



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

May 1, 2019

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

**RE: Notice of Exempt Modification for Sprint DO Macro: 826927**  
**Sprint Site ID: CT23XC384**  
**845 Ethan Allen Highway, Ridgefield, CT 06877**  
**Latitude: 41° 18' 46.86" / Longitude: -73° 28' 20.48"**

Dear Ms. Bachman:

Sprint currently maintains three (3) antennas at the 77-foot level of the existing 100-foot flag pole located at 845 Ethan Allen Highway, Ridgefield, CT. The tower is owned by Crown Castle. The property is owned by 845 Wireless Investments LLC. Sprint now intends to replace three (3) antennas with three (3) new antennas. These antennas would be installed at the 77-foot level of the tower. Sprint also intends to install four (4) RRH's, six (6) diplexers and twelve (12) 7/8" cables.

Original zoning documents were obtain at the Town of Ridgefield Planning & Zoning office on April 30, 2019. On July 11, 2000, the town of Ridgefield Zoning Board of Appeals granted approval for a 100' flagpole with two conditions. First, the Sprint antenna would not be constructed to a height not greater than 100'. Second, there will be no illumination of the flagpole. On May 15, 2001, the Connecticut Siting Council issued a Notice of Intent to Modify an Existing Telecommunication Facility with no conditions. On June 14, 2011, The Planning & Zoning Commission issued Sprint a zoning permit to add antennas and a cabinet to an existing flagpole with no conditions.

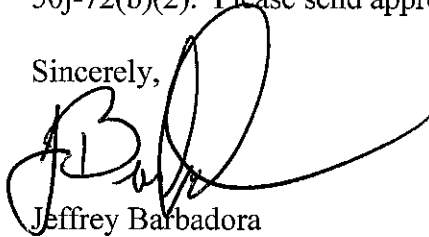
Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.S.C.A. § 16-50j-73, a copy of this letter is being sent to the Town Clerk, Ms. Wendy Gannon Lionetti, The Director of Planning & Zoning Mr. Richard Baldelli, and the land owner, 845 Wireless investments LLC. Crown Castle is the tower owner.

1. The proposed modifications will not result in an increase in the height of the existing tower.
2. The proposed modifications will not require the extension of the site boundary.

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

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

Sincerely,



Jeffrey Barbadora  
Real Estate Specialist  
12 Gill Street, Suite 5800, Woburn, MA 01801  
781-729-0053  
[Jeff.Barbadora@crowncastle.com](mailto:Jeff.Barbadora@crowncastle.com)

Melanie A. Bachman

May 1, 2019

Page 3

Attachments:

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

Tab 2: Exhibit-2: Structural Modification Report

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

cc: Town Clerk,  
Ms. Wendy Gannon Lionetti  
Town of Ridgefield  
400 Main Street  
Ridgefield, CT 06877  
(203)-431-2783

Director of Planning & Zoning  
Mr. Richard Baldelli  
Town of Ridgefield  
400 Main Street  
Ridgefield, CT 06877  
(203)-431-2768

Land owner  
845 Wireless Investments LLC  
107 Lords Highway  
Weston, CT 06883



ZONING BOARD OF APPEALS  
66 Prospect Street  
Ridgefield, CT 06877  
Tel: 203 431-2786  
E-mail: mtzba@ridgefieldct.org

July 11, 2000

Mr. D. W. Brown  
Omnipoint Communications Inc.  
100 Filley Street  
Bloomfield, CT 06002

Dear Mr. Brown,

Appeal No. 00-033 - Petition of Omnipoint Communications, Inc.  
Property Located at 845 Ethan Allen Highway  
Owner of Property: Sierra Co./Amin B. Iebe

In open session of the Board of Appeals on Zoning of Ridgefield, held on July 10, 2000,  
the following action was voted on your petition:

**VOTED:** To Grant, with Conditions, a variance of Section 311.0B3, minimum setback for telecommunications towers and antennae, to allow a telecommunications antenna closer than permitted to the lot lines, for property situated in the B2 zone and located at 845 Ethan Allen Highway.

**VOLE:** To Grant: 5 To Deny: 0

**CONDITIONS:**

This action is subject to the following conditions which are an integral and essential part of the decision. Without these conditions, the variance would not have been granted.

1. The location of the antenna shall be as shown on plans presented to the board during the hearing. It shall be constructed with a height no greater than 100 ft. with the appearance and use as a flagpole, also as shown on plans presented to the board.
2. There shall be no illumination of the flagpole.

The board voted this action for the following reasons:

RECEIVED

JUL 27 2000

Planning & Zoning Commission  
Inland Wetlands Board

1. Telecommunications towers are under the jurisdiction of the Federal Communications Commission, and the Federal Communications Act of 1936 prohibits a community from banning these structures. The 'substantial evidence' presented in this petition is that the flagpole-like antenna will have no impact on the surrounding properties.
2. The flagpole/antenna will meet the setback requirements on three sides, and on the fourth side is the Norwalk River. This is an unusual hardship that justifies the grant of the variance requested, as outlined in Section 8-6 of the Connecticut General Statutes. No purpose is served in requiring a shorter antenna that would meet the setback on that side.
3. The Route 7 corridor area is currently lacking in cell phone coverage, and because of the unique nature of the requirements for coverage, this is the only property available for the antenna. This exacerbates the hardship.
4. With the above conditions, the proposal will not be contrary to the public health, safety, welfare, convenience or property values of the neighborhood. With the appearance of a flagpole, it is in harmony with the general scheme of development in the area.

Magjane Tippet  
 Magjane Tippet  
 Administrator

Charles E. Creamer  
 Charles E. Creamer  
 Chairman

CERTIFIED MAIL

DEFECTIVE: Date filed with Town Clerk

cc: Richard Baldali  
 P&Z Commission

Date Recorded by Town Clerk

July 27, 2000 at 10:00am  
Embree Surpless  
 Town Clerk



**STATE OF CONNECTICUT**  
**CONNECTICUT SITING COUNCIL**

10 Franklin Square  
 New Britain, Connecticut 06051  
 Phone: (860) 827-2935  
 Fax: (860) 827-2950

MAY 17 2001

May 15, 2001

Paul T. Tusch  
 Cacace, Tusch, & Santagata  
 777 Summer Street  
 P.O. Box 15859  
 Stamford, CT 06901-0859

RE: **EM-SPRINT-118-010427** - Sprint Spectrum LP notice of intent to modify an existing telecommunications facility located at 845 Ethan Allen Highway, Ridgefield, Connecticut.

Dear Attorney Tusch:

At a public meeting held on May 10, 2001, the Connecticut Siting Council (Council) acknowledged your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies.

The proposed modifications are to be implemented as specified here and in your notice dated April 26, 2001. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

Thank you for your attention and cooperation.

Very truly yours,

  
 Mortimer A. Gelston  
 Chairman

MAG/RKE/laf

c: Honorable Rudolph P. Marconi, First Selectman, Town of Ridgefield  
 Oswald Inglese, Town Planner, Town of Ridgefield  
 Stephen J. Humes, Esq., LeBoeuf, Lamb, Greene & MacRae



COMMUNITY DEVELOPMENT & ENVIRONMENTAL PROTECTION  
TOWN HALL ANNEX - 66 PROSPECT STREET  
RIDGEFIELD, CONNECTICUT 06877  
(203) 431-2766  
FAX (203) 431-2737

## ZONING PERMIT PLANNING & ZONING COMMISSION

PROPERTY OWNER: SEIMA CO. SPRINT SPECTRUM DBA SPRINT PCS,  
OWNER'S ADDRESS: 845 ETHAN ALLEN HWY  
RIDGEFIELD, CT 06877  
PROPERTY ADDRESS: 845 ETHAN ALLEN HWY  
ZONE: B-2 MAP: TC#2509 LOT: X  
LOT SIZE: 1.817AC LOT FRONTAGE @ 75FT.  
PROJECT DESCRIPTION:

ADD SPRINT PCS ANTENNA CABINETS TO EXIST CELL (FLAGPOLE)

PERMIT VOID IF CONSTRUCTION AUTHORIZED IS NOT COMPLETED WITHIN ONE (1)  
YEAR OF ISSUANCE.

THIS PERMIT IF ISSUED, IS BASED UPON THE PLOT PLAN SUBMITTED. FALSIFICATION  
BY MISREPRESENTATION OR OMISSION, OR FAILURE TO COMPLY WITH THE  
CONDITIONS OF APPROVAL OF THIS PERMIT SHALL CONSTITUTE A VIOLATION OF THE  
RIDGEFIELD ZONING REGULATIONS.

### CONDITIONS OF APPROVAL:

- SURVEYOR TO CERTIFY TOTAL AREA OF ALL UNMANNED EQUIPMENT DOES  
NOT EXCEED 750 SQFT. OF GROSS FLOOR AREA AND IS 12FT. OR LESS IN HEIGHT.

PERMIT NO. 201160 FEE 80.00 (plus \$10 for state surcharge)

DATE ISSUED 06/14/01

  
ZONING ENFORCEMENT OFFICER

CONSTRUCTION MAY NOT PROCEED UNTIL A BUILDING PERMIT HAS BEEN OBTAINED.

THE YELLOW PLACARD PROVIDED MUST BE PROMINENTLY POSTED ON THE  
PREMISES.

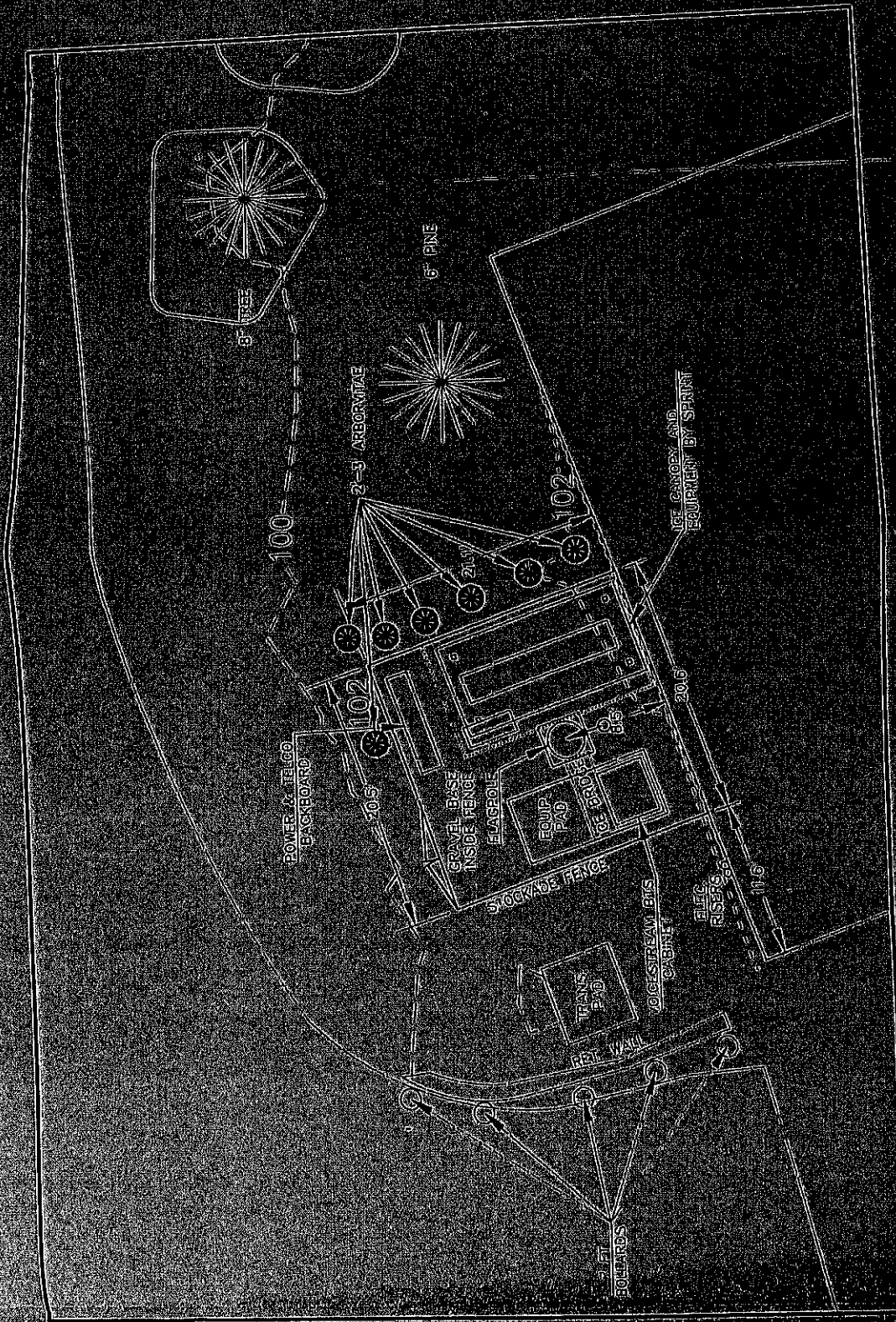
assigns to ensure compliance with Sec. 311.0 D(a) and (b), pertaining to removal of the structure and restoration of the site upon abandonment of its use as a telecommunications facility, said bond shall remain in place until such time as the abandoned facility has been removed and the site restored, may be claimed by default, or may be released in part or in full by the Planning and Zoning Commission; the bond amount may be reviewed and adjusted by the Planning Director at two-year intervals, to accommodate increase or decrease in cost estimates.

\* Note: Amount to be fixed by Planning Director upon receipt of a reliable cost estimate.

**Reasons:** In granting the above Special Permit, the Planning and Zoning Commission wishes to state upon its records that, in the Commission's judgment, the subject project will not exert a detrimental effect on the development of the district nor on the value of the nearby properties. In addition, the records of the Commission will show that the application complies either "de facto" or by variance with all applicable requirements according to Sections 312.0 and 311.0 of the Zoning Regulations. The Commission acknowledges the variance granted by the Zoning Board of Appeals effective 7/27/00.

Draft: 11/16/00  
Revised: 12/5/00  
Adopted: 12/5/00  
Effective: 12/15/00





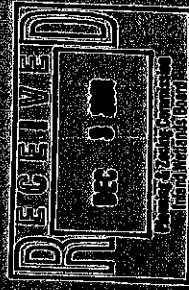
THIS INSERT SHOWS GREATER DETAIL OF THE CELL TOWER.  
 SCALE, 1"=10'

*Comp. by k*  
*AG - built w/ 201001*

- NOTES:
1. THIS MAP WAS PREPARED FROM RECORD RESEARCH, OTHER MAPS, LIMITED FIELD MEASUREMENTS AND OTHER SOURCES. IT IS NOT TO BE CONSTRUED AS A PROPERTY / BOUNDARY OR LIMITED PROPERTY / BOUNDARY SURVEY AND IS SUBJECT TO SUCH FACTS AS SAID SURVEYS MAY DISCLOSE.
  2. WETLANDS WERE FIELD LOCATED AND MET 6' STANDARDS OF ACCURACY. THE BELL TOWER STRUCTURE AND ITS APPURTENANCES WERE FIELD LOCATED TO 1/2" STANDARDS OF ACCURACY.
  3. PROPERTY PRESSENTLY UNDER THE OWNERSHIP OF THE SIEMA COMPANY.
  4. NORTH IS BASED ON THE MAP REFERENCED HEREON.
  5. PROPERTY MAY BE SUBJECT TO UTILITY EASEMENTS AND GRANTS AS PER VOL. 209 PG. 147 OF THE RIDGEBFIELD LAND RECORDS.
  6. AREA OF ENCLOSURE = 4564 SQUARE FEET.
  7. THE PURPOSE OF THIS MAP IS TO DEPICT THE "AS-BUILT" CONDITION OF THE FLAGPOLE AND ITS APPURTENANCES AND FOR THAT PURPOSE ONLY.

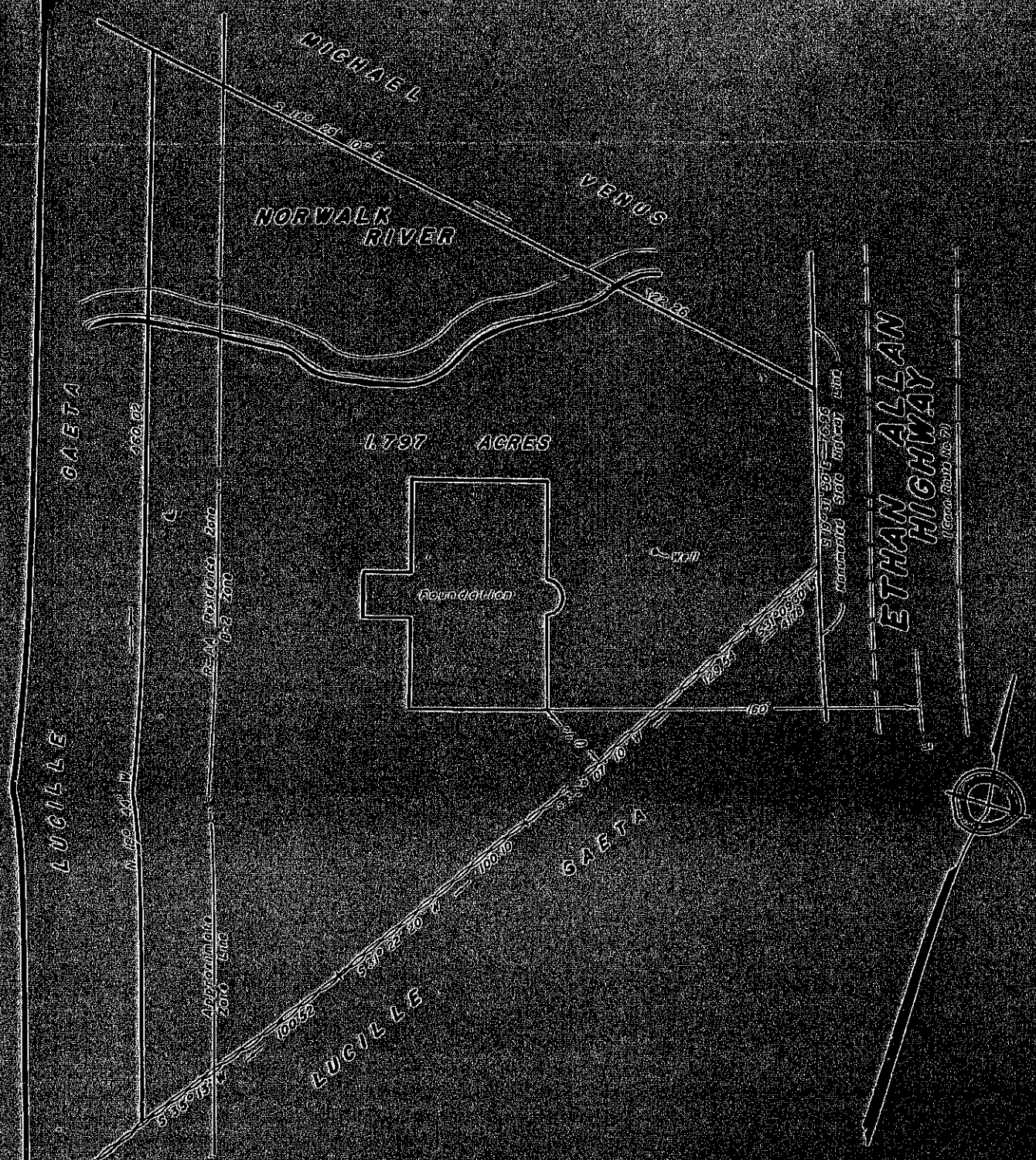
MAP REFERENCE

1. MAP PREPARED FOR ARVA TOOL & DIE COMPANY, RIDGEBFIELD, CONNECTICUT 11-001, DEC. 15, 1974 BY OFFICE OF WOODY & OBIEN MAP 5896



GENERAL LOCATION SURVEY  
 PREPARED FOR  
**VOICESTREAM WIRELESS**  
 STEVE GYIMIZI  
 845 BETHAN ALLEN HIGHWAY  
 RIDGEBFIELD, CONNECTICUT

DESIGN	DRAWING	CHECKED BY
JOB NO. 1227-4		DATE OCT. 30, 2001



**MAP**  
 PREPARED FOR  
**ARMA TOOL & DIE COMPANY**  
 RIDGEFIELD, CONNECTICUT

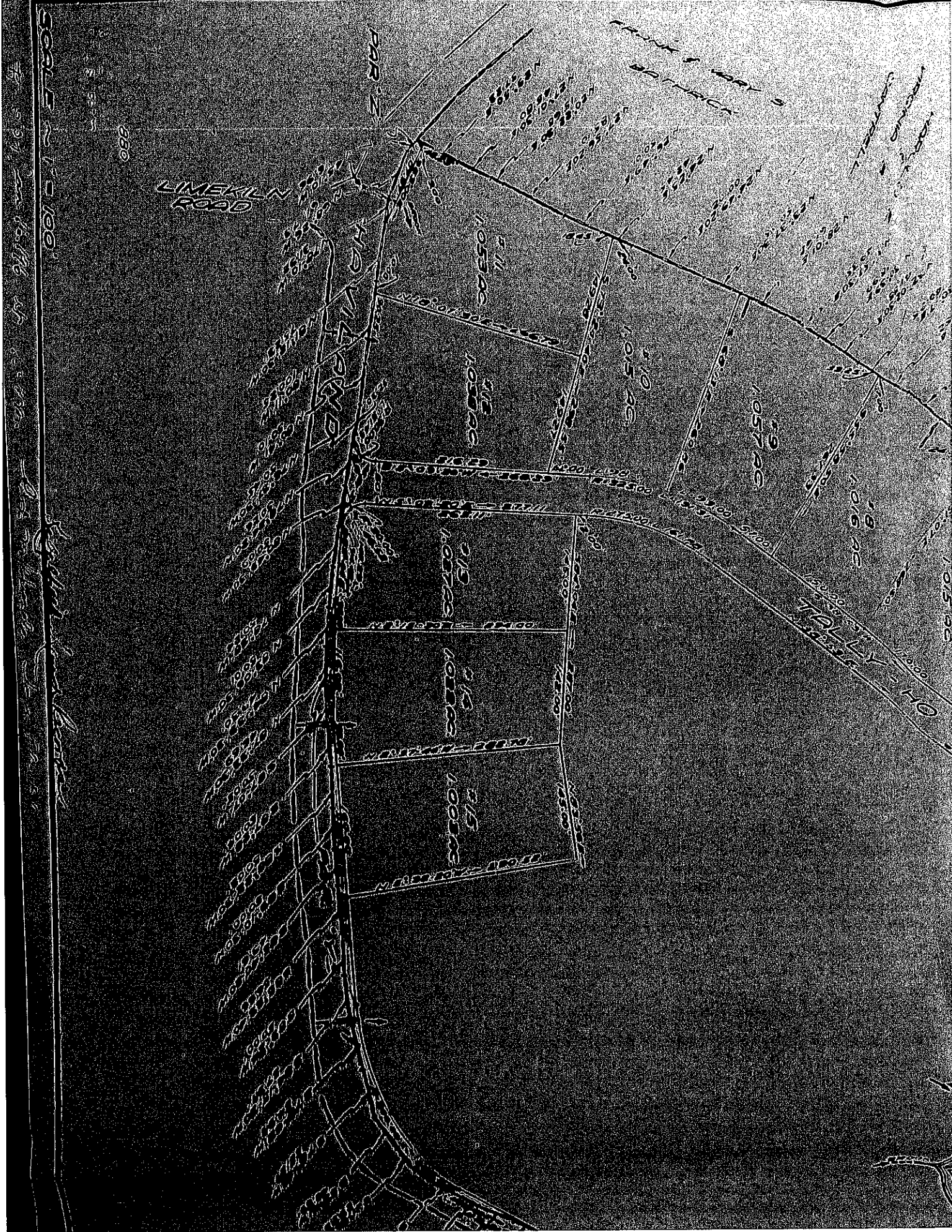
Refer to Diagram entitled "Topographic Map Prepared for Arma Tool & Die Company, Ridgefield, Conn.", made by Robert M. Harbeck, dated Feb. 4, 1974.

Refer to Maps No. 2505 & 1529 on file in the Ridgefield Land Records.



Created & Substantially Corrected  
 Andrew G. Whelan  
 June 15, 1980, File No. 1529  
 Andrew G. Whelan  
 State of Connecticut

SCALE: 1" = 40'



SCALE 1:5000

LIMEKILN ROAD

TALLEY ROAD

1053 AS

1054 AS

1055 AS

1056 AS

1057 AS

1058 AS

1059 AS

1060 AS

1061 AS

1052 AS

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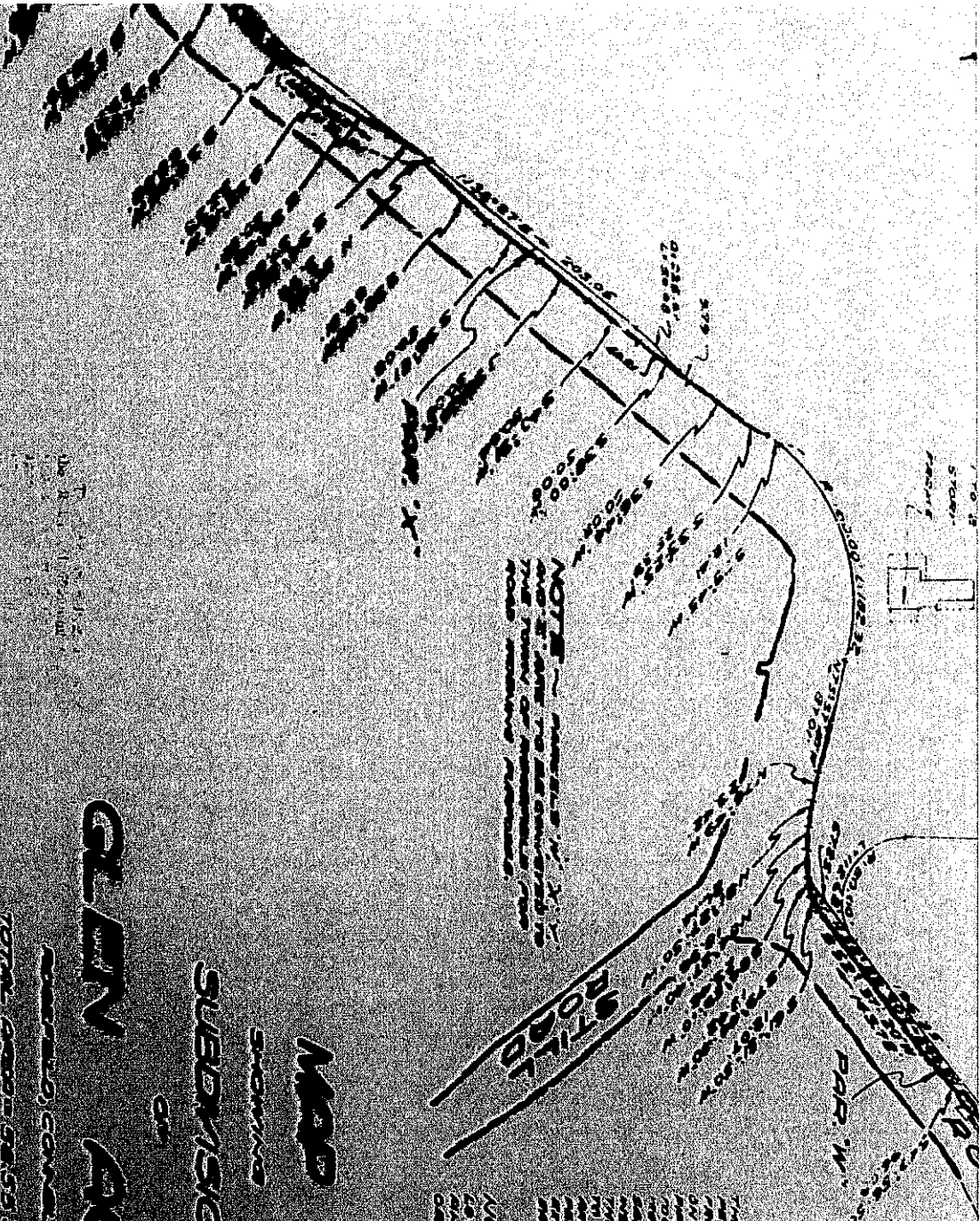
1068 AS

1069 AS

1070 AS

1071 AS

1072 AS



PERMANENT DRAINAGE EASEMENTS

The easements described in this plan are hereby agreed to by the parties hereto, and shall be a part of the final plat of the subdivision. The easements are to be used for the purpose of providing for the drainage of water from the lots shown on this plan to the streets shown on this plan. The easements are to be used for the purpose of providing for the drainage of water from the lots shown on this plan to the streets shown on this plan. The easements are to be used for the purpose of providing for the drainage of water from the lots shown on this plan to the streets shown on this plan.

NOTE: LOT 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.

MAP SHOWING SUBDIVISION OF

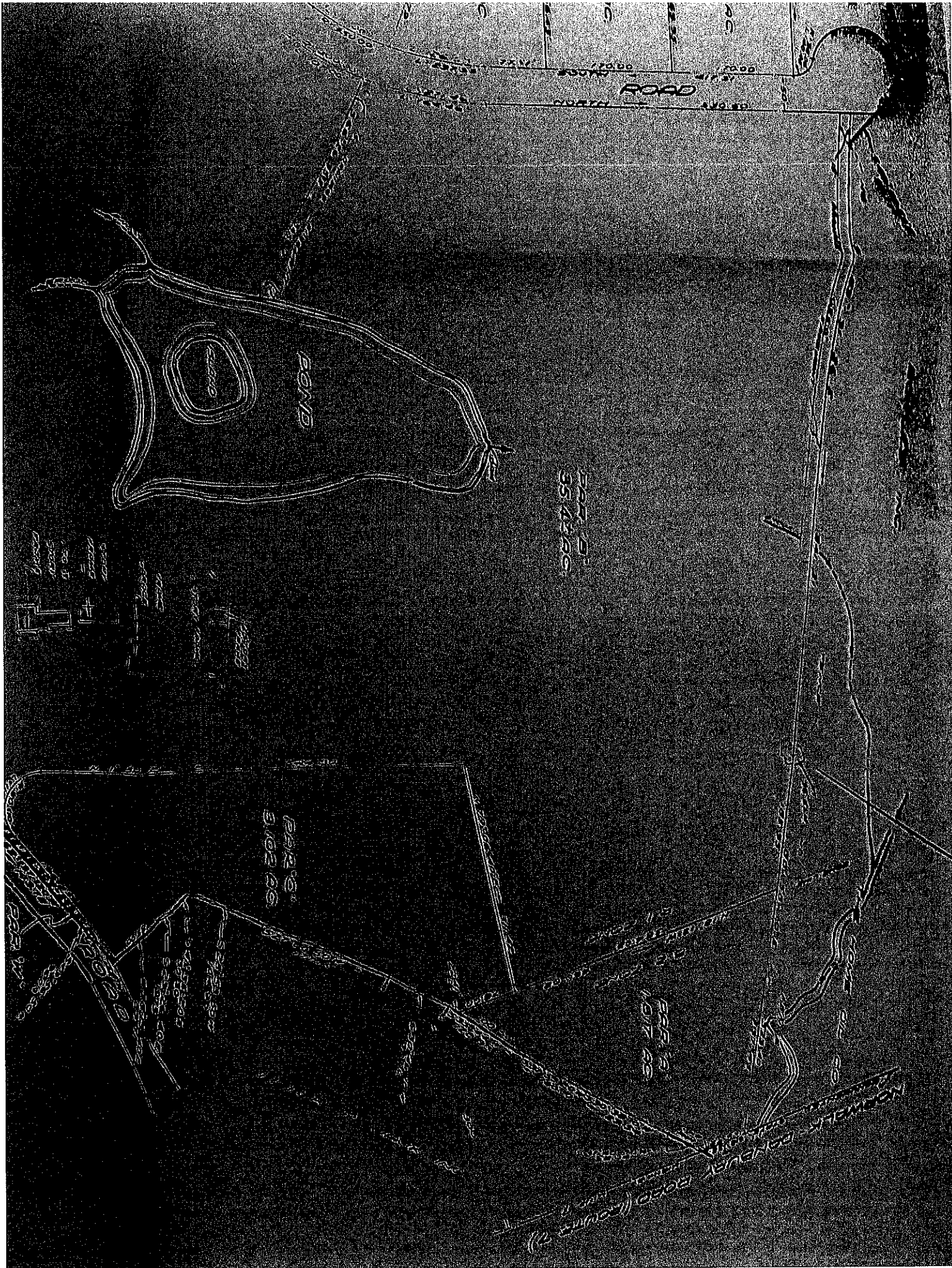
OLMN ACRES

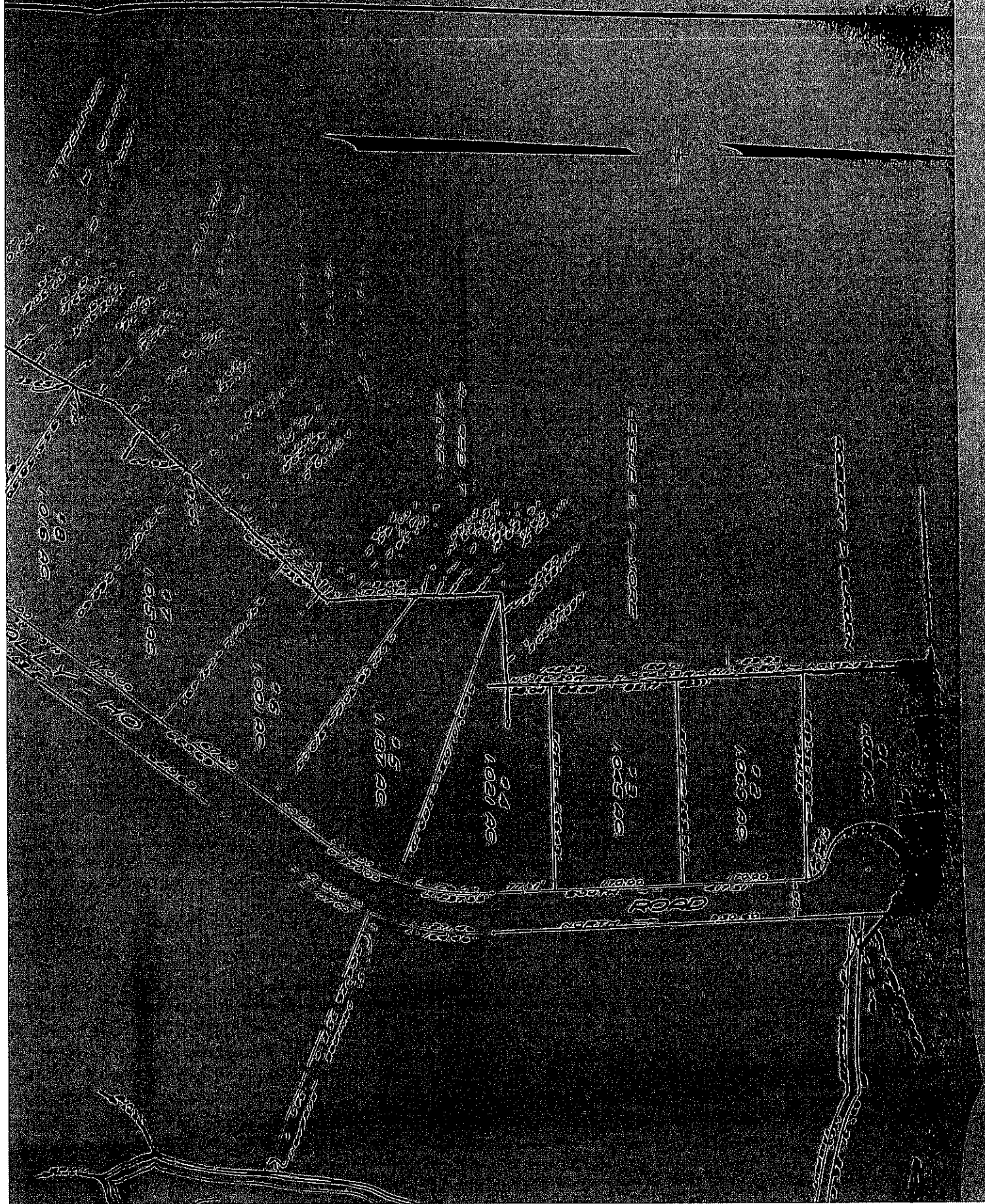
RESERVED, CONVEYED TOTAL AREA: 65.51 ACRES STRIPPED N/A RESIDENCE ZONE

Submitted by **Daniel A. Ryan** (Signature)

RECEIVED [Stamp] PLANNING COMMISSION







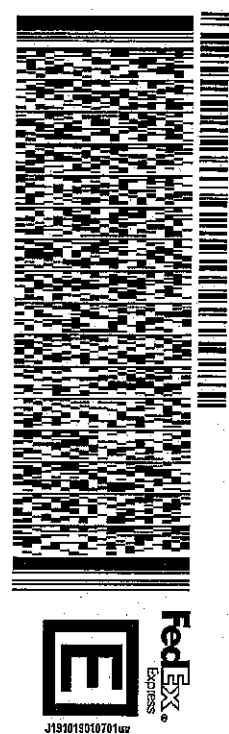
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 JEFF BARBADORA  
 CROWN CASTLE  
 12 GILL STREET  
 SUITE 5880  
 WOBURN, MA 01801  
 UNITED STATES US

SHIP DATE: 01MAY19  
 ACTWGT: 0.50 LB  
 CAD: 10492419/VIN/ET14100  
 BILL SENDER

TO TOWN CLERK  
 TOWN OF RIDGEFIELD  
 400 MAIN STREET

RIDGEFIELD CT 06877  
 (203) 431-2783 REF: 1763 6880  
 INV: DEPT:  
 PO:

565.J1/D66C/23AD



TRK# 7751 1090 7776 THU - 02 MAY 10:30A  
 0201 PRIORITY OVERNIGHT

EG WODA 06877  
 CT-US SWF

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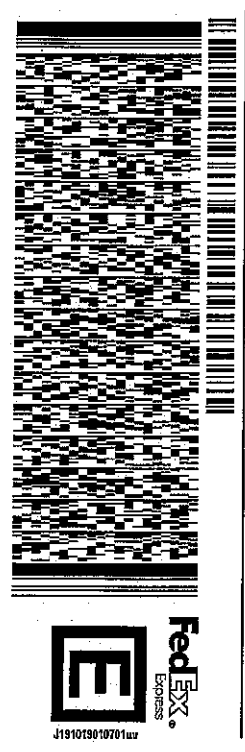


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 JEFF BARBADORA  
 CROWN CASTLE  
 12 GILL STREET  
 SUITE 5800  
 WOBURN, MA 01801  
 UNITED STATES US

SHIP DATE: 01MAY19  
 ACTWGT: 0.50 LB  
 CAD: 104924191/ANET/4100  
 BILL SENDER

TO PLANNING & ZONING MR. BALDELLI  
 TOWN OF RIDGEFIELD  
 400 MAIN STREET

RIDGEFIELD CT 06877  
 (203) 431-2768 REF: 17663880  
 INV. DEPT:



TRK# 7751 1093 0546  
 0201  
 THU - 02 MAY 10:30A  
 PRIORITY OVERNIGHT

EG WODA  
 CT-US SWF 06877

565J1/D66C/23AD

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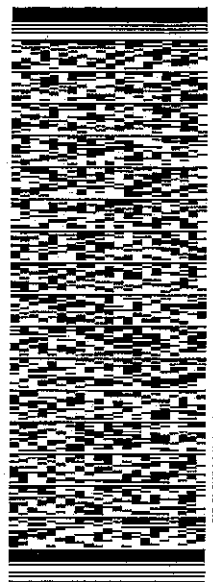
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 JEFF BARBADORA  
 CROWN CASTLE  
 12 GILL STREET  
 SUITE 5800  
 WOBURN, MA 01801  
 UNITED STATES US

SHIP DATE: 01MAY19  
 ACTWGT: 0.50 LB  
 CAD: 10482419/NET4100

BILL SENDER

TO **845 WIRELESS INVESTMENTS LLC**  
**845 WIRELESS INVESTMENTS LLC**  
**107 LORDS HIGHWAY LLC**

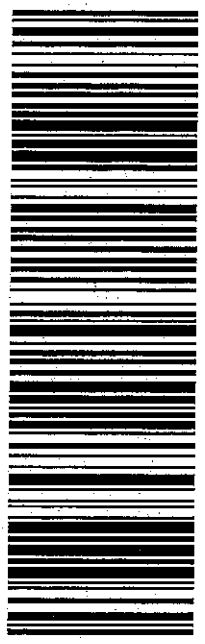
**WESTON CT 06883**  
 (781) 970-0053 REF: 17566990  
 NV: DEPT  
 PO:



565J1/D66C/23AD

TRK# 7751 1098 9490  
 0201  
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 PRIORITY OVERNIGHT  
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**EG DXRA**  
 CT-US  
**06883 SWF**



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Date: February 7, 2019

Andrew Bazinet  
Crown Castle  
3 Corporate Dr., Suite 101  
Clifton Park, NY 12065

Paul J. Ford & Company  
250 E. Broad St., Suite 600  
Columbus, OH 43215  
(614) 221-6679

**Subject:** Structural Modification Report

**Carrier Designation:** Sprint PCS Co-Locate  
**Carrier Site Number:** CT23XC384  
**Carrier Site Name:** N/A

**Crown Castle Designation:** Crown Castle BU Number: 826927 – Structure A  
Crown Castle Site Name: Redding / Rt. 7  
Crown Castle JDE Job Number: 465161  
Crown Castle Work Order Number: 1683879  
Crown Castle Order Number: 410825 Rev. 9

**Engineering Firm Designation:** Paul J. Ford & Company Project Number: 37519-0244.001.7700

**Site Data:** 845 Ethan Allen Highway, Ridgefield, Fairfield County, CT  
Latitude 41° 18' 46.86", Longitude -73° 28' 20.48"  
100 Foot – Monopole Concealment Tower

Dear Andrew Bazinet,

Paul J. Ford & 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:

LC4.5: Proposed Equipment Configuration

**Sufficient Capacity**

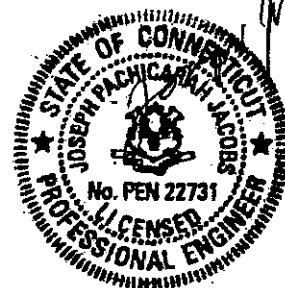
This analysis utilizes an ultimate 3-second gust wind speed of 120 mph as required by the 2018 Connecticut State Building Code per section 1609.3 and Appendix N. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

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:



Michael Timas, EI  
Structural Designer  
mtimas@pauljford.com BKK



MAR 29 2019

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tnxTower Output

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### 8) APPENDIX D

Modification Drawings

**1) INTRODUCTION**

This tower is a 100-ft monopole concealment tower designed by Pirod Manufactures, Inc.

