



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

December 5, 2019

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

RE: Notice of Exempt Modification for Crown Site BU: 842874
AT&T Site ID: 10071277
566 Enfield Street, Enfield, CT 06082
Latitude: 42° 0' 29.71"/ Longitude: -72° 35' 36.67"

Dear Ms. Bachman:

AT&T currently maintains three (3) antennas at the 93-foot level of the existing 98-foot stealth concealment monopole at 566 Enfield Street in Enfield, Connecticut. The tower is owned by Crown Castle. The property is owned by T M Realty Corp. AT&T intends to replace three (3) antennas, remove three (3) TMAs and replace with six (6) twin TMAs, and install twelve (12) lines of coax. AT&T is also proposing a structural modification from 68' to 98' wherein the concealment canisters will be removed and replaced with canisters with an increased diameter of 38".

Two emails were sent to the Town of Enfield's Planning & Zoning Department seeking the original facility approval, though we did not receive a responses to these requests for the original approval.

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 Christopher W. Bromson, Town Manager for the Town of Enfield, Lauren Whitten, Development Director, as well as the property owner and 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.

The Foundation for a Wireless World.

CrownCastle.com

6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, AT&T 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: Anne Marie Zsamba.

Sincerely,

Anne Marie Zsamba
Network Real Estate Specialist
3 Corporate Park Drive,
Suite 101, Clifton Park, NY 12065
annemarie.zsamba@crowncastle.com

Attachments:

Exhibit-A: Compound Plan and Elevation Depicting the Planned Changes
Exhibit-B: Structural Modification Report
Exhibit-C: General Power Density Table Report (RF Emissions Analysis Report)

cc: Christopher W. Bromson, Town Manager
Town of Enfield
820 Enfield Street
Enfield, CT 06082
860-253-6350

Lauren Whitten, Development Director
Town of Enfield
820 Enfield Street
Enfield, CT 06082
860-253-6507

T M Realty Corp
C/O American Legion
566 Enfield Street
Enfield, CT 06082

ORIGIN ID: ONHA (585) 445-5896
RICHARD ZAJAC
CROWN CASTLE
300 MERIDIAN CENTRE
ROCHESTER, NY 14618
UNITED STATES US

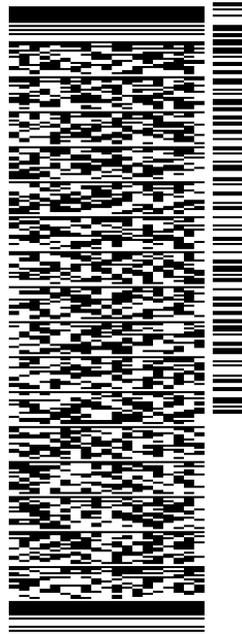
SHIP DATE: 18NOV19
ACTWGST: 1.50 LB
CAD: 104924194/N/NET4160

BILL SENDER

TO TOWN MANAGERS OFFICE
TOWN OF ENFIELD
820 ENFIELD ST

ENFIELD CT 06082

(860) 253-6350 REF: 1734 7890
INV/ DEPT:
PO:



J192119091901uv

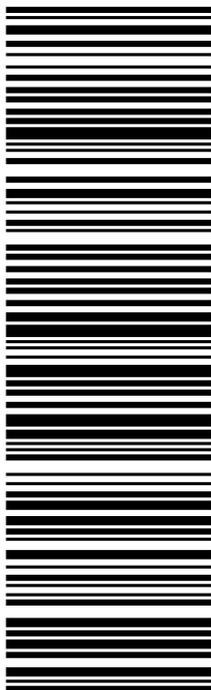
567J1/F330/05A2

TRK# 7770 1357 2665
#0201

TUE - 19 NOV 10:30A
PRIORITY OVERNIGHT

XEQCWA

06082
CT-US BDL



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ORIGIN ID: ONHA (585) 445-5896
RICHARD ZAJAC
CROWN CASTLE
300 MERIDIAN CENTRE
ROCHESTER, NY 14618
UNITED STATES US

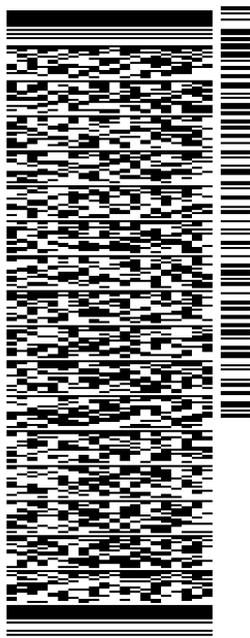
SHIP DATE: 18NOV19
ACTWGT: 1.50 LB
CAD: 104924194/IN/ET4160

BILL SENDER

TO LAUREN WHITTEN, DIRECTOR OF DEVELOP
TOWN OF ENFIELD
820 ENFIELD ST

ENFIELD CT 06082

(860) 253-6350 REF: 1734.7890
INV/ DEPT:
PO:

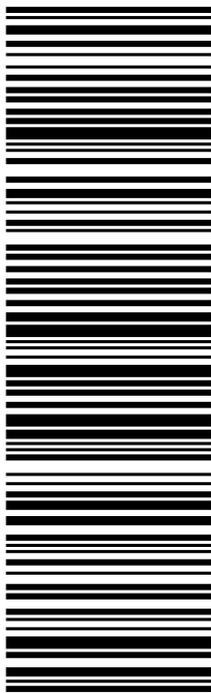


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567J1/F330/05A2

TRK# 7770 1359 0631
0201

TUE - 19 NOV 10:30A
PRIORITY OVERNIGHT

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CROWN CASTLE
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ROCHESTER, NY 14618
UNITED STATES US

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CAD: 104924194/NINET4160

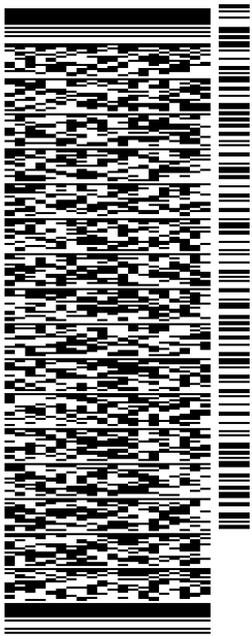
BILL SENDER

TO **T M REALTY CORP**

C/O AMERICAN LEGION
566 ENFIELD STREET
ENFIELD CT 06082

(201) 236-9224 REF: 1734.7890
INV/ PO: DEPT:

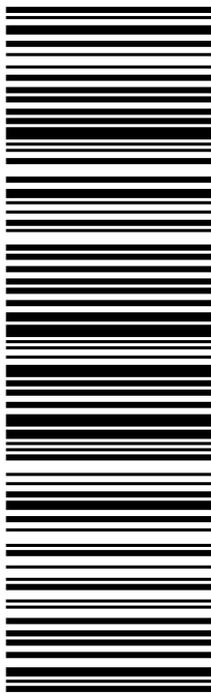
567J1/F330/05A2



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0201 PRIORITY OVERNIGHT

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RICHARD ZAJAC
CROMWELL CASTLE
300 MERIDIAN CENTRE
ROCHESTER, NY 14618
UNITED STATES US

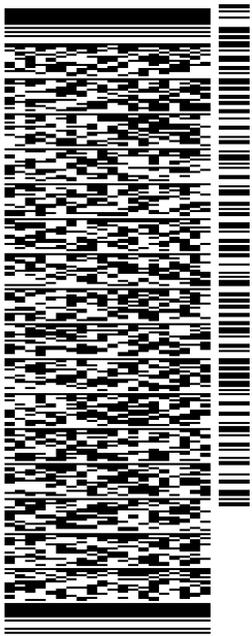
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ACTWGT: 3.20 LB
CAD: 104924194/NET4160

BILL SENDER

TO **MELANIE BACHMAN**
CONNECTICUT SITING COUNCIL
10 FRANKLIN SQUARE

NEW BRITAIN CT 06051

(860) 827-2951 REF: 1765 6880
INV: DEPT:
PO:



J192119091901uv

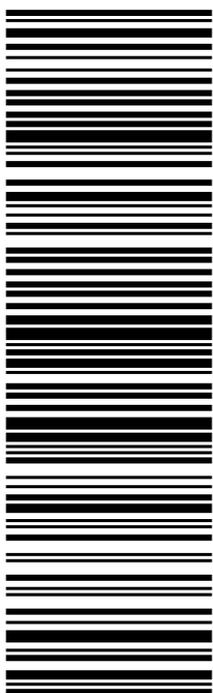
567J1/F330/05A2

TRK# 7770 1363 6464
0201

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Exhibit A

Original Facility Approval

From: Zsamba, Anne Marie
To: PlanningZoningService@enfield.org
Subject: RE: 566 Enfield Street - Seeking Original Telecom Zoning Approval
Date: Friday, November 22, 2019 10:45:00 AM

Hello Planning & Zoning,

Any assistance you can provide in locating the original tower approval per the request below would be so appreciated. I will attach the original approval to our internal files to ensure your efforts are not duplicated. I have also combed through the carrier's database in an attempt to locate it but could not find the original tower approval in their records either. Thank you.

Best,
Anne Marie

ANNE MARIE ZSAMBA
Network Real Estate Specialist
T: (201) 236-9224
F: (724) 416-6112

CROWN CASTLE
3 Corporate Park Drive, Suite 101,
Clifton Park, NY 12065
CrownCastle.com

From: Zsamba, Anne Marie
Sent: Monday, November 18, 2019 2:28 PM
To: PlanningZoningService@enfield.org
Subject: 566 Enfield Street - Seeking Original Telecom Zoning Approval

Good afternoon Planning & Zoning,

Seeking some assistance if possible in locating the original zoning approval for the telecommunications facility located at 566 Enfield Street. This is a stealth flagpole facility directly located in front of the American Legion. Any assistance that could be provided in helping me find the original planning/zoning document would be so appreciated. Thank you!

