Town of Ashland
Planning Department
101 Main St.
Ashland, MA 01721
508.881.0101
Ashlandmass.com/193/Planning

Application for Planning Board Approval/Permit

Note: Application must be complete, with a certified plot plan and all application fees to be accepted.

Property Information:

Street Address: 34 Albert Ray Drive

Zoning District: RA Overlay District: _____

Assessor's Map: 014 Lot: 009. Deed Book: 30867 Page: 0381

Current Property Owner: Crown Atlantic Company

Permit/Approval Sought:

____Special Permit (§9.3) ____Special Permit Amendment/Modification ____Design Plan Review (§9.6)

____Site Plan Review (§9.4) ____Site Plan Modification ____Scenic Road Permit (Ch. 249 §20)

____Earth Removal Permit (Ch. 242 §3) ____Site Alteration Special Permit (§5.8)

____Subdivision (Include Subdivision Application Form) ✓ Wireless Communication Facilities (§6.4)

Use Type: Residential:____ Commercial:____ Industrial:____ Mixed Use:____

Applicant Information: Owner:____ Tenant: ✓ Prospective Purchaser/Tenant:____

Name: T Mobile Northeast

Address: c/o Terra Search 157 Riverside Drive, Norwell, MA 02061

Phone: 617-877-2950 Email: tgreene@terrasearchllc.com

Agent's Name: Timothy Greene

Agent's Address: 157 Riverside Drive, Norwell, MA 02061

Agent's Phone: 617-877-2950 Agent's Email: tgreene@terrasearchllc.com

Additional Information:

Are all real estate taxes and other assessments to the Town current?: yes

Is the parcel on a scenic road?: No Is the parcel in a flood plain?: No

Is the parcel within 100 feet of a wetland or 200 feet of a river: No

Is this an amendment to a previously issued Special Permit? (attach approved permit): yes

Date structure(s) built?: 1999

Description of the Relief Sought: (attach additional pages if needed)

Special Permit to upgrade existing wireless facility.
See attached Narrative

What specific zoning bylaws and/or Special Permit types are relevant to this application?:

6.4 of bylaw

Benefits of Project:

See attached narrative

Existing use and condition of the property and surrounding neighborhood: (Please list all non-conformities.)

None

Attach Building Permit Denial letter if applicable.

By signing below you assert this application is complete and accurate to the best of your knowledge:

Signatures:

Applicant/Agent: [signature] Applicant's Name: Timothy Greene

Agent's Relationship to Applicant: Agent Firm: TerraSearch

Owner: See attached Authorization letter Owner's Name: Crown Atlantic Company

Note: If the applicant is not the owner, please have the owner sign above or submit a letter of permission with the application.

CROWN CASTLE

1800 W Park Dr, r2nd Floor
Westborough, Town of, MA 01581

Phone: (781) 970-0053
Fax: (724) 416-6120
www.crowncastle.com

Crown Castle Letter of Authorization

Town of Ashland
Planning Board
101 Main Street
Ashland, MA 01721

Re: Application for Zoning/Building Permit
Crown Castle telecommunications site at: 34 Albert Ray Drive, Ashland, MA

CROWN ATLANTIC COMPANY LLC ("Crown Castle") hereby authorizes T Mobile and TerraSearch, to act as our Agent in the processing of all zoning applications, building permits and approvals through the Town of Ashland for the existing wireless communications site described below:

Crown Site ID/Name:	**806042/BOS Ashland**
Customer Site ID:	**4BSM233**
Site Address:	**34 Albert Ray Drive**

Crown Castle

By: _____ Date: 11-9-22

Jeff Barbadora
Real Estate Specialist

PARID: 0140090017300000 MUNICIPALITY: ASHLAND LUC: 431
CROWN ATLANTIC COMPANY LLC 34 ALBERT RAY DR PARCEL YEAR: 2023

Property Information

Property Location:	34 ALBERT RAY DR
Class:	I-INDUSTRIAL
Use Code (LUC):	431-TELEPHONE RELAY TOWERS
District:	MA014 - ASHLAND
Deeded Acres:	.6900
Square Feet:	30,056

Owner

Owner	Co-Owner	City	Address	State	Zip Code	Deed Book/Page
CROWN ATLANTIC COMPANY LLC	P M B 353	MCMURRAY	4017 WASHINGTON RD	PA	15317	30867/0381

RE:	Wireless Telecommunications Facility Special Permit
Applicant:	T MOBILE NORTHEST, LLC ("T MOBILE" or "Applicant")
Facility Locations:	34 Albert Ray Drive
Facility Upgrade:	Add three (3) antennas (one antenna per sector) for new network service upgrade with associated antenna and electronic equipment, fiber and coax conduits, and install additional equipment inside an existing fenced area at the base of the facility (the "Facility").
Relief Requested:	Special Permit per 6.4 of the Town of Ashland Zoning By-Laws (hereinafter the "Ordinance") and any other relief the board deems necessary.

Dear Honorable Members of the Ashland Planning Board:

On behalf of T MOBILE, we are pleased to submit this memorandum to the Town of Ashland Planning Board (the "Board") in support of T MOBILE's Special Permit application (the "Application") for the operation and maintenance of this Facility. The following provides background information regarding proposal.

BACKGROUND

T MOBILE proposes to install three additional (3) panel antennas to the existing facility. In addition, T MOBILE will add associated antenna equipment, new fiber and coax conduits and related wireless communications equipment. The electronic equipment will be located inside the existing fenced area located at the base of the Facility. The Facility is shown in detail on the plans (the "Plans") attached hereto and submitted with this Application.

This facility has previously been granted a special permit relating to the existing wireless telecommunications facility. A copy of the most recent special permit for this facility is in this package. Pursuant to Section 6.4.2 of the Ordinance, a Special Permit is required for any changes to the site. The Application complies with the terms of above section of the Ordinance.

T MOBILE operates a nationwide wireless communications system that offers enhanced features such as caller ID, voice mail, e-mail, and superior call clarity. T MOBILE is in the process of building out a national network as required by T MOBILE's license issued by the Federal Communications Commission (the "FCC"). By filling a significant coverage gap and upgrading technology, these Facilities will aid in reaching T

MOBILE's goal of providing adequate and reliable wireless communications services in and around Ashland and to all of Massachusetts. T MOBILE is using its best efforts, to the maximum extent possible, to install the new network utilizing existing T MOBILE sites and facilities to avoid the need to construct new tower sites and antenna facilities.

A reliable communications system depends on a grid of antennae arranged in a geographical pattern, similar to a honeycomb. Each "site" is created by an antenna and serves as a link between the customer and the telephone system, while that caller is within proximity to the site. Each site can handle a finite number of telephone calls. As the number of customers increase, more sites must be added to handle the increased volume. If this is not accomplished, calls are dropped or customers' calls are blocked and they will get a busy signal. A new antenna installation must be constructed each time a new site is created.

T MOBILE submits and will demonstrate through the Application materials and the written and oral evidence at the public hearing(s) in connection with the Application that the proposed Facilities meet with all applicable requirements of the Ordinance, to the extent possible. The Facilities will not adversely impact adjacent properties and neighborhoods as T MOBILE's Facilities will not change the height of the tower. The Facilities will not be a threat to public health, safety and welfare. In fact, Applicant submits that the proposed upgrades to the Facilities will aid in public safety by providing and improving wireless communications services to the residents, businesses, commuters, and emergency personnel utilizing wireless communications in the immediate vicinity.

Consistent with the Ordinance, the existing wireless installation already functions as a wireless communications services facility within a local, regional, and national communications system. This system operates under license from the FCC and T MOBILE is mandated and authorized to provide adequate service to the general public. These Sites were selected after a careful screening process and was found useful to T MOBILE. These upgrades will not generate noise, odor, fumes, glare, smoke, or dust or require additional lighting or signage. The Facilities will have no negative impact on property values in the area. No increased traffic or hindrance to pedestrian movements will result from the Facilities. On average, only one round trip visit per month is required to service and maintain the Facilities. These are unmanned Facilities and will have minimal negative effect on the adjoining lots. The Facilities does not require police or fire protection because the installation has its own monitoring equipment that can detect malfunction and/or tampering.

APPROVAL REQUESTED

T MOBILE respectfully requests that the Board grant, to the extent necessary, a Special Permit for the, operation and maintenance of the Facility as provided in the Plans submitted with the Application, all rights reserved. As will be further demonstrated by the Applicant by evidence submitted to the Board at the public hearing(s) in connection herewith, such approval is appropriate as the Facility satisfies all pertinent provisions and standards contained in the Ordinance for the granting of the special permit, to the extent required, all rights reserved, as enumerated below.

The Facility will not have any adverse effect on property values in the area. The Facilities will not be dangerous to the public health or safety as it is designed to comply with all applicable FCC requirements relating to radio frequency emissions and will comply with all applicable requirements of the Massachusetts building code. Indeed, the maximum radio frequency output per channel for this facility will be well below the maximum radio frequency exposure levels established by the FCC. Each Facility is a passive use, and will not cause any nuisance such as noise, vibration, smoke, odor or dust. Further, the Facility will improve communication coverage to residents, commercial establishments and travelers through the area and improves call connections in this area of the Town of Ashland. These Facilities will greatly improve emergency communications for police and fire personnel by reducing the number and frequency of dropped and incomplete calls due to weak signals and adding an additional layer of communication to traditional land lines. In fact, published reports have highlighted the fact that during and after adverse major weather events, including ice storms, wireless telecommunications has been the only form of reliable communication. Lastly, the upgrades of the Facilities at each Site will assist the Town of Ashland in complying with its obligations under the federal Telecommunications Act of 1996 (the "1996 Act").

Applicant respectfully requests that the Board grant all necessary approvals to install and operate the Facility. For the foregoing reasons, as well as to satisfy the mandate of the Federal Government to facilitate competition in the telecommunications industry as set forth in the 1996 Act, Applicant respectfully requests that the Board grant the foregoing approval. We respectfully submit that the standards for approval as set forth in the Ordinance as well as Massachusetts law relating to zoning must be interpreted and applied such that the decision issued by the Board is in conformance with the 1996 Act. Accordingly, a denial of the foregoing petition would effectively prohibit T MOBILE from providing adequate service to the Town of Ashland, would unreasonably discriminate among providers of substantially equivalent services and thus would be contrary to the purpose and intent of the 1996 Act.

TOWN OF ASHLAND MASSACHUSETTS
OFFICE OF
PLANNING BOARD
101 MAIN STREET

John Dudley, Chairman
Nathaniel Strosberg, Director

2015 00053543
Bk: 65222 Pg: 121 Doc: DECIS
Page: 1 of 3 04/15/2015 02:45 PM

Notice of Decision
Special Permit
T-Mobile Telecommunications Infrastructure Modification
34 Albert Ray Drive

Date: February 5, 2014
To: Town Clerk
Cc: Applicant
Building Inspector

The Planning Board (the "Board") received a special permit application for the modification of equipment at the existing wireless communications facility located at 34 Albert Ray Drive. The Board reviewed the application in accordance with Section 6.4 of the Town's Zoning Bylaw (the "Zoning Bylaw"). The applicant (the "Applicant") was T-Mobile Northeast LLC, operating through its authorized agent, Daniel D. Klasnick, Esq. The Board opened a duly-noticed public hearing on the aforesaid application on January 29, 2015. The Board also closed the public hearing on January 29, 2015, deliberated and voted 4-0 to grant the special permit as hereinafter described and conditioned.

During the aforementioned public hearing, the following documentation was reviewed by the Board:

1. "Application for Special Permit" and accompanying documentation, submitted by the Applicant and dated December 18, 2014.
2. Cell tower schematics dated April 8, 2013
3. Cell tower schematics dated July 1, 2014 (for comment) and July 22, 2014 (for construction).

In accordance with Section 6.4 of the Zoning Bylaw, it was determined by the Board that the proposed modification is in compliance with the criteria set forth in said section, with the following condition:

1. All modifications to the telecommunications facility at 34 Albert Ray Drive shall be conducted during the hours of 7AM to 7PM, Monday through Saturday.

In accordance with Section 9.3.8 of the Zoning Bylaw, a special permit shall lapse after two (2) years from the grant thereof if a substantial use thereof or construction thereunder has not sooner commenced except for good cause.

25711-306

Owner: Crown Atlantic Company LLC

Any appeal of this decision of the Board shall be made in accordance with G.L. c. 40A, § 17, to a court of competent jurisdiction.

Town of Ashland Planning Board

By: _____

By: _____
John Addy

By: _____

By: _____

By: _____

2/26/15

Filed with the Town Clerk on:

Date: ~~February~~ March 2, 2015

Tara M. Ward
Town Clerk

I HEREBY CERTIFY THAT TWENTY DAYS HAVE ELAPSED FROM THE DATE THIS DECISION WAS FILED IN THE TOWN CLERK'S OFFICE AND THAT NO APPEAL HAS BEEN FILED.

DATE: April 15, 2015

Tara M. Ward
Tara M. Ward, Town Clerk

PAUL J. FORD & COMPANY

Date: **November 1, 2022**

Paul J. Ford and Company
250 E. Broad St., Ste 600
Columbus, OH 43215
614-221-6679

Subject:	**Structural Modification Report**	
Carrier Designation:	***Metro PCS* Co-Locate**	
	Site Number:	4BSM233A
	Site Name:	Crown Ashland_MP
Crown Castle Designation:	**BU Number:**	806042
	Site Name:	BOS ASHLAND 959026
	JDE Job Number:	729827
	Work Order Number:	2164726
	Order Number:	631434 Rev. 0
Engineering Firm Designation:	**Paul J. Ford and Company Project Number:**	37522-0071.004.7700
Site Data:	**Albert Ray Drive Fountain and Green Streets, Ashland, Middlesex County, MA**	
	Latitude *42° 16' 25.3"*, Longitude *-71° 27' 5.6"*	
	100 Foot - Monopole Tower	

Paul J. Ford and Company is 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: Modified Structure w/ Proposed Equipment Configuration **Sufficient Capacity**

This analysis utilizes an ultimate 3-second gust wind speed of 127 mph as required by the 2015 International Building Code as amended by the Massachusetts State Building Code, Ninth Edition. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

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

Respectfully submitted by:

Nathan C. Miller

Nathan C. Miller, P.E.
Project Engineer
nmiller@pauljford.com

BKK

11/02/2022

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 100 ft Monopole tower designed by ITT MEYER INC. and mapped by AERO Solutions in February of 2008.

The tower has been modified multiple times to accommodate additional loading.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	127 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)
94.0	94.0	3	ericsson	4003_840590966_TMO w/ Mount Pipe	3	1-5/8
		6	ericsson	AIR 21 B4A/B2P w/ Mount Pipe		
		3	ericsson	RADIO 4480_TMOV2		
		1	site pro 1	RMQP w/ HRK12		

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)
102.0	104.0	2	raycap	RVZDC-6627-PF-48	2 6	1-5/8 7/8
		3	samsung telecommunications	RFV01U-D1A		
		3	samsung telecommunications	RFV01U-D2A		
	102.0	6	commscope	NHH-65B-R2B w/ Mount Pipe		
		3	css	X7C-680 w/ Mount Pipe		
		3	samsung telecommunications	MT6407-77A w/ Mount Pipe		
		1	tower mounts	Platform Mount (LP 101-1)		
		1	tower mounts	Side Arm Mount [SO 203-3]		

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)
84.0	87.0	3	cci antennas	DMP65R-BU6e w/ Mount Pipe	7 3 6	7/8 3/8 13/16
		3	ericsson	RRUS 32 B2		
		3	ericsson	RRUS 32 B30		
		3	ericsson	RRUS 32 B66		
		3	ericsson	RRUS 4449 B5/B12		
		3	ericsson	RRUS 4478 B14		
		3	kathrein	80010965 w/ Mount Pipe		
		2	raycap	DC6-48-60-18-8F		
		1	raycap	DC9-48-60-24-8C-EV		
	86.0	3	ericsson	AIR 6419 B77G w/ Mount Pipe		
		3	ericsson	AIR 6449 N77 w/ Mount Pipe		
	84.0	2	tower mounts	T-Arm Mount [TA 602-3]		
74.0	74.0	3	fujitsu	TA08025-B604	1	1-3/8
		3	fujitsu	TA08025-B605		
		3	jma wireless	MX08FRO665-21 w/ Mount Pipe		
		1	mounts	Commscope_MC-Pk8-DSH_Platform		
		1	raycap	RDIDC-9181-PF-48		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
4-GEOTECHNICAL REPORTS	1094280	CCISITES
4-TOWER FOUNDATION MAPPING	1094282	CCISITES
4-TOWER MAPPING	5871749	CCISITES
4-TOWER REINFORCEMENT DRAWINGS	1287595	CCISITES
4-POST-MODIFICATION INSPECTION	2033623	CCISITES
4-TOWER REINFORCEMENT DRAWINGS	2217666	CCISITES
4-POST-MODIFICATION INSPECTION	3672212	CCISITES
4-TOWER REINFORCEMENT DRAWINGS	3794055	CCISITES
4-POST-MODIFICATION INSPECTION	3817361	CCISITES

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. 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.

tnxTower was used to determine the loads on the modified structure. Additional calculations were performed to determine the stresses in the pole and in the reinforcing elements. These calculations are presented in Appendix C.

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.
3) The structure was modified in conformance with the referenced modification drawings as shown in the referenced post modification inspection.
4) The structure will be modified in conformance with the attached proposed modification drawings.