**2) ANALYSIS CRITERIA**

TIA-222 Revision: TIA-222-H  
 Risk Category: II  
 Wind Speed: 120 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)
77.0	77.0	3	commscope	DHHTT65B-3XR	12	7/8
	74.0	8	rfs celwave	FD9R6004/1C-3L		
	73.0	4	rfs celwave	FD9R6004/1C-3L		

**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)
95.0	95.0	3	ericsson	KRY 112 71	6	7/8
		3	rfs celwave	APX18-206517-CT2		
86.0	86.0	3	ericsson	KRY 112 71	6	7/8
		3	rfs celwave	APX18-206517-CT2		
67.0	67.0	3	communication components inc.	DTMABP7819VG12A	6	7/8
		6	kaelus	TBC0020FXVX		
		3	kmw communications	AM-X-CD-16-65-00T-RET		

### 3) ANALYSIS PROCEDURE

**Table 3 - Documents Provided**

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Clarence Welti Associates, INC., 05/01/2000	3493879	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	PiRod, 153438-B, 02/14/2001	3848258	CCISITES
4-TOWER MANUFACTURER DRAWINGS	PiRod, 153438-B, 02/14/2001	5237965	CCISITES

#### 3.1) Analysis Method

tnxTower (version 8.0.4.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

#### 3.2) Assumptions

- 1) Tower and structures were built and maintained in accordance with the manufacturer's specifications.
- 2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
- 3) Based on the assumption that the monopole manufacturer (PiRod) has designed the base/flange plates to adequately develop the full capacity of the unreinforced shaft section using unpublished and/or proprietary methodologies, we are assuming that if our analysis shows that both the existing shaft and the existing anchor rods/bolts are at a usage capacity of 100% or less, then the existing base/flange plate is at a usage capacity of 100% or less and no additional analysis of the flange plate is required.

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

**4) ANALYSIS RESULTS**

**Table 4 - Section Capacity (Summary)**

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	100 - 82	Spine	P6.625x0.403	1	-1.30	260.55	38.9	Pass
L2	82 - 62	Spine	P6.75x0.75	2	-4.25	467.59	77.7	Pass
L3	62 - 30	Base Pole	P24x0.375	3	-8.49	1104.67	26.1	Pass
L4	30 - 0	Base Pole	P24x0.375	4	-12.14	1104.67	47.6	Pass
							Summary	
						Pole (L2)	77.7	Pass
						<b>RATING =</b>	<b>77.7</b>	<b>Pass</b>

**Table 5 - Tower Component Stresses vs. Capacity – LC5**

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0.0	44.3	Pass
1,2	Base Plate	0.0	47.6	Pass
1	Base Foundation – Structural Steel	0.0	56.1	Pass
1	Base Foundation – Soil Interaction	0.0	19.6	Pass
1,2	Base Pole Flange Connection	30.0	40.4	Pass
1,3	Concealment Flange Connection	62.0	Sufficient	Pass
1,2	Concealment Flange Connection	82.0	38.9	Pass

<b>Structure Rating (max from all components) =</b>	<b>77.7%</b>
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Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed. All ratings per TIA-222-H section 15.5.
- 2) See assumption 3.
- 3) Flange adequacy evaluated utilizing commercially available FEA software.

**4.1) Recommendations**

The monopole and its foundation will have sufficient capacity to carry the proposed loading configuration once the proposed modifications are installed.

- Install the proposed modifications per the attached drawings.

**APPENDIX A**  
**TNXTOWER OUTPUT**



## Tower Input Data

The tower is a monopole.

This tower is designed using the TIA-222-H standard.

The following design criteria apply:

- 1) Tower is located in Fairfield County, Connecticut.
- 2) Tower base elevation above sea level: 492.89 ft.
- 3) Basic wind speed of 120.00 mph.
- 4) Risk Category II.
- 5) Exposure Category C.
- 6) Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- 7) Topographic Category: 1.
- 8) Crest Height 0.00 ft.
- 9) Nominal ice thickness of 1.2750 in.
- 10) Ice thickness is considered to increase with height.
- 11) Ice density of 56.00 pcf.
- 12) A wind speed of 50.00 mph is used in combination with ice.
- 13) Temperature drop of 50.00 °F.
- 14) Deflections calculated using a wind speed of 60.00 mph.
- 15) TIA-222-H Annex S.
- 16) A non-linear (P-delta) analysis was used.
- 17) Pressures are calculated at each section.
- 18) Stress ratio used in pole design is 1.05.
- 19) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

## Options

- |  |   |  |
|--|---|--|
| <ul style="list-style-type: none"> <li>Consider Moments - Legs</li> <li>Consider Moments - Horizontals</li> <li>Consider Moments - Diagonals</li> <li>Use Moment Magnification</li> <li>Use Code Stress Ratios</li> <li>√ Use Code Safety Factors - Guys</li> <li>Escalate Ice</li> <li>Always Use Max Kz</li> <li>Use Special Wind Profile</li> <br/> <li>Include Bolts In Member Capacity</li> <br/> <li>Leg Bolts Are At Top Of Section</li> <li>Secondary Horizontal Braces Leg</li> <li>Use Diamond Inner Bracing (4 Sided)</li> <li>SR Members Have Cut Ends</li> <li>SR Members Are Concentric</li> </ul> | <ul style="list-style-type: none"> <li>Distribute Leg Loads As Uniform</li> <li>Assume Legs Pinned</li> <li>√ Assume Rigid Index Plate</li> <li>√ Use Clear Spans For Wind Area</li> <li>Use Clear Spans For KL/r</li> <li>Retension Guys To Initial Tension</li> <li>√ Bypass Mast Stability Checks</li> <li>√ Use Azimuth Dish Coefficients</li> <li>√ Project Wind Area of Appurt.</li> <br/> <li>Autocalc Torque Arm Areas</li> <br/> <li>Add IBC .6D+W Combination</li> <li>Sort Capacity Reports By Component</li> <li>Triangulate Diamond Inner Bracing</li> <li>Treat Feed Line Bundles As Cylinder</li> <li>Ignore KL/ry For 60 Deg. Angle Legs</li> </ul> | <ul style="list-style-type: none"> <li>Use ASCE 10 X-Brace Ly Rules</li> <li>Calculate Redundant Bracing Forces</li> <li>Ignore Redundant Members in FEA</li> <li>SR Leg Bolts Resist Compression</li> <li>All Leg Panels Have Same Allowable</li> <li>Offset Girt At Foundation</li> <li>√ Consider Feed Line Torque</li> <li>Include Angle Block Shear Check</li> <li>Use TIA-222-H Bracing Resist.</li> <li>Exemption</li> <li>Use TIA-222-H Tension Splice</li> <li>Exemption</li> <li style="text-align: center;"><b>Poles</b></li> <li>√ Include Shear-Torsion Interaction</li> <li>Always Use Sub-Critical Flow</li> <li>Use Top Mounted Sockets</li> <li>Pole Without Linear Attachments</li> <li>Pole With Shroud Or No</li> <li>Appurtenances</li> <li>Outside and Inside Corner Radii Are</li> <li>Known</li> </ul> |
|--|---|--|

### Pole Section Geometry

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L1	100.00-82.00	18.00	P6.625x0.403	A53-B-35 (35 ksi)	
L2	82.00-62.00	20.00	P6.75x0.75	A53-B-35 (35 ksi)	
L3	62.00-30.00	32.00	P24x0.375	A53-B-42 (42 ksi)	
L4	30.00-0.00	30.00	P24x0.375	A53-B-42 (42 ksi)	

Tower Elevation ft	Gusset Area (per face) ft <sup>2</sup>	Gusset Thickness in	Gusset Grade	Adjust. Factor A <sub>r</sub>	Adjust. Factor A <sub>r</sub>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 100.00- 82.00				1	0	1			
L2 82.00- 62.00				1	0	1			
L3 62.00- 30.00				1	1	0.95			
L4 30.00-0.00				1	1	0.95			

**Feed Line/Linear Appurtenances - Entered As Area**

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C <sub>A</sub> A <sub>A</sub> ft <sup>2</sup> /ft	Weight plf
LDF5-50A(7/8)	C	No	No	Inside Pole	95.00 - 0.00	6	No Ice	0.00	0.33
							1/2" Ice	0.00	0.33
							1" Ice	0.00	0.33
							2" Ice	0.00	0.33
*****									
LDF5-50A(7/8)	C	No	No	Inside Pole	86.00 - 0.00	6	No Ice	0.00	0.33
							1/2" Ice	0.00	0.33
							1" Ice	0.00	0.33
							2" Ice	0.00	0.33
*****									
LCF78-50JA- A7(7/8)	C	No	No	Inside Pole	77.00 - 0.00	12	No Ice	0.00	0.29
							1/2" Ice	0.00	0.29
							1" Ice	0.00	0.29
							2" Ice	0.00	0.29
*****									
LDF5-50A(7/8)	C	No	No	Inside Pole	67.00 - 0.00	6	No Ice	0.00	0.33
							1/2" Ice	0.00	0.33
							1" Ice	0.00	0.33
							2" Ice	0.00	0.33
*****									
*****									

### Feed Line/Linear Appurtenances Section Areas

Tower Sectio n	Tower Elevation ft	Face	$A_R$ ft <sup>2</sup>	$A_F$ ft <sup>2</sup>	$C_{AA}$ In Face ft <sup>2</sup>	$C_{AA}$ Out Face ft <sup>2</sup>	Weight K
L1	100.00-82.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.03
L2	82.00-62.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.14
L3	62.00-30.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.30
L4	30.00-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.28

### Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Sectio n	Tower Elevation ft	Face or Leg	Ice Thickness in	$A_R$ ft <sup>2</sup>	$A_F$ ft <sup>2</sup>	$C_{AA}$ In Face ft <sup>2</sup>	$C_{AA}$ Out Face ft <sup>2</sup>	Weight K
L1	100.00-82.00	A	1.411	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.03
L2	82.00-62.00	A	1.378	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.14
L3	62.00-30.00	A	1.319	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.30
L4	30.00-0.00	A	1.178	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.28

### Feed Line Center of Pressure

Section	Elevation ft	$CP_x$ in	$CP_z$ in	$CP_x$ Ice in	$CP_z$ Ice in
L1	100.00-82.00	0.0000	0.0000	0.0000	0.0000
L2	82.00-62.00	0.0000	0.0000	0.0000	0.0000
L3	62.00-30.00	0.0000	0.0000	0.0000	0.0000
L4	30.00-0.00	0.0000	0.0000	0.0000	0.0000

Note: For pole sections, center of pressure calculations do not consider feed line shielding.

### User Defined Loads

Description	Elevation	Offset From Centroid	Azimuth Angle	Weight	$F_x$	$F_z$	Wind Force	$C_A A_c$	
	ft	ft	°	K	K	K	K	ft <sup>2</sup>	
Flag (20'x12')	100.00	0.00	0.00	No Ice	0.03	0.00	0.00	0.43	9.41
				Ice	0.78	0.00	0.00	0.08	9.76
				Service	0.03	0.00	0.00	0.11	10.52

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustmen t	Placement  ft	$C_A A_A$ Front	$C_A A_A$ Side	Weight	
			ft ft ft	°		ft <sup>2</sup>	ft <sup>2</sup>	K	
APX18-206517-CT2	A	From Leg	0.50 0.00 0.00	0.00	95.00	No Ice	0.00	0.00	0.02
						1/2" Ice	0.00	0.00	0.05
						Ice	0.00	0.00	0.08
						1" Ice	0.00	0.00	0.16
						2" Ice	0.00	0.00	0.16
APX18-206517-CT2	B	From Leg	0.50 0.00 0.00	0.00	95.00	No Ice	0.00	0.00	0.02
						1/2" Ice	0.00	0.00	0.05
						Ice	0.00	0.00	0.08
						1" Ice	0.00	0.00	0.16
						2" Ice	0.00	0.00	0.16
APX18-206517-CT2	C	From Leg	0.50 0.00 0.00	0.00	95.00	No Ice	0.00	0.00	0.02
						1/2" Ice	0.00	0.00	0.05
						Ice	0.00	0.00	0.08
						1" Ice	0.00	0.00	0.16
						2" Ice	0.00	0.00	0.16
KRY 112 71	A	From Leg	0.50 0.00 0.00	0.00	95.00	No Ice	0.00	0.00	0.01
						1/2" Ice	0.00	0.00	0.02
						Ice	0.00	0.00	0.03
						1" Ice	0.00	0.00	0.04
						2" Ice	0.00	0.00	0.04
KRY 112 71	B	From Leg	0.50 0.00 0.00	0.00	95.00	No Ice	0.00	0.00	0.01
						1/2" Ice	0.00	0.00	0.02
						Ice	0.00	0.00	0.03
						1" Ice	0.00	0.00	0.04
						2" Ice	0.00	0.00	0.04
KRY 112 71	C	From Leg	0.50 0.00 0.00	0.00	95.00	No Ice	0.00	0.00	0.01
						1/2" Ice	0.00	0.00	0.02
						Ice	0.00	0.00	0.03
						1" Ice	0.00	0.00	0.04
						2" Ice	0.00	0.00	0.04
*****									
APX18-206517-CT2	A	From Leg	0.50 0.00 0.00	0.00	86.00	No Ice	0.00	0.00	0.02
						1/2" Ice	0.00	0.00	0.05
						Ice	0.00	0.00	0.08
						1" Ice	0.00	0.00	0.16
						2" Ice	0.00	0.00	0.16
APX18-206517-CT2	B	From Leg	0.50 0.00 0.00	0.00	86.00	No Ice	0.00	0.00	0.02
						1/2" Ice	0.00	0.00	0.05
						Ice	0.00	0.00	0.08
						1" Ice	0.00	0.00	0.16
						2" Ice	0.00	0.00	0.16
APX18-206517-CT2	C	From Leg	0.50 0.00 0.00	0.00	86.00	No Ice	0.00	0.00	0.02
						1/2" Ice	0.00	0.00	0.05
						Ice	0.00	0.00	0.08
						1" Ice	0.00	0.00	0.16
						2" Ice	0.00	0.00	0.16
KRY 112 71	A	From Leg	0.50 0.00 0.00	0.00	86.00	No Ice	0.00	0.00	0.01
						1/2" Ice	0.00	0.00	0.02
						Ice	0.00	0.00	0.03

Description	Face or Leg	Offset Type	Offsets:			Placement ft	C <sub>AA</sub> <sub>Front</sub> ft <sup>2</sup>	C <sub>AA</sub> <sub>Side</sub> ft <sup>2</sup>	Weight K
			Horz Lateral ft	Vert ft	Adjustment ft				
KRY 112 71	B	From Leg	0.50 0.00 0.00	0.00	86.00	1" Ice	0.00	0.00	0.04
						2" Ice	0.00	0.00	0.01
						No Ice	0.00	0.00	0.02
						1/2" Ice	0.00	0.00	0.03
						1" Ice	0.00	0.00	0.04
KRY 112 71	C	From Leg	0.50 0.00 0.00	0.00	86.00	2" Ice	0.00	0.00	0.01
						No Ice	0.00	0.00	0.01
						1/2" Ice	0.00	0.00	0.02
						1" Ice	0.00	0.00	0.03
						1" Ice	0.00	0.00	0.04
*****									
DHHTT65B-3XR	A	From Leg	0.50 0.00 0.00	0.00	77.00	No Ice	0.00	0.00	0.05
						1/2" Ice	0.00	0.00	0.10
						Ice	0.00	0.00	0.15
						1" Ice	0.00	0.00	0.28
DHHTT65B-3XR	B	From Leg	0.50 0.00 0.00	0.00	77.00	2" Ice	0.00	0.00	0.05
						No Ice	0.00	0.00	0.05
						1/2" Ice	0.00	0.00	0.10
						Ice	0.00	0.00	0.15
DHHTT65B-3XR	C	From Leg	0.50 0.00 0.00	0.00	77.00	1" Ice	0.00	0.00	0.28
						2" Ice	0.00	0.00	0.05
						No Ice	0.00	0.00	0.10
						1/2" Ice	0.00	0.00	0.15
(4) FD9R6004/1C-3L	A	From Leg	0.50 0.00 -3.00	0.00	77.00	Ice	0.00	0.00	0.01
						1" Ice	0.00	0.00	0.02
						2" Ice	0.00	0.00	0.00
						No Ice	0.00	0.00	0.00
(4) FD9R6004/1C-3L	B	From Leg	0.50 0.00 -3.00	0.00	77.00	1/2" Ice	0.00	0.00	0.00
						Ice	0.00	0.00	0.01
						1" Ice	0.00	0.00	0.02
						2" Ice	0.00	0.00	0.00
(4) FD9R6004/1C-3L	C	From Leg	0.50 0.00 -4.00	0.00	77.00	No Ice	0.00	0.00	0.00
						1/2" Ice	0.00	0.00	0.00
						Ice	0.00	0.00	0.01
						1" Ice	0.00	0.00	0.02
*****									
AM-X-CD-16-65-00T-RET	A	From Leg	0.50 0.00 0.00	0.00	67.00	No Ice	0.00	0.00	0.05
						1/2" Ice	0.00	0.00	0.09
						Ice	0.00	0.00	0.15
						1" Ice	0.00	0.00	0.27
AM-X-CD-16-65-00T-RET	B	From Leg	0.50 0.00 0.00	0.00	67.00	2" Ice	0.00	0.00	0.05
						No Ice	0.00	0.00	0.05
						1/2" Ice	0.00	0.00	0.09
						Ice	0.00	0.00	0.15
AM-X-CD-16-65-00T-RET	C	From Leg	0.50 0.00 0.00	0.00	67.00	1" Ice	0.00	0.00	0.27
						2" Ice	0.00	0.00	0.05
						No Ice	0.00	0.00	0.09
						1/2" Ice	0.00	0.00	0.15
DTMABP7819VG12A	A	From Leg	0.50 0.00 0.00	0.00	67.00	Ice	0.00	0.00	0.04
						1" Ice	0.00	0.00	0.06
						2" Ice	0.00	0.00	0.02
						No Ice	0.00	0.00	0.02
DTMABP7819VG12A	B	From Leg	0.50	0.00	67.00	No Ice	0.00	0.00	0.02

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>A</sub> A <sub>A</sub> Front	C <sub>A</sub> A <sub>A</sub> Side	Weight
			Horz Lateral	Vert					
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K
			0.00			1/2"	0.00	0.00	0.03
			0.00			Ice	0.00	0.00	0.04
						1" Ice	0.00	0.00	0.06
						2" Ice			
DTMABP7819VG12A	C	From Leg	0.50	0.00	67.00	No Ice	0.00	0.00	0.02
			0.00			1/2"	0.00	0.00	0.03
			0.00			Ice	0.00	0.00	0.04
						1" Ice	0.00	0.00	0.06
						2" Ice			
(2) TBC0020FXVX	A	From Leg	0.50	0.00	67.00	No Ice	0.00	0.00	0.01
			0.00			1/2"	0.00	0.00	0.02
			0.00			Ice	0.00	0.00	0.03
						1" Ice	0.00	0.00	0.05
						2" Ice			
(2) TBC0020FXVX	B	From Leg	0.50	0.00	67.00	No Ice	0.00	0.00	0.01
			0.00			1/2"	0.00	0.00	0.02
			0.00			Ice	0.00	0.00	0.03
						1" Ice	0.00	0.00	0.05
						2" Ice			
(2) TBC0020FXVX	C	From Leg	0.50	0.00	67.00	No Ice	0.00	0.00	0.01
			0.00			1/2"	0.00	0.00	0.02
			0.00			Ice	0.00	0.00	0.03
						1" Ice	0.00	0.00	0.05
						2" Ice			
*****									
Canister Load1	C	None		0.00	100.00	No Ice	4.05	4.05	0.06
						1/2"	4.22	4.22	0.12
						Ice	4.39	4.39	0.19
						1" Ice	4.72	4.72	0.34
						2" Ice			
Canister Load2	C	None		0.00	91.00	No Ice	8.10	8.10	0.38
						1/2"	8.44	8.44	0.51
						Ice	8.78	8.78	0.65
						1" Ice	9.45	9.45	0.95
						2" Ice			
Canister Load3	C	None		0.00	82.00	No Ice	11.18	11.18	0.42
						1/2"	11.53	11.53	0.61
						Ice	11.89	11.89	0.80
						1" Ice	12.60	12.60	1.20
						2" Ice			
Canister Load4	C	None		0.00	72.00	No Ice	14.25	14.25	0.46
						1/2"	14.63	14.63	0.70
						Ice	15.00	15.00	0.94
						1" Ice	15.75	15.75	1.44
						2" Ice			
Canister Load5	C	None		0.00	62.00	No Ice	7.13	7.13	0.36
						1/2"	7.31	7.31	0.48
						Ice	7.50	7.50	0.60
						1" Ice	7.88	7.88	0.85
						2" Ice			
Truck Ball	C	None		0.00	100.75	No Ice	0.88	0.88	0.00
						1/2"	1.38	1.38	0.00
						Ice	1.87	1.87	0.00
						1" Ice	2.86	2.86	0.00
						2" Ice			
*****									
*****									

### Tower Pressures - No Ice

$G_H = 1.100$

Section Elevation ft	z ft	$K_z$	$q_z$ psf	$A_G$ ft <sup>2</sup>	F a c e	$A_F$ ft <sup>2</sup>	$A_R$ ft <sup>2</sup>	$A_{leg}$ ft <sup>2</sup>	Leg %	$C_A A_A$ In Face ft <sup>2</sup>	$C_A A_A$ Out Face ft <sup>2</sup>
L1 100.00-82.00	91.00	1.241	41	9.938	A	0.000	0.000	0.000	0.00	0.000	0.000
					B	0.000	0.000	0.00	0.000	0.000	
					C	0.000	0.000	0.00	0.000	0.000	
L2 82.00-62.00	72.00	1.181	39	11.250	A	0.000	0.000	0.000	0.00	0.000	0.000
					B	0.000	0.000	0.00	0.000	0.000	
					C	0.000	0.000	0.00	0.000	0.000	
L3 62.00-30.00	46.30	1.076	33	64.000	A	0.000	64.000	64.000	100.00	0.000	0.000
					B	0.000	64.000	100.00	0.000	0.000	
					C	0.000	64.000	100.00	0.000	0.000	
L4 30.00-0.00	15.00	0.85	26	60.000	A	0.000	60.000	60.000	100.00	0.000	0.000
					B	0.000	60.000	100.00	0.000	0.000	
					C	0.000	60.000	100.00	0.000	0.000	

### Tower Pressure - With Ice

$G_H = 1.100$

Section Elevation ft	z ft	$K_z$	$q_z$ psf	$t_z$ in	$A_G$ ft <sup>2</sup>	F a c e	$A_F$ ft <sup>2</sup>	$A_R$ ft <sup>2</sup>	$A_{leg}$ ft <sup>2</sup>	Leg %	$C_A A_A$ In Face ft <sup>2</sup>	$C_A A_A$ Out Face ft <sup>2</sup>
L1 100.00-82.00	91.00	1.241	7	1.4111	14.171	A	0.000	0.000	0.000	0.00	0.000	0.000
						B	0.000	0.000	0.00	0.000	0.000	
						C	0.000	0.000	0.00	0.000	0.000	
L2 82.00-62.00	72.00	1.181	7	1.3785	15.845	A	0.000	0.000	0.000	0.00	0.000	0.000
						B	0.000	0.000	0.00	0.000	0.000	
						C	0.000	0.000	0.00	0.000	0.000	
L3 62.00-30.00	46.30	1.076	6	1.3189	71.034	A	0.000	71.034	71.034	100.00	0.000	0.000
						B	0.000	71.034	100.00	0.000	0.000	
						C	0.000	71.034	100.00	0.000	0.000	
L4 30.00-0.00	15.00	0.85	5	1.1783	65.892	A	0.000	65.892	65.892	100.00	0.000	0.000
						B	0.000	65.892	100.00	0.000	0.000	
						C	0.000	65.892	100.00	0.000	0.000	

### Tower Pressure - Service

$G_H = 1.100$

Section Elevation ft	z ft	$K_z$	$q_z$ psf	$A_G$ ft <sup>2</sup>	F a c e	$A_F$ ft <sup>2</sup>	$A_R$ ft <sup>2</sup>	$A_{leg}$ ft <sup>2</sup>	Leg %	$C_A A_A$ In Face ft <sup>2</sup>	$C_A A_A$ Out Face ft <sup>2</sup>
L1 100.00-82.00	91.00	1.241	10	9.938	A	0.000	0.000	0.000	0.00	0.000	0.000
					B	0.000	0.000	0.00	0.000	0.000	
					C	0.000	0.000	0.00	0.000	0.000	
L2 82.00-62.00	72.00	1.181	9	11.250	A	0.000	0.000	0.000	0.00	0.000	0.000
					B	0.000	0.000	0.00	0.000	0.000	
					C	0.000	0.000	0.00	0.000	0.000	
L3 62.00-30.00	46.30	1.076	8	64.000	A	0.000	64.000	64.000	100.00	0.000	0.000
					B	0.000	64.000	100.00	0.000	0.000	
					C	0.000	64.000	100.00	0.000	0.000	
L4 30.00-0.00	15.00	0.85	6	60.000	A	0.000	60.000	60.000	100.00	0.000	0.000
					B	0.000	60.000	100.00	0.000	0.000	
					C	0.000	60.000	100.00	0.000	0.000	



## Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

### Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	100 - 82	Pole	Max Tension	8	0.00	0.00	0.00
			Max. Compression	26	-3.70	0.00	0.00
			Max. Mx	8	-1.30	-16.54	0.00
			Max. My	2	-1.30	0.00	16.54
			Max. Vy	8	1.15	-16.54	0.00
			Max. Vx	2	-1.15	0.00	16.54
L2	82 - 62	Pole	Max. Torque	5			-0.00
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-9.32	-0.00	0.00
			Max. Mx	8	-4.25	-57.37	0.00
			Max. My	2	-4.25	0.00	57.37
			Max. Vy	8	2.40	-36.14	0.00
L3	62 - 30	Pole	Max. Vx	2	-2.40	0.00	36.14
			Max. Torque	11			-0.00
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-15.21	-0.00	0.00
			Max. Mx	8	-8.49	-165.86	0.00
			Max. My	2	-8.49	0.00	165.86
L4	30 - 0	Pole	Max. Vy	8	4.12	-165.86	0.00
			Max. Vx	2	-4.12	0.00	165.86
			Max. Torque	11			-0.00
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-19.88	-0.00	-0.00
			Max. Mx	8	-12.14	-304.25	0.00
			Max. My	2	-12.14	0.00	304.25
			Max. Vy	8	5.07	-304.25	0.00
			Max. Vx	2	-5.07	0.00	304.25
			Max. Torque	7			0.00

### Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	19.88	-0.00	-0.00
	Max. H <sub>x</sub>	20	12.15	5.07	0.00
	Max. H <sub>z</sub>	2	12.15	0.00	5.07
	Max. M <sub>x</sub>	2	304.25	0.00	5.07
	Max. M <sub>z</sub>	8	304.25	-5.07	0.00
	Max. Torsion	7	0.00	-4.39	2.53
	Min. Vert	3	9.11	0.00	5.07
	Min. H <sub>x</sub>	8	12.15	-5.07	0.00
	Min. H <sub>z</sub>	14	12.15	0.00	-5.07
	Min. M <sub>x</sub>	14	-304.25	0.00	-5.07
	Min. M <sub>z</sub>	20	-304.25	5.07	0.00
	Min. Torsion	11	-0.00	-4.39	-2.53

### Tower Mast Reaction Summary

Load Combination	Vertica l  K	Shear <sub>x</sub>  K	Shear <sub>z</sub>  K	Overturing Moment, M <sub>x</sub> kip-ft	Overturing Moment, M <sub>z</sub> kip-ft	Torque  kip-ft
Dead Only	10.12	0.00	0.00	0.00	0.00	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	12.15	0.00	-5.07	-304.25	0.00	0.00
0.9 Dead+1.0 Wind 0 deg - No Ice	9.11	0.00	-5.07	-301.06	0.00	0.00
1.2 Dead+1.0 Wind 30 deg - No Ice	12.15	2.53	-4.39	-263.54	-152.16	0.00
0.9 Dead+1.0 Wind 30 deg - No Ice	9.11	2.53	-4.39	-260.77	-150.56	0.00
1.2 Dead+1.0 Wind 60 deg - No Ice	12.15	4.39	-2.53	-152.16	-263.54	-0.00
0.9 Dead+1.0 Wind 60 deg - No Ice	9.11	4.39	-2.53	-150.56	-260.77	-0.00
1.2 Dead+1.0 Wind 90 deg - No Ice	12.15	5.07	0.00	0.00	-304.25	0.00
0.9 Dead+1.0 Wind 90 deg - No Ice	9.11	5.07	0.00	0.00	-301.06	0.00
1.2 Dead+1.0 Wind 120 deg - No Ice	12.15	4.39	2.53	152.16	-263.54	0.00
0.9 Dead+1.0 Wind 120 deg - No Ice	9.11	4.39	2.53	150.56	-260.77	0.00
1.2 Dead+1.0 Wind 150 deg - No Ice	12.15	2.53	4.39	263.54	-152.16	-0.00
0.9 Dead+1.0 Wind 150 deg - No Ice	9.11	2.53	4.39	260.77	-150.56	-0.00
1.2 Dead+1.0 Wind 180 deg - No Ice	12.15	0.00	5.07	304.25	0.00	0.00
0.9 Dead+1.0 Wind 180 deg - No Ice	9.11	0.00	5.07	301.06	0.00	0.00
1.2 Dead+1.0 Wind 210 deg - No Ice	12.15	-2.53	4.39	263.54	152.16	0.00
0.9 Dead+1.0 Wind 210 deg - No Ice	9.11	-2.53	4.39	260.77	150.56	0.00
1.2 Dead+1.0 Wind 240 deg - No Ice	12.15	-4.39	2.53	152.16	263.54	-0.00
0.9 Dead+1.0 Wind 240 deg - No Ice	9.11	-4.39	2.53	150.56	260.77	-0.00
1.2 Dead+1.0 Wind 270 deg - No Ice	12.15	-5.07	0.00	0.00	304.25	0.00
0.9 Dead+1.0 Wind 270 deg - No Ice	9.11	-5.07	0.00	0.00	301.06	0.00
1.2 Dead+1.0 Wind 300 deg - No Ice	12.15	-4.39	-2.53	-152.16	263.54	0.00
0.9 Dead+1.0 Wind 300 deg - No Ice	9.11	-4.39	-2.53	-150.56	260.77	0.00
1.2 Dead+1.0 Wind 330 deg - No Ice	12.15	-2.53	-4.39	-263.54	152.16	-0.00
0.9 Dead+1.0 Wind 330 deg - No Ice	9.11	-2.53	-4.39	-260.77	150.56	-0.00
1.2 Dead+1.0 Ice+1.0 Temp	19.88	0.00	0.00	0.00	-0.00	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	19.88	-0.00	-1.47	-79.43	0.00	0.00
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	19.88	0.74	-1.27	-68.79	-39.71	0.00
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	19.88	1.27	-0.74	-39.71	-68.79	-0.00
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	19.88	1.47	0.00	0.00	-79.43	-0.00
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	19.88	1.27	0.74	39.71	-68.79	-0.00
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	19.88	0.74	1.27	68.79	-39.71	-0.00
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	19.88	-0.00	1.47	79.43	0.00	-0.00
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	19.88	-0.74	1.27	68.79	39.71	-0.00
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	19.88	-1.27	0.74	39.71	68.79	-0.00
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	19.88	-1.47	0.00	0.00	79.43	0.00
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	19.88	-1.27	-0.74	-39.71	68.79	0.00
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	19.88	-0.74	-1.27	-68.79	39.71	0.00
Dead+Wind 0 deg - Service	10.12	0.00	-1.15	-69.36	0.00	0.00
Dead+Wind 30 deg - Service	10.12	0.58	-1.00	-60.07	-34.68	0.00
Dead+Wind 60 deg - Service	10.12	1.00	-0.58	-34.68	-60.07	-0.00
Dead+Wind 90 deg - Service	10.12	1.15	0.00	0.00	-69.36	0.00
Dead+Wind 120 deg - Service	10.12	1.00	0.58	34.68	-60.07	0.00
Dead+Wind 150 deg - Service	10.12	0.58	1.00	60.07	-34.68	-0.00
Dead+Wind 180 deg - Service	10.12	0.00	1.15	69.36	0.00	0.00
Dead+Wind 210 deg - Service	10.12	-0.58	1.00	60.07	34.68	0.00
Dead+Wind 240 deg - Service	10.12	-1.00	0.58	34.68	60.07	-0.00
Dead+Wind 270 deg - Service	10.12	-1.15	0.00	0.00	69.36	0.00
Dead+Wind 300 deg - Service	10.12	-1.00	-0.58	-34.68	60.07	0.00
Dead+Wind 330 deg - Service	10.12	-0.58	-1.00	-60.07	34.68	-0.00

## Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-10.12	0.00	0.00	10.12	0.00	0.000%
2	0.00	-12.15	-5.07	0.00	12.15	5.07	0.009%
3	0.00	-9.11	-5.07	0.00	9.11	5.07	0.012%
4	2.53	-12.15	-4.39	-2.53	12.15	4.39	0.004%
5	2.53	-9.11	-4.39	-2.53	9.11	4.39	0.005%
6	4.39	-12.15	-2.53	-4.39	12.15	2.53	0.004%
7	4.39	-9.11	-2.53	-4.39	9.11	2.53	0.005%
8	5.07	-12.15	0.00	-5.07	12.15	0.00	0.009%
9	5.07	-9.11	0.00	-5.07	9.11	0.00	0.012%
10	4.39	-12.15	2.53	-4.39	12.15	-2.53	0.004%
11	4.39	-9.11	2.53	-4.39	9.11	-2.53	0.005%
12	2.53	-12.15	4.39	-2.53	12.15	-4.39	0.004%
13	2.53	-9.11	4.39	-2.53	9.11	-4.39	0.005%
14	0.00	-12.15	5.07	0.00	12.15	-5.07	0.009%
15	0.00	-9.11	5.07	0.00	9.11	-5.07	0.012%
16	-2.53	-12.15	4.39	2.53	12.15	-4.39	0.004%
17	-2.53	-9.11	4.39	2.53	9.11	-4.39	0.005%
18	-4.39	-12.15	2.53	4.39	12.15	-2.53	0.004%
19	-4.39	-9.11	2.53	4.39	9.11	-2.53	0.005%
20	-5.07	-12.15	0.00	5.07	12.15	0.00	0.009%
21	-5.07	-9.11	0.00	5.07	9.11	0.00	0.012%
22	-4.39	-12.15	-2.53	4.39	12.15	2.53	0.004%
23	-4.39	-9.11	-2.53	4.39	9.11	2.53	0.005%
24	-2.53	-12.15	-4.39	2.53	12.15	4.39	0.004%
25	-2.53	-9.11	-4.39	2.53	9.11	4.39	0.005%
26	0.00	-19.88	0.00	-0.00	19.88	-0.00	0.005%
27	0.00	-19.88	-1.47	0.00	19.88	1.47	0.002%
28	0.74	-19.88	-1.27	-0.74	19.88	1.27	0.002%
29	1.27	-19.88	-0.74	-1.27	19.88	0.74	0.002%
30	1.47	-19.88	0.00	-1.47	19.88	-0.00	0.002%
31	1.27	-19.88	0.74	-1.27	19.88	-0.74	0.002%
32	0.74	-19.88	1.27	-0.74	19.88	-1.27	0.002%
33	0.00	-19.88	1.47	0.00	19.88	-1.47	0.002%
34	-0.74	-19.88	1.27	0.74	19.88	-1.27	0.002%
35	-1.27	-19.88	0.74	1.27	19.88	-0.74	0.002%
36	-1.47	-19.88	0.00	1.47	19.88	-0.00	0.002%
37	-1.27	-19.88	-0.74	1.27	19.88	0.74	0.002%
38	-0.74	-19.88	-1.27	0.74	19.88	1.27	0.002%
39	0.00	-10.12	-1.15	0.00	10.12	1.15	0.005%
40	0.58	-10.12	-1.00	-0.58	10.12	1.00	0.005%
41	1.00	-10.12	-0.58	-1.00	10.12	0.58	0.005%
42	1.15	-10.12	0.00	-1.15	10.12	0.00	0.005%
43	1.00	-10.12	0.58	-1.00	10.12	-0.58	0.005%
44	0.58	-10.12	1.00	-0.58	10.12	-1.00	0.005%
45	0.00	-10.12	1.15	0.00	10.12	-1.15	0.005%
46	-0.58	-10.12	1.00	0.58	10.12	-1.00	0.005%
47	-1.00	-10.12	0.58	1.00	10.12	-0.58	0.005%
48	-1.15	-10.12	0.00	1.15	10.12	0.00	0.005%
49	-1.00	-10.12	-0.58	1.00	10.12	0.58	0.005%
50	-0.58	-10.12	-1.00	0.58	10.12	1.00	0.005%

### Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	22	0.00013202	0.00006520
3	Yes	21	0.00013275	0.00008213
4	Yes	24	0.00006130	0.00010809
5	Yes	23	0.00006098	0.00012941
6	Yes	24	0.00006130	0.00010809
7	Yes	23	0.00006098	0.00012941
8	Yes	22	0.00013202	0.00006520
9	Yes	21	0.00013275	0.00008213
10	Yes	24	0.00006130	0.00010809
11	Yes	23	0.00006098	0.00012941
12	Yes	24	0.00006130	0.00010809
13	Yes	23	0.00006098	0.00012941
14	Yes	22	0.00013202	0.00006520
15	Yes	21	0.00013275	0.00008213
16	Yes	24	0.00006130	0.00010809
17	Yes	23	0.00006098	0.00012941
18	Yes	24	0.00006130	0.00010809
19	Yes	23	0.00006098	0.00012941
20	Yes	22	0.00013202	0.00006520
21	Yes	21	0.00013275	0.00008213
22	Yes	24	0.00006130	0.00010809
23	Yes	23	0.00006098	0.00012941
24	Yes	24	0.00006130	0.00010809
25	Yes	23	0.00006098	0.00012941
26	Yes	6	0.00000001	0.00004186
27	Yes	25	0.00000001	0.00001854
28	Yes	25	0.00000001	0.00000931
29	Yes	25	0.00000001	0.00000931
30	Yes	25	0.00000001	0.00002850
31	Yes	25	0.00000001	0.00000931
32	Yes	25	0.00000001	0.00000931
33	Yes	25	0.00000001	0.00001854
34	Yes	25	0.00000001	0.00000930
35	Yes	25	0.00000001	0.00000930
36	Yes	25	0.00000001	0.00002850
37	Yes	25	0.00000001	0.00000930
38	Yes	25	0.00000001	0.00000930
39	Yes	20	0.00000001	0.00003409
40	Yes	20	0.00000001	0.00003176
41	Yes	20	0.00000001	0.00003176
42	Yes	20	0.00000001	0.00003409
43	Yes	20	0.00000001	0.00003176
44	Yes	20	0.00000001	0.00003176
45	Yes	20	0.00000001	0.00003409
46	Yes	20	0.00000001	0.00003176
47	Yes	20	0.00000001	0.00003176
48	Yes	20	0.00000001	0.00003409
49	Yes	20	0.00000001	0.00003176
50	Yes	20	0.00000001	0.00003176

### Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	100 - 82	10.81	42	1.32	0.00
L2	82 - 62	6.11	42	1.08	0.00
L3	62 - 30	2.83	42	0.35	0.00
L4	30 - 0	0.81	42	0.23	0.00

### Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
100.75	Truck Ball	42	10.81	1.32	0.00	6716
100.00	Canister Load1	42	10.81	1.32	0.00	6716
95.00	APX18-206517-CT2	42	9.41	1.29	0.00	6716
91.00	Canister Load2	42	8.33	1.25	0.00	3731
86.00	APX18-206517-CT2	42	7.05	1.18	0.00	2400
82.00	Canister Load3	42	6.11	1.08	0.00	1983
77.00	DHHTT65B-3XR	42	5.08	0.91	0.00	2023
72.00	Canister Load4	42	4.20	0.71	0.00	2211
67.00	AM-X-CD-16-65-00T-RET	42	3.45	0.51	0.00	2438
62.00	Canister Load5	42	2.83	0.35	0.00	2725

### Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	100 - 82	46.52	8	5.61	0.00
L2	82 - 62	26.53	2	4.64	0.00
L3	62 - 30	12.36	6	1.53	0.00
L4	30 - 0	3.53	6	1.02	0.00

### Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
100.75	Truck Ball	8	46.52	5.61	0.00	1638
100.00	Canister Load1	8	46.52	5.61	0.00	1638
95.00	APX18-206517-CT2	8	40.60	5.50	0.00	1638
91.00	Canister Load2	8	35.98	5.35	0.00	909
86.00	APX18-206517-CT2	2	30.53	5.04	0.00	583
82.00	Canister Load3	2	26.53	4.64	0.00	481
77.00	DHHTT65B-3XR	2	22.11	3.93	0.00	487
72.00	Canister Load4	6	18.30	3.08	0.00	528
67.00	AM-X-CD-16-65-00T-RET	6	15.07	2.23	0.00	576
62.00	Canister Load5	6	12.36	1.53	0.00	638

