POST-INSTALLED ADHESIVE ANCHORS SHALL BE INSTALLED AND CLEANED IN ACCORDANCE WITH THE MANUFACTURERS PRINTED INSTALLATION INSTRUCTIONS (MPII).
22. INSTALLATION OF ADHESIVE ANCHORS HORIZONTALLY OR UPWARDLY INCLINED TO SUPPORT SUSTAINED TENSION LOADS SHALL BE PERFORMED BY PERSONNEL CERTIFIED BY THE ACI/CRSI ADHESIVE ANCHOR INSTALLER CERTIFICATION PROGRAM. THESE ANCHORS ARE DESIGNATED WITH A (CERT) AFTER THE ANCHOR CALL-OUT. THESE ANCHORS SHALL BE CONTINUOUSLY INSPECTED DURING INSTALLATION BY AN INSPECTOR SPECIALLY APPROVED FOR THAT PURPOSE BY THE BUILDING OFFICIAL.
23. THE INSTALLERS QUALIFICATIONS SHALL BE SUBMITTED AND APPROVED IN ACCORDANCE WITH THE SPECIFICATIONS.
24. INSTALLED ADHESIVE ANCHORS SHALL BE SECURELY FIXED IN-PLACE TO PREVENT DISPLACEMENT WHILE THE ADHESIVE CURES. UNLESS SHOWN OTHERWISE WITHIN THE DRAWINGS, ANCHORS SHALL BE INSTALLED PERPENDICULAR TO THE CONCRETE SURFACE. ANCHORS DISPLACED PRIOR TO ADHESIVE CURING SHALL BE CONSIDERED DAMAGED AND ARE THE RESPONSIBILITY OF THE CONTRACTOR.
25. REINFORCING BARS OR ALL-THREADED BARS SHALL NOT BE BENT AFTER BEING ADHESIVELY EMBEDDED IN HARDENED, SOUND CONCRETE, UNLESS PERMITTED BY THE ENGINEER.

ANCHOR ROD SPECIFICATIONS

CCI PART #	DIAMETER (IN.)	QUANTITY	MATERIAL	HOLE DIAMETER (IN.)	TARGET TENSION LOAD (KIPS)
CCI-AR-0175	1 3/4	2	A193 GR B7	2	111

EPOXY	HILTI RE-500 V3
EMBEDMENT DEPTH (IN.)[3]	46
INSTALLED LENGTH (IN.)[5]	89

BRACKET DIMENSIONS

HEIGHT (IN.)	BASE WIDTH (IN.)	BRACKET QUANTITY	PLATE THICKNESS (IN.)	HSS SIZE	HSS WELD LENGTH (IN.)	WASHER PLATE SIZE (IN.)	BEARING PLATE SIZE (IN.)	MAX. GAP (IN.)
48	27 1/2	2	1 1/4	4x4x1/2	18	4-1/2x4-1/2x1-1/4	10x10x2	5 1/4

NOTES:
1. ALL SIZES AND QUANTITIES SHALL BE VERIFIED PRIOR TO FABRICATION. CONTRACTOR IS REQUIRED TO PROVIDE FINAL SHOP DRAWINGS TO ENGINEER FOR APPROVAL.
2. ALL DIMENSIONS/MEASUREMENTS ARE SHOWN IN INCHES.
3. ALL CORE DRILLED HOLES SHALL BE MECHANICALLY ROUGHENED PRIOR TO INSTALLATION OF THE NEW ANCHOR RODS.
4. AFTER ANCHOR ROD PROOF TESTING IS COMPLETE, INSTALL NUTS TO SNUG TIGHT PLUS 1/4 TURN BEFORE INSTALLING SECOND NUT FOR TOP CONNECTION.
5. CONTRACTOR SHALL FIELD VERIFY THE TOTAL REQUIRED LENGTH PRIOR TO INSTALLATION.

NO.	DATE	DESCRIPTION	BY

REVISIONS

STATE OF CONNECTICUT
CHRISTOPHER J. SCHEKS
No. 30026
LICENSED PROFESSIONAL ENGINEER

8/23/21

GPD Engineering and Architecture Professional Corporation
520 South Main Street, Suite 2531
Akron, OH 44311
330.572.2100 Fax 330.572.2102

GPD PROJECT NUMBER
2021777.828257.06

SITE NAME: STONINGTON

BU NUMBER: 828257

WO NUMBER: 2002920

SITE ADDRESS:
82 MECHANIC STREET
PAWCATUCK, CT 06379
NEW LONDON COUNTY, USA

ENG/QA BY: BK DATE: 8/23/21

DFT BY: MJS DATE: 8/23/21

DFT/QA BY: DP DATE: 8/23/21

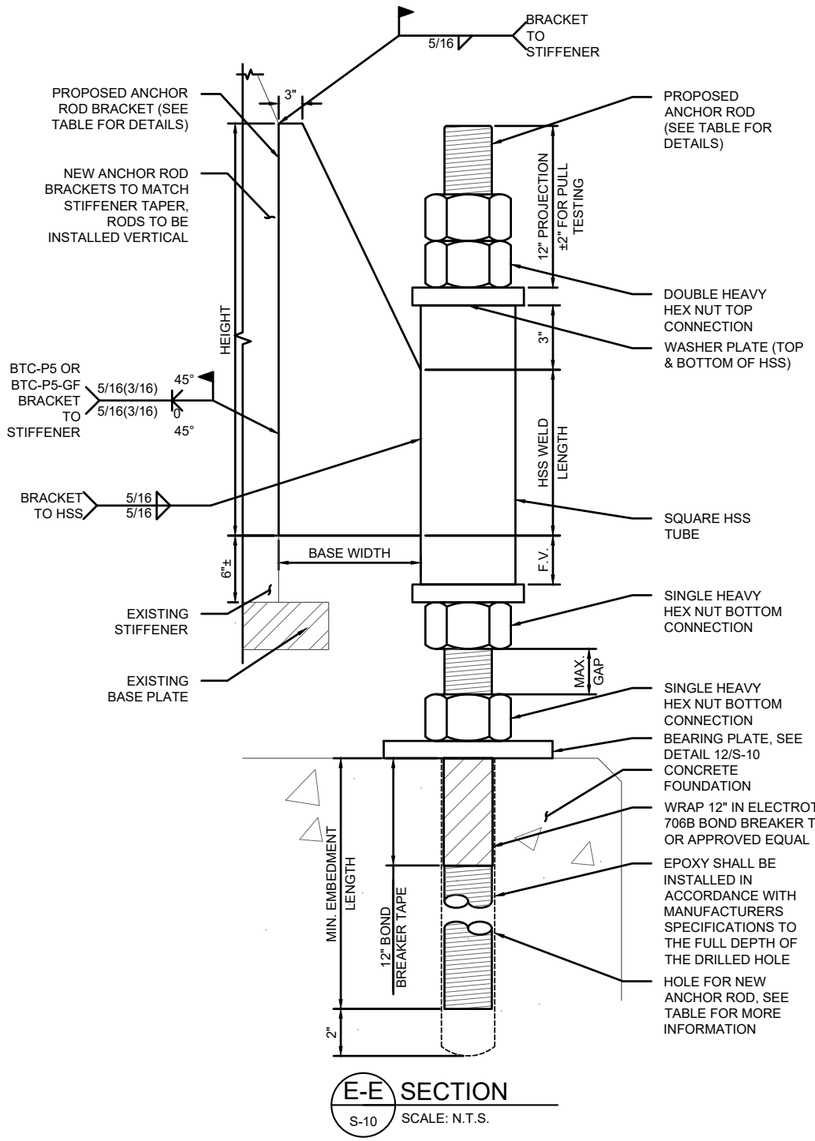
APRV'D BY: CJS DATE: 8/23/21

SCALE: N.T.S.

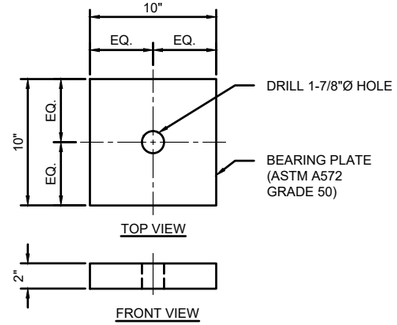
ADDITIONAL SECTIONS

S-9

REV 0



E-E SECTION
S-10
SCALE: N.T.S.



12 BEARING PLATE
S-10
SCALE: 1" = 1'-0"

ANCHOR ROD SPECIFICATIONS

CCI PART #	DIAMETER (IN.)	QUANTITY	MATERIAL	HOLE DIAMETER (IN.)	TARGET TENSION LOAD (KIPS)
CCI-AR-0175	1 3/4	4	A193 GR B7	2	111

EPOXY	HILTI RE-500 V3
EMBEDMENT DEPTH (IN.)[3]	46
INSTALLED LENGTH (IN.)[5]	89

BRACKET DIMENSIONS

HEIGHT (IN.)	BASE WIDTH (IN.)	BRACKET QUANTITY	PLATE THICKNESS (IN.)	HSS SIZE	HSS WELD LENGTH (IN.)	WASHER PLATE SIZE (IN.)	BEARING PLATE SIZE (IN.)	MAX. GAP (IN.)
36	21 1/2	4	1 1/4	4x4x1/2	18	4-1/2x4-1/2x1-1/4	10x10x2	5 1/4

NOTES:
1. ALL SIZES AND QUANTITIES SHALL BE VERIFIED PRIOR TO FABRICATION. CONTRACTOR IS REQUIRED TO PROVIDE FINAL SHOP DRAWINGS TO ENGINEER FOR APPROVAL.
2. ALL DIMENSIONS/MEASUREMENTS ARE SHOWN IN INCHES.
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4. AFTER ANCHOR ROD PROOF TESTING IS COMPLETE, INSTALL NUTS TO SNUG TIGHT PLUS 1/4 TURN BEFORE INSTALLING SECOND NUT FOR TOP CONNECTION.
5. CONTRACTOR SHALL FIELD VERIFY THE TOTAL REQUIRED LENGTH PRIOR TO INSTALLATION.

NO.	DATE	DESCRIPTION	BY

REVISIONS

STATE OF CONNECTICUT
CHRISTOPHER J. SCHEKS
No. 30026
LICENSED
PROFESSIONAL ENGINEER
8/23/21

GPD Engineering and Architecture Professional Corporation
520 South Main Street, Suite 2531
Akron, OH 44311
330.572.2100 Fax 330.572.2102

GPD PROJECT NUMBER
2021777.828257.06

SITE NAME: STONINGTON

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DFT/QA BY: DP	DATE: 8/23/21
APRV'D BY: CJS	DATE: 8/23/21

SCALE: N.T.S.

ADDITIONAL SECTIONS

S-10

REV 0

EBI Consulting

environmental | engineering | due diligence

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

T-Mobile Existing Facility

Site ID: CT11307C

Stonington
82 Mechanic Street
Pawcatuck, Connecticut 06379

October 4, 2021

EBI Project Number: 6221005852

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**3.07%**

October 4, 2021

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

Emissions Analysis for Site: CT11307C - Stonington

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **82 Mechanic Street** in **Pawcatuck, Connecticut** 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 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu W/cm^2$). The number of $\mu W/cm^2$ 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 population 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 population would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$, respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz frequency bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at 82 Mechanic Street in Pawcatuck, Connecticut 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 manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, 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 LTE channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

2) 1 NR channel (600 MHz Band) was considered for each sector of the proposed installation. This Channel has a transmit power of 80 Watts.

3) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

4) 4 GSM 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.

5) 2 /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.

6) 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.

7) 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.

8) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, 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.

9) The antennas used in this modeling are the Rosenberger D2WC-21 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz channel(s) in Sector A, the Rosenberger D2WC-21 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz channel(s) in Sector B, the Rosenberger D2WC-21 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, 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.

10) The antenna mounting height centerline of the proposed antennas is 148 feet above ground level (AGL).

11) 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.

12) All calculations were done with respect to uncontrolled / general population threshold limits.

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Rosenberger D2WC-21	Make / Model:	Rosenberger D2WC-21	Make / Model:	Rosenberger D2WC-21
Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz
Gain:	9.98 dBd / 9.98 dBd / 10.88 dBd / 14.69 dBd / 14.69 dBd / 15.35 dBd	Gain:	9.98 dBd / 9.98 dBd / 10.88 dBd / 14.69 dBd / 14.69 dBd / 15.35 dBd	Gain:	9.98 dBd / 9.98 dBd / 10.88 dBd / 14.69 dBd / 14.69 dBd / 15.35 dBd
Height (AGL):	148 feet	Height (AGL):	148 feet	Height (AGL):	148 feet
Channel Count:	13	Channel Count:	13	Channel Count:	13
Total TX Power (W):	500 Watts	Total TX Power (W):	500 Watts	Total TX Power (W):	500 Watts
ERP (W):	11,541.51	ERP (W):	11,541.51	ERP (W):	11,541.51
Antenna A1 MPE %:	**2.58%**	Antenna B1 MPE %:	**2.58%**	Antenna C1 MPE %:	**2.58%**

Site Composite MPE %	
Carrier	**MPE %**
T-Mobile (Max at Sector A):	2.58%
AT&T	0.49%
Site Total MPE % :	3.07%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	2.58%
T-Mobile Sector B Total:	2.58%
T-Mobile Sector C Total:	2.58%
Site Total MPE % :	3.07%

T-Mobile Maximum MPE Power Values (Sector A)

T-Mobile Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
T-Mobile 600 MHz LTE	2	298.62	148.0	1.06	600 MHz LTE	400	0.27%
T-Mobile 600 MHz NR	1	796.32	148.0	1.42	600 MHz NR	400	0.35%
T-Mobile 700 MHz LTE	2	367.38	148.0	1.31	700 MHz LTE	467	0.28%
T-Mobile 1900 MHz GSM	4	883.33	148.0	6.30	1900 MHz GSM	1000	0.63%
T-Mobile 1900 MHz UMTS	2	883.33	148.0	3.15	1900 MHz UMTS	1000	0.31%
T-Mobile 2100 MHz LTE	2	2056.61	148.0	7.33	2100 MHz LTE	1000	0.73%
						Total:	**2.58%**

• NOTE: Totals may vary by approximately 0.01% due to summation of remainders in calculations.

Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general population 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 population exposure to RF Emissions are shown here:

T-Mobile Sector	Power Density Value (%)
Sector A:	2.58%
Sector B:	2.58%
Sector C:	2.58%
T-Mobile Maximum MPE % (Sector A):	2.58%
Site Total:	3.07%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **3.07%** of the allowable FCC established general population 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.

T-MOBILE SITE NAME:

STONINGTON

T-MOBILE SITE NUMBER:

CT11307C

CROWN BU: 828257 / APP#: 479826

67D94BRL2 CONFIGURATION

82 MECHANIC STREET
PAWCATUCK, CT 06379

EXISTING 150'-0" FLAGPOLE

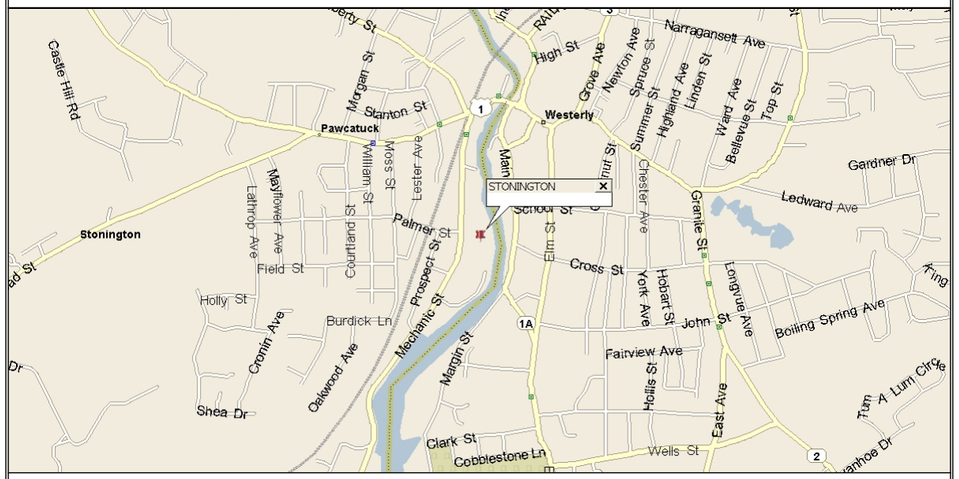
PROJECT SUMMARY

SITE TYPE:	EXISTING EQUIPMENT UPGRADE
SITE ADDRESS:	82 MECHANIC STREET PAWCATUCK, CT 06379
JURISDICTION:	NEW LONDON COUNTY

NAD83

LATITUDE:	41.371939° N
LONGITUDE:	71.832764° W
TOWER OWNER:	CROWN CASTLE 3200 HORIZON DRIVE, SUITE 150 KING OF PRUSSIA, PA 19406 JASON SMITH (610) 635-3225
CUSTOMER/APPLICANT:	T-MOBILE 4 SYLVAN WAY PARSIPPANY, NJ 07054 (973) 397-4800
OCCUPANCY TYPE:	UNMANNED
A.D.A. COMPLIANCE:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION

LOCATION MAP



NO SCALE

DRAWING INDEX

SHEET #	SHEET DESCRIPTION	REV. #
T-1	TITLE SHEET	7
A-1	OVERALL SITE PLAN	7
A-2	ANTENNA/CABLE SCHEDULE AND AZIMUTH PLANS	7
A-3	TOWER ELEVATION	7
A-4	ANTENNA AND EQUIPMENT DETAILS	7
A-4.1	ANTENNA AND EQUIPMENT DETAILS	7
A-4.2	TMA/DIPLEXER/RRH MOUNTING DETAILS	7
E-1	PANEL SCEHDULE AND ONE-LINE DIAGRAM	7
ATTACHED	TOWER MODIFICATION	7

CONTACT INFORMATION

A&E FIRM:	B+T GROUP 1717 S. BOULDER, STE. 300 TULSA, OK 74119
CONTACT:	MIKE OAKES
PHONE:	(918) 587-4630
ELECTRIC PROVIDER:	BOZRAH LIGHT & POWER CO 860-889-7388
TELCO PROVIDER:	COMCAST 800-934-6489

DRIVING DIRECTIONS

DEPART BRADLEY INTERNATIONAL AIRPORT ON TERMINAL RD. ROAD NAME CHANGES TO BRADLEY FIELD CONNECTOR. ROAD NAME CHANGES TO CT-20 [BRADLEY FIELD CONNECTOR]. TAKE RAMP (RIGHT) ONTO I-91 [RICHARD P HORAN MEMORIAL HWY]. AT EXIT 30, TAKE RAMP ONTO I-84 [US-44]. AT EXIT 55, TAKE RAMP (RIGHT) ONTO CT-2 [VETERANS OF FOREIGN WARS MEM'L HWY]. AT EXIT 19, KEEP RIGHT ONTO RAMP. ROAD NAME CHANGES TO CT-11. AT EXIT 4, KEEP STRAIGHT ONTO RAMP. TURN LEFT ONTO CT-82 [E HADDAM RD]. TURN RIGHT ONTO CT-85 [NEW LONDON RD]. TAKE RAMP (LEFT) ONTO I-95. AT EXIT 91, TURN RIGHT ONTO RAMP. KEEP STRAIGHT ONTO CT-234 [PEQUOT TRAIL]. BEAR LEFT ONTO US-1 [W BROAD ST]. TURN RIGHT ONTO MECHANIC ST. TURN LEFT ONTO LOCAL ROAD(S). ARRIVE AT STONINGTON.