Best,
Anne Marie

ANNE MARIE ZSAMBA
Network Real Estate Specialist
T: (201) 236-9224
F: (724) 416-6112

CROWN CASTLE
3 Corporate Park Drive, Suite 101,
Clifton Park, NY 12065
CrownCastle.com

Exhibit B

Property Card



ENFIELD, CT



566 ENFIELD ST

[Sales](#)
[Print](#)
[Map It](#)

Location 566 ENFIELD ST **Mblu** 033/ / 0002/ /
Acct# 000700020265 **Owner** T M REALTY CORP
Assessment \$192,500 **Appraisal** \$275,000
PID 14036 **Building Count** 1
Fire District 4

Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2017	\$95,000	\$180,000	\$275,000

Assessment			
Valuation Year	Improvements	Land	Total
2017	\$66,500	\$126,000	\$192,500

Owner of Record

Owner T M REALTY CORP **Sale Price** \$0
Co-Owner C/O AMERICAN LEGION **Certificate** 1
Address 566 ENFIELD ST **Book & Page** 148/ 524
 ENFIELD, CT 06082 **Sale Date**

Ownership History

Ownership History				
Owner	Sale Price	Certificate	Book & Page	Sale Date
T M REALTY CORP	\$0	1	148/ 524	

Building Information

Building 1 : Section 1

Year Built:
Living Area: 0
Replacement Cost: \$0

Building Photo

Building Percent

Good:

Replacement Cost

Less Depreciation: \$0

Building Attributes	
Field	Description
Style	Vacant Land
Model	
Grade:	
Stories	
Occupancy	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Full Bthrms:	
Half Baths:	
Extra Fixtures	
Total Rooms:	
Bath Style:	
Kitchen Style:	
Extra Kitchens	
Fireplace(s)	
Extra Opening(s)	
Gas Fireplace(s)	
Blocked FPL(s)	
Bsmt Garage(s)	
Fin Bsmt	
FBM Quality	
Whirlpool(s)	



Building Layout

Building Sub-Areas (sq ft)	Legend
No Data for Building Sub-Areas	

Sauna	
Walk Out	
Solar	

Extra Features

Extra Features	Legend Legend
No Data for Extra Features	

Land

Land Use

Use Code	300
Description	Ind Land
Zone	BL
Neighborhood	C300
Alt Land Appr Category	No

Land Line Valuation

Size (Acres)	0
Frontage	
Depth	
Assessed Value	\$126,000
Appraised Value	\$180,000

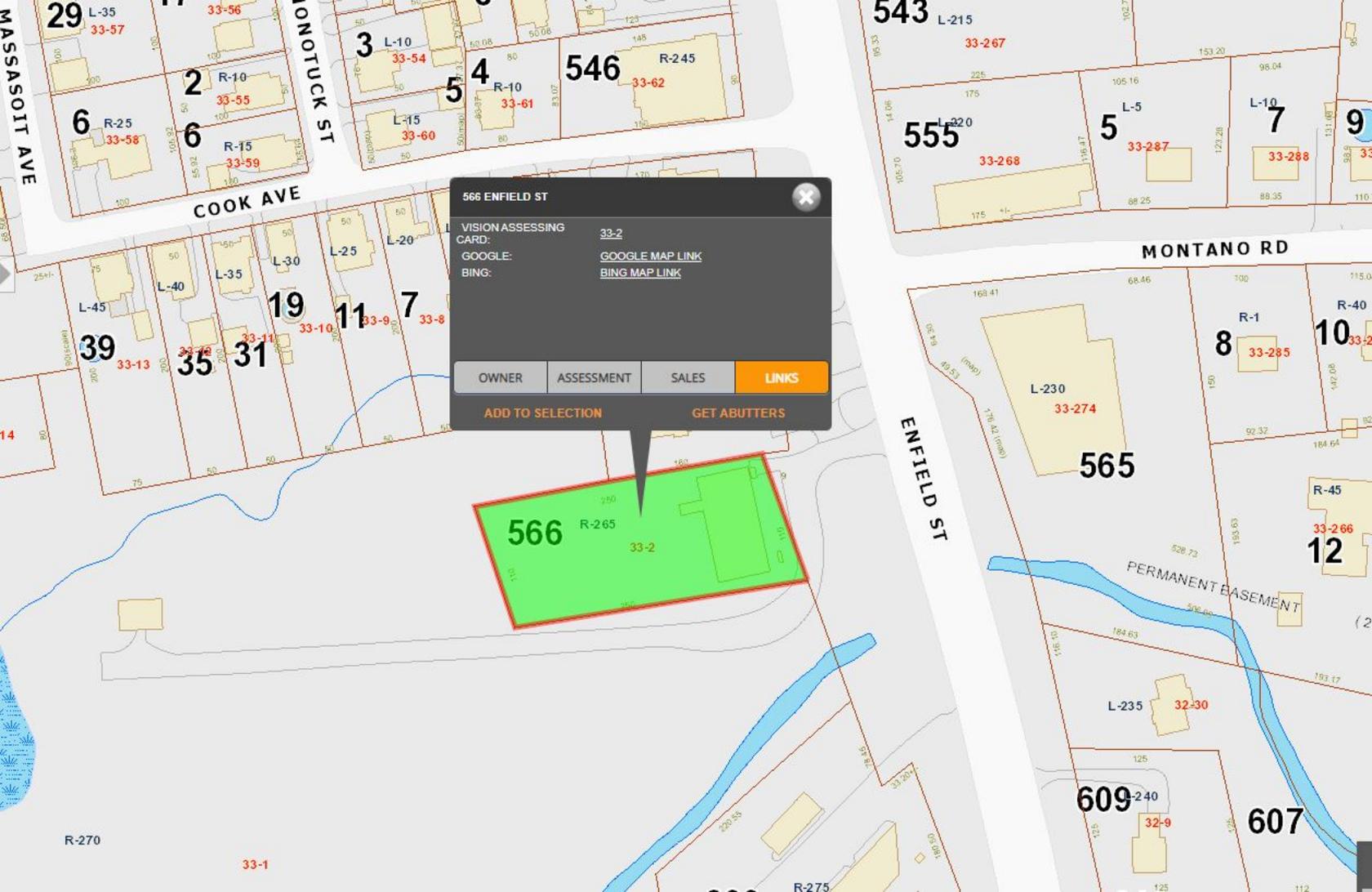
Outbuildings

Outbuildings					Legend Legend	
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
TWR1	Cell Twr 1 Carrier			1 UNITS	\$95,000	1

Valuation History

Appraisal			
Valuation Year	Improvements	Land	Total
2018	\$95,000	\$180,000	\$275,000
2017	\$95,000	\$180,000	\$275,000
2016	\$95,000	\$180,000	\$275,000

Assessment			
Valuation Year	Improvements	Land	Total
2018	\$66,500	\$126,000	\$192,500
2017	\$66,500	\$126,000	\$192,500
2016	\$66,500	\$126,000	\$192,500



566 ENFIELD ST

VISION ASSESSING CARD: 33-2

GOOGLE: [GOOGLE MAP LINK](#)

BING: [BING MAP LINK](#)

OWNER	ASSESSMENT	SALES	LINKS
-------	------------	-------	--------------

[ADD TO SELECTION](#) [GET ABUTTERS](#)

566 R-265
33-2

33-2
[GOOGLE MAP LINK](#)
[BING MAP LINK](#)

OWNER ASSESSMENT SALES **LINKS**

[ADD TO SELECTION](#) [GET ABUTTERS](#)

Exhibit C

Construction Drawings

PROJECT INFORMATION

SCOPE OF WORK:

ITEMS TO BE REMOVED FROM EXISTING TOWER & ON GROUND:

- REMOVE (3) EXISTING ANTENNAS, (3) TMA's
- INSTALL AT&T ANTENNA (80010798) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- INSTALL AT&T TMA's (TMA21X23868) (TYP. OF 2 PER SECTOR, TOTAL OF 6).
- INSTALL (12) COAX CABLES.

ITEMS TO BE MOUNTED INSIDE EXISTING SHELTER:

- INSTALL AT&T RRU'S-32 B2 (1900) (TOTAL OF 3).
- INSTALL AT&T RRU'S-32 (WCS) (TOTAL OF 3).
- INSTALL AT&T TRIPLEXERS (TOTAL OF 6)
- INSTALL AT&T QUADPLEXERS (TOTAL OF 12).
- SWAP DUL TO 5216 AND ADD NEW XMU.
- INSTALL (24) SURGE ARRESTORS TOTAL ON PORTS OF PROPOSED RRU'S

ITEMS TO REMAIN:

- (3) RRU'S

SITE ADDRESS: 566 ENFIELD STREET
ENFIELD, CT 06082

LATITUDE (NAD 83): N 42° 0' 29.71"

LONGITUDE (NAD 83): W -72° 35' 36.67"

LANDLORD: CROWN CASTLE INTERNATIONAL
500 W. CUMMINGS PARK, STE 3600
WOBURN, MA 01801

TYPE OF SITE: MONOPOLE/INDOOR

TOWER HEIGHT: 98' 2"

RAD CENTER: 94'

CURRENT USE: TELECOMMUNICATIONS FACILITY

PROPOSED USE: TELECOMMUNICATIONS FACILITY



SITE NUMBER: CTL05156

FA LOCATION CODE: 10071277

SITE NAME: THOMPSONVILLE

CROWN SITE NAME: THOMPSONVILLE

PROJECT: LTE 3C/LTE 2C

PACE ID: MRCTB024518, MRCTB024346

BU#: 842874

NOTE:

ALL CONSTRUCTION ACTIVITIES ARE TO BE COMPLETED DIRECTLY THROUGH CROWN. CONTRACTOR MUST HAVE CONSTRUCTION PO AND NTP FROM CROWN DIRECT IN ORDER TO BEGIN. PRE-APPROVAL TO ENTER THE PROPERTY MUST BE OBTAINED FOR ACCESS AUTHORIZATION. PLEASE CONTACT CROWN.