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
100 - 95	Pole	TP15.319x14.5x0.19	Pole	31.0%	Pass
95 - 90	Pole	TP16.138x15.319x0.19	Pole	56.3%	Pass
90 - 85.5	Pole	TP16.875x16.138x0.19	Pole	76.2%	Pass
85.5 - 85.25	Pole + Reinf.	TP16.916x16.875x0.615	Reinf. 7 Bolt-Shaft Bearing	35.1%	Pass
85.25 - 80.25	Pole + Reinf.	TP17.736x16.916x0.59	Reinf. 7 Tension Rupture	44.5%	Pass
80.25 - 75.25	Pole + Reinf.	TP18.555x17.736x0.565	Reinf. 7 Tension Rupture	57.2%	Pass
75.25 - 70.25	Pole + Reinf.	TP19.374x18.555x0.54	Reinf. 7 Tension Rupture	70.9%	Pass
70.25 - 68.5	Pole + Reinf.	TP20.07x19.374x0.54	Reinf. 7 Tension Rupture	75.6%	Pass
68.5 - 65	Pole + Reinf.	TP19.863x19.29x0.825	Reinf. 7 Tension Rupture	64.1%	Pass
65 - 60	Pole + Reinf.	TP20.681x19.863x0.7875	Reinf. 7 Tension Rupture	73.4%	Pass
60 - 55	Pole + Reinf.	TP21.499x20.681x0.75	Reinf. 7 Tension Rupture	82.1%	Pass
55 - 54.75	Pole + Reinf.	TP21.54x21.499x0.75	Reinf. 7 Tension Rupture	82.5%	Pass
54.75 - 54.5	Pole + Reinf.	TP21.581x21.54x0.95	Reinf. 3 Bolt-Shaft Bearing	66.2%	Pass
54.5 - 54.25	Pole + Reinf.	TP21.622x21.581x0.95	Reinf. 3 Tension Rupture	66.5%	Pass
54.25 - 54	Pole + Reinf.	TP21.663x21.622x1.9	Reinf. 17 Tension Rupture	37.7%	Pass
54 - 49	Pole + Reinf.	TP22.481x21.663x1.8	Reinf. 17 Tension Rupture	41.6%	Pass
49 - 44	Pole + Reinf.	TP23.3x22.481x1.7	Reinf. 17 Tension Rupture	45.5%	Pass
44 - 39	Pole + Reinf.	TP24.118x23.3x1.6	Reinf. 17 Tension Rupture	49.1%	Pass
39 - 38.75	Pole + Reinf.	TP24.159x24.118x0.85	Reinf. 1 Tension Rupture	85.9%	Pass
38.75 - 36.25	Pole + Reinf.	TP25.1x24.159x0.825	Reinf. 1 Tension Rupture	88.7%	Pass
36.25 - 32.75	Pole + Reinf.	TP24.643x24.07x0.825	Reinf. 1 Tension Rupture	94.9%	Pass
32.75 - 32.5	Pole + Reinf.	TP24.683x24.643x0.85	Reinf. 1 Tension Rupture	88.3%	Pass
32.5 - 29.75	Pole + Reinf.	TP25.133x24.683x0.85	Reinf. 1 Tension Rupture	91.0%	Pass
29.75 - 29.5	Pole + Reinf.	TP25.174x25.133x1.125	Reinf. 1 Tension Rupture	73.4%	Pass
29.5 - 26.75	Pole + Reinf.	TP25.624x25.174x1.1	Reinf. 1 Tension Rupture	75.6%	Pass
26.75 - 26.5	Pole + Reinf.	TP25.665x25.624x0.9125	Reinf. 5 Tension Rupture	84.3%	Pass
26.5 - 23.5	Pole + Reinf.	TP26.156x25.665x0.9	Reinf. 5 Tension Rupture	86.9%	Pass
23.5 - 23.25	Pole + Reinf.	TP26.197x26.156x0.9	Reinf. 5 Tension Rupture	86.4%	Pass
23.25 - 22.75	Pole + Reinf.	TP26.278x26.197x0.9	Reinf. 5 Tension Rupture	86.9%	Pass
22.75 - 22.5	Pole + Reinf.	TP26.319x26.278x1.05	Reinf. 3 Tension Rupture	79.6%	Pass

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
22.5 - 17.5	Pole + Reinf.	TP27.137x26.319x1.025	Reinf. 3 Tension Rupture	83.4%	Pass
17.5 - 15.75	Pole + Reinf.	TP27.424x27.137x1	Reinf. 3 Tension Rupture	84.6%	Pass
15.75 - 15.5	Pole + Reinf.	TP27.464x27.424x1.0875	Reinf. 6 Tension Rupture	74.0%	Pass
15.5 - 12.25	Pole + Reinf.	TP27.996x27.464x1.075	Reinf. 6 Tension Rupture	76.0%	Pass
12.25 - 12	Pole + Reinf.	TP28.037x27.996x0.95	Reinf. 1 Tension Rupture	84.6%	Pass
12 - 11.75	Pole + Reinf.	TP28.078x28.037x1.075	Reinf. 3 Tension Rupture	71.6%	Pass
11.75 - 11.5	Pole + Reinf.	TP28.119x28.078x0.875	Reinf. 6 Tension Rupture	84.3%	Pass
11.5 - 6.5	Pole + Reinf.	TP28.937x28.119x0.85	Reinf. 6 Tension Rupture	87.6%	Pass
6.5 - 6	Pole + Reinf.	TP29.018x28.937x0.85	Reinf. 6 Tension Rupture	87.9%	Pass
6 - 5.75	Pole + Reinf.	TP29.059x29.018x0.85	Reinf. 6 Tension Rupture	88.1%	Pass
5.75 - 4.5	Pole + Reinf.	TP29.264x29.059x0.8375	Reinf. 6 Tension Rupture	88.9%	Pass
4.5 - 4.25	Pole + Reinf.	TP29.305x29.264x0.9	Reinf. 8 Tension Yield	90.2%	Pass
4.25 - 3	Pole + Reinf.	TP29.509x29.305x0.9	Reinf. 8 Tension Yield	90.9%	Pass
3 - 2.75	Pole + Reinf.	TP29.55x29.509x1	Reinf. 8 Tension Yield	85.9%	Pass
2.75 - 1.75	Pole + Reinf.	TP29.714x29.55x1	Reinf. 8 Tension Yield	86.5%	Pass
1.75 - 1.5	Pole + Reinf.	TP29.755x29.714x0.975	Reinf. 8 Tension Yield	90.0%	Pass
1.5 - 1.25	Pole + Reinf.	TP29.796x29.755x0.975	Reinf. 8 Tension Yield	90.2%	Pass
1.25 - 1	Pole + Reinf.	TP29.836x29.796x1.0375	Reinf. 14 Connection	82.1%	Pass
1 - 0	Pole + Reinf.	TP30x29.836x1.025	Reinf. 14 Connection	82.6%	Pass
				Summary	
			Pole	80.4%	Pass
			Reinforcement	94.9%	Pass
			Overall	94.9%	Pass

Table 5 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	88.8	Pass
1	Base Plate	0	69.1	Pass
1	Base Foundation (Structure)	0	81.6	Pass
1	Base Foundation (Soil Interaction)	0	83.9	Pass

Structure Rating (max from all components) =	94.9%

4.1) Recommendations

Perform the modifications detailed in Appendix D to remedy the deficiencies identified in Crown Castle Work Order No. 2155617.

APPENDIX D

MODIFICATION DRAWINGS

MODIFIED 100'-0" MONOPOLE

BU #806042; BOS ASHLAND 959026

ALBERT RAY DRIVE FOUNTAIN AND GREEN STREETS
ASHLAND, MASSACHUSETTS 01721
MIDDLESEX COUNTY
LAT: 42° 16' 25.30"; LONG: -71° 27' 05.60"
ORDER: 631434 REV 0; WO: 2164726

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

CROWN CASTLE
2055 S. STEARMAN DR. CHANDLER, AZ 85286
PH: (678) 366-1233

PROJECT CONTACTS

STRUCTURE OWNER:
CROWN CASTLE
MOD PM: JOHN MCGEE AT JOHN.MCGEE@CROWNCASTLE.COM
PH: 704-877-8397

ENGINEER OF RECORD:
CCI@PAULJFORD.COM

WIND DESIGN DATA	
REFERENCE STANDARD	ANSI/TIA-222-H-2017
LOCAL CODE	MASSACHUSETTS BUILDING CODE 9TH EDITION
BASIC WIND SPEED (MPH)	127
ICE THICKNESS (IN)	1.5
ICE WIND SPEED (MPH)	50
SERVICE WIND SPEED (MPH)	60
RISK CATEGORY	II
EXPOSURE CATEGORY	C
MAXIMUM TOPOGRAPHIC FACTOR, K_{ZT}	1

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HOT WORK INCLUDED	
NA	BASE GRINDING ONLY
X	BASE WELDING (AND GRINDING)
NA	AERIAL GRINDING ONLY
X	AERIAL WELDING (AND GRINDING)

STRUCTURE INFORMATION CCISITES DOC #: 5781749

QUALIFIED ENGINEERING SERVICES ARE AVAILABLE FROM PAUL J. FORD & COMPANY TO ASSIST CONTRACTORS IN CLASS IV RIGGING PLAN REVIEWS. FOR REQUESTED QUALIFIED ENGINEERING SERVICES, PLEASE CONTACT CCI@PAULJFORD.COM.

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.

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 INSTALLATIONS SHALL NOT COMPROMISE THE INTEGRITY OR FUNCTIONAL USE OF ANY WIRE ROPE SAFETY CLIMB ON THE STRUCTURE. THIS SHALL INCLUDE, BUT NOT BE 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 TO THE ANCHORAGE POINTS IN ANY WAY. ANY COMPROMISED SAFETY CLIMB MUST BE REPORTED TO YOUR CROWN POC FOR RESOLUTION, INCLUDING EXISTING CONDITIONS

11/02/2022

REV	DATE	DESCRIPTION

BU #806042; BOS ASHLAND 959026
ASHLAND, MASSACHUSETTS
MODIFIED 100'-0" MONOPOLE

PROJECT No:	37522-0071.004.7700
DRAWN BY:	BJH
DESIGNED BY:	NCM
CHECKED BY:	BKK
DATE:	11/1/2022

TITLE SHEET

T-1

V1.0 37522\0071.004.DWG

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 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.
NA	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 REPORT (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	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.
X	NDE REPORT 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 THAT WAS USED DURING CONSTRUCTION OF THE MODIFICATION.
ADDITIONAL TESTING AND INSPECTIONS:			
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.
NA	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.
X	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	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.
NA	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 INSPECTIONS/DOCUMENTATION THAT ARE APPLICABLE TO THE SOW THEY ARE PERFORMING. ERRORS ON THE CHECKLIST DO NOT ABSOLVE THE GC OR MI INSPECTOR FROM PERFORMING/COLLECTING DOCUMENTATION.

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 CED-SOW-10007.

11/02/2022

JASON C. MARTIN CIVIL No. 55038 REGISTERED PROFESSIONAL ENGINEER COMMONWEALTH OF MASSACHUSETTS

REV	DATE	DESCRIPTION

PAUL J. FORD & COMPANY
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CROWN CASTLE
2055 S. STEARMAN DR. CHANDLER, AZ 85286
PH: (678) 366-1233

BU #806042; BOS ASHLAND 959026
ASHLAND, MASSACHUSETTS
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PROJECT No:	37522-0071.004.7700
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MI CHECKLIST

MI-1

V1.0 37522-0071.004.DWG

GENERAL NOTES:

1. The General Contractor (GC) shall reference CON-STD-10159, "Tower Modification Construction Specifications", as a continuation of the following General Notes. The GC shall keep a printed or electronic copy of this document with the Structural Design Drawings (SDD) at all times, in a location accessible to all contractor personnel, and shall ensure that all Contractor Personnel are aware of the information enclosed within the General Notes and CON-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. Hoisting grips used for feed line installation shall follow manufacturer guidelines for maximum installed spacing intervals and pull load capacity restrictions.
9. 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.
10. 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.
11. 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.
12. 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
- Welding electrodes, GMAW: ER80S-X

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
- Welding electrodes, GMAW: ER70S-X

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

13. 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.
14. 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.
15. For a list of Crown-approved cold galvanizing compounds, refer to OPS-STD-10149, “Tower Protective Coatings Guidelines”.
16. 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 OPS-STD-10149, “Tower Protective Coatings Guidelines”. Photo documentation is required to be submitted to the MI Inspector.
17. 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.
18. 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.
19. 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".
20. If scope of modification requires removal or covering of tower ID tag, the tag must be replaced.
21. 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.
22. All joints using ASTM A325 or A490 bolts, U-bolts, V-bolts, and threaded rods shall be snug tightened, UNO.
23. 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.
24. 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.
25. Blind bolts shall be installed per the installation specifications on the corresponding Approved Fastener sheets contained in CON-CAT-10300, "Monopole Standard Drawings and Approved Reinforcement Components".
26. 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.
27. 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.
28. If scope of modification involves bark removal or installation, the GC shall reference CED-SOW-10265, "Tree Concealment for Monopoles", as well as CED-STD-10395, "Installation Guidelines for Bark Surfaces".
29. If scope of modification involves concealment components including branching, the GC shall reverence CED-CAT-10398 "Monopole Concealed Decorative Structures (CDS) Approved Components". All new branch installation required tethering.
30. If scope of modification involves cathodic protection, the GC shall reference CED-SOW-10397, Cathodic Protection Installation, Replacement, and Enhancement".

REV	DATE	DESCRIPTION

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BU #806042; BOS ASHLAND 959026
ASHLAND, MASSACHUSETTS
MODIFIED 100'-0" MONOPOLE

PROJECT No:	37522-0071.004.7700
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COMMONWEALTH OF MASSACHUSETTS
JASON C. MARTIN
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GENERAL NOTES

N-1

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BASE PLATE GROUT REMOVAL

1. THE GC SHALL BEGIN THIS PROCEDURE AS EARLY AS POSSIBLE DURING THE MODIFICATION PROCESS SO THAT IF ISSUES ARISE, THEY CAN BE RESOLVED WITHIN THE ANTICIPATED MODIFICATION TIMELINE.

2. IF ANY DETERIORATED GROUT EXISTS, BEGIN AT THIS LOCATION. REMOVE DETERIORATED GROUT AND THE GROUT AROUND THE NEAREST ONE OR TWO ANCHOR RODS TO FULLY EXPOSE THE LEVELING NUT. IF THE GC DISCOVERS THAT A HALF NUT OR JAM NUT WAS USED AS A LEVELING NUT, OR IF NO LEVELING NUT IS PRESENT, IMMEDIATELY CONTACT CED AND THE CROWN POC (TYPICALLY THE MOD PM) FOR A RESOLUTION. DO NOT REMOVE ANY ADDITIONAL GROUT UNTIL DIRECTED TO BY CROWN.

3. OTHERWISE, CHECK THE LEVELING NUT FOR TIGHTNESS IN ACCORDANCE WITH SECTION 7.2.3 OF ENG-STD-10323 “BASE PLATE GROUT”. IF SEVERE CORROSION / MATERIAL LOSS IS FOUND OR CORROSION EXISTS TO THE POINT WHERE THE LEVELING NUT IS UNABLE TO BE TIGHTENED WHEN OBVIOUSLY LOOSE, IMMEDIATELY NOTIFY THE CROWN POC (TYPICALLY THE MOD PM). REFERENCE ENG-BUL-10114 “RUST CLASSIFICATION” FOR EXAMPLES OF MATERIAL LOSS. DO NOT REMOVE ANY ADDITIONAL GROUT UNTIL DIRECTED TO BY CROWN.

4. IN THE EVENT THAT SEVERE CORROSION IS NOT ENCOUNTERED AND BEING SURE TO CHECK EACH ANCHOR ROD FOR CORROSION PER ENG-BUL-10114 “RUST CLASSIFICATION”, REMOVE ALL EXISTING BASEPLATE GROUT WHILE CHECKING EACH LEVELING NUT FOR TIGHTNESS IN ACCORDANCE WITH SECTION 7.2.3 OF ENG-STD-10323 “BASE PLATE GROUT”.

5. CONSISTENT WITH SECTION 7.2.4 OF ENG-STD-10323 “BASE PLATE GROUT”, HAND TOOL CLEAN TO SSPC-SP2 AND SOLVENT CLEAN TO SSPC-SP1, ALL EXPOSED STRUCTURAL STEEL ELEMENTS, INCLUDING ANCHOR RODS, LEVELING NUTS, AND UNDERSIDE OF BASE PLATE TO THE GREATEST EXTENT POSSIBLE. ENSURE THAT ALL OLD GROUT IS REMOVED TO ALLOW COLD GALVANIZING TO ADHERE TO THE STEEL.

6. APPLY BY BRUSH TWO COATS OF A CROWN-APPROVED COLD-GALVANIZING COMPOUND TO ALL EXPOSED STRUCTURAL STEEL ELEMENTS BENEATH THE BASE PLATE AND ALLOW CURING IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATION. A LIST OF CROWN-APPROVED DIRECT APPLICATION COLD-GALVANIZING COMPOUNDS CAN BE FOUND IN ENG-STD-10149 “TOWER PROTECTIVE COATINGS GUIDELINES” SECTION 2.1.1.

7. THE GC SHALL PROVIDE PHOTOGRAPHS OF EACH ANCHOR ROD WITH LEVELING NUT AFTER CLEANING BUT BEFORE COLD GALVANIZATION, AND AGAIN AFTER COLD GALVANIZATION, FOR INCLUSION IN THE MI REPORT.

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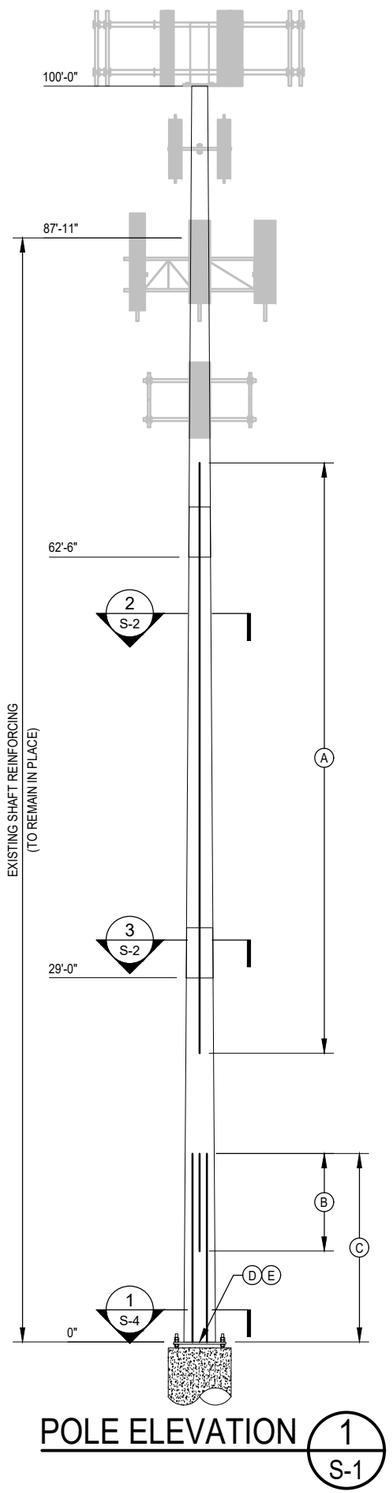
REV	DATE	DESCRIPTION

V1.0 37522-0071.004.DWG



POLE ELEVATION 1 / S-1

TOWER MODIFICATION SCHEDULE

	ELEVATION	TOWER MODIFICATION DESCRIPTION	REFERENCE SHEETS
(A)	23'-0" TO 70'-0"	INSTALL NEW SHAFT REINFORCING	S-2 & S-3
(B)	7'-3" TO 15'-0"	INSTALL NEW TRANSITION STIFFENER EXTENSIONS	S-4 & S-6
(C)	0'-0" TO 15'-0"	INSTALL NEW TRANSITION STIFFENER. REMOVE EXISTING BLIND BOLTS AS REQUIRED.	S-4 & S-5
(D)	0'	REMOVE EXISTING BASE PLATE GROUT. SEE BASE PLATE GROUT REMOVAL NOTES.	S-1
(E)	0'	INSTALL NEW ANCHOR ROD BRACKET EXTENSIONS	S-4 & S-7

** CONTRACTOR NOTE: REFER TO THE OBSTRUCTION CLIMBING FACILITIES SINAGE SHEET OF CROWN CASTLE DOCUMENT CAT-CED-10300 FOR INFORMATION REGARDING OBSTRUCTION SIGNAGE.

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

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

MANUFACTURER POLE SPECIFICATIONS

TAPER	0.163586 IN/FT
BASE PLATE STEEL	ASTM A572 GR 60 (FY=60 KSI)
ANCHOR RODS	2.25"ø ASTM A615 (FY=75 KSI)
FLANGE BOLTS	

SHAFT SECTION DATA

SHAFT SECTION	SECTION LENGTH (FT)	POLE SHAFT THICKNESS (IN)	LAP SPLICE (FT)	DIAMETER ACROSS FLATS (IN)		POLE GRADE (KSI)	FLANGE PLATE GRADE (KSI)	POLE SHAPE
				@ TOP	@ BOTTOM			
1	34.000	0.1875	2.500	14.500	20.070	50		12-SIDED
2	35.500	0.2500	3.250	19.290	25.100	50		12-SIDED
3	36.250	0.2500		24.070	30.000	65		12-SIDED

NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

NEW REINFORCING SCHEDULE

BOTTOM ELEVATION	TOP ELEVATION	PART NUMBER	FLAT # / DEGREE	TERMINATION BOLTS (BOTTOM)	TERMINATION BOLTS (TOP)	MAXIMUM INTERMEDIATE BOLT SPACING	BOLT QUANTITY PER PLATE	STEEL WEIGHT PER PLATE (BLACK)	TOTAL BOLT QUANTITY	TOTAL STEEL WEIGHT (BLACK)
23' - 0"	58' - 0"	CFP-06512535 #1	F4, F8 & F10	15	15	19"	47	968 LBS	141	2904 LBS
35' - 0"	70' - 0"	CFP-06512535 #2	F2, F6 & F12	16	16	19"	49	968 LBS	147	2904 LBS
									288	5808 LBS

BOLT COUNT BY LENGTH

LENGTH	QTY
SHORT	213
MEDIUM	0
LONG	0
TOTAL	213

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

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

NEXGEN2	APPROVED	SPECIALTY FASTENERS	NA

ORDERING INFORMATION AND INSTALLATION DETAILS FOR NEXGEN2 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 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.