A/E DOCUMENT REVIEW STATUS

TITLE	SIGNATURE	DATE
T-MOBILE PROP:		
T-MOBILE R.F. MGR.:		
T-MOBILE NetOps:		
T-MOBILE CONST. MGR.:		
INTERCONNECT:		
T-MOBILE SITE DEV. MGR.:		
PROPERTY OWNER:		
PLANNING:		

THE FOLLOWING PARTIES HEREBY APPROVE AND ACCEPT THESE DOCUMENTS AND AUTHORIZE THE CONTRACTOR TO PROCEED WITH THE CONSTRUCTION DESCRIBED HEREIN. ALL DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT AND MAY IMPOSE CHANGES OR MODIFICATIONS.

CODE COMPLIANCE

ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES:

CODE TYPE	CODE
BUILDING/DWELLING	2018 CT SBC
STRUCTURAL	2018 CT SBC
MECHANICAL	2018 CT SBC
ELECTRICAL	2018 CT SBC

PROJECT DESCRIPTION

THE PROPOSED PROJECT INCLUDES:

- REMOVE (6) EXISTING ANTENNAS AT 147'-0"
- REMOVE (6) EXISTING TMAS ON GROUND & (6) RU22 RADIO.
- REMOVE AND REPLACE (1) DUW30.
- INSTALL (3) NEW ANTENNAS AT 147'-0"
- INSTALL (6) NEW TMAS ON GROUND MOUNT.
- INSTALL (3) NEW RRUS ON GROUND MOUNT.
- INSTALL (12) NEW DIPLEXERS & (1) BB 6630 AT 6102 CABINET.
- MODIFY EXISTING TOWER PER STRUCTURAL MODIFICATION REPORT BY GPD ENGINEERING & ARCHITECTURE PROFESSIONAL CORPORATION DATED 8/23/21.

DO NOT SCALE DRAWINGS

ALL DRAWINGS CONTAINED HEREIN ARE FORMATTED FOR 11X17. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

CALL CONNECTICUT ONE CALL
(800) 922-4455
CALL 3 WORKING DAYS
BEFORE YOU DIG!

811

B+T GRP

CROWN CASTLE

T-Mobile

CT11307C
BU #: 828257
STONINGTON
82 MECHANIC STREET
PAWCATUCK, CT 06379
EXISTING 150'-0" FLAGPOLE

PROJECT NO:	137128.002.01
CHECKED BY:	MTJ

ISSUED FOR:

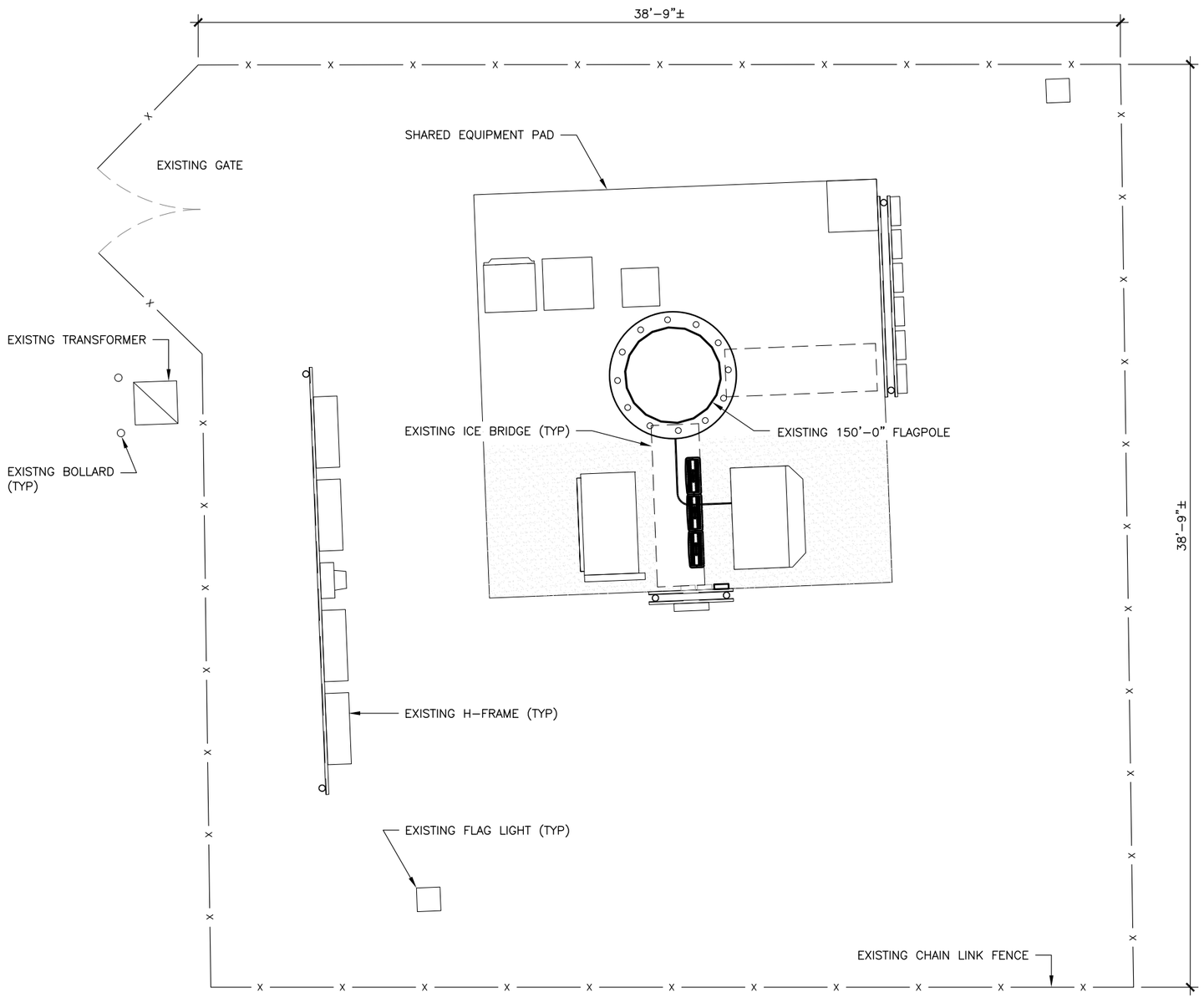
REV	DATE	DRWN	DESCRIPTION
3	9/27/21	MTJ	CONSTRUCTION
4	10/6/21	JTS	CONSTRUCTION
5	10/21/21	JTS	CONSTRUCTION
6	10/29/21	TDG	CONSTRUCTION
7	11/3/21	TDG	CONSTRUCTION

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/22

STATE OF CONNECTICUT
CHAD T. GILE
No. 23924
LICENSED PROFESSIONAL ENGINEER

11/3/21

SHEET NUMBER:	REVISION:
T-1	7



1 OVERALL SITE PLAN

SCALE: 0' 1' 4' 8' 16'

N

GENERAL NOTES:

1. SUBJECT PROPERTY IS SITUATED AT 82 MECHANIC STREET, PAWCATUCK, CT 06379.

2. APPLICANT: T-MOBILE
A DELAWARE LIMITED LIABILITY COMPANY
4 SYLVAN WAY
PARSIPPANY, NEW JERSEY 07054
(973) 397-4800

   TOWER OWNER: CROWN CASTLE INTERNATIONAL

- THE APPLICANT IS TO UPDATE THEIR NETWORK BY INSTALLING THREE (3) NEW PANEL ANTENNAS MOUNTED ON AN EXISTING FLAGPOLE.

3. THIS FACILITY SHALL BE VISITED ON THE AVERAGE OF ONCE A MONTH FOR MAINTENANCE AND SHALL BE MONITORED FROM A REMOTE FACILITY.

4. THE EXISTING SITE IS LOCATED AT LATITUDE OF 41.371939° N± AND LONGITUDE OF 71.832764° W±. THE HORIZONTAL DATUM ARE IN TERMS OF NORTH AMERICAN DATUM OF 1983 (NAD 83).

5. THIS SET OF PLANS HAS BEEN PREPARED FOR THE PURPOSES OF MUNICIPAL AND AGENCY REVIEW AND APPROVAL. THIS SET OF PLANS SHALL NOT BE UTILIZED AS CONSTRUCTION DOCUMENTS UNTIL ALL CONDITIONS OF APPROVAL HAVE BEEN SATISFIED AND EACH OF THE DRAWINGS HAVE BEEN REVISED TO INDICATED "ISSUED FOR CONSTRUCTION"

6. ALL MATERIALS, WORKMANSHIP, AND CONSTRUCTION FOR THE SITE IMPROVEMENTS SHOWN HEREON SHALL BE IN ACCORDANCE WITH:

   6.A. CURRENT PREVAILING MUNICIPAL AND/OR COUNTY SPECIFICATIONS, STANDARDS, AND REQUIREMENTS.
   6.B. CURRENT PREVAILING UTILITY COMPANY AUTHORITY SPECIFICATIONS, STANDARDS AND REQUIREMENTS.

7. THE CONTRACTOR SHALL NOTIFY B+T GROUP, P.A. IMMEDIATELY IF ANY FIELD-CONDITIONS ENCOUNTERED DIFFER FROM THOSE REPRESENTED HEREON, AND/OR IF SUCH CONDITIONS WOULD OR COULD RENDER THE DESIGNS SHOWN HEREON INAPPROPRIATE AND/OR INEFFECTIVE.

8. THE CONTRACTOR IS RESPONSIBLE TO PROTECT, REPAIR AND/OR REPLACE ANY DAMAGED STRUCTURES, UTILITIES OR LANDSCAPED AREA WHICH MAY BE DISTURBED DURING THE CONSTRUCTION OF THIS FACILITY.

9. THE CONSTRUCTION CONTRACTOR IS SOLELY RESPONSIBLE FOR DETERMINING ALL CONSTRUCTION MEANS AND METHODS. THE CONSTRUCTION CONTRACTOR IS ALSO RESPONSIBLE FOR ALL JOB SITE SAFETY.

10. SITE INFORMATION SHOWN TAKEN FROM CROWN CASTLE SITE PLANS AND FROM CROWN CASTLE INSPECTION PHOTOS.

11. NO GUARANTEE IS MADE NOR SHOULD BE ASSUMED AS TO THE COMPLETENESS OR ACCURACY OF THE HORIZONTAL OR VERTICAL LOCATIONS. ALL PARTIES UTILIZING THIS INFORMATION SHALL FIELD VERIFY THE ACCURACY AND COMPLETENESS OF THE INFORMATION SHOWN PRIOR TO CONSTRUCTION ACTIVITIES.

12. ALL IMPROVEMENTS SHALL BE SUBJECT TO INSPECTION AND APPROVAL BY THE TOWNSHIP ENGINEER WHO WILL BE GIVEN PROPER NOTIFICATION PRIOR TO THE START OF ANY CONSTRUCTION.

B+T GRP

CROWN CASTLE

T···Mobile

CT11307C
BU #: 828257

STONINGTON

82 MECHANIC STREET
PAWCATUCK, CT 06379

EXISTING 150'-0" FLAGPOLE

PROJECT NO:	137128.002.01
CHECKED BY:	MTJ

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION
3	9/27/21	MTJ	CONSTRUCTION
4	10/6/21	JTS	CONSTRUCTION
5	10/21/21	JTS	CONSTRUCTION
6	10/29/21	TDG	CONSTRUCTION
7	11/3/21	TDG	CONSTRUCTION

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/22

STATE OF CONNECTICUT
CHAD T. TYLER
No. 23924
LICENSED PROFESSIONAL ENGINEER
11/3/21

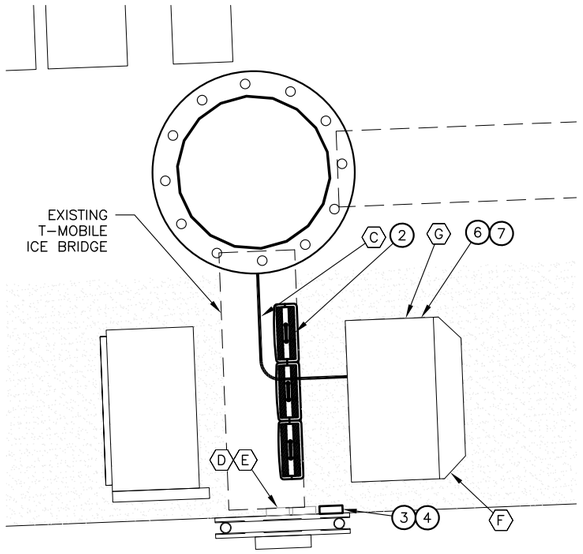
SHEET NUMBER:	REVISION:
A-1	7

LEGEND

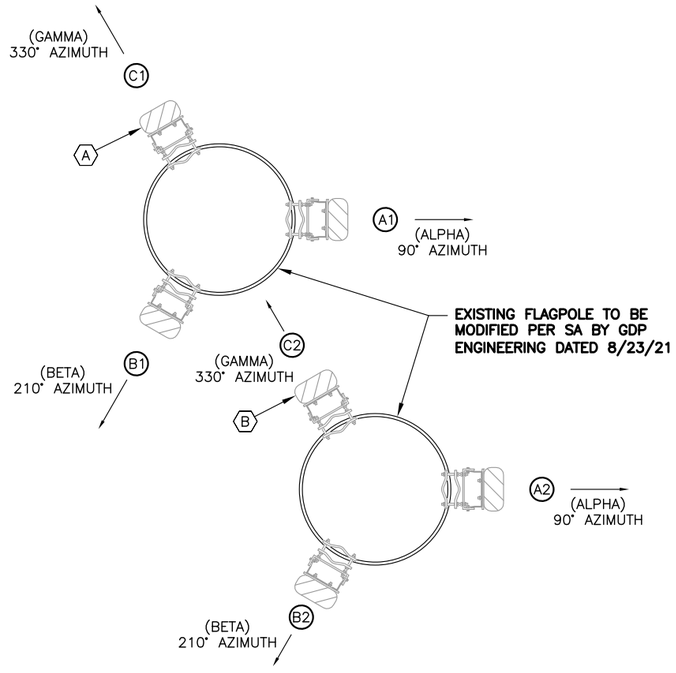
EXISTING/DEMOLITION NOTES		INSTALLATION NOTES	
A	EXISTING RFS APXV18-209014-C-A20 ANTENNA TO BE REMOVED (TOTAL OF 3)	1	INSTALL ROSENBERGER – D2WC-21 (2 LB+4MB) (HEX) ANTENNA ON EXISTING MOUNT (TYP OF 1 PER SECTOR, TOTAL OF 3)
B	EXISTING RFS APXV18-206516S-C-A20 ANTENNA TO BE REMOVED (TOTAL OF 3)	2	INSTALL RADIO 4449 B71+B85 ON GROUND (TOTAL OF 3)
C	EXISTING 1 5/8" COAX CABLES TO REMAIN (TOTAL OF 12)	3	INSTALL NEW COMMSCOPE TWIN STYLE 3CX – TMAT1921B68-21-43 (E14R00P09) ON GROUND (TOTAL OF 6)
D	EXISTING TWIN STYLE 1B-AWS TMA TO BE REMOVED (TOTAL OF 3)	4	INSTALL NEW COMMSCOPE – TWIN LB/MIDBAND CBC426T-DS-43 (4.3-10) DIPLEXER ON GROUND (TOTAL OF 6)
E	EXISTING TWIN STYLE 1A-PCS TMA TO BE REMOVED (TOTAL OF 3)	5	INSTALL NEW COMMSCOPE – TWIN LB/MIDBAND CBC426T-DS-43 (4.3-10) DIPLEXER ON EXISTING MOUNT (TOTAL OF 6)
F	REMOVE (6) RU22 RADIO	6	INSTALL (1) BB 6630
G	REMOVE (1) DUW30	7	INSTALL (1) DUW30

ANTENNA AND CABLE SCHEDULE

SECTOR	POSITION	EXISTING ANTENNAS	PROPOSED ANTENNA CONFIGURATION	E-TILT	M-TILT	ANTENNA CENTERLINE	TMA/RRU	CABLES	JUMPER TYPE	CABLE LENGTH
90° – ALPHA	**A1**	**ROSENBERGER – D2WC-21 (2 LB+4MB) (HEX)**	**N600/L700/L600/ U1900/L2100/ G1900**	**2°**	**2°**	**147'-0"**	**0/0**	(4) 1 5/8" COAX	–	197'-0"
210° – BETA	**B1**	**ROSENBERGER – D2WC-21 (2 LB+4MB) (HEX)**	**N600/L700/L600/ U1900/L2100/ G1900**	**2°**	**2°**	**147'-0"**	**0/0**	(4) 1 5/8" COAX	–	197'-0"
330° – GAMMA	**C1**	**ROSENBERGER – D2WC-21 (2 LB+4MB) (HEX)**	**N600/L700/L600/ U1900/L2100/ G1900**	**2°**	**2°**	**147'-0"**	**0/0**	(4) 1 5/8" COAX	–	197'-0"