### Compression Checks

### Pole Design Data

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	K/lr	A in <sup>2</sup>	P <sub>u</sub> K	φP <sub>n</sub> K	Ratio $\frac{P_u}{\phi P_n}$
L1	100 - 82 (1)	P6.625x0.403	18.00	0.00	0.0	7.8774	-1.30	248.14	0.005
L2	82 - 62 (2)	P6.75x0.75	20.00	0.00	0.0	14.137	-4.25	445.32	0.010
L3	62 - 30 (3)	P24x0.375	32.00	0.00	0.0	27.832	-8.49	1052.07	0.008
L4	30 - 0 (4)	P24x0.375	30.00	0.00	0.0	27.832	-12.14	1052.07	0.012

### Pole Bending Design Data

Section No.	Elevation ft	Size	M <sub>ux</sub> kip-ft	φM <sub>nx</sub> kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M <sub>uy</sub> kip-ft	φM <sub>ny</sub> kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	100 - 82 (1)	P6.625x0.403	16.54	41.01	0.403	0.00	41.01	0.000
L2	82 - 62 (2)	P6.75x0.75	57.39	71.24	0.806	0.00	71.24	0.000
L3	62 - 30 (3)	P24x0.375	165.90	623.72	0.266	0.00	623.72	0.000
L4	30 - 0 (4)	P24x0.375	304.31	623.72	0.488	0.00	623.72	0.000

### Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V <sub>u</sub> K	φV <sub>n</sub> K	Ratio $\frac{V_u}{\phi V_n}$	Actual T <sub>u</sub> kip-ft	φT <sub>n</sub> kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	100 - 82 (1)	P6.625x0.403	1.16	74.44	0.016	0.00	40.72	0.000
L2	82 - 62 (2)	P6.75x0.75	2.32	133.60	0.017	0.00	70.47	0.000
L3	62 - 30 (3)	P24x0.375	4.12	315.62	0.013	0.00	655.57	0.000
L4	30 - 0 (4)	P24x0.375	5.07	315.62	0.016	0.00	655.57	0.000

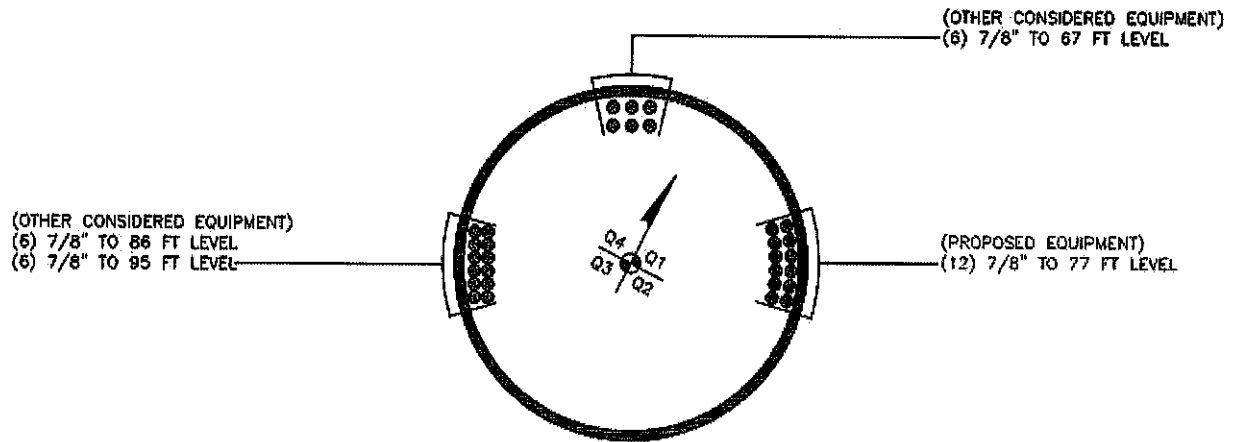
### Pole Interaction Design Data

Section No.	Elevation ft	Ratio P <sub>u</sub> φP <sub>n</sub>	Ratio M <sub>ux</sub> φM <sub>nx</sub>	Ratio M <sub>uy</sub> φM <sub>ny</sub>	Ratio V <sub>u</sub> φV <sub>n</sub>	Ratio T <sub>u</sub> φT <sub>n</sub>	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	100 - 82 (1)	0.005	0.403	0.000	0.016	0.000	0.409	1.050	4.8.2
L2	82 - 62 (2)	0.010	0.806	0.000	0.017	0.000	0.815	1.050	4.8.2
L3	62 - 30 (3)	0.008	0.266	0.000	0.013	0.000	0.274	1.050	4.8.2
L4	30 - 0 (4)	0.012	0.488	0.000	0.016	0.000	0.500	1.050	4.8.2

### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	φP <sub>allow</sub> K	% Capacity	Pass Fail
L1	100 - 82	Pole	P6.625x0.403	1	-1.30	260.55	38.9	Pass
L2	82 - 62	Pole	P6.75x0.75	2	-4.25	467.59	77.7	Pass
L3	62 - 30	Pole	P24x0.375	3	-8.49	1104.67	26.1	Pass
L4	30 - 0	Pole	P24x0.375	4	-12.14	1104.67	47.6	Pass
Summary								
Pole (L2)							77.7	Pass
RATING =							77.7	Pass

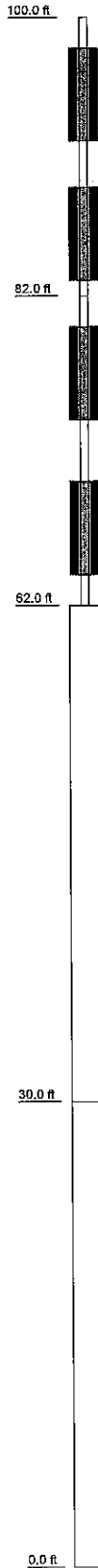
APPENDIX B  
BASE LEVEL DRAWING





**APPENDIX C**  
**ADDITIONAL CALCULATIONS**

Section	1	2	3	4	
Size	P6.825x0.403	P6.75x0.75	P24x0.375	P24x0.375	
Length (ft)	18.00	20.00	32.00	30.00	
Grade	A53-B-33	A53-B-33	A53-B-42	A53-B-42	
Weight (K)	0.5	1.0	2.9	2.7	7.0



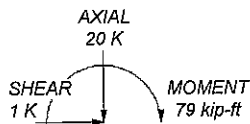
### MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	60 ksi	A53-B-42	42 ksi	63 ksi

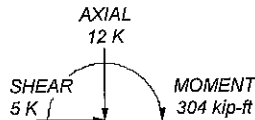
### TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 120.00 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50.00 mph basic wind with 1.27 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60.00 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TIA-222-H Annex S
9. TOWER RATING: 77.7%


ALL REACTIONS  
ARE FACTORED



50.00 mph WIND - 1.2750 in ICE



REACTIONS - 120.00 mph WIND

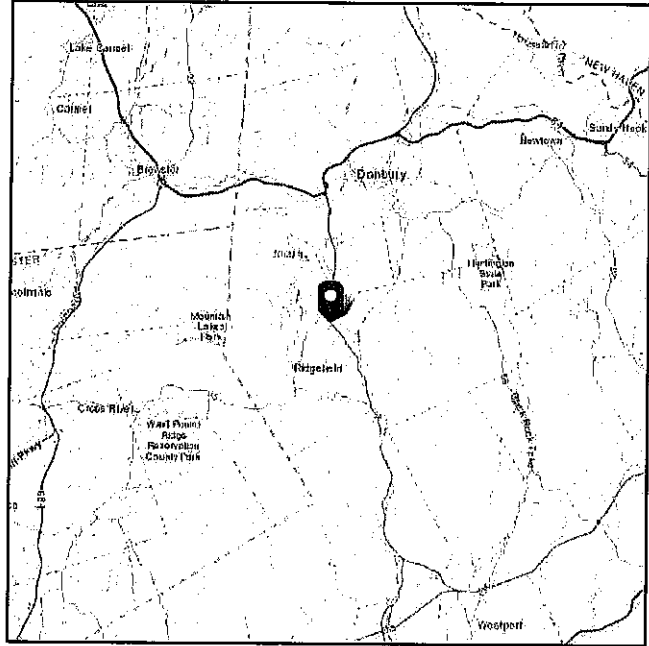
 <b>Paul J. Ford and Company</b> 250 East Broad St., Suite 600 Columbus, OH 43215 Phone: (614) 221-6679 FAX:	<b>Job: 100' Concealment Monopole   Redding / Rt.</b>		
	Project: 37519-0244.001.7700   BU 826927		
	Client: Crown Castle International	Drawn by: mimas	App'd:
	Code: TIA-222-H	Date: 02/06/19	Scale: NTS
	Path:	Dwg No. E-1	

# ASCE 7 Hazards Report

**Address:**  
No Address at This  
Location

**Standard:** ASCE/SEI 7-10  
**Risk Category:** II  
**Soil Class:** D - Stiff Soil

**Elevation:** 492.89 ft (NAVD 88)  
**Latitude:** 41.313  
**Longitude:** -73.4724



## Wind

<b>Results:</b>	<b>76 Vmph</b>
Wind Speed:	117 Vmph
10-year MRI	76 Vmph
25-year MRI	85 Vmph
50-year MRI	90 Vmph
100-year MRI	96 Vmph

**Data Source:** ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, incorporating errata of March 12, 2014

**Date Accessed:** Tue Dec 04 2018

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-10 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

**Results:**

Ice Thickness: 0.75 in.  
Concurrent Temperature: 15 F  
Gust Speed: 50 mph

**Data Source:** Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8

**Date Accessed:** Tue Dec 04 2018

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 50-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

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The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided "as is" and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

ASCE does not intend, nor should anyone interpret, the results provided by this Tool to replace the sound judgment of a competent professional, having knowledge and experience in the appropriate field(s) of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the contents of this Tool or the ASCE 7 standard.

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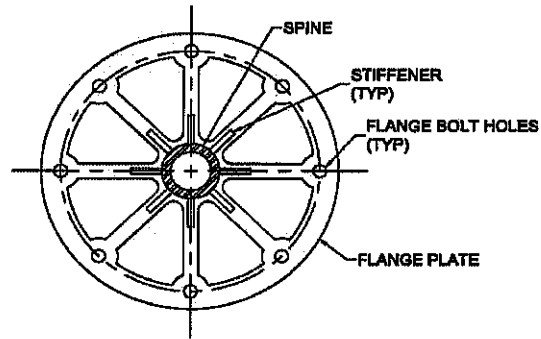
# CCI Flagpole Tool



Site Data	
BU#:	826927 - Structure A
Site Name:	Redding/Rt 7
Order #:	1683879

Code	
Code:	TIA-222-H
Ice Thickness:	1.5 in
Windspeed (V):	120 mph
Ice Wind Speed (V):	50 mph
Exposure Category:	C
Topographic Feature:	N/A
Risk Category:	II

Tower Information	
Total Tower Height:	100 ft
Base Tower Height:	62 ft
Total Canister Length:	38 ft
Number of Canister Assembly Sections:	4



**FLANGE PLATE**  
(TYPE 4: SOLIDITY RATIO 0.55)

Canister Section Number *	Canister Assembly Length (ft):	Canister Assembly Diameter (in):	Number of Sides Canister Section	Plate Type:	Mating Flange Plate Thickness (in)**:	Mating Flange Plate Diameter (in):	Solidity Ratio	Plate Weight (Kip):	Canister Weight (Kip)
1	9	24	Round	4	2.00	23.25	0.55	0.265	0.113
2	9	24	Round	4	2.00	23.25	0.55	0.265	0.113
3	10	38	Round	4	2.00	23.25	0.55	0.265	0.199
4	10	38	Round	4	2.00	23.25	0.55	0.265	0.199

\* Sections are numbered from the top of the tower down

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

Flag on Tower:	Yes
Flag Width:	20 ft
Flag Height:	12 ft
Flag Elevation(z):	100 ft

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

Geometry : Base Tower + Spine			
Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides
100	18		0
82	20		0
62	32		0
30	30		0

37519-0244.001.7700 - Concealment.eri (last saved 01/23 4:34 pm)

Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material	Delete
6.625	6.625	0.403	n/a	A53-B-35	[x]
6.75	6.75	0.75	n/a	A53-B-35	[x]
24	24	0.375	n/a	A53-B-35	[x]
24	24	0.375	n/a	A53-B-35	[x]

Discrete Loads: Truck Ball	Apply $C_a A_A$ at Elevation(z) (ft)	$C_a A_A$ No Ice (ft <sup>2</sup> )	$C_a A_A$ 1/2" Ice (ft <sup>2</sup> )	$C_a A_A$ 1" Ice (ft <sup>2</sup> )	$C_a A_A$ 2" Ice (ft <sup>2</sup> )	$C_a A_A$ 4" Ice (ft <sup>2</sup> )	Weight No Ice (Kip)	Weight 1/2" Ice (Kip)
	100.75	0.884	1.378	1.527	1.848	2.581	0.05	0.067

Discrete Loads : $C_F A_F$ for Canister Assembly								
Canister Loading	Apply $C_F A_F$ at Elevation(z) (ft)	$C_F A_F$ No Ice (ft <sup>2</sup> )	$C_F A_F$ 1/2" Ice (ft <sup>2</sup> )	$C_F A_F$ 1" Ice (ft <sup>2</sup> )	$C_F A_F$ 2" Ice (ft <sup>2</sup> )	$C_F A_F$ 4" Ice (ft <sup>2</sup> )	Canister Assembly Weight No Ice (Kip)	Canister Assembly Weight 1/2" Ice (Kip)
Canister Load 1	100	4.050	4.219	4.388	4.725	5.400	0.057	0.124
Canister Load 2	91	8.100	8.438	8.775	9.450	10.800	0.378	0.513
Canister Load 3	82	11.175	11.531	11.888	12.600	14.025	0.421	0.606
Canister Load 4	72	14.250	14.625	15.000	15.750	17.250	0.464	0.699
Canister Load 5	62	7.125	7.313	7.500	7.875	8.625	0.364	0.482

User Forces: Flag Force Calculation Per ANSI/NAAMM FP 1001-07	
Wind <sub>FORCE</sub> =	0.451 Kip
Weight=	0.025 Kip
Wind <sub>FORCE, ICE</sub> =	0.081 Kip
Weight <sub>ICE</sub> =	0.776 Kip
W <sub>FORCE, SERVICE WIND</sub> =	0.113 Kip
Weight=	0.025 Kip

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

Deflection Check Required:	Yes	Import Deflection Results
3% Spine Deflection Check		
Allowable (3%) Horizontal Spine Deflection (inches)	Actual Deflection ***(inches)	Sufficient/ Insufficient
13.680	7.780	Sufficient

\*\*\* Relative deflection under service level wind speed

v4.5.6 - Effective 1-21-19

**Asymmetric Bolt Analysis**

Moment = 17 k-ft  
 Axial = 1.3 kips (+Comp, -Tension)  
 Shear = 1.2 kips  
 Anchor Qty = 8

TIA Ref. H  
 ASIF = N/A  
 Max Ratio = 100.0%  
 Location = Flange Plate

$\eta$  =  
 Threads =  
 Grout =

for Base Plates, Rev. G Sect. 4.9.9  
 for Flange Plates, Rev. G & H  
 psi, for Base Plates, Rev. H Sect 4.9.9 (Note)

Use An?  No  for Anchors or Bolts

**\*\* For Flange Plates: Prying action is not considered in the bolt loads. \*\***

Item	Nominal Bolt Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Bolt Circle, in	Type	Area Override, in <sup>2</sup>	Iar, in	Area, in <sup>2</sup>	Max Net Comp, kips	Max Net Tension, kips	Tension Override, kips	Comp Override, kips	Tension Cap, kips	Comp Cap, kips	Capacity Ratio
1	1.000	A325	92	120	45.0	21.00	Original	0.00	0.00	0.79	4.88	4.56	0.00	0.00	54.52		8.0%
2	1.000	A325	92	120	90.0	21.00	Original	0.00	0.00	0.79	4.88	4.56	0.00	0.00	54.52		8.0%
3	1.000	A325	92	120	135.0	21.00	Original	0.00	0.00	0.79	4.88	4.56	0.00	0.00	54.52		8.0%
4	1.000	A325	92	120	180.0	21.00	Original	0.00	0.00	0.79	4.88	4.56	0.00	0.00	54.52		8.0%
5	1.000	A325	92	120	225.0	21.00	Original	0.00	0.00	0.79	4.88	4.56	0.00	0.00	54.52		8.0%
6	1.000	A325	92	120	270.0	21.00	Original	0.00	0.00	0.79	4.88	4.56	0.00	0.00	54.52		8.0%
7	1.000	A325	92	120	315.0	21.00	Original	0.00	0.00	0.79	4.88	4.56	0.00	0.00	54.52		8.0%
8	1.000	A325	92	120	360.0	21.00	Original	0.00	0.00	0.79	4.88	4.56	0.00	0.00	54.52		8.0%
										6.28							

v4.5.6 - Effective 1-21-19

**Asymmetric Bolt Analysis**

Moment =  k-ft  
 Axial =  kips (+Comp, -Tension)  
 Shear =  kips  
 Anchor Qty =

TIA Ref.   
 ASIF =   
 Max Ratio =   
 Location =

$\eta =$   for Base Plates, Rev. G Sect. 4.9.9  
 for Flange Plates, Rev. G & H  
 for Anchors or Bolts

Threads =  psi, for Base Plates, Rev. H Sect 4.9.9 (Note)  
 Grout =

Use An?  No

**\*\* For Flange Plates: Prying action is not considered in the bolt loads. \*\***

Item	Nominal Bolt Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Bolt Circle, in	Type	Area Override, in <sup>2</sup>	Area, in <sup>2</sup>	Max Net Comp, kips	Max Net Tension, kips	Tension Override, kips	Comp Override, kips	Tension Cap, kips	Comp Cap, kips	Capacity Ratio
1	1.000	A325	92	120	22.5	21.00	Original	0.00	0.79	24.20	23.14	0.00	0.00	54.52		40.4%
2	1.000	A325	92	120	45.0	21.00	Original	0.00	0.79	24.20	23.14	0.00	0.00	54.52		40.4%
3	1.000	A325	92	120	67.5	21.00	Original	0.00	0.79	24.20	23.14	0.00	0.00	54.52		40.4%
4	1.000	A325	92	120	90.0	21.00	Original	0.00	0.79	24.20	23.14	0.00	0.00	54.52		40.4%
5	1.000	A325	92	120	112.5	21.00	Original	0.00	0.79	24.20	23.14	0.00	0.00	54.52		40.4%
6	1.000	A325	92	120	135.0	21.00	Original	0.00	0.79	24.20	23.14	0.00	0.00	54.52		40.4%
7	1.000	A325	92	120	157.5	21.00	Original	0.00	0.79	24.20	23.14	0.00	0.00	54.52		40.4%
8	1.000	A325	92	120	180.0	21.00	Original	0.00	0.79	24.20	23.14	0.00	0.00	54.52		40.4%
9	1.000	A325	92	120	202.5	21.00	Original	0.00	0.79	24.20	23.14	0.00	0.00	54.52		40.4%
10	1.000	A325	92	120	225.0	21.00	Original	0.00	0.79	24.20	23.14	0.00	0.00	54.52		40.4%
11	1.000	A325	92	120	247.5	21.00	Original	0.00	0.79	24.20	23.14	0.00	0.00	54.52		40.4%
12	1.000	A325	92	120	270.0	21.00	Original	0.00	0.79	24.20	23.14	0.00	0.00	54.52		40.4%
13	1.000	A325	92	120	292.5	21.00	Original	0.00	0.79	24.20	23.14	0.00	0.00	54.52		40.4%
14	1.000	A325	92	120	315.0	21.00	Original	0.00	0.79	24.20	23.14	0.00	0.00	54.52		40.4%
15	1.000	A325	92	120	337.5	21.00	Original	0.00	0.79	24.20	23.14	0.00	0.00	54.52		40.4%
16	1.000	A325	92	120	360.0	21.00	Original	0.00	0.79	24.20	23.14	0.00	0.00	54.52		40.4%
									12.57							



# Monopole Base Plate Connection

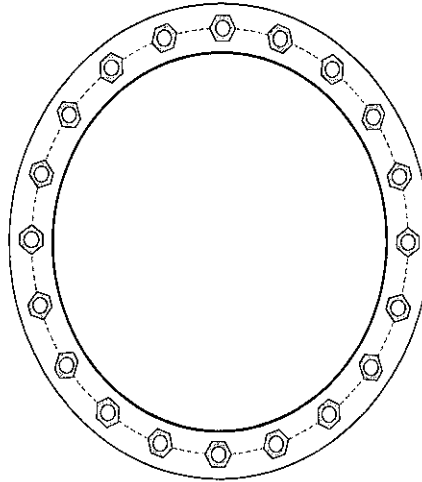


Site Info	
BU #	826927
Site Name	Redding / Rt. 7
Order #	1683879

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
$l_{gr}$ (in)	2

Applied Loads	
Moment (kip-ft)	304.31
Axial Force (kips)	12.14
Shear Force (kips)	5.07

\*TIA-222-H Section 15.5 Applied



Connection Properties	Analysis Results
-----------------------	------------------

Anchor Rod Data
(20) 1" $\phi$ bolts (A687 N; $F_y=105$ ksi, $F_u=125$ ksi) on 27" BC
Base Plate Data
30.125" OD x 1.25" Plate (A36; $F_y=36$ ksi, $F_u=58$ ksi)
Stiffener Data
N/A
Pole Data
24" x 0.375" round pole (A53-B-42; $F_y=42$ ksi, $F_u=60$ ksi)

Anchor Rod Summary		(units of kips, kip-in)	
$P_u_c = 27.64$	$\phi P_{n_c} = 63.63$	<b>Stress Rating</b>	
$V_u = 0.25$	$\phi V_n = 19.09$	44.3%	
$M_u = 0.33$	$\phi M_n = 10.67$	Pass	
Base Plate Summary			
Max Stress (ksi):	-		
Allowable Stress (ksi):	-		
Stress Rating:	<b>Pirod OK</b>		

# Drilled Pier Foundation

BU #: B26927  
 Site Name: Redding / Rt. 7  
 Order Number: 1683879

TIA-222 Revision: H  
 Tower Type: Monopole



Applied Loads		Uplift
Moment (kip-ft)	304	-
Axial Force (kips)	12	-
Shear Force (kips)	5	-

Material Properties	
Concrete Strength, f <sub>c</sub>	3 ksi
Rebar Strength, F <sub>y</sub>	60 ksi

Pier Design Data	
Depth	20 ft
Ext. Above Grade	0.5 ft
Pier Section 1	
<i>From 0.5' above grade to 20' below grade</i>	
Pier Diameter	3.5 ft
Rebar Quantity	12
Rebar Size	7
Clear Cover to Ties	3 in
Tie Size	5

Analysis Results		
Soil Lateral Capacity	Compression	Uplift
D <sub>req</sub> (ft from TOC)	5.68	-
Soil Safety Factor	9.43	-
Max Moment (kip-ft)	332.46	-
Rating*	13.4%	-
Soil Vertical Capacity	Compression	Uplift
Skin Friction (kips)	41.23	-
End Bearing (kips)	144.32	-
Weight of Concrete (kips)	26.14	-
Total Capacity (kips)	185.55	-
Axial (kips)	38.14	-
Rating*	19.6%	-
Reinforced Concrete Capacity	Compression	Uplift
Critical Depth (ft from TOC)	5.52	-
Critical Moment (kip-ft)	332.42	-
Critical Moment Capacity	564.26	-
Rating*	56.1%	-
Soil Interaction Rating*	19.6%	-
Structural Foundation Rating*	56.1%	-

\*Rating per TIA-222-H Section 15.5

Soil Profile

# of Layers 3

Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ <sub>soil</sub> (pcf)	γ <sub>concrete</sub> (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	3.333333	3.333333	135	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
2	3.333333	7	3.666667	135	150	0	38	0.000	0.000	0.30	0.30			Cohesionless
3	7	20	13	75	87.6	0	38	0.000	0.000	0.30	0.30	20		Cohesionless

**Concealment FEA Results & Discussion**

Analysis Software Information: ANSYS, Inc. Products Release 19.1

**RESULTS SUMMARY**

**62'-0" CONCEALMENT FLANGE CONNECTION**

ELEMENT	MATERIAL	DESIGNATION
Concealment Flange Plate	Gr. 50	<b>Sufficient</b>
Base Pole Flange Plate	Gr. 36	<b>Sufficient</b>
Stiffeners	Gr. 36	<b>Sufficient</b>

**CONNECTIONS**

COMPONENT	SIZING	DESIGNATION
Bolts – Concealment Flange to Base Pole Flange	1.0"Ø Bolts	<b>Sufficient</b>
Welds – Stiffeners to Concealment Spine and Flange	5/16" Fillet	<b>Sufficient</b>

**ANALYSIS APPROACH**

**Finite Element Analysis**

This analysis has been completed by means of computer based finite element analysis (FEA). To establish the basic behavior of the connection, a finite element model (FEM) was developed with elastic material properties. If results of the elastic analysis prove to be unsatisfactory, the connection will be further analyzed with plastic (non-linear) material properties to allow for stress redistribution.

**Loading**

The loading applied to the connection has been done by means of three applied loads: Axial, Shear, and Moment. All loads are calculated through tnxTower. The value of the moment has been adjusted to account for the moment induced by the shear component. The applied loads within the model are a set distance from the interface of the two flange plates. Loading has been applied in a direction that results in the highest stresses in the connection. The applied moment has been increased by a factor of 1.11 to consider a Phi equal to 0.9.

**Loading Direction:**

Two loading directions were considered in this analysis:

- D1) load directly into a stiffener, and
- D2) load directly in between two stiffeners.

**Modeling Notes**

- All welded surfaces have been modeling using bonded contact definitions.
- All non-welded surfaces in contact have been conservatively modeled with frictionless contact definitions.
- The bolts have been modeled using deformable ANSYS one-dimensional beam elements as recommended by the software developers.
- All other structural members are modeled as ANSYS two-dimensional shell elements or three dimensional solid elements.
  - Both linear and quadratic elements are utilized in this analysis
- The base pole is constrained in all degrees of freedom at its base. The length of the base pole which is modeled is chosen so as not to introduce any false rigidity to the model.
- The load is applied at the top of the spine. The length of the spine modeled is chosen to allow for proper flexural behavior of the connection.



Job Number:	37519-0244.001.7700
Engineer:	MJT
Site Name:	REDDING/RT7
Site Number:	826927

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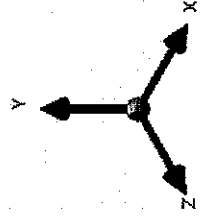
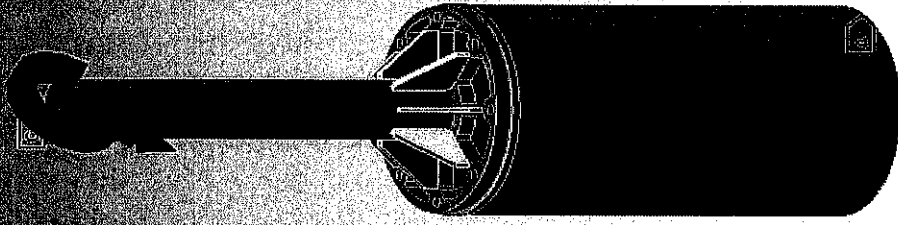
**LOAD CONVERSIONS FOR INPUT INTO ANSYS**

Distance from Applied Loads To Flange Connection [in]: 54.00

Elevation	Load Type	Loads from trn in Kips or Kip*ft	Loads for Input into Ansys (lb or lb*in)
<b>62.00</b>	Moment	<b>57.39</b>	563,400
	Axial	<b>4.25</b>	4,250
	Shear	<b>2.32</b>	2,320
<b>62(11%)</b>	Moment	63.77	639,920
	Axial	4.25	4,250
	Shear	2.32	2,320
<b>Resultant Force due to Shear &amp; Axial:</b>			<b>4,842</b>

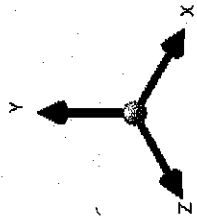
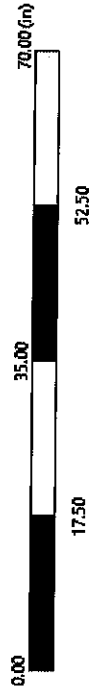
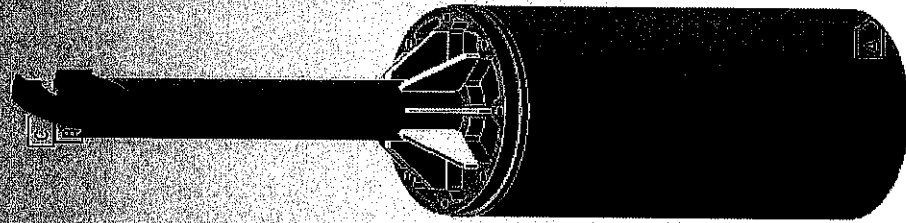
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D:\P  
Time: 1:5  
7/20/2015 8:55 AM

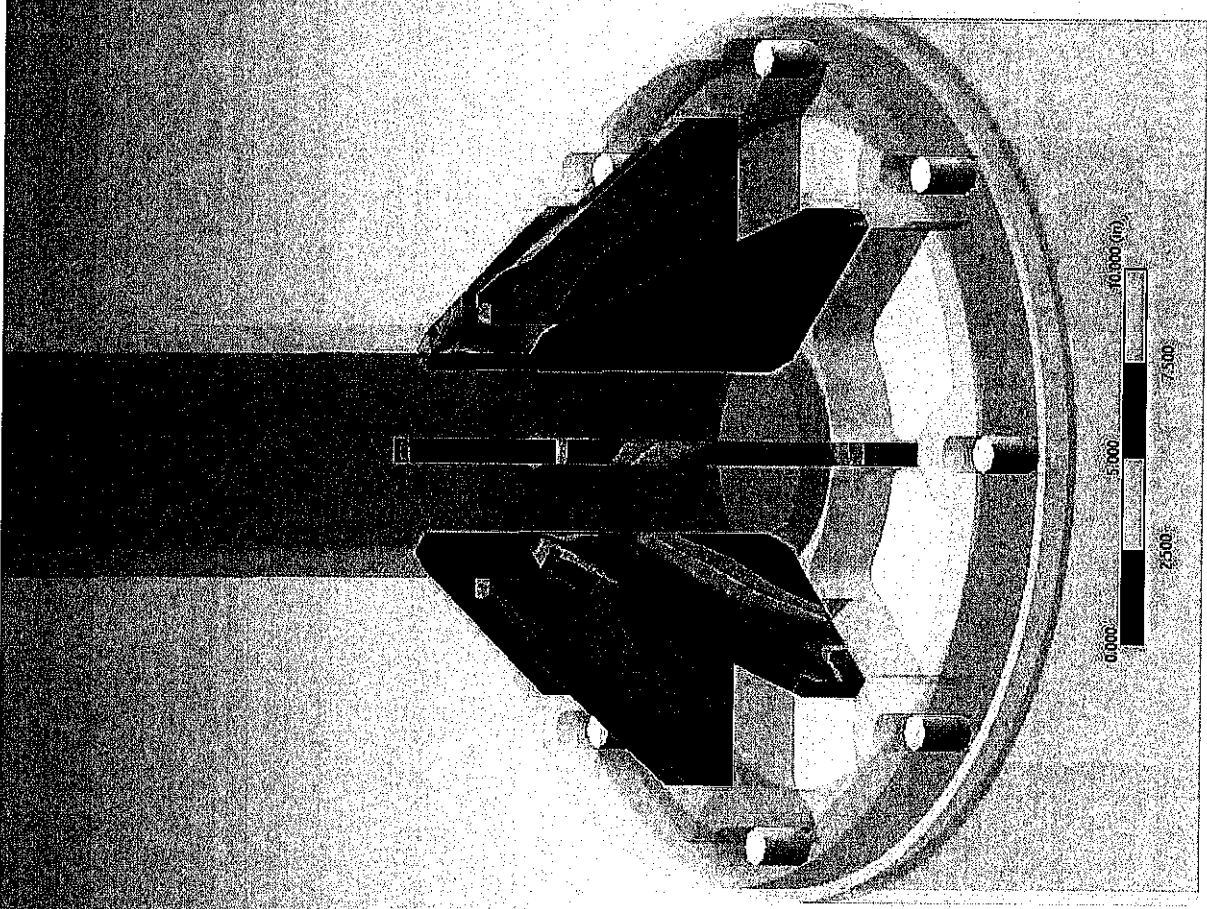
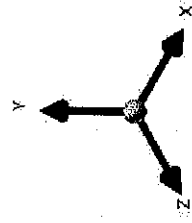
- Fixed Support
- Remote Force: 482 lbf
- Moment: 65092.5005 lbf-in



E:02 (R)  
D:2 (P)  
Time: 15  
2/17/2015 8:41 AM

- Fixed Support
- Remote Force: 4042.1bf
- Moment: 6.3992e+005 lbf.in

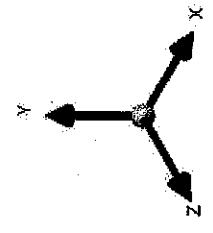
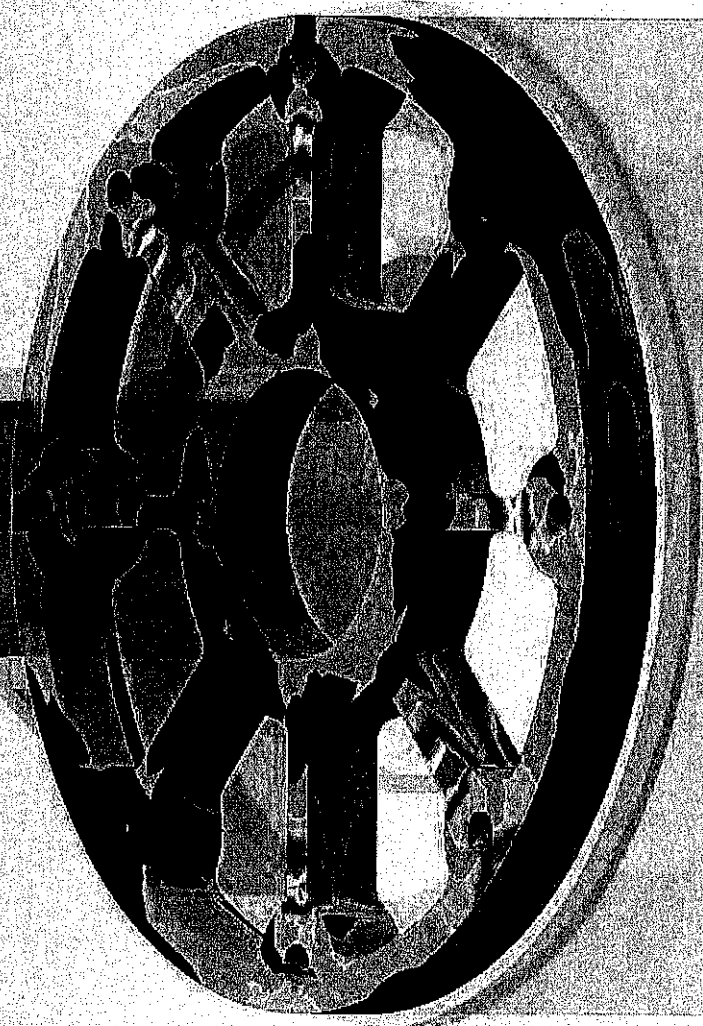




D:\11m  
Equilibrium Solution  
Type: Modal (with Mass Scaling)  
Units: SI  
Time: 0  
2/1/2019 9:57 AM

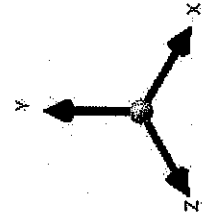
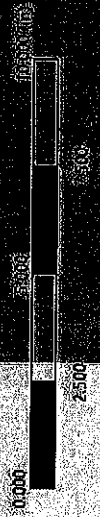
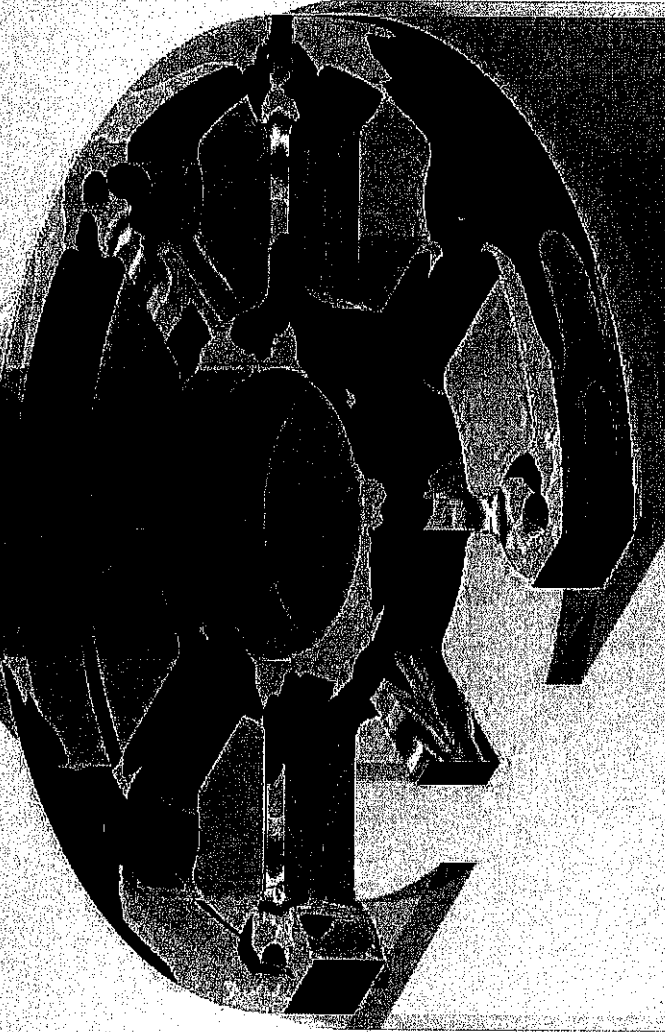


ID: 101 (P)  
 Equilibrium Solution: Completed  
 Was Squared (Completed Success)  
 Displacement  
 Time: 7  
 2/27/2019 9:37:36 AM

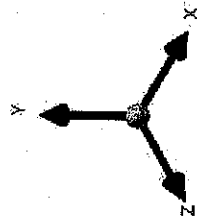
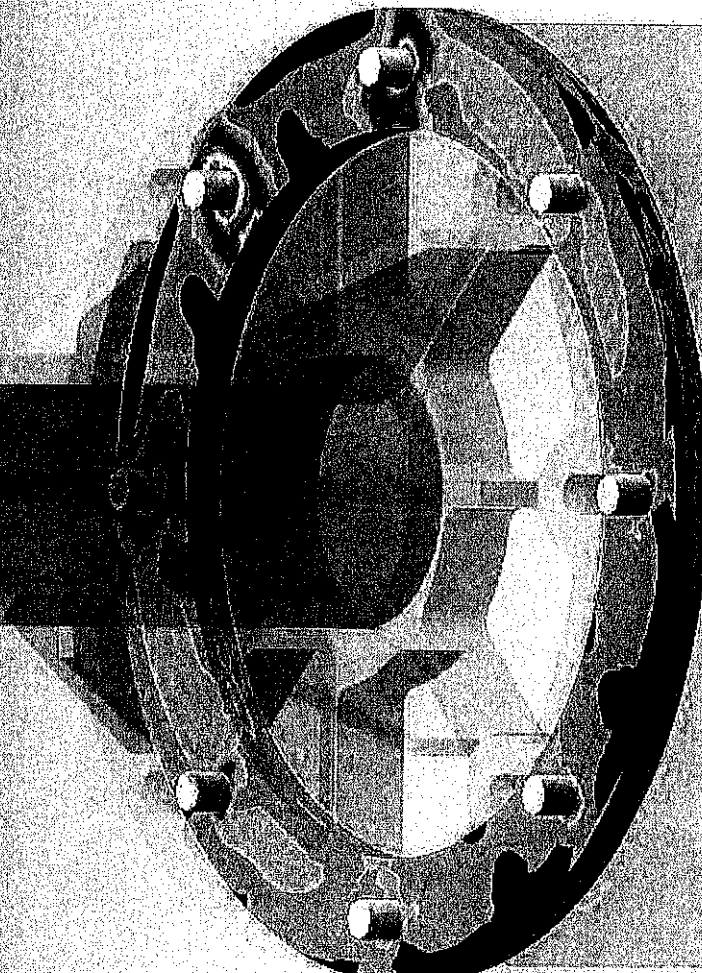




12.01.2017  
Evaluation of the stress concentration factor  
Type: Static Structural  
Time: 27.72109353417



0-01 (1) 1  
Equipment Control System - Back Plate - Rev 111111  
Type: Coupled (Static Structural)  
Unit: mm  
Time: 27/07/2019 09:27 AM



**APPENDIX D**  
**MODIFICATION DRAWINGS**

# MODIFIED 100'-0" MONOPOLE

## BU #826927-STRUCTURE A; REDDING/RT

845 ETHAN ALLEN HIGHWAY  
 RIDGEFIELD, CONNECTICUT 06877  
 FAIRFIELD COUNTY

LAT: 41° 18' 46.86"; LONG: -73° 28' 20.48"  
 ORDER: 410825 REV. 9; WO: 1683879

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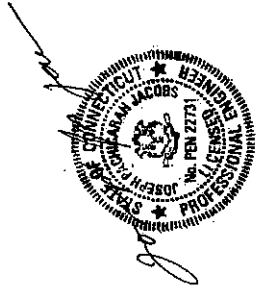
**PAUL J. FORD & COMPANY**  
 250 E Broad St., Ste 600 - Columbus, OH 43215  
 Phone 614.221.6679 www.pauljford.com  
 3 CORPORATE PARK DRIVE SUITE 101 CLIFTON PARK, NY 10865  
 PH 6881.270.088

BU #826927-STRUCTURE A;  
 REDDING/RT  
 RIDGEFIELD, CONNECTICUT  
 MODIFIED 100'-0" MONOPOLE

PROJECT NO: 31518-0044-001-700  
 DRAWN BY: DJ  
 DESIGNED BY: MT  
 CHECKED BY: JJK  
 DATE: 2-2-2018

TITLE SHEET

T-1



FEB 08 2019

SHEET INDEX	
SHEET NUMBER	DESCRIPTION
T-1	TITLE SHEET
M-1	IM CHECKLIST AND NOTES
N-1	GENERAL NOTES
S-1	MONOPOLE PROFILE
S-2	CONCEALMENT ELEVATION DETAILS
S-3	CONCEALMENT SECTIONS
S-4	BULKHEAD DETAILS

TOWER MANUFACTURER: PIKOC  
 TOWER MANUFACTURER #: 163438-B  
 THE ASSOCIATED FALLING SA WO NUMBER FOR THIS PROJECT IS 1686242

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 PJFMD@PAULJFORD.COM.