CROWN CASTLE US PATENT NOS 8,046,972; 8,156,712; 7,849,659; 8,424,269 AND PATENT PENDING

REV	DATE	DESCRIPTION

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

CROWN CASTLE
2055 S. STEARMAN DR. CHANDLER, AZ 85286
PH: (678) 366-1233

BU #806042; BOS ASHLAND 959026
ASHLAND, MASSACHUSETTS
MODIFIED 100'-0" MONOPOLE

PROJECT No:	37522-0071.004.7700
DRAWN BY:	BJH
DESIGNED BY:	NCM
CHECKED BY:	BKK
DATE:	11/1/2022

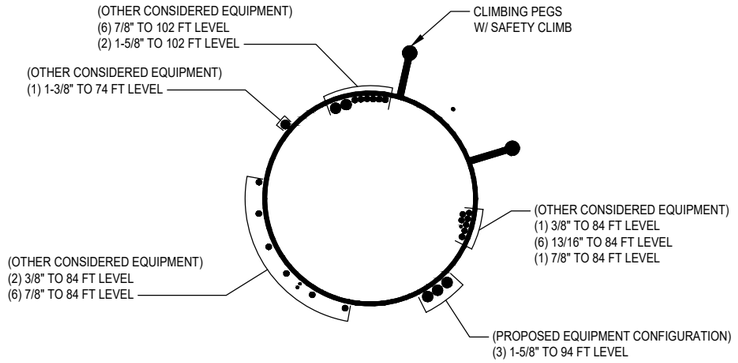
11/02/2022

COMMONWEALTH OF MASSACHUSETTS
JASON C. MARTIN
CIVIL
No. 55038
REGISTERED
PROFESSIONAL ENGINEER

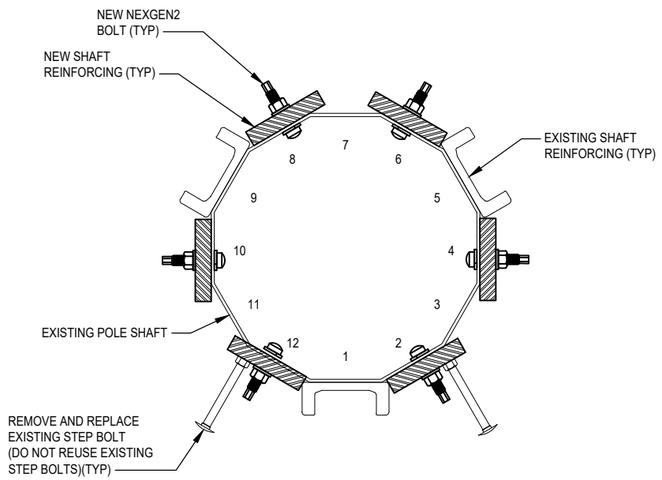
MONOPOLE PROFILE

S-1

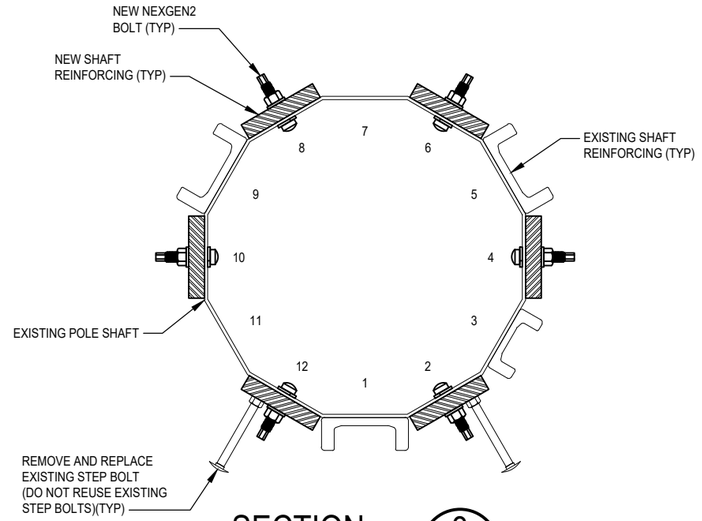
V1.0 37522-0071.004.DWG



COAX LAYOUT 1 S-2

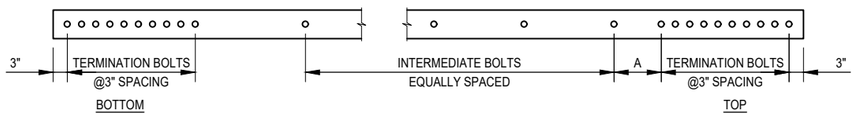


SECTION 2 S-2
EL 58'



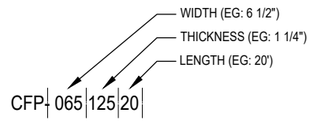
SECTION 3 S-2
EL 35'

NOTE: SHAFT REINFORCING MAY NEED TO BE INSTALLED OFF-CENTER OF FLAT FOR FIT UP. OFFSETS THAT RESULT IN THE FASTENER BEING LOCATED LESS THAN 1 1/2" FROM THE APEX OF THE FLAT MUST BE APPROVED BY THE ENGINEER OF RECORD.



CUSTOM BOLTED FLAT PLATE DETAIL

NOTE: "A" DIMENSION MAY VARY, NOT TO EXCEED MAXIMUM INTERMEDIATE BOLT SPACING



CUSTOM FLAT PLATE PART NUMBER BREAKDOWN

REV	DATE	DESCRIPTION

11/02/2022

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MONOPOLE SECTIONS & DETAILS

S-2

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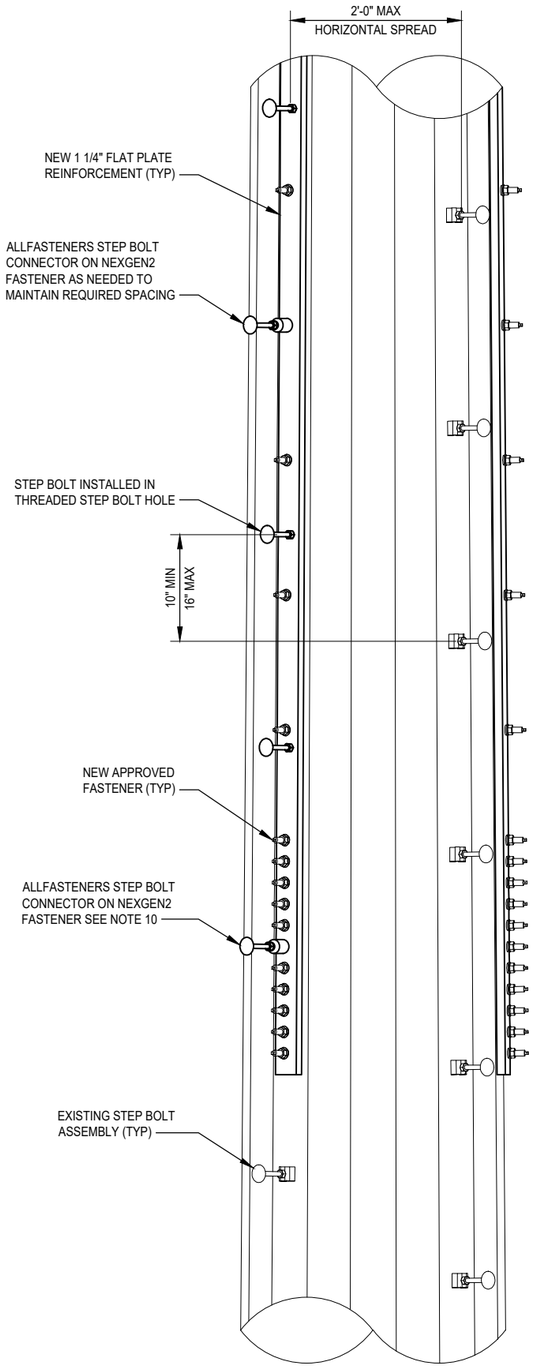
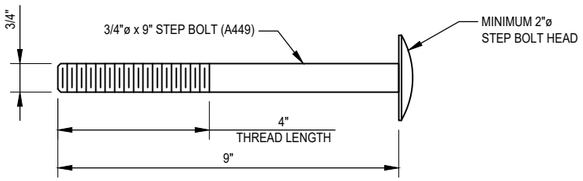
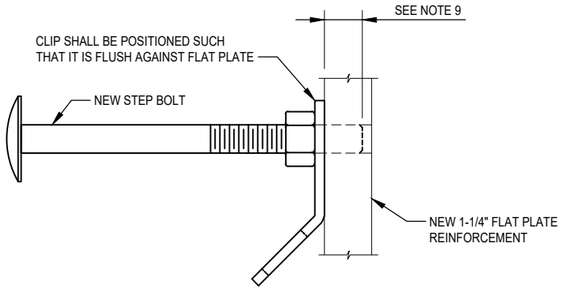
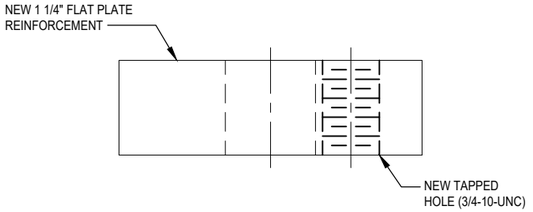




STEP BOLT



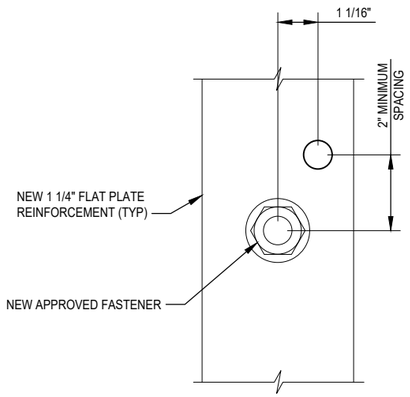
STEP BOLT INSTALLATION DETAIL



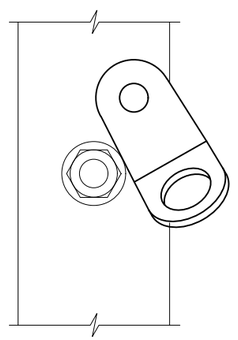
STEP BOLT HOLE DETAIL

NOTES:

1. CONTRACTOR SHALL USE ALL NEW STEP BOLTS AND HARDWARE.
2. CENTER TO CENTER STAGGERED SPACING SHOULD BE MATCHED TO EXISTING FIELD CONDITIONS. STAGGERED SPACING SHALL BE A MINIMUM OF 10" AND MAXIMUM OF 16" IN THE VERTICAL DIRECTION.
3. HORIZONTAL SPREAD IS NOT TO EXCEED 24".
4. STEP BOLT MATERIAL SHALL MEET THE REQUIREMENTS OF ASTM A449 AND SHALL BE TESTED AS FINISHED STEP BOLTS AT TEST FREQUENCY P (PIECE TESTING) OF ASTM A673 TO MEET MINIMUM ABSORBED ENERGY REQUIREMENT AT -20 DEGREES F [-29 DEGREES C] OF 15 FT-LBS [20 J] AVERAGE FOR 3 SPECIMENS AND A MINIMUM OF 12 FT-LBS [16 J] FOR ANY ONE SPECIMEN IN ACCORDANCE WITH ASTM A370.
5. ALL HOLES ARE TO BE DRILLED. DO NOT BURN OR PUNCH.
6. FABRICATION TOLERANCES: FRACTIONS ±1/16"
   BOLT HOLES ±1/32"
7. STEP BOLT HOLE LOCATIONS SHALL BE PLACED 1-1/16" HORIZONTALLY FROM THE CENTER OF THE PLATE, AND NO CLOSER THAN 2" VERTICALLY FROM THE CENTER OF A FASTENER BOLT HOLE.
8. STEP BOLT HOLES SHALL BE OVER-TAPPED TO ALLOW ROOM FOR THE STEP BOLT GALVANIZING. GALVANIZATION OF THE PLATE SHALL OCCUR PRIOR TO THREADING THE STEP BOLT HOLE.
9. THE STEP BOLT SHALL BE INSTALLED WITH A 1" ENGAGEMENT INTO THE THREADED HOLE, ±1/8". THE STEP BOLT NUT SHALL THEN BE TIGHTENED TO A SNUG TIGHT CONDITION AND SHALL BE PRE-TENSIONED BY ROTATING THE NUT 1/3 TURN.
10. THREAD ENGAGEMENT SHALL BE VERIFIED BY CONFIRMING THAT THE END OF THE EXPOSED THREADS ARE 3" +/- 1/8" FROM THE FACE OF THE FLAT PLATE.
11. THIS SHEET ILLUSTRATES ONE OF TWO DEFAULT OPTIONS THE CONTRACTOR MAY USE TO INSTALL STEP BOLTS ONTO FLAT PLATE; THE OTHER OPTION IS CCI-SB-0100.
12. WHEN THIS OPTION IS UTILIZED, THE THREADED STEP BOLT HOLE SHALL BE USED TO INSTALL STEP BOLTS ON CROWN 1-1/4" THICK FLAT PLATES WITH STANDARD WIDTHS OF 4", 5", 6 1/2", AND 8 1/2", EXCLUDING WITHIN THE TERMINATION REGIONS OF THE PLATES. IN THE TERMINATION REGIONS, THE ALLFASTENERS STEP BOLT CONNECTORS (ADAPTERS) SHALL BE USED ON NEXGEN2 FASTENERS.



HOLE INSTALLATION DETAIL



TIE-OFF CLIP INSTALLATION DETAIL

11/02/2022

REV	DATE	DESCRIPTION

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

CROWN CASTLE
2055 S. STEARMAN DR. CHANDLER, AZ 85286
PH: (678) 366-1233

BU #806042; BOS ASHLAND 959026
ASHLAND, MASSACHUSETTS
MODIFIED 100'-0" MONOPOLE

PROJECT No:	37522-0071.004.7700
DRAWN BY:	BJH
DESIGNED BY:	NCM
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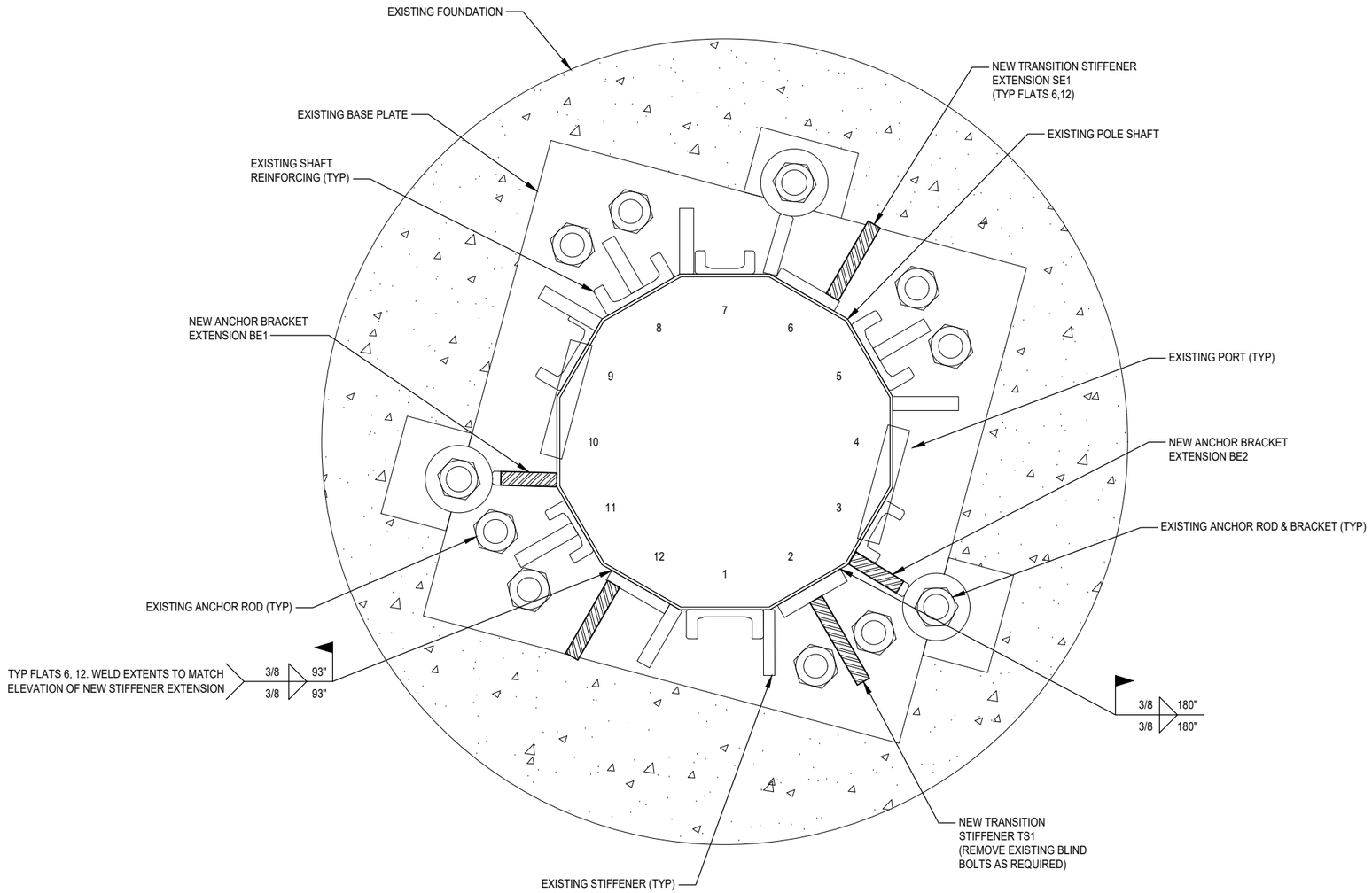
DATE:	11/1/2022

THREADED STEP BOLT HOLE

S-3

V1.0 37522-0071.004.DWG



BASE PLATE 1 / S-4

11/02/2022

COMMONWEALTH OF MASSACHUSETTS
JASON C. MARTIN
CIVIL
No. 55038
REGISTERED PROFESSIONAL ENGINEER

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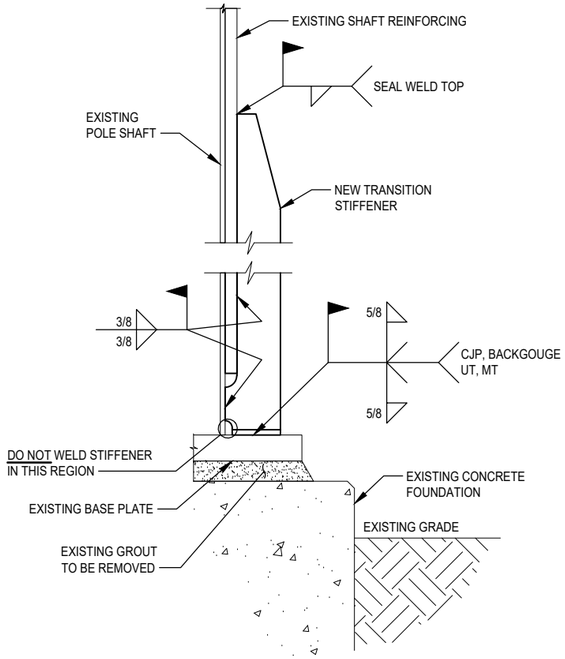
BASE PLATE DETAILS

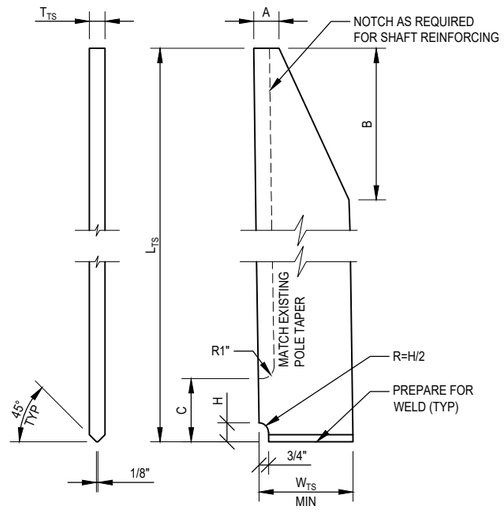
S-4

V1.0 37522-0071.004.DWG



TRANSITION STIFFENER DETAIL 1 / S-5

CONTRACTOR SHALL VERIFY THAT HEAVY HEX NUTS ARE INSTALLED BELOW BASE PLATE ON ALL EXISTING ANCHOR RODS DURING THE GROUT REMOVAL PROCESS. SEE NOTE 18 ON SHEET N-1. IF HEAVY HEX NUTS ARE NOT INSTALLED, SPLIT NUTS SHALL BE ADDED TO ALL EXISTING ANCHOR RODS.