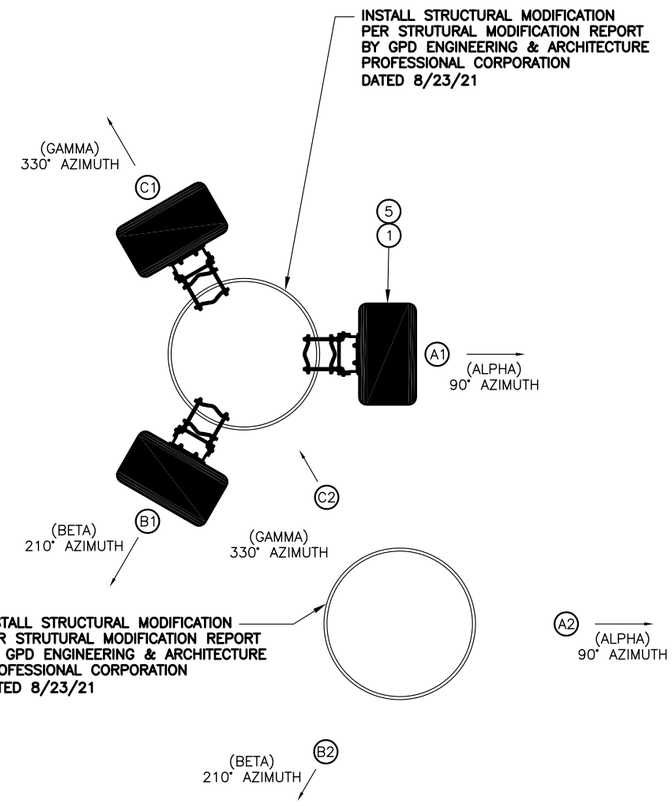


1 ENLARGED AREA PLAN
SCALE: 0' 1' 2' 4' 10'



2 EXISTING ANTENNA ORIENTATION
SCALE: 0' 1' 2' 3' 4' 5'

N



3 PROPOSED ANTENNA ORIENTATION
SCALE: 0' 1' 2' 3' 4' 5'

N

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CROWN CASTLE

T-Mobile

CT11307C
BU #: 828257
STONINGTON
82 MECHANIC STREET
PAWCATUCK, CT 06379
EXISTING 150'-0" FLAGPOLE

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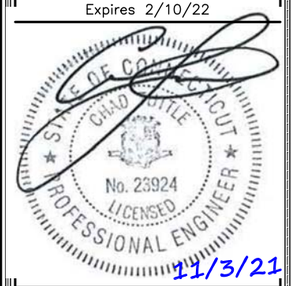

SHEET NUMBER:	REVISION:
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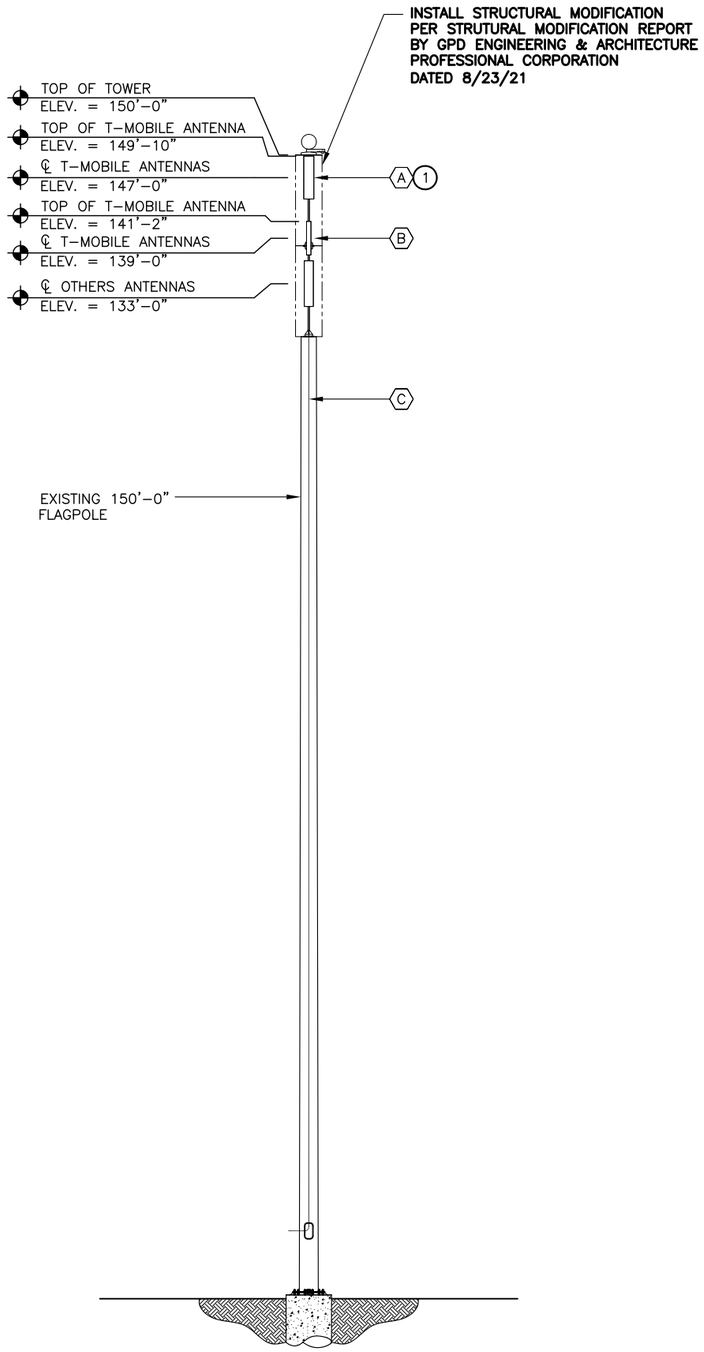
LEGEND			
EXISTING/DEMOLITION NOTES		INSTALLATION NOTES	
(A)	EXISTING RFS APXV18-209014-C-A20 ANTENNA TO BE REMOVED (TOTAL OF 3)	(1)	INSTALL ROSENBERGER - D2WC-21 (2 LB+4MB) (HEX) ANTENNA ON EXISTING MOUNT (TYP OF 1 PER SECTOR, TOTAL OF 3)
(B)	EXISTING RFS APXV18-206516S-C-A20 ANTENNA TO BE REMOVED (TOTAL OF 3)		
(C)	EXISTING 1 5/8" COAX CABLES TO REMAIN (TOTAL OF 12)		

EXISTING STRUCTURE TO BE MODIFIED PER STRUCTURAL MODIFICATION REPORT BY GPD ENGINEERING & ARCHITECTURE PROFESSIONAL CORPORATION DATED 8/23/23

LEGEND:

NEW

EXISTING



1 TOWER ELEVATION

SCALE: 0' 10' 20' 30' 40' 1"=20'

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T-Mobile

CT11307C
BU #: 828257

STONINGTON

82 MECHANIC STREET
PAWCATUCK, CT 06379

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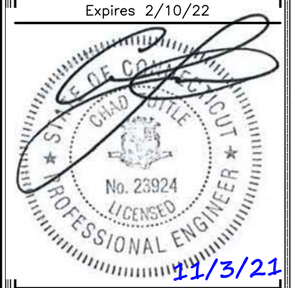

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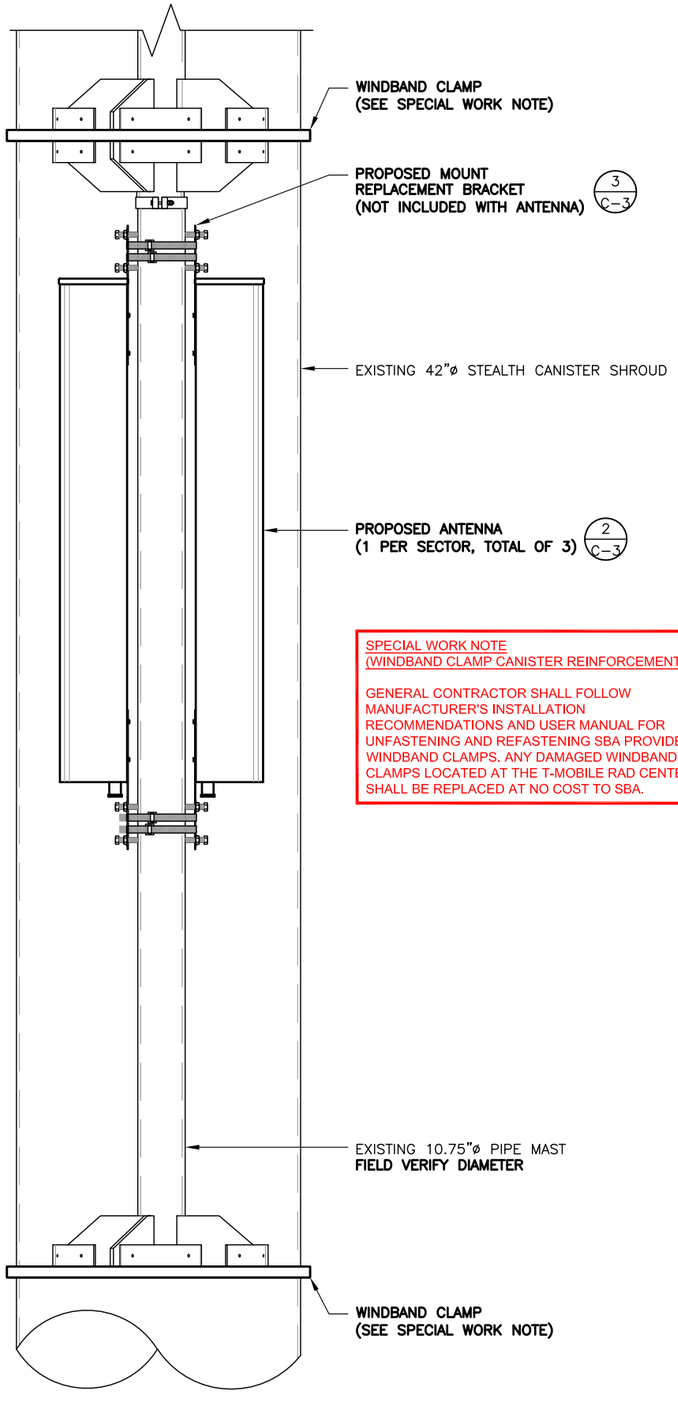


SPECIAL WORK NOTE
(WINDBAND CLAMP CANISTER REINFORCEMENT):

GENERAL CONTRACTOR SHALL FOLLOW MANUFACTURER'S INSTALLATION RECOMMENDATIONS AND USER MANUAL FOR UNFASTENING AND REFASTENING SBA PROVIDED WINDBAND CLAMPS. ANY DAMAGED WINDBAND CLAMPS LOCATED AT THE T-MOBILE RAD CENTER SHALL BE REPLACED AT NO COST TO SBA.

1 PROPOSED L700 ANTENNA MOUNTING DETAIL

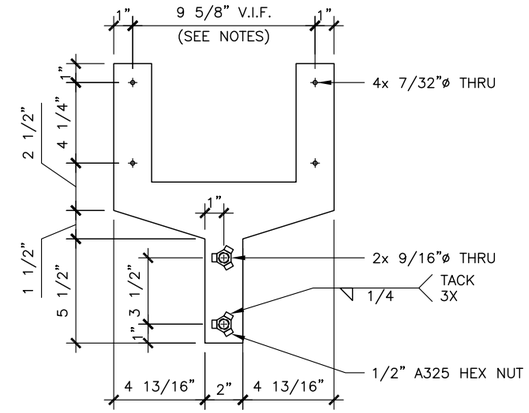
SCALE: 0' 6" 1' 2' 4'

STRUCTURAL NOTES:

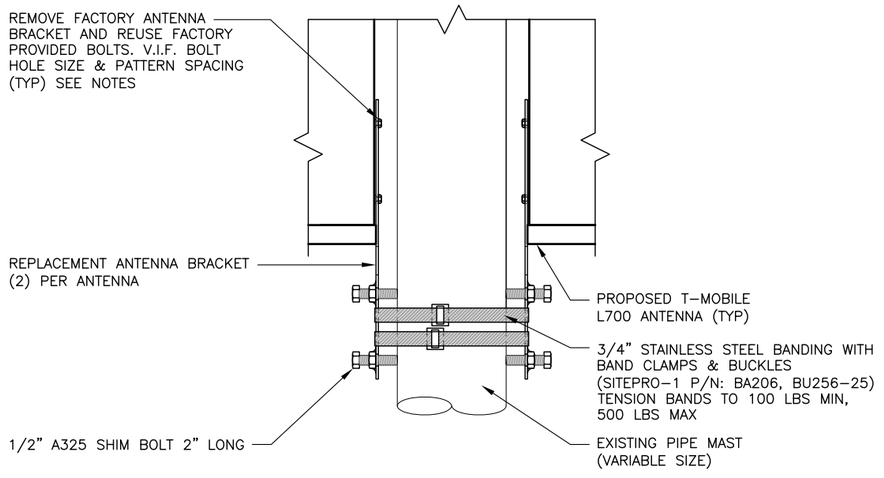
PRIOR TO COMMENCING CONSTRUCTION, GC SHALL REFER TO TOWER STRUCTURAL ANALYSIS PROVIDED BY SBA TO DETERMINE IF THERE ARE ANY SUPPLEMENTAL OR SPECIAL INSTALLATION REQUIREMENTS FOR TOWER TOP EQUIPMENT AND FOR CABLE BUNDLING, SHIELDING, MOUNTING OR RELOCATION ARRANGEMENTS.

ANTENNA MOUNT STRUCTURAL ASSESSMENT REQUIREMENT:

ENGINEER OF RECORD HAD MADE A VISUAL ASSESSMENT ONLY AND DETERMINED THAT THE EXISTING ANTENNA MOUNT SHALL BE REPLACED OR MODIFIED TO ACCOMMODATE ANY ADDITIONAL EQUIPMENT LOADS. STRUCTURAL DESIGNS AND DETAILS AS SHOWN HEREIN FOR STRUCTURAL MODIFICATIONS OF THE EXISTING ANTENNA MOUNT ARE PRELIMINARY ONLY AND FINAL CONSTRUCTION DETAILS ARE SUBJECT TO CHANGE PENDING THE COMPLETION OF AN ANTENNA MOUNT STRUCTURAL ASSESSMENT.



FRONT VIEW



SIDE VIEW

GENERAL NOTES:

1. REPLACEMENT BRACKET DESIGNED FOR USE WITH COMMSCOPE ANTENNAS DBX, LNX AND SBN-SERIES, INSTALLED IN A TRI-SECTOR CLUSTERED ARRANGEMENT, 120 DEGREE AZIMUTH SEPARATION.
2. ANTENNA BRACKET INTENDED FOR USE INSIDE ENCLOSED CANISTERS AND HAS NOT BEEN DESIGNED FOR HIGH-SPEED WIND OR ICE LOAD.
3. MAX. ALLOWABLE ANTENNA WEIGHT IS 65 LBS.
4. ANTENNA BRACKET INTENDED FOR USE ONLUY ON SBA TOWERS, CANISTER DIAMETER 24"-36" AND SUPPORTING PIPE MAST DIAMETERS 4"-10".

INSTALLATION NOTES:

1. GC TO VERIFY BOLT HOLE SIZE AND SPACING FROM THE ANTENNA BACK PLANE.
2. FACTORY INSTALLED MOUNTING BRACKET TO BE REMOVED, EXISTING INSTALLATION BOLTS TO BE RE-INSTALLED ON REPLACEMENT BRACKET.
3. ADJUST SHIM BOLTS EQUALLY TO CENTER ANTENNA CLUSTER ON EXISTING PIPE MAST. SHIM BOLTS NOT REQUIRED FOR PIPE MASTS OVER 6 7/8" O.D.

2 L700 ANTENNA CLOSE MOUNT ANTENNA BRACKET

SCALE: N.T.S.