ATTENTION ALL CONTRACTORS, ANY TIME 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

**PROJECT CONTACTS**  
 STRUCTURE OWNER:  
 CROWN CASTLE  
 1100 PM DAN VADNEY AT DAN.VADNEY@CROWNCastle.COM  
 PH: (618) 373-3510  
 MOD CM: JASON DAMICO AT JASON.DAMICO@CROWNCastle.COM  
 PH: (860) 209-0104  
 ENGINEER OF RECORD:  
 PJFMD@PAULJFORD.COM

WIND DESIGN DATA	
REFERENCE STANDARD	ANSI/TIA-222-H
LOCAL CODE	2016 CBC
ULTIMATE WIND SPEED (3-SECOND GUST)	120 MPH
ICE THICKNESS	1.5 IN
ICE WIND SPEED	50 MPH
SERVICE WIND SPEED	60 MPH
RISK CATEGORY	II
EXPOSURE CATEGORY	C
Kz	1.0

REV. DATE. DESCRIPTION

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**PJF PAUL J. FORD & COMPANY**  
 250 Broad St., Ste 600 Columbus, OH 43215  
 Phone 614.221.6878 www.pjford.com

3 CORPORATE PARK DRIVE SUITE 101 CLIFTON PARK, NY 12065  
 PH: 518.370.4166

**BU #826927-STRUCTURE A;  
 REDDING/R17  
 RIDGFIELD, CONNECTICUT  
 MODIFIED 100-0 MONOPOLE**

PROJECT No: 318-004-001700  
 DRAWING No: 00  
 DESIGNED BY: MTF  
 CHECKED BY: ZS KZC  
 DATE: 2-7-2019

**MI CHECKLIST**

**MI-1**

**MODIFICATION INSPECTION NOTES**

**GENERAL**  
 THE MI IS AN ON-SITE VISUAL AND HANDS-ON INSPECTION OF TOWER MODIFICATIONS INCLUDING A REVIEW OF THE ORIGINAL DESIGN DRAWINGS AND ANY MODIFICATIONS PROVIDED BY THE GENERAL CONTRACTOR (GC), AS WELL AS ANY INSPECTION DOCUMENTS PROVIDED BY THE GENERAL CONTRACTOR (GC). THE MI IS CONDUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS, A MODIFICATION WITH APPLICABLE CROWN STANDARDS, AND AS DESIGNED BY THE ENGINEER OF RECORD (EOR). NO DOCUMENT CODE OR POLICY CAN AUTOMATICALLY BE APPLIED TO THIS PROJECT. 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, WORKMANSHIP AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE OWNERSHIP OF THE MI. THE MI INSPECTOR DOES NOT TAKE OWNERSHIP OF THE MODIFICATION DESIGN. THE MI INSPECTOR SHALL INSPECT AND NOTE CONFORMANCE WITH CROWN STANDARDS AND PROVIDE TO THE CROWN POINT OF CONTACT (CROWN PO) FOR EVALUATION. ALL MIS SHALL BE CONDUCTED BY A CROWN APPROVED MI INSPECTOR, WORKING FOR A CROWN APPROVED MI VENDOR, SEE CROWN-CES-31-0101, APPROVED BY THE EOR.

TO DISURE 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 LOCATION  
 • PHOTOGRAPHS DURING THE REINFORCEMENT/INSTALLATION CONSTRUCTION INSPECTION AND INSPECTION  
 • PHOTOS OF ALL CRITICAL DETAILS  
 • FOUNDATION MODIFICATIONS  
 • BOLT INSTALLATION  
 • FINAL INSTALLED CONDITION  
 • SURFACE CORROSION REPAIR  
 • POST CONSTRUCTION PHOTOGRAPHS  
 • FINAL WELD CONDITION

PHOTOS OF ELEVATED MODIFICATIONS TAKEN ONLY FROM THE GROUND SHALL BE CONSIDERED INADEQUATE. THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS. PLEASE REFER TO CROWN DOCUMENT # CROWN-10007.

**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 LOCATION  
 • PHOTOGRAPHS DURING THE REINFORCEMENT/INSTALLATION CONSTRUCTION INSPECTION AND INSPECTION  
 • PHOTOS OF ALL CRITICAL DETAILS  
 • FOUNDATION MODIFICATIONS  
 • BOLT INSTALLATION  
 • FINAL INSTALLED CONDITION  
 • SURFACE CORROSION REPAIR  
 • POST CONSTRUCTION PHOTOGRAPHS  
 • FINAL WELD CONDITION

**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 48 HOURS NOTICE, PREFERABLY 14, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.  
 • WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OPERATIONS.  
 • WHEN POSSIBLE, US PERSONNEL SHOULD BE AVAILABLE TO ASSIST MI INSPECTORS ON-SITE DURING THE MI TO HAVE ANY IMPROVEMENTS CORRECTED DURING THE INITIAL MI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON-SITE.

**GENERAL**  
 THE MI IS AN ON-SITE VISUAL AND HANDS-ON INSPECTION OF TOWER MODIFICATIONS INCLUDING A REVIEW OF THE ORIGINAL DESIGN DRAWINGS AND ANY MODIFICATIONS PROVIDED BY THE GENERAL CONTRACTOR (GC), AS WELL AS ANY INSPECTION DOCUMENTS PROVIDED BY THE GENERAL CONTRACTOR (GC). THE MI IS CONDUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS, A MODIFICATION WITH APPLICABLE CROWN STANDARDS, AND AS DESIGNED BY THE ENGINEER OF RECORD (EOR). NO DOCUMENT CODE OR POLICY CAN AUTOMATICALLY BE APPLIED TO THIS PROJECT. 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, WORKMANSHIP AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE OWNERSHIP OF THE MI. THE MI INSPECTOR DOES NOT TAKE OWNERSHIP OF THE MODIFICATION DESIGN. THE MI INSPECTOR SHALL INSPECT AND NOTE CONFORMANCE WITH CROWN STANDARDS AND PROVIDE TO THE CROWN POINT OF CONTACT (CROWN PO) FOR EVALUATION. ALL MIS SHALL BE CONDUCTED BY A CROWN APPROVED MI INSPECTOR, WORKING FOR A CROWN APPROVED MI VENDOR, SEE CROWN-CES-31-0101, APPROVED BY THE EOR.

TO DISURE 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 LOCATION  
 • PHOTOGRAPHS DURING THE REINFORCEMENT/INSTALLATION CONSTRUCTION INSPECTION AND INSPECTION  
 • PHOTOS OF ALL CRITICAL DETAILS  
 • FOUNDATION MODIFICATIONS  
 • BOLT INSTALLATION  
 • FINAL INSTALLED CONDITION  
 • SURFACE CORROSION REPAIR  
 • POST CONSTRUCTION PHOTOGRAPHS  
 • FINAL WELD CONDITION

PHOTOS OF ELEVATED MODIFICATIONS TAKEN ONLY FROM THE GROUND SHALL BE CONSIDERED INADEQUATE. THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS. PLEASE REFER TO CROWN DOCUMENT # CROWN-10007.

STATE OF CONNECTICUT  
 PROFESSIONAL ENGINEER  
 LICENSE NO. 10273  
 PAUL J. FORD

**FEB 08 2019**

DESCRIPTION

**MI CHECKLIST**

REQUIRED REPORT ITEM	APPLICABLE CROWN DOC #	BRIEF DESCRIPTION
<b>PRE-CONSTRUCTION</b>		
X	CEB-SOW-10007	THIS CHECKLIST SHALL BE INCLUDED IN THE MI REPORT.
X	CEB-SOW-10007	ONCE THE PRE-MODIFICATION DRAWINGS IS COMPLETE AND PRIOR TO FABRICATION, THE CONTRACTOR SHALL PROVIDE DETAILED ASSEMBLY DRAWINGS AND SHOP DRAWINGS. THESE ARE NOT LIMITED TO A VISUAL LAYOUT OF NEW WORK, BUT INCLUDES THE EXISTING REINFORCEMENT PORTHOLES, MOUNTS, STEPPERS, SAFETY CLAMPS AND ANY OTHER DETAILS THAT WILL BE REQUIRED FOR THE MODIFICATION. THESE DRAWINGS SHALL BE SUBMITTED TO THE EOR FOR APPROVAL. APPROVED ASSEMBLY DRAWINGS SHALL BE SUBMITTED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	CEB-SOW-10007	A LETTER FROM THE FABRICATOR, STATING THAT THE WORK WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND ALL CONTRACT DOCUMENTS, SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	CEB-SOW-10007	A COW 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	CEB-SOW-10007	MATERIAL TEST REPORTS SHALL BE PROVIDED FOR MATERIAL USED AS REQUIRED PER SECTION 0215 OF CEB-SOW-10007. ATRS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	CEB-SOW-10008	CRITICAL SHOP WELDS THAT REQUIRE TESTING ARE NOTED ON THESE CONTRACT DRAWINGS. A CERTIFIED MI INSPECTOR SHALL PERFORM NONDESTRUCTIVE EXAMINATION AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	ENG-SOW-10023	RIPE OF THE POLE TO BASE FLATE CONNECTION IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	CEB-SOW-10007	THE MATERIAL SHIPPING LIST SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
<b>CONSTRUCTION</b>		
NA	CEB-SOW-10144	A VISUAL OBSERVATION OF THE EXCAVATION AND REBAR SHALL BE PERFORMED BEFORE PLACING THE CONCRETE. A VISUAL CHECK FOR CORROSION OF THE REBAR SHALL BE PERFORMED AND THE EOR/A SCALED WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	CEB-SOW-10144	THE CONCRETE MIX DESIGN, SLUMP TEST, AND COMPRESSIVE STRENGTH TESTS SHALL BE PROVIDED AS PART OF THE FOUNDATION REPORT.
NA	CEB-SOW-10144	FOUNDATION SUB-GRASSES SHALL BE INSPECTED AND APPROVED BY AN APPROVED FOUNDATION INSPECTOR AND RESULTS INCLUDED AS PART OF THE FOUNDATION REPORT.
NA	CEB-SOW-10144	MICROPIER/ROCK ANCHORS SHALL BE INSPECTED BY THE FOUNDATION INSPECTOR AND SHALL BE LISTED AS PART OF THE FOUNDATION INSPECTION REPORT. ADDITIONAL TESTING AND/OR INSPECTION REQUIREMENTS ARE NOTED IN THESE CONTRACT DOCUMENTS.
NA	CEB-SOW-10007	POST INSTALLED ANCHOR ROD VERIFICATION SHALL BE PERFORMED IN ACCORDANCE WITH CROWN REQUIREMENTS AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	ENG-STD-10221	THE GENERAL CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE MI INSPECTOR THAT CERTIFIES THAT THE GROUT WAS REMOVED ANCHOR INSTALLED IN ACCORDANCE WITH CROWN REQUIREMENTS FOR INCLUSION IN THE MI REPORT.
NA	CEB-SOW-10008	CROWN APPROVED CERTIFIED WELD INSPECTOR SHALL INSPECT AND TEST FIELD WELDS FOLLOWING ALL PROCEDURES AND REQUIREMENTS OF THE CROWN STANDARDS AND CONTRACT DOCUMENTS. A REPORT SHALL BE PROVIDED. NONE OF FIELD WELDS SHALL BE PERFORMED AS REQUIRED BY CROWN STANDARDS AND CONTRACT DOCUMENTS. THE MI REPORT SHALL BE INCLUDED IN THE MI REPORT.
X	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	CEB-STD-10102	THE GENERAL CONTRACTOR SHALL PROVIDE A REPORT IN ACCORDANCE WITH APPLICABLE STANDARDS DOCUMENTING TENSION TESTS AND PLUMB.
X	CEB-SOW-10007	THE GENERAL CONTRACTOR SHALL SUBMIT A LEGIBLE COPY OF THE ORIGINAL DESIGN DRAWINGS EITHER STATING "INSTALLED AS SHOWN" OR "AS SHOWN AS APPROVED BY THE ENGINEER OF RECORD." APPROVED BY THE ENGINEER OF RECORD. COLOR FORMS APPROVING ALL CHANGES SHALL BE SUBMITTED WHEN THE COW IS SPECIFIED. ADDITIONAL INSPECTION DESCRIPTIONS AND APPLICABLE STANDARDS SHALL BE APPLIED.
<b>POST-CONSTRUCTION</b>		
X	CEB-SOW-10007	LETTER FROM THE GENERAL CONTRACTOR STATING THAT THE REINFORCEMENT WAS PERFORMED TO THE CONTRACTORS WITH INDUSTRY STANDARDS AND THESE CONTRACT DRAWINGS, INCLUDING LISTING ADDITIONAL PARTIES TO THE MODIFICATION PROCESS.
NA	CEB-PRC-10119	POST INSTALLED ANCHOR ROD PULL TESTS
X	CEB-SOW-10007	PHOTOGRAPHS
NA	CEB-SOW-10007	BOLT INSTALLATION VERIFICATION REPORT
X	CEB-SOW-10007	PUNCHLIST DEVELOPMENT AND CORRECTION DOCUMENTATION
X	CEB-SOW-10007	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
X	CEB-SOW-10127	FACT TA INSPECTION
X	CEB-SOW-10127	CONCEALMENT REINFORCING SOLUTION

PROJECT NO:	37014-004-017170
DRAWN BY:	CC
DESIGNED BY:	MT
CHECKED BY:	B.K.K.
DATE:	2-20-09

**GENERAL NOTES**

**N-1**

**1. GENERAL NOTES**

- 1.1. THE MONOPOLE STRUCTURE IN ITS EXISTING CONDITION DOES NOT HAVE THE STRUCTURAL CAPACITY TO CARRY ALL OF THE PROPOSED AND EXISTING LOADS FROM THE COMPLETELY AND SUCCESSFULLY INSTALLED.
- 1.2. THESE DRAWINGS WERE PREPARED FROM INFORMATION PROVIDED BY CROWN CASTLE. THE INFORMATION PROVIDED HAS NOT BEEN FIELD VERIFIED BY THE ENGINEER OF RECORD (EOR) FOR ACCURACY AND THEREFORE THE ENGINEER HAS NOT BEEN ADVISED OF ANY CHANGES OR DIMENSIONS. BEFORE PROCEEDING WITH THE WORK, THE CONTRACTOR SHALL IMMEDIATELY REPORT ANY AND ALL DISCREPANCIES TO THE EOR AND CROWN CASTLE BEFORE PROCEEDING WITH THE WORK. ANY WORK PERFORMED WITHOUT A PRELIMINARY MAPPING IS DONE AT THE RISK OF THE CONTRACTOR AND/OR THE FABRICATOR.
- 1.3. IF MATERIALS, QUANTITIES, STRENGTHS OR SIZES INDICATED BY THE DRAWINGS OR SPECIFICATIONS ARE NOT IN AGREEMENT WITH THESE NOTES, THE BETTER QUALITY AND/OR HIGHER CAPACITY SHALL TAKE PRECEDENCE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE CORRECT INFORMATION FROM THE EOR AND CROWN CASTLE.
- 1.4. COMPLETED. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO ENSURE THE SAFETY AND STABILITY OF THE MONOPOLE AND ITS COMPONENT PARTS BEFORE FIELD MATERIAL SHALL BE REMOVED AND SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AFTER THE COMPLETION OF THE PROJECT.
- 1.5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF THE EXISTING UTILITIES AND SHALL TAKE ALL NECESSARY MEASURES TO AVOID DAMAGE TO EXISTING UTILITIES, FEDERAL, STATE, AND LOCAL REGULATIONS, AND ANY APPLICABLE INDUSTRY STANDARDS RELATED TO THE CONSTRUCTION ACTIVITIES BEING PERFORMED. ALL REGULATIONS FOR CLASSIFICATION OF THE SUPPORTING STRUCTURE IN ACCORDANCE WITH THE REGULATIONS OF THE PROJECTED REGULATIONS ON THE CONSTRUCTION PROCEDURE. ANY SUPPORT SERVICES PROVIDED BY THE EOR DURING CONSTRUCTION ARE SOLELY FOR THE PURPOSE OF ACHIEVING GENERAL CONFORMANCE WITH THE CONTRACT DOCUMENTS. THEY DO NOT GUARANTEE THE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF THE CONSTRUCTION.
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- 1.7. THE CONTRACTOR IS RESPONSIBLE TO ENGINEER THAT THIS PROJECT AND RELATED WORK COMPLETES WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY CODES AND REGULATIONS GOVERNING THIS WORK AS WELL AS CROWN CASTLE SAFETY GUIDELINES.
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**2. STRUCTURAL STEEL**

- 2.1. BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC):
  - 2.1.1. SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS
  - 2.1.2. SPECIFICATION FOR STRUCTURAL STEEL BOLTS, NUTS, AND WELDING ELECTRODES
  - 2.1.3. SPECIFICATION FOR STRUCTURAL STEEL SHAPES AND SECTIONS
  - 2.1.4. SPECIFICATION FOR STRUCTURAL STEEL PLATES
  - 2.1.5. SPECIFICATION FOR STRUCTURAL STEEL TUBES
- 2.2. STANDARD SYMBOLS FOR WELDING, BRACING, AND NONSTRUCTURAL EXAMINATION
- 2.3. ANY MATERIAL OF WORKMANSHIP WHICH IS OBSERVED TO BE DEFECTIVE OR INCONSISTENT WITH THE CONTRACT DOCUMENTS SHALL BE CORRECTED, MODIFIED, OR RE-PLACED AT THE CONTRACTOR'S EXPENSE.
- 2.4. ALL WELD CONNECTIONS SHALL CONFORM TO THE LATEST REVISED CODE OF THE AMERICAN WELDING SOCIETY, AWS D1.1. ALL WELD ELECTRODES SHALL BE BBOX UNLESS OTHERWISE SPECIFIED.
- 2.5. TO CROWN CASTLE'S TESTING AGENCY FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
- 2.6. STRUCTURAL STEEL PLATES SHALL CONFORM TO ASTM A572 GRADE 60 (60 KSI MINIMUM) UNLESS NOTED OTHERWISE ON THE DRAWINGS.
- 2.7. SURFACES OF EXISTING STEEL SHALL BE PREPARED AS REQUIRED BY THE AISC AND AWS SPECIFICATIONS AS WELL AS ALL APPLICABLE LOCAL, STATE, AND FEDERAL REGULATIONS.
- 2.8. NO WELDS SHALL BE MADE TO THE EXISTING STRUCTURE WITHOUT THE PRIOR APPROVAL AND SUPERVISION OF THE TESTING AGENCY.
- 2.9. FIELD CUTTING OF STEEL
- 2.9.1. IMPORTANT CUTTING AND WELDING SAFETY GUIDELINES: THE CONTRACTOR SHALL FOLLOW ALL CROWN CASTLE CUTTING WELDING, PREPARATION AND SAFETY GUIDELINES. ALL CUTTING AND WELDING ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH CROWN CASTLE POLICY CUTTING AND WELDING SAFETY PLAN (DCL # ENR-PL-010) ON AN ONGOING BASIS THROUGHOUT THE ENTIRE LIFE OF THE PROJECT. ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE, RESULTING FROM THE CONTRACTOR'S ACTIVITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. THE INSPECTING/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.
- 2.9.2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF THE EXISTING UTILITIES AND SHALL TAKE ALL NECESSARY MEASURES TO AVOID DAMAGE TO EXISTING UTILITIES, FEDERAL, STATE, AND LOCAL REGULATIONS, AND ANY APPLICABLE INDUSTRY STANDARDS RELATED TO THE CONSTRUCTION ACTIVITIES BEING PERFORMED. ALL REGULATIONS FOR CLASSIFICATION OF THE SUPPORTING STRUCTURE IN ACCORDANCE WITH THE REGULATIONS OF THE PROJECTED REGULATIONS ON THE CONSTRUCTION PROCEDURE. ANY SUPPORT SERVICES PROVIDED BY THE EOR DURING CONSTRUCTION ARE SOLELY FOR THE PURPOSE OF ACHIEVING GENERAL CONFORMANCE WITH THE CONTRACT DOCUMENTS. THEY DO NOT GUARANTEE THE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF THE CONSTRUCTION.

**3. TOUCH UP OF GALVANIZING**

- 3.1. THE CONTRACTOR SHALL TOUCH UP ANY AND ALL AREAS OF GALVANIZING ON THE EXISTING STRUCTURE OR NEW COMPONENTS THAT ARE DAMAGED OR ABRASION DURING CONSTRUCTION. GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS ANY AND ALL ABRASIONS, CUTS, FIELD DRILLING, AND ALL FIELD WELDING SHALL BE TOUCHED UP WITH TWO COATS OF ZINC COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE 30 MILS DRY 1.5 MILS WET. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY APPROVALS FROM ALL APPLICABLE LOCAL, STATE, AND FEDERAL REGULATIONS.
- 3.2. FACTORS THAT MAY AFFECT THE QUALITY OF GALVANIZING INCLUDE: CONTAMINATION OF GALVANIZED SURFACES FOR TOUCH-UP COATING IN ACCORDANCE WITH AWS D1.1. GALVANIZING SHALL BE APPLIED TO ALL GALVANIZED SURFACES TO BE TOUCH-UP COATED.
- 3.3. CROWN CASTLE'S TESTING AGENCY SHALL VERIFY THE PREPARED SURFACE PRIOR TO APPLICATION OF THE TOUCH-UP COATING.
- 3.4. CROWN CASTLE'S TESTING AGENCY SHALL TEST AND VERIFY THE COATING THICKNESS AFTER THE CONTRACTOR HAS APPLIED THE ZINC COLD GALVANIZING COMPOUND AND IT HAS SUFFICIENTLY DRIED. AREAS FOUND TO BE ADEQUATELY COATED, SHALL BE RE-TOUCHED BY THE CONTRACTOR AND RE-TESTED BY THE TESTING AGENCY.

**4. HOT-DIP GALVANIZING**

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

**5. PERIODICAL INSPECTION AND MAINTENANCE BY THE OWNER**

- 5.1. AFTER THE CONTRACTOR HAS SUCCESSFULLY COMPLETED THE INSTALLATION OF THE MONOPOLE REINFORCING SYSTEM AND THE WORK HAS BEEN ACCEPTED BY CROWN CASTLE, CROWN CASTLE WILL BE RESPONSIBLE FOR THE LONG TERM AND PERIODICAL INSPECTION AND MAINTENANCE OF THE POLE AND REINFORCING SYSTEMS. THE FREQUENCY OF INSPECTION AND MAINTENANCE SHALL BE DETERMINED BY CROWN CASTLE AND SHALL BE BASED ON THE INSPECTION AND MAINTENANCE RECORDS OF THE REINFORCING SYSTEM. THE FREQUENCY OF INSPECTION AND MAINTENANCE SHALL BE BASED ON THE INSPECTION AND MAINTENANCE RECORDS OF THE REINFORCING SYSTEM.
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**6. FIELD MINIMUM REQUIREMENTS**

- 6.1. ALL WELDS SHALL BE IN ACCORDANCE WITH AWS D1.1.
- 6.2. FOR NEW STEEL JOINTS (WELDED OR BOLTED) ALL WELDS SHALL BE 100% INSPECTED BY UT.
- 6.3. FOR NEW FLAT PLATE REINFORCEMENT AT THE BASE OF THE TOWER, COMPLETE JOINT PENETRATION WELDS SHALL BE 100% INSPECTED BY UT. ALL PARTIAL JOINT PENETRATION AND FILLET WELDS SHALL BE 100% INSPECTED BY MT, BUT MAY BE LIMITED TO A HEIGHT OF 10'-0".
- 6.4. FOR THE EXISTING BASE PLATE CIRCUMFERENTIAL WELD, CC SHALL REPERE THE MACHINIST FOR APPLICABILITY. PLEASE SEE ENGINEERING DRAWING TOWER BASE WELDING DETAIL. ALL WELDS SHALL BE 100% INSPECTED BY UT. ALL WELDS SHALL BE 100% INSPECTED BY UT. ALL WELDS SHALL BE 100% INSPECTED BY UT.
- 6.5. ALL TESTING LIMITATIONS SHALL BE DETAILED IN THE NDE REPORT.

**7. FOUNDATION WORK - NOT REQUIRED**

- 7.1. FOUNDATION WORK - NOT REQUIRED
- 7.2. FOUNDATION WORK - NOT REQUIRED
- 7.3. FOUNDATION WORK - NOT REQUIRED
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**8. CAST-IN-PLACE CONCRETE - NOT REQUIRED**

- 8.1. CAST-IN-PLACE CONCRETE - NOT REQUIRED
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**9. EPOXY GROUTED REINFORCING ANCHOR BOLTS - NOT REQUIRED**

- 9.1. EPOXY GROUTED REINFORCING ANCHOR BOLTS - NOT REQUIRED
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- 10.1. BASE PLATE GROUT - NOT REQUIRED
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- 12.9. FIELD CUTTING OF STEEL
- 12.9.1. IMPORTANT CUTTING AND WELDING SAFETY GUIDELINES: THE CONTRACTOR SHALL FOLLOW ALL CROWN CASTLE CUTTING WELDING, PREPARATION AND SAFETY GUIDELINES. ALL CUTTING AND WELDING ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH CROWN CASTLE POLICY CUTTING AND WELDING SAFETY PLAN (DCL # ENR-PL-010) ON AN ONGOING BASIS THROUGHOUT THE ENTIRE LIFE OF THE PROJECT. ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE, RESULTING FROM THE CONTRACTOR'S ACTIVITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. THE INSPECTING/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.
- 12.9.2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF THE EXISTING UTILITIES AND SHALL TAKE ALL NECESSARY MEASURES TO AVOID DAMAGE TO EXISTING UTILITIES, FEDERAL, STATE, AND LOCAL REGULATIONS, AND ANY APPLICABLE INDUSTRY STANDARDS RELATED TO THE CONSTRUCTION ACTIVITIES BEING PERFORMED. ALL REGULATIONS FOR CLASSIFICATION OF THE SUPPORTING STRUCTURE IN ACCORDANCE WITH THE REGULATIONS OF THE PROJECTED REGULATIONS ON THE CONSTRUCTION PROCEDURE. ANY SUPPORT SERVICES PROVIDED BY THE EOR DURING CONSTRUCTION ARE SOLELY FOR THE PURPOSE OF ACHIEVING GENERAL CONFORMANCE WITH THE CONTRACT DOCUMENTS. THEY DO NOT GUARANTEE THE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF THE CONSTRUCTION.

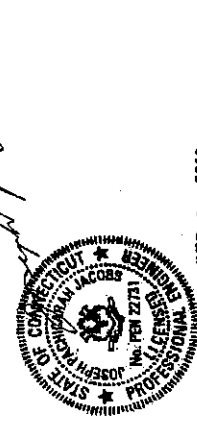
**13. TOUCH UP OF GALVANIZING**

- 13.1. THE CONTRACTOR SHALL TOUCH UP ANY AND ALL AREAS OF GALVANIZING ON THE EXISTING STRUCTURE OR NEW COMPONENTS THAT ARE DAMAGED OR ABRASION DURING CONSTRUCTION. GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS ANY AND ALL ABRASIONS, CUTS, FIELD DRILLING, AND ALL FIELD WELDING SHALL BE TOUCHED UP WITH TWO COATS OF ZINC COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE 30 MILS DRY 1.5 MILS WET. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY APPROVALS FROM ALL APPLICABLE LOCAL, STATE, AND FEDERAL REGULATIONS.
- 13.2. FACTORS THAT MAY AFFECT THE QUALITY OF GALVANIZING INCLUDE: CONTAMINATION OF GALVANIZED SURFACES FOR TOUCH-UP COATING IN ACCORDANCE WITH AWS D1.1. GALVANIZING SHALL BE APPLIED TO ALL GALVANIZED SURFACES TO BE TOUCH-UP COATED.
- 13.3. CROWN CASTLE'S TESTING AGENCY SHALL VERIFY THE PREPARED SURFACE PRIOR TO APPLICATION OF THE TOUCH-UP COATING.
- 13.4. CROWN CASTLE'S TESTING AGENCY SHALL TEST AND VERIFY THE COATING THICKNESS AFTER THE CONTRACTOR HAS APPLIED THE ZINC COLD GALVANIZING COMPOUND AND IT HAS SUFFICIENTLY DRIED. AREAS FOUND TO BE ADEQUATELY COATED, SHALL BE RE-TOUCHED BY THE CONTRACTOR AND RE-TESTED BY THE TESTING AGENCY.

**14. HOT-DIP GALVANIZING**

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

REV	DATE	DESCRIPTION
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FEB 08 2019

*Handwritten signature and initials*

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**PAUL J. FORD & COMPANY**  
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 www.pauljford.com

**CROWN CASTLE**  
 3 CORPORATE PARK DRIVE SUITE 101 CLIFTON PARK, NY 12065  
 PH: (518) 370-4700

**BU #826927-STRUCTURE A,  
 REDDING/RT7  
 RIDGEFIELD, CONNECTICUT  
 MODIFIED 100'-0" MONOPOLE**

PROJECT NO: 30150244001700  
 DRAWN BY: MNT  
 DESIGNED BY: BJK  
 CHECKED BY: BJK  
 DATE: 2/26/19

**MONOPOLE  
 PROFILE**

**S-1**

**MANUFACTURER POLE SPECIFICATIONS**

TAPER	NA
BASE PLATE STEEL	ASTM A36 (60 KSI)
ANCHOR RODS	1" ASTM A307
FLANGE PLATE STEEL	ASTM A572 (60 KSI)
FLANGE BOLTS	1" A325

**SHAFT SECTION DATA**

SHAFT SECTION	SECTIONAL LENGTH (FT)	PLATE THICKNESS (IN)	LAP SPACE (FT)	DIAMETER AT TOP (IN)	DIAMETER AT BOTTOM (IN)	GRADE (IN)	POLE SHAPE
1	16.00	0.4000	0.000	8.000	6.000	36	ROUND
2	20.00	0.4500	0.000	8.500	6.500	36	ROUND
3	32.00	0.5750	0.000	10.000	8.000	42	ROUND
4	30.00	0.5750	0.000	10.000	8.000	42	ROUND

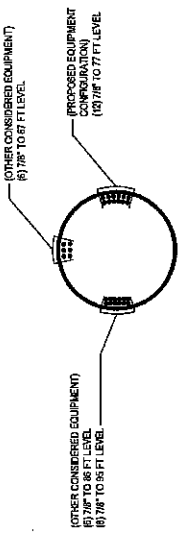
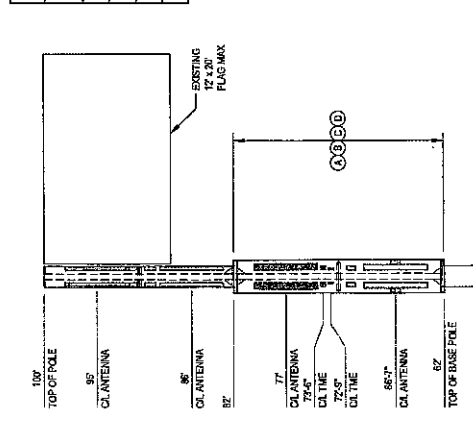
NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

PRIOR TO FABRICATION AND INSTALLATION CONTRACTORS 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 STATING WITH "CO" - SEE CATALOG FOR DETAILS. CEC-CAT-10300, MONOPOLE STANDARD DRAWINGS AND APPROVED REINFORCEMENT COMPONENTS

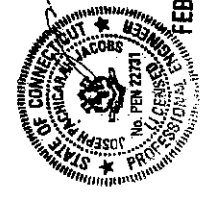
- EXISTING CONCEALMENT SHROUDS TO BE REMOVED AND REPLACED WITH THE NEW CONCEALMENT SHROUDS.
- NEW CONCEALMENT BULKHEADS ARE TO BE BOLTED TO EXISTING CONCEALMENT SPINE. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS PRIOR TO FABRICATION AND INSTALLATION.
- CONTRACTOR SHALL SEND PAUL J. FORD & COMPANY THE FABRICATION DRAWINGS FOR APPROVAL PRIOR TO MANUFACTURING.
- CONTRACTOR TO COORDINATE EQUIPMENT SHUT DOWN AND CONCEALMENT REMOVAL WITH CROWN CASTLE PROJECT PM AND CARRIERS. CONTRACTOR TO PROVIDE SCHEDULE THAT MINIMIZES DOWN TIME FOR CUSTOMER SYSTEMS. TEMPORARY POLES OR COWS MAY BE REQUIRED DURING THE INSTALLATION OF THE NEW CONCEALMENT AND MODIFICATIONS.
- ALL EXISTING COAX SHALL BE REMOVED PRIOR TO INSTALLATION OF THE NEW CONCEALMENT AND SHAFT REINFORCING. UPON COMPLETION COAX SHALL BE REINSTALLED. NEW COAX MAY BE REQUIRED. COORDINATE COAX INSTALLATION WITH PROJECT PM.

**TOWER MODIFICATION SCHEDULE**

ELEVATION	TOWER MODIFICATION DESCRIPTION	REFERENCE SHEETS
S2 TO S4	REMOVE EXISTING CONCEALMENT BULKHEADS AND SHROUDS	S-1
S2 TO S4	INSTALL NEW CONCEALMENT BULKHEADS AND SHROUDS	S-2 TO S-4
S2 TO S4	INSTALL CONCEALMENT REINFORCING SOLUTION PER CROWN CASTLE DOC: OPS-PROC-0127	S-1
S2 TO S4	PAINT MODIFICATIONS TO MATCH EXISTING POLE	S-1



**COAX LAYOUT**



CROWN CASTLE US PATENT NOS. 8,046,972 & 8,156,712, 7,840,659, 8,426,350 AND PATENT PENDING

**POLE ELEVATION 1**

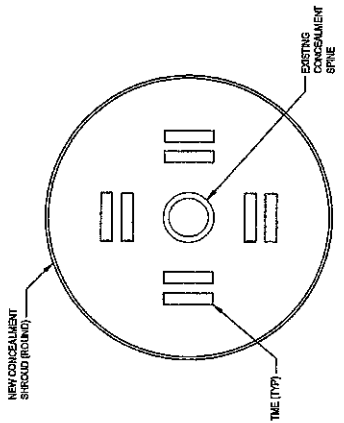
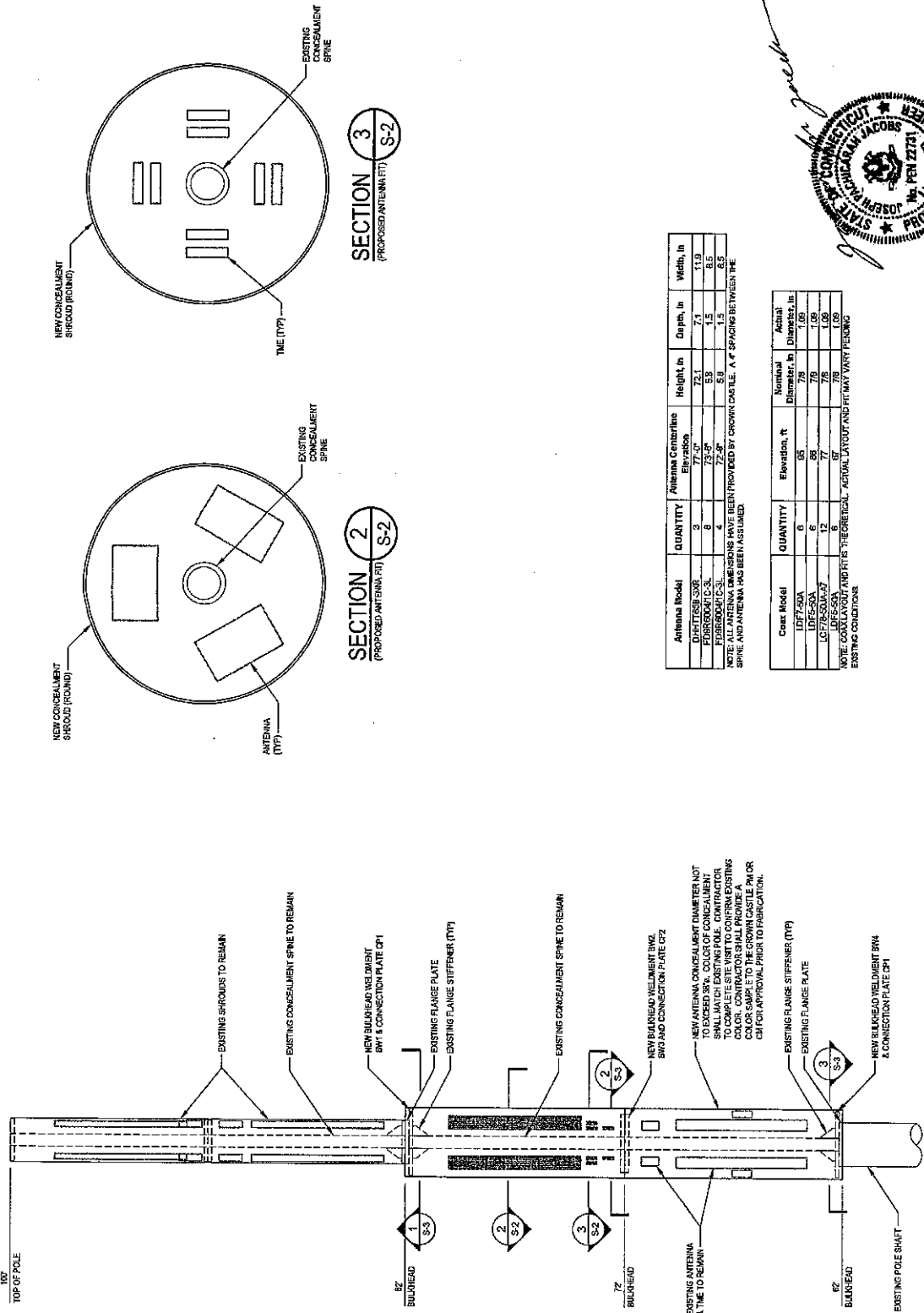
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 Phone 614.221.6679 www.pauljford.com  
 3 CORPORATE PARK DRIVE SUITE 101 CLIFTON PARK, NY 12065  
 PH: (518) 970-4766

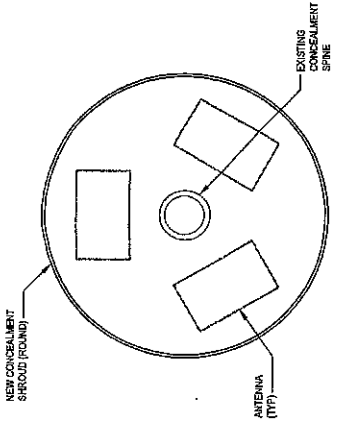
**CROWN CASTLE**  
 RIDGFIELD, CONNECTICUT  
 REDDING/RT7  
 BU #826927-STRUCTURE A:  
 MODIFIED 100'-0" MONOPOLE

**CONCEALMENT ELEVATION DETAILS**  
**S-2**

PROJECT No: 31519-004.001.0706  
 DRAWN BY: [Signature]  
 DESIGNED BY: [Signature]  
 CHECKED BY: JAK  
 DATE: 2-2-2019



**SECTION 3**  
 (PROPOSED ANTENNA FIT) **S-2**



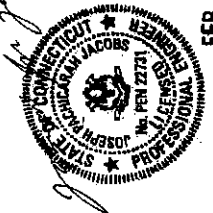
**SECTION 2**  
 (PROPOSED ANTENNA FIT) **S-2**

Antenna Model	QUANTITY	Antenna Characteristics	Height, In	Depth, In	Width, In
DRITTSER-S3R	3	71'-0"	72.1	7.1	11.9
FURRODOUT C-3L	8	73'-0"	53	1.5	8.5
FURRODOUT C-3L	4	72'-0"	5.9	1.5	8.5

NOTE: ALL ANTENNA DIMENSIONS HAVE BEEN PROVIDED BY CROWN CASTLE. A 4" SPACING BETWEEN THE SPINE AND ANTENNA HAS BEEN ASSUMED.

Cruc Model	QUANTITY	Elevation, ft	Nominal Diameter, In	Actual Diameter, In
LD7-S2A	6	85	78	1.09
LD5-S2A	6	86	78	1.09
LD7-S2A-W3	12	77	78	1.09

NOTE: COIL LAYOUT AND FITS TO THE CRUCIAL. ACTUAL LAYOUT AND FITS MAY VARY FROM EXISTING CONDITIONS.