TRANSITION STIFFENER											
PART #	FLAT # / ANGLE	QTY	MAT'L SPEC	T_{TS} (IN)	W_{TS} (IN)	L_{TS} (IN)	A (IN)	B (IN)	H (IN)	NOTCH	
										REQ'D	C (IN)
TS1	2	1	ASTM A572 GR 65KSI	1 1/4	8 5/8	180	2	12	1 1/4	Y	5

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TRANSITION STIFFENER DETAILS

S-5

11/02/2022

COMMONWEALTH OF MASSACHUSETTS
JASON C. MARTIN
CIVIL
No. 55038
REGISTERED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION

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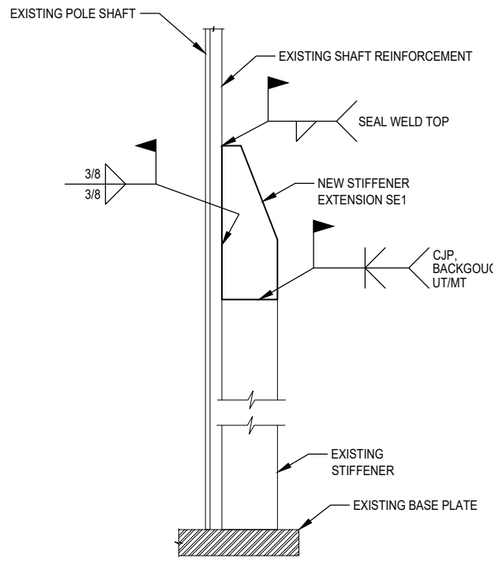
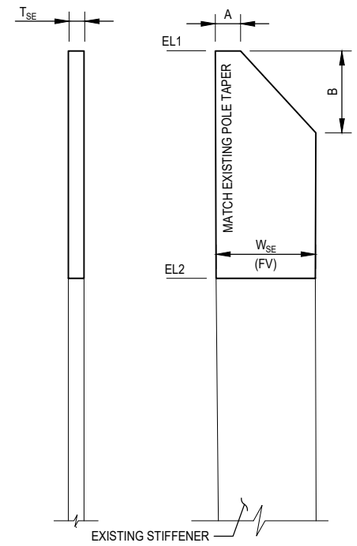


STIFFENER EXTENSION DETAIL 1 / S-6



STIFFENER EXTENSION									
PART #	FLAT # / ANGLE	QTY	MAT'L SPEC	T_{SE} (IN)	W_{SE} (IN)	A (IN)	B (IN)	EL1	EL2
SE1	6,12	2	ASTM A572 GR 65KSI	1 1/4	7 3/8	2	12	15'-0"	7'-3"

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TRANSITION STIFFENER DETAILS

S-6

11/02/2022

COMMONWEALTH OF MASSACHUSETTS
JASON C. MARTIN
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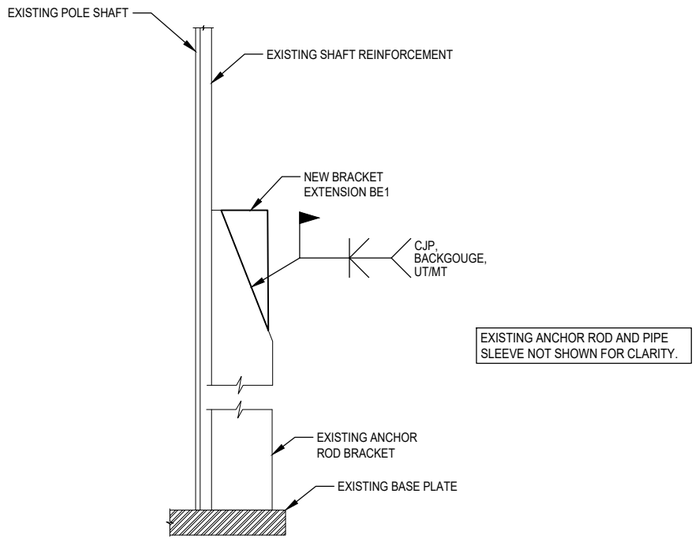
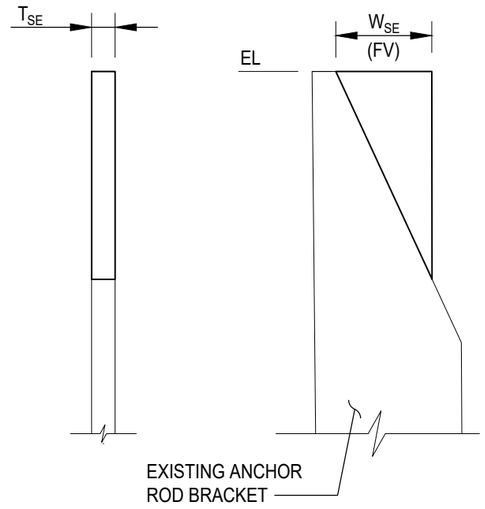
No. 55038
REGISTERED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION

V1.0 37522-0071.004.DWG



EXISTING ANCHOR ROD AND PIPE SLEEVE NOT SHOWN FOR CLARITY.



BRACKET EXTENSION DETAIL 1 / S-7

BRACKET EXTENSION						
PART #	FLAT # / ANGLE	QTY	MAT'L SPEC	T_{SE} (IN)	W_{SE} (IN)	EL
BE1	10/11	1	ASTM A572 GR 65KSI	1 1/4	4	5'-6"
BE2	2/3	1	ASTM A572 GR 65KSI	1 1/4	4	4'-0"

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BRACKET EXTENSION DETAILS

S-7

11/02/2022

COMMONWEALTH OF MASSACHUSETTS
JASON C. MARTIN
CIVIL
No. 55038
REGISTERED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION

V1.0 37522-0071.004.DWG

T-Mobile

T-MOBILE SITE NUMBER: 4BSM233A
T-MOBILE SITE NAME: CROWN ASHLAND_MP
SITE TYPE: MONOPOLE
TOWER HEIGHT: 100'-0"

BUSINESS UNIT #: 806042
SITE ADDRESS: 34 ALBERT RAY DRIVE ASHLAND, MA 01721
COUNTY: MIDDLESEX
JURISDICTION: TOWN OF ASHLAND

T-MOBILE L600 SITE CONFIGURATION: 67E05A

SITE INFORMATION

CROWN CASTLE USA INC. SITE NAME:	BOS ASHLAND 959026
SITE ADDRESS:	34 ALBERT RAY DRIVE ASHLAND, MA 01721
COUNTY:	MIDDLESEX
MAP/PARCEL #:	014/009.0-0173-0000.0
AREA OF CONSTRUCTION:	EXISTING
LATITUDE:	42.273694°
LONGITUDE:	-71.451556°
LAT/LONG TYPE:	NAD83
GROUND ELEVATION:	344'
CURRENT ZONING:	RA (RESIDENTIAL A)
JURISDICTION:	TOWN OF ASHLAND
OCCUPANCY CLASSIFICATION:	U
TYPE OF CONSTRUCTION:	IIB
A.D.A. COMPLIANCE:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION
PROPERTY OWNER:	CROWN ATLANTIC COMPANY LLC 4017 WASHINGTON RD MCMURRAY, PA 15317
TOWER OWNER:	CROWN CASTLE 2000 CORPORATE DRIVE CANONSBURG, PA 15317
CARRIER/APPLICANT:	T-MOBILE 35 GRIFFIN ROAD BLOOMFIELD, CT 06002
ELECTRIC PROVIDER:	NSTAR 800-572-9337
TELCO PROVIDER:	COMCAST 800-934-6489

PROJECT TEAM

A&E FIRM:	B+T GROUP 1717 S. BOULDER AVE. TULSA, OK 74119 MARVIN PHILLIPS MARVIN.PHILLIPS@BTGRP.COM
CROWN CASTLE USA INC. DISTRICT CONTACTS:	12 GILL STREET, SUITE 5800 WOBURN, MA 01801 WILLIAM GATES - PROJECT MANAGER WILLIAM.GATES@CROWNCASTLE.COM FRED JOYCE - CONSTRUCTION MANAGER FRED.JOYCE@CROWNCASTLE.COM

DRAWING INDEX

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ATTACHED	MOUNT SPECIFICATIONS
ATTACHED	HANDRAIL SPECIFICATIONS

ALL DRAWINGS CONTAINED HEREIN ARE FORMATTED FOR FULL SIZE. 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.

PROJECT DESCRIPTION

THE PURPOSE OF THIS PROJECT IS TO ENHANCE BROADBAND CONNECTIVITY AND CAPACITY TO THE EXISTING ELIGIBLE WIRELESS FACILITY.

TOWER SCOPE OF WORK:
- REMOVE (3) T-ARM MOUNTS
- REMOVE (6) 7/8" COAX CABLES
- RELOCATE (6) ANTENNAS
- INSTALL (1) SITEPRO1 - RMQP-396 PLATFORM MOUNT W/ HRK12 PER MOUNT ANALYSIS BY AIROSMITH ENGINEERING DATED SEPTEMBER 6, 2022
- INSTALL (3) ANTENNAS
- INSTALL (3) RRHs
- INSTALL (1) 1-5/8" HYBRID CABLE

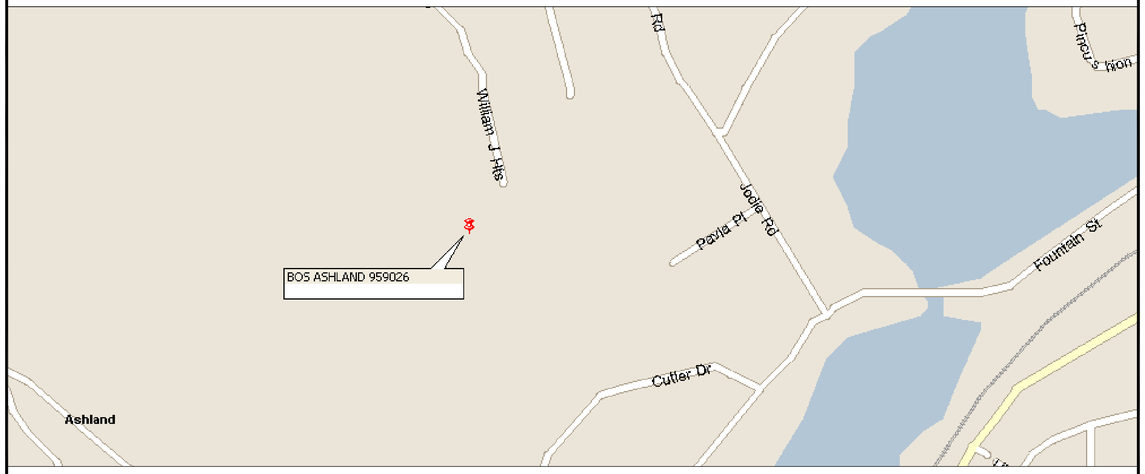
GROUND SCOPE OF WORK:
- INSTALL (1) RP 6651 IN RBS 6201 CABINET

INSTALLER NOTE:

NO PROPOSED LOADING TO BE ADDED UNTIL MOUNT SWAP IS COMPLETE PER MOUNT REPLACEMENT ANALYSIS BY AIROSMITH DATED SEPTEMBER 6, 2022.

NOTE:
PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE CROWN NOC AT (800) 788-7011 & CROWN CONSTRUCTION MANAGER.

LOCATION MAP



NO SCALE

APPLICABLE CODES/REFERENCE DOCUMENTS

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	2015 IBC
MECHANICAL	2015 IMC
ELECTRICAL	2017 NEC

REFERENCE DOCUMENTS:

STRUCTURAL ANALYSIS:	BY OTHERS
DATED:	
MOUNT ANALYSIS:	AIROSMITH ENGINEERING
DATED:	9/6/22
RFDS REVISION:	6
DATED:	8/12/22
ORDER ID:	631434
REVISION:	0

CALL MASSACHUSETTS ONE CALL (888) 344-7233 CALL 3 WORKING DAYS BEFORE YOU DIG!

APPROVALS

APPROVAL	SIGNATURE	DATE
PROPERTY OWNER OR REP.		
LAND USE PLANNER		
T-MOBILE		
OPERATIONS		
RF		
NETWORK		
BACKHAUL		
CONSTRUCTION MANAGER		

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

T-Mobile
35 GRIFFIN ROAD
BLOOMFIELD, CT 06002

CROWN CASTLE
12 GILL STREET, SUITE 5800
WOBURN, MA 01801

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

T-MOBILE SITE NUMBER:
4BSM233A

BU #: **806042**
BOS ASHLAND 959026

34 ALBERT RAY DRIVE
ASHLAND, MA 01721

EXISTING
100'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	9/14/22	TDG	PRELIMINARY REVIEW	LR
0	9/23/22	TDG	CONSTRUCTION	LR

COMMONWEALTH OF MASSACHUSETTS
PETER D. SMITH
No.56245
REGISTERED PROFESSIONAL ENGINEER
9/23/22

B&T ENGINEERING, INC.

SHEET NUMBER: T-1
REVISION: 0

CROWN CASTLE USA INC. SITE ACTIVITY REQUIREMENTS:

1. NOTICE TO PROCEED– NO WORK SHALL COMMENCE PRIOR TO CROWN CASTLE USA INC. WRITTEN NOTICE TO PROCEED (NTP) AND THE ISSUANCE OF A PURCHASE ORDER. PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE CROWN CASTLE USA INC. NOC AT 800–788–7011 & THE CROWN CASTLE USA INC. CONSTRUCTION MANAGER.
2. "LOOK UP" – CROWN CASTLE USA INC. SAFETY CLIMB REQUIREMENT:
THE INTEGRITY OF THE SAFETY CLIMB AND ALL COMPONENTS OF THE CLIMBING FACILITY SHALL BE CONSIDERED DURING ALL STAGES OF DESIGN, INSTALLATION, AND INSPECTION. TOWER MODIFICATION, MOUNT REINFORCEMENTS, AND/OR EQUIPMENT INSTALLATIONS SHALL NOT COMPROMISE THE INTEGRITY OR FUNCTIONAL USE OF THE SAFETY CLIMB OR ANY COMPONENTS OF THE CLIMBING FACILITY ON THE STRUCTURE. THIS SHALL INCLUDE, BUT NOT BE 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, IMPACT TO THE ANCHORAGE POINTS IN ANY WAY, OR TO IMPEDE/BLOCK ITS INTENDED USE. ANY COMPROMISED SAFETY CLIMB, INCLUDING EXISTING CONDITIONS MUST BE TAGGED OUT AND REPORTED TO YOUR CROWN CASTLE USA INC. POC OR CALL THE NOC TO GENERATE A SAFETY CLIMB MAINTENANCE AND CONTRACTOR NOTICE TICKET.
3. PRIOR TO THE START OF CONSTRUCTION, ALL REQUIRED JURISDICTIONAL PERMITS SHALL BE OBTAINED. THIS INCLUDES, BUT IS NOT LIMITED TO, BUILDING, ELECTRICAL, MECHANICAL, FIRE, FLOOD ZONE, ENVIRONMENTAL, AND ZONING. AFTER ONSITE ACTIVITIES AND CONSTRUCTION ARE COMPLETED, ALL REQUIRED PERMITS SHALL BE SATISFIED AND CLOSED OUT ACCORDING TO LOCAL JURISDICTIONAL REQUIREMENTS.
4. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN, AND SHALL MEET ANSI/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 CASTLE USA INC. STANDARD CED–STD–10253, INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION, TO CERTIFY THE SUPPORTING STRUCTURE(S) IN ACCORDANCE WITH ANSI/TIA–322 (LATEST EDITION).
5. ALL SITE WORK TO COMPLY WITH QAS–STD–10068 "INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON CROWN CASTLE USA INC. TOWER SITE," CED–STD–10294 "STANDARD FOR INSTALLATION OF MOUNTS AND APPURTENANCES," AND LATEST VERSION OF ANSI/TIA–1019–A–2012 "STANDARD FOR INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS."
6. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY CROWN CASTLE USA INC. PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
7. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
8. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
9. THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
10. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY CONTRACTOR. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING AND EXCAVATION E) CONSTRUCTION SAFETY PROCEDURES.
11. ALL SITE WORK SHALL BE AS INDICATED ON THE STAMPED CONSTRUCTION DRAWINGS AND PROJECT SPECIFICATIONS, LATEST APPROVED REVISION.
12. CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH AT THE COMPLETION OF THE WORK. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
13. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF CONTRACTOR, TOWER OWNER, CROWN CASTLE USA INC., AND/OR LOCAL UTILITIES.
14. THE CONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE REQUIRED BY LOCAL JURISDICTION AND SIGNAGE REQUIRED ON INDIVIDUAL PIECES OF EQUIPMENT, ROOMS, AND SHELTERS.
15. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE CARRIER'S EQUIPMENT AND TOWER AREAS.
16. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
17. THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION AS SPECIFIED ON THE CONSTRUCTION DRAWINGS AND/OR PROJECT SPECIFICATIONS.
18. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
19. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
20. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
21. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.
22. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
   - CONTRACTOR: GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION
   - CARRIER: T–MOBILE
   - TOWER OWNER: CROWN CASTLE USA INC.
2. THESE DRAWINGS HAVE BEEN PREPARED USING STANDARDS OF PROFESSIONAL CARE AND COMPLETENESS NORMALLY EXERCISED UNDER SIMILAR CIRCUMSTANCES BY REPUTABLE ENGINEERS IN THIS OR SIMILAR LOCALITIES. IT IS ASSUMED THAT THE WORK DEPICTED WILL BE PERFORMED BY AN EXPERIENCED CONTRACTOR AND/OR WORKPEOPLE WHO HAVE A WORKING KNOWLEDGE OF THE APPLICABLE CODE STANDARDS AND REQUIREMENTS AND OF INDUSTRY ACCEPTED STANDARD GOOD PRACTICE. AS NOT EVERY CONDITION OR ELEMENT IS (OR CAN BE) EXPLICITLY SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL USE INDUSTRY ACCEPTED STANDARD GOOD PRACTICE FOR MISCELLANEOUS WORK NOT EXPLICITLY SHOWN.
3. THESE DRAWINGS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE MEANS OR METHODS OF CONSTRUCTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY FOR PROTECTION OF LIFE AND PROPERTY DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO, BRACING, FORMWORK, SHORING, ETC. SITE VISITS BY THE ENGINEER OR HIS REPRESENTATIVE WILL NOT INCLUDE INSPECTION OF THESE ITEMS AND IS FOR STRUCTURAL OBSERVATION OF THE FINISHED STRUCTURE ONLY.
4. NOTES AND DETAILS IN THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS. WHERE NO DETAILS ARE SHOWN, CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ON THE PROJECT, AND/OR AS PROVIDED FOR IN THE CONTRACT DOCUMENTS. WHERE DISCREPANCIES OCCUR BETWEEN PLANS, DETAILS, GENERAL NOTES, AND SPECIFICATIONS, THE GREATER, MORE STRICT REQUIREMENTS, SHALL GOVERN. IF FURTHER CLARIFICATION IS REQUIRED CONTACT THE ENGINEER OF RECORD.
5. SUBSTANTIAL EFFORT HAS BEEN MADE TO PROVIDE ACCURATE DIMENSIONS AND MEASUREMENTS ON THE DRAWINGS TO ASSIST IN THE FABRICATION AND/OR PLACEMENT OF CONSTRUCTION ELEMENTS BUT IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY THE DIMENSIONS, MEASUREMENTS, AND/OR CLEARANCES SHOWN IN THE CONSTRUCTION DRAWINGS PRIOR TO FABRICATION OR CUTTING OF ANY NEW OR EXISTING CONSTRUCTION ELEMENTS. IF IT IS DETERMINED THAT THERE ARE DISCREPANCIES AND/OR CONFLICTS WITH THE CONSTRUCTION DRAWINGS THE ENGINEER OF RECORD IS TO BE NOTIFIED AS SOON AS POSSIBLE.
6. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING CONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CROWN CASTLE.
7. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
8. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
9. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
10. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY THE CARRIER AND CROWN CASTLE PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
11. CONTRACTOR IS TO PERFORM A SITE INVESTIGATION AND IS TO DETERMINE THE BEST ROUTING OF ALL CONDUITS FOR POWER, AND TELCO AND FOR GROUNDING CABLES AS SHOWN IN THE POWER, TELCO, AND GROUNDING PLAN DRAWINGS.
12. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF CROWN CASTLE USA INC.
13. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
14. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST–IN–PLACE CONCRETE.
2. UNLESS NOTED OTHERWISE, SOIL BEARING PRESSURE USED FOR DESIGN OF SLABS AND FOUNDATIONS IS ASSUMED TO BE 1000 psf.
3. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH (f'c) OF 3000 psi AT 28 DAYS, UNLESS NOTED OTHERWISE. NO MORE THAN 90 MINUTES SHALL ELAPSE FROM BATCH TIME TO TIME OF PLACEMENT UNLESS APPROVED BY THE ENGINEER OF RECORD. TEMPERATURE OF CONCRETE SHALL NOT EXCEED 90°f AT TIME OF PLACEMENT.
4. CONCRETE EXPOSED TO FREEZE–THAW CYCLES SHALL CONTAIN AIR ENTRAINING ADMIXTURES. AMOUNT OF AIR ENTRAINMENT TO BE BASED ON SIZE OF AGGREGATE AND F3 CLASS EXPOSURE (VERY SEVERE). CEMENT USED TO BE TYPE II PORTLAND CEMENT WITH A MAXIMUM WATER–TO–CEMENT RATIO (W/C) OF 0.45.
5. ALL STEEL REINFORCING SHALL CONFORM TO ASTM A615. ALL WELDED WIRE FABRIC (WWF) SHALL CONFORM TO ASTM A185. ALL SPLICES SHALL BE CLASS "B" TENSION SPLICES, UNLESS NOTED OTHERWISE. ALL HOOKS SHALL BE STANDARD 90 DEGREE HOOKS, UNLESS NOTED OTHERWISE. YIELD STRENGTH (Fy) OF STANDARD DEFORMED BARS ARE AS FOLLOWS:
   - #4 BARS AND SMALLER........40 ksi
   - #5 BARS AND LARGER........60 ksi
6. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:
   - CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH........3"
   - CONCRETE EXPOSED TO EARTH OR WEATHER:
     - #6 BARS AND LARGER........2"
     - #5 BARS AND SMALLER........1–1/2"
   - CONCRETE NOT EXPOSED TO EARTH OR WEATHER:
     - SLAB AND WALLS........3/4"
     - BEAMS AND COLUMNS........1–1/2"
7. A TOOLED EDGE OR A 3/4" CHAMFER SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNLESS NOTED OTHERWISE, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