B+T GRP

CROWN CASTLE

T-Mobile

CT11307C
BU #: 828257

STONINGTON

82 MECHANIC STREET
PAWCATUCK, CT 06379

EXISTING 150'-0" FLAGPOLE

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B&T ENGINEERING, INC.
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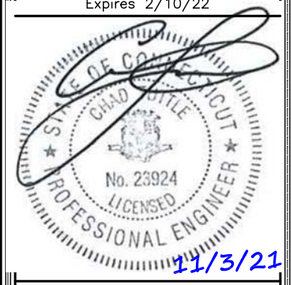

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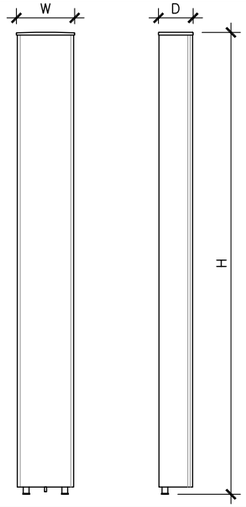
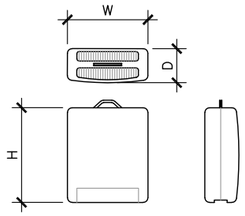


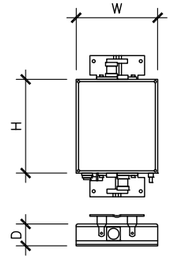
ANTENNA SPECS	
MANUFACTURER	ROSENBERGER
MODEL #	D2WC-21
WIDTH	11.6"
DEPTH	4.5"
HEIGHT	57.9
WEIGHT	32.0 LBS

1 ANTENNA DETAIL
SCALE: 3/8" = 1'-0"



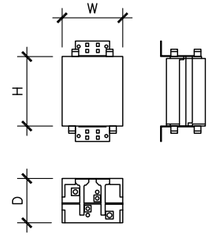
RRU SPECIFICATIONS	
MANUFACTURER	ERICSSON
MODEL #	4449
WIDTH	13.2"
DEPTH	10.4"
HEIGHT	14.9"
WEIGHT	74 LBS

2 REMOTE RADIO UNIT (RRU)
SCALE: 3/8" = 1'-0"



TMA SPECIFICATIONS	
MANUFACTURER	COMMSCOPE
MODEL #	E14R00P09
WIDTH	8.681"
DEPTH	4.1"
HEIGHT	9.114"
WEIGHT	15.653 LBS

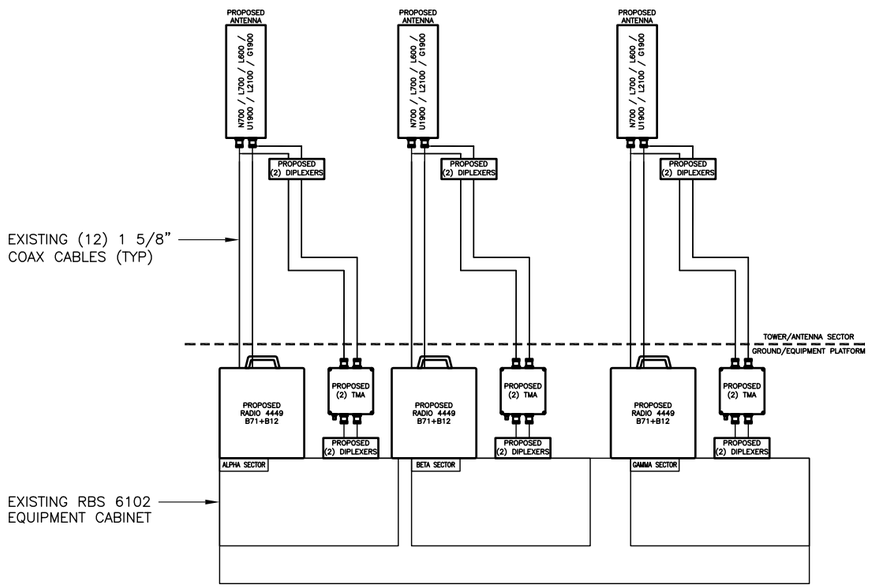
3 TMA DETAIL
SCALE: 3/4" = 1'-0"



DIPLEXER SPECIFICATIONS	
MANUFACTURER	KAELUS
MODEL #	CBC426T-DS-43
WIDTH	4.764"
DEPTH	3.425"
HEIGHT	5.984"
WEIGHT	5.952 LBS

4 DIPLEXER DETAIL
SCALE: 3/4" = 1'-0"

NOTES:
1. TAG ALL EXISTING AND PROPOSED CABLES/JUMPERS PER T-MOBILE SPECIFICATIONS.
2. SEE RF SCHEDULE FOR CABLE AND JUMPER LENGTHS.
3. REFER TO ANTENNA ORIENTATION ON SHEET A-2 FOR EXACT ANTENNA POSITIONING.



5 ANTENNA & CABLING SCHEMATIC
SCALE: N.T.S.

B+T GRP

CROWN CASTLE

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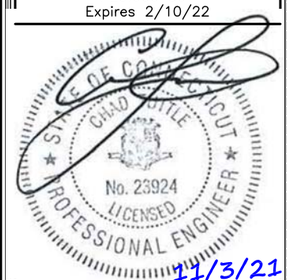

11/3/21

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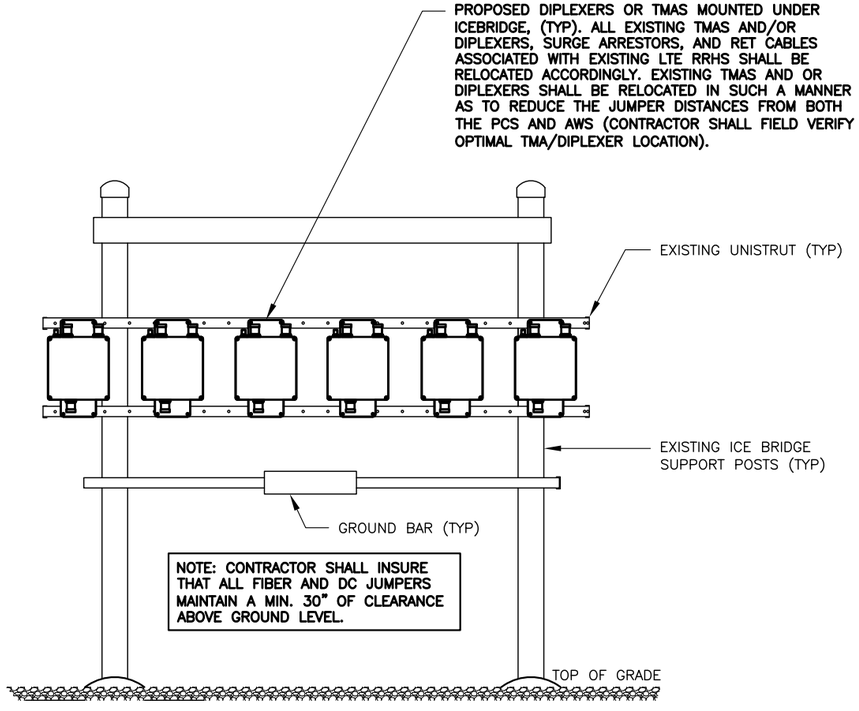
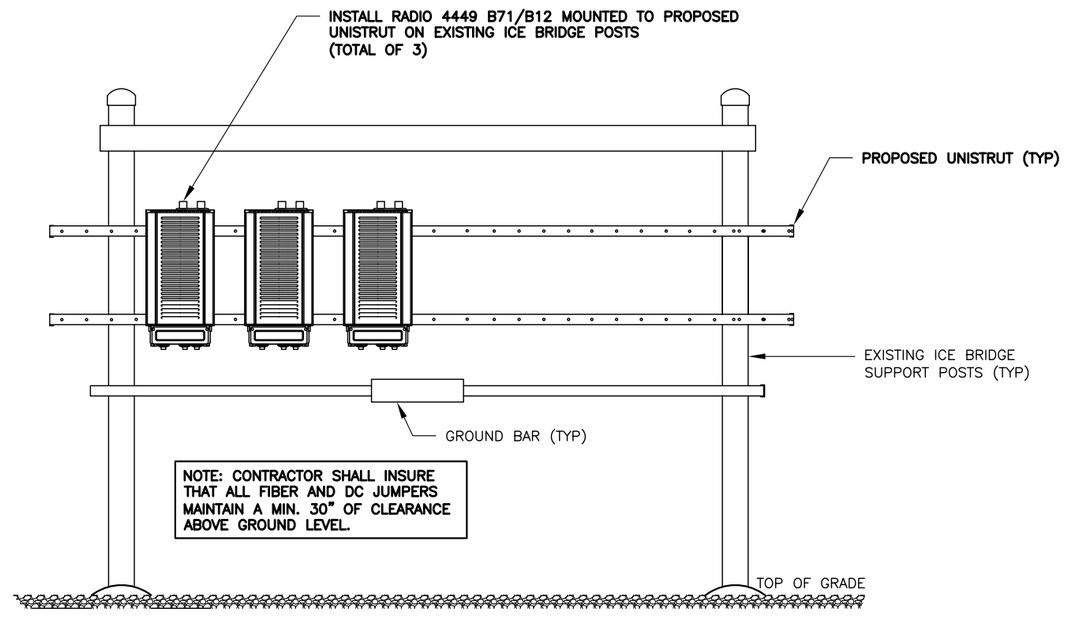


1 DIPLEXER/TMA TO ICE BRIDGE POST MOUNTING DETAIL

SCALE: N.T.S.



2 RRH TO ICE BRIDGE POST MOUNTING DETAIL

SCALE: N.T.S.

B+T GRP

CROWN CASTLE

T···Mobile

CT11307C
BU #: 828257

STONINGTON

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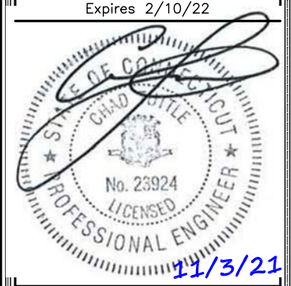

SHEET NUMBER:	REVISION:
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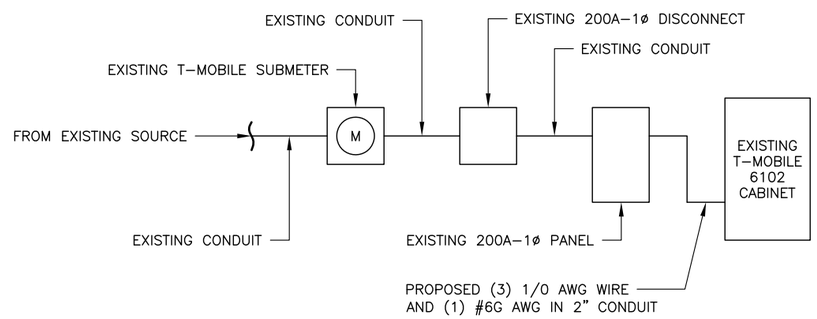
FINAL PANEL SCHEDULE							
LOAD	POLES	AMPS	BUS L1	BUS L2	AMPS	POLES	LOAD
RBS 6102 CABINET	2	**100A**	1	2	20A	1	EQUIPMENT
			3	4	20A	1	EQUIPMENT
			5	6	20A	1	EQUIPMENT
			7	8	60A	2	RBS 3106
			9	10			

RATED VOLTAGE: ■120/240 □_____. 1 PHASE, 3 WIRE		BRANCH POLES: □12 □24 ■30 □42	APPROVED MF'RS
RATED AMPS: □100 ■200 □400 □_____.		CABINET: ■SURFACE □FLUSH	NEMA □1 ■3R □4X
□MAIN LUGS ONLY	MAIN 200 AMPS ■BREAKER □FUSED SWITCH	■HINGED DOOR	■KEYED DOOR LATCH
□FUSED ■CIRCUIT BREAKER BRANCH DEVICES		□_____ TO BE GFCI BREAKERS	FULL NEUTRAL BUS / GROUND BAR
ALL BREAKERS MUST BE RATED TO INTERRUPT A SHORT CIRCUIT ISC OF 10,000 AMPS SYMMETRICAL			

REPLACE EXISTING BREAKER IN POSITION 1 AND 3 WITH A NEW 2P 100A BREAKER
REPLACE EXISTING WIRES FOR EXISTING 6102 CABINET WITH (3) 1/0 AWG THWN (COPPER) AND (1) #6G AWG. MINIMUM CONDUIT SIZE TO BE 2".
IF 100A BREAKER WILL NOT PROPERLY FIT IN EXISTING PANEL, REPLACE (E) PANEL WITH SQUARE D PANEL QO12040M200RB (OR APPROVED EQUAL).
UPGRADE FEEDER WIRES TO MEET AMPACITY IF NEW PANEL IS REQUIRED.
FINAL PANEL DESIGN AND CALCULATIONS FOR WIRE SIZE WERE BASED OFF OF EXISTING PHOTOS

1 FINAL T-MOBILE PANEL DETAIL

SCALE: N.T.S.



2 ONE-LINE DIAGRAM

SCALE: N.T.S.

B+T GRP

CROWN CASTLE

T···Mobile

CT11307C
BU #: 828257

STONINGTON

82 MECHANIC STREET
PAWCATUCK, CT 06379

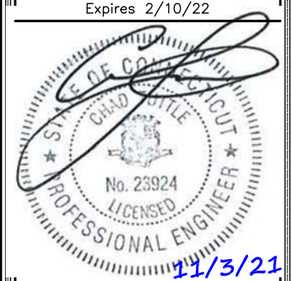
EXISTING 150'-0" FLAGPOLE

PROJECT NO:	137128.002.01
CHECKED BY:	MTJ

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION
3	9/27/21	MTJ	CONSTRUCTION
4	10/6/21	JTS	CONSTRUCTION
5	10/21/21	JTS	CONSTRUCTION
6	10/29/21	TDG	CONSTRUCTION
7	11/3/21	TDG	CONSTRUCTION

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/22



SHEET NUMBER:	REVISION:
E-1	7

MONOPOLE REINFORCEMENT DRAWINGS
PREPARED FOR CROWN CASTLE

SITE NAME: STONINGTON
BU NUMBER: 828257

SITE ADDRESS:
82 MECHANIC STREET
PAWCATUCK, CT 06379
NEW LONDON COUNTY, USA

DIRECTIONS: I-95 N TO EXIT 91, TURN LEFT ONTO TAUGWONK RD.. TAKE THE 1ST RIGHT ONTO CT-234 E/PEQUOT TRAIL, TURN LEFT ONTO W BROAD ST., TURN RIGHT ONTO MECHANIC ST. (SITE WILL BE ON THE LEFT).

SAFETY CLIMB: 'LOOK UP'
THE INTEGRITY OF THE WIRE ROPE SAFETY CLIMB SYSTEM SHALL BE CONSIDERED DURING ALL STAGES OF DESIGN, INSTALLATION, AND INSPECTION. TOWER REINFORCEMENT AND EQUIPMENT INSTALLATION SHALL NOT COMPROMISE THE INTEGRITY OR FUNCTIONAL USE OF ANY WIRE ROPE SAFETY CLIMB ON THE STRUCTURE. THIS SHALL INCLUDE, BUT NOT LIMITED TO: PINCHING OF THE WIRE ROPE, BENDING OF THE WIRE ROPE FROM ITS SUPPORTS, DIRECT CONTACT OR CLOSE PROXIMITY TO THE WIRE ROPE WHICH MAY CAUSE FRICTIONAL WEAR, OR IMPACT THE ANCHORAGE POINTS IN ANY WAY. ANY COMPROMISED SAFETY CLIMB MUST BE REPORTED TO YOUR CROWN POC FOR RESOLUTION, INCLUDING EXISTING CONDITIONS.

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.

QUALIFIED ENGINEERING SERVICES ARE AVAILABLE FROM GPD TO ASSIST CONTRACTORS IN CLASS IV RIGGING PLAN REVIEWS. FOR REQUESTING QUALIFIED ENGINEERING SERVICES PLEASE CONTACT GPD AT CROWNMODS@GPDGROUP.COM.

HOT WORK INCLUDED

NA	BASE GRINDING ONLY
X	BASE WELDING (AND GRINDING)
NA	AERIAL GRINDING ONLY
X	AERIAL WELDING (AND GRINDING)

PROJECT CONTACTS:

1. CROWN PROJECT MANAGER:
JOHN MCGEE
(704) 877-8397
JOHN.MCGEE@CROWNCASTLE.COM
6325 ARDREY KELL ROAD, SUITE 600
CHARLOTTE, NC 28277

2. ENGINEER OF RECORD:
GPD ENGINEERING AND ARCHITECTURE PROFESSIONAL CORPORATION
520 SOUTH MAIN STREET, SUITE 2531
AKRON, OH 44311
(330) 572-2100
FOR QUESTIONS PLEASE EMAIL:
CROWNMODS@GPDGROUP.COM

DRAWINGS INCLUDED

SHEET NUMBER	DESCRIPTION
S-1	TITLE PAGE
S-2	MODIFICATION INSPECTION CHECKLIST
S-3	GENERAL NOTES
S-4	TOWER ELEVATION
S-5	TOWER SECTIONS
S-6	ADDITIONAL SECTIONS
S-7	ADDITIONAL SECTIONS
S-8	ADDITIONAL SECTIONS
S-9	ADDITIONAL SECTIONS
S-10	ADDITIONAL SECTIONS

TOWER INFORMATION

TOWER MAPPING:	DOC ID #: 3487587
TOWER HEIGHT / TYPE:	150 FT MODIFIED CONCEALMENT TOWER
TOWER LOCATION:	LAT: 41° 22' 18.91"
DATUM: (NAD 1983)	LONG: -71° 49' 58.01"
	ELEV: 7 FT AMSL
STRUCTURAL DESIGN DRAWING:	CCI/WO #: 2002920
STRUCTURAL ANALYSIS REPORT:	GPD/WO #: 1977764
STRUCTURAL ANALYSIS DATE:	6/28/2021
CCI ORDER NUMBER:	479826 REV #: 9
CCISITES DOCUMENT ID:	9862531

CODE COMPLIANCE

GOVERNING CODES:	TIA-222-H & 2018 CONNECTICUT STATE BUILDING CODE
WIND SPEEDS:	140 MPH 3 SECOND GUST
	50 MPH 3 SECOND GUST (W/ ICE)
ICE THICKNESS:	1-1/2"
STRUCTURE CLASS:	II
EXPOSURE CATEGORY:	C
TOPO CATEGORY:	1

NO.	DATE	DESCRIPTION	BY

REVISIONS

STATE OF CONNECTICUT
CHRISTOPHER J. SCHEKS
No. 30026
LICENSED PROFESSIONAL ENGINEER

8/23/21

GPD Engineering and Architecture Professional Corporation
520 South Main Street, Suite 2531
Akron, OH 44311
330.572.2100 Fax 330.572.2102

GPD PROJECT NUMBER
2021777.828257.06

SITE NAME: STONINGTON
BU NUMBER: 828257
WO NUMBER: 2002920
SITE ADDRESS:
82 MECHANIC STREET
PAWCATUCK, CT 06379
NEW LONDON COUNTY, USA

ENG/QA BY: BK DATE: 8/23/21
DFT BY: MJS DATE: 8/23/21
DFT/QA BY: DP DATE: 8/23/21
APRV'D BY: CJS DATE: 8/23/21
SCALE: N.T.S.