FEB 08 2019

**PARTIAL ELEVATION 1**  
**S-2**

REV / DATE / DESCRIPTION



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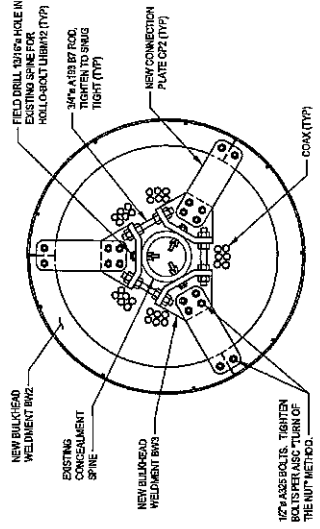
**PJF PAUL J. FORD & COMPANY**  
250 E Broad St, Ste 600 Columbus, OH 43215  
Phone 614.221.6679 www.pjford.com

**BU #826927-STRUCTURE A;  
REDDING/RT7  
RIDGEFIELD, CONNECTICUT  
MODIFIED 100'-0" MONOPOLE**

PROJECT NO.	2019-0244-001.DWG
DRAWN BY:	DC
DESIGNED BY:	MJ
CHECKED BY:	JAC
DATE:	2-20-19

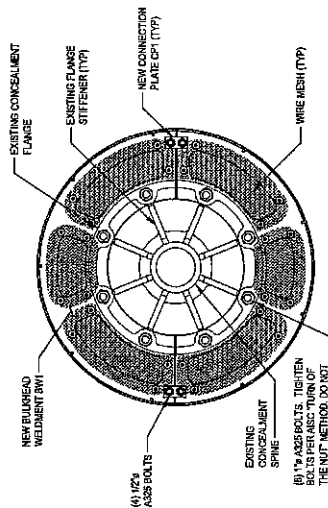
CONCEALMENT SECTIONS

S-3



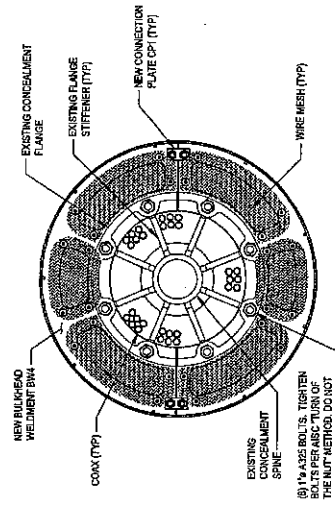
SECTION 2  
EL 72 (LOOKING DOWN) S-3

USE ALL SHEET METAL CONNECTORS INC. 1/2" x 1/2" ZINC PLATED ALL WELLS. ALL BOLTS SHALL BE 1/2" DIA. 1/2" LONG. ALL BOLTS OPENING OUTSIDE OF BASE PALE. FASTEN TO BULKHEAD USING HULTI SAND 12-241 1/4" PHW AS OR APPROVED EQUIVALENT SELF DILLING SCREW AND 1" x 1/8" WASHERS WITH 1/4" HOLE.



SECTION 1  
EL 62 (LOOKING UP) S-3

NOTE: CONTRACTOR SHALL COORDINATE WITH CROWN CM AND PM ON BRIDGE DEFORMED SYSTEM TO BE PLACED AT TOP OF THE MESH



SECTION 3  
EL 62 (LOOKING DOWN) S-3



FEB 08 2019

REV	DATE	DESCRIPTION

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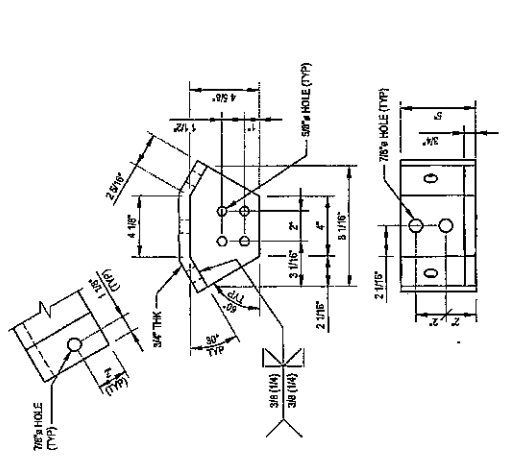
**CROWN CASTLE**  
 3 CORPORATE PARK DRIVE SUITE 101 CLIFTON PARK, NY 12565  
 PH (518) 370-1766

BU #826927-STRUCTURE A;  
 REDDING/RT  
 RIDGEFIELD, CONNECTICUT  
 MODIFIED 100'-0" MONOPOLE

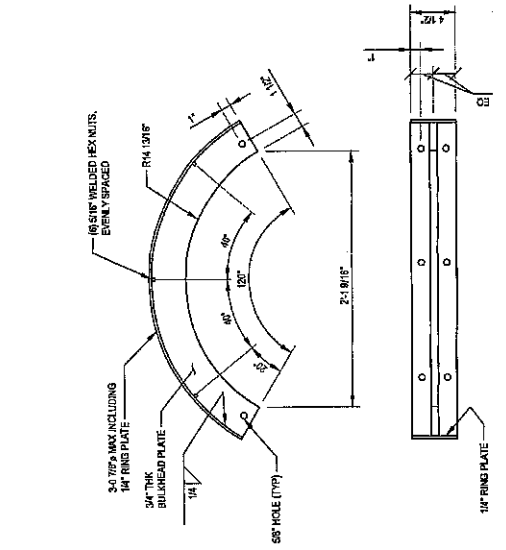
PROJECT No: 375194040017700  
 DRAWN BY: DC  
 DESIGNED BY: MIT  
 CHECKED BY: BKK  
 DATE: 2-2-2019

**BULKHEAD DETAILS**

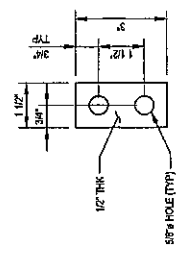
**S-4**



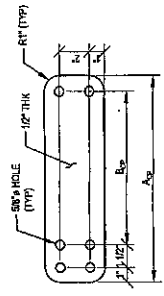
**BULKHEAD WELDMENT MK-BW3**  
 (2 REQUIRED) (ASTM A58)



**BULKHEAD WELDMENT MK-BW2**  
 (2 REQUIRED) (ASTM A58)

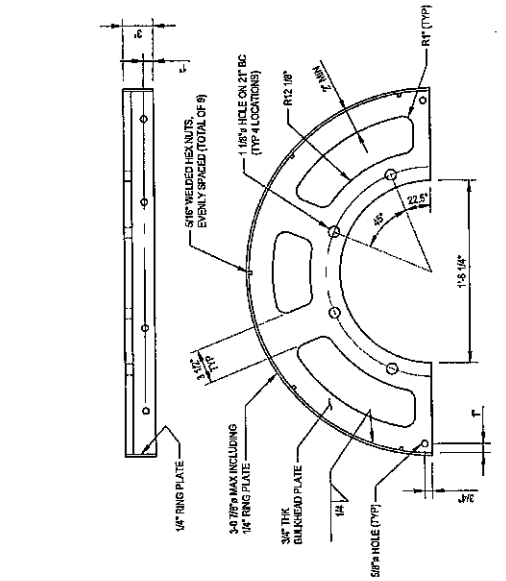


**CONNECTION PLATE MK-CP1**  
 (4 REQUIRED) (ASTM A58)

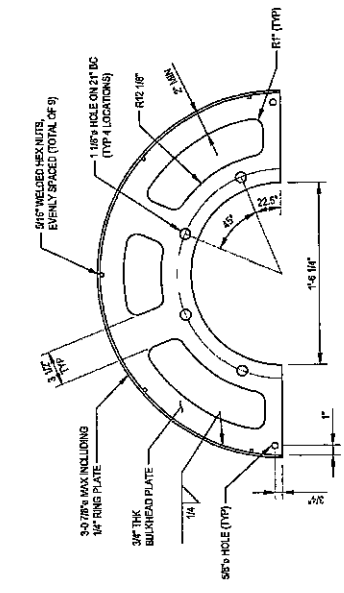


**CONNECTION PLATE**

CONNECTION PLATE					
PART #	GRADE	QTY	A <sub>58</sub> (IN)	B <sub>58</sub> (IN)	B <sub>58</sub> (IN)
CP2	ASTM A58	3	12	8	8.52



**BULKHEAD WELDMENT MK-BW1**  
 (2 REQUIRED) (ASTM A58)



**BULKHEAD WELDMENT MK-BW4**  
 (2 REQUIRED) (ASTM A58)



**FEB 08 2019**

REV DATE DESCRIPTION

# MODIFIED 100'-0" MONOPOLE

## BU #826927-STRUCTURE A; REDDING/RT7

845 ETHAN ALLEN HIGHWAY  
 RIDGEFIELD, CONNECTICUT 06877  
 FAIRFIELD COUNTY  
 LAT: 41° 18' 46.86"; LONG: -73° 28' 20.48"  
 ORDER: 410825 REV. 9; WO: 1683879

**PROJECT CONTACTS**  
 STRUCTURE OWNER:  
 CROWN CASTLE  
 MOD PM: DAN VADNEY AT DAN.VADNEY@CROWNCASTLE.COM  
 PH: (518) 373-3510  
 MOD CM: JASON D'AMICO AT JASON.DAMICO@CROWNCASTLE.COM  
 PH: (860) 209-0104  
 ENGINEER OF RECORD:  
 P.J.FORD@PAULJFORD.COM

**WIND DESIGN DATA**

REFERENCE STANDARD	ANSI/TIA-222-H
LOCAL CODE	2018 CBC
ULTIMATE WIND SPEED (3-SECOND GUST)	120 MPH
ICE THICKNESS	1.5 IN
SERVICE WIND SPEED	50 MPH
RISK CATEGORY	II
EXPOSURE CATEGORY	C
Kz1	1.0

**SHEET INDEX**

SHEET NUMBER	DESCRIPTION
T-1	TITLE SHEET
M-1	IM CHECKLIST AND NOTES
N-1	GENERAL NOTES
S-1	MONOPOLE PROFILE
S-2	CONCEALMENT ELEVATION DETAILS
S-3	CONCEALMENT SECTIONS
S-4	BULKHEAD DETAILS

**HOT WORK INCLUDED**

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

TOWER MANUFACTURER: PIRDD  
 TOWER MANUFACTURER #: 453438-B

THE ASSOCIATED FAILING SA WO NUMBER FOR THIS PROJECT IS 1688242

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 P.J.FORD@PAULJFORD.COM.

ATTENTION ALL CONTRACTORS: ANY TIME YOU ACCESS A CROWN SITE FOR ANY REASON YOU ARE TO CALL THE CROWN NOC UPON ARRIVAL AND DEPARTURE, DAILY AT (860) 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

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 PH: (665) 376-4766

BU #826927-STRUCTURE A;  
 REDDING/RT7  
 RIDGEFIELD, CONNECTICUT  
 MODIFIED 100'-0" MONOPOLE

PROJECT NO.: 37518044-001-1700  
 DRAWN BY: DC  
 DESIGNED BY: MTF  
 CHECKED BY: PJK  
 DATE: 2-2-2019

TITLE SHEET

T-1

REV	DATE	DESCRIPTION

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 PH. (518) 370-6166

**CROWN CASTLE**  
 RIDGEBELD, CONNECTICUT  
 REDDING/R17  
 BU #826927-STRUCTURE A,  
 MODIFIED 100-0 MONOPOLE

PROJECT No: 37516-024-MI-1700  
 DRAWN BY: DC  
 DESIGNED BY: BJK  
 CHECKED BY: BJK  
 DATE: 2-7-2019

MI CHECKLIST

**MI CHECKLIST**

REQUIRED	REPORT ITEM	BRIEF DESCRIPTION
	<b>MI CHECKLIST</b>	
	<b>APPLICABLE CROWN DOC #</b>	
	<b>PRE-CONSTRUCTION</b>	
X	IN CHECKLIST DRAWING	THIS CHECKLIST SHALL BE INCLUDED IN THE MI REPORT.
X	FOR APPROVED SHOP DRAWINGS	ONCE THE PRE-MODIFICATION MAPPING IS COMPLETE AND PRIOR TO FABRICATION, THE CONTRACTOR SHALL PROVIDE DETAILED ASSEMBLY DRAWINGS AND SHOP DRAWINGS. THESE ARE TO INCLUDE, BUT NOT BE LIMITED TO, A SET OF ALL NEW AND EXISTING TOWER AND BEARING ASSEMBLY DRAWINGS AND SHOP DRAWINGS. THESE DRAWINGS SHALL BE SUBMITTED TO THE MI INSPECTOR FOR REVIEW AND APPROVAL. ANY OTHER MISCELLANEOUS ITEMS WHICH MAY AFFECT SUCCESSFUL INSTALLATION OF MODIFICATIONS ON THE TOWER, THESE DRAWINGS SHALL BE SUBMITTED TO THE EOR FOR APPROVAL. APPROVED ASSEMBLY SHOP DRAWINGS SHALL BE SUBMITTED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	FABRICATION INSPECTION	A LETTER FROM THE FABRICATOR, STATING THAT THE WORK WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THE CONTRACT DOCUMENTS, SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	FABRICATOR-CERTIFIED WELD INSPECTION	A CWI SHALL INSPECT ALL WELDING PERFORMED ON STRUCTURAL MEMBERS DURING FABRICATION. A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	MATERIAL TEST REPORTS (MTR)	MATERIAL TEST REPORTS SHALL BE PROVIDED FOR MATERIAL USED AS REQUIRED PER SECTION 9.2.2 OF CED-SOW-1007. MTRs SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	FABRICATOR WELD INSPECTION REPORT	CRITICAL SHOP WELDS THAT REQUIRE TESTING ARE NOTED ON THESE CONTRACT DRAWINGS. A CERTIFIED WELD INSPECTOR SHALL PERFORM NON-DESTRUCTIVE EXAMINATION AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	NDE OF MONOPOLE BASE PLATE	A USE OF THE SOLE 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	THE MATERIAL SHIPPING LIST SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
	<b>ADDITIONAL TESTING AND INSPECTIONS:</b>	
	<b>CONSTRUCTION</b>	
NA	FOUNDATION INSPECTIONS	A VISUAL OBSERVATION OF THE EXCAVATION AND BEARER SHALL BE PERFORMED BEFORE PLACING THE CONCRETE. A VISUAL OBSERVATION OF THE BEARER SHALL BE PERFORMED BEFORE PLACING THE EXPOSURE. A SEALED WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	CONCRETE COMP. STRENGTH AND SLUMP TEST	THE CONCRETE MIX DESIGN, SLUMP TEST, AND COMPRESSIVE STRENGTH TESTS SHALL BE PROVIDED AS PART OF THE FOUNDATION REPORT.
NA	EARTHWORK	FOUNDATION SUB-GRADES SHALL BE INSPECTED AND APPROVED BY AN APPROVED FOUNDATION INSPECTOR AND RESULTS INCLUDED AS PART OF THE FOUNDATION REPORT.
NA	MICROPIER/ROCK ANCHOR	MICROPIER/ROCK ANCHORS SHALL BE INSPECTED BY THE FOUNDATION INSPECTOR VENDOR AND SHALL BE INCLUDED AS PART OF THE FOUNDATION INSPECTION REPORT. ADDITIONAL TESTING AND INSPECTION REQUIREMENTS ARE NOTED IN THESE CONTRACT DOCUMENTS.
NA	POST-INSTALLED ANCHOR ROD VERIFICATION	POST-INSTALLED ANCHOR ROD VERIFICATION SHALL BE PERFORMED IN ACCORDANCE WITH CROWN REQUIREMENTS AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	BASE PLATE GROUT VERIFICATION	THE GENERAL CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE MI INSPECTOR THAT CERTIFIES THAT THE GROUT WAS PROPERLY INSTALLED IN ACCORDANCE WITH CROWN REQUIREMENTS FOR INCLUSION IN THE MI REPORT.
NA	FIELD CERTIFIED WELD INSPECTION	WELDS SHALL BE PERFORMED AS REQUIRED BY CROWN STANDARDS AND CONTRACT DOCUMENTS. THE MI REPORT SHALL BE INCLUDED IN THE CWI REPORT.
X	ON-SITE COLD GALVANIZING VERIFICATION	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 TREST AND PLUMB	THE GENERAL CONTRACTOR SHALL SUBMIT A TENSILE COPY OF THE ORIGINAL DESIGN USING ASSUMES EITHER STAINING OR UNSTAINING WELDS. THE MI INSPECTOR SHALL OBSERVE AND REPORT ANY DISCREPANCIES BETWEEN THE CONTRACTORS HEADLINE DRAWING AND THE ACTUAL COMPLETED INSTALLATION.
X	GC AS-BUILT DRAWINGS	GC AS-BUILT DRAWINGS SHALL BE SUBMITTED WHEN THE WORK IS SPECIFYING ADDITIONAL INSPECTIONS DESCRIPTION AND APPLICABLE STANDARDS SHALL BE APPLIED.
	<b>ADDITIONAL TESTING AND INSPECTIONS:</b>	
	<b>POST-CONSTRUCTION</b>	
X	CONSTRUCTION COMPLIANCE LETTER	A LETTER FROM THE GENERAL CONTRACTOR STATING THAT THE WORK WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THESE CONTRACT DRAWINGS, INCLUDING LISTING ADDITIONAL PARTIES TO THE MODIFICATION PROCESS.
NA	POST-INSTALLED ANCHOR ROD FULL TESTS	ALL POST-INSTALLED ANCHOR RODS SHALL BE TESTED BY A CROWN APPROVED FULL TEST INSPECTOR AND A REPORT SHALL BE PROVIDED INDICATING TESTING RESULTS.
X	PHOTOGRAPHS	PHOTOGRAPHS SHALL BE SUBMITTED TO THE MI INSPECTOR WITH ALL 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 INSTALLATION VERIFICATION REPORT	THE MI INSPECTOR SHALL VERIFY THE INSTALLATION AND TIGHTNESS 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	PUNCHLIST DEVELOPMENT AND CORRECTION DOCUMENTATION	FINAL PUNCHLIST INDICATING ALL NONCONFORMANCES IDENTIFIED AND THE FINAL RESOLUTION AND APPROVAL.
X	MI INSPECTOR HEADLINE OR RECORD DRAWING(S)	THE MI INSPECTOR SHALL OBSERVE AND REPORT ANY DISCREPANCIES BETWEEN THE CONTRACTORS HEADLINE DRAWING AND THE ACTUAL COMPLETED INSTALLATION.
X	FACTIA INSPECTION	PERFORM FACTIA INSPECTION PER CROWN CASTLE DOC OPS-SOW-19127
X	CONCRETE REINFORCING SOLUTION	INSTALL CONCRETE REINFORCING SOLUTION PER CROWN CASTLE DOC OPS-SOW-19127 & OPS-PRC-19127

**GENERAL**  
 THE MI IS AN ON-SITE VISUAL AND HANDSON 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 ACCORDS 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 PART OF CONTACT (EOR/AN PCS) FOR EVALUATION.  
 ALL WORK SHALL BE CONDUCTED BY A CROWN APPROVED MI INSPECTOR, WORKING FOR A CROWN APPROVED MI VENDOR. SEE CROWN CED-SOW-1007, "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 COMMUNICATION 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 (POC).  
 REFER TO CROWN CED-SOW-1007, "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 2 BUSINESS DAYS NOTICE, PREFERABLY 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.  
 • WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RETENSIONING OPERATIONS.  
 • WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY MINOR CORRECTIONS IMMEDIATELY IDENTIFIED AND CORRECTED. THE GC MUST BE AVAILABLE TO ASSIST THE MI INSPECTOR IN OBTAINING ALL NECESSARY CONSTRUCTION FACILITIES AREA AT THEIR DISPOSAL WHEN THE MI INSPECTORS ARE 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 (SECTION AND INSPECTION)  
 • PHOTOS OF ALL CRITICAL DETAILS  
 • FOUNDATION MODIFICATIONS  
 • WELD PREPARATION  
 • BOLT INSTALLATION  
 • SURFACE COATING 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, PLEASE REFER TO CROWN DOCUMENT # CED-SOW-1007.

REV	DATE	DESCRIPTION

MI CHECKLIST

MI-1



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**RF PAUL J. FORD & COMPANY**  
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 12065 CROWN CASTLE  
 PH: (614) 970-4766

**BU #826927-STRUCTURE A:**  
 REDDING/RT7  
 RIDGFIELD, CONNECTICUT  
 MODIFIED 100'-0" MONOPOLE

PROJECT NO.: 2019-024-001-700  
 DRAWN BY: DC  
 DESIGNED BY: MIT  
 CHECKED BY: BKK  
 DATE: 2-7-2019

**MONOPOLE PROFILE**

**S-1**

**MANUFACTURER POLE SPECIFICATIONS**

TAPER	VA
BASE PLATE STEEL	ASTM A36 (58 KSI)
ANCHOR BOLTS	1" ASTM A307
FLANGE PLATE STEEL	ASTM A572 (50 KSI)
FLANGE BOLTS	1" A325

**SHAFT SECTION DATA**

SECTION	SECTION LENGTH (FT)	PLATE THICKNESS (IN)	LAP SPICE (FT)	DIAMETER ACROSS FLATS (IN)	@ TOP	@ BOTTOM	GRADE (ft)	POLE SHAPE
1	18.00	0.4930	6.625	6.225			35	ROUND
2	20.00	0.7500	6.750	6.750			35	ROUND
3	32.00	0.1350	24.000	24.000			42	ROUND
4	30.00	0.3780	24.000	24.000			42	ROUND

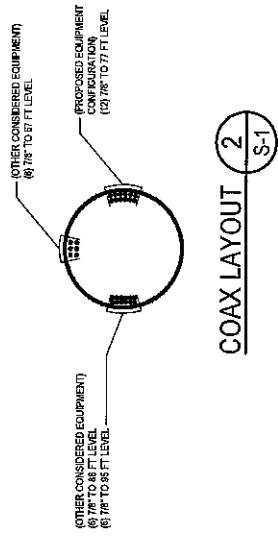
NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

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 "CCH", SEE CATALOG FOR DETAILS: CED-CAT-10300. MONO-POLE STANDARD DRAWINGS AND APPROVED REINFORCEMENT COMPONENTS.

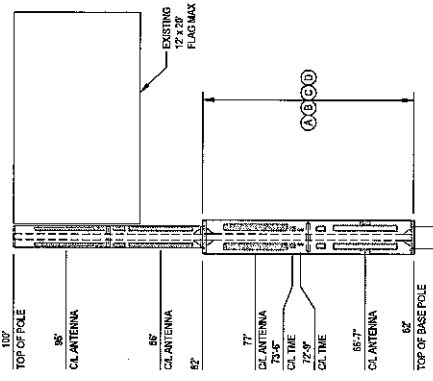
- EXISTING CONCEALMENT SHROUDS TO BE REMOVED AND REPLACED WITH THE NEW CONCEALMENT SHROUDS.
- NEW CONCEALMENT BULKHEADS ARE TO BE BOLTED TO EXISTING CONCEALMENT SPINE. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS PRIOR TO FABRICATION AND INSTALLATION.
- CONTRACTOR SHALL SEND PAUL J. FORD & COMPANY THE FABRICATION DRAWINGS FOR APPROVAL PRIOR TO MANUFACTURING.
- CONTRACTOR TO COORDINATE EQUIPMENT SHUT DOWN AND CONCEALMENT REMOVAL WITH CROWN CASTLE PROJECT PM AND CARRIERS. CONTRACTOR TO PROVIDE SCHEDULE THAT MINIMIZES DOWN TIME FOR CUSTOMER SYSTEMS. TEMPORARY POLES OR COWS MAY BE REQUIRED DURING THE INSTALLATION OF THE NEW CONCEALMENT AND MODIFICATIONS.
- ALL EXISTING COAX SHALL BE REMOVED PRIOR TO INSTALLATION OF THE NEW CONCEALMENT AND SHAFT REINFORCING. UPON COMPLETION COAX SHALL BE REINSTALLED. NEW COAX MAY BE REQUIRED. COORDINATE COAX INSTALLATION WITH PROJECT PM.

**TOWER MODIFICATION SCHEDULE**

ELEVATION	TOWER MODIFICATION DESCRIPTION	REFERENCE SHEETS
62 TO 67	REMOVE EXISTING CONCEALMENT BULKHEADS AND SHROUDS	S-1
67 TO 82	INSTALL NEW CONCEALMENT BULKHEADS AND SHROUDS	S-2 TO S-4
82 TO 87	INSTALL CONCEALMENT REINFORCING SOLUTION PER CROWN CASTLE DOC OPS-PRC-10127	S-1
87 TO 92	PAINT MODIFICATIONS TO MATCH EXISTING POLE	S-1



**COAX LAYOUT**  
 2  
 S-1



**POLE ELEVATION 1**  
 1  
 S-1

CROWN CASTLE US PATENT NOS. 8,448,972; 8,148,717; 7,946,855; & 8,242,955 AND PATENT PENDING

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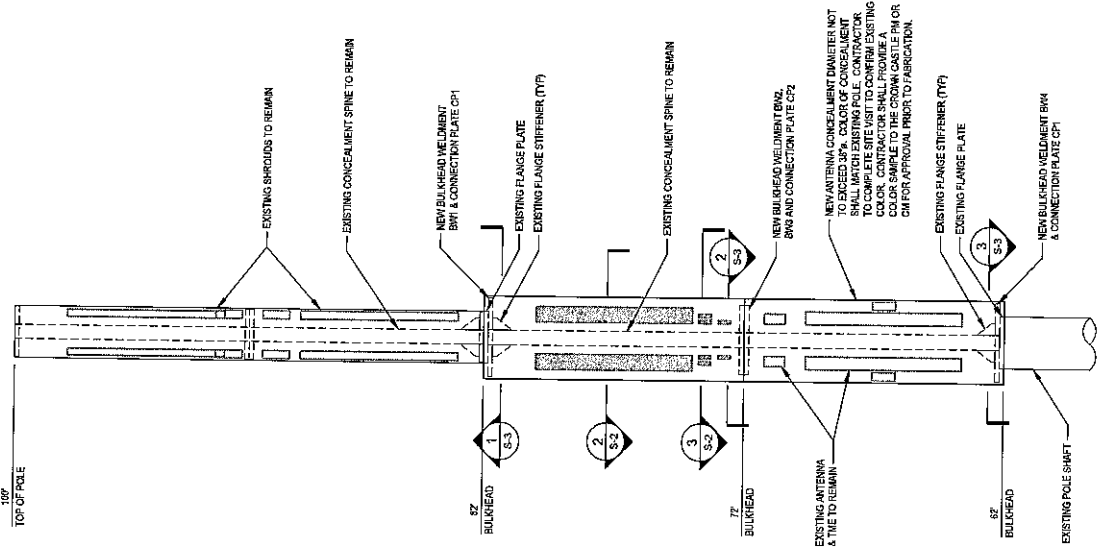
**CROWN CASTLE**  
 3 CORPORATE PARK DRIVE SUITE 101 CLIFTON PARK, NY 12065  
 PH: (855) 378-1765

**BU #826927-STRUCTURE A;  
 REDDING/RT  
 RIDGFIELD, CONNECTICUT  
 MODIFIED 100'-0" MONOPOLE**

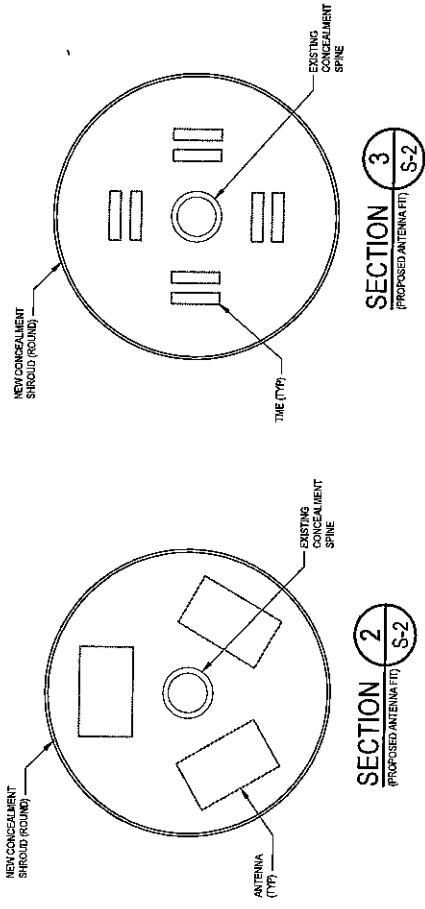
PROJECT NO: 37519-004A-001-1700  
 DRAWN BY: DC  
 DESIGNED BY: MJD  
 CHECKED BY: ZKK  
 DATE: 2-1-2018

**CONCEALMENT  
 ELEVATION  
 DETAILS**

**S-2**



**PARTIAL ELEVATION 1**  
 S-2



**SECTION 3**  
 (PROPOSED ANTENNA TYP)  
 S-2

**SECTION 2**  
 (PROPOSED ANTENNA TYP)  
 S-2

Antenna Model	QUANTITY	Antenna Centerline Elevation	Height, in	Depth, in	Width, in
DBHT155B-392	3	72.1	7.1	7.1	11.9
F538200A1-C-3L	8	72.5	7.5	7.5	8.3
F538200A1-C-3L	4	72.5	7.5	1.5	8.3

NOTE: ALL ANTENNA DIMENSIONS HAVE BEEN PROVIDED BY CROWN CASTLE. A 4" SPACING BETWEEN THE SPINE AND ANTENNA HAS BEEN ASSUMED.

Coax Model	QUANTITY	Elevation, ft	Nominal Diameter, in	Actual Diameter, in
LD77-50A	6	55	7/8	1.00
LD75-50A	6	86	7/8	1.00
LD77-50A-A7	12	77	7/8	1.00
LD75-50A	6	67	7/8	1.00

NOTE: COAX MODEL AND TYP IS THEORETICAL. ACTUAL LAYOUT AND FIT MAY VARY PERENDING EXISTING CONDITIONS.

REV	DATE	DESCRIPTION

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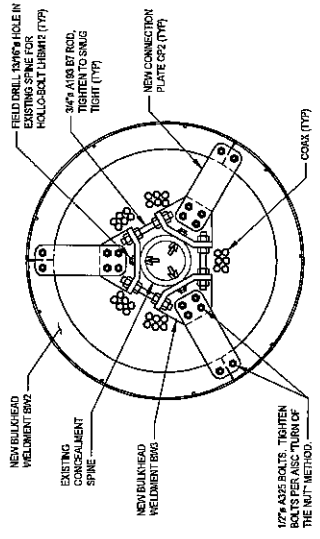
**CROWN CASTLE**

**BU #826927-STRUCTURE A:**  
 REDDING/RT7  
 RIDGEFIELD, CONNECTICUT  
 MODIFIED 100'-0" MONOPOLE

PROJECT NO: 37816-02410617102  
 DRAWN BY: MJT  
 DESIGNED BY: ZKZ  
 CHECKED BY: ZKZ  
 DATE: 2-2-2019

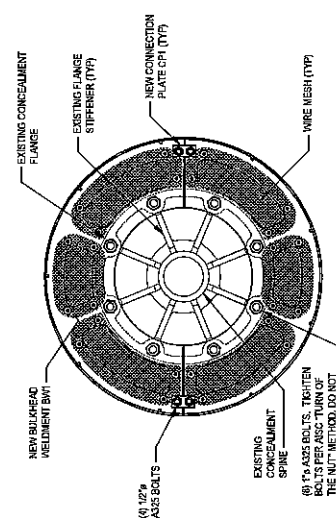
CONCEALMENT SECTIONS

S-3



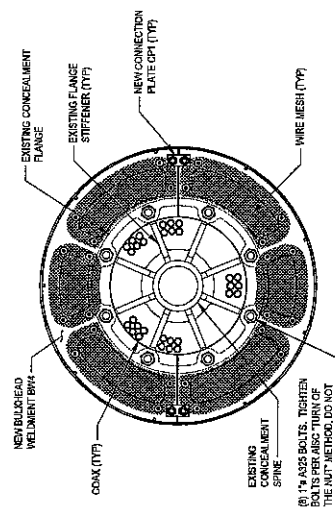
**SECTION 2**  
 EL 72 (LOOKING DOWN)  
 S-3

INSTALL WIRE MESH CONCEALMENT AND 1/2\"/>



**SECTION 1**  
 EL 87 (LOOKING UP)  
 S-3

NOTE: CONTRACTOR SHALL COORDINATE WITH CROWN CM AND PM ON BRIDGEMASTER SYSTEM TO BE PLACED TOP OF THE MESH



**SECTION 3**  
 EL 82 (LOOKING DOWN)  
 S-3

REV DATE DESCRIPTION



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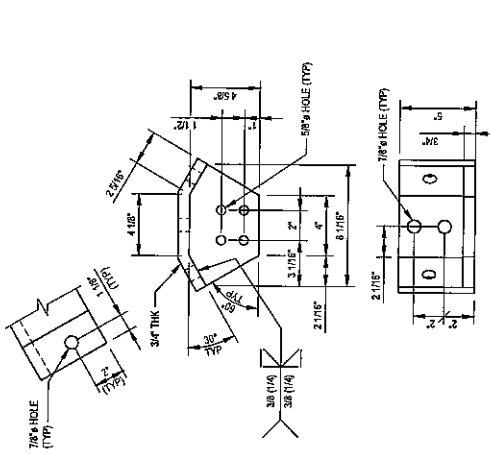
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**CROWN CASTLE**  
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**BU #826927-STRUCTURE A:**  
**REDDING/R17**  
**RIDGEFIELD, CONNECTICUT**  
**MODIFIED 100'-0" MONOPOLE**

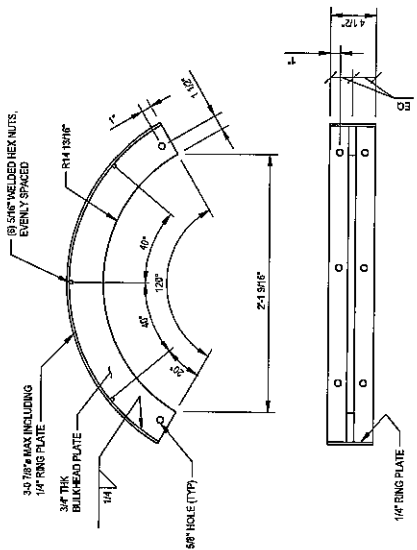
PROJECT No.: 375849-4406-1700  
 DRAWN BY: DC  
 CHECKED BY: MJT  
 DATE: 2/28/18

**BULKHEAD DETAILS**

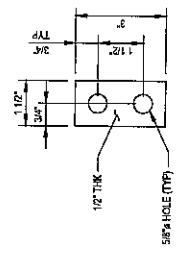
**S4**



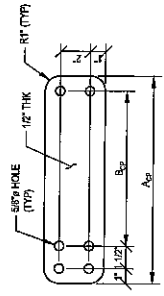
**BULKHEAD WELDMENT MK-BW3**  
 (3 REQUIRED) (ASTM A58)



**BULKHEAD WELDMENT MK-BW2**  
 (3 REQUIRED) (ASTM A58)

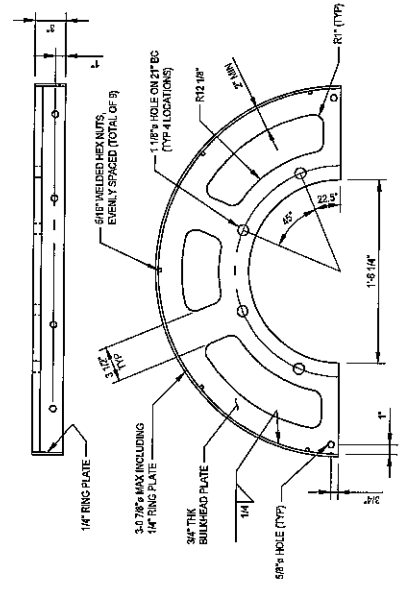


**CONNECTION PLATE MK-CP1**  
 (4 REQUIRED) (ASTM A58)

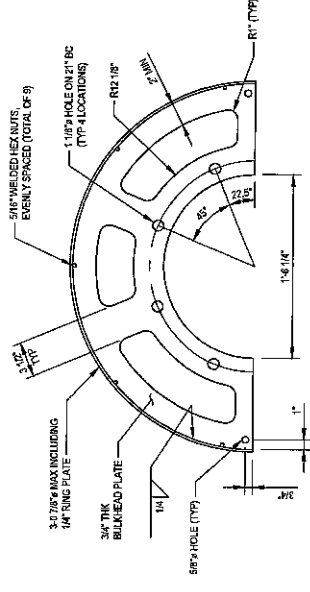


**CONNECTION PLATE**

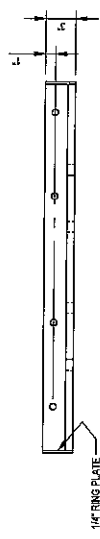
CONNECTION PLATE					
PART #	GRADE	QTY	A <sub>sp</sub> (IN)	B <sub>sp</sub> (IN)	
CP1	ASTM A58	3	12	8 1/2	



**BULKHEAD WELDMENT MK-BW1**  
 (2 REQUIRED) (ASTM A58)



**BULKHEAD WELDMENT MK-BW4**  
 (2 REQUIRED) (ASTM A58)



REV	DATE	DESCRIPTION

# MODIFIED 100'-0" MONOPOLE

## BU #826927-STRUCTURE A; REDDING/RT7

845 ETHAN ALLEN HIGHWAY  
RIDGEFIELD, CONNECTICUT 06877  
FAIRFIELD COUNTY

LAT: 41° 18' 46.86"; LONG: -73° 28' 20.48"  
ORDER: 410825 REV. 9; WO: 1683879

### PROJECT CONTACTS

STRUCTURE OWNER:  
CROWN CASTLE  
MCD PM: DAN VADNEY AT DAN.VADNEY@CROWNCastle.COM  
PH: (618) 373-3510  
MOD CM: JASON D'AMICO AT JASON.DAMICO@CROWNCastle.COM  
PH: (860) 208-0104  
ENGINEER OF RECORD:  
PJFORD@PAULJFORD.COM

### WIND DESIGN DATA

REFERENCE STANDARD	ANSI/TIA-222-H
LOCAL CODE	2018 CBC
ULTIMATE WIND SPEED (3-SECOND GUST)	120 MPH
ICE THICKNESS	1.5 IN
ICE WIND SPEED	50 MPH
SERVICE WIND SPEED	60 MPH
RISK CATEGORY	II
EXPOSURE CATEGORY	C
Kz1	1.0

SHEET NUMBER	DESCRIPTION
T-1	TITLE SHEET
M-1	M CHECKLIST AND NOTES
N-1	GENERAL NOTES
S-1	MONOPOLE PROFILE
S-2	CONCEALMENT ELEVATION DETAILS
S-3	CONCEALMENT SECTIONS
S-4	BULKHEAD DETAILS


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

TOWER MANUFACTURER: PIROD  
TOWER MANUFACTURER #: 453438-B

THE ASSOCIATED FAILING SA W/O NUMBER FOR THIS PROJECT IS 1686242

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 PJFORD@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 (860) 786-1011.