GREENFIELD GROUNDING NOTES:

1. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION AND AC POWER GES'S) SHALL BE BONDED TOGETHER AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
2. THE CONTRACTOR SHALL PERFORM IEEE FALL–OF–POTENTAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS, THE CONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.
3. THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT AND PROVIDE TESTING RESULTS.
4. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
5. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
6. EACH CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, #6 STRANDED COPPER OR LARGER FOR INDOOR BTS; #2 BARE SOLID TINNED COPPER FOR OUTDOOR BTS.
7. CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED BACK TO BACK CONNECTIONS ON OPPOSITE SIDE OF THE GROUND BUS ARE PERMITTED.
8. ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING SHALL BE #2 SOLID TINNED COPPER UNLESS OTHERWISE INDICATED.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED.
11. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
12. ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR AND EXTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS.
13. COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMIC WELD CONNECTIONS.
14. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.
15. APPROVED ANTIOXIDANT COATINGS (i.e. CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
16. ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
17. MISCELLANEOUS ELECTRICAL AND NON–ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
18. BOND ALL METALLIC OBJECTS WITHIN 6 ft OF MAIN GROUND RING WITH (1) #2 BARE SOLID TINNED COPPER GROUND CONDUCTOR.
19. GROUND CONDUCTORS USED FOR THE FACILITY GROUNDING AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON–METALLIC MATERIAL SUCH AS PVC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (i.e., NONMETALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.
20. ALL GROUNDS THAT TRANSITION FROM BELOW GRADE TO ABOVE GRADE MUST BE #2 BARE SOLID TINNED COPPER IN 3/4" NON–METALLIC, FLEXIBLE CONDUIT FROM 24" BELOW GRADE TO WITHIN 3" TO 6" OF CAD–WELD TERMINATION POINT. THE EXPOSED END OF THE CONDUIT MUST BE SEALED WITH SILICONE CAULK. (ADD TRANSITIONING GROUND STANDARD DETAIL AS WELL).
21. BUILDINGS WHERE THE MAIN GROUNDING CONDUCTORS ARE REQUIRED TO BE ROUTED TO GRADE, THE CONTRACTOR SHALL ROUTE TWO GROUNDING CONDUCTORS FROM THE ROOFTOP, TOWERS, AND WATER TOWERS GROUNDING RING, TO THE EXISTING GROUNDING SYSTEM, THE GROUNDING CONDUCTORS SHALL NOT BE SMALLER THAN 2/0 COPPER. ROOFTOP GROUNDING RING SHALL BE BONDED TO THE EXISTING GROUNDING SYSTEM, THE BUILDING STEEL COLUMNS, LIGHTNING PROTECTION SYSTEM, AND BUILDING MAIN WATER LINE (FERROUS OR NONFERROUS METAL PIPING ONLY).

ELECTRICAL INSTALLATION NOTES:

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.
2. CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED AND TRIP HAZARDS ARE ELIMINATED.
3. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC.
4. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.
   - 4.1. ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO REQUIREMENT OF THE NATIONAL ELECTRICAL CODE.
   - 4.2. ALL OVERCURRENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED, 22,000 AIC MINIMUM. VERYIFY AVAILABLE SHORT CIRCUIT CURRENT DOES NOT EXCEED THE RATING OF ELECTRICAL EQUIPMENT IN ACCORDANCE WITH ARTICLE 110.24 NEC OR THE MOST CURRENT ADOPTED CODE PRE THE GOVERNING JURISDICTION.
5. EACH END OF EVERY POWER PHASE CONDUCTOR, GROUNDING CONDUCTOR, AND TELCO CONDUCTOR OR CABLE SHALL BE LABELED WITH COLOR–CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2" PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC AND OSHA.
6. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH LAMICOID TAGS SHOWING THEIR RATED VOLTAGE, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING AND BRANCH CIRCUIT ID NUMBERS (i.e. PANEL BOARD AND CIRCUIT ID'S).
7. PANEL BOARDS (ID NUMBERS) SHALL BE CLEARLY LABELED WITH PLASTIC LABELS.
8. ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.
9. ALL POWER AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE COPPER CONDUCTOR (#14 OR LARGER) WITH TYPE THHW, THWN, THWN–2, XHHW, XHHW–2, THW, THW–2, RHW, OR RHW–2 INSULATION UNLESS OTHERWISE SPECIFIED.
10. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE COPPER CONDUCTOR (#6 OR LARGER) WITH TYPE THHW, THWN, THWN–2, XHHW, XHHW–2, THW, THW–2, RHW, OR RHW–2 INSULATION UNLESS OTHERWISE SPECIFIED.
11. POWER AND CONTROL WIRING IN FLEXIBLE CORD SHALL BE MULTI–CONDUCTOR, TYPE SOOW CORD (#14 OR LARGER) UNLESS OTHERWISE SPECIFIED.
12. POWER AND CONTROL WIRING FOR USE IN CABLE TRAY SHALL BE MULTI–CONDUCTOR, TYPE TC CABLE (#14 OR LARGER), WITH TYPE THHW, THWN, THWN–2, XHHW, XHHW–2, THW, THW–2, RHW, OR RHW–2 INSULATION UNLESS OTHERWISE SPECIFIED.
13. ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP–STYLE, COMPRESSION WIRE LUGS AND WIRE NUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRE NUTS SHALL BE RATED FOR OPERATION NOT LESS THAN 75° C (90° C IF AVAILABLE).
14. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.
15. ELECTRICAL METALLIC TUBING (EMT), INTERMEDIATE METAL CONDUIT (IMC), OR RIGID METAL CONDUIT (RMC) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
16. ELECTRICAL METALLIC TUBING (EMT) OR METAL–CLAD CABLE (MC) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
17. SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE GRADE PVC CONDUIT.
18. LIQUID–TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID–TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
19. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION–TYPE AND APPROVED FOR THE LOCATION USED. SET SCREW FITTINGS ARE NOT ACCEPTABLE.
20. CABINETS, BOXES AND WIRE WAYS SHALL BE LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND THE NEC.
21. WIREWAYS SHALL BE METAL WITH AN ENAMEL FINISH AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARDS (WIREMOLD SPECMATE WIREWAY).
22. SLOTTED WIRING DUCT SHALL BE PVC AND INCLUDE COVER (PANDUIT TYPE E OR EQUAL).
23. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON–PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES (i.e. POWDER–ACTUATED) FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER. PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED FLUSH TO FINISH GRADE TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.
24. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES AND PULL BOXES SHALL BE GALVANIZED OR EPOXY–COATED SHEET STEEL. SHALL MEET OR EXCEED UL 50 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND NEMA 3R (OR BETTER) FOR EXTERIOR LOCATIONS.
25. METAL RECEPTACLE, SWITCH AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY–COATED OR NON–CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
26. NONMETALLIC RECEPTACLE, SWITCH AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2 (NEWEST REVISION) AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
27. THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CARRIER AND/OR CROWN CASTLE USA INC. BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
28. THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD LIFE AND PROPERTY.
29. INSTALL LAMICOID LABEL ON THE METER CENTER TO SHOW "T–MOBILE".
30. ALL EMPTY/SPARE CONDUITS THAT ARE INSTALLED ARE TO HAVE A METERED MULE TAPE PULL CORD INSTALLED.

CONDUCTOR COLOR CODE		
SYSTEM	CONDUCTOR	COLOR
120/240V, 1Ø	A PHASE	BLACK
	B PHASE	RED
	NEUTRAL	WHITE
	GROUND	GREEN
120/208V, 3Ø	A PHASE	BLACK
	B PHASE	RED
	C PHASE	BLUE
	NEUTRAL	WHITE
	GROUND	GREEN
277/480V, 3Ø	A PHASE	BROWN
	B PHASE	ORANGE OR PURPLE
	C PHASE	YELLOW
	NEUTRAL	GREY
	GROUND	GREEN
DC VOLTAGE	POS (+)	RED**
	NEG (–)	BLACK**

* SEE NEC 210.5(C)(1) AND (2)
** POLARITY MARKED AT TERMINATION

APWA UNIFORM COLOR CODE:

WHITE	PROPOSED EXCAVATION
PINK	TEMPORARY SURVEY MARKINGS
RED	ELECTRIC POWER LINES, CABLES, CONDUIT, AND LIGHTING CABLES
YELLOW	GAS, OIL, STEAM, PETROLEUM, OR GASEOUS MATERIALS
ORANGE	COMMUNICATION, ALARM OR SIGNAL LINES, CABLES, OR CONDUIT AND TRAFFIC LOOPS
BLUE	POTABLE WATER
PURPLE	RECLAIMED WATER, IRRIGATION, AND SLURRY LINES
GREEN	SEWERS AND DRAIN LINES

ABBREVIATIONS:

ANT	ANTENNA
(E)	EXISTING
FIF	FACILITY INTERFACE FRAME
GEN	GENERATOR
GPS	GLOBAL POSITIONING SYSTEM
GSM	GLOBAL SYSTEM FOR MOBILE
LTE	LONG TERM EVOLUTION
MGB	MASTER GROUND BAR
MW	MICROWAVE
(N)	NEW
NEC	NATIONAL ELECTRIC CODE
(P)	PROPOSED
PP	POWER PLANT
QTY	QUANTITY
RECT	RECTIFIER
RBS	RADIO BASE STATION
RET	REMOTE ELECTRIC TILT
RFDS	RADIO FREQUENCY DATA SHEET
RRH	REMOTE RADIO HEAD
RRU	REMOTE RADIO UNIT
SIAD	SMART INTEGRATED DEVICE
TMA	TOWER MOUNTED AMPLIFIER
TYP	TYPICAL
UMTS	UNIVERSAL MOBILE TELECOMMUNICATIONS SYSTEM
W.P.	WORK POINT

T-Mobile
35 GRIFFIN ROAD
BLOOMFIELD, CT 06002

CROWN CASTLE
12 GILL STREET, SUITE 5800
WOBURN, MA 01801

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

T-MOBILE SITE NUMBER:
4BSM233A

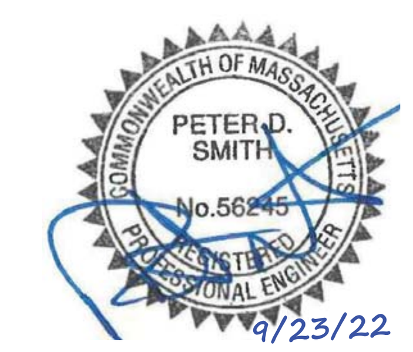
BU #: **806042**
BOS ASHLAND 959026

34 ALBERT RAY DRIVE
ASHLAND, MA 01721

EXISTING
100'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	9/14/22	TDG	PRELIMINARY REVIEW	LR
0	9/23/22	TDG	CONSTRUCTION	LR



B&T ENGINEERING, INC.

SHEET NUMBER: T-2

REVISION: 0

SITE PLAN DISCLAIMER:

PROPERTY LINES AND STRUCTURES HAVE BEEN DIGITIZED FROM GOOGLE MAPS. CROWN CASTLE USA INC. HAS NOT COMPLETED A SITE SURVEY AND THEREFORE MAKES NO CLAIMS AS TO THE ACCURACY OF INFORMATION DEPICTED ON THIS SHEET.

1 OVERALL SITE PLAN
SCALE: 30' 15' 0 30' 1"=30'-0" (FULL SIZE) 1"=60'-0" (11x17)

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BLOOMFIELD, CT 06002

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T-MOBILE SITE NUMBER:
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BU #: **806042**
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ASHLAND, MA 01721

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100'-0" MONOPOLE

ISSUED FOR:

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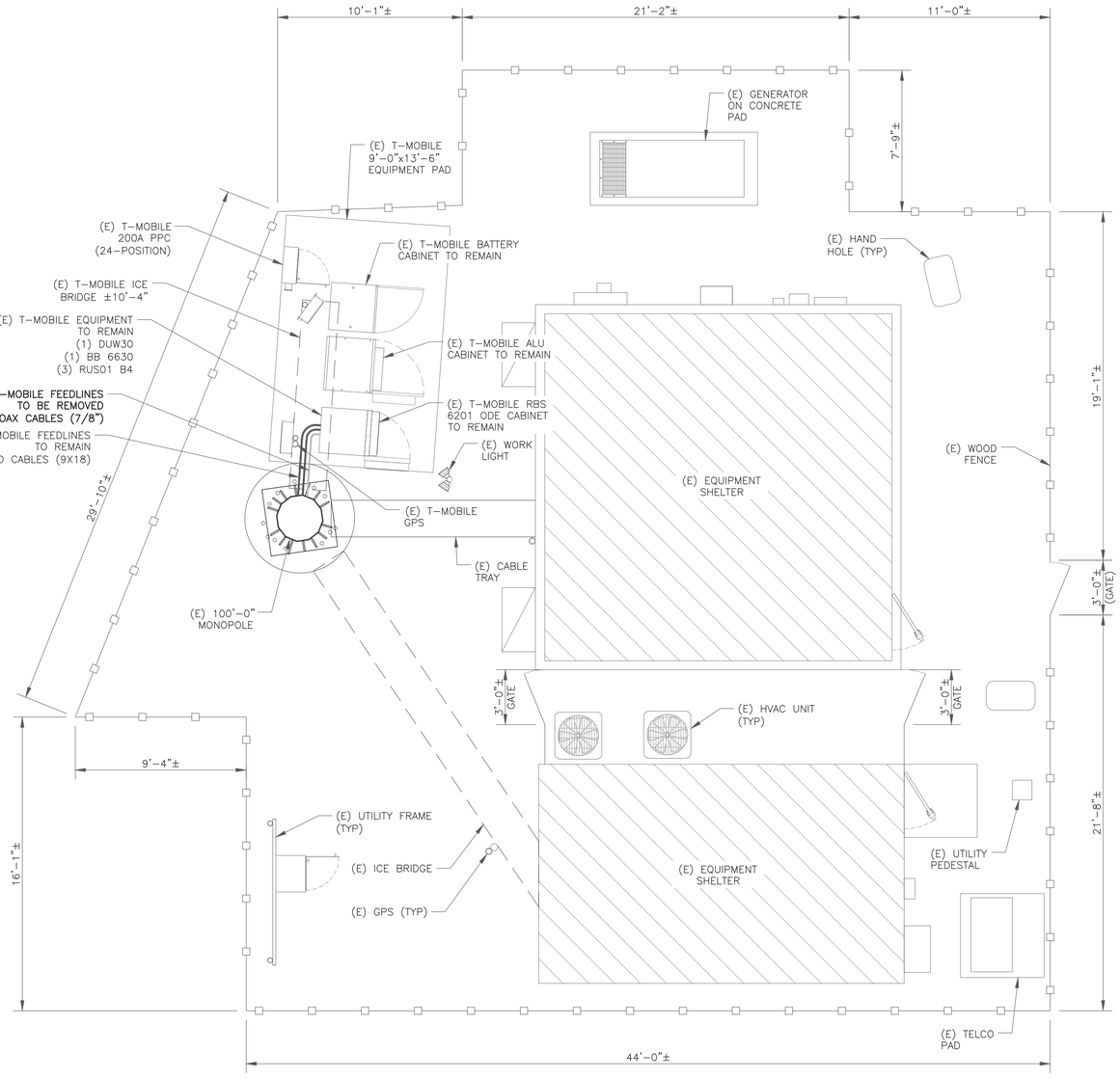
0	9/23/22	TDG	CONSTRUCTION	LR

COMMONWEALTH OF MASSACHUSETTS
PETER D. SMITH
No. 56845
REGISTERED PROFESSIONAL ENGINEER
9/23/22

B&T ENGINEERING, INC.