TITLE PAGE

S-1 REV 0

CED-FRM-10354 MI CHECKLIST

REQUIRED	REPORT ITEM	APPLICABLE CROWN DOC #	BRIEF DESCRIPTION
PRE-CONSTRUCTION			
X	MI CHECKLIST DRAWING	CED-SOW-10007	THIS CHECKLIST SERVES AS A GUIDELINE FOR THE REQUIRED CONSTRUCTION DOCUMENTS AND INSPECTIONS FOR THIS MODIFICATION
X	EOR APPROVED SHOP DRAWINGS	CED-SOW-10007	ONCE THE PRE-MODIFICATION MAPPING IS COMPLETE AND PRIOR TO FABRICATION, THE CONTRACTOR SHALL PROVIDE DETAILED ASSEMBLY DRAWINGS AND/OR SHOP DRAWINGS. THESE ARE TO INCLUDE, BUT ARE NOT LIMITED TO, A VISUAL LAYOUT OF NEW REINFORCEMENT, EXISTING REINFORCEMENT CONFIGURATION, PORTHOLES, MOUNTS, STEP PEGS, SAFETY CLIMBS AND ANY OTHER MISCELLANEOUS ITEMS WHICH MAY AFFECT SUCCESSFUL INSTALLATION OF MODIFICATIONS ON THE TOWER. THESE DRAWINGS SHALL BE SUBMITTED TO THE EOR FOR APPROVAL. SHOP DRAWING SUBMISSION SHALL INCLUDE THE EOR RFI FORM DETAILING ANY CHANGES FROM THE ORIGINAL DESIGN
X	FABRICATION INSPECTION	CED-SOW-10007	A LETTER FROM THE FABRICATOR, STATING THAT THE WORK WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THE CONTRACT DOCUMENTS, SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	FABRICATOR CERTIFIED WELD INSPECTION	CED-SOW-10007 CED-STD-10069	A CWI SHALL INSPECT ALL WELDING PERFORMED ON STRUCTURAL MEMBERS DURING FABRICATION. A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	MATERIAL TEST REPORTS (MTR)	CED-SOW-10007	MATERIAL TEST REPORTS SHALL BE PROVIDED FOR MATERIAL USED AS REQUIRED PER SECTION 9.2.5 OF CED-SOW-10007. MTRS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	FABRICATOR NDE INSPECTION REPORT	CED-SOW-10066 CED-STD-10069	CRITICAL SHOP WELDS THAT REQUIRE TESTING ARE NOTED ON THESE CONTRACT DRAWINGS. A CERTIFIED NDT INSPECTOR SHALL PERFORM NON-DESTRUCTIVE EXAMINATION AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	NDE OF MONOPOLE BASE PLATE	ENG-SOW-10033	A NDE OF THE POLE TO BASE PLATE CONNECTION IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	PACKING SLIPS	CED-SOW-10007	PACKING/SHIPPING LIST FOR ALL MATERIAL USED DURING CONSTRUCTION OF THE MODIFICATION
ADDITIONAL TESTING AND INSPECTIONS:			
NA			
CONSTRUCTION			
NA	FOUNDATION INSPECTIONS	CED-SOW-10144	A VISUAL OBSERVATION OF THE EXCAVATION AND REBAR SHALL BE PERFORMED BEFORE PLACING THE CONCRETE. A VISUAL OBSERVATION OF THE REBAR SHALL BE PERFORMED BEFORE PLACING THE EPOXY. A SEALED WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	CONCRETE COMP. STRENGTH AND SLUMP TEST	CED-SOW-10144	THE CONCRETE MIX DESIGN, SLUMP TEST, AND COMPRESSIVE STRENGTH TESTS SHALL BE PROVIDED AS PART OF THE FOUNDATION REPORT.
NA	EARTHWORK	CED-SOW-10144	FOUNDATION SUB-GRADES SHALL BE INSPECTED AND APPROVED BY AN APPROVED FOUNDATION INSPECTOR AND RESULTS INCLUDED AS PART OF THE FOUNDATION REPORT.
NA	MICROPILE/ROCK ANCHOR	CED-SOW-10144	MICROPILES/ROCK ANCHORS SHALL BE INSPECTED BY THE FOUNDATION INSPECTION VENDOR AND SHALL BE INCLUDED AS PART OF THE FOUNDATION INSPECTION REPORT, ADDITIONAL TESTING AND/OR INSPECTION REQUIREMENTS ARE NOTED IN THESE CONTRACT DOCUMENTS.
X	POST-INSTALLED ANCHOR ROD VERIFICATION	CED-SOW-10007 CED-FRM-10358	POST INSTALLED ANCHOR ROD VERIFICATION SHALL BE PERFORMED IN ACCORDANCE WITH CROWN REQUIREMENTS AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	BASE PLATE GROUT VERIFICATION	ENG-STD-10323	THE GENERAL CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE MI INSPECTOR THAT CERTIFIES THAT THE GROUT WAS REMOVED AND/OR INSTALLED IN ACCORDANCE WITH CROWN REQUIREMENTS FOR INCLUSION IN THE MI REPORT.
X	FIELD CERTIFIED WELD INSPECTION	CED-SOW-10066 CED-STD-10069	A CROWN APPROVED CERTIFIED WELD INSPECTOR SHALL INSPECT AND TEST FIELD WELDS, FOLLOWING ALL PROCEDURES SPECIFIED IN CROWN STANDARD DOCUMENTS APPLICABLE TO WELD INSPECTIONS. A REPORT SHALL BE PROVIDED. NDE OF FIELD WELDS SHALL BE PERFORMED AS REQUIRED BY CROWN STANDARDS AND CONTRACT DOCUMENTS. THE NDE REPORT SHALL BE INCLUDED IN THE CWI REPORT.
X	ON-SITE COLD GALVANIZING VERIFICATION	ENG-STD-10149 CED-FRM-10358	THE GENERAL CONTRACTOR SHALL PROVIDE WRITTEN AND PHOTOGRAPHIC DOCUMENTATION TO THE MI INSPECTOR VERIFYING THAT ANY ON-SITE COLD GALVANIZING WAS APPLIED PER MANUFACTURER SPECIFICATIONS AND APPLICABLE STANDARDS.
NA	TENSION TWIST AND PLUMB	CED-PRC-10182 CED-STD-10261	THE GENERAL CONTRACTOR SHALL PROVIDE A REPORT IN ACCORDANCE WITH APPLICABLE STANDARDS DOCUMENTING TENSION TWIST AND PLUMB.
X	GC AS-BUILT DRAWINGS	CED-SOW-10007	THE GENERAL CONTRACTOR SHALL SUBMIT A LEGIBLE COPY OF THE ORIGINAL DESIGN DRAWINGS EITHER STATING "INSTALLED AS DESIGNED" OR NOTING ANY CHANGES THAT WERE REQUIRED AND APPROVED BY THE ENGINEER OF RECORD. EOR/RFI FORMS APPROVING ALL CHANGES SHALL BE SUBMITTED
ADDITIONAL TESTING AND INSPECTIONS:			
POST-CONSTRUCTION			
X	CONSTRUCTION COMPLIANCE LETTER	CED-SOW-10007 CED-FRM-10358	A LETTER FROM THE GENERAL CONTRACTOR STATING THAT THE WORKMANSHIP WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THESE CONTRACT DRAWINGS, INCLUDING LISTING ADDITIONAL PARTIES TO THE MODIFICATION PROCESS.
X	POST-INSTALLED ANCHOR ROD PULL TESTS	CED-PRC-10119	POST-INSTALLED ANCHOR RODS SHALL BE TESTED BY A CROWN APPROVED PULL TEST INSPECTOR AND A REPORT SHALL BE PROVIDED INDICATING TESTING RESULTS.
X	PHOTOGRAPHS	CED-SOW-10007	PHOTOGRAPHS SHALL BE SUBMITTED TO THE MI. PHOTOS SHALL DOCUMENT ALL PHASES OF THE CONSTRUCTION. THE PHOTOS SHALL BE ORGANIZED IN A MANNER THAT EASILY IDENTIFIES THE EXACT LOCATION OF THE PHOTO.
NA	BOLT HOLE INSTALLATION VERIFICATION REPORT	CED-SOW-10007	THE MI INSPECTOR SHALL VERIFY THE INSTALLATION AND TIGHTNESS 10% OF ALL NON PRE-TENSIONED BOLTS INSTALLED AS PART OF THE MODIFICATION. THE MI INSPECTOR SHALL LOOSEN THE NUT AND VERIFY THE BOLT HOLE SIZE AND CONDITION. THE MI REPORT SHALL CONTAIN THE COMPLETED BOLT INSTALLATION VERIFICATION REPORT, INCLUDING THE SUPPORTING PHOTOGRAPHS.
X	PUNCH LIST DEVELOPMENT AND CORRECTION DOCUMENTATION	CED-PRC-10283 CED-FRM-10285	FINAL PUNCH LIST INDICATING ALL NONCONFORMANCE(S) IDENTIFIED AND THE FINAL RESOLUTION/APPROVAL.
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)	CED-SOW-10007	THE MI INSPECTOR SHALL OBSERVE AND REPORT ANY DISCREPANCIES BETWEEN THE CONTRACTOR'S REDLINE DRAWING AND THE ACTUAL COMPLETED INSTALLATION.
ADDITIONAL TESTING AND INSPECTIONS:			

THE MI CHECKLIST SHALL BE REVIEWED PRIOR TO THE START OF CONSTRUCTION. ALL PARTIES TO THE MODIFICATION SHALL UNDERSTAND CROWN REQUIREMENTS AND INSPECTION/DOCUMENTATION THAT IS APPLICABLE TO THE SCOPE OF WORK THEY ARE PERFORMING. ERRORS ON THE MI CHECKLIST SHALL BE BROUGHT TO THE ATTENTION OF THE CROWN POC AND EOR AS SOON AS POSSIBLE.

MODIFICATION INSPECTION NOTES

GENERAL

THE MI IS AN ON-SITE VISUAL AND HANDS-ON INSPECTION OF TOWER MODIFICATIONS INCLUDING A REVIEW OF CONSTRUCTION REPORTS AND ADDITIONAL PERTINENT DOCUMENTATION PROVIDED BY THE GENERAL CONTRACTOR (GC), AS WELL AS ANY INSPECTION DOCUMENTS PROVIDED BY 3RD PARTY INSPECTORS. THE MI IS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS; IN ACCORDANCE WITH APPLICABLE CROWN STANDARDS; AND AS DESIGNED BY THE ENGINEER OF RECORD (EOR).

NO DOCUMENT, CODE OR POLICY CAN ANTICIPATE EVERY SITUATION THAT MAY ARISE. ACCORDINGLY, THIS CHECKLIST IS INTENDED TO SERVE AS A SOURCE OF GUIDING PRINCIPLES IN ESTABLISHING GUIDELINES FOR MODIFICATION INSPECTION.

THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, AND THE MI INSPECTOR DOES NOT TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES. THE MI INSPECTOR SHALL INSPECT AND NOTE CONFORMANCE/NONCONFORMANCE AND PROVIDE TO THE CROWN POINT OF CONTACT (CROWN POC) FOR EVALUATION.

ALL MI'S SHALL BE CONDUCTED BY A CROWN APPROVED MI INSPECTOR, WORKING FOR A CROWN APPROVED MI VENDOR. SEE CROWN CED-LST-10173, "APPROVED MI VENDORS".

TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PURCHASE ORDER (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 THE GC AND/OR INSPECTOR SHALL CONTACT THE CROWN POINT OF CONTACT (CROWN POC).

REFER TO CROWN CED-SOW-10007, "MODIFICATION INSPECTION SOW", FOR FURTHER DETAILS AND REQUIREMENTS.

SERVICE LEVEL COMMITMENT

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

- THE GC SHALL PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLY 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
- THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY MINOR 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.

REQUIRED PHOTOS

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

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

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

THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS, FOR A COMPLETE LIST OF PHOTOS SEE CROWN DOCUMENT # CED-SOW-10007.

NO.	DATE	DESCRIPTION	BY

REVISIONS

STATE OF CONNECTICUT
CHRISTOPHER J. SCHEKS
No. 30026
PROFESSIONAL ENGINEER

8/23/21

GPD Engineering and Architecture Professional Corporation
520 South Main Street, Suite 2531
Akron, OH 44311
330.572.2100 Fax 330.572.2102

GPD PROJECT NUMBER
2021777.828257.06

SITE NAME: STONINGTON

BU NUMBER: 828257

WO NUMBER: 2002920

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NEW LONDON COUNTY, USA

ENG/QA BY: BK	DATE: 8/23/21
DFT BY: MJS	DATE: 8/23/21
DFT/QA BY: DP	DATE: 8/23/21
APRV'D BY: CJS	DATE: 8/23/21

SCALE: N.T.S.

MODIFICATION INSPECTION CHECKLIST

S-2

REV 0

GENERAL NOTES:

1. The General Contractor (GC) shall reference CED-STD-10159, "Tower Modification Construction Specifications", as a continuation of the following General Notes. The GC shall keep a copy of this document with the Structural Design Drawings (SDD) at all times, and shall ensure that all Contractor Personnel are aware of the information enclosed within the General Notes and CED-STD-10159.
2. The Contract Documents are the property of Crown Castle (Crown). They are provided to the GC and its Lower Tier Contractors and material suppliers for the limited purpose of use in completing the Work for this Site, and shall be kept in strict confidence and not disclosed to any third parties. The Contract Documents shall not be used for any other purpose whatsoever without the prior written consent of Crown.
3. Detail drawings, including notes and tables, shall govern over general notes and typical details. Contact the Crown Point of Contact (POC) and Engineer of Record (EOR) for clarification as needed.
4. Do not scale drawings.
5. Any Work performed without a prefabrication mapping is done at the risk of the GC and/or fabricator. All dimensions of existing structural elements are assumed based on the available documentation and are preliminary until field-verified by the GC, unless noted otherwise (UNO). Where discrepancies are found, GC shall contact the Crown POC and EOR through RFI.
6. For this analysis and modification, the tower has been assumed to be in good condition without any structural defects, UNO. If the GC discovers any indication of an existing structural defect, contact the Crown POC and EOR immediately.
7. 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 GC responsible for the execution of the Work contained herein, and shall meet ANSI/ASSE A10.48 (latest edition); federal, state, and local regulations; and any applicable industry consensus standards related to the construction activities being performed. All rigging plans shall adhere to ANSI/ASSE A10.48 (latest edition) and Crown standard CED-STD-10253, "Rigging Program", including the required involvement of a qualified engineer for class IV construction to certify the supporting structure(s) in accordance with the ANSI/TIA-322 (latest edition).
8. The structural integrity of the modification design extends to the complete condition only. The GC must be cognizant that the removal of any structural component of an existing tower has the potential to cause the partial or complete collapse of the structure. All necessary precautions must be taken to ensure structural integrity, including, but not limited to, engineering assessment of construction stresses with installation maximum wind speed and/or temporary bracing and shoring.
9. Aerial and underground utilities and facilities may or may not be shown on the drawings. The GC shall take every precaution to preserve and protect these items, which may include aerial or underground power lines, telephone lines, water lines, sewer lines, cable television facilities, pipelines, structures and other public and private improvements within or adjacent to the Work area. The responsibility for determining the actual on-site location of these items shall rest exclusively with the GC.
10. All manufacturer's hardware assembly instructions shall be followed, UNO. Conflicting notes shall be brought to the attention of the EOR and the Crown POC.
11. The GC shall fabricate all required items per the materials specified below, UNO on the detail drawing sheets. If the GC finds for any component that the materials have not been clearly specified, the GC shall submit an RFI to the EOR to confirm the required material.

    All structural elements shall be new and shall conform to the following requirements, UNO:

    Monopoles:
    - Structural shapes and plates: ASTM A572 Grade 65 (FY = 65 KSI)
    - Welding electrodes, SMAW: E80XX
    - Welding electrodes, FCAW: E8XT-XX

    Self-Support and Guyed Towers:
    - Structural shapes and plates: ASTM A572 Grade 50 (FY = 50 KSI)
    - Welding electrodes, SMAW: E70XX
    - Welding electrodes, FCAW: E7XT-XX

    All tower types:
    - Steel angle: ASTM A572 Grade 50 (FY = 50 KSI)
    - Solid rod: ASTM A36 (FY = 36 KSI)
    - Pipe/tube (round): ASTM A500 Grade C (FY = 46 KSI)
    - Pipe/tube (square): ASTM A500 Grade C (FY = 50 KSI)
    - Bolts: ASTM F3125 Grade A325 Type 1
    - U-bolts: ASTM A307 Grade A, or SAE J429 Grade 2
    - Nuts: ASTM A563 Grade DH
    - Washers: ASTM F436 Type 1
    - Guy Wires: ASTM A475 Grade EHS
    - Bridge Strand: ASTM A586 Grade 1
12. After fabrication, hot-dip galvanize all steel items, UNO. Galvanize per ASTM A123, ASTM A153/A153M, or ASTM A653 G90, as applicable. ASTM A490 bolts shall not be hot-dip galvanized, but shall instead be coated with Magni 565 or EOR approved equivalent, per ASTM F2833.
13. Contractor Personnel shall not drill holes in any new or existing structural members, other than those drilled holes shown on structural drawings, without the approval of the EOR.
14. For a list of Crown-approved cold galvanizing compounds, refer to ENG-STD-10149, “Tower Protective Coatings Guidelines”.
15. All exposed structural steel as the result of this scope of Work including welds (after final inspection of the weld by the CWI), field drilled holes, and shaft interiors (where accessible), shall be cleaned and two (2) coats cold galvanizing shall be applied by brush in accordance with ENG-STD-10149, “Tower Protective Coatings Guidelines”. Photo documentation is required to be submitted to the MI Inspector.
16. If removal of existing modifications is required per the modification scope, the GC shall clean and cold galvanize any existing empty bolt holes, UNO. If additional unexpected, oversized, or slotted holes are found, the GC shall contact the EOR and Crown POC for guidance prior to proceeding with the modifications.
17. All Work involving base plate grout scope items or resulting in disturbance of base plate grout shall reference ENG-STD-10323, "Base Plate Grout", and shall follow any Base Plate Grout Removal Notes contained herein.
18. All tower grounding affected by the Work shall be repaired or replaced in accordance with OPS-STD-10090, "Tower Grounding", and OPS-BUL-10133, "Grounding Repair Recommendation".
19. If scope of modification requires removal or covering of tower ID tag, the tag must be replaced.
20. Any hardware removed from the existing tower shall be replaced with new hardware of equal size and quality, UNO. No existing fasteners shall be reused.
21. All joints using ASTM A325 or A490 bolts, U-bolts, V-bolts, and threaded rods shall be snug tightened, UNO.
22. A nut locking device shall be installed on all proposed and/or replaced snug tightened ASTM A325 or A490 bolts, U-bolts, V-bolts, and threaded rods.
23. All joints are bearing type connections UNO. If no bolt length is given in the Bill of Materials, the connection may include threads in the shear planes, and the GC is responsible for sizing the length of the bolt.
24. Blind bolts shall be installed per the installation specifications on the corresponding Approved Fastener sheets contained in CED-CAT-10300, "Monopole Standard Drawings and Approved Reinforcement Components".
25. If ASTM A325 or A490 bolts, and/or threaded rods are specified to be pre-tensioned, these shall be installed and tightened to the pretensioned condition according to the requirements of the RCSC Specification for Structural Joints Using ASTM High Strength Bolts.
26. All proposed and/or replaced bolts shall be of sufficient length such that the end of the bolt be at least flush with the face of the nut. It is not permitted for the bolt end to be below the face of the nut after tightening is completed.