**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



MAR 29 2019

REV	DATE	DESCRIPTION

**PJF PAUL J. FORD & COMPANY**  
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BU #826927-STRUCTURE A;  
REDDING/RT7  
RIDGEFIELD, CONNECTICUT  
MODIFIED 100'-0" MONOPOLE

PROJECT NO:	SP19044-001770
DRAWN BY:	DC
DESIGNED BY:	MJT
CHECKED BY:	JAZ
DATE:	2/20/19

TITLE SHEET  
T-1



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PH (609) 370-4700

**BU #826927-STRUCTURE A;  
REDDING/R77  
RIDGFIELD, CONNECTICUT  
MODIFIED 100'-0" MONOPOLE**

PROJECT No: 37519-0244-001-1700  
DESIGN BY: DC  
CHECKED BY: MFT  
DATE: 2/29/18

**GENERAL NOTES**  
**N-1**

1. GENERAL NOTES
  - 1.1. ATTACHED STRUCTURE MODIFICATION REPORT. CHECK ALL SETBACKS, ENCROACHMENTS AND EXISTING LOADS FROM THE COMPLETELY AND SUCCESSFULLY INSTALLED REPORT. DO NOT INSTALL ANY NEW LOADS UNTIL THE REQUIRED ENGINEERING SYSTEMS ARE IN PLACE.
  - 1.2. THESE DIMENSIONS AND ACTUAL SITE CONDITIONS SHALL BE ANTICIPATED BY THE CONTRACTOR. THE CONTRACTOR SHALL VERIFY THE DIMENSIONS AND ACTUAL SITE CONDITIONS BEFORE PROCEEDING WITH THE WORK. ANY WORK PERFORMED WITHOUT A PREPARATION REPORT IS AT THE RISK OF THE GENERAL CONTRACTOR AND/OR THE FABRICATOR.
  - 1.3. THE CONTRACTOR SHALL VERIFY THE DIMENSIONS AND ACTUAL SITE CONDITIONS BEFORE PROCEEDING WITH THE WORK. ANY WORK PERFORMED WITHOUT A PREPARATION REPORT IS AT THE RISK OF THE GENERAL CONTRACTOR AND/OR THE FABRICATOR.
  - 1.4. THIS STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER THE INSTALLATION IS COMPLETED. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO OBTAIN THE SAFETY AND STABILITY OF THE MONOPOLE AND ITS COMPONENT PARTS DURING FIELD OPERATIONS. THIS INCLUDES, BUT IS NOT LIMITED TO, THE ADDITION OF TEMPORARY BRACING, GUYS OR DOWNES THAT MAY BE NECESSARY, SUCH AS BRACING, GUYS OR DOWNES TO REMAIN IN PLACE UNTIL THE STRUCTURE IS FULLY STABILIZED AND THE COMPLETION OF THE PROJECT.
  - 1.5. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE AMERICAN WELDING SOCIETY (AWS) D11.1, "STRUCTURAL STEEL FABRICATION AND WELDING" AND ANY APPLICABLE LOCAL, STATE AND FEDERAL SAFETY CODES AND REGULATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL, STATE AND FEDERAL AUTHORITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL, STATE AND FEDERAL AUTHORITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL, STATE AND FEDERAL AUTHORITIES.
  - 1.6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL, STATE AND FEDERAL AUTHORITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL, STATE AND FEDERAL AUTHORITIES.
  - 1.7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL, STATE AND FEDERAL AUTHORITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL, STATE AND FEDERAL AUTHORITIES.
  - 1.8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL, STATE AND FEDERAL AUTHORITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL, STATE AND FEDERAL AUTHORITIES.
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  - 1.10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL, STATE AND FEDERAL AUTHORITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL, STATE AND FEDERAL AUTHORITIES.
  - 1.11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL, STATE AND FEDERAL AUTHORITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL, STATE AND FEDERAL AUTHORITIES.
  - 1.12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL, STATE AND FEDERAL AUTHORITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL, STATE AND FEDERAL AUTHORITIES.
  - 1.13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL, STATE AND FEDERAL AUTHORITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL, STATE AND FEDERAL AUTHORITIES.
  - 1.14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL, STATE AND FEDERAL AUTHORITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL, STATE AND FEDERAL AUTHORITIES.
2. STRUCTURAL STEEL
  - 2.1. STRUCTURAL STEEL MATERIALS, FABRICATION, DETAILING AND WORKMANSHIP SHALL CONFORM TO THE LATEST EDITION OF THE FOLLOWING REFERENCE STANDARDS:
    - 2.1.1. BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC):
      - 2.1.1.1. SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS
      - 2.1.1.2. SPECIFICATION FOR STRUCTURAL STEEL BOLTS
      - 2.1.1.3. CODE OF STANDARD PRACTICES FOR STEEL BUILDINGS AND BRIDGES
    - 2.1.2. BY THE AMERICAN WELDING SOCIETY (AWS):
      - 2.1.2.1. STRUCTURAL WELDING CODE - STEEL D11.1
      - 2.1.2.2. STANDARD METHODS FOR WELDING, BRACING AND NONDESTRUCTIVE EXAMINATION
  - 2.2. STRUCTURAL JOINTS USING ASTM HIGH STRENGTH BOLTS (F1554, F1555) SHALL BE INSTALLED IN ACCORDANCE WITH THE PRELIMINARY CONDITIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL, STATE AND FEDERAL AUTHORITIES.
  - 2.3. ANY MATERIAL OR WORKMANSHIP WHICH IS OBSERVED TO BE DEFECTIVE OR INCONSISTENT WITH THE CONTRACT DOCUMENTS SHALL BE CORRECTED, MODIFIED, OR REPLACED AT THE CONTRACTOR'S EXPENSE.
  - 2.4. ALL WELDED CONNECTIONS SHALL BE MADE BY WELDERS CERTIFIED BY AWS. CONTRACTOR SHALL SUBMIT WELDERS' CERTIFICATION AND QUALIFICATION DOCUMENTATION TO CROWN CASTLE TESTING AGENCY FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
  - 2.5. TO CROWN CASTLE TESTING AGENCY FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
  - 2.6. STRUCTURAL STEEL PLATES SHALL CONFORM TO ASTM A572 GRADE 50 (F50) OR AS SHOWN ON THE DRAWINGS. ALL WELDED JOINTS SHALL BE WELDED PER AWS. SEE SECTION NOTES REGARDING TOUCH UP OF GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND REPAIRS.
  - 2.7. NO WELDING SHALL BE DONE TO THE EXISTING STRUCTURE WITHOUT THE PRIOR APPROVAL AND SUPERVISION OF THE TESTING AGENCY.
  - 2.8. FIELD CUTTING OF STEEL:
    - 2.8.1. ALL CUTTING AND WELDING ACTIVITIES SHALL FOLLOW ALL CROWN CASTLE CUTTING, WELDING, FIRE PREVENTION AND SAFETY GUIDELINES. ALL CUTTING AND WELDING ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH THE PRELIMINARY CONDITIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL, STATE AND FEDERAL AUTHORITIES.
    - 2.8.2. ALL CUTTING AND WELDING ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH THE PRELIMINARY CONDITIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL, STATE AND FEDERAL AUTHORITIES.
  - 2.9. THE CONTRACTOR SHALL TOUCH UP ANY AND ALL AREAS OF GALVANIZING ON THE EXISTING STRUCTURE OR NEW COMPONENTS THAT ARE DAMAGED OR REMOVED DURING CONSTRUCTION. GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS ANY AND ALL AREAS OF GALVANIZING SHALL BE TOUCHED UP WITH TWO (2) COATS OF ZINC COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE WET 3.0 MILS DRY 1.5 MILS. THE CONTRACTOR SHALL SUBMIT A TOUCH UP REPORT TO CROWN CASTLE TESTING AGENCY FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
  - 2.10. GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS ANY AND ALL AREAS OF GALVANIZING SHALL BE TOUCHED UP WITH TWO (2) COATS OF ZINC COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE WET 3.0 MILS DRY 1.5 MILS. THE CONTRACTOR SHALL SUBMIT A TOUCH UP REPORT TO CROWN CASTLE TESTING AGENCY FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
  - 2.11. GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS ANY AND ALL AREAS OF GALVANIZING SHALL BE TOUCHED UP WITH TWO (2) COATS OF ZINC COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE WET 3.0 MILS DRY 1.5 MILS. THE CONTRACTOR SHALL SUBMIT A TOUCH UP REPORT TO CROWN CASTLE TESTING AGENCY FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
3. TOUCHUP OF GALVANIZING
  - 3.1. THE CONTRACTOR SHALL TOUCH UP ANY AND ALL AREAS OF GALVANIZING ON THE EXISTING STRUCTURE OR NEW COMPONENTS THAT ARE DAMAGED OR REMOVED DURING CONSTRUCTION. GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS ANY AND ALL AREAS OF GALVANIZING SHALL BE TOUCHED UP WITH TWO (2) COATS OF ZINC COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE WET 3.0 MILS DRY 1.5 MILS. THE CONTRACTOR SHALL SUBMIT A TOUCH UP REPORT TO CROWN CASTLE TESTING AGENCY FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
  - 3.2. GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS ANY AND ALL AREAS OF GALVANIZING SHALL BE TOUCHED UP WITH TWO (2) COATS OF ZINC COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE WET 3.0 MILS DRY 1.5 MILS. THE CONTRACTOR SHALL SUBMIT A TOUCH UP REPORT TO CROWN CASTLE TESTING AGENCY FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
  - 3.3. GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS ANY AND ALL AREAS OF GALVANIZING SHALL BE TOUCHED UP WITH TWO (2) COATS OF ZINC COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE WET 3.0 MILS DRY 1.5 MILS. THE CONTRACTOR SHALL SUBMIT A TOUCH UP REPORT TO CROWN CASTLE TESTING AGENCY FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
4. HOT-DIP GALVANIZING
  - 4.1. HOT-DIP GALVANIZE ALL STRUCTURAL STEEL MEMBERS AND ALL STEEL ACCESSORIES, BOLTS, WASHERS, ETC. PER ASTM A153 OR PER ASTM A152 OR PER ASTM A151, AS APPROPRIATE.
  - 4.2. PROPERLY PREPARE STEEL ITEMS FOR GALVANIZING. DRILL OR PUNCH KEYS AND/OR DRAINAGE HOLES WITH ECR APPROVAL OF LOCATIONS.
  - 4.3. ALL GALVANIZING SHALL BE DONE AFTER FABRICATION IS COMPLETED AND PRIOR TO FIELD INSTALLATION.

MAR 29 2019



*[Handwritten Signature]*

REV | DATE | DESCRIPTION

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

**CROWN CASTLE**  
 3 CORPORATE PARK DRIVE SUITE 101 CLINTON PARK, NY 12065  
 PH: (885) 974-0766

PROJECT NO: 8259-004-001-706  
 DRAWN BY: DC  
 DESIGNED BY: MIT  
 CHECKED BY: ZKK  
 DATE: 8-2018

**MONOPOLE PROFILE**

**S-1**

BU #826927-STRUCTURE A:  
 REDDING/R17  
 RIDGFIELD, CONNECTICUT  
 MODIFIED 100'-0" MONOPOLE

**MANUFACTURER POLE SPECIFICATIONS**

TOWER	NO.
BASE PLATE STEEL	ASTM A36 (58 KSI)
ANCHOR RODS	1/2" ASTM A687
FLANGE PLATE STEEL	ASTM A572 (50 KSI)
FLANGE BOLTS	1/2" A525

**SHAFT SECTION DATA**

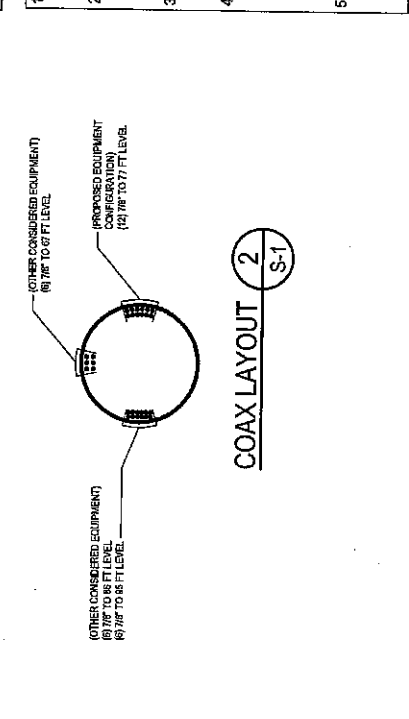
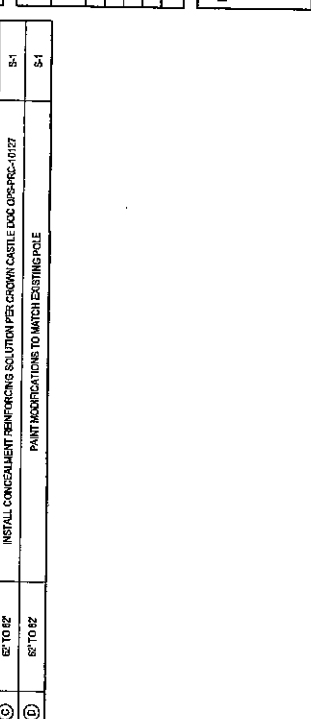
SHAFT SECTION	SECTION LENGTH (FT)	PLATE THICKNESS (IN)	LAP SPICE (FT)	DIAMETER ACROSS FLATS (IN)		POLE GRADE (IN)	POLE SHAPE
				@ TOP	@ BOTTOM		
1	18.00	0.4039	6.625	6.625	36	ROUND	
2	23.00	0.7500	6.750	6.750	36	ROUND	
3	32.00	0.3750	24.000	24.000	42	ROUND	
4	30.00	0.3750	24.000	24.000	42	ROUND	

NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

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 "CCL", SEE CATALOG FOR DETAILS. CCL-CAT-1020A, MONOPOLE STANDARD DRAWINGS AND APPROVED REINFORCEMENT COMPONENTS.

**TOWER MODIFICATION SCHEDULE**

ELEVATION	TOWER MODIFICATION DESCRIPTION	REFERENCE SHEETS
82' TO 82'	REMOVE EXISTING CONCEALMENT BULKHEADS AND SHROUDS	S-1
82' TO 82'	INSTALL NEW CONCEALMENT BULKHEADS AND SHROUDS	S-2 TO S-4
82' TO 82'	INSTALL CONCEALMENT REINFORCING SOLUTION PER CROWN CASTLE DOC. CDS-PRC-10127	S-1
82' TO 82'	PAINT MODIFICATIONS TO MATCH EXISTING POLE	S-1



1. EXISTING CONCEALMENT SHROUDS TO BE REMOVED AND REPLACED WITH THE NEW CONCEALMENT SHROUDS.

2. NEW CONCEALMENT BULKHEADS ARE TO BE BOLTED TO EXISTING CONCEALMENT SPINE. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS PRIOR TO FABRICATION AND INSTALLATION.

3. CONTRACTOR SHALL SEND PAUL J. FORD & COMPANY THE FABRICATION DRAWINGS FOR APPROVAL PRIOR TO MANUFACTURING.

4. CONTRACTOR TO COORDINATE EQUIPMENT SHUT DOWN AND CONCEALMENT REMOVAL WITH CROWN CASTLE PROJECT PM AND CARRIERS. CONTRACTOR TO PROVIDE SCHEDULE THAT MINIMIZES DOWN TIME FOR CUSTOMER SYSTEMS. TEMPORARY POLES OR COWS MAY BE REQUIRED DURING THE INSTALLATION OF THE NEW CONCEALMENT AND MODIFICATIONS.

5. ALL EXISTING COAX SHALL BE REMOVED PRIOR TO INSTALLATION OF THE NEW CONCEALMENT AND SHAFT REINFORCING. UPON COMPLETION COAX SHALL BE REINSTALLED. NEW COAX MAY BE REQUIRED. COORDINATE COAX INSTALLATION WITH PROJECT PM.

STATE OF CONNECTICUT  
 JOSEPH M. JACOBS  
 No. PEN 27373  
 PROFESSIONAL ENGINEER  
 MAR 29 2019

DESCRIPTION

REF. DATE

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

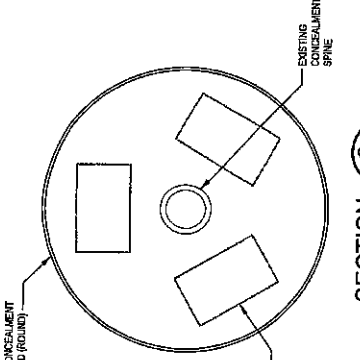
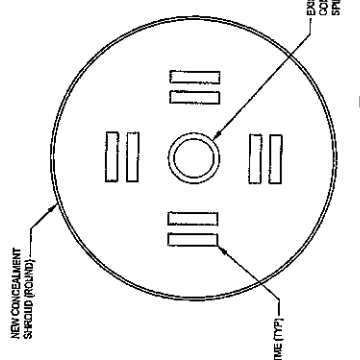
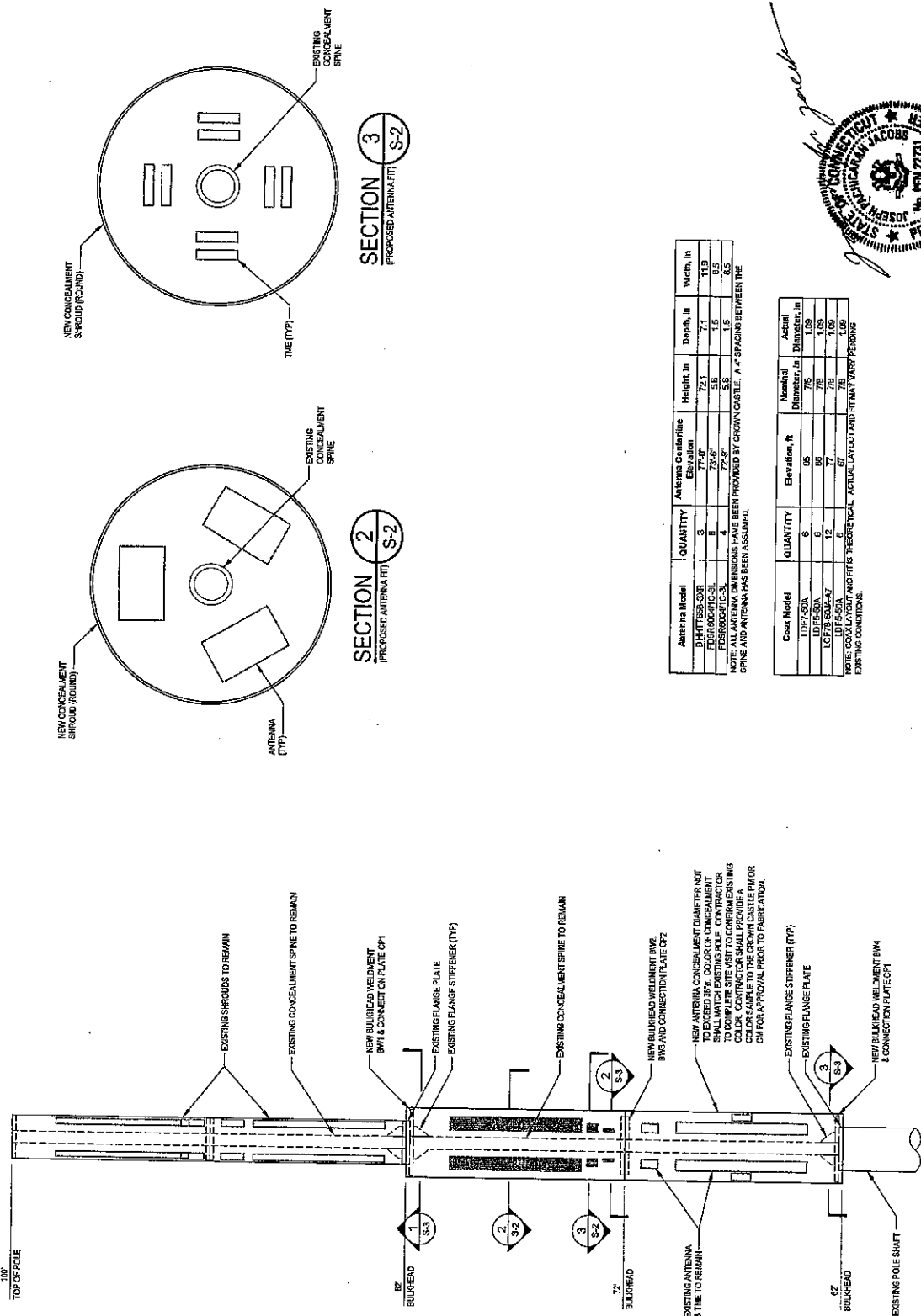
**CROWN CASTLE**  
 3 CORPORATE PARK DRIVE SUITE 101 CLIFTON PARK, NY 11785  
 PH: (845) 378-4786

**BU #826927-STRUCTURE A:**  
 REDDING/RT7  
 RIDGFIELD, CONNECTICUT  
 MODIFIED 100'-0" MONOPOLE

PROJECT No: 305194044.001/206  
 DRAWN BY: JAC  
 DESIGNED BY: JAC  
 CHECKED BY: JAC  
 DATE: 02-20-19

CONCEALMENT  
 ELEVATION  
 DETAILS

**S-2**

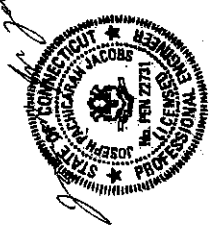


Antenna Model	QUANTITY	Antenna Centerline Elevation	Height, in	Depth, in	Width, in
DH1755-30R	3	77'-0"	72.1	7.1	11.9
DH1755-30L	3	75'-6"	51.8	1.5	8.5
LCF78-S04-A7	4	75'-6"	53	1.5	8.5

NOTE: ALL ANTENNA DIMENSIONS HAVE BEEN PROVIDED BY CROWN CASTLE. A 4" SPACING BETWEEN THE SPINE AND ANTENNA HAS BEEN ASSUMED.

Case Model	QUANTITY	Elevation, ft	Monthal Diameter, in	Actual Diameter, in
LD12-S0A	6	65	7.8	1.09
LD12-S0A	6	72	7.8	1.09
LD12-S0A	6	79	7.8	1.09
LD12-S0A	6	86	7.8	1.09

NOTE: COOLAYOUT AND PFS THEORETICAL. ACTUAL LAYOUT AND FIT MAY VARY PER VARIOUS CONDITIONS.



MAR 29 2019

REV DATE DESCRIPTION

**PARTIAL ELEVATION 1**  
**S-2**

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**PJF PAUL J. FORD & COMPANY**  
 250 E Broad St, Ste 600 Columbus, OH 43215  
 Phone 614.221.6879 www.pauljford.com

**CROWN CASTLE**  
 3 CORPORATE PARK DRIVE SUITE 101 CLIFTON PARK, NY 12058  
 PH: (518) 370-4188

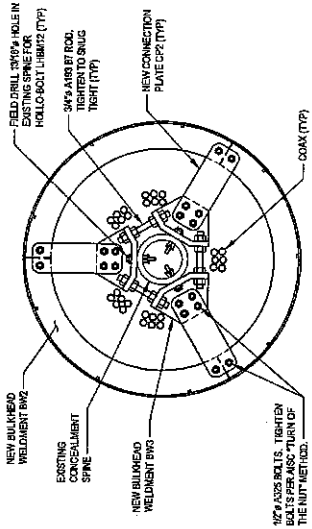
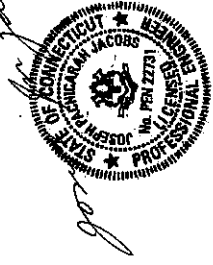
**BU #826927-STRUCTURE A;  
 REDDING/RTT  
 RIDGEFIELD, CONNECTICUT  
 MODIFIED 100'-0" MONOPOLE**

PROJECT No: 37519-2019-01/770  
 DRAWN BY: DC  
 CHECKED BY: AMT  
 DATE: 2-7-2019

**CONCEALMENT  
 SECTIONS**

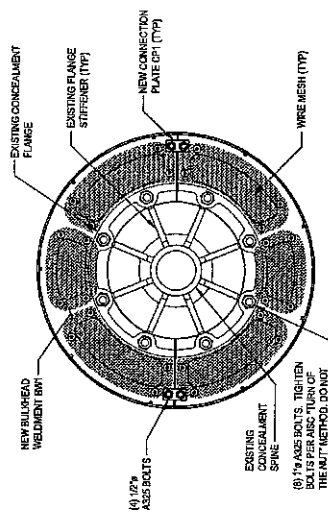
**S-3**

**MAR 29 2019**



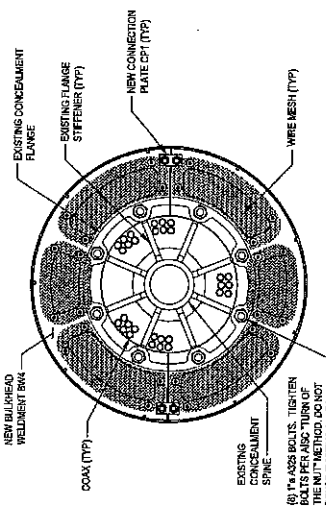
**SECTION 2**  
 EL 12' (LOADING DOWN)  
 S-3

INSTALL SHEET METAL CONNECTORS, INC. 1/2" x 1/2" ZINC PLATED OPENING LUGS OR CASE HARDENED EQUIVALENT TO COVER OPENING. LUGS OR CASE HARDENED EQUIVALENT MUST BE HELD TO S.A.M.S. 12.241.14 IN HWY 65 OR APPROVED EQUIVALENT SELF DRILLING SCREWS AND 1/8" x 1/8" WASHERS WITH 1/8" HOLE.



**SECTION 1**  
 EL 12' (LOOKING UP)  
 S-3

NOTE: CONTRACTOR SHALL COORDINATE WITH CROWN CH AND/OR BRIDG DETERMINE SYSTEM TO BE PLACED AT TOP OF THE MESH.



**SECTION 3**  
 EL 12' (LOADING DOWN)  
 S-3

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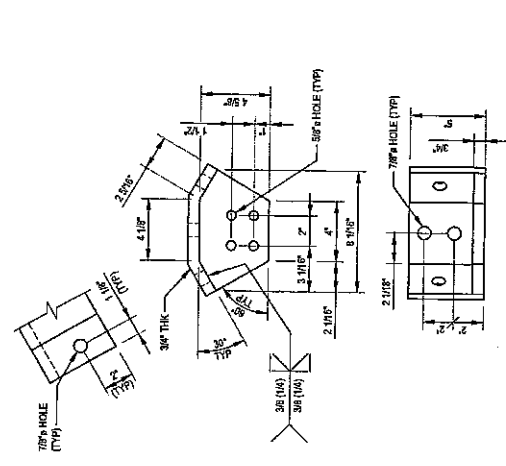
**PJF PAUL J. FORD & COMPANY**  
 250 E Broad St., Ste 600 - Columbus, OH 43215  
 Phone 614.221.6679 www.pjfu.com  
**CROWN CASTLE**  
 3 CORPORATE PARK DRIVE SUITE 101 CUYTON PARK, NY 12085  
 NY 12085 370-0706

**BU #826927-STRUCTURE A;  
 REDDING/RT7  
 RIDGEFIELD, CONNECTICUT  
 MODIFIED 100'-0" MONOPOLE**

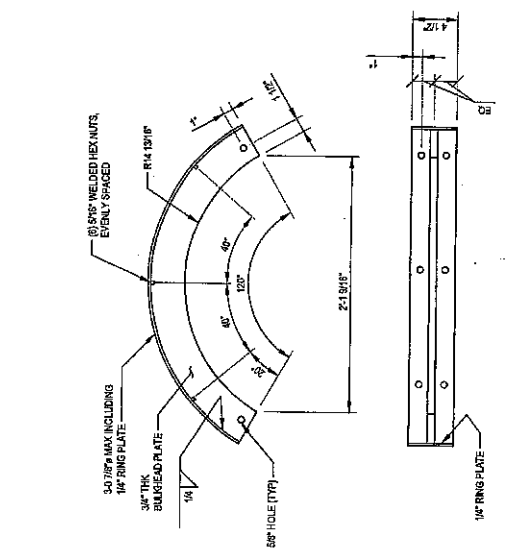
PROJECT NO: 37518-0014-001.700  
 DRAWN BY: MFT  
 DESIGNED BY: B.A.K.Z.  
 CHECKED BY: B.A.K.Z.  
 DATE: 2-7-2019

**BULKHEAD  
 DETAILS**

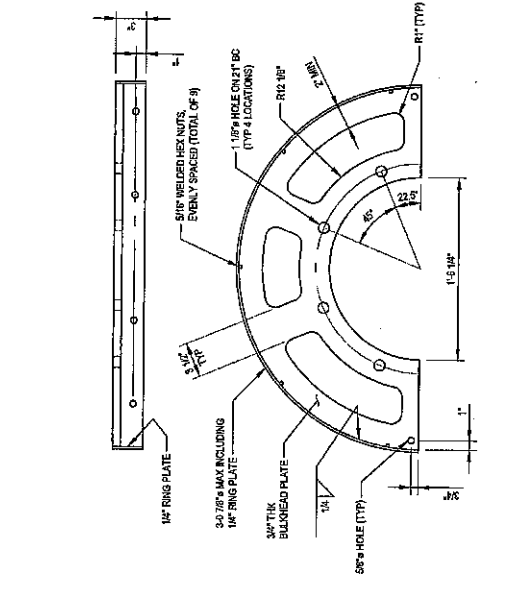
**S-4**



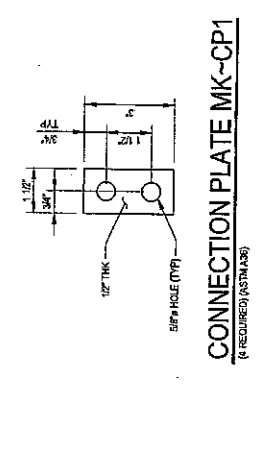
**BULKHEAD WELDMENT MK-BW3**  
 (2 REQUIRED) (ASTM A393)



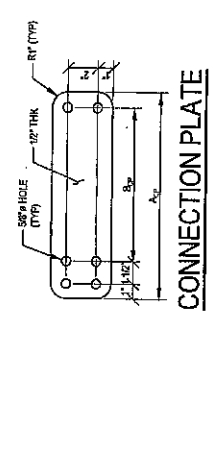
**BULKHEAD WELDMENT MK-BW2**  
 (2 REQUIRED) (ASTM A393)



**BULKHEAD WELDMENT MK-BW1**  
 (2 REQUIRED) (ASTM A393)

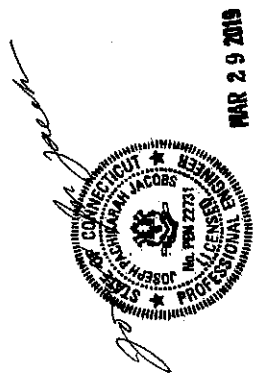


**CONNECTION PLATE MK-CP1**  
 (2 REQUIRED) (ASTM A393)



**CONNECTION PLATE**

CONNECTION PLATE				
PART #	GRADE	CITY	A <sub>3</sub> (IN)	B <sub>3</sub> (IN)
CP2	ASTM A393	3	12	8 1/2



**MAR 29 2019**

REV / DATE DESCRIPTION





# EBI Consulting

environmental | engineering | due diligence

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

SPRINT Existing Facility

Site ID: CT23XC384

Redding / Rt7  
845 Ethan Allen Highway  
Ridgefield, CT 06877

**April 8, 2019**

**EBI Project Number: 6219001012**

Site Compliance Summary	
Compliance Status:	<b>COMPLIANT</b>
Site total MPE% of FCC general population allowable limit:	<b>19.43 %</b>



April 8, 2019

SPRINT

Attn: RF Engineering Manager  
1 International Boulevard, Suite 800  
Mahwah, NJ 07495

Emissions Analysis for Site: **CT23XC384 – Redding / Rt7**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **845 Ethan Allen Highway, Ridgefield, CT**, for the purpose of determining whether the emissions from the Proposed SPRINT Antenna Installation located on this property are within specified federal limits.

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

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

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

General population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ( $\mu\text{W}/\text{cm}^2$ ). The general population exposure limits for the 850 MHz Band is approximately  $567 \mu\text{W}/\text{cm}^2$ . The general population exposure limit for the 1900 MHz (PCS) and 2500 MHz (BRS) bands is  $1000 \mu\text{W}/\text{cm}^2$ . Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.



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

Additional details can be found in FCC OET 65.

## CALCULATIONS

Calculations were done for the proposed SPRINT Wireless antenna facility located at **845 Ethan Allen Highway, Ridgefield, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since SPRINT is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

- 1) 2 LTE channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 50 Watts per Channel.
- 2) 4 LTE channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.
- 3) 3 LTE channels (2500 MHz (BRS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.
- 4) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.



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- 5) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 6) The antennas used in this modeling are the **Commscope DHHTT65B-3XR** for transmission in the 850 MHz, 1900 MHz (PCS) and 2500 MHz (BRS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 7) The antenna mounting height centerlines of the proposed panel antennas are **77 feet** above ground level (AGL) for **Sector A**, **77 feet** above ground level (AGL) for **Sector B** and **77 feet** above ground level (AGL) for Sector C.
- 8) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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



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## SPRINT Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Commscope DHHTT65B-3XR	Make / Model:	Commscope DHHTT65B-3XR	Make / Model:	Commscope DHHTT65B-3XR
Gain:	13.35 / 15.25 / 15.05 dBd	Gain:	13.35 / 15.25 / 15.05 dBd	Gain:	13.35 / 15.25 / 15.05 dBd
Height (AGL):	77 feet	Height (AGL):	77 feet	Height (AGL):	77 feet
Frequency Bands:	850 MHz / 1900 MHz (PCS) / 2500 MHz (BRS)	Frequency Bands:	850 MHz / 1900 MHz (PCS) / 2500 MHz (BRS)	Frequency Bands:	850 MHz / 1900 MHz (PCS) / 2500 MHz (BRS)
Channel Count:	9	Channel Count:	9	Channel Count:	9
Total TX Power (W):	380 Watts	Total TX Power (W):	380 Watts	Total TX Power (W):	380 Watts
ERP (W):	11,360.84	ERP (W):	11,360.84	ERP (W):	11,360.84
Antenna Eff. MPE%:	9.28 %	Antenna Eff. MPE%:	9.28 %	Antenna Eff. MPE%:	9.28 %

Site Composite MPE %	
Carrier	MPE%
SPRINT – Max per sector	9.28 %
AT&T	8.28 %
T-Mobile	1.87 %
<b>Site Total MPE %:</b>	<b>19.43 %</b>

SPRINT Sector A Total:	9.28 %
SPRINT Sector B Total:	9.28 %
SPRINT Sector C Total:	9.28 %
<b>Site Total:</b>	<b>19.43 %</b>

SPRINT Frequency Band / Technology (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ( $\mu\text{W}/\text{cm}^2$ )	Frequency (MHz)	Allowable MPE ( $\mu\text{W}/\text{cm}^2$ )	Calculated % MPE
Sprint 850 MHz LTE	2	1,081.36	77	15.42	850 MHz	567	2.72%
Sprint 1900 MHz (PCS) LTE	4	1,339.86	77	38.22	1900 MHz (PCS)	1000	3.82%
Sprint 2500 MHz (BRS) LTE	3	1,279.56	77	27.38	2500 MHz (BRS)	1000	2.74%
<b>Total:</b>							<b>9.28%</b>



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## Summary

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

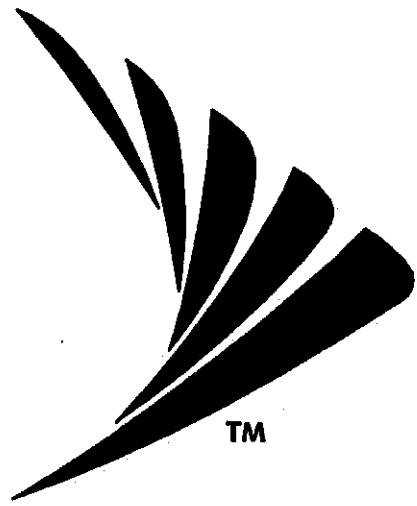
The anticipated maximum composite contributions from the SPRINT facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

SPRINT Sector	Power Density Value (%)
Sector A:	9.28 %
Sector B:	9.28 %
Sector C:	9.28 %
SPRINT Maximum MPE % (per sector):	9.28 %
Site Total:	19.43 %
Site Compliance Status:	<b>COMPLIANT</b>

The anticipated composite MPE value for this site assuming all carriers present is **19.43 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

# Sprint®



PROJE

SITE M

SITE C

CROWN

SITE A

SITE T

## SITE INFORMATION

### TOWER OWNER:

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

CROWN PROJECT MANAGER:  
SCOTT WIATROSKI: (201) 236-9228  
SCOTT.WIATROSKI@CROWNCastle.COM

CROWN CONSTRUCTION MANAGER:  
TRICIA PELON: (518) 373-3507  
TRICIA.PELON@CROWNCastle.COM

### SITE ADDRESS:

845 ETHAN ALLEN HIGHWAY  
RIDGEFIELD, CT 06877

### GEOGRAPHIC COORDINATES:

LATITUDE: 41°-18'-46.86" N, (41.313017)  
LONGITUDE: 73°-28'-20.48" W, (-73.472356)

### COUNTY:

FAIRFIELD COUNTY

### POWER COMPANY:

CONNECTICUT LIGHT & POWER  
(800) 286-2000

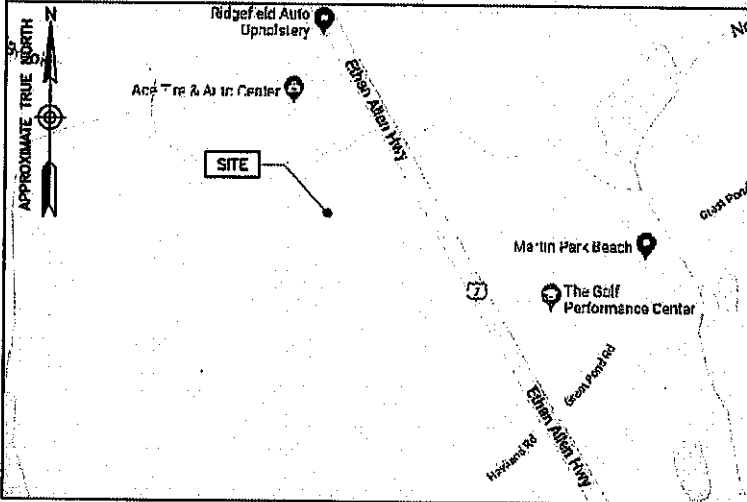
### TELCO PROVIDER:

LIGHTOWER  
(845) 458-7720

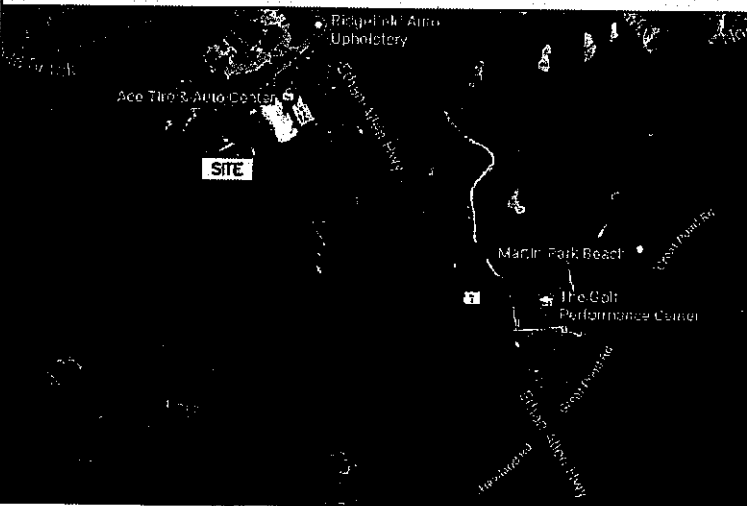
### SPRINT CONSTRUCTION MANAGER:

NAME: LIZ ROMAN  
E-MAIL: ELIZABETH.ROMAN@SPRINT.COM

## AREA MAP



## LOCATION MAP



## PROJ

- REMOVE (3) PANEL AN
- INSTALL (3) PANEL AN
- INSTALL (6) DIPLEXERS
- REMOVE (6) 1-1/4"
- INSTALL (12) 7/8" CC
- INSTALL (4) RRH'S AT
- INSTALL (6) DIPLEXERS
- INSTALL 2.5 EQUIPMENT EQUIPMENT PAD
- INSTALL BATTERY STRIN EQUIPMENT PAD
- INSTALL THIRD RAIL OF MANAGEMENT ENCLOSUR
- INSTALL (1) 2" CONDU ENCLOSURE TO EXISTING

## APP

- ALL WORK SHALL BE PERI ACCORDANCE WITH THE FC GOVERNING AUTHORITIES. TO PERMIT WORK NOT COI
- 1. BUILDING CODE: BUILDING
- 2. ANSI/TIA (TELECOMMUNIC STANDARDS FOR STEEL ANI STRUCTURES.
- 3. LIGHTNING PROTECTION COD
- 4. ELECTRICAL CODE: NATIONAL
- 5. FIRE/LIFE SAFETY CODE: FI
- 6. ANSI T1.311, FOR TELECOM ENVIRONMENTAL PROTECTION



THESE OUTLINE SPECIFICATIONS IN CONJUNCTION WITH THE SPRINT STANDARD CONSTRUCTION SPECIFICATIONS, INCLUDING CON  
CONTRACTOR.

### SECTION 01 100 - SCOPE OF WORK

#### THE WORK:

SHALL COMPLY WITH APPLICABLE NATIONAL CODES AND STANDARDS, LATEST EDITION, AND PORTIONS THEREOF. ALSO SEE SPRINT METHOD OF PROCEDURE (MOP) AND SPRINT STANDARDS AT THE TIME OF CONSTRUCTION START.

#### PRECEDENCE:

SHOULD CONFLICTS OCCUR BETWEEN THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES INCLUDING THE STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES AND THE CONSTRUCTION DRAWINGS, INFORMATION ON THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE ALONG WITH SPRINT CONSTRUCTION MANAGER APPROVAL.

#### SITE FAMILIARITY:

CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS PRIOR TO PROCEEDING WITH CONSTRUCTION.

#### ON-SITE SUPERVISION:

THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

#### DRAWINGS, SPECIFICATIONS AND DETAILS REQUIRED AT JOBSITE:

THE CONSTRUCTION CONTRACTOR SHALL MAINTAIN A FULL SET OF THE CONSTRUCTION DRAWINGS AT THE JOBSITE FROM MOBILIZATION THROUGH CONSTRUCTION COMPLETION.

- A. DETAILS ARE INTENDED TO SHOW DESIGN INTENT. PROVIDE ALL MATERIALS AND LABOR AS REQUIRED TO PROVIDE A COMPLETE AND FUNCTIONING SYSTEM. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK.
- B. CONTRACTOR SHALL NOTIFY SPRINT CONSTRUCTION MANAGER OF ANY VARIATIONS PRIOR TO PROCEEDING WITH THE WORK. DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS NOTED OTHERWISE. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK.
- C. MARK THE FIELD SET OF DRAWINGS IN RED, DOCUMENTING ANY CHANGES FROM THE CONSTRUCTION DOCUMENTS.

#### METHODS OF PROCEDURE (MOPS) FOR CONSTRUCTION:

CONTRACTOR SHALL PERFORM WORK AS DESCRIBED IN THE FOLLOWING INSTALLATION AND COMMISSIONING MOPS. CONTRACTOR IS RESPONSIBLE TO USE LATEST MOP'S.

- A. BASE BAND UNIT IN EXISTING UNIT
- B. INSTALLATION OF BATTERIES
- C. INSTALLATION OF FIBER CABLE
- D. INSTALLATION OF RRU'S
- E. CABLING
- F. TS-0200 REV 5 - ANTENNA LINE ACCEPTANCE STANDARDS
- G. SPRINT CELL SITE ENGINEERING NOTICE - EN 2012-001, REV 1.
- H. COMMISSIONING MOPS

### SECTION 01 200 - COMPANY FURNISHED MATERIAL AND EQUIPMENT

COMPANY FURNISHED MATERIAL AND EQUIPMENT IS IDENTIFIED ON THE RF DATA SHEET IN THE CONSTRUCTION DRAWINGS.

CONTRACTOR IS RESPONSIBLE FOR SPRINT PROVIDED MATERIAL AND EQUIPMENT TO ENSURE IT IS PROTECTED AND HANDLED PROPERLY THROUGHOUT THE CONSTRUCTION DURATION.

CONTRACTOR RESPONSIBLE FOR RECEIPT OF SPRINT FURNISHED EQUIPMENT AT CELL SITE OR CONTRACTORS LOCATION. CONTRACTOR TO COMPLETE SHIPPING AND RECEIPT DOCUMENTATION IN ACCORDANCE WITH COMPANY PRACTICE. CONTRACTOR MAY BE REQUIRED TO PICK UP MATERIAL AT LOCATION PRESCRIBED BY SPRINT.

### SECTION 01 300 - CELL SITE CONSTRUCTION CO.

#### NOTICE TO PROCEED:

NO WORK SHALL COMMENCE PRIOR TO COMPANY'S WRITTEN NOTICE TO PROCEED AND THE ISSUANCE OF WORK ORDER.

#### SITE CLEANLINESS:

CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH. AT THE COMPLETION OF THE WORK, CONTRACTOR SHALL REMOVE FROM THE SITE ALL REMAINING RUBBISH, IMPLEMENTS, TEMPORARY FACILITIES, AND SURPLUS MATERIALS.

### SECTION 01 400 - SUBMITTALS & TESTS

#### ALTERNATES:

AT THE COMPANY'S REQUEST, ANY ALTERNATIVES TO THE MATERIALS OR METHODS SPECIFIED SHALL BE SUBMITTED TO SPRINTS CONSTRUCTION MANAGER FOR APPROVAL. SPRINT WILL REVIEW AND APPROVE ONLY THOSE REQUESTS MADE IN WRITING. NO VERBAL APPROVALS WILL BE CONSIDERED.