SHEET NUMBER: C-1.1

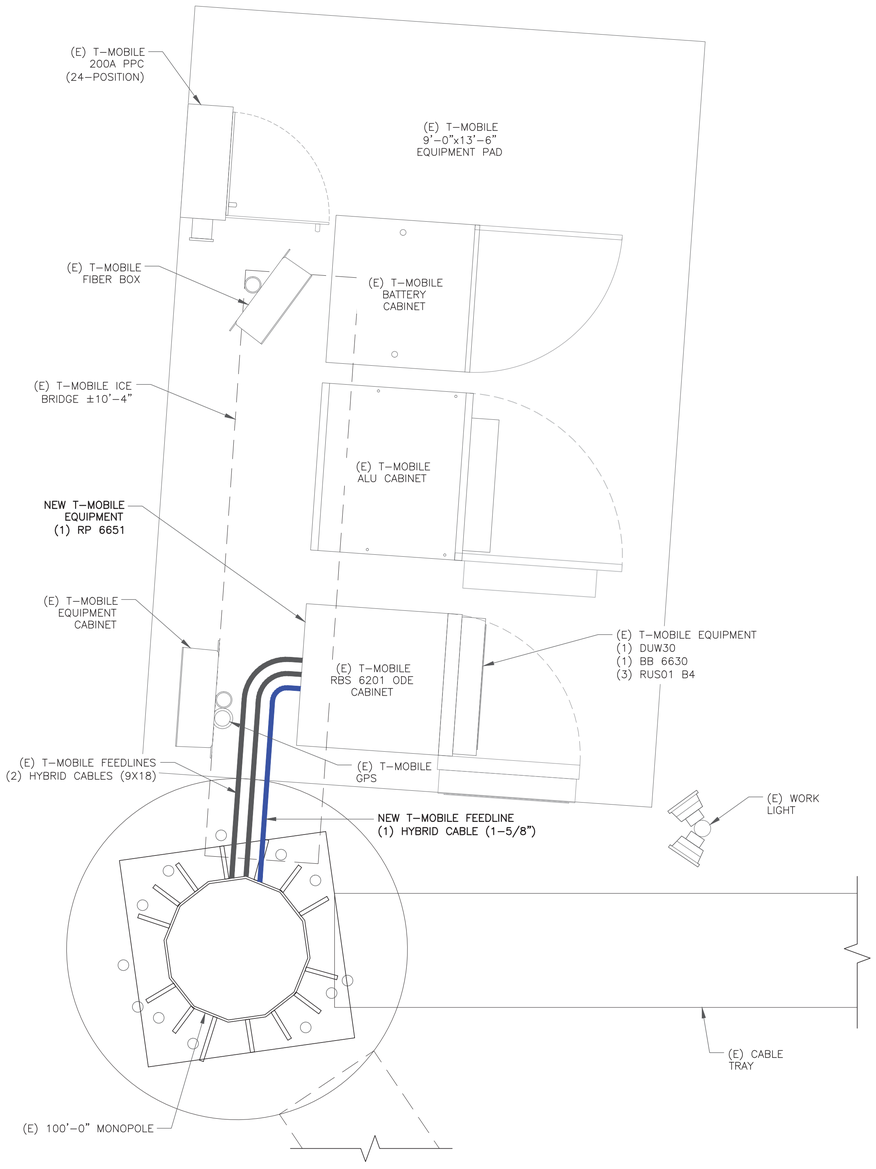
REVISION: 0



1 SITE PLAN

SCALE: 4' 3' 2' 1' 0 4' — 1/4"=1'-0" (FULL SIZE) 1/8"=1'-0" (11x17)

N



2 ENLARGED SITE PLAN

SCALE: 1' 6" 0 1' — 3/4"=1'-0" (FULL SIZE) 3/8"=1'-0" (11x17)

N

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T-MOBILE SITE NUMBER:
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BU #: **806042**
BOS ASHLAND 959026

34 ALBERT RAY DRIVE
ASHLAND, MA 01721

EXISTING
100'-0" MONOPOLE

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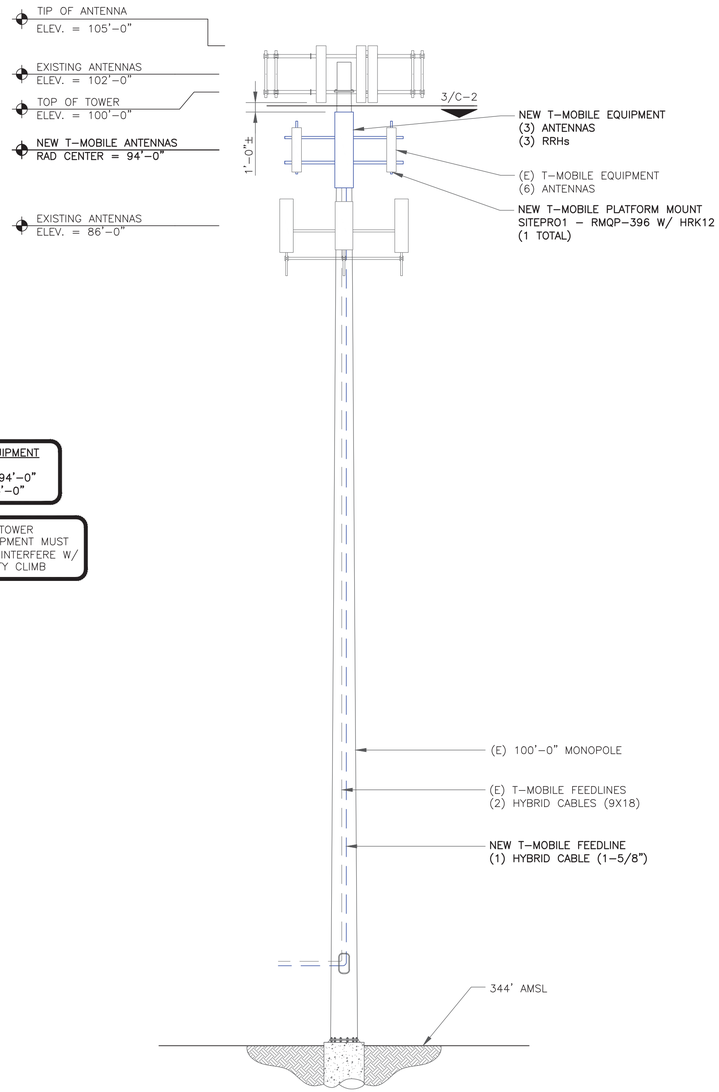
0	9/23/22	TDG	CONSTRUCTION	LR

COMMONWEALTH OF MASSACHUSETTS
PETER D. SMITH
No. 56245
REGISTERED PROFESSIONAL ENGINEER
9/23/22

B&T ENGINEERING, INC.

SHEET NUMBER: C-1.2

REVISION: 0

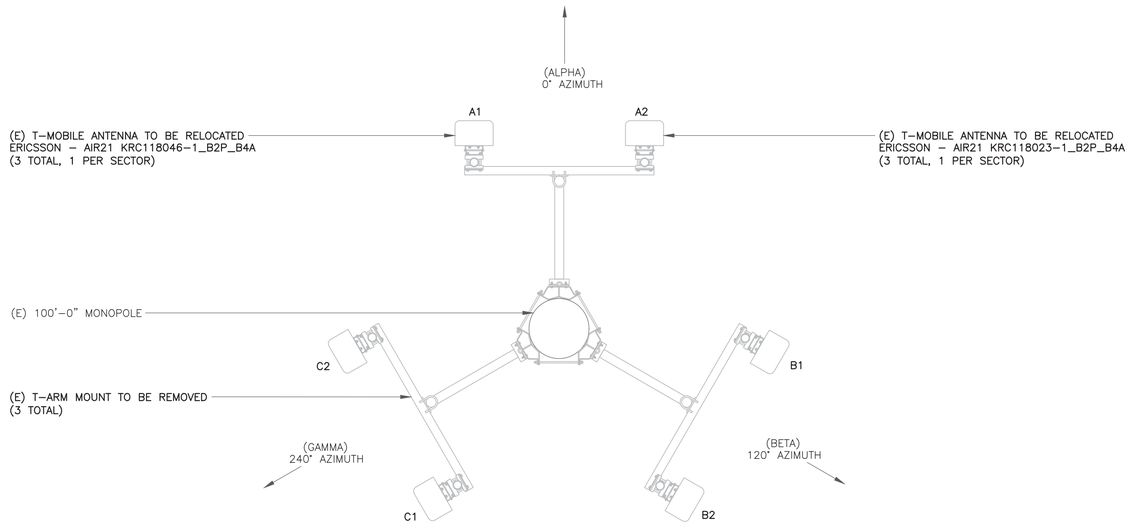


T-MOBILE EQUIPMENT

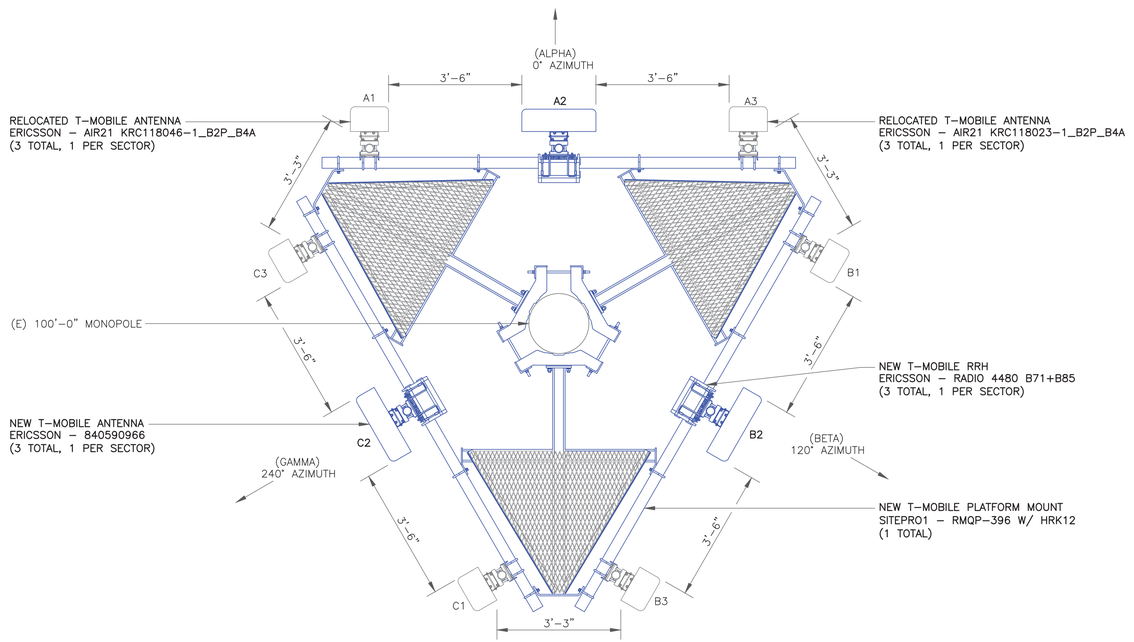
ANTENNA CL: 94'-0"
MOUNT CL: 94'-0"

ANY AND ALL TOWER MOUNTED EQUIPMENT MUST NOT TRAP OR INTERFERE W/ EXISTING SAFETY CLIMB

1 FINAL ELEVATION
SCALE: NOT TO SCALE



2 EXISTING ANTENNA LAYOUT
SCALE: NOT TO SCALE



3 FINAL ANTENNA LAYOUT
SCALE: NOT TO SCALE

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4BSM233A

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BOS ASHLAND 959026

34 ALBERT RAY DRIVE
ASHLAND, MA 01721

EXISTING
100'-0" MONOPOLE

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B&T ENGINEERING, INC.

SHEET NUMBER: C-2

REVISION: 0

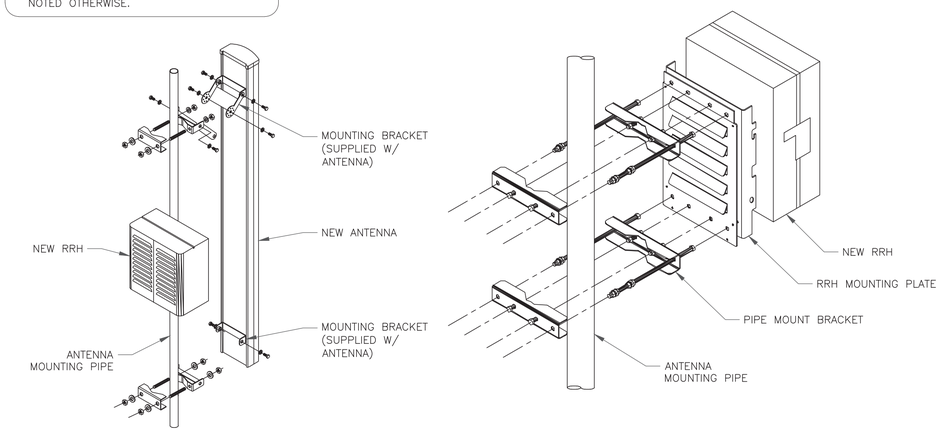
RF SYSTEM SCHEDULE

SECTOR	ANTENNA	TECH	MANUFACTURER	ANTENNA MODEL	AZIMUTH	M-TILT	E-TILT	RAD CENTER	TMA/RRU	FEEDLINE TYPE
ALPHA	A1	U2100	ERICSSON	AIR21 KRC118046-1_B2P_B4A	0°	0°	2°	94'-0"	–	(2) 9X18 HYBRID (40M) (1) 6/24 HYBRID (40M)
	A2	L600/N600/L700	ERICSSON	840590966	0°	0°	2°/2°	94'-0"	4480 B71+B85	
	A3	L2100	ERICSSON	AIR21 KRC118023-1_B2P_B4A	0°	0°	2°	94'-0"	–	
BETA	B1	U2100	ERICSSON	AIR21 KRC118046-1_B2P_B4A	120°	0°	2°	94'-0"	–	
	B2	L600/N600/L700	ERICSSON	840590966	120°	0°	2°/2°	94'-0"	4480 B71+B85	
	B3	L2100	ERICSSON	AIR21 KRC118023-1_B2P_B4A	120°	0°	2°	94'-0"	–	
GAMMA	C1	U2100	ERICSSON	AIR21 KRC118046-1_B2P_B4A	240°	0°	2°	94'-0"	–	
	C2	L600/N600/L700	ERICSSON	840590966	240°	0°	2°/2°	94'-0"	4480 B71+B85	
	C3	L2100	ERICSSON	AIR21 KRC118023-1_B2P_B4A	240°	0°	2°	94'-0"	–	

1 ANTENNA AND CABLE SCHEDULE
SCALE: NOT TO SCALE

INSTALLER NOTES:

1. COMPLY WITH MANUFACTURERS INSTRUCTIONS TO ENSURE THAT ALL RRHs RECEIVE ELECTRICAL POWER WITHIN 24 HOURS OF BEING REMOVED FROM THE MANUFACTURER'S PACKAGING.
2. DO NOT OPEN RRH PACKAGES IN THE RAIN.
3. ALL PIPES, BRACKETS, AND MISCELLANEOUS HARDWARE TO BE GALVANIZED UNLESS NOTED OTHERWISE.



2 ANTENNA WITH RRH MOUNTING DETAIL
SCALE: NOT TO SCALE

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CROWN CASTLE
12 GILL STREET, SUITE 5800
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SUITE 300
TULSA, OK 74119
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T-MOBILE SITE NUMBER:
4BSM233A

BU #: **806042**
BOS ASHLAND 959026

34 ALBERT RAY DRIVE
ASHLAND, MA 01721

EXISTING
100'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	9/14/22	TDG	PRELIMINARY REVIEW	LR
0	9/23/22	TDG	CONSTRUCTION	LR

COMMONWEALTH OF MASSACHUSETTS
PETER D. SMITH
No. 56845
REGISTERED PROFESSIONAL ENGINEER
9/23/22

B&T ENGINEERING, INC.

SHEET NUMBER: C-3
REVISION: 0

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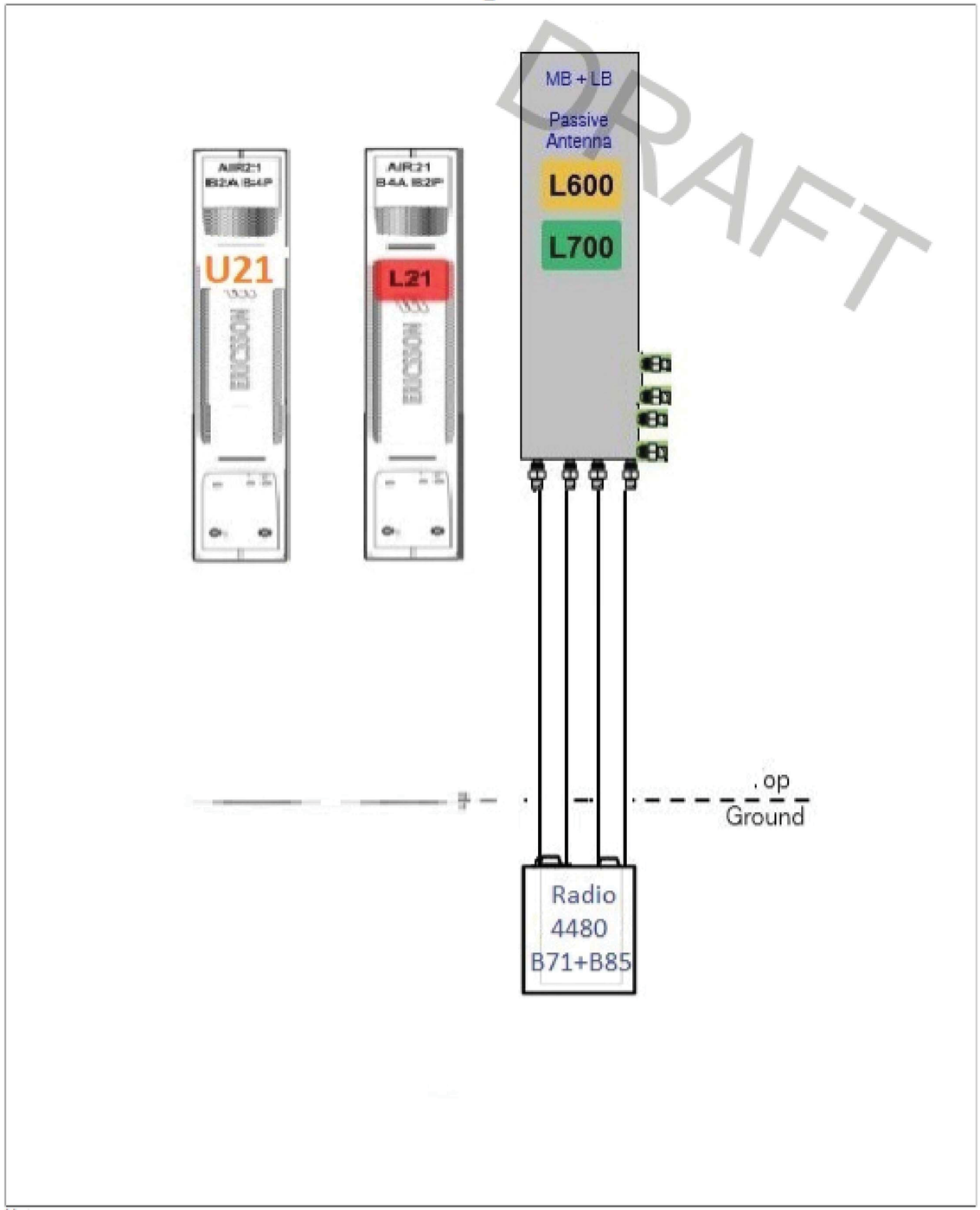

Notes:

1 PLUMBING DIAGRAM
SCALE: NOT TO SCALE

T-Mobile
35 GRIFFIN ROAD
BLOOMFIELD, CT 06002

CROWN CASTLE
12 GILL STREET, SUITE 5800
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EXISTING
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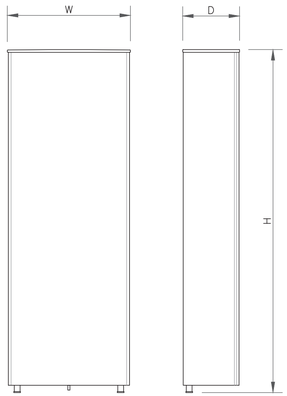
COMMONWEALTH OF MASSACHUSETTS
PETER D. SMITH
No. 56845
REGISTERED PROFESSIONAL ENGINEER
9/23/22

B&T ENGINEERING, INC.