5841 BRIDGE STREET
EAST SYRACUSE, NY 13057



3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065



100 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116



PROJECT NO: ERCC0004

DRAWN BY: CM

CHECKED BY: CAT

SUBMITTALS

NO.	DATE	ISSUED FOR CONSTRUCTION	ISSUED FOR PERMITTING
1	05/03/19	ISSUED FOR CONSTRUCTION	
0	05/15/19	ISSUED FOR PERMITTING	

THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF AT&T. WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED REPRODUCTION AND USE BY ANY OTHER PARTY FOR ANY PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS SPECIFICALLY ALLOWED.

FA# 10071277
SITE# CTL05156
THOMPSONVILLE

566 ENFIELD STREET
ENFIELD, CT 06082

TITLE SHEET

T-1

DRAWING INDEX

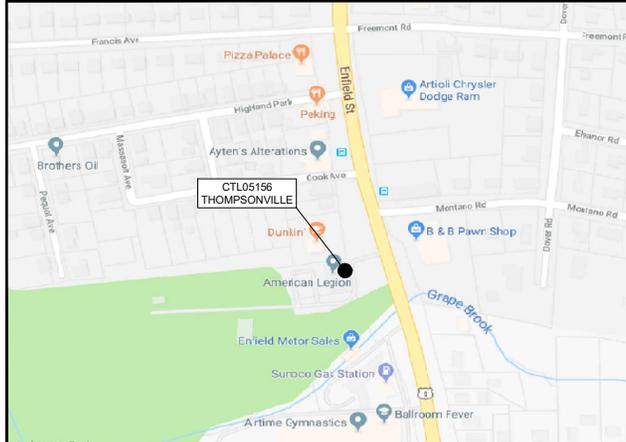
SHEET NO.	SHEET TITLE
T-1	TITLE SHEET
GN-1	GENERAL NOTES I
GN-2	GENERAL NOTES II
C-1	SITE PLAN
C-2	EQUIPMENT LAYOUT & PROPOSED TOWER ELEVATION
C-3	EXISTING & PROPOSED ANTENNA LAYOUT
C-4	EQUIPMENT DETAILS
S-1	STRUCTURAL DETAILS
S-2	STRUCTURAL DETAILS
S-3	STRUCTURAL DETAILS
S-4	STRUCTURAL DETAILS
S-5	STRUCTURAL DETAILS
S-6	STRUCTURAL DETAILS
RF-1	ANTENNA CHART & RF EQUIPMENT SCHEMATIC
G-1	GROUNDING DETAILS

CROWN CASTLE SITE ID #: 842874
CROWN CASTLE SITE NAME: THOMPSONVILLE

ENGINEERING

2018 CONNECTICUT STATE BUILDING CODE
2018 AMENDMENT WITH 2015 INTERNATIONAL BUILDING CODE
2009 ICC/ANSI A117.1 ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES
2015 INTERNATIONAL MECHANICAL CODE
2015 INTERNATIONAL ENERGY CONSERVATION CODE
2017 NATIONAL ELECTRICAL CODE (NFPA 70 2017)
ANSI/TIA-222-G

VICINITY MAP



UPDATED 10/09CT-1561-91 NORTH TO EXIT 48, TAKE A LEFT OFF THE EXIT ONTO ELM STREET, FOLLOW TO ROUTE 5 AND TAKE A RIGHT ONTO ROUTE FIVE, FOLLOW ABOUT A MILE; TAKE A LEFT INTO THE DRIVEWAY TO THE AMERICAN LEGION HALL. SHELTER IS ATTACHED TO FRONT OF THE BUILDING. ANTENNA IS THE FLAG POLE IN THE FRONT OF THE BUILDING. NEED TRAC KEYADDRESS: 566 ENFIELD STREET, ENFIELD, CT ACCESS:247 CONTACT: SECURITY: NO ISSUES/POWER COMPANY: NORTHEAST UTILITIES (800) 286-2000/METER #: 89-194-614/LOCATED ON SIDE OF BUILDING/FIRE: (860) 745-1878 POLICE: (860) 763-6400T-1:HGCS 742413UMTS T1S ARE 1 HGCS 742413 2 HGCS 742414D-MARC:LOCATED INSIDE OF OUR SHELTER.SNET: (800) 448-1008 AND (203) 420-3131 (24-HR REPAIR)

GENERAL NOTES

1. THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
2. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE AT&T REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.



UNDERGROUND SERVICE ALERT
STATE LAW REQUIRES
TWO WORKING DAYS NOTICE PRIOR TO ANY
EARTH MOVING ACTIVITIES BY CALLING
DIAL 811

PART 1 - GENERAL

- 1.1 GENERAL CONDITIONS:
 - A. CONTRACTOR SHALL INSPECT THE EXISTING SITE CONDITIONS PRIOR TO SUBMITTING BID. ANY QUESTIONS ARISING DURING THIS BID PERIOD IN REGARDS TO THE CONTRACTORS FUNCTIONS, THE SCOPE OF WORK, OR ANY OTHER ISSUE RELATED TO THIS PROJECT SHALL BE BROUGHT UP DURING THE BID PERIOD WITH THE PROJECT MANAGER FOR CLARIFICATION, NOT AFTER THE CONTRACT HAS BEEN AWARDED.
 - B. THE CONTRACTOR SHALL OBTAIN PERMITS, LICENSES, MAKE ALL DEPOSITS, AND PAY ALL FEES REQUIRED FOR THE CONSTRUCTION PERFORMANCE FOR THE WORK UNDER THIS SECTION.
 - C. DRAWINGS SHOW THE GENERAL ARRANGEMENT OF ALL SYSTEMS AND COMPONENTS COVERED UNDER THIS SECTION. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, DRAWING SHALL NOT BE SCALED TO DETERMINE DIMENSIONS.
- 1.2 LAWS, REGULATIONS, ORDINANCES, STATUTES AND CODES:
 - A. ALL WORK SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE, AND ALL APPLICABLE LOCAL LAWS, REGULATIONS, ORDINANCES, STATUTES AND CODES. CONDUIT BENDS SHALL BE THE RADIUS BEND FOR THE TRADE SIZE OF CONDUIT IN COMPLIANCE WITH THE LATEST EDITIONS OF NEC.
- 1.3 REFERENCES:
 - A. THE PUBLICATIONS LISTED BELOW ARE PART OF THIS SPECIFICATION. EACH PUBLICATION SHALL BE THE LATEST REVISION AND INCLUDED IN EFFECT ON THE DATE THIS SPECIFICATION IS ISSUED FOR CONSTRUCTION UNLESS OTHERWISE NOTED. EXCEPT AS MODIFIED BY THE REQUIREMENT SPECIFIED HEREIN OR THE DETAILS OF THE DRAWINGS, WORK UNDER THIS SPECIFICATION SHALL CONFORM TO THE APPLICABLE PROVISION OF THESE PUBLICATIONS.
 - 1. ANSI/IEEE (AMERICAN NATIONAL STANDARDS INSTITUTE)
 - 2. ASTM (AMERICAN SOCIETY FOR TESTING AND MATERIALS)
 - 3. ICEA (INSULATED CABLE ENGINEERS ASSOCIATION)
 - 4. NEMA (NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION)
 - 5. NFPA (NATIONAL FIRE PROTECTION ASSOCIATION)
 - 6. OSHA (OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION)
 - 7. UL (UNDERWRITERS LABORATORIES INC.)
 - 8. AT&T GROUNDING AND BONDING STANDARDS TP-76416

- 1.4 SCOPE OF WORK
 - A. WORK UNDER THIS SECTION SHALL CONSIST OF FURNISHING ALL LABOR, MATERIAL, AND ASSOCIATED SERVICES REQUIRED TO COMPLETE REQUIRED CONSTRUCTION AND BE OPERATIONAL.
 - B. ALL ELECTRICAL EQUIPMENT UNDER THIS CONTRACT SHALL BE PROPERLY TESTED, ADJUSTED, AND ALIGNED BY THE CONTRACTOR.
 - C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL EXCAVATING, DRAINING, TRENCHES, BACKFILLING, AND REMOVAL OF EXCESS DIRT.
 - D. THE CONTRACTOR SHALL FURNISH TO THE OWNER WITH CERTIFICATES OF A FINAL INSPECTION AND APPROVAL FROM THE INSPECTION AUTHORITIES HAVING JURISDICTION.
 - E. THE CONTRACTOR SHALL PREPARE A COMPLETE SET OF AS-BUILT DRAWINGS, DOCUMENT ALL WIRING EQUIPMENT CONDITIONS, AND CHANGES WHILE COMPLETING THIS CONTRACT. THE AS-BUILT DRAWINGS SHALL BE SUBMITTED AT COMPLETION OF THE PROJECT.