#### TESTS AND INSPECTIONS:

- A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION TESTS, INSPECTIONS AND PROJECT DOCUMENTATION.
- B. CONTRACTOR SHALL ACCOMPLISH TESTING INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
  1. COAX SWEEPS AND FIBER TESTS PER TS-0200 REV 5 ANTENNA LINE ACCEPTANCE STANDARDS.
  2. AZIMUTH AND DOWNTILT PROVIDE AN AUTOMATED REPORT UPLOADED TO SITERRA USING A COMMERCIAL MADE-FOR-THE-PURPOSE ELECTRONIC ANTENNA ALIGNMENT TOOL (AAT). INSTALLED AZIMUTH, CENTERLINE AND DOWNTILT MUST CONFORM WITH RF CONFIGURATION DATA.
  3. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN SITE INSPECTION ACTIVITIES AND/OR AS A RESULT OF TESTING.
  4. ALL TESTING REQUIRED BY APPLICABLE INSTALLATION MOPS.

C. REQUIRED CLOSEOUT DOCUMENTATION INCLUDES, BUT IS NOT LIMITED TO:

1. AZIMUTH, DOWNTILT, AGL FROM SUNSIGHT INSTRUMENTS OR ALIGNMENT TOOL (AAT)
  2. SWEEP AND FIBER TESTS
  3. SCANABLE BARCODE PHOTOGRAPHS OF TOWER TOP AND INV EQUIPMENT
  4. ALL AVAILABLE JURISDICTIONAL INFORMATION
  5. PDF SCAN OF REDLINES PRODUCED IN FIELD
  6. A PDF SCAN OF REDLINE MARK-UPS SUITABLE FOR USE IN DRAWING PRODUCTION
  7. LIEN WAIVERS
  8. FINAL PAYMENT APPLICATION
  9. REQUIRED FINAL CONSTRUCTION PHOTOS
  10. CONSTRUCTION AND COMMISSIONING CHECKLIST COMPLETE WITH SIGNATURES
  11. ALL POST NTP TASKS INCLUDING DOCUMENT UPLOADS COMPLETED AND DOCUMENT REPOSITORY OF RECORD).
  12. CLOSEOUT PHOTOGRAPHS:
- D. PROVIDE PHOTOGRAPHS OF FINAL PROJECT PER THE FOLLOWING PHOTOGRAPHS MAY BE REQUIRED TO SUPPORT ACCEPTANCE PROCEDURE:
- (i) BACK MAIN HYBRID CABLE ROUTE (MINIMUM TWO PHOTOS)
  - (ii) OF EACH ANTENNA AND RRU
  - (iii) MANUFACTURERS NAME TAG FOR ALL SERIALIZED EQUIPMENT
  - (iv) PULL AND DISTRIBUTION BOXES INTERMEDIATE BETWEEN RRU'S (DOOR OPEN)
  - (v) MMBS CABINET WITH DOOR OPEN SHOWING MODIFICATIONS
  - (vi) POWER CABINET, DOORS OPEN, BATTERIES INSTALLED
  - (vii) BREAK OUT CYLINDERS
  - (viii) ASR SIGNAGE FOR SPRINT OWNED TOWERS
  - (ix) RADIATION EXPOSURE WARNING SIGNS
  - (x) PHOTOGRAPH FROM EACH SECTOR FROM APPROXIMATELY 90 DEGREES FROM NEW ANTENNA AT HORIZON.

E. LOAD PHOTOS TO SITERRA PROJECT LIBRARY 15. IN 15 CREATE NEW MEDIA-FILE INFORMATION.

#### COMMISSIONING:

PERFORM ALL COMMISSIONING AS REQUIRED BY APPLICABLE MOPS

#### INTEGRATION:

PERFORM ALL INTEGRATION ACTIVITIES AS REQUIRED BY APPLICABLE MOPS

### SECTION 11 700 - ANTENNA ASSEMBLY, REMOTE CABLE INSTALLATION

#### SUMMARY:

THIS SECTION SPECIFIES INSTALLATION OF ANTENNAS, RRU'S, AND CABLE AND TESTING OF COAXIAL FIBER CABLE.

#### ANTENNAS AND RRU'S:

THE NUMBER AND TYPE OF ANTENNAS AND RRU'S TO BE INSTALLED IS SHOWN ON THE CONSTRUCTION DRAWINGS.

#### HYBRID CABLE:

HYBRID CABLE WILL BE DC/FIBER AND FURNISHED FOR INSTALLATION. CABLE SHALL BE INSTALLED PER THE CONSTRUCTION DRAWINGS AND THE APPLICABLE REQUIREMENTS.

#### JUMPERS AND CONNECTORS:

FURNISH AND INSTALL 1/2" COAX JUMPER CABLES BETWEEN THE RRU AND ANTENNAS. JUMPER SHALL BE TYPE LDF 4, FLC 12-50, CR 540, OR FXL 540. SUPER-FLEXIBLE ACCEPTABLE JUMPERS BETWEEN THE RRU'S AND ANTENNAS OR TOWERS SHALL BE 1/2 INCH FOAM DIELECTRIC, OUTDOOR RATED COAXIAL CABLE. JUMPER SHALL BE 90 DEGREES TO ALLOW FOR THE PROPER BEND RADIUS PER SPRINT SPECIFICATIONS.



CONTINUE FROM SP-1

5. GROUNDING OF TRANSMISSION LINES: ALL TRANSMISSION LINES SHALL BE GROUNDED AS INDICATED ON DRAWINGS.
6. HYBRID CABLE COLOR CODING: ALL COLOR CODING SHALL BE AS REQUIRED PER LATEST VERSION OF TS 0200.
7. HYBRID CABLE LABELING: INDIVIDUAL HYBRID AND DC BUNDLES SHALL BE LABELED ALPHA-NUMERICALLY ACCORDING TO SPRINT CELL SITE ENGINEERING NOTICE - EN 2012-001, REV 1

WEATHERPROOFING EXTERIOR CONNECTORS AND HYBRID CABLE GROUND KITS:

- A. ALL FIBER & COAX CONNECTORS AND GROUND KITS SHALL BE WEATHERPROOFED.  
WEATHERPROOFED USING ONE OF THE FOLLOWING METHODS. ALL INSTALLATIONS MUST BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND INDUSTRY BEST PRACTICES.
  1. COLD SHRINK: ENCOMPASS CONNECTOR IN COLD SHRINK TUBING AND PROVIDE A DOUBLE WRAP OF 2" ELECTRICAL TAPE EXTENDING 2" BEYOND TUBING. PROVIDE 3M COLD SHRINK CXS SERIES OR EQUAL.
  2. SELF-AMALGAMATING TAPE: CLEAN SURFACES. APPLY A DOUBLE WRAP OF SELF-AMALGAMATING TAPE 2" BEYOND CONNECTOR. APPLY A SECOND WRAP OF SELF-AMALGAMATING TAPE IN OPPOSITE DIRECTION. APPLY DOUBLE WRAP OF 2" WIDE ELECTRICAL TAPE EXTENDING 2" BEYOND THE SELF-AMALGAMATING TAPE.
  3. 3M SLIM LOCK CLOSURE 718: SUBSTITUTIONS WILL NOT BE ALLOWED.
  4. OPEN FLAME ON JOB SITE IS NOT ACCEPTABLE.

SECTION 11 800 - INSTALLATION OF MULTIMODAL BASE STATIONS (MMBTS) AND RELATED EQUIPMENT

SUMMARY:

- A. THIS SECTION SPECIFIES MMBTS CABINETS, POWER CABINETS, AND INTERNAL EQUIPMENT INCLUDING BUT NOT LIMITED TO RECTIFIERS, POWER DISTRIBUTION UNITS, BASE BAND UNITS, SURGE ARRESTORS, BATTERIES, AND SIMILAR EQUIPMENT FURNISHED BY THE COMPANY FOR INSTALLATION BY THE CONTRACTOR (OFC)
- B. CONTRACTOR SHALL PROVIDE AND INSTALL ALL MISCELLANEOUS MATERIALS AND PROVIDE ALL LABOR REQUIRED FOR INSTALLATION EQUIPMENT IN EXISTING CABINET OR NEW CABINET AS SHOWN ON DRAWINGS AND AS REQUIRE BY THE APPLICABLE INSTALLATION MOPS.
- C. COMPLY WITH MANUFACTURERS INSTALLATION AND START-UP REQUIREMENTS

DC CIRCUIT BREAKER LABELING

- A. NEW DC CIRCUIT IS REQUIRED IN MMBTS CABINET SHALL BE CLEARLY IDENTIFIED AS TO RRU BEING SERVICED

SECTION 26 100 - BASIC ELECTRICAL REQUIREMENTS

SUMMARY:

THIS SECTION SPECIFIES BASIC ELECTRICAL REQUIREMENTS FOR SYSTEMS AND COMPONENTS.

QUALITY ASSURANCE:

- A. ALL EQUIPMENT FURNISHED UNDER DIVISION 26 SHALL CARRY UL LABELS AND LISTINGS WHERE SUCH LABELS AND LISTINGS ARE AVAILABLE IN THE INDUSTRY.
- B. MANUFACTURERS OF EQUIPMENT SHALL HAVE A MINIMUM OF THREE YEARS EXPERIENCE WITH THEIR EQUIPMENT INSTALLED AND OPERATING IN THE FIELD IN A USE SIMILAR TO THE PROPOSED USE FOR THIS PROJECT.
- C. MANUFACTURERS OF EQUIPMENT: ALL MATERIALS AND EQUIPMENT SPECIFIED IN DIVISION 26 OF THE SAME TYPE SHALL BE OF THE SAME MANUFACTURER AND SHALL BE NEW, OF THE BEST QUALITY AND DESIGN, AND FREE FROM DEFECTS.

SUPPORTING DEVICES:

- A. ALL EQUIPMENT FURNISHED UNDER DIVISION 26 SHALL CARRY UL LABELS AND LISTINGS WHERE SUCH LABELS AND LISTINGS ARE AVAILABLE IN THE INDUSTRY.

MANUFACTURERS OF EQUIPMENT SHALL HAVE A MINIMUM OF THREE YEARS EXPERIENCE WITH THEIR EQUIPMENT INSTALLED AND OPERATING IN THE FIELD IN A USE SIMILAR TO THE PROPOSED USE FOR THIS PROJECT.

MANUFACTURERS OF EQUIPMENT:

ALL MATERIALS AND EQUIPMENT SPECIFIED IN DIVISION 26 OF THE SAME TYPE SHALL BE OF THE SAME MANUFACTURER AND SHALL BE NEW, OF THE BEST QUALITY AND DESIGN, AND FREE FROM DEFECTS.

SUPPORTING DEVICES:

- A. MANUFACTURED STRUCTURAL SUPPORT MATERIALS: SUBJECT TO PROVIDE PRODUCTS BY THE FOLLOWING.

1. ALLIED TUBE AND CONDUIT
2. B-LINE SYSTEM
3. UNISTRUT DIVERSIFIED PRODUCTS
4. THOMAS & BETTS

- B. FASTENERS: TYPES, MATERIALS, AND CONSTRUCTION FEATURES AS

1. EXPANSION ANCHORS: CARBON STEEL WEDGE OR SLEEVE TYPE
2. POWER-DRIVEN THREADED STUDS: HEAT-TREATED STEEL, DE SERVICE.
3. FASTEN BY MEANS OF WOOD SCREWS ON WOOD.
4. TOGGLE BOLTS ON HOLLOW MASONRY UNITS.
5. CONCRETE INSERTS OR EXPANSION BOLTS ON CONCRETE OR
6. MACHINE SCREWS, WELDED THREADED STUDS, OR SPRING-T
7. EXPLOSIVE DEVICES FOR ATTACHING HANGERS TO STRUCTURE
8. DO NOT WELD CONDUIT, PIPE STRAPS, OR ITEMS OTHER THAN STRUCTURES.
9. IN PARTITIONS OF LIGHT STEEL CONSTRUCTION, USE SHEET

SUPPORTING DEVICES:

- A. INSTALL SUPPORTING DEVICES TO FASTEN ELECTRICAL COMPONENTS IN ACCORDANCE WITH NEC.

- B. COORDINATE WITH THE BUILDING STRUCTURAL SYSTEM AND WITH

- C. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, FASTEN ELECTRICAL HARDWARE SECURELY TO THE STRUCTURE IN ACCORDANCE WITH

- D. ENSURE THAT THE LOAD APPLIED BY ANY FASTENER DOES NOT EXCEED TEST LOAD.

- E. USE VIBRATION AND SHOCK-RESISTANT FASTENERS FOR ATTACHMENT

ELECTRICAL IDENTIFICATION:

- A. UPDATE AND PROVIDE TYPED CIRCUIT BREAKER SCHEDULES IN THE FIELD OF AC PANEL BOARDS WITH ANY CHANGES MADE TO THE AC SYSTEM

- B. BRANCH CIRCUITS FEEDING AVIATION OBSTRUCTION LIGHTING EQUIPMENT SHALL BE IDENTIFIED AS SUCH AT THE BRANCH CIRCUIT PANELLOAD.

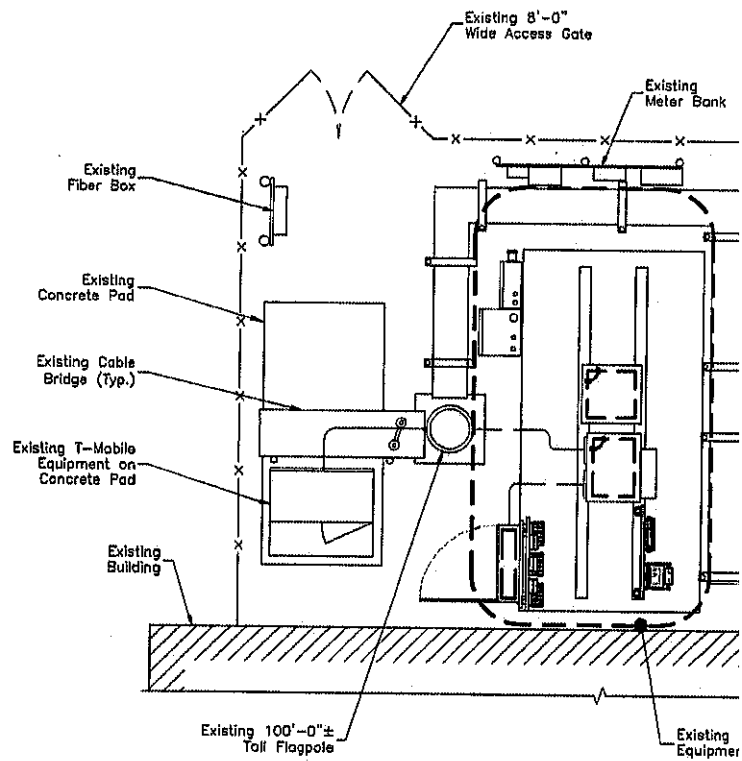
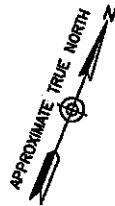
SECTION 26 200 - ELECTRICAL MATERIALS AND EQUIPMENT

- A. RIGID GALVANIZED STEEL (RGS) CONDUIT SHALL BE USED FOR EXTERIOR AND IN UNFINISHED INTERIOR LOCATIONS AND FOR ENCASED RUNS. FITTINGS SHALL BE STEEL, COATED WITH ZINC EXTERIOR AND INTERIOR PROCESS. CONDUIT SHALL BE PRODUCED TO ANSI SPECIFICATIONS WW-C-581 AND SHALL BE LISTED WITH THE UNDERWRITERS' LABORATORY. SET SCREW OR COMPRESSION FITTINGS WILL NOT BE USED. FITTINGS SHALL BE MANUFACTURED BY ALLIED, REPUBLIC OR WHEATLAND.

- B. UNDERGROUND CONDUIT IN CONCRETE SHALL BE POLYVINYLCHLORIDE (PVC) BURIAL AS APPLICABLE. JOINTS SHALL BE BELLED, AND FLUSH SO AS TO MEET MANUFACTURER'S INSTRUCTIONS. CONDUIT SHALL BE CARLON ELEC EQUAL.

- C. TRANSITIONS BETWEEN PVC AND RIGID (RGS) SHALL BE MADE WITH SWEEP RADIUS ELBOWS.

- D. EMT OR RIGID GALVANIZED STEEL CONDUIT MAY BE USED IN FINISHED AND CEILING. EMT SHALL BE MILD STEEL, ELECTRICALLY WELDED, HOT-DIPPED GALVANIZED AND PRODUCED TO ANSI SPECIFICATION WW-C-563, AND SHALL BE UL LISTED. EMT SHALL BE MANUFACTURED BY WHEATLAND, OR APPROVED EQUAL. FITTINGS SHALL BE METALLIC CONNECTIONS SHALL NOT BE ACCEPTABLE.



### COMPOUND PLAN

SCALE: 1/8"=1' FOR 11"x17"  
1/4"=1' FOR 22"x34"



#### NOTE:

EXISTING INFORMATION SHOWN HEREON IS BASED ON INFORMATION PROVIDED BY CROWN CASTLE. NO FIELD VISIT WAS PERFORMED BY DEWBERRY.

Top Of Existing Flagpole  
Elev. = 100'-0" ± A.G.L.

C.L. OF PROPOSED SPRINT ANTENNAS  
ELEV. = 77'-0" ± A.G.L.

4  
A-4  
INSTALL PROPOSED SPRINT 1900/2.5 DIPLEXER (DPO-7126Y-0x1) ON EXISTING CONCEALMENT SPINE (TYP.-1 PER SECTOR) (3 TOTAL)

Existing 24" Diameter Canisters (Typ.-2 Total) (By Others)

1  
A-4  
INSTALL PROPOSED SPRINT PANEL ANTENNA (DHHHT-65B-3XR) ON EXISTING CONCEALMENT SPINE (TYP.-1 PER SECTOR) (3 TOTAL) (TO REPLACE EXISTING)

5  
A-4  
INSTALL PROPOSED SPRINT 800/1800 DIPLEXER (FDSR6004/1C-DL) ON EXISTING CONCEALMENT SPINE (TYP.-1 PER SECTOR) (3 TOTAL)

PROPOSED 38" DIAMETER CANISTER (TYP.-2 TOTAL) (TO REPLACE EXISTING) (BY OTHERS)

INSTALL PROPOSED SPRINT (12) 7/8" COAX CABLES ROUTED INSIDE FLAGPOLE TO ANTENNAS (TO REPLACE EXISTING)

Existing SPRINT (6) 1-1/4" Coax Cables Routed Inside Flagpole to Antennas (TO BE REMOVED & REPLACED)

Existing 100'-0" ± Tall Flagpole

Existing Building

Existing 9'-0" Tall Stockade Wood Fence

Existing Grade  
Elev. = 0'-0" A.G.L.

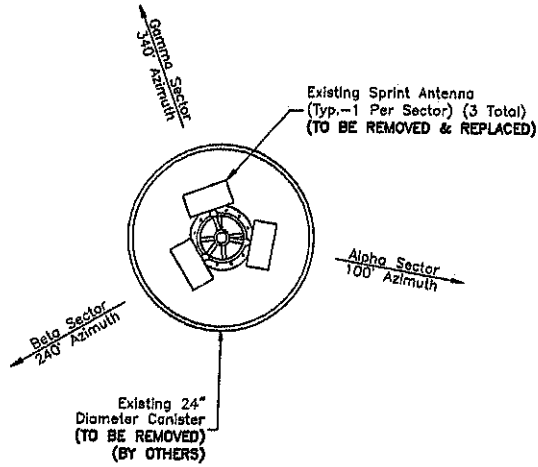
INSTALL PR  
FLEXIBLE CONI  
MANAGEMENT ENCLC  
CABINET FOR PRO

**NOTE:**  
ANALYSIS OF THE STRUCTURE HAS BEEN PERFORMED BY PAUL J. FORD & COMPANY (DATED: 02/07/19). STRUCTURAL ANALYSIS SUBJECT TO AMENDMENT AFTER ALL MODIFICATION WORK IS COMPLETED. THE ANTENNAS SHOWN ON THIS PLAN ARE FOR REFERENCE ONLY AND THE HEIGHT, LOCATION, AND MOUNTING SHOWN IN THE STRUCTURAL ANALYSES SHOULD SUPERSEDE THESE DRAWINGS. NO WORK IS TO BE PERFORMED PRIOR TO ANY AND ALL MODIFICATIONS BEING COMPLETED AS SHOWN IN THE STRUCTURAL ANALYSIS. CONTRACTOR TO OBTAIN COPY OF STRUCTURAL ANALYSIS PRIOR TO START OF WORK.

**ELEVATION**  
SCALE: 1/16"=1' FOR 11"x17"  
1/8"=1' FOR 22"x34"



**NOTE:**  
EXISTING INFORMATION SHOWN HEREON IS BASED ON INFORMATION PROVIDED BY CROWN CASTLE. NO FIELD VISIT WAS PERFORMED BY DEWBERRY.



**EXISTING ANTENNA LAYOUT**

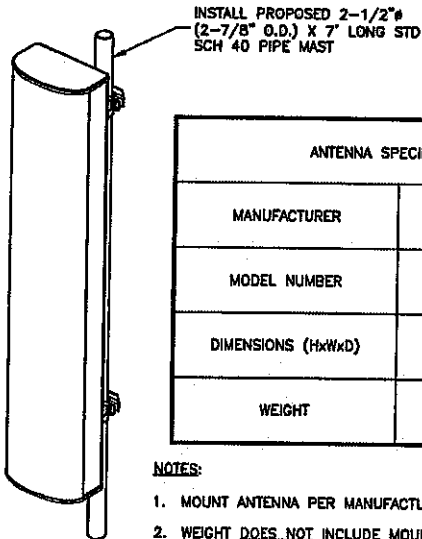
SCALE: N.T.S.

1

**NOTE:**

EXISTING INFORMATION SHOWN HEREON IS BASED ON INFORMATION PROVIDED BY CROWN CASTLE.

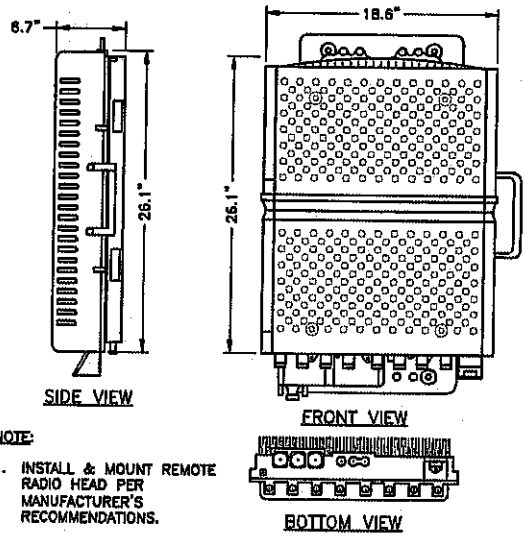
**NOTE:**  
COMPLY WITH MANUFACTURERS INSTRUCTIONS TO ENSURE THAT ALL RRH'S RECEIVE ELECTRICAL POWER WITHIN 24 HOURS OF BEING REMOVED FROM THE MANUFACTURER'S PACKAGING. DO NOT OPEN RRH PACKAGES IN THE RAIN.



ANTENNA SPECIFICATIONS	
MANUFACTURER	COMMSCOPE
MODEL NUMBER	DHHTT65B-3XR
DIMENSIONS (HxWxD)	72.1" x 11.9" x 7.1"
WEIGHT	45.4 LBS

- NOTES:**
1. MOUNT ANTENNA PER MANUFACTURER'S RECOMMENDATIONS.
  2. WEIGHT DOES NOT INCLUDE MOUNTING BRACKETS.

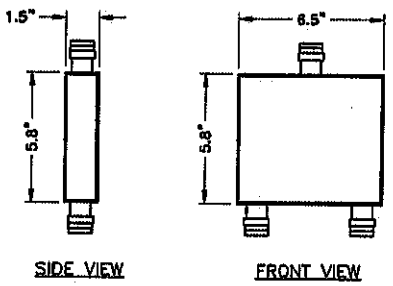
CONTRACTOR IS RESPONSIBLE FOR VERIFYING EXISTING CONDITIONS AND IDENTIFYING ANY EXISTING CONFLICTS (INCLUDING BUT NOT LIMITED TO EXISTING COAXIAL CABLES, SAFETY CLIMBS, ETC) AND DETERMINING TEMPORARY BRACING OR RELOCATION REQUIRED FOR INSTALLATION OF THE PROPOSED EQUIPMENT. CONTRACTOR TO CONTACT ENGINEER AND SPRINT CM IMMEDIATELY IN CASE OF ANY CONFLICTS. THE CONTRACTOR SHALL RESTORE ALL RELOCATED ITEMS TO PREVIOUS CONDITIONS.



- NOTE:**
1. INSTALL & MOUNT REMOTE RADIO HEAD PER MANUFACTURER'S RECOMMENDATIONS.

MANUFACTURER	ALCATEL-LUCENT
MODEL NUMBER	TD-RRHBx20-25
DIMENSIONS (HxWxD)	26.1" x 18.6" x 6.71"
WEIGHT	70 LBS

**ISOMETRIC ANTENNA DETAIL** ①  
SCALE: N.T.S.

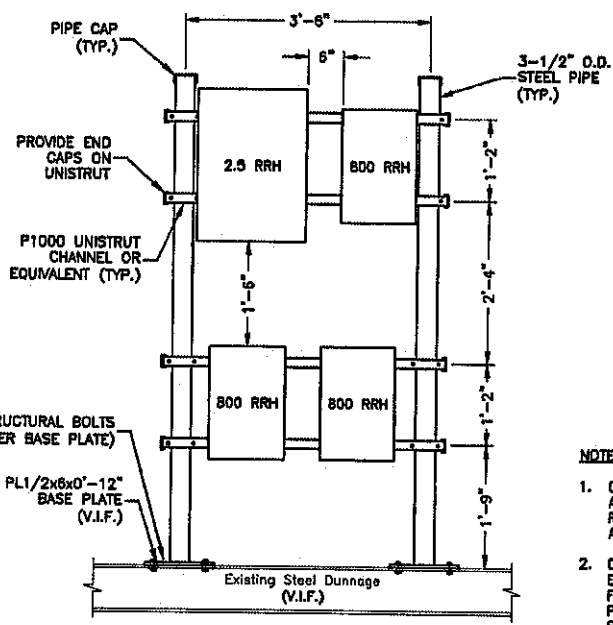


MANUFACTURER	RFS
MODEL NUMBER	FD9R6004/1C-DL
DIMENSIONS (HxWxD)	5.8" x 6.5" x 1.5"
WEIGHT	2.6 LBS

- NOTE:**
1. INSTALL & MOUNT DIPLEXER PER MANUFACTURER'S RECOMMENDATIONS.

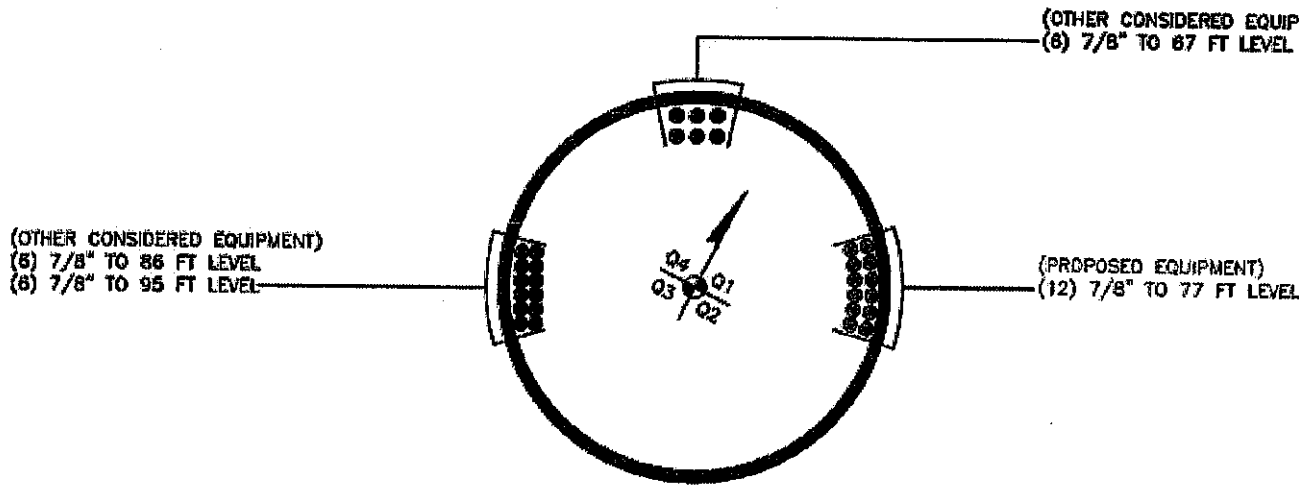
**800/1900 DIPLEXER DETAIL** ⑤  
SCALE: N.T.S.

**2.5 RRH DETAIL** ②  
SCALE: N.T.S.



- NOTES:**
1. CONTRACTOR TO CONFIRM SP/ AVAILABLE FOR THE PROPOSED RACK & REACH OUT TO ENGI A REDESIGN IF SPACE IS UNA
  2. CONTRACTOR TO FIELD VERIFY EXISTING STEEL DUNNAGE PRI FABRICATION OF BASE PLATES. PLATE WIDTH TO MATCH WIDTH STEEL DUNNAGE FLANGE.

**RRH RACK MOUNTING DETAIL** ⑥  
SCALE: N.T.S.

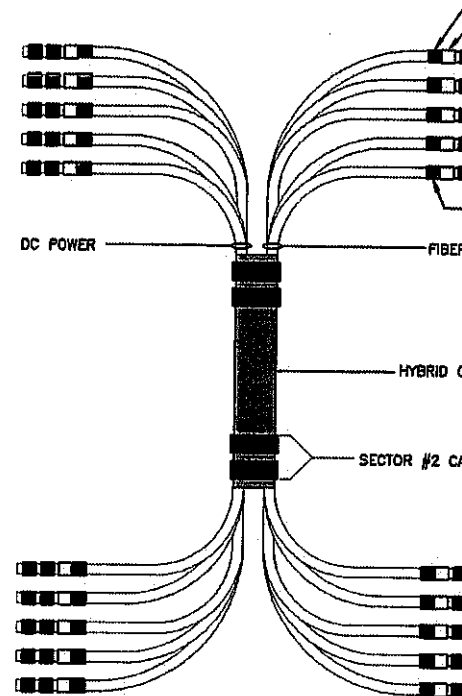


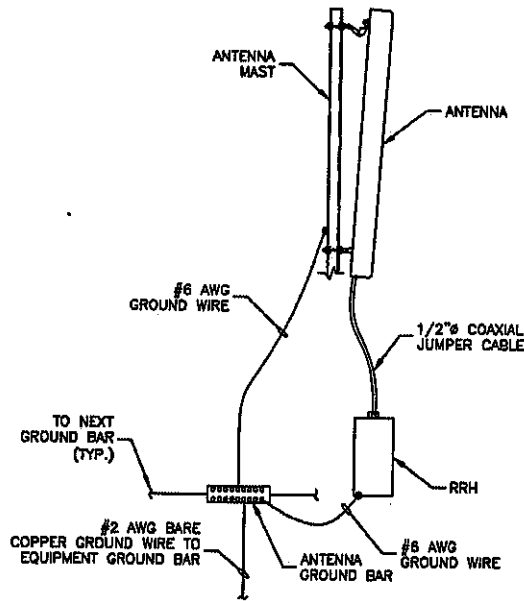
**BASE LEVEL DETAIL**  
SCALE: N.T.S.

1

**NOTES:**

1. ALL CABLES SHALL BE MARKED AT THE TOP AND BOTTOM WITH 2" COLORED TAPE, STENCIL TAG COLORED TAPE, OR COLORED HEAT SHRINK TUBING.
2. COLORED TAPE MAY BE OBTAINED FROM GRAYBAR ELECTRIC. UV STABILIZED TAPE OR HEAT SHRINK ARE PREFERRED.
3. THE FIRST RING SHALL BE CLOSEST TO THE END OF THE CABLE, AND THERE SHALL BE A 1" SPACE BETWEEN EACH RING.
4. THE CABLE COLOR CODE SHALL BE APPLIED IN ACCORDANCE TO TABLE 19-1
  - 4.A. TABLE 19-1 ONLY SHOWS 3 SECTORS, BUT ADDITIONAL SECTORS ARE EASILY SUPPORTED BY ADDING THE APPROPRIATE NUMBER OF COLORED RINGS TO THE CABLE COLOR CODE.
5. AFTER THE CABLE COLOR CODE IS APPLIED, THE FREQUENCY COLOR CODE, TABLE 19-2, MUST BE APPLIED FOR THE SPECIFIC FREQUENCY BAND IN USE ON A GIVEN LINE.
  - 5.A. 2" GAP SHALL SEPARATE THE CABLE COLOR CODE FROM THE FREQUENCY COLOR CODE.
  - 5.B. THE 2" COLOR RINGS FOR THE FREQUENCY CODE SHALL BE PLACED NEXT TO EACH OTHER WITH NO SPACES.
6. WRAP 2" COLORED TAPE A MINIMUM OF 3 TIMES AROUND THE COAX, AND KEEP THE TAPE IN THE SAME AREA AS MUCH AS POSSIBLE. THIS WILL ALLOW REMOVAL OF TAPE THAT FADES OR DISCOLORS DUE TO WEATHER.
7. EXAMPLES OF THE CABLE AND FREQUENCY COLOR CODES ARE SHOWN IN FIGURE 19-1 AND FIGURE 19-2

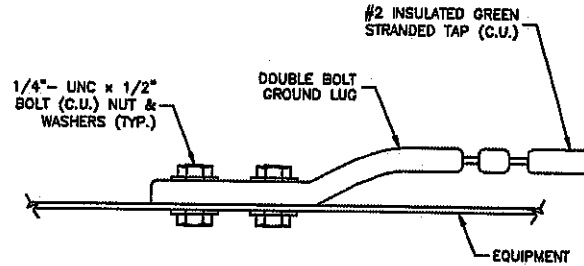




**TYPICAL ANTENNA GROUNDING DETAIL**

SCALE: N.T.S.

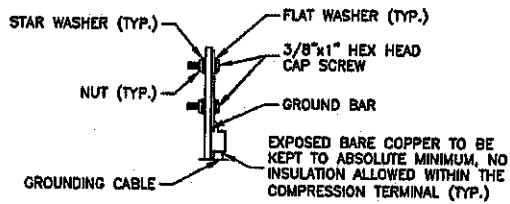
1



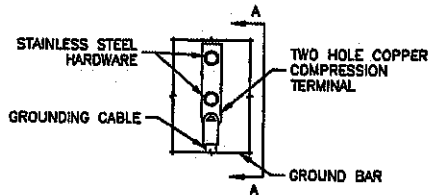
**CONNECTION TO EQUIPMENT DETAIL**

SCALE: N.T.S.

2



**SECTION 'A-A'**



**ELEVATION**

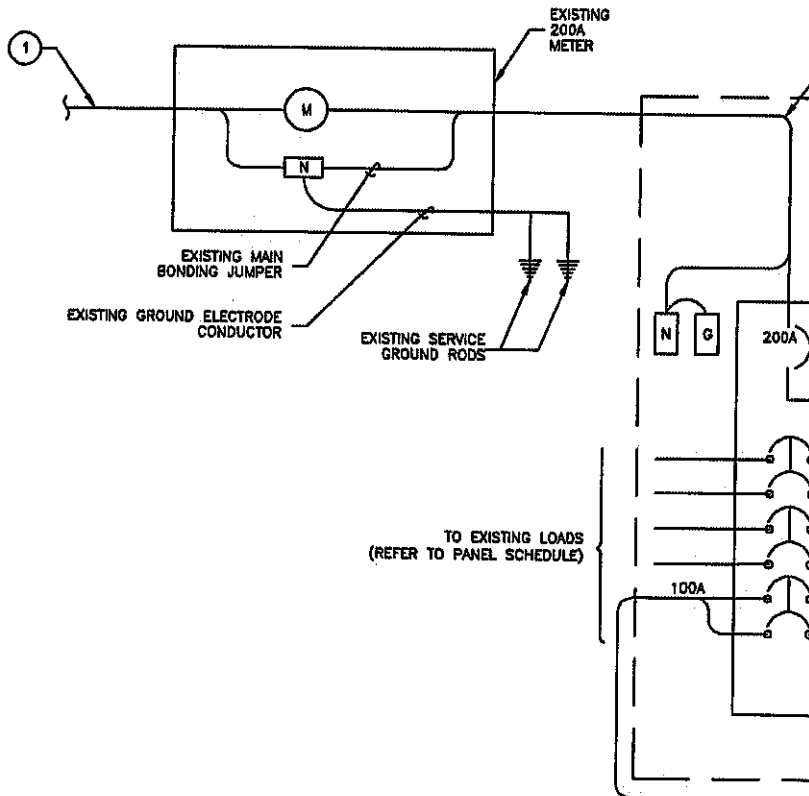
**NOTES:**

1. DOUBLING UP OR STACKING OF CONNECTIONS IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.

**TYPICAL GROUND BAR MECHANICAL CONNECTION DETAIL**

SCALE: N.T.S.

4



## ELECTRICAL INSTALLATION NOTES:

### PART 1 GENERAL:

1. WORK INCLUDED
  - A. SECONDARY ELECTRICAL SERVICE INCLUDING UNDERGROUND CONDUIT BANK FROM POWER COMPANY TRANSFORMER AND SECONDARY SERVICE ENTRANCE SERVICE;
  - B. OUTDOOR SECONDARY DISTRIBUTION SYSTEM INCLUDING EXISTING EQUIPMENT TO BE RELOCATED AS SHOWN ON THE DRAWINGS AND PROPOSED RACEWAYS, CABLES, WIRING, JUNCTION BOXES, PULL BOXES AND OTHER COMPONENTS REQUIRED FOR COMPLETE INSTALLATION OF ELECTRICAL DISTRIBUTION SYSTEM.
2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING ELECTRICAL SUBCONTRACTOR 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 CONTRACTOR.
3. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, AND LATEST EDITION ALL APPLICABLE NATIONAL AND LOCAL CODES.
4. THE POWER COMPANY SERVING THIS PROJECT IS ORLANDO UTILITIES COMMISSION. SERVICE WILL BE OBTAINED 200 AMPERES AT 240/120 VOLTS, SINGLE PHASE, 3 WIRE. COORDINATE WITH POWER COMPANY TRENCHING REQUIREMENTS, INSTALLATION OF THE SECONDARY POWER CONDUITS AND CABLES, AND METERING.
5. THE DRAWINGS, WHICH CONSTITUTE AN INTEGRAL PART OF THIS CONTRACT, SHALL SERVE AS THE WORKING DRAWINGS. THEY INDICATE THE GENERAL LAYOUT OF THE EXISTING FACILITIES AND THE COMPLETE NEW ELECTRICAL SYSTEM OR SYSTEMS, ARRANGEMENT OF FEEDERS, CIRCUITS, OUTLETS, SWITCHES, CONTROLS, PANELBOARDS, SERVICE EQUIPMENT, AND OTHER WORK.
6. DISCONNECT POWER AND CONTROL AND MAKE SAFE FOR RELOCATION OR DEMOLITION FROM EQUIPMENT INDICATED FOR RELOCATION OR DEMOLITION. PROVIDE RELOCATION OR DEMOLITION IN ACCORDANCE WITH CONTRACT DRAWINGS. REMOVE ALL DEBRIS, DEMOLISHED WIRING, CONDUIT AND EQUIPMENT, UNLESS THESE SCHEDULED TO BE RETURN TO OWNER.
7. INSTALLATION OF ELECTRICAL EQUIPMENT, ACCESSORIES AND COMPONENTS SHALL BE IN ACCORDANCE WITH SEISMIC REQUIREMENTS IDENTIFIED IN THE LATEST EDITION OF THE APPLICABLE BUILDING CODES.
8. SUBMIT SHOP DRAWING FOR EQUIPMENT SPECIFIED IN THE PROJECT; SWITCHING DEVICES, WIRING DEVICES AND COVER PLATES, WIRING AND CABLES, CONDUITS, BOXES AND FITTINGS, SAFETY SWITCHES. THE SHOP DRAWINGS SHALL INCLUDE CATALOG NUMBERS, CUTS, DIAGRAMS, DETAILED DIMENSIONED SHOP DRAWINGS OF EQUIPMENT, BROCHURES OF LIGHTING FIXTURES, WIRING DIAGRAMS AS REQUIRED, DRAWINGS, SAMPLES AS REQUESTED, AND SUCH OTHER PERTINENT DESCRIPTIVE RATINGS AND DATA AS MAY BE REQUIRED BY THE ENGINEER.
9. THE ELECTRICAL CONTRACTOR BEFORE STARTING WORK SHALL CONFER WITH ALL OTHER TRADES INTERESTED IN THE LOCATION OF PIPES, PITS, TRENCHES OR ANY OTHER APPARATUS TO BE INSTALLED BY THEM AND SHALL SELECT HIS LOCATION SO AS NOT TO INTERFERE WITH THE WORK AND RIGHTS OF THE OTHER TRADES. ALL DIFFERENCES OR CONFLICTING CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR ADJUSTMENT BEFORE COMMENCING WORK, AND ANY SUCH WORK OR MATERIALS PLACED IN POSITION IN VIOLATION OF THIS CLAUSE SHALL BE READJUSTED AT THE EXPENSE OF THE ELECTRICAL CONTRACTOR.
10. THE CONTRACTOR SHALL FURNISH, INSTALL, MAINTAIN AND REMOVE, AFTER CONSTRUCTION IS COMPLETED, A TEMPORARY POWER AND LIGHTING SYSTEM AS REQUIRED FOR CONSTRUCTION PURPOSES. THE SYSTEM SHALL CONSIST OF A POWER SERVICE, DISTRIBUTION SYSTEM, PANELBOARDS, GROUNDING, GROUND FAULT PROTECTIVE DEVICES, BRANCH CIRCUITS AND RECEPTACLE OUTLETS AS REQUIRED.
11. ELECTRICAL ENCLOSURE SHALL BE NEMA 3R FOR OUTDOOR LOCATION AND NEMA 4 FOR WET LOCATION WITH OPEN WATER.
12. THE ELECTRICAL SYSTEM OR SYSTEMS, TOGETHER WITH THE COMPONENT UNITS AS INCLUDED IN THIS SECTION OF THE SPECIFICATIONS, SHALL BE WARRANTED FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE THEREOF AGAINST DEFECTIVE MATERIALS AND WORKMANSHIP.