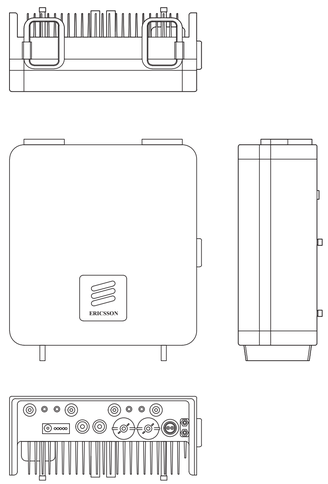
SHEET NUMBER: C-4

REVISION: 0



ANTENNA SPECS	
MANUFACTURER	ERICSSON
MODEL #	840590966
WIDTH	23.50"
DEPTH	7.10"
HEIGHT	95.90"
WEIGHT	135.80 LBS

1 ANTENNA SPECS
SCALE: NOT TO SCALE



ERICSSON – RADIO 4480
WEIGHT: 92.6 LBS
SIZE (HxWxD): 21.8x15.7x7.5 IN.

2 ERICSSON – RADIO 4480
SCALE: NOT TO SCALE

3 NOT USED
SCALE: NOT TO SCALE

4 NOT USED
SCALE: NOT TO SCALE

5 NOT USED
SCALE: NOT TO SCALE

6 NOT USED
SCALE: NOT TO SCALE

7 NOT USED
SCALE: NOT TO SCALE

8 NOT USED
SCALE: NOT TO SCALE

T-Mobile
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BLOOMFIELD, CT 06002

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T-MOBILE SITE NUMBER:
4BSM233A

BU #: **806042**
BOS ASHLAND 959026

34 ALBERT RAY DRIVE
ASHLAND, MA 01721

EXISTING
100'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
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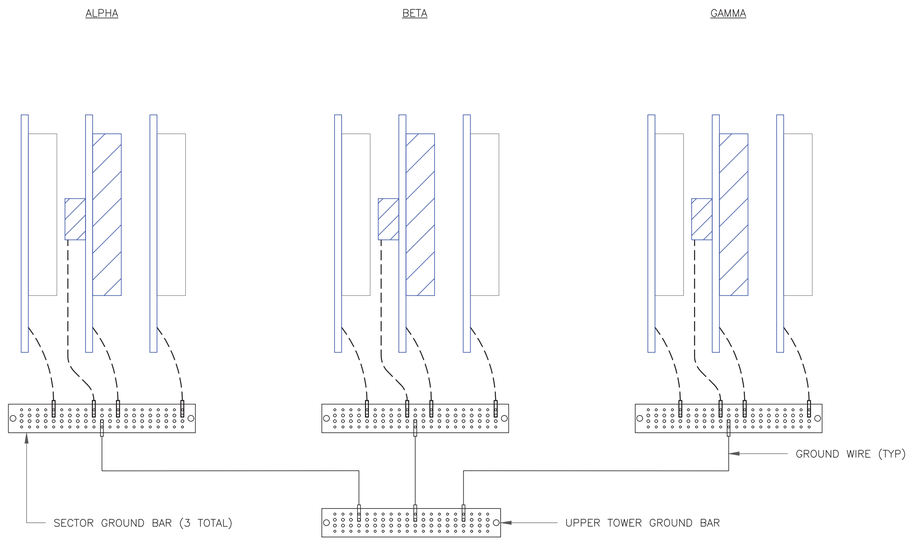
0	9/23/22	TDG	CONSTRUCTION	LR

B&T ENGINEERING, INC.

SHEET NUMBER: C-5

REVISION: 0



NOTE:

ALL NEW GROUNDS TO BE #6 STRANDED COPPER WITH GREEN INSULATION UNLESS NOTED OTHERWISE.

1 ANTENNA GROUNDING DIAGRAM
SCALE: NOT TO SCALE

T-Mobile
35 GRIFFIN ROAD
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EXISTING
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ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
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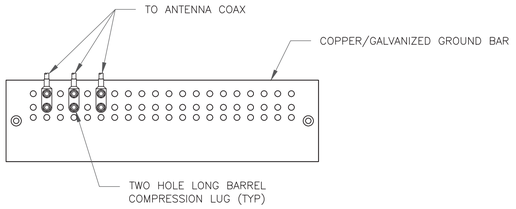
0	9/23/22	TDG	CONSTRUCTION	LR

COMMONWEALTH OF MASSACHUSETTS
PETER D. SMITH
No.56245
REGISTERED PROFESSIONAL ENGINEER
9/23/22

B&T ENGINEERING, INC.

SHEET NUMBER: G-1

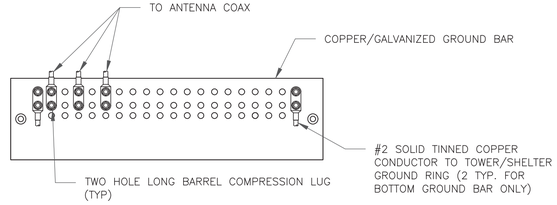
REVISION: 0



NOTES:

1. DOUBLING UP "OR STACKING" OF CONNECTIONS IS NOT PERMITTED.
2. EXTERIOR ANTIOXIDANT JOINT COMPOUND TO BE USED ON ALL EXTERIOR CONNECTIONS.
3. GROUND BAR SHALL NOT BE ISOLATED FROM TOWER. MOUNT DIRECTLY TO ANTENNA MOUNT STEEL.

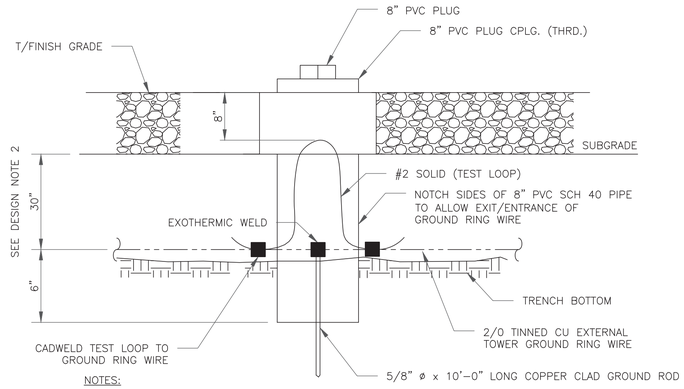
1 ANTENNA SECTOR GROUND BAR DETAIL
SCALE: NOT TO SCALE



NOTES:

1. EXTERIOR ANTIOXIDANT JOINT COMPOUND TO BE USED ON ALL EXTERIOR CONNECTIONS.
2. GROUND BAR SHALL NOT BE ISOLATED FROM TOWER. MOUNT DIRECTLY TO TOWER STEEL (TOWER ONLY).
3. GROUND BAR SHALL BE ISOLATED FROM BUILDING OR SHELTER.

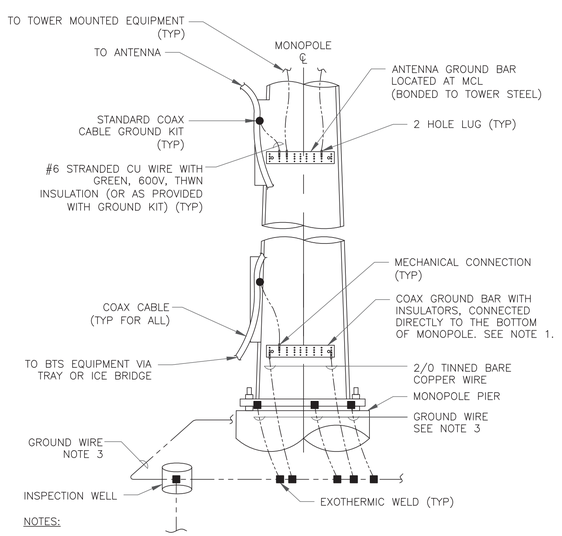
2 TOWER/SHELTER GROUND BAR DETAIL
SCALE: NOT TO SCALE



NOTES:

1. GROUND ROD SHALL BE DRIVEN VERTICALLY, NOT TO EXCEED 45 DEGREES FROM THE VERTICAL
2. GROUND WIRE SHALL BE MIN. 30" BELOW GRADE OR 6" BELOW FROST LINE. (WHICH EVER IS GREATER) AS PER N.E.C. ARTICLE 250-50(D)

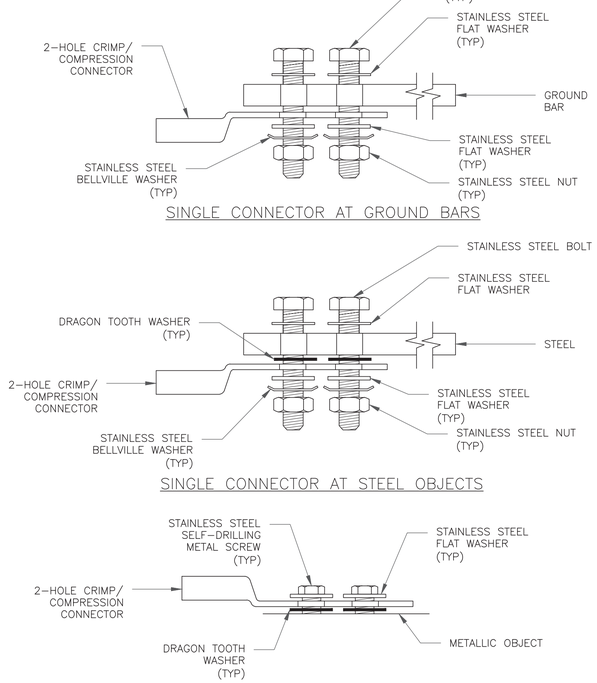
3 INSPECTION WELL DETAIL
SCALE: NOT TO SCALE



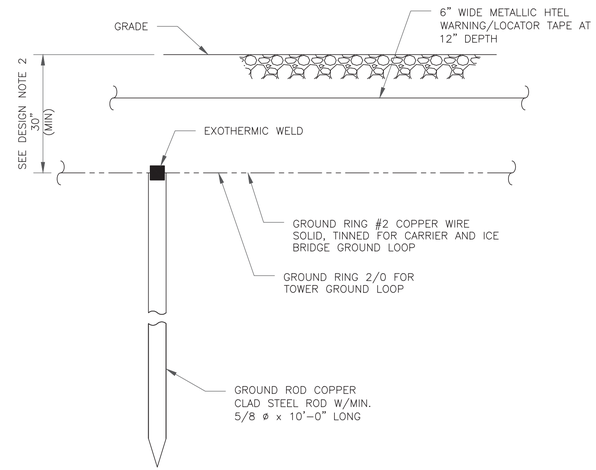
NOTES:

1. NUMBER OF GROUNDING BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, ANTENNA LOCATIONS AND CONNECTION ORIENTATION. COAXIAL CABLES EXCEEDING 200 FEET ON THE TOWER SHALL HAVE GROUND KITS AT THE MIDPOINT. PROVIDE AS REQUIRED.
2. ONLY MECHANICAL CONNECTIONS ARE ALLOWED TO BE MADE TO CROWN CASTLE USA INC. TOWERS. ALL MECHANICAL CONNECTIONS SHALL BE TREATED WITH AN ANTI-OXIDANT COATING.
3. ALL TOWER GROUNDING SYSTEMS SHALL COMPLY WITH THE REQUIREMENTS OF THE RECOGNIZED EDITION OF ANSI/TIA 222 AND NFPA 780.

4 TYPICAL ANTENNA CABLE GROUNDING
SCALE: NOT TO SCALE



5 HARDWARE DETAIL FOR EXTERIOR CONNECTIONS
SCALE: NOT TO SCALE



NOTES:

1. GROUND ROD SHALL BE DRIVEN VERTICALLY, NOT TO EXCEED 45 DEGREES FROM THE VERTICAL
2. GROUND WIRE SHALL BE MIN. 30" BELOW GRADE OR 6" BELOW FROST LINE. (WHICH EVER IS GREATER) AS PER N.E.C. ARTICLE 250-50(D)

6 GROUND ROD DETAIL
SCALE: NOT TO SCALE

T-Mobile
35 GRIFFIN ROAD
BLOOMFIELD, CT 06002

CROWN CASTLE
12 GILL STREET, SUITE 5800
WOBURN, MA 01801

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

T-MOBILE SITE NUMBER:
4BSM233A

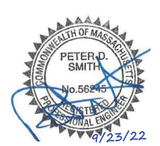
BU #: **806042**
BOS ASHLAND 959026

34 ALBERT RAY DRIVE
ASHLAND, MA 01721

EXISTING
100'-0" MONOPOLE

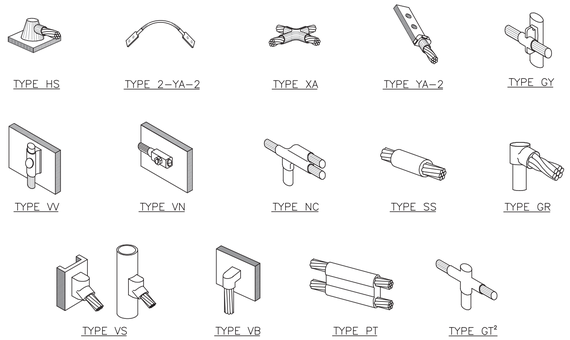
ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	9/14/22	TDG	PRELIMINARY REVIEW	LR
0	9/23/22	TDG	CONSTRUCTION	LR



B&T ENGINEERING, INC.

SHEET NUMBER: G-2
REVISION: 0

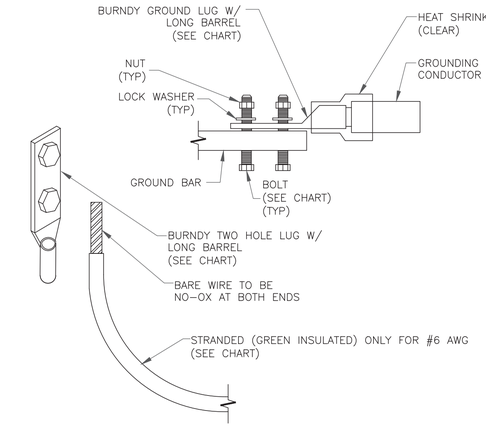


NOTE:

1. ERICO EXOTHERMIC "MOLD TYPES" SHOWN HERE ARE EXAMPLES. CONSULT WITH CONSTRUCTION MANAGER FOR SPECIFIC MOLDS TO BE USED FOR THIS PROJECT.
2. MOLD TYPE ONLY TO BE USED BELOW GRADE WHEN CONNECTING GROUND RING TO GROUND ROD.

1 CADWELD GROUNDING CONNECTIONS
SCALE: NOT TO SCALE

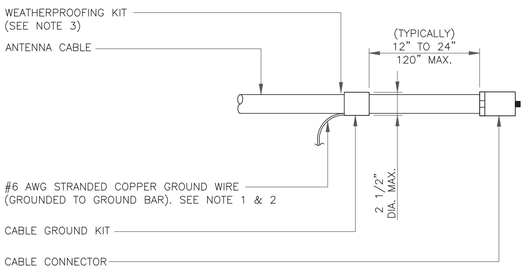
WIRE SIZE	BURNDY LUG	BOLT SIZE
#6 AWG GREEN INSULATED	YA6C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG SOLID TINNED	YA3C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG STRANDED	YA2C-2TC38	3/8" - 16 NC S 2 BOLT
#2/0 AWG STRANDED	YA26-2TC38	3/8" - 16 NC S 2 BOLT
#4/0 AWG STRANDED	YA28-2N	1/2" - 16 NC S 2 BOLT



NOTES:

1. ALL GROUNDING LUGS ARE TO BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS. ALL HARDWARE BOLTS, NUTS, LOCK WASHERS SHALL BE STAINLESS STEEL. ALL HARDWARE ARE TO BE AS FOLLOWS: BOLT, FLAT WASHER,GROUND BAR, GROUND LUG, FLAT WASHER AND NUT.

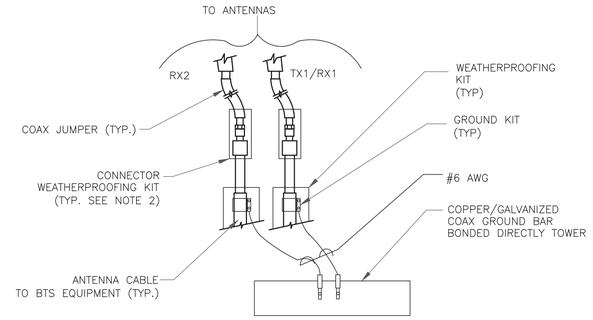
2 MECHANICAL LUG CONNECTION
SCALE: NOT TO SCALE



NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2. GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
3. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT, COLD SHRINK SHALL NOT BE USED.

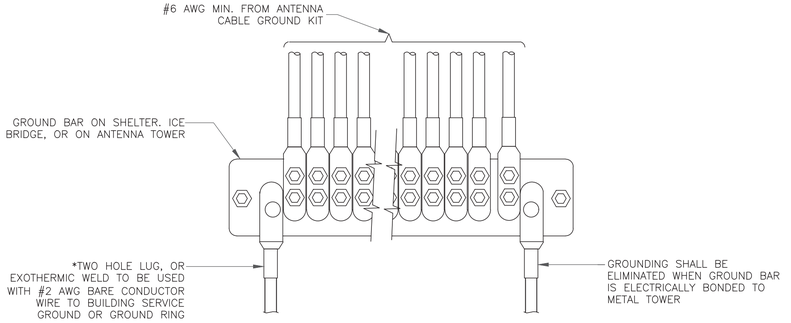
3 CABLE GROUND KIT CONNECTION
SCALE: NOT TO SCALE



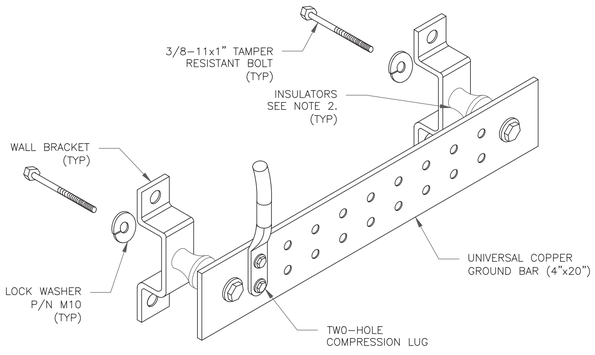
NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO ANTENNA GROUND BAR.
2. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT. COLD SHRINK SHALL NOT BE USED.