PART 2 - PRODUCTS

- 2.1 GENERAL:
 - A. ALL MATERIALS AND EQUIPMENT SHALL BE UL LISTED, NEW, AND FREE FROM DEFECTS.
 - B. ALL ITEMS OF MATERIALS AND EQUIPMENT SHALL BE ACCEPTABLE TO THE AUTHORITY HAVING JURISDICTION AS SUITABLE FOR THE USE INTENDED.
 - C. ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE.
 - D. ALL OVERCURRENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED. 10,000 AAC MINIMUM, VERIFY AVAILABLE SHORT CIRCUIT CURRENT DOES NOT EXCEED THE RATING OF ELECTRICAL EQUIPMENT IN ACCORDANCE WITH ARTICLE 110.24 NEC OR THE MOST CURRENT ADOPTED CODE PER THE GOVERNING JURISDICTION.
- 2.2 MATERIALS AND EQUIPMENT:
 - A. CONDUIT:
 - 1. RIGID METAL CONDUIT (RMC) SHALL BE HOT-DIPPED GALVANIZED INSIDE AND OUTSIDE INCLUDING ENDS AND THREADS AND ENAMELED OR LACQUERED INSIDE IN ACCORDANCE TO GALVANIZING.
 - 2. LIQUIDTIGHT FLEXIBLE METAL CONDUIT SHALL BE UL LISTED.
 - 3. CONDUIT CLAMPS, STRAPS AND SUPPORTS SHALL BE STEEL OR MALLEABLE IRON. ALL FITTINGS SHALL BE COMPRESSION AND CONCRETE TIGHT TYPE. GROUNDING BUSHINGS WITH INSULATED THROATS SHALL BE INSTALLED ON ALL CONDUIT TERMINATIONS.
 - 4. NONMETALLIC CONDUIT AND FITTINGS SHALL BE SCHEDULE 40 PVC. INSTALL USING SOLVENT-CEMENT-TYPE JOINTS AS RECOMMENDED BY THE MANUFACTURER.
 - B. CONDUCTORS AND CABLE:
 - 1. CONDUCTORS AND CABLE SHALL BE FLAME-RETARDANT, MOISTURE AND HEAT RESISTANT THERMOPLASTIC, SINGLE CONDUIT, COPPER, TYPE THHN/THWN-2, 600 VOLT, SIZE AS INDICATED, #12 AWG SHALL BE THE MINIMUM SIZE CONDUIT USED.
 - 2. #10 AWG AND SMALLER CONDUCTOR SHALL BE SOLID OR STRANDED AND #8 AWG AND LARGER CONDUCTORS SHALL BE SOLID.
 - 3. SOLDERLESS, COMPRESSION-TYPE CONNECTORS SHALL BE USED FOR TERMINATION OF ALL STRANDED CONDUCTORS.
 - 4. STRAIN-RELIEF SUPPORTS GRIPS SHALL BE HUBBELL KELLEMS OR APPROVED EQUAL. CABLES SHALL BE SUPPORTED IN ACCORDANCE WITH THE NEC AND CABLE MANUFACTURERS RECOMMENDATIONS.
 - 5. ALL CONDUCTORS SHALL BE TAGGED AT BOTH ENDS OF THE CONDUCTOR, AT ALL PULL BOXES, J-BOXES, EQUIPMENT AND CABINETS AND SHALL BE IDENTIFIED WITH APPROVED PLASTIC TAGS (ACTION CRAFT, BRADY, OR APPROVED EQUAL).
 - C. DISCONNECT SWITCHES:
 - 1. DISCONNECT SWITCHES SHALL BE HEAVY DUTY, DEAD-FRONT, QUICK-MAKE, QUICK-BREAK, EXTERNALLY OPERABLE, HANDLE LOCKABLE AND INTERLOCK WITH COVER IN CLOSED POSITION, RATINGS AS INDICATED, UL LABELED FURNISHED IN NEMA 3R ENCLOSURE, SQUARE-D OR ENGINEER APPROVED EQUAL.
 - D. CHEMICAL ELECTROLYTIC GROUNDING SYSTEM:
 - 1. INSTALL CHEMICAL GROUNDINGS AS REQUIRED. THE SYSTEM SHALL BE ELECTROLYTIC MAINTENANCE FREE ELECTRODE CONSISTING OF RODS WITH A MINIMUM #2 AWG CU EXOTHERMICALLY WELDED RIGID, PROTECTIVE BOXES, AND BACKFILL MATERIAL. MANUFACTURER SHALL BE LYNCOLE XIT GROUNDING ROD TYPES K2-(*)CS OR K2L-(*)CS (*) LENGTH AS REQUIRED.
 - 2. GROUND ACCESS BOX SHALL BE A POLYPLASTIC BOX FOR NON-TRAFFIC APPLICATIONS, INCLUDING BOLT DOWN FLUSH COVER WITH "BREATHER" HOLES, XIT MODEL #XB-22. ALL DISCONNECT SWITCHES AND CONTROLLING DEVICES SHALL BE PROVIDED WITH ENGRAVED LAMICOID NAMEPLATES INDICATING EQUIPMENT CONTROLLED, BRANCH CIRCUITS ID

- NUMBERING, AND THE ELECTRICAL POWER SOURCE.
- 3. BACKFILL MATERIAL SHALL BE LYNCOMITE AND LYNCOLE GROUNDING GRAVEL.
- E. SYSTEM GROUNDING:
 - 1. ALL GROUNDING COMPONENTS SHALL BE TINNED AND GROUNDING CONDUCTOR SHALL BE #2 AWG BARE, SOLID, TINNED, COPPER. ABOVE GRADE GROUNDING CONDUCTORS SHALL BE INSULATED WHERE NOTED.
 - 2. GROUNDING BUSES SHALL BE BARE, TINNED, ANNEALED COPPER BARS OF RECTANGULAR CROSS SECTION. STANDARD BUS BARS M88, SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR. THEY SHALL NOT BE FABRICATED OR MODIFIED IN THE FIELD. ALL GROUNDING BUSES SHALL BE IDENTIFIED WITH MINIMUM 3/4" LETTERS BY WAY OF STENCILING OR DESIGNATION PLATE.
 - 3. CONNECTORS SHALL BE HIGH-CONDUCTIVITY, HEAVY DUTY, LISTED AND LABELED AS GROUNDING CONNECTORS FOR THE MATERIALS USED. USE TWO-HOLE COMPRESSION LUGS WITH HEAT SHRINK FOR MECHANICAL CONNECTIONS. INTERIOR CONNECTIONS USE TWO-HOLE COMPRESSION LUGS WITH INSPECTION WINDOW AND CLEAR HEAT SHRINK.
 - 4. EXOTHERMIC WELDED CONNECTIONS SHALL BE PROVIDED IN KIT FORM AND SELECTED FOR THE SPECIFIC TYPES, SIZES, AND COMBINATIONS OF CONDUCTORS AND OTHER ITEMS TO BE JOINED.
 - 5. GROUND RODS SHALL BE COPPER-CLAD STEEL WITH HIGH-STRENGTH STEEL CORE AND ELECTROLYTIC-GRADE COPPER OUTER SHEATH, MOLTEN WELDED TO CORE, 5/8"x10'-0". ALL GROUNDING RODS SHALL BE INSTALLED WITH INSPECTION SLEEVES.
 - 6. INSTALL AN EQUIPMENT GROUNDING CONDUCTOR IN ALL CONDUITS IN COMPLIANCE WITH THE AT&T SPECIFICATIONS AND NEC. THE EQUIPMENT GROUNDING CONDUCTORS SHALL BE BONDED AT ALL JUNCTION BOXES, PULLBOXES, DISCONNECT SWITCHES, STARTERS, AND EQUIPMENT CABINETS.
- F. OTHER MATERIALS:
 - 6. THE CONTRACTOR SHALL PROVIDE OTHER MATERIALS, THOUGH NOT SPECIFICALLY DESCRIBED, WHICH ARE REQUIRED FOR A COMPLETELY OPERATIONAL SYSTEM AND PROPER INSTALLATION OF THE WORK.
 - 7. PROVIDE PULL BOXES AND JUNCTION BOXES WHERE SHOWN OR REQUIRED BY NEC.
 - G. PANELS AND LOAD CENTERS:
 - 1. ALL PANEL DIRECTORIES SHALL BE TYPEDWRITTEN.