### PART 2 PRODUCT:

1. ALL EQUIPMENT AND MATERIALS EXCEPT RELOCATED FINISHED BY THE ELECTRICAL CONTRACTOR SHALL BE NEW AND FIRST GRADE, AND AS APPROVED BY THE UNDERWRITERS' LABORATORIES, INC., AND/OR BY OTHER STANDARDS MENTIONED IN THESE SPECIFICATIONS. MATERIALS TO BE FURNISHED UNDER THIS SPECIFICATION SHALL BE THE STANDARD PRODUCTS OF MANUFACTURERS REGULARLY ENGAGED IN THE PRODUCTION OF SUCH EQUIPMENT AND SHALL BE OF THE LATEST STANDARD DESIGN. EQUIPMENT AND MATERIALS SHALL BE OF THE TYPE AND QUALITY LISTED BELOW.
2. PVC CONDUIT SHALL BE RIGID POLYVINYL CHLORIDE SCHEDULE 40. RIGID PVC CONDUIT AND FITTINGS TRADE SIZE SHALL BE AS SHOWN ON THE DRAWINGS. CONDUITS SHALL BE INSTALLED DIRECT BURIAL AND COMPLY WITH NEMA TC-8 AND ASTM F512. ACCEPTABLE MANUFACTURER: CARLON CORP, CERTAINED CORP., CONUX PIPE SYSTEMS, INC. OR EQUAL. CONNECTORS, COUPLINGS, FITTINGS AND ANCILLARY MATERIALS SHALL BE SUPPLIED BY THE CONDUIT MANUFACTURER.
3. GALVANIZED RIGID METAL CONDUIT (GRS), COUPLINGS, FACTORY ELBOWS AND FITTINGS SHALL BE HEAVY WALL STEEL TUBING WITH A HOT-DIPPED GALVANIZED FINISH INSIDE AND OUT AFTER THREADING AND SHALL COMPLY WITH ANSI C 80.1 AND UL/6. ACCEPTABLE MANUFACTURER: ALJEN TUBE & CONDUIT CORP.; LTV STEEL TUBULAR PRODUCTS CORP. TRIANGLE PVC, CORP. OR EQUAL.
4. PULL AND JUNCTION BOXES FOR DRY LOCATION SHALL BE ZINC-GALVANIZED, EXTRA DEPTH, PRESSED STEEL WITH KNOCKOUTS AND OF SIZE AND TYPE SUITABLE FOR THE INTENDED APPLICATION. NEMA 3R TERMINAL BOXES, JUNCTION BOXES AND PULL BOXES SHALL BE SHEET TYPE 316 STAINLESS STEEL. BOXES SHALL BE CONTINUOUSLY WELDED SEAM AND MOUNTING FEET. WELDS SHALL BE GROUND SMOOTH. BOXES SHALL BE FLANGED AND SHALL NOT HAVE HOLES AND KNOCKOUTS. ACCEPTABLE MANUFACTURERS: HOFFMAN STAHLIN - DIVISION OF ROBOY IND. ENGLISH ELECTRIC, OR EQUAL.
5. WIRES AND CABLES SHALL BE OF ANNEALED, 98 PERCENT CONDUCTIVITY, SOFT DRAWN COPPER. ALL CONDUCTORS SHALL BE STRANDED, EXCEPT THAT CONTROL WIRING MAY BE SOLID. POWER WIRE SMALLER THAN NO. 12 AWG SHALL NOT BE USED. CONTROL AND SIGNAL WIRE SHALL BE NO.14 AWG NEC TYPE THHN/THWN, STRANDED WIRE SHALL BE NEC TYPE THHN/THWN AS MANUFACTURED BY THE OKONITE CO.; CAROL CABLE CO. INC.; PIRELLI CABLE CORP. OR EQUAL.
6. RECEPTACLES INSTALLED OUTDOOR SHALL BE WEATHERPROOF WITH GFI PROTECTION. RECEPTACLES SHALL BE MADE BY THE FOLLOWING MANUFACTURER: HARVEY HUBBELL, INC.; PASS & SEYMOUR, INC. OR EQUAL. RECEPTACLES PLATES SHALL BE THE SAME MANUFACTURER AND SUITABLE FOR NEMA ENVIRONMENT.
7. DISCONNECT SWITCHES SHALL BE HEAVY DUTY, QUICK MAKE, QUICK BREAK, VISIBLE BLADES, 600 VOLT, 3 POLE WITH FULL COVER INTERLOCK, INTERLOCK DEFEAT AND FLANGE MOUNTED OPERATING HANDLE. FUSED DISCONNECT SHALL BE EQUIPPED WITH FUSE SIZE AND TYPE AS SHOWN ON THE DRAWING. SWITCHES ALL CURRENT CARRYING PARTS SHALL BE COPPER. SWITCHES SHALL BE AS MANUFACTURED BY THE SQUARE D CO.; GENERAL ELECTRIC; CUTLER-HAMMER, OR EQUAL.
8. MOLDED CASE CIRCUIT BREAKER: 800 VOLT, 2 POLE FULLY RATED, INSULATED CASE, WITH INTEGRAL FULLY ADJUSTABLE SOLID STATE TRIP DEVICE. TRIP DEVICE SHALL BE TEMPERATURE INSENSITIVE AND HAVE THE FOLLOWING CHARACTERISTICS AND FUNCTIONS: INDEPENDENTLY ADJUSTABLE LONG TIME PICK\_UP AND DELAY; INDEPENDENTLY ADJUSTABLE SHORT TIME PICK\_UP AND DELAY WITH I2T IN AND OUT SWITCH, ADJUSTABLE INSTANTANEOUS; INDEPENDENTLY ADJUSTABLE GROUND FAULT PICK\_UP AND DELAY; TRIP MODE TARGETS FOR OVER LOAD, SHORT CIRCUIT AND GROUND FAULT; LONG TIME PICK\_UP LIGHT. CIRCUIT BREAKER SHALL BE SHALL HAVE A SHORT CIRCUIT RATING OF 42,000 RMS SYMMETRICAL AT RATED VOLTAGE. CIRCUIT BREAKER SHALL BE AS MANUFACTURED BY SQUARE D CO.; GENERAL ELECTRIC CO.; CUTLER-HAMMER, OR EQUAL.

### PART 3 INSTALLATION:

12. ALL WIRE SHALL BE COLOR CODED OR CODED USING ELECTRIC COLORED INSULATION IS NOT AVAILABLE. WHERE TAPE IS US SYSTEM, IT SHALL BE APPLIED IN ALL JUNCTION BOXES, AND LOCATIONS AS WELL AS AT EACH TERMINATION. EACH END OF EVERY POWER, POWER PHASE CONDUCTOR, GROUND AND CABLE SHALL BE LABELED WITH COLOR-CODED INSULATION BRAND, 1/2 INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTIVE IDENTIFICATION METHOD SHALL CONFORM WITH NEC & OSHA. INSTALLATION REQUIREMENTS.
13. GALVANIZED RIGID STEEL CONDUIT (GRS) SHALL BE USED FOR GRADE.
14. RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40 OR SHALL BE USED UNDERGROUND; DIRECT BURIED, IN AREAS OF OCCASIONAL LIGHT IN REINFORCED CONCRETE IN AREAS OF HEAVY VEHICLE TRAFFIC.
15. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
16. IN DAMP, WET OR WET/CORROSIVE AREAS INSTALL SURFACE MOUNTED.
17. FIELD MOUNTED DISCONNECTS, PUSHBUTTON CONTROL STATION STARTERS AND CIRCUIT BREAKERS, AUTOMATIC TRANSFER SWITCH PANELS, WIREWAYS, CONTACTORS, TERMINAL BOXES, JUNCTION BOXES MOUNTED ON GALVANIZED OR STAINLESS STEEL STANDS UNLESS ALLOWED BY ENGINEER.
18. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH LABELS. ALL EQUIPMENT SHALL BE LABELED WITH THEIR VOLTAGE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING NUMBERS (I.E., PANELBOARDS AND CIRCUIT ID'S).
19. PANELBOARDS (ID NUMBERS) AND INTERNAL CIRCUIT BREAKERS BE CLEARLY LABELED WITH ENGRAVED LAMACOID PLASTIC LABELS.
20. SUPPLEMENTAL GROUNDING CONDUCTOR LOCATED OUTDOORS, (SINGLE CONDUCTOR #2 AWG SOLID TINNED COPPER CABLE, UNLESS OTHERWISE SPECIFIED).
21. ALL POWER AND POWER GROUNDING CONNECTIONS SHALL BE IDENTIFIED WITH WIRE LUGS AND WIRENUTS BY THOMAS AND BETTS (OR EQUAL) BE RATED FOR OPERATION AT NO LESS THAN 75°C (90°C IF APPLICABLE).
22. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ACCORDANCE WITH NEMA, UL, ANSI/IEEE, AND NEC.
23. NEW RACEWAY OR CABLE TRAY WILL MATCH THE EXISTING INSTALLATION.
24. CABINETS, BOXES, AND WIREWAYS SHALL BE LISTED OR LABELED FOR ACCORDANCE WITH NEMA, UL, ANSI/IEEE, AND NEC.
25. THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORITY FROM CONTRACTOR BEFORE COMMENCING WORK ON THE AC POWER SYSTEM.
26. THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES TO SAFEGUARD AGAINST LIFE AND PROPERTY.
26. ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING EDGES.



# MODIFIED 100'-0"

## BU #826927-STRUCTURE

845 ETHAN ALLEN  
RIDGEFIELD, CONNEC  
FAIRFIELD CO

LAT: 41° 18' 46.86"; LONG  
ORDER: 410825 REV. 9;

### PROJECT CONTACTS

#### STRUCTURE OWNER:

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

ENGINEER OF RECORD:  
PJFMOD@PAULJFORD.COM

### SHEET INDEX

SHEET NUMBER	DES
T-1	TI
MI-1	MI CHECK
N-1	GENE
S-1	MONOF
S-2	CONCEALMEN
S-3	CONCEAL
S-4	BULKH

### WIND DESIGN DATA

REFERENCE STANDARD	ANSI/TIA-222-H
LOCAL CODE	2018 CBC
ULTIMATE WIND SPEED (3-SECOND GUST)	120 MPH
ICE THICKNESS	1.5 IN
ICE WIND SPEED	50 MPH
SERVICE WIND SPEED	60 MPH
RISK CATEGORY	II
EXPOSURE CATEGORY	C
Kzt	1.0

### HOT WORK INCLUI

NA	BASE GI
NA	BASE WELDI
NA	AERIAL G
NA	AERIAL WELDI

**MI CHECKLIST**

REQUIRED	REPORT ITEM	APPLICABLE CROWN DOC #	BRIEF DESCRIPTION
<b>PRE-CONSTRUCTION</b>			
X	MI CHECKLIST DRAWING	CED-SOW-10007	THIS CHECKLIST SHALL BE INCLUDED IN THE MI REPORT.
X	EOR APPROVED SHOP DRAWINGS	CED-SOW-10007	ONCE THE PRE-MODIFICATION MAPPING IS COMPLETE AND PRIOR TO FABRICATION ASSEMBLY DRAWINGS AND/OR SHOP DRAWINGS. THESE ARE TO INCLUDE, BUT NOT LIMITED TO, REINFORCEMENT, EXISTING REINFORCEMENT CONFIGURATION, PORTHOLE, MOUNTING, AND OTHER MISCELLANEOUS ITEMS WHICH MAY AFFECT SUCCESSFUL INSTALLATION. DRAWINGS SHALL BE SUBMITTED TO THE EOR FOR APPROVAL. APPROVED ASSEMBLY DRAWINGS SHALL BE SUBMITTED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	FABRICATION INSPECTION	CED-SOW-10007	A LETTER FROM THE FABRICATOR, STATING THAT THE WORK WAS PERFORMED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	FABRICATOR CERTIFIED WELD INSPECTION	CED-SOW-10007 CED-STD-10069	A CWI SHALL INSPECT ALL WELDING PERFORMED ON STRUCTURAL MEMBERS DURING CONSTRUCTION. THE CWI REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	MATERIAL TEST REPORTS (MTR)	CED-SOW-10007	MATERIAL TEST REPORTS SHALL BE PROVIDED FOR MATERIAL USED AS REQUIRED BY THE CONTRACT DOCUMENTS. THE MTR SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	FABRICATOR NDE INSPECTION REPORT	CED-SOW-10066 CED-STD-10069	CRITICAL SHOP WELDS THAT REQUIRE TESTING ARE NOTED ON THESE CONTRACT DOCUMENTS. THE FABRICATOR SHALL PERFORM NON-DESTRUCTIVE EXAMINATION AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	NDE OF MONOPOLE BASE PLATE	ENG-SOW-10033	A NDE OF THE POLE TO BASE PLATE CONNECTION IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	PACKING SLIPS	CED-SOW-10007	THE MATERIAL SHIPPING LIST SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
ADDITIONAL TESTING AND INSPECTIONS:			
<b>CONSTRUCTION</b>			
NA	FOUNDATION INSPECTIONS	CED-SOW-10144	A VISUAL OBSERVATION OF THE EXCAVATION AND REBAR SHALL BE PERFORMED BEFORE PLACING THE EPOXY. THE OBSERVATION OF THE REBAR SHALL BE PERFORMED BEFORE PLACING THE EPOXY. THE OBSERVATION 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 TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	EARTHWORK	CED-SOW-10144	FOUNDATION SUB-GRADES SHALL BE INSPECTED AND APPROVED BY AN APPROVED INSPECTOR. THE INSPECTION REPORT SHALL BE INCLUDED AS PART OF THE FOUNDATION REPORT.
NA	MICROPILE/ROCK ANCHOR	CED-SOW-10144	MICROPILES/ROCK ANCHORS SHALL BE INSPECTED BY THE FOUNDATION INSPECTOR. THE INSPECTION REPORT SHALL BE INCLUDED IN THE FOUNDATION INSPECTION REPORT, ADDITIONAL TESTING AND/OR INSPECTIONS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	POST-INSTALLED ANCHOR ROD VERIFICATION	CED-SOW-10007	POST INSTALLED ANCHOR ROD VERIFICATION SHALL BE PERFORMED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	BASE PLATE GROUT VERIFICATION	ENG-STD-10323	THE GENERAL CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT. THE DOCUMENTATION SHALL BE REMOVED AND/OR INSTALLED IN ACCORDANCE WITH CROWN REQUIREMENTS FOR FOUNDATION INSPECTIONS.
NA	FIELD CERTIFIED WELD INSPECTION	CED-SOW-10066 CED-STD-10069	A CROWN APPROVED CERTIFIED WELD INSPECTOR SHALL INSPECT AND TEST FIELD WELDS SPECIFIED IN CROWN STANDARD DOCUMENTS APPLICABLE TO WELD INSPECTIONS. WELDS SHALL BE PERFORMED AS REQUIRED BY CROWN STANDARDS AND CONTRACT DOCUMENTS. THE REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	ON-SITE COLD GALVANIZING VERIFICATION	ENG-STD-10149 ENG-BUL-10149	THE GENERAL CONTRACTOR SHALL PROVIDE WRITTEN AND PHOTOGRAPHIC DOCUMENTATION THAT ANY ON-SITE COLD GALVANIZING WAS APPLIED PER MANUFACTURER SPECIFICATIONS.
NA	TENSION TWIST AND PLUMB	CED-PRC-10182 CED-STD-10261	THE GENERAL CONTRACTOR SHALL PROVIDE A REPORT IN ACCORDANCE WITH APPLICABLE STANDARDS FOR 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 OR NOTING ANY CHANGES THAT WERE REQUIRED AND APPROVED BY THE EOR. APPROVING ALL CHANGES SHALL BE SUBMITTED WHEN THE EOR IS SPECIFYING APPLICABLE STANDARDS SHALL BE APPLIED.
ADDITIONAL TESTING AND INSPECTIONS:			
<b>POST-CONSTRUCTION</b>			
X	CONSTRUCTION COMPLIANCE LETTER	CED-SOW-10007	A LETTER FROM THE GENERAL CONTRACTOR STATING THAT THE WORKMANSHIP WAS IN ACCORDANCE WITH INDUSTRY STANDARDS AND THESE CONTRACT DRAWINGS, INCLUDING LISTING ADDITIONAL TESTING AND INSPECTIONS.
NA	POST-INSTALLED ANCHOR ROD PULL TESTS	CED-PRC-10119	POST-INSTALLED ANCHOR RODS SHALL BE TESTED BY A CROWN APPROVED PULL TESTER. THE 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 CONSTRUCTION. PHOTOS SHALL BE ORGANIZED IN A MANNER THAT EASILY IDENTIFIES THE EXACT LOCATION OF THE PHOTOGRAPHS.
NA	BOLT INSTALLATION VERIFICATION REPORT	CED-SOW-10007	THE MI INSPECTOR SHALL VERIFY THE INSTALLATION AND TIGHTNESS 10% OF ALL NUTS OF THE MODIFICATION. THE MI INSPECTOR SHALL LOOSEN THE NUT AND VERIFY THE REPORT SHALL CONTAIN THE COMPLETED BOLT INSTALLATION VERIFICATION REPORT PHOTOGRAPHS.
X	PUNCHLIST DEVELOPMENT AND CORRECTION DOCUMENTATION	CED-PRC-10263 CED-FRM-10285	FINAL PUNCHLIST INDICATING ALL NONCONFORMANCE(S) IDENTIFIED AND THE FINAL CORRECTION PLAN.
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)	CED-SOW-10007	THE MI INSPECTOR SHALL OBSERVE AND REPORT ANY DISCREPANCIES BETWEEN THE CONTRACT DOCUMENTS AND THE ACTUAL COMPLETED INSTALLATION.
ADDITIONAL TESTING AND INSPECTIONS:			
X	FACT TIA INSPECTION	OPS-SOW-10127	PERFORM FACT TIA INSPECTION PER CROWN CASTLE DOCUMENTS.
X	CONCEALMENT REINFORCING SOLUTION	OPS-SOW-10127 OPS-PRC-10127	INSTALL CONCEALMENT REINFORCING SOLUTION PER CROWN CASTLE DOCUMENTS.

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1. GENERAL NOTES

- 1.1. THE MONOPOLE STRUCTURE IN ITS EXISTING CONDITION DOES NOT HAVE THE STRUCTURAL CAPACITY TO CARRY ALL OF THE PROPOSED AND EXISTING LOADS FROM THE ATTACHED STRUCTURAL MODIFICATION REPORT AT THE REQUIRED MINIMUM WIND SPEEDS. DO NOT INSTALL ANY NEW LOADS UNTIL THE MONOPOLE REINFORCING SYSTEM IS COMPLETELY AND SUCCESSFULLY INSTALLED.
- 1.2. THESE DRAWINGS WERE PREPARED FROM INFORMATION PROVIDED BY CROWN CASTLE. THE INFORMATION PROVIDED HAS NOT BEEN FIELD VERIFIED BY THE ENGINEER OF RECORD (EOR) FOR ACCURACY AND THEREFORE DISCREPANCIES BETWEEN THESE DRAWINGS AND ACTUAL SITE CONDITIONS SHOULD BE ANTICIPATED. THE CONTRACTOR SHALL COORDINATE WITH THE PROJECT DRAWINGS AND THEIR FIELD VERIFIED CONDITIONS AND DIMENSIONS BEFORE PROCEEDING WITH THE WORK. THE CONTRACTOR SHALL IMMEDIATELY REPORT ANY AND ALL DISCREPANCIES TO THE EOR AND CROWN CASTLE BEFORE PROCEEDING WITH THE WORK. ANY WORK PERFORMED WITHOUT A PREFABRICATION MAPPING IS DONE AT THE RISK OF THE GENERAL CONTRACTOR AND/OR THE FABRICATOR
- 1.3. IF MATERIALS, QUANTITIES, STRENGTHS OR SIZES INDICATED BY THE DRAWINGS OR SPECIFICATIONS ARE NOT IN AGREEMENT WITH THESE NOTES, THE BETTER QUALITY AND/OR GREATER QUANTITY, STRENGTH OR SIZE INDICATED, SPECIFIED OR NOTED SHALL BE PROVIDED.
- 1.4. THIS STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER THE INSTALLATION OF THE REINFORCING REPAIR SYSTEM HAS BEEN SUCCESSFULLY COMPLETED. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO ENSURE THE SAFETY AND STABILITY OF THE MONOPOLE AND ITS COMPONENT PARTS DURING FIELD MODIFICATIONS. THIS INCLUDES, BUT IS NOT LIMITED TO, THE ADDITION OF WHATEVER TEMPORARY BRACING, GUYS OR TIE DOWNS THAT MAY BE NECESSARY. SUCH MATERIAL SHALL BE REMOVED AND SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AFTER THE COMPLETION OF THE PROJECT.
- 1.5. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN AND SHALL MEET ANS/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 ANS/ASSE A10.48 (LATEST EDITION) AND CROWN 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 THE ANS/ASSE A10.48 (LATEST EDITION).
- 1.6. OBSERVATION VISITS TO THE SITE BY CROWN CASTLE AND/OR THE EOR SHALL NOT INCLUDE INSPECTIONS OF THE PROTECTIVE MEASURES OR THE CONSTRUCTION PROCEDURES. ANY SUPPORT SERVICES PERFORMED BY THE EOR DURING CONSTRUCTION ARE SOLELY FOR THE PURPOSE OF ACHIEVING GENERAL CONFORMANCE WITH THE CONTRACT DOCUMENTS. THEY DO NOT GUARANTEE THE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF CONSTRUCTION.
- 1.7. ALL MATERIALS AND EQUIPMENT FURNISHED SHALL BE NEW AND OF GOOD QUALITY, FREE FROM FAULTS AND DEFECTS AND IN CONFORMANCE WITH THE CONTRACT DOCUMENTS. ANY AND ALL SUBSTITUTIONS MUST BE PROPERLY APPROVED AND AUTHORIZED IN WRITING BY CROWN CASTLE AND EOR PRIOR TO INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF MATERIALS AND EQUIPMENT BEING SUBSTITUTED.
- 1.8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT THIS PROJECT AND RELATED WORK COMPLIES WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY CODES AND REGULATIONS GOVERNING THIS WORK AS WELL AS CROWN CASTLE SAFETY GUIDELINES.
- 1.9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING AND NEW COAXIAL CABLES AND OTHER EQUIPMENT DURING CONSTRUCTION.
- 1.10. ANY EXISTING ATTACHMENTS AND/OR PROJECTIONS ON THE POLE THAT MAY INTERFERE WITH THE INSTALLATION OF THE REINFORCING SYSTEM WILL HAVE TO BE REMOVED AND RELOCATED, REPLACED, OR RE-INSTALLED AS REQUIRED AFTER THE REINFORCING IS SUCCESSFULLY COMPLETED. THE CONTRACTOR SHALL IDENTIFY AND COORDINATE THESE ITEMS PRIOR TO CONSTRUCTION WITH CROWN CASTLE, TESTING AGENCY, AND EOR.
- 1.11. ANY AND ALL EXISTING PLATFORMS THAT ARE LOCATED IN AREAS OF THE POLE SHAFT WHERE SHAFT REINFORCING MUST BE APPLIED SHALL BE TEMPORARILY REMOVED OR OTHERWISE SUPPORTED TO PERMIT NEW CONTINUOUS REINFORCEMENT TO BE ATTACHED. AFTER THE CONTRACTOR HAS SUCCESSFULLY INSTALLED THE MONOPOLE REINFORCEMENT SYSTEM, THE CONTRACTOR SHALL RE-INSTALL THE PLATFORMS.
- 1.12. THE CLIMBING FACILITIES, SAFETY CLIMB AND ALL PARTS THEREOF SHALL NOT BE IMPEDED, MODIFIED OR ALTERED WITHOUT THE EXPRESS APPROVAL OF THE YOUR CROWN POC. ALL ALTERATIONS TO A SAFETY CLIMB'S ORIGINAL MANUFACTURER'S CONFIGURATION MUST BE DESIGNED BY THE ENGINEER OF RECORD. IF THE GENERAL CONTRACTOR FINDS THAT THE CLIMBING FACILITIES ARE IMPEDED, EITHER DURING BIDDING, DURING PRE-FABRICATION MAPPING, OR WHILE ON-SITE, THE GENERAL CONTRACTOR SHALL CONTACT THE CROWN POC TO DETERMINE A METHOD OF RESOLUTION.
- 1.13. FOR STANDARD CROWN PARTS SEE THE MOST RECENT VERSION OF THE "CCI APPROVED REINFORCEMENT COMPONENTS" CATALOG.
- 1.14. ALL SOLUTIONS FOR THE REPLACEMENT, RELOCATION OR MODIFICATION OF THE SAFETY CLIMB AND/OR ANY OF THE MONOPOLE CLIMBING FACILITIES SHALL BE COORDINATED WITH TUF-TUG PRODUCTS. CONTACT DETAILS: 3434 ENCRETE LANE, MORAIN, OHIO 45439 PHONE: 937-299-1213 EMAIL: TUFTUG@AOL.COM

5. PERPETUA  
5.1.  
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6. FIELD NDE  
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8. CAST-IN-PL  
9. EPOXY GRC  
10. BASE PLAT  
11. BASE PLAT

2. STRUCTURAL STEEL

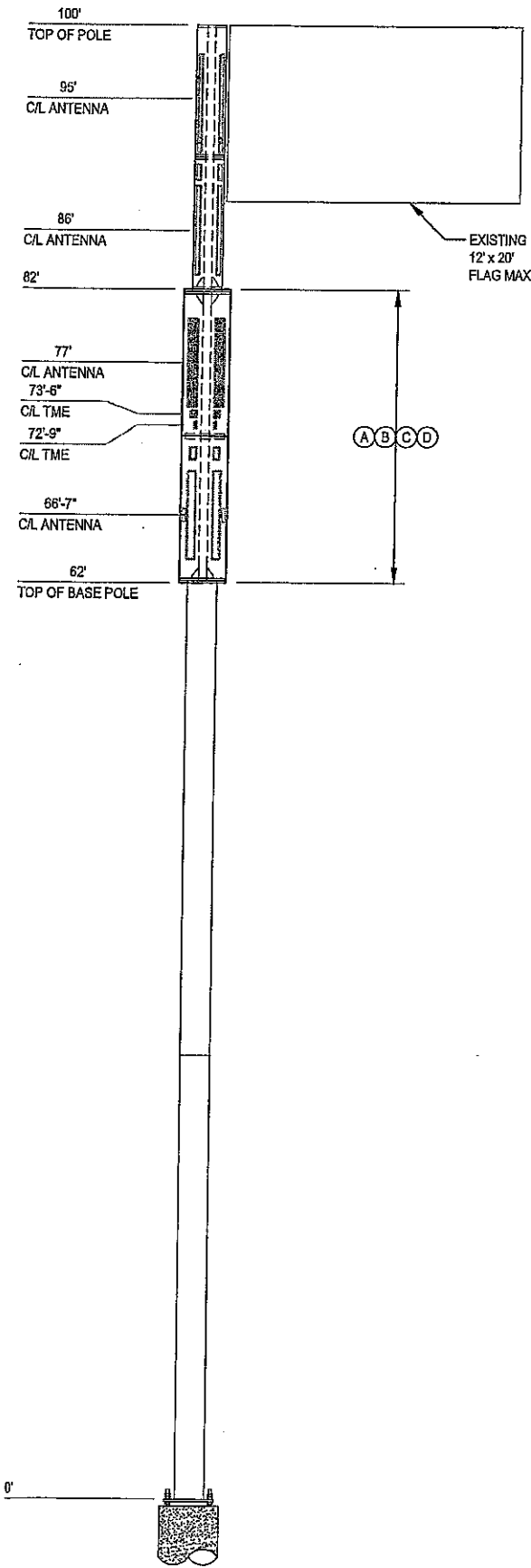
- 2.1. STRUCTURAL STEEL MATERIALS, FABRICATION, DETAILING, AND WORKMANSHIP SHALL CONFORM TO THE LATEST EDITION OF THE FOLLOWING REFERENCE STANDARDS:
  - 2.1.1. BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC):
    - 2.1.1.1. "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS."
    - 2.1.1.2. "SPECIFICATION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

3. TOUCH UP OF GALVANIZING

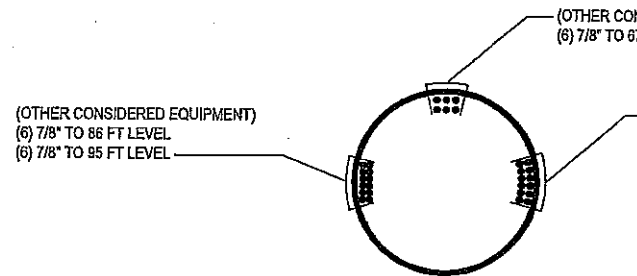
- 3.1. THE CONTRACTOR SHALL TOUCH UP ANY AND ALL AREAS OF GALVANIZING ON THE EXISTING STRUCTURE OR NEW COMPONENTS THAT ARE DAMAGED OR ABRADED DURING CONSTRUCTION. GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS ANY AND ALL ABRASIONS, CUTS, FIELD DRILLING, AND ALL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

4. HOT-DIP GALVANIZING

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



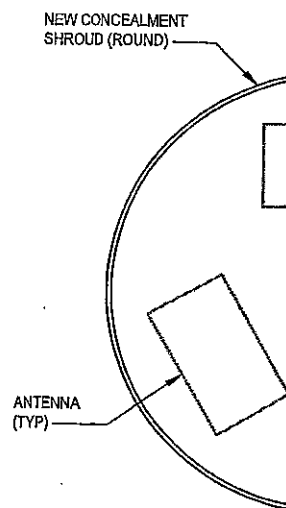
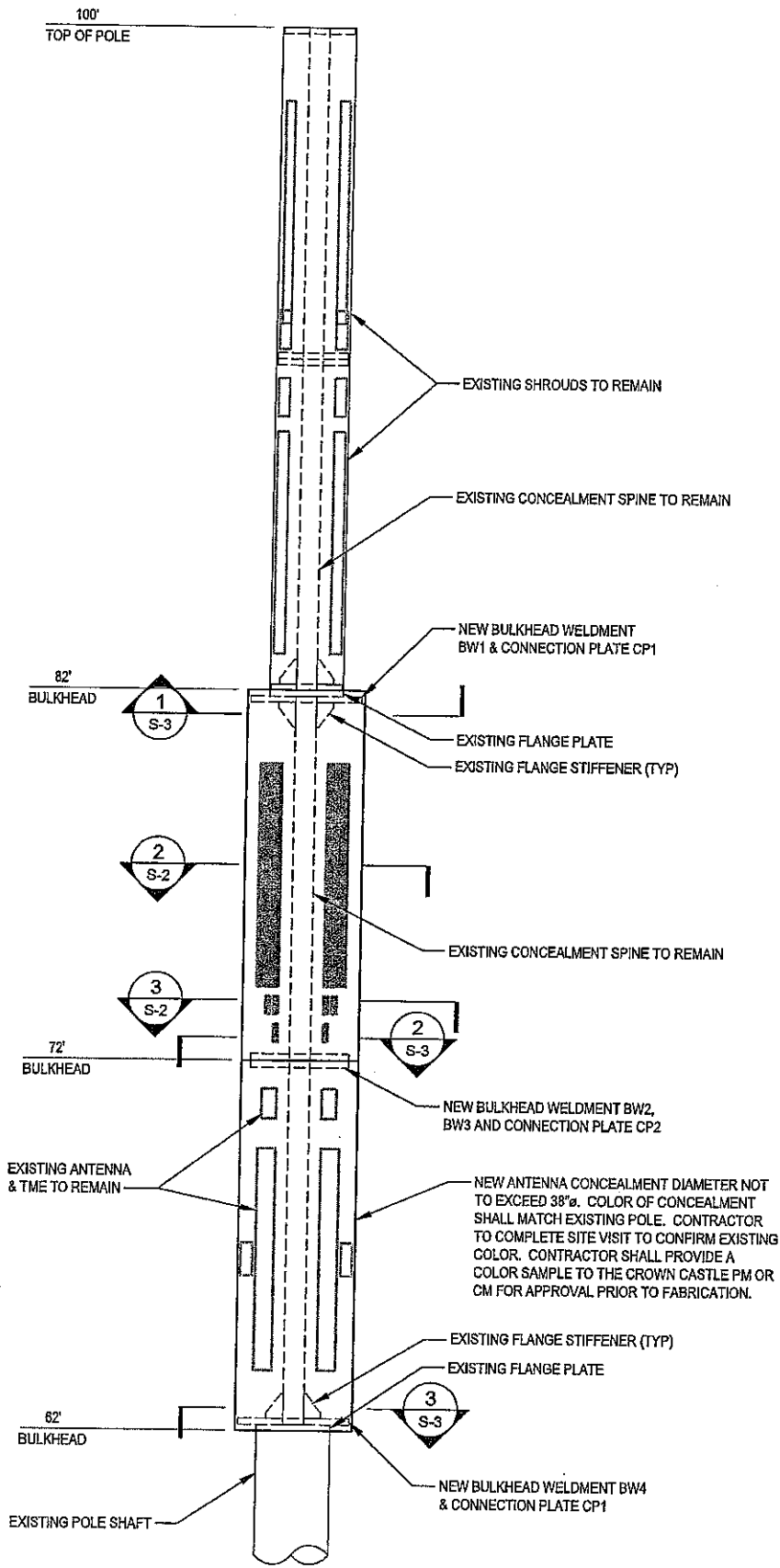
TOWER MODIFICATION SCHEDULE		
	ELEVATION	TOWER MODIFICATION DESCRIPTION
(A)	62' TO 82'	REMOVE EXISTING CONCEALMENT BULKHEADS AND SHRO
(B)	62' TO 82'	INSTALL NEW CONCEALMENT BULKHEADS AND SHRO
(C)	62' TO 82'	INSTALL CONCEALMENT REINFORCING SOLUTION PER CROWN CASTL
(D)	62' TO 82'	PAINT MODIFICATIONS TO MATCH EXISTING POLI



**COAX LAYOUT** (1/2) S-1

**POLE ELEVATION** (1) S-1

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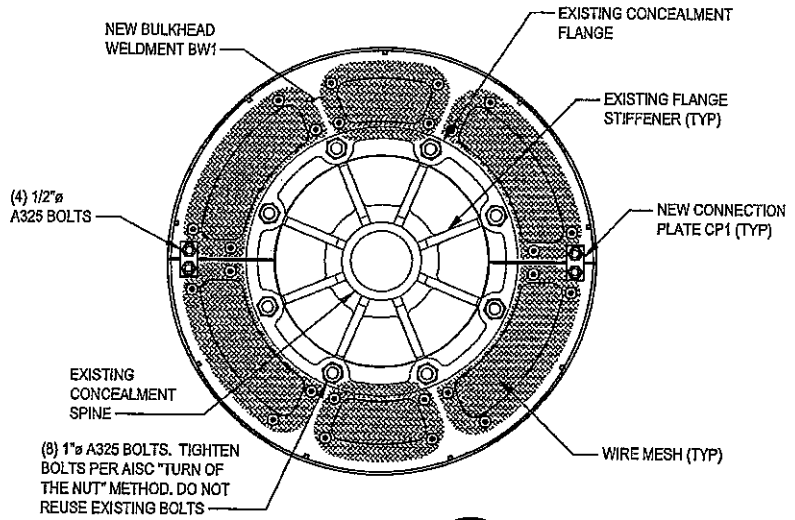
**SECTION**  
(PROPOSED AN)

**PARTIAL ELEVATION** 1  
S-2

<b>Antenna M</b>
DH-TT85B
FD9R6004/1
FD9R6004/1
NOTE: ALL ANTENNA SPINE AND ANTENNA

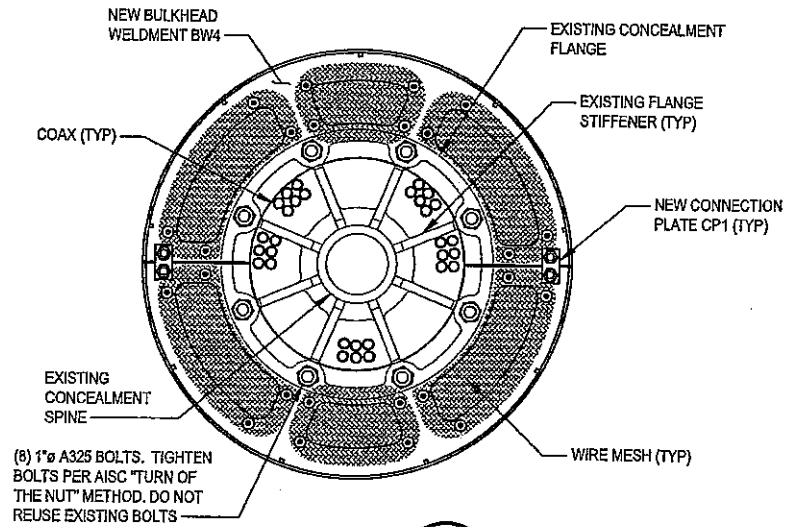
<b>Coax M</b>
LDF7-50
LDF5-50
LCF78-50/A
LDF5-50
NOTE: COAX LAYOUT EXISTING CONDITION

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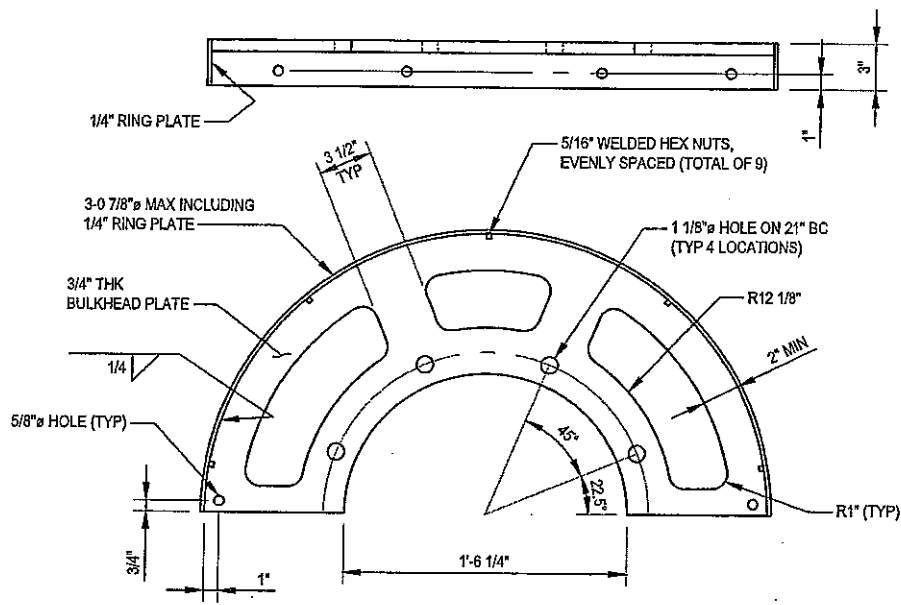
**SECTION 1**  
EL. 82' (LOOKING UP)

NOTE: CONTRACTOR SHALL COORDINATE WITH CROWN CM AND PM ON BIRD DETERRENT SYSTEM TO BE PLACED ATOP OF THE MESH



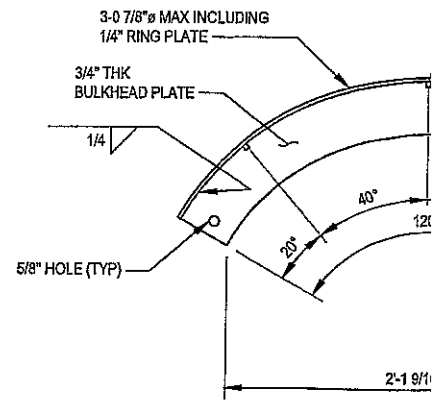
**SECTION 3**  
EL. 62' (LOOKING DOWN)

INSTALL ALL STIFFENERS AND HILTI S-DRILLING



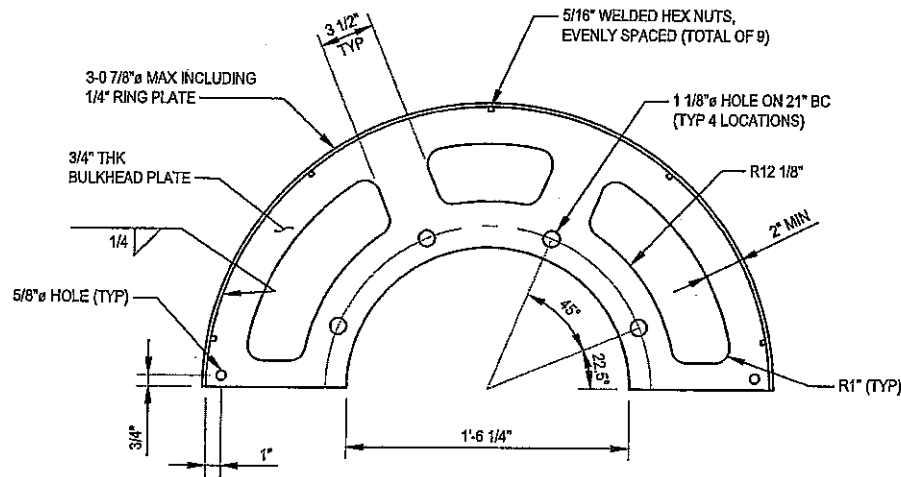
**BULKHEAD WELDMENT MK~BW1**

(2 REQUIRED) (ASTM A36)



**BULKHEAD WEL**

(3 REQUIRED) (ASTM A36)

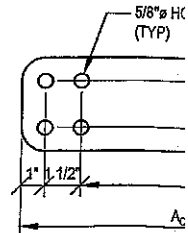
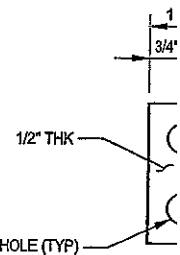


**BULKHEAD WELDMENT MK~BW4**

(2 REQUIRED) (ASTM A36)

**CONNECTION**

(4 REQUIRED) (ASTM A36)



**CONNECT**

CONNECT		
PART #	GRADE	QTY
CP2	ASTM A36	4

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