NO.	DATE	DESCRIPTION	BY

REVISIONS

STATE OF CONNECTICUT
CHRISTOPHER J. SCHEKS
No. 30026
LICENSED
PROFESSIONAL ENGINEER

8/23/21

GPD Engineering and Architecture Professional Corporation
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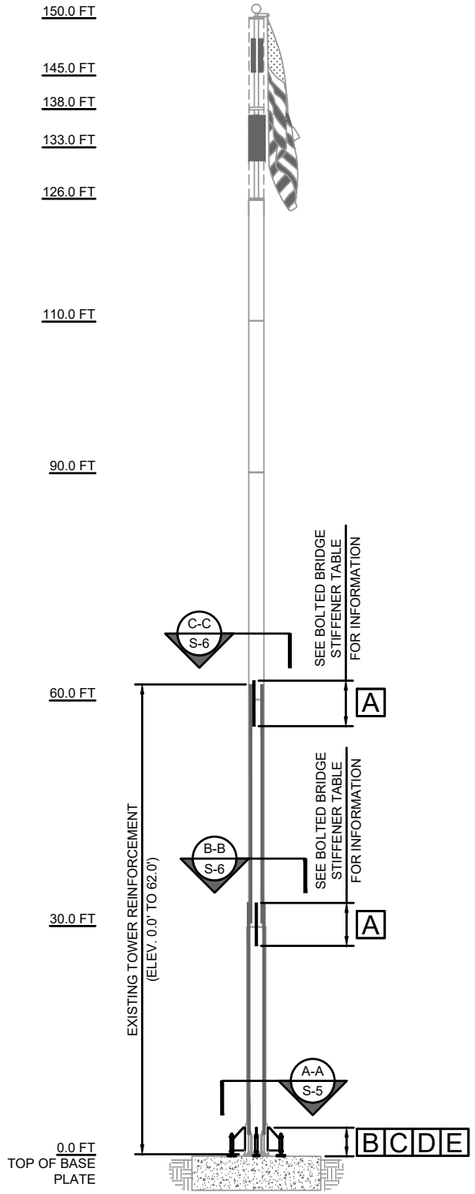
SCALE: N.T.S.

GENERAL NOTES

S-3 REV 0



POLE ELEVATION

POLE MODIFICATION SCHEDULE

	ELEVATION (FT)	MODIFICATION	REFERENCE SHEET
A	56.5 - 62.5	INSTALL NEW FLAT PLATE REINFORCEMENT.	S-6, S-7, & S-8
	27.5 - 32.83		S-6, S-7, & S-8
B	0.0 - 4.5	INSTALL NEW ANCHOR RODS WITH BRACKETS TO THE TOWER BASE.	S-5
C	0.0	RELOCATE EQUIPMENT AT THE BASE OF THE TOWER TO ALLOW FOR INSTALLATION OF NEW ANCHOR RODS. COORDINATE WITH TOWER OWNER.	S-5
D	0.0	REMOVE EXISTING TOP HEX NUTS FROM ANCHOR RODS AND PROVIDE CAULKING AROUND PERIMETER TO PREVENT WATER ENTRY	S-5
E	0.0	REMOVE AND RELOCATE EXISTING GROUNDING WIRE FOR INSTALLATION OF ANCHOR RODS	-
F	VARIES	PAINT NEW/ EXISTING MATERIAL IN MODIFIED REGIONS TO MATCH THE EXISTING TOWER FINISH.	-

FOR PARTS NOT DETAILED WITHIN THE DRAWING AND STARTING WITH "CCI-", SEE THE FOLLOWING CATALOG FOR DETAILS: CED-CAT-10300, MONOPOLE STANDARD DRAWINGS AND APPROVED REINFORCEMENT COMPONENTS.

PRIOR TO FABRICATION AND INSTALLATION, CONTRACTOR SHALL FIELD VERIFY ALL LENGTHS AND QUANTITIES GIVEN. LENGTH AND QUANTITIES PROVIDED ARE FOR QUOTING PURPOSES ONLY AND SHALL NOT BE USED FOR FABRICATION.

NOTE:

1. ALL EXISTING MATERIAL REMOVED FROM THE TOWER SHALL BE DISPOSED OF BY THE CONTRACTOR OFF SITE.

NOTES FOR CROWN (65 KSI) FLAT PLATES INCLUDING BOLTED BRIDGE STIFFENERS:

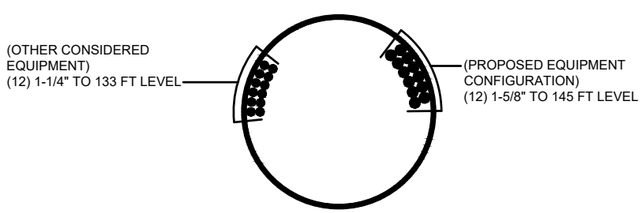
1. APPROVED FASTENERS MAY BE USED ON THIS PROJECT AS INDICATED IN THE FOLLOWING TABLE:

NEXGEN2	APPROVED	SPECIALTY FASTENERS	NA

   ORDERING INFORMATION AND INSTALLATION DETAILS FOR APPROVED FASTENERS CAN BE FOUND IN CED-CAT-10300.
2. ALL FLAT PLATE REINFORCEMENT IS TO BE INSTALLED CENTERED ON ITS DESIGNATED FLAT OR AZIMUTH, UNO, WITH A TOLERANCE FROM CENTER OF THE FLAT OR AZIMUTH AS FOLLOWS:

ALLOWABLE FLAT PLATE CENTERING TOLERANCE	3/8"

   GC SHALL REDLINE ALL DEVIATIONS FROM CENTER, INCLUDING THOSE WITHIN TOLERANCE.
3. GC SHALL REPLACE ANY STEP BOLTS AND STEP BOLT CLIPS THAT INTERFERE WITH THE INSTALLATION OF FLAT PLATE. REFERENCE CED-CAT-10300 FOR APPROVED OPTIONS. CCI-SB-0100 IS THE DEFAULT OPTION; OTHER OPTIONS MAY BE REQUIRED FOR FIT-UP.
4. FOR PLATES STARTING AT 6", THE BOTTOM OF THE FLAT PLATE SHALL BEGIN AT 6" +/- 1". FOR SINGLE PLATES OR MULTIPLE PLATES SPLICED TOGETHER, THE BOTTOM OF THE FLAT PLATE RUN SHALL BEGIN AT THE PROPOSED ELEVATION +/- 3". FOR MULTIPLE PLATES SPLICED TOGETHER, THE TOP OF THE FLAT PLATE IS TO BE PLACED SUCH THAT THERE IS NO MORE THAN 3" DIFFERENCE BETWEEN THE ACTUAL OVERALL LENGTH OF THE SPAN AND THE PROPOSED OVERALL LENGTH OF THE SPAN, FROM THE BOTTOM OF THE BOTTOM PLATE TO THE TOP OF THE TOP PLATE.
5. SHIMS FOR MONOPOLE REINFORCEMENT MEMBER SHALL BE REQUIRED WHERE GAPS BETWEEN THE POLE SHAFT AND REINFORCING MEMBER EXIST AT FASTENER LOCATIONS. FOR INTERMEDIATE CONNECTIONS, THE MINIMUM SHIM LENGTH AND WIDTH SHALL BE THE WIDTH OF THE REINFORCING MEMBER. FOR TERMINATION CONNECTIONS, A CONTINUOUS SHIM PLATE (PREFERRED) OR EQUIVALENT INDIVIDUAL SHIM PLATES THE WIDTH OF THE REINFORCING MEMBER MAY BE USED. SHIM THICKNESSES SHALL BE NO LESS THAN 1/16". STACKING OF SHIMS IS PERMITTED. FINGER SHIMS AND HORSESHOE SHIMS ARE PERMITTED. SINGLE AND STACKED SHIMS IN BOLT TERMINATION REGIONS SHALL BE NO GREATER THAN A TOTAL OF ¼" WITHOUT EOR APPROVAL. SINGLE AND STACKED SHIMS AT INTERMEDIATE CONNECTIONS SHALL BE NO GREATER THAN A TOTAL OF 5/8" WITHOUT EOR APPROVAL.
6. SHIM MATERIAL SHALL BE STEEL GRADE A36 OR GREATER IF WELDED, UNO, AND SHALL REQUIRE MTR; IF SHIMS ARE NOT WELDED, THERE IS NO MINIMUM REQUIRED STEEL GRADE.
7. IF UNEXPECTED HOLES ARE FOUND IN A LOCATION WHERE FLAT PLATE IS PROPOSED TO BE INSTALLED, THE GC SHALL NOT PLACE NEW BOLT HOLES WITHIN A CENTER-TO-CENTER DISTANCE OF 3 TIMES THE DIAMETER OF THE LARGER OF THE TWO HOLES, WITHOUT EOR APPROVAL. EXISTING HOLES MAY INCLUDE BUT ARE NOT LIMITED TO EMPTY BOLT HOLES AND JACKING NUTS WITH CENTER HOLES.



COAX LAYOUT

MANUFACTURER POLE SPECIFICATIONS

TAPER:	ROUND
BASE PL STEEL:	ASTM A36
ANCHOR RODS:	1"Ø ASTM A687 (Fy=105 KSI)

BOLT COUNT BY LENGTH	
LENGTH	**QUANTITY**
SHORT	80
MEDIUM	0
LONG	28
TOTAL	108

MANUFACTURER SHAFT SECTION DATA

SHAFT SECTION	SHAFT SECTION	SECTION LENGTH (FT)	POLE THICKNESS (IN)	SECTION GRADE (KSI)	FLANGE PLATE GRADE (KSI)	LAP SPLICE (IN)	DIAMETER ACROSS FLATS OR OF ROUND SECTION (IN)	
							@TOP	@BOTTOM
1	ROUND	24.00	0.4650	42	36		10.75	10.75
2	ROUND	16.00	0.3750	42	36		24.00	24.00
3	ROUND	20.00	0.3750	42	36		24.00	24.00
4	ROUND	30.00	0.3750	42	36		24.00	24.00
5	ROUND	30.00	0.3750	42	36		24.00	24.00
6	ROUND	30.00	0.3750	42	36		30.00	30.00

NO.	DATE	DESCRIPTION	BY

REVISIONS

STATE OF CONNECTICUT
CHRISTOPHER J. SCHERER
No. 30026
LICENSED
PROFESSIONAL ENGINEER

8/23/21

GPD Engineering and Architecture Professional Corporation
520 South Main Street, Suite 2531
Akron, OH 44311
330.572.2100 Fax 330.572.2102

GPD PROJECT NUMBER
2021777.828257.06

SITE NAME: STONINGTON

BU NUMBER: 828257

WO NUMBER: 2002920

SITE ADDRESS:
82 MECHANIC STREET
PAWCATUCK, CT 06379
NEW LONDON COUNTY, USA

ENG/QA BY: BK DATE: 8/23/21

DFT BY: MJS DATE: 8/23/21

DFT/QA BY: DP DATE: 8/23/21

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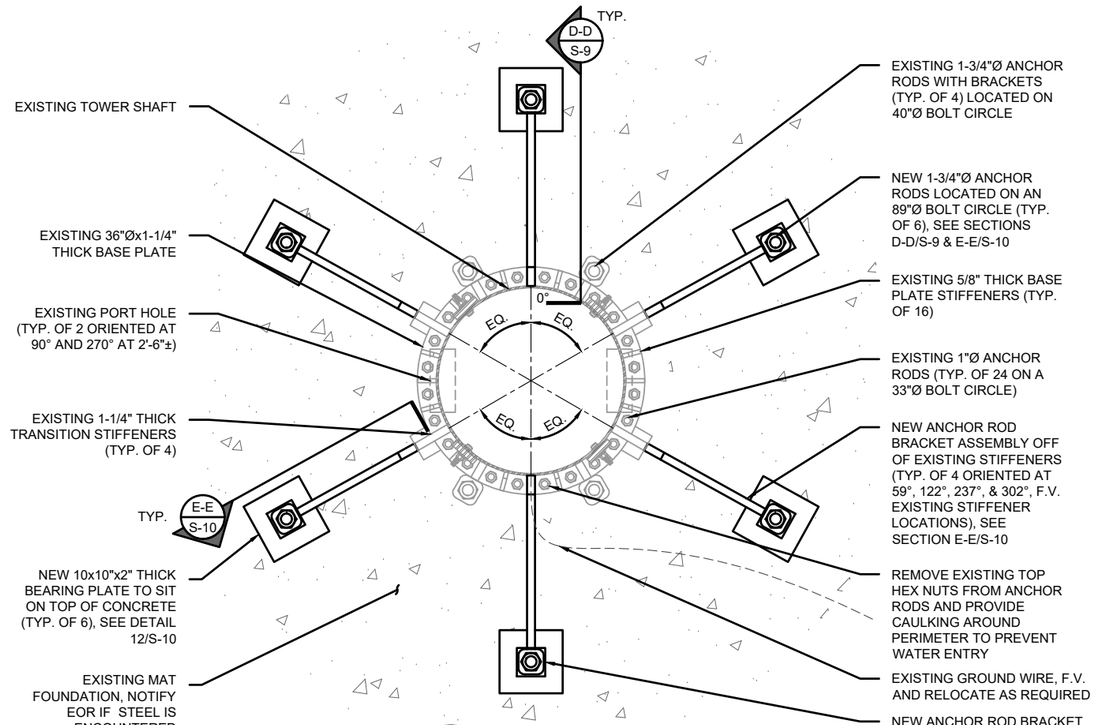
SCALE: N.T.S.

TOWER ELEVATION

S-4

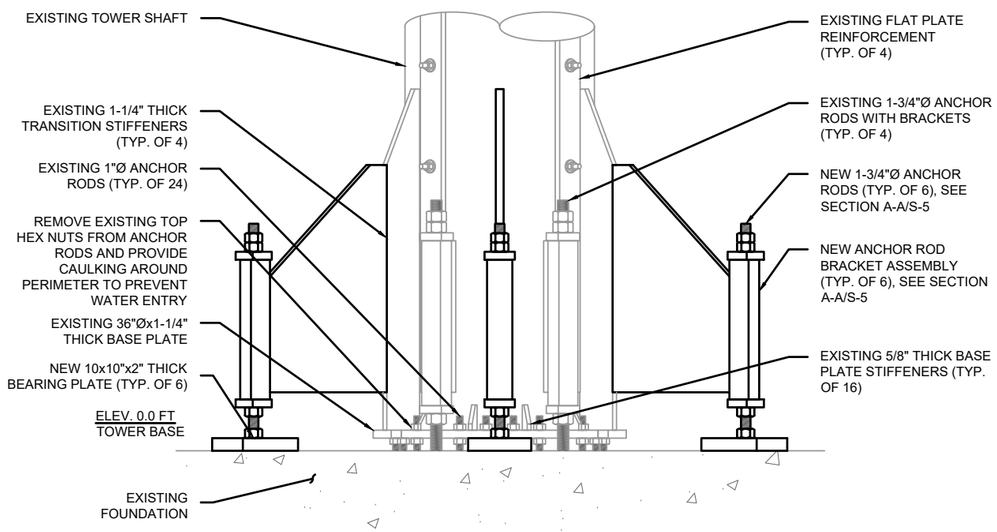
REV 0



A-A / S-5 TOWER SECTION

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

NOTE:
1. CONTRACTOR SHALL F.V. AND RELOCATE EXISTING EQUIPMENT AT BASE OF THE TOWER FOR INSTALLATION OF PROPOSED ANCHOR ROD BRACKETS, COORDINATE WITH TOWER OWNER.