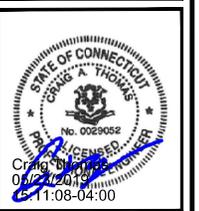
PART 3 - EXECUTION

- 3.1 GENERAL:
 - A. ALL MATERIAL AND EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS.
 - B. EQUIPMENT SHALL BE TIGHTLY COVERED AND PROTECTED AGAINST DIRT OR WATER, AND AGAINST CHEMICAL OR MECHANICAL INJURY DURING INSTALLATION AND CONSTRUCTION PERIODS.
- 3.2 LABOR AND WORKMANSHIP:
 - A. ALL LABOR FOR THE INSTALLATION OF MATERIALS AND EQUIPMENT FURNISHED FOR THE ELECTRICAL SYSTEM SHALL BE INSTALLED BY EXPERIENCED WIREMEN, IN A NEAT AND WORKMAN-LIKE MANNER.
 - B. ALL ELECTRICAL EQUIPMENT SHALL BE ADJUSTED, ALIGNED AND TESTED BY THE CONTRACTOR AS REQUIRED TO PRODUCE THE INTENDED PERFORMANCE.
 - C. UPON COMPLETION OF WORK, THE CONTRACTOR SHALL THOROUGHLY CLEAN ALL FINISHED EQUIPMENT, REMOVE ALL LABELS AND ANY DEBRIS, CRATING OR CARTONS AND LEAVE THE INSTALLATION EXPOSED AND READY FOR OPERATION.
- 3.3 COORDINATION:
 - A. THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF ELECTRICAL ITEMS WITH THE OWNER-FURNISHED EQUIPMENT DELIVERY SCHEDULE TO PREVENT UNNECESSARY DELAYS IN THE TOTAL WORK.
- 3.4 INSTALLATION:
 - A. CONDUIT:
 - 1. ALL ELECTRICAL WIRING SHALL BE INSTALLED IN CONDUIT AS SPECIFIED. NO CONDUIT OR TUBING OF LESS THAN 3/4" INCH TRADE SIZE.
 - 2. PROVIDE RIGID PVC SCHEDULE 40 CONDUITS FOR ALL RISERS, RMC OTHERWISE NOTED. EMT MAY BE INSTALLED FOR EXTERIOR CONDUITS WHERE NOT SUBJECT TO PHYSICAL DAMAGE.
 - 3. INSTALL SCHEDULE 40 PVC CONDUIT WITH A MINIMUM COVER OF 24" UNDER ROADWAYS, PARKING LOTS, STREETS, AND ALLEYS. CONDUIT SHALL HAVE A MINIMUM COVER OF 18" IN ALL OTHER NON-TRAFFIC APPLICATIONS (REFER TO 2017 NEC, TABLE 300.5).
 - 4. USE GALVANIZED FLEXIBLE STEEL CONDUIT WHERE DIRECT CONNECTION TO EQUIPMENT WITH MOVEMENT, VIBRATION, OR FOR EASE OF MAINTENANCE. USE LIQUID TIGHT, FLEXIBLE METAL CONDUIT FOR OUTDOOR APPLICATIONS. INSTALL GALVANIZED FLEXIBLE STEEL CONDUIT AT ALL POINTS OF CONNECTION TO EQUIPMENT MOUNTED ON SUPPORT TO ALLOW FOR EXPANSION AND CONTRACTION.
 - 5. A RUN OF CONDUIT BETWEEN BOXES OR EQUIPMENT SHALL NOT CONTAIN MORE THAN THE EQUIVALENT OF THREE QUARTER-BENDS. CONDUIT BEND SHALL BE MADE WITH THE UL LISTED BENDER OR FACTORY 90 DEGREE ELBOWS MAY BE USED.
 - 6. FIELD FABRICATED CONDUITS SHALL BE CUT SQUARE WITH A CONDUIT CUTTING TOOL AND REAMED TO PROVIDE A SMOOTH INSIDE SURFACE.
 - 7. PROVIDE INSULATED GROUNDING BUSHING FOR ALL CONDUITS.
 - 8. CONTRACTOR IS RESPONSIBLE FOR PROTECTING ALL CONDUITS DURING CONSTRUCTION. TEMPORARY OPENINGS IN THE CONDUIT SYSTEM SHALL BE PLUGGED OR CAPPED TO PREVENT ENTRANCE OF MOISTURE OR FOREIGN MATTER. CONTRACTOR SHALL REPLACE ANY CONDUITS CONTAINING FOREIGN MATERIALS THAT CANNOT BE REMOVED.
 - 9. ALL CONDUITS SHALL BE SWABBED CLEAN BY PULLING AN APPROPRIATE SIZE MANDREL THROUGH THE CONDUIT BEFORE INSTALLATION OF CONDUIT OR CABLES. CONDUIT SHALL BE FREE OF DIRT AND DEBRIS.
 - 10. INSTALL PULL STRINGS IN ALL CLEAN EMPTY CONDUITS. IDENTIFY PULL STRINGS AT EACH END.
 - 11. INSTALL 2" HIGHLY VISIBLE AND DETECTABLE TAPE 12" ABOVE ALL UNDERGROUND CONDUITS AND CONDUCTORS.
 - 12. CONDUITS SHALL BE INSTALLED IN SUCH A MANNER AS TO INSURE AGAINST COLLECTION OF TRAPPED CONDENSATION.
 - 13. PROVIDE CORE DRILLING AS NECESSARY FOR PENETRATIONS TO ALLOW FOR RACEWAYS AND CABLES TO BE ROUTED THROUGH THE BUILDING. DO NOT PENETRATE STRUCTURAL MEMBERS. SLEEVES AND/OR PENETRATIONS IN FIRE RATED CONSTRUCTION SHALL BE EFFECTIVELY SEALED WITH FIRE RATED MATERIAL WHICH SHALL MAINTAIN THE FIRE RATING OF THE WALL OR STRUCTURE. FIRE STOPS AT FLOOR PENETRATIONS SHALL PREVENT PASSAGE OF WATER, SMOKE, FIRE, AND FUMES. ALL MATERIAL SHALL BE UL APPROVED FOR THIS PURPOSE.
 - B. CONDUCTORS AND CABLE:
 - 1. ALL POWER WIRING SHALL BE COLOR CODED AS FOLLOWS:

DESCRIPTION	208/240/120 VOLT SYSTEMS
PHASE A	BLACK
PHASE B	RED
PHASE C	BLUE
NEUTRAL	WHITE
GROUNDING	GREEN
 - 2. SPLICES SHALL BE MADE ONLY AT OUTLETS, JUNCTION BOXES, OR ACCESSIBLE RACEWAY CONDUITS APPROVED FOR THIS PURPOSE.

- 3. PULLING LUBRICANTS SHALL BE UL APPROVED. CONTRACTOR SHALL USE NYLON OR HEMP ROPE FOR PULLING CONDUCTOR OR CABLES INTO THE CONDUIT.
- 4. CABLES SHALL BE NEATLY TRIMMED, WITHOUT INTERLACING, AND BE OF SUFFICIENT LENGTH IN ALL BOXES & EQUIPMENT TO PERMIT MAKING A NEAT ARRANGEMENT. CABLES SHALL BE SECURED IN A MANNER TO AVOID TENSION ON CONDUCTORS OR TERMINALS. CONDUCTORS SHALL BE PROTECTED FROM MECHANICAL INJURY AND MOISTURE. SHARP BENDS OVER CONDUIT BUSHINGS IS PROHIBITED. DAMAGED CABLES SHALL BE REMOVED AND REPLACED AT THE CONTRACTORS EXPENSE.
- C. DISCONNECT SWITCHES:
 - 1. INSTALL DISCONNECT SWITCHES LEVEL AND PLUMB. CONNECT TO WIRING SYSTEM AND GROUNDING SYSTEM AS INDICATED.
- D. GROUNDING:
 - 1. ALL METALLIC PARTS OF ELECTRICAL EQUIPMENT WHICH DO NOT CARRY CURRENT SHALL BE GROUNDED IN ACCORDANCE WITH THE REQUIREMENTS OF THE BUILDING MANUFACTURER, AT&T GROUNDING AND BONDING STANDARDS TP-76416, ND-00135, AND THE NATIONAL ELECTRICAL CODE.
 - 2. PROVIDE ELECTRICAL GROUNDING AND BONDING SYSTEM INDICATED WITH ASSEMBLY OF MATERIALS, INCLUDING GROUNDING ELECTRODES, BONDING JUMPERS AND ADDITIONAL ACCESSORIES AS REQUIRED FOR A COMPLETE INSTALLATION.
 - 3. ALL GROUNDING CONDUCTORS SHALL PROVIDE A STRAIGHT DOWNWARD PATH TO GROUND WITH GRADUAL BEND AS REQUIRED. GROUNDING CONDUCTORS SHALL NOT BE LOOPED OR SHARPLY BENT. ROUTE GROUNDING CONNECTIONS AND CONDUCTORS TO GROUND IN THE SHORTEST AND STRAIGHTEST PATHS POSSIBLE TO MINIMIZE TRANSIENT VOLTAGE RISES.
 - 4. BUILDINGS AND/OR NEW TOWERS GREATER THAN 75 FEET IN HEIGHT AND WHERE THE MAIN GROUNDING CONDUCTORS ARE REQUIRED TO BE ROUTED TO GRADE, THE CONTRACTOR SHALL ROUTE TWO GROUNDING CONDUCTORS FROM THE ROOFTOP, TOWERS, AND WATER TOWERS GROUNDING RING, TO THE EXISTING GROUNDING SYSTEM. THE GROUNDING CONDUCTORS SHALL NOT BE SMALLER THAN 20 AWG COPPER. ROOFTOP GROUNDING SHALL BE BONDED TO THE EXISTING GROUNDING SYSTEM, THE BUILDING STEEL COLUMNS, LIGHTNING PROTECTION SYSTEM, AND BUILDING MAIN WATER LINE (FERROUS OR NONFERROUS METAL PIPING ONLY). SEE STANDARD 6.3.2.2.
 - 5. TIGHTEN GROUNDING AND BONDING CONNECTORS, INCLUDING SCREWS AND BOLTS, IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS. TORQUE TIGHTENING VALUES FOR CONNECTORS AND BOLTS, WHERE MANUFACTURERS TORQUING REQUIREMENTS ARE NOT AVAILABLE, TIGHTEN CONNECTIONS TO COMPLY WITH TIGHTENING TORQUE VALUES SPECIFIED IN UL TO ASSURE PERMANENT AND EFFECTIVE GROUNDING.
 - 6. CONTRACTOR SHALL VERIFY THE LOCATIONS OF GROUNDING TIE-IN POINTS TO THE EXISTING GROUNDING SYSTEM. ALL UNDERGROUND GROUNDING CONNECTIONS SHALL BE MADE BY THE EXOTHERMIC WELD PROCESS AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
 - 7. ALL GROUNDING CONNECTIONS SHALL BE INSPECTED FOR TIGHTNESS. EXOTHERMIC WELDED CONNECTIONS SHALL BE APPROVED BY THE INSPECTOR HAVING JURISDICTION BEFORE BEING PERMANENTLY CONCEALED.
 - 8. APPLY CORROSION-RESISTANT FINISH TO FIELD CONNECTIONS AND PLACES WHERE FACTORY APPLIED PROTECTIVE COATINGS HAVE BEEN DESTROYED. USE KOPR-SHEILD ANTI-OXIDATION COMPOUND ON ALL COMPRESSION GROUNDING CONNECTIONS.
 - 9. A SEPARATE, CONTINUOUS, INSULATED EQUIPMENT GROUNDING CONDUCTOR SHALL BE INSTALLED IN ALL FEEDER AND BRANCHED CIRCUITS.
 - 10. BOND ALL INSULATED GROUNDING BUSHINGS WITH A BARE #6 AWG GROUNDING CONDUCTOR TO A GROUND BUS.
 - 11. DIRECT BURIED GROUNDING CONDUCTORS SHALL BE INSTALLED AT A NOMINAL DEPTH OF 36" MINIMUM BELOW GRADE, OR 6" BELOW THE FROST LINE, USE THE GREATER OF THE TWO DISTANCES.
 - 12. ALL GROUNDING CONDUCTORS EMBEDDED IN OR PENETRATING CONCRETE SHALL BE INSTALLED IN SCHEDULE 40 PVC CONDUIT.
 - 13. THE INSTALLATION OF CHEMICAL ELECTROLYTIC GROUNDING SYSTEM IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. REMOVE SEALING TAPE FROM LEACHING AND BREATHER HOLES. INSTALL PROTECTIVE BOX FLUSH WITH GRADE.
 - 14. DRIVE GROUND RODS UNTIL TOPS ARE A MINIMUM DISTANCE OF 36" DEPTH OR 6" BELOW FROST LINE, USING THE GREATER OF THE TWO DISTANCES.
 - 15. IF COAX ON THE ICE BRIDGE IS MORE THAN 6 FT. FROM THE GROUNDING BAR AT THE BASE OF THE TOWER, A SECOND GROUNDING BAR WILL BE NEEDED AT THE END OF THE ICE BRIDGE TO GROUND THE COAX CABLE GROUNDING KITS AND IN-LINE ARRESTORS.
 - 16. CONTRACTOR SHALL REPAIR AND/OR REPLACE EXISTING GROUNDING SYSTEM COMPONENTS DAMAGED DURING CONSTRUCTION AT THE CONTRACTORS EXPENSE.