4 GROUND CABLE CONNECTION
SCALE: NOT TO SCALE



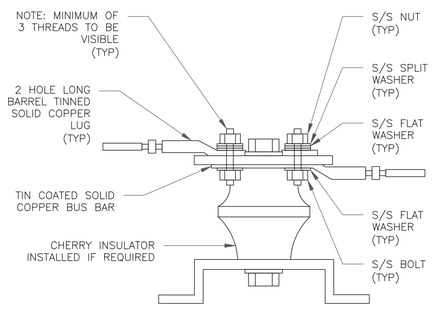
5 GROUNDWIRE INSTALLATION
SCALE: NOT TO SCALE



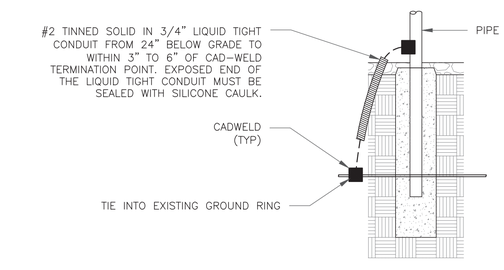
NOTES:

1. DOWN LEAD (HOME RUN) CONDUCTORS ARE NOT TO BE INSTALLED ON CROWN CASTLE USA INC. TOWER, PER THE GROUNDING DOWN CONDUCTOR POLICY QAS-STD-10091. NO MODIFICATION OR DRILLING TO TOWER STEEL IS ALLOWED IN ANY FORM OR FASHION, CAD-WELDING ON THE TOWER AND/OR IN THE AIR ARE NOT PERMITTED.
2. OMIT INSULATOR WHEN MOUNTING TO TOWER STEEL OR PLATFORM STEEL USE INSULATORS WHEN ATTACHING TO BUILDING OR SHELTERS.

6 GROUND BAR DETAIL
SCALE: NOT TO SCALE



7 LUG DETAIL
SCALE: NOT TO SCALE



8 TRANSITIONING GROUND DETAIL
SCALE: NOT TO SCALE

T-Mobile
35 GRIFFIN ROAD
BLOOMFIELD, CT 06002

CROWN CASTLE
12 GILL STREET, SUITE 5800
WOBURN, MA 01801

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

T-MOBILE SITE NUMBER:
4BSM233A

BU #: **806042**
BOS ASHLAND 959026

34 ALBERT RAY DRIVE
ASHLAND, MA 01721

EXISTING
100'-0" MONOPOLE

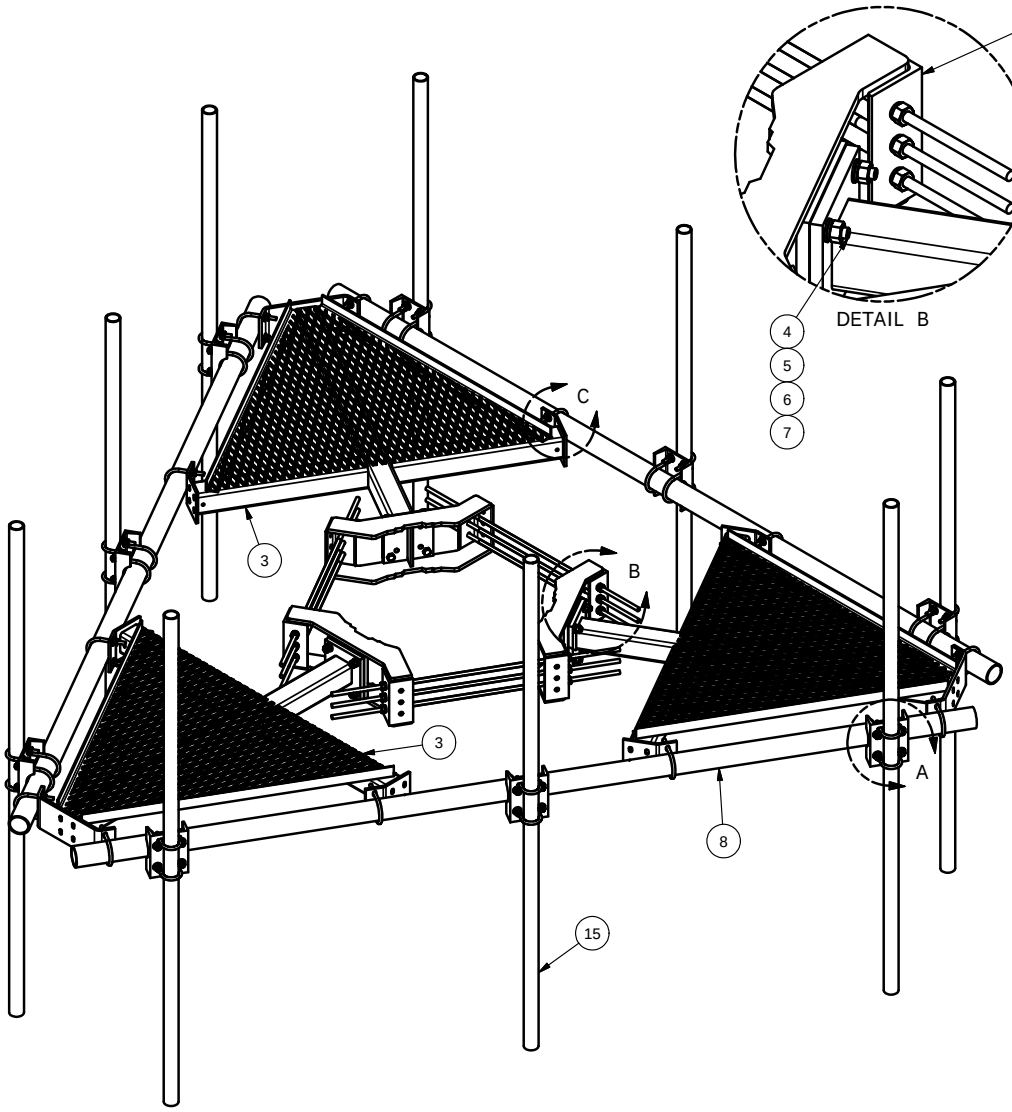
ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	9/14/22	TDG	PRELIMINARY REVIEW	LR
0	9/23/22	TDG	CONSTRUCTION	LR

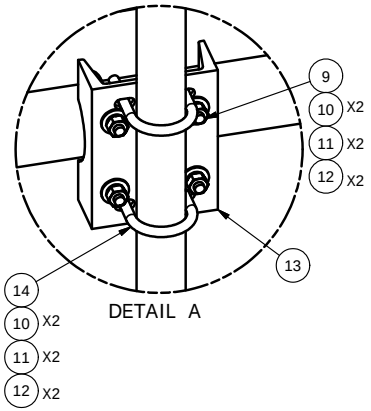
COMMONWEALTH OF MASSACHUSETTS
PETER D. SMITH
No.56845
REGISTERED PROFESSIONAL ENGINEER
9/23/22

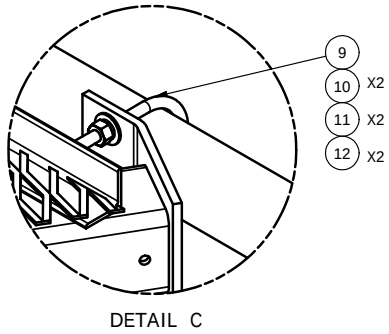
B&T ENGINEERING, INC.

SHEET NUMBER: G-3
REVISION: 0



PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	3	X-LWRM	RING MOUNT WELDMENT		68.81	206.42
2	9	G58R-24	5/8" x 24" THREADED ROD (HDG.)		0.40	3.59
2	9	G58R-48	5/8" x 48" THREADED ROD (HDG.)		0.40	3.59
3	3	X-SV196	LOW PROFILE PLATFORM CORNER		212.10	636.31
4	12	A58234	5/8" x 2-3/4" HDG A325 HEX BOLT	2.75	0.36	4.27
5	12	A58FW	5/8" HDG A325 FLATWASHER		0.03	0.41
6	30	G58LW	5/8" HDG LOCKWASHER		0.03	0.78
7	30	A58NUT	5/8" HDG A325 HEX NUT		0.13	3.90
8	3	P3150	3-1/2" X 150" SCH 40 GALVANIZED PIPE	150.000 in	94.80	284.40
9	30	X-UB1306	1/2" X 3-5/8" X 6" X 3" U-BOLT (HDG.)		0.26	7.71
10	96	G12FW	1/2" HDG USS FLATWASHER		0.03	3.27
11	96	G12LW	1/2" HDG LOCKWASHER		0.01	1.33
12	96	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	6.88
13	9	X-SP219	SMALL SUPPORT CROSS PLATE	8.250 in	8.61	77.50
14	18	X-UB1212	1/2" X 2-1/2" X 4-1/2" X 2" U-BOLT (HDG.)		0.26	4.63
15	9	B	ANTENNA MOUNTING PIPE	C	D	E





2-3/8" O.D. VERTICAL MOUNTING PIPES					
ASSEMBLY NO. "A"	PART NO. "B"	LENGTH, "C"	UNIT WEIGHT, "D"	NET WEIGHT, "E"	TOTAL WEIGHT
RMQP-363	P263	63"	20.18	181.62	1494.37
RMQP-372	P272	72"	23.07	207.63	1520.38
RMQP-384	P284	84"	26.91	242.19	1554.94
RMQP-396	P296	96"	30.76	276.84	1589.59
RMQP-3126	P2126	126"	40.75	366.75	1679.50

REVISION HISTORY				
REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
A	ADDED 10' 6" ANTENNA MOUNTING PIPES		CEK	7/7/2015

TOLERANCE NOTE

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES (± 0.030")
DRILLED AND GAS CUT HOLES (± 0.030") - NO CONING OF HOLES
LASER CUT EDGES AND HOLES (± 0.010") - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE - ALL OTHER MACHINING (± 0.030")
ALL OTHER ASSEMBLY (± 0.060")

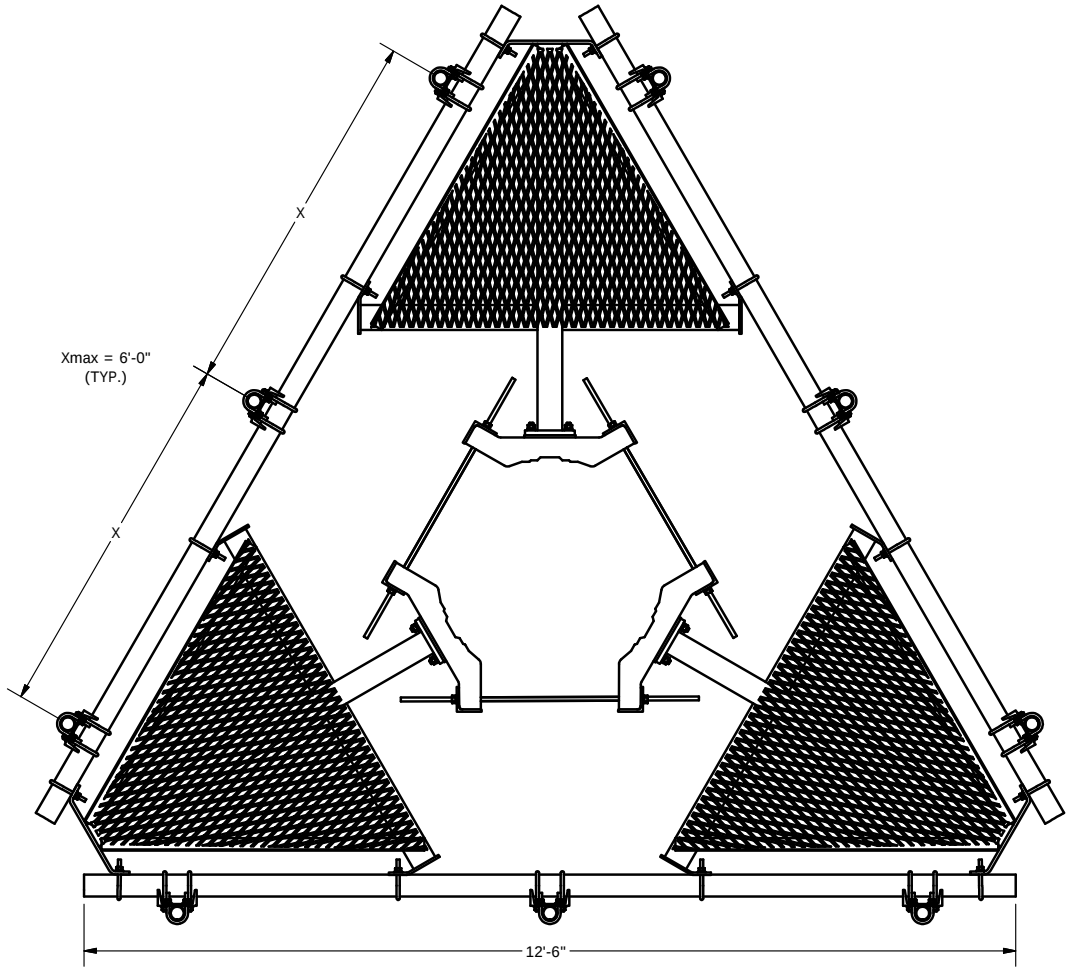
DESCRIPTION
LOW PROFILE CO-LOCATION PLATFORM FOR 9 ANTENNAS WITH 12' 6" FACE WIDTH FOR 12" - 38" DIAMETER POLES

SITE PRO 1 — A valmont COMPANY

Engineering Support Team: 1-888-753-7446

Locations: New York, NY; Atlanta, GA; Los Angeles, CA; Plymouth, IN; Salem, OR; Dallas, TX

DRAWN BY	CPD NO.	DRAWING USAGE	PART NO.	PAGE
CEK 1/19/2012	semb	CUSTOMER	SEE ASSEMBLY NO. "A"	1 OF 2
ENG. APPROVAL	CHECKED BY		DWG. NO.	
	BMC 1/23/2012		RMQP-3XX	



TOLERANCE NOTE

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES (± 0.030")
DRILLED AND GAS CUT HOLES (± 0.030") - NO CONING OF HOLES
LASER CUT EDGES AND HOLES (± 0.010") - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE - ALL OTHER MACHINING (± 0.030")
ALL OTHER ASSEMBLY (± 0.060")

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
A	ADDED 10' 6" ANTENNA MOUNTING PIPES		CEK	7/7/2015

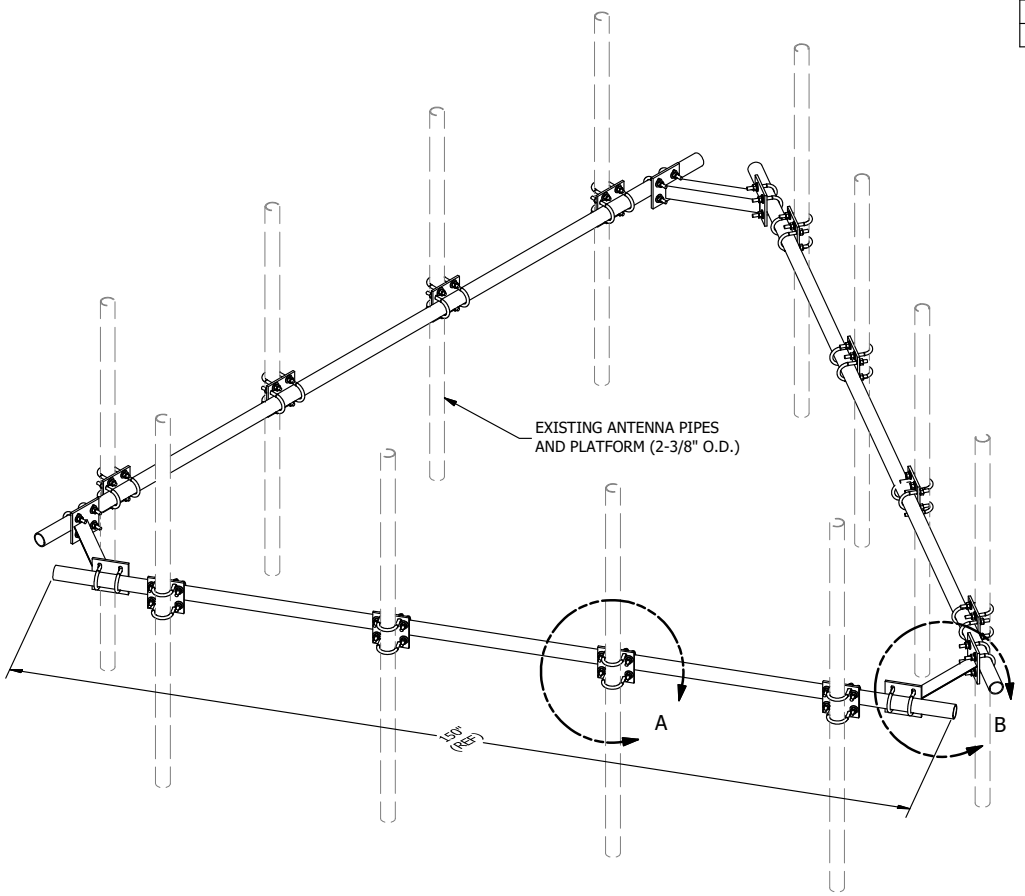
REVISION HISTORY

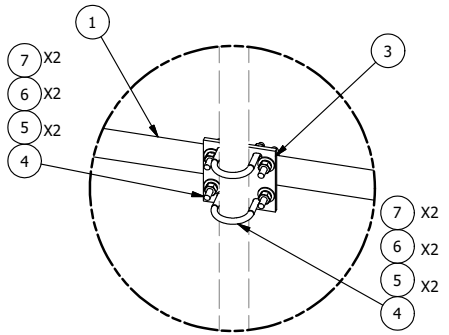
DESCRIPTION
LOW PROFILE CO-LOCATION PLATFORM
FOR 9 ANTENNAS WITH 12' 6" FACE WIDTH
FOR 12" - 38" DIAMETER POLES

SITE PRO 1
A valmont COMPANY
Engineering Support Team:
1-888-753-7446
Locations:
New York, NY
Atlanta, GA
Los Angeles, CA
Plymouth, IN
Salem, OR
Dallas, TX

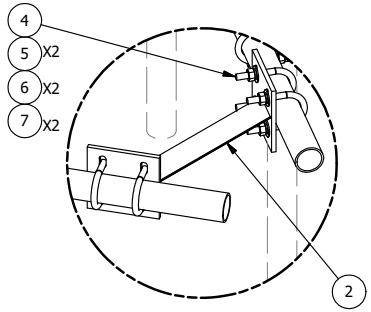
DRAWN BY	CPD NO.	DRAWING USAGE	PART NO.
CEK 1/19/2012	semb	CUSTOMER	SEE ASSEMBLY NO. "A"
ENG. APPROVAL	CHECKED BY	DWG. NO.	
	BMC 1/23/2012	RMQP-3XX	

PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	3	P2150	2-3/8" O.D. X 150" SCH 40 GALVANIZED PIPE	150 in	45.77	137.31
2	3	X-AHCP	ANGLE HANDRAIL CORNER PLATE		12.92	38.76
3	12	SCX1	CROSSOVER PLATE 2-3/8" X 2-3/8"	6 in	3.71	44.50
4	60	X-UB1212	1/2" X 2-1/2" X 4-1/2" X 2" U-BOLT (HDG.)		0.63	37.51
5	120	G12FW	1/2" HDG USS FLATWASHER	3/32 in	0.03	4.09
6	120	G12LW	1/2" HDG LOCKWASHER	1/8 in	0.01	1.67
7	120	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	8.60
					TOTAL WT. #	272.43





DETAIL A



DETAIL B

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
A	REPLACED HCP WITH X-AHCP		CEK	7/10/2014

REVISION HISTORY

TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES *(± 0.030")*
DRILLED AND GAS CUT HOLES *(± 0.030")* - NO CONING OF HOLES
LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

DESCRIPTION: **HANDRAIL KIT FOR 12'-6" FACE**

SITE PRO 1
A valmont COMPANY
Engineering Support Team: 1-888-753-7446
Locations: New York, NY; Atlanta, GA; Los Angeles, CA; Plymouth, IN; Salem, OR; Dallas, TX

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.
	KC8 5/30/2012		HRK12

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	01	CUSTOMER	BMC 7/13/2014	HRK12