1 / S-5 ELEVATION

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

NOTES:

1. ALL EXPOSED STRUCTURAL STEEL SHALL BE HOT-DIP GALVANIZED PER ASTM A153 / A153M OR A123, AS APPLICABLE. FIELD DRILLED OR CUT MATERIAL TO BE COATED WITH TWO BRUSH COATS OF CROWN APPROVED ZINC RICH PAINT IN ACCORDANCE WITH ENG-BUL-10149 *TOWER PROTECTIVE COATINGS BULLETIN.*

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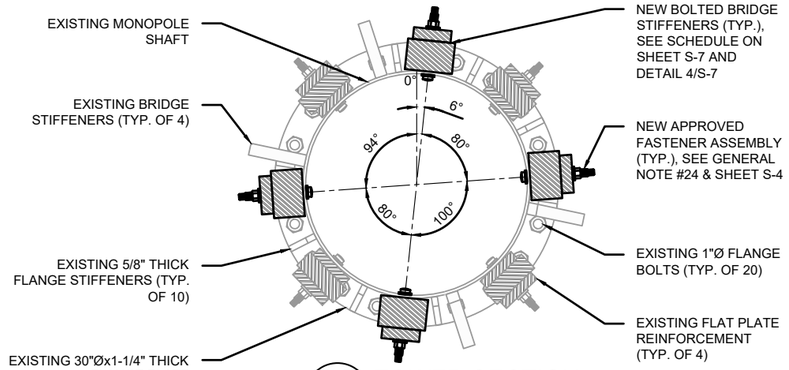
STATE OF CONNECTICUT
CHRISTOPHER J. SCHEKS
No. 30026
LICENSED PROFESSIONAL ENGINEER

8/23/21

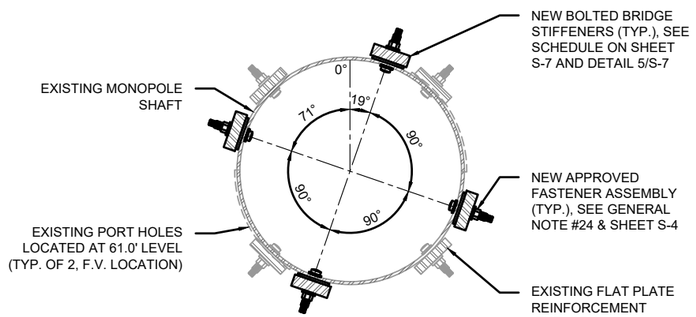
TOWER SECTIONS

S-5

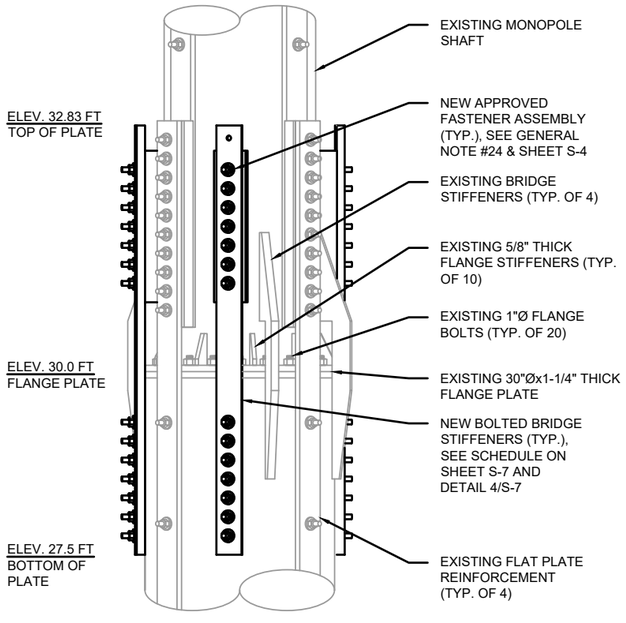
REV 0



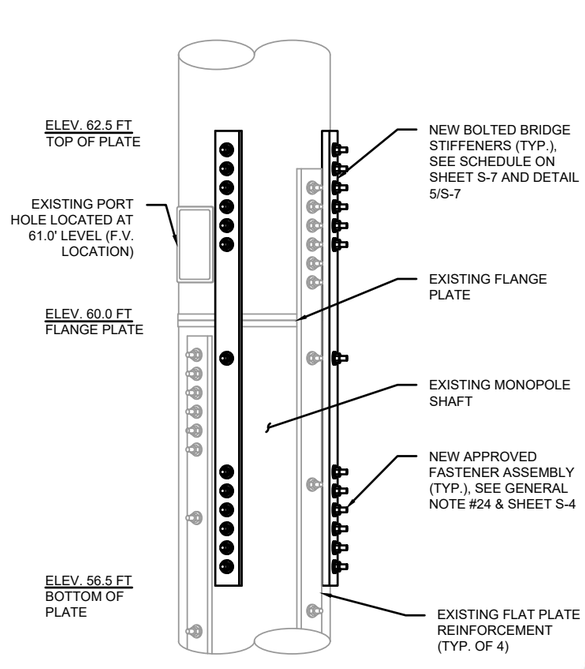
B-B TOWER SECTION
S-6
SCALE: 3/4" = 1'-0"



C-C TOWER SECTION
S-6
SCALE: 3/4" = 1'-0"



2 ELEVATION
S-6
SCALE: 1/2" = 1'-0"



3 ELEVATION
S-6
SCALE: 1/2" = 1'-0"

NOTES:

1. ALL EXPOSED STRUCTURAL STEEL SHALL BE HOT-DIP GALVANIZED PER ASTM A153 / A153M OR A123, AS APPLICABLE. FIELD DRILLED OR CUT MATERIAL TO BE COATED WITH TWO BRUSH COATS OF CROWN APPROVED ZINC RICH PAINT IN ACCORDANCE WITH ENG-BUL-10149 *TOWER PROTECTIVE COATINGS BULLETIN.*

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CHRISTOPHER J. SCHEKSNAYER
No. 30026
LICENSED PROFESSIONAL ENGINEER

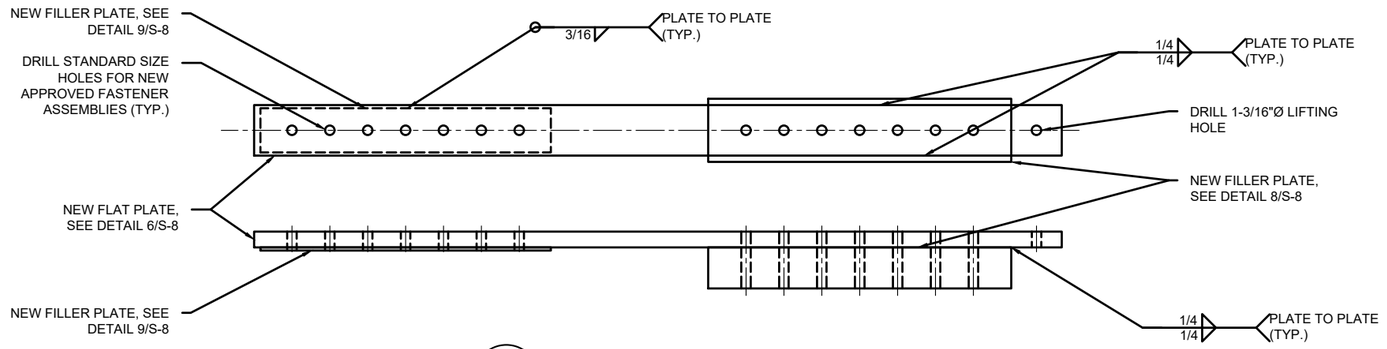
8/23/21

ADDITIONAL SECTIONS

S-6

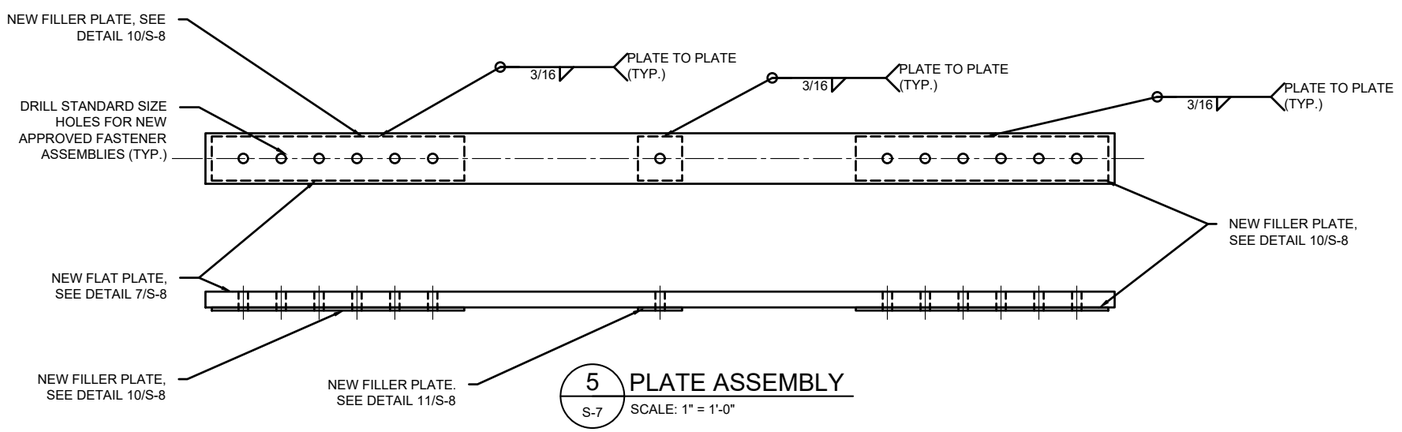
REV 0

BOLTED BRIDGE STIFFENER (65 KSI)									TOP FILLER PLATE					MIDDLE FILLER PLATE					BOTTOM FILLER PLATE					TOTALS		
BOTTOM ELEVATION	TOP ELEVATION	PART NUMBER	FLAT/ DEGREES	TERMINATION BOLTS (BOTTOM)	TERMINATION BOLTS (TOP)	MAX INTERMEDIATE BOLT SPACING	BOLT QTY PER PLATE	STEEL WEIGHT PER PLATE (BLACK)	W	THK	L	TOTAL BOLT HOLE QTY FOR FILLER PLATES	STEEL WEIGHT PER FILLER PLATE (BLACK)	W	THK	L	TOTAL BOLT HOLE QTY FOR FILLER PLATES	STEEL WEIGHT PER FILLER PLATE (BLACK)	W	THK	L	TOTAL BOLT HOLE QTY FOR FILLER PLATES	STEEL WEIGHT PER FILLER PLATE (BLACK)	TOTAL STEEL WEIGHT PER ASSEMBLY (BLACK)	TOTAL BOLT QTY	TOTAL STEEL WEIGHT (BLACK)
27.5'	32.83'	CCI-CFP-04012505.33* REF 4/S-7	94°, 174°, 274°, & 354°	7	7	1'-6"	14	90.7	5"	3.25"	24"	7	88.39	-	-	-	-	-	3.5"	0.25"	23"	7	5.70	184.79	56	739.16
56.5'	62.5'	CCI-CFP-04012506* REF 5/S-7	71°, 161°, 251°, & 341°	6	6	1'-6"	13	102.0	3.5"	0.25"	20"	6	4.96	3.5"	0.25"	3.5"	1	0.87	3.5"	0.25"	20"	6	4.96	112.79	52	451.16
									TOTAL			13		TOTAL			1		TOTAL			13		TOTAL	108	1190.32



4 S-7 PLATE ASSEMBLY
SCALE: 1" = 1'-0"

NOTES
1. DETAIL IS TYPICAL FOR THE BOLTED BRIDGE STIFFENER ASSEMBLIES ORIENTED AT 94°, 174°, 274°, & 354° FROM 27.5' TO 32.83'



5 S-7 PLATE ASSEMBLY
SCALE: 1" = 1'-0"

NOTES
1. DETAIL IS TYPICAL FOR THE BOLTED BRIDGE STIFFENER ASSEMBLIES ORIENTED AT 71°, 161°, 251°, & 341° FROM 56.5' TO 62.5'

NOTE.
1. ALL FILLER PLATES TO BE ASTM A572 GRADE 50 MATERIAL. MATERIAL TEST REPORTS ARE REQUIRED.
2. ALL EXPOSED STRUCTURAL STEEL SHALL BE HOT-DIP GALVANIZED PER ASTM A153 / A153MOR A123, AS APPLICABLE. FIELD DRILLED OR CUT MATERIAL TO BE COATED WITH TWO BRUSH COATS OF CROWN APPROVED ZINC RICH PAINT IN ACCORDANCE WITH ENG-BUL-10149 TOWER PROTECTIVE COATINGS BULLETIN.

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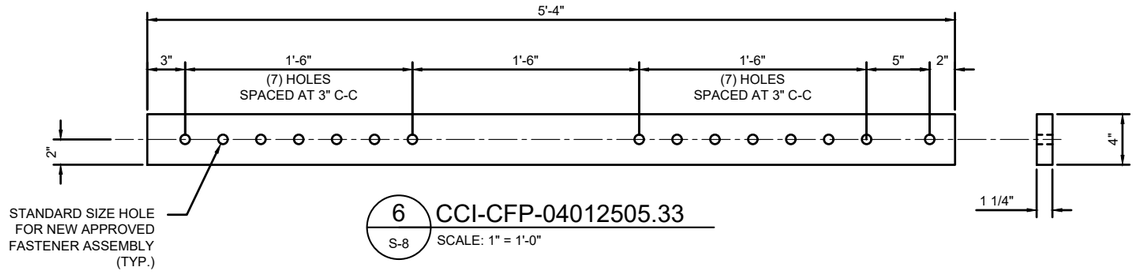
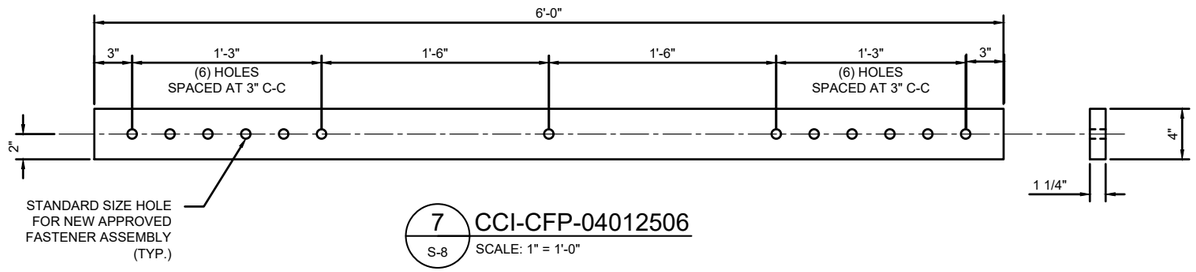
LICENSED
PROFESSIONAL ENGINEER
8/23/21

ADDITIONAL SECTIONS

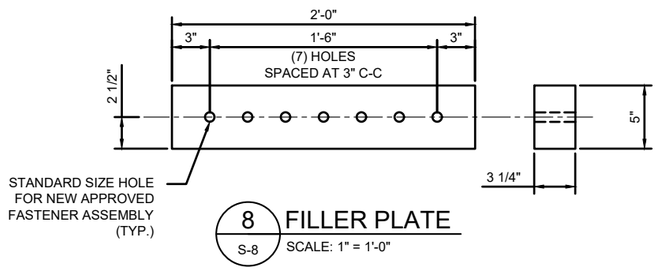
S-7 REV 0



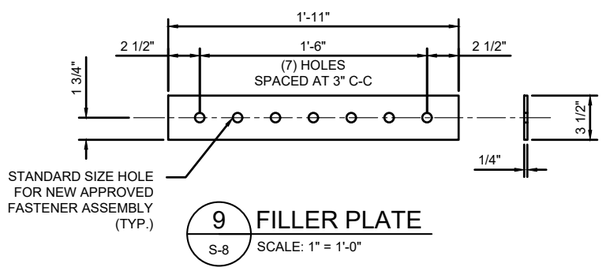
6 S-8 CCI-CFP-04012505.33
SCALE: 1" = 1'-0"



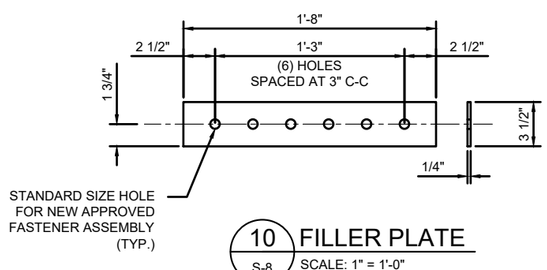
7 S-8 CCI-CFP-04012506
SCALE: 1" = 1'-0"



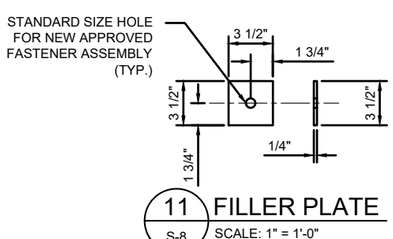
8 S-8 FILLER PLATE
SCALE: 1" = 1'-0"



9 S-8 FILLER PLATE
SCALE: 1" = 1'-0"



10 S-8 FILLER PLATE
SCALE: 1" = 1'-0"



11 S-8 FILLER PLATE
SCALE: 1" = 1'-0"

NOTE.
1. ALL FILLER PLATES TO BE ASTM A572 GRADE 50 MATERIAL. MATERIAL TEST REPORTS ARE REQUIRED.
2. ALL EXPOSED STRUCTURAL STEEL SHALL BE HOT-DIP GALVANIZED PER ASTM A153 / A153MOR A123, AS APPLICABLE. FIELD DRILLED OR CUT MATERIAL TO BE COATED WITH TWO BRUSH COATS OF CROWN APPROVED ZINC RICH PAINT IN ACCORDANCE WITH ENG-BUL-10149 TOWER PROTECTIVE COATINGS BULLETIN.