- 3.5 ACCEPTANCE TESTING:
 - A. CERTIFIED PERSONNEL USING CERTIFIED EQUIPMENT SHALL PERFORM REQUIRED TESTS AND SUBMIT WRITTEN TEST REPORTS UPON COMPLETION.
 - B. WHEN MATERIAL AND/OR WORKMANSHIP IS FOUND NOT TO COMPLY WITH THE SPECIFIED REQUIREMENTS, THE NON-COMPLYING ITEMS SHALL BE REMOVED FROM THE PROJECT SITE AND REPLACED WITH ITEMS COMPLYING WITH THE SPECIFIED REQUIREMENTS PROMPTLY AFTER RECEIPT OF NOTICE FOR NON-COMPLIANCE.
- C. TEST PROCEDURES:
 - 1. ALL FEEDERS SHALL HAVE INSULATION TESTED AFTER INSTALLATION, BEFORE CONNECTION TO DEVICES. THE CONDUCTORS SHALL TEST FREE FROM SHORT CIRCUITS AND GROUNDS. TESTING SHALL BE FOR ONE MINUTE USING 1000V DC. PROVIDE WRITTEN DOCUMENTATION FOR ALL TEST RESULTS.
 - 2. PRIOR TO ENERGIZING CIRCUITRY, TEST WIRING DEVICES FOR ELECTRICAL CONTINUITY AND PROPER POLARITY CONNECTIONS.
 - 3. MEASURE AND RECORD VOLTAGES BETWEEN PHASES AND BETWEEN PHASE CONDUCTORS AND NEUTRALS. SUBMIT A REPORT OF MAXIMUM AND MINIMUM VOLTAGES.
 - 4. PERFORM GROUNDING TEST TO MEASURE GROUNDING RESISTANCE OF GROUNDING SYSTEM USING THE IEEE STANDARD 3-POINT "FALL-OF-POTENTIAL" METHOD. PROVIDE PLOTTED TEST VALUES AND LOCATION SKETCH. NOTIFY THE ENGINEER IMMEDIATELY IF MEASURED VALUE IS OVER 5 OHMS.



PROJECT NO: ERCC0004

DRAWN BY: CM

CHECKED BY: CAT

SUBMITTALS	
1	05/23/19 ISSUED FOR CONSTRUCTION
0	05/15/19 ISSUED FOR PERMITTING

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GENERAL NOTES I

GN-1

ANTENNA MOUNTING

- DESIGN AND CONSTRUCTION OF ANTENNA SUPPORTS SHALL CONFORM TO CURRENT ANSIT/A-222 OR APPLICABLE LOCAL CODES.
- ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS, UNLESS NOTED OTHERWISE.
- ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 ZINC-COATING (HOT-DIP) ON IRON AND STEEL HARDWARE, UNLESS NOTED OTHERWISE.
- DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED BY COLD GALVANIZING IN ACCORDANCE WITH ASTM A780.
- ALL ANTENNA MOUNTS SHALL BE INSTALLED WITH LOCK NUTS, DOUBLE NUTS AND SHALL BE TORQUED TO MANUFACTURER'S RECOMMENDATIONS.
- CONTRACTOR SHALL INSTALL ANTENNA PER MANUFACTURER'S RECOMMENDATION FOR INSTALLATION AND GROUNDING.
- ALL UNUSED PORTS ON ANY ANTENNAS SHALL BE TERMINATED WITH A 50-ohm LOAD TO ENSURE ANTENNAS PERFORM AS DESIGNED.
- PRIOR TO SETTING ANTENNA AZIMUTHS AND DOWN TILTS, ANTENNA CONTRACTOR SHALL CHECK THE ANTENNA MOUNT FOR TIGHTNESS AND ENSURE THAT THEY ARE PLUMB, ANTENNA AZIMUTHS SHALL BE SET FROM TRUE NORTH AND BE ORIENTED WITHIN +/- 2K AS DEFINED BY THE RFDS. ANTENNA DOWN TILTS SHALL BE WITHIN +/- 0.25 AS DEFINED BY THE RFDS. REFER TO NP-20026.
- JUMPERS FROM THE TMA'S MUST TERMINATE TO OPPOSITE POLARIZATION'S IN EACH SECTOR.
- CONTRACTOR SHALL RECORD THE SERIAL #, SECTOR, AND POSITION OF EACH ACTUATOR INSTALLED AT THE ANTENNAS AND PROVIDE THE INFORMATION TO AT&T.
- TMA'S SHALL BE MOUNTED ON PIPE DIRECTLY BEHIND ANTENNAS AS CLOSE TO ANTENNA AS FEASIBLE IN A VERTICAL POSITION.

TORQUE REQUIREMENTS

- ALL RF CONNECTIONS SHALL BE TIGHTENED BY A TORQUE WRENCH.
- ALL RF CONNECTIONS, GROUNDING HARDWARE AND ANTENNA HARDWARE SHALL HAVE A TORQUE MARK INSTALLED IN A CONTINUOUS STRAIGHT LINE FROM BOTH SIDES OF THE CONNECTION.
 - RF CONNECTION BOTH SIDES OF THE CONNECTOR.
 - GROUNDING AND ANTENNA HARDWARE ON THE NUT SIDE STARTING FROM THE THREADS TO THE SOLID SURFACE, EXAMPLE OF SOLID SURFACE: GROUND BAR, ANTENNA BRACKET METAL.
 - ALL 8M ANTENNA HARDWARE SHALL BE TIGHTENED TO 9 LB-FT (12 NIM).
- ALL 12M ANTENNA HARDWARE SHALL BE TIGHTENED TO 43 LB-FT (58 NIM).
- ALL GROUNDING HARDWARE SHALL BE TIGHTENED UNTIL THE LOCK WASHER COLLAPSES AND THE GROUNDING HARDWARE IS NO LONGER LOOSE.
- ALL DN TYPE CONNECTIONS SHALL BE TIGHTENED TO 18-22 LB-FT (24.8 - 29.8 NM).
- ALL N TYPE CONNECTIONS SHALL BE TIGHTENED TO 15-20 LB-IN (1.7 - 2.3 NIM).

FIBER & POWER CABLE MOUNTING

- THE FIBER OPTIC TRUNK CABLES SHALL BE INSTALLED INTO CONDUITS, CHANNEL CABLE TRAYS, OR CABLE TRAY, WHEN INSTALLING FIBER OPTIC TRUNK CABLES INTO A CABLE TRAY SYSTEM, THEY SHALL BE INSTALLED INTO AN INTER DUCT AND A PARTITION BARRIER SHALL BE INSTALLED BETWEEN THE 800 VOLT CABLES AND THE INTER DUCT IN ORDER TO SEGREGATE CABLE TYPES, OPTIC FIBER TRUNK CABLES SHALL HAVE APPROVED CABLE RESTRAINTS EVERY (60) SIXTY FEET AND SECURELY FASTENED TO THE CABLE TRAY SYSTEM, NFPA 70 (NEC) ARTICLE 770 RULES SHALL APPLY.
- THE TYPE T-CGR CABLES SHALL BE INSTALLED INTO CONDUITS, CHANNEL CABLE TRAYS, OR CABLE TRAY AND SHALL BE SECURED AT INTERVALS NOT EXCEEDING (8) SIX FEET, AN EXCEPTION WHERE TYPE T-CGR CABLES ARE NOT SUBJECT TO PHYSICAL DAMAGE CABLES SHALL BE PERMITTED TO MAKE A TRANSITION BETWEEN CONDUITS, CHANNEL CABLE TRAYS, OR CABLE TRAY WHICH ARE SERVING UTILIZATION EQUIPMENT OR DEVICES, A DISTANCE (8) SIX FEET SHALL NOT BE EXCEEDED WITHOUT CONTINUOUS SUPPORTING. NFPA 70 (NEC) ARTICLES 336 AND 302 RULES SHALL APPLY.
- WHEN INSTALLING OPTIC FIBER TRUNK CABLES OR TYPE T-CGR CABLES INTO CONDUITS, NFPA 70 (NEC) ARTICLE 300 RULES SHALL APPLY.