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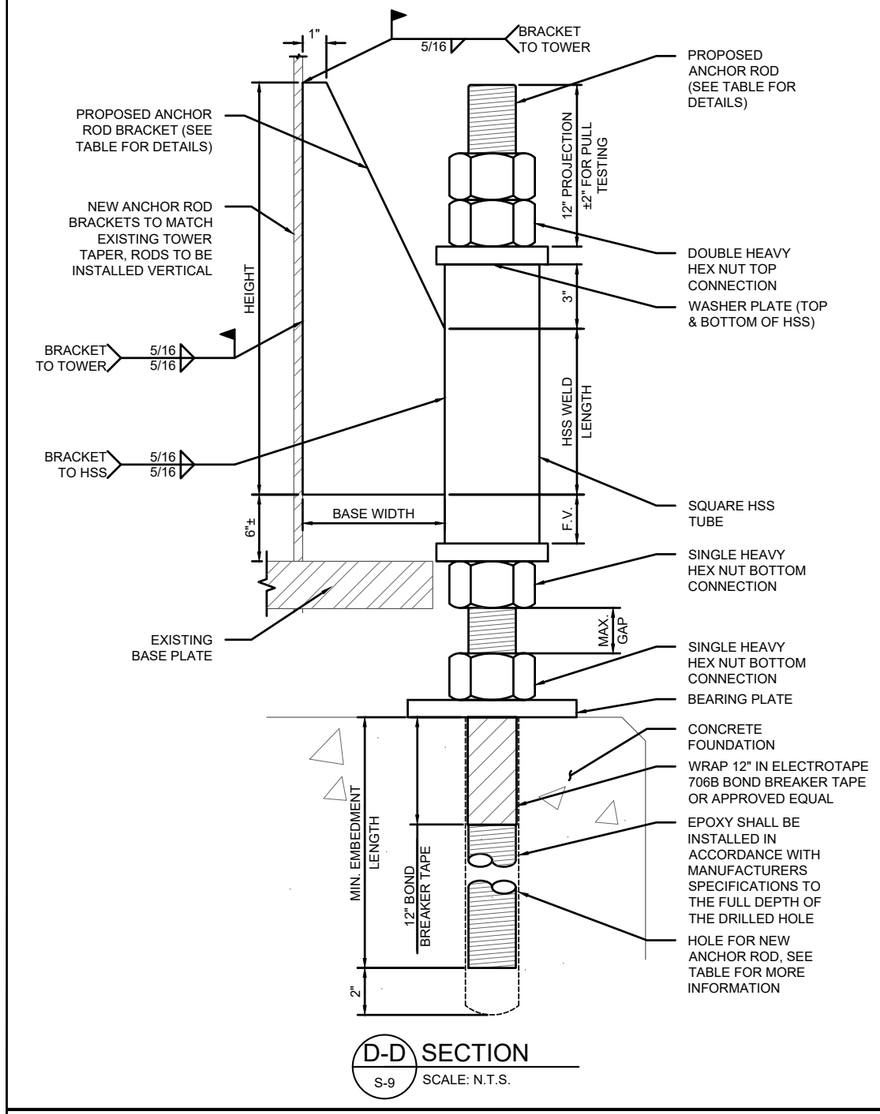
STATE OF CONNECTICUT
CHRISTOPHER J. SCHEKS
No. 30026
PROFESSIONAL ENGINEER
8/23/21

ADDITIONAL SECTIONS

S-8

REV 0



D-D / S-9 SECTION

SCALE: N.T.S.

ANCHOR ROD NOTES

1. THE GC SHALL ATTEMPT TO CENTER THE ROD IN THE BRACKET. HOWEVER, THE ROD MAY BE INSTALLED ANYWHERE WITHIN THE BRACKET SO LONG AS THE PLATE WASHER IS FULLY BEARING ON THE BRACKET.
2. REFERENCE CC APPROVED COMPONENTS (CURRENT VERSION) FOR ANCHOR ROD DIMENSIONS.
3. RODS MUST BE GALVANIZED FROM THE TOP OF THE PROJECTION TO 15" BELOW THE CONCRETE SURFACE AT A MINIMUM.
4. CORED HOLES MUST BE MECHANICALLY ROUGHENED USING A CARBIDE HOLE ROUGHENER OR EQUIVALENT. BRUSHING WITH A NYLON OR WIRE BRUSH SHALL BE USED IN THE PROCESS OF HOLE CLEANING, BUT DOES NOT SATISFY THE HOLE ROUGHENING REQUIREMENT.
5. FOLLOW EPOXY MANUFACTURER'S RECOMMENDATIONS FOR HOLE CLEANING.
6. ALL HOLES MUST BE DRY PRIOR TO PLACING EPOXY.
7. FOLLOW EPOXY MANUFACTURER'S RECOMMENDATIONS REGARDING HANDLING OF THREADED ROD AND EPOXY, AS WELL AS ALL INSTALLATION INSTRUCTIONS AND REQUIREMENTS.
8. TAKE ALL MEASUREMENTS NECESSARY TO AVOID DAMAGING EXISTING REINFORCING BARS DURING CORING OPERATIONS. NOTIFY EOR IMMEDIATELY IF EXISTING REINFORCING BARS ARE ENCOUNTERED AND INTERFERE WITH PLACEMENT OF NEW ANCHORS. MINOR ADJUSTMENT TO PROPOSED LOCATION OF NEW ANCHORS MAY BE REQUIRED.
9. ONCE ALL RESIN AND GROUT HAVE CURED, NEW ANCHOR ROD REINFORCING SHALL BE TARGET TENSIONED TO THE VALUE LISTED IN THE TABLE ON THIS SHEET. SEE ENG-PRC-10119; PULL-OUT TESTING POST-INSTALLED ANCHOR RODS, FOR SPECIFICATIONS.
10. CONTRACTOR TO VERIFY THAT A PULL TEST IS ABLE TO BE PERFORMED USING THE ANCHOR ROD PROJECTION SHOWN.
11. WHEN COMPLETED WITH EPOXY INSTALLATION, THE TOP OF THE EPOXY SHALL BE EQUAL TO OR HIGHER THAN THE TOP OF THE FOUNDATION, SUCH THAT WATER IS NOT ABLE TO COLLECT IN THE ANNULAR AREA AROUND THE EXPOSED PORTION OF THE ANCHOR ROD.
12. CONTRACTOR SHALL INSTALL RODS AND BRACKETS AT LOCATIONS INDICATED ON DRAWINGS.
13. CONTRACTOR SHALL VERIFY THAT TOWER IS PLUMB PRIOR TO THE INSTALLATION OF ANY TOWER MODIFICATIONS.
14. PULL TESTING RESULTS SHALL BE SUPPLIED TO THE TOWER OWNER AND THE MODIFICATION INSPECTOR FOR REFERENCE IN THE POST INSTALLATION OBSERVATION REPORT.
15. INSTALLATION OF GROUT AND/OR BOTTOM NUT FLUSH TO BASE PLATE IS PROHIBITED PRIOR TO COMPLETION OF ANCHOR ROD PULL TEST.
16. THE ADHESIVE ANCHOR SYSTEM USED FOR POST-INSTALLED ANCHORAGE TO CONCRETE SHALL CONFORM TO THE MOST RECENTLY PUBLISHED ACI 355.4, ACCEPTANCE CRITERIA FOR QUALIFICATION OF POST-INSTALLED ADHESIVE ANCHORS IN CONCRETE AND COMMENTARY. THE ANCHOR SYSTEM SHALL BE AS LISTED WITHIN THE ANCHOR ROD SPECIFICATIONS OR AN ENGINEER APPROVED EQUAL MEETING ACI 355.4 AND THE MINIMUM BOND STRESS VALUES BELOW. BULK MIXED ADHESIVES ARE NOT PERMITTED.
17. THE ADHESIVE ANCHORS SELECTED FROM THE PARAGRAPH ABOVE SHALL BE SUPPLIED AS AN ENTIRE SYSTEM. THE SYSTEM SHALL INCLUDE, BUT NOT BE LIMITED TO, THE NEW ADHESIVE CARTRIDGE, A CLEAN MIXING NOZZLE, EXTENSION TUBE, A DISPENSING GUN, AND ALL MANUFACTURER RECOMMENDED SUPPLIES FOR PROPERLY CLEANING THE HOLE. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL EQUIPMENT REQUIRED FOR INSTALLATION OF THE ADHESIVE ANCHOR SYSTEM.
18. ANCHORAGE DESIGN IS IN ACCORDANCE WITH APPENDIX D OF ACI 318-11. FOR ADHESIVE ANCHORS, THE FOLLOWING MINIMUM VALUES FOR BOND STRESS WERE ASSUMED FOR THE DESIGN USING THE ABOVE ADHESIVE ANCHOR ASSEMBLIES:

    A. HILTI RE-500 V3 UNCRACKED CONCRETE BOND STRESS (BASED ON HAMMER DRILLING):
    T_{CR} = 1130 PSI
19. ANCHOR ROD THREADS SHALL BE UNC COARSE THREADS, UNLESS NOTED OTHERWISE. COMPATIBLE NUTS AND WASHERS SHALL BE FURNISHED WITH ALL THE ALL-THREAD ROD AND CONSIDERED PART OF THE ASSEMBLY. THE COST OF HARDWARE SHALL BE CONSIDERED INCIDENTAL TO THE ADHESIVE ANCHOR ASSEMBLY.
20. NUTS, WASHERS, AND OTHER HARDWARE USED WITH AN ALL-THREADED BAR ADHESIVE ANCHOR SYSTEM SHALL HAVE A MATERIAL OR AN ALLOY DESIGNATION THAT MATCHES THE ALL-THREAD MATERIAL/ALLOY. GALVANIZED ASSEMBLIES SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A153 CLASS C. ELECTROPLATE GALVANIZING IS NOT ACCEPTABLE. DISSIMILAR METAL ASSEMBLIES SHALL BE SEPARATED BY NYLON, EPDM, OR OTHER APPROVED NON-METALLIC WASHERS.
21. ADHESIVE ANCHORS SHALL BE INSTALLED BY QUALIFIED PERSONNEL TRAINED TO INSTALL ADHESIVE ANCHORS IN ACCORDANCE WITH THE SPECIFICATIONS. POST-INSTALLED ADHESIVE ANCHORS SHALL BE INSTALLED AND CLEANED IN ACCORDANCE WITH THE MANUFACTURERS PRINTED INSTALLATION INSTRUCTIONS (MPII).
22. INSTALLATION OF ADHESIVE ANCHORS HORIZONTALLY OR UPWARDLY INCLINED TO SUPPORT SUSTAINED TENSION LOADS SHALL BE PERFORMED BY PERSONNEL CERTIFIED BY THE ACI/CRSI ADHESIVE ANCHOR INSTALLER CERTIFICATION PROGRAM. THESE ANCHORS ARE DESIGNATED WITH A (CERT) AFTER THE ANCHOR CALL-OUT. THESE ANCHORS SHALL BE CONTINUOUSLY INSPECTED DURING INSTALLATION BY AN INSPECTOR SPECIALLY APPROVED FOR THAT PURPOSE BY THE BUILDING OFFICIAL.
23. THE INSTALLERS QUALIFICATIONS SHALL BE SUBMITTED AND APPROVED IN ACCORDANCE WITH THE SPECIFICATIONS.
24. INSTALLED ADHESIVE ANCHORS SHALL BE SECURELY FIXED IN-PLACE TO PREVENT DISPLACEMENT WHILE THE ADHESIVE CURES. UNLESS SHOWN OTHERWISE WITHIN THE DRAWINGS, ANCHORS SHALL BE INSTALLED PERPENDICULAR TO THE CONCRETE SURFACE. ANCHORS DISPLACED PRIOR TO ADHESIVE CURING SHALL BE CONSIDERED DAMAGED AND ARE THE RESPONSIBILITY OF THE CONTRACTOR.
25. REINFORCING BARS OR ALL-THREADED BARS SHALL NOT BE BENT AFTER BEING ADHESIVELY EMBEDDED IN HARDENED, SOUND CONCRETE, UNLESS PERMITTED BY THE ENGINEER.

ANCHOR ROD SPECIFICATIONS

CCI PART #	DIAMETER (IN.)	QUANTITY	MATERIAL	HOLE DIAMETER (IN.)	TARGET TENSION LOAD (KIPS)
CCI-AR-0175	1 3/4	2	A193 GR B7	2	111

EPOXY	HILTI RE-500 V3
EMBEDMENT DEPTH (IN.)[3]	46
INSTALLED LENGTH (IN.)[5]	89

BRACKET DIMENSIONS

HEIGHT (IN.)	BASE WIDTH (IN.)	BRACKET QUANTITY	PLATE THICKNESS (IN.)	HSS SIZE	HSS WELD LENGTH (IN.)	WASHER PLATE SIZE (IN.)	BEARING PLATE SIZE (IN.)	MAX. GAP (IN.)
48	27 1/2	2	1 1/4	4x4x1/2	18	4-1/2x4-1/2x1-1/4	10x10x2	5 1/4

NOTES:
1. ALL SIZES AND QUANTITIES SHALL BE VERIFIED PRIOR TO FABRICATION. CONTRACTOR IS REQUIRED TO PROVIDE FINAL SHOP DRAWINGS TO ENGINEER FOR APPROVAL.
2. ALL DIMENSIONS/MEASUREMENTS ARE SHOWN IN INCHES.
3. ALL CORE DRILLED HOLES SHALL BE MECHANICALLY ROUGHENED PRIOR TO INSTALLATION OF THE NEW ANCHOR RODS.
4. AFTER ANCHOR ROD PROOF TESTING IS COMPLETE, INSTALL NUTS TO SNUG TIGHT PLUS 1/4 TURN BEFORE INSTALLING SECOND NUT FOR TOP CONNECTION.
5. CONTRACTOR SHALL FIELD VERIFY THE TOTAL REQUIRED LENGTH PRIOR TO INSTALLATION.

NO.	DATE	DESCRIPTION	BY

REVISIONS

STATE OF CONNECTICUT
CHRISTOPHER J. SCHEKS
No. 30026
LICENSED PROFESSIONAL ENGINEER

8/23/21

GPD Engineering and Architecture Professional Corporation
520 South Main Street, Suite 2531
Akron, OH 44311
330.572.2100 Fax 330.572.2102

GPD PROJECT NUMBER
2021777.828257.06

SITE NAME: STONINGTON

BU NUMBER: 828257

WO NUMBER: 2002920

SITE ADDRESS:
82 MECHANIC STREET
PAWCATUCK, CT 06379
NEW LONDON COUNTY, USA

ENG/QA BY: BK DATE: 8/23/21

DFT BY: MJS DATE: 8/23/21

DFT/QA BY: DP DATE: 8/23/21

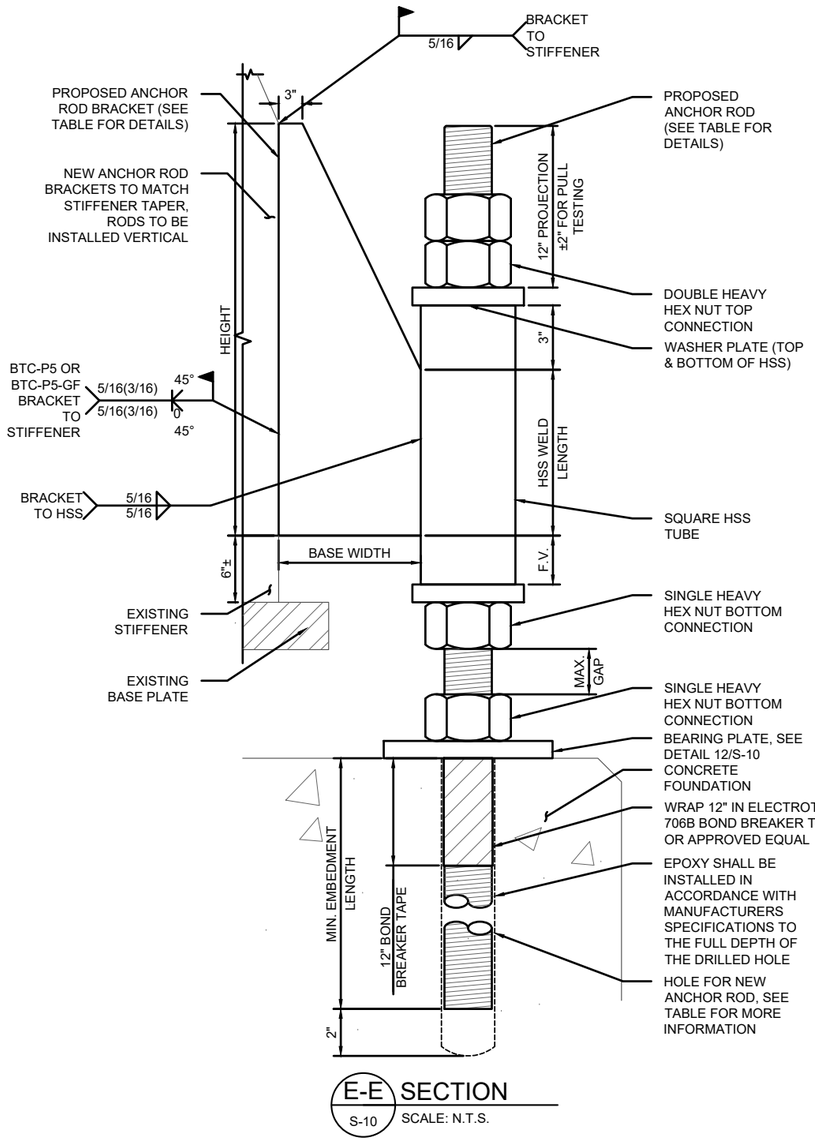
APRV'D BY: CJS DATE: 8/23/21

SCALE: N.T.S.

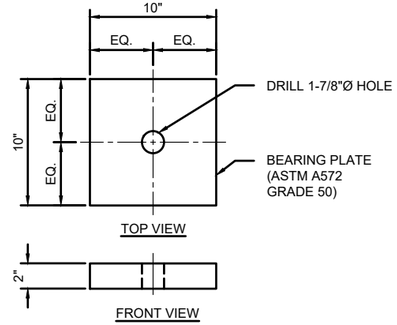
ADDITIONAL SECTIONS

S-9

REV 0



E-E SECTION
S-10
SCALE: N.T.S.



12 BEARING PLATE
S-10
SCALE: 1" = 1'-0"

ANCHOR ROD SPECIFICATIONS

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BRACKET DIMENSIONS

HEIGHT (IN.)	BASE WIDTH (IN.)	BRACKET QUANTITY	PLATE THICKNESS (IN.)	HSS SIZE	HSS WELD LENGTH (IN.)	WASHER PLATE SIZE (IN.)	BEARING PLATE SIZE (IN.)	MAX. GAP (IN.)
36	21 1/2	4	1 1/4	4x4x1/2	18	4-1/2x4-1/2x1-1/4	10x10x2	5 1/4

NOTES:
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REV 0