COAXIAL CABLE NOTES

- TYPES AND SIZES OF THE ANTENNA CABLE ARE BASED ON ESTIMATED LENGTHS, PRIOR TO ORDERING CABLE, CONTRACTOR SHALL VERIFY ACTUAL LENGTH BASED ON CONSTRUCTION LAYOUT AND NOTIFY THE PROJECT MANAGER IF ACTUAL LENGTHS EXCEED ESTIMATED LENGTHS.
- CONTRACTOR SHALL VERIFY THE DOWN-TILT OF EACH ANTENNA WITH A DIGITAL LEVEL.
- CONTRACTOR SHALL CONFIRM COAX COLOR CODING PRIOR TO CONSTRUCTION, REFER TO "ANTENNA SYSTEM LABELING STANDARD" M0-0007 LATEST VERSION.
- ALL JUMPERS TO THE ANTENNAS FROM THE MAIN TRANSMISSION LINE SHALL BE 1/2" DIA. LDF AND SHALL NOT EXCEED 6'-0".
- ALL COAXIAL CABLE SHALL BE SECURED TO THE DESIGNED SUPPORT STRUCTURE, IN AN APPROVED MANNER, AT DISTANCES NOT TO EXCEED 4'-0" O.C.
- CONTRACTOR SHALL FOLLOW ALL MANUFACTURER'S RECOMMENDATIONS REGARDING BOTH THE INSTALLATION AND GROUNDING OF ALL COAXIAL CABLES, CONNECTORS, ANTENNAS, AND ALL OTHER EQUIPMENT.
- CONTRACTOR SHALL WEATHERPROOF ALL ANTENNA CONNECTORS WITH SELF-AMALGAMATING TAPE, WEATHERPROOFING SHALL BE COMPLETED IN STRICT ACCORDANCE WITH AT&T STANDARDS.
- CONTRACTOR SHALL GROUND ALL EQUIPMENT, INCLUDING ANTENNAS, RET MOTORS, TMA'S, COAX CABLES, AND RET CONTROL CABLES AS A COMPLETE SYSTEM, GROUNDING SHALL BE EXECUTED BY QUALIFIED WIREMEN IN COMPLIANCE WITH MANUFACTURER'S SPECIFICATION AND RECOMMENDATION.
- CONTRACTOR SHALL PROVIDE STRAIN-RELIEF AND CABLE SUPPORTS FOR ALL CABLE ASSEMBLIES, COAX CABLES, AND RET CONTROL CABLES, CABLE STRAIN-RELIEFS AND CABLE SUPPORTS SHALL BE APPROVED FOR THE PURPOSE, INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.
- CONTRACTOR TO VERIFY THAT EXISTING COAX HANGERS ARE STACKABLE SNAP IN HANGERS, IF EXISTING HANGERS ARE NOT STACKABLE SNAP IN HANGERS THE CONTRACTOR SHALL REPLACE EXISTING HANGERS WITH NEW SNAP IN HANGERS IF APPLICABLE.

GENERAL CABLE AND EQUIPMENT NOTES

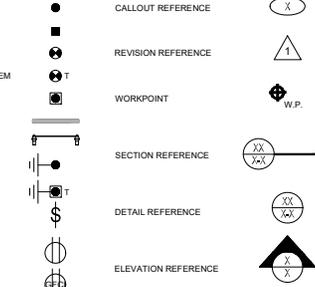
- CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY ANTENNA, TMA'S, DUPLEXERS, AND COAX CONFIGURATION, MAKE AND MODELS PRIOR TO INSTALLATION.
- ALL CONNECTIONS FOR HANGERS, SUPPORTS, BRACING, ETC. SHALL BE INSTALLED PER TOWER MANUFACTURER'S RECOMMENDATIONS.

- CONTRACTOR SHALL REFERENCE THE TOWER STRUCTURAL ANALYSIS/DESIGN DRAWINGS FOR DIRECTIONS ON CABLE DISTRIBUTION/ROUTING.
- ALL OUTDOOR RF CONNECTORS/CONNECTIONS SHALL BE WEATHERPROOFED, EXCEPT THE RET CONNECTORS, USING BUTYL TAPE AFTER INSTALLATION AND FINAL CONNECTIONS ARE MADE, BUTYL TAPE SHALL HAVE A MINIMUM OF ONE-HALF TAPE WIDTH OVERLAP ON EACH TURN AND EACH LAYER SHALL BE WRAPPED THREE TIMES, WEATHERPROOFING SHALL BE SMOOTH WITHOUT BUCKLING, BUTYL BLEEDING IS NOT ALLOWED.
- IF REQUIRED TO PAINT ANTENNAS AND/OR COAX:
 - TEMPERATURE SHALL BE ABOVE 50° F.
 - PAINT COLOR MUST BE APPROVED BY BUILDING OWNER/LANDLORD.
 - FOR REGULATED TOWERS, FAA/CFR APPROVED PAINT IS REQUIRED.
 - DO NOT PAINT OVER COLOR CODING OR ON EQUIPMENT MODEL NUMBERS.
- ALL CABLES SHALL BE GROUNDED WITH COAXIAL CABLE GROUND KITS, FOLLOW THE MANUFACTURER'S RECOMMENDATIONS.
 - GROUNDING AT THE ANTENNA LEVEL.
 - GROUNDING AT MID LEVEL, TOWERS WHICH ARE OVER 200'-0", ADDITIONAL CABLE GROUNDING REQUIRED.
 - GROUNDING AT BASE OF TOWER PRIOR TO TURNING HORIZONTAL.
 - GROUNDING OUTSIDE THE EQUIPMENT SHELTER AT ENTRY PORT.
 - GROUNDING INSIDE THE EQUIPMENT SHELTER AT THE ENTRY PORT.
- ALL PROPOSED GROUND BAR DOWNLOADS ARE TO BE TERMINATED TO THE EXISTING ADJACENT GROUND
- BAR DOWNLOADS A MINIMUM DISTANCE OF 4'-0" BELOW GROUND BAR, TERMINATIONS MAY BE EXOTHERMIC OR COMPRESSION.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE ANTENNA AND THE COAX CONFIGURATION IS THE CORRECT MAKE AND MODELS PRIOR TO INSTALLATION.
- ALL CONNECTIONS FOR HANGERS, SUPPORTS, BRACING, ETC. SHALL BE INSTALLED PER TOWER MANUFACTURER'S SPECIFICATION & RECOMMENDATIONS.
- ANTENNA CONTRACTOR SHALL FURNISH AND INSTALL A 12'-0" T-BOOM SECTOR ANTENNA MOUNT, IF APPLICABLE, INCLUDING ALL HARDWARE.

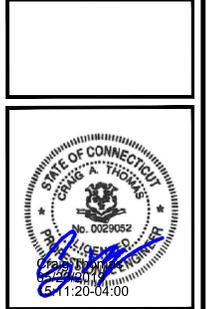
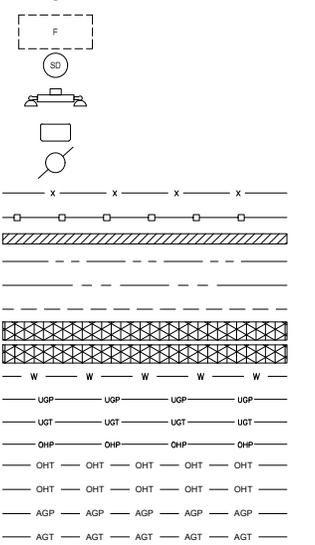
GROUNDING NOTES

- GROUNDING IS SHOWN DIAGRAMMATICALLY ONLY.
- CONTRACTOR SHALL GROUND ALL EQUIPMENT AS A COMPLETE SYSTEM, GROUNDING SHALL BE IN COMPLIANCE WITH NEC SECTION 250 AND AT&T GROUNDING AND BONDING REQUIREMENTS (ATT-TP-76416) AND MANUFACTURER'S SPECIFICATIONS.
- ALL GROUND CONDUCTORS SHALL BE COPPER, NO ALUMINUM CONDUCTORS SHALL BE USED.
- ALL CABLES SHALL BE GROUNDED WITH COAXIAL CABLE GROUNDING KITS, FOLLOW THE MANUFACTURER'S RECOMMENDATIONS.
 - GROUNDING AT THE ANTENNA LEVEL.
 - GROUNDING AT MID LEVEL, TOWERS WHICH ARE OVER 200', ADDITIONAL CABLE GROUNDING REQUIRED.
 - GROUNDING AT BASE OF TOWER PRIOR TO TURNING HORIZONTAL.
 - GROUNDING OUTSIDE THE EQUIPMENT SHELTER AT ENTRY PORT.
 - GROUNDING INSIDE THE EQUIPMENT SHELTER AT THE ENTRY PORT.
- ALL PROPOSED GROUNDING BAR DOWNLOADS ARE TO BE TERMINATED TO THE EXISTING ADJACENT GROUNDING BAR DOWNLOADS A MINIMUM DISTANCE OF 4'-0" BELOW GROUNDING BAR, TERMINATIONS MAY BE EXOTHERMIC OR COMPRESSION.

- EXOTHERMIC CONNECTION
- MECHANICAL CONNECTION
- CHEMICAL ELECTROLYTIC GROUNDING SYSTEM
- TEST CHEMICAL ELECTROLYTIC GROUNDING SYSTEM
- EXOTHERMIC WITH INSPECTION SLEEVE
- GROUNDING BAR
- SHELTER GROUNDING BAR
- GROUND ROD
- TEST GROUND ROD WITH INSPECTION SLEEVE
- SINGLE POLE SWITCH
- DUPLEX RECEPTACLE
- DUPLEX GFCI RECEPTACLE



- FLUORESCENT LIGHTING FIXTURE (2) TWO LAMPS 48-T8
- EXISTING SMOKE DETECTION (DC)
- EXISTING EMERGENCY LIGHTING (DC)
- SECURITY LIGHT W/PHOTOCELL LITHONIA ALW LED-I-25A40051K-SR4-120-PE-00B7XD
- EXISTING UTILITY POLE
- EXISTING CHAIN LINK FENCE
- EXISTING WOOD/WROUGHT IRON FENCE
- EXISTING WALL STRUCTURE
- LEASE AREA
- PROPERTY LINE (PL)
- SETBACKS
- PROPOSED/EXISTING ICE BRIDGE
- PROPOSED/EXISTING CABLE TRAY
- EXISTING WATER LINE
- PROPOSED UNDERGROUND POWER
- PROPOSED UNDERGROUND TELCO
- PROPOSED OVERHEAD POWER
- PROPOSED OVERHEAD TELCO
- PROPOSED OVERHEAD UTILITIES
- PROPOSED ABOVE GROUND POWER
- PROPOSED ABOVE GROUND TELCO



PROJECT NO.	ERC0004
DRAWN BY:	CM
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SUBMITTALS	
1	05/23/19 ISSUED FOR CONSTRUCTION
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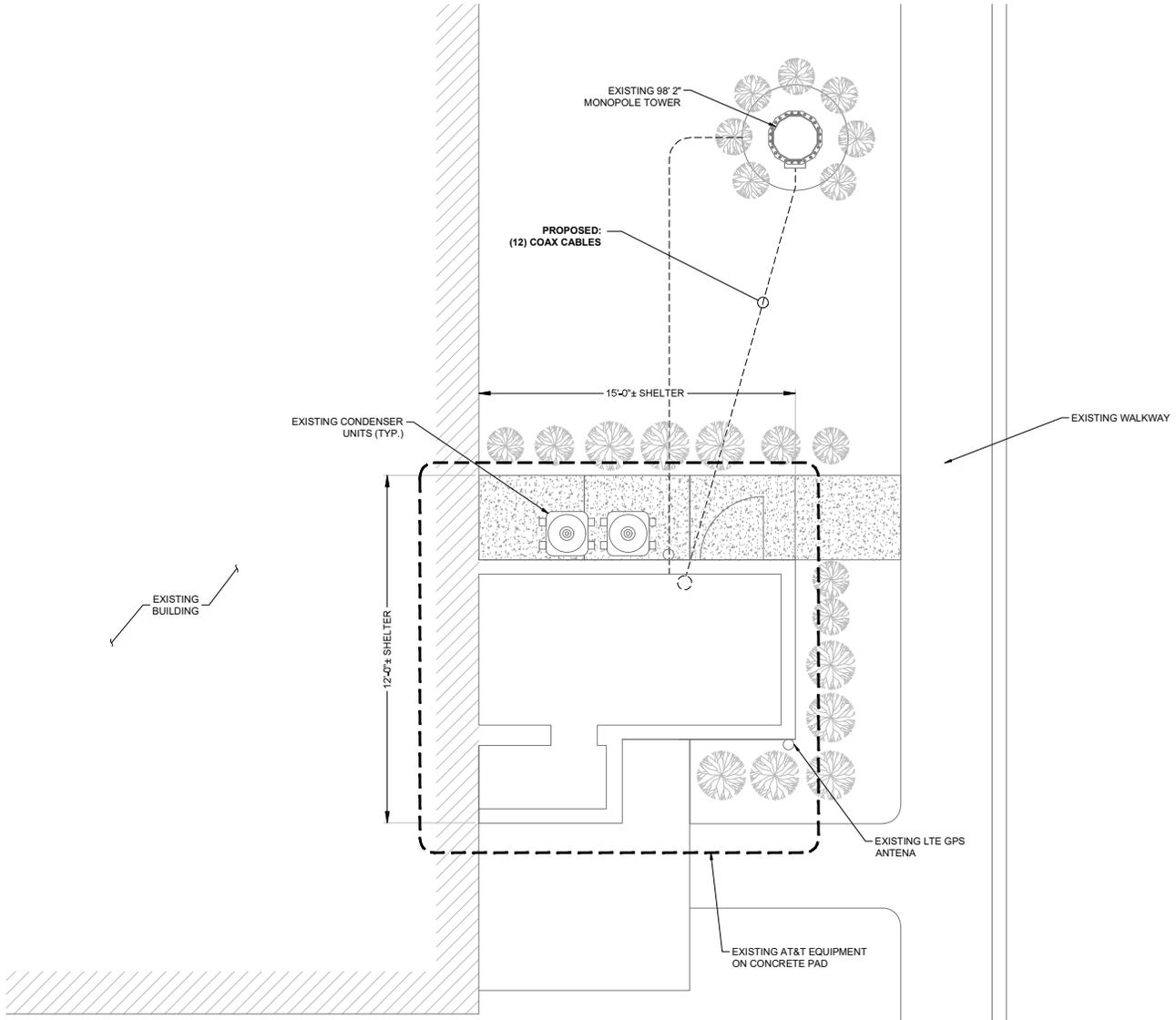
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SITE# CTLO5156
THOMPSONVILLE

586 EIFIELD STREET
EIFIELD, CT 06082

GENERAL NOTES II

GN-2

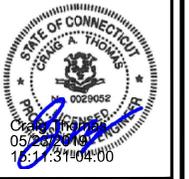
AB	ANCHOR	COL	COLUMN	FN	FINISHED	MAS	MASONRY	QTY	QUANTITY	TOF	TOP OF FOUNDATION
ABV	ABOVE	COMM	COMMON	FLR	FLOOR	MAX	MAXIMUM	RAD	RADIUS	TOP	TOP OF PLATE (PARAPET)
AC	ALTERNATING CURRENT	CONC	CONCRETE	FDN	FOUNDATION	MB	MACHINE BOLT	RECT	RECTIFIER	TOS	TOP OF STEEL
ADDL	ADDITIONAL	CONSTR	CONSTRUCTION	FOC	FACE OF CONCRETE	MECH	MECHANICAL	REF	REFERENCE	TOW	TOP OF WALL
AFF	ABOVE FINISHED FLOOR	DBL	DOUBLE	FOF	FACE OF MASONRY	MFR	MANUFACTURER	REIN	REINFORCEMENT	TVSS	TRANSIENT VOLTAGE SUPPRESSOR
AFG	ABOVE FINISHED GRADE	DC	DIRECT CURRENT	FOS	FACE OF STUD	MSB	MASTER GROUND BAR	REQD	REQUIRED	USP	UNDERGROUND SYSTEM
AC	AMPERE INTERRUPTION CAPACITY	DEPT	DEPTH	FW	FACE OF WALL	MIN	MINIMUM	NET	NET	TYP	TYPICAL
ALM	ALUMINUM	DF	DOUGLAS FIR	FS	FINISH SURFACE	MSC	MISCELLANEOUS	RVC	RIBBON METALLIC CONDUIT	UG	UNDERGROUND
ALT	ALTERNATE	DN	DIA METER	FT	FOOT	MTL	METAL	RRH	REMOTE RADIO HEAD	UL	UNDERWRITERS' LABORATORY
ANT	ANTENNA	DG4	DIAGONAL	FTG	FOOTING	MTS	MANUAL TRANSFER SWITCH	RRU	REMOTE RADIO UNIT	UNO	UNLESS NOTED OTHERWISE
APPROX	APPROXIMATE	DM	DIMENSION	GA	GAUGE	MW	MICROWAVE	RWY	RACEWAY	UMTS	UNIVERSAL MOBILE
ARCH	ARCHITECTURAL	DWG	DRAWING	GEN	GENERATOR	NI	NEW	SCH	SCHEDULE		TELECOMMUNICATIONS SYSTEM
ATS	AUTOMATIC TRANSFER SWITCH	DWL	DOWEL	GFCI	GROUND FAULT CIRCUIT INTERRUPTER	NEC	NATIONAL ELECTRIC CODE	SHT	SHEET	UPS	UNINTERRUPTIBLE POWER SYSTEM
AWG	AMERICAN WIRE GAUGE	(E)	EXISTING	GLB	GLUE LAMP/PAINTED BEAM	NO#	NUMBER	SHT	SMART INTEGRATED DEVICE		(DC POWER PLANT)
BATT	BATTERY	EACH	EACH	GLV	GALVANIZED	NTS	NOT TO SCALE	SBW	SHIELD	VF	VERIFIED IN FIELD
BLDG	BUILDING	EC	ELECTRICAL CONDUCTOR	GNS	GLOBAL POSITIONING SYSTEM	OC	ON CENTER	SPEC	SPECIFICATION	W	WIDE
BLK	BLOCK	EL	ELEVATION	OND	GROUND	OPNG	OPENING	SO	SQUARE	W	WITH
BLKG	BLOCKING	ELEC	ELECTRICAL	OSM	GLOBAL SYSTEM FOR MOBILE	(P)	PROPOSED	SS	STAINLESS STEEL	WO	WOOD
BM	BEAM	EMT	ELECTRICAL METALLIC TUBING	HDR	HEADER	IPC	PRECAST CONCRETE	STD	STANDARD	WP	WORK POINT
BTC	BAR TINED THREADED CONDUCTOR	ENG	ENGINEER	HGR	HANGER	PCS	PERSONAL COMMUNICATION SERVICES	STL	STEEL	WP	WEATHERPROOF
BOF	BOTTOM OF FOOTING	EQ	EQUAL	HVAC	HEAT/VENTILATION/AIR CONDITIONING	PCU	PRIMARY CONTROL UNIT	STRUCT	STRUCTURAL	WT	WEIGHT
CAB	CABINET	EXP	EXPANSION	HSR	HEIGHT	PRC	PRIMARY RADIO CABINET	TEMP	TEMPERATURE		
CANT	CANTILEVERED	EXT	EXTERIOR	IGR	INTERIOR GROUND RING	PP	POLARIZING PRESERVING	THK	THICKNESS		
CSC	CALIFORNIA ELECTRIC CODE	FAB	FABRICATION	IN	INCH	PSF	POUNDS PER SQUARE FOOT	TMA	TOWER MOUNTED AMPLIFIER		
CHG	CHARGING	FF	FRESH FLOOR	INT	INTERIOR	PSI	POUNDS PER SQUARE INCH	TN	TOE NAIL		
CLG	CEILING	FG	FINISH GRADE	LBS	POUNDS	PT	PRESSURE TREATED	TOA	TOP OF ANTENNA		
CLR	CLEAR	FF	FACILITY INTERFACE FRAME	LF	LINEAR FEET	PWR	POWER CABINET	TOC	TOP OF CURB		



at&t
 5841 BRIDGE STREET
 EAST SYRACUSE, NY 13057

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

JACOBS
 JACOBS ENGINEERING GROUP, INC.
 120 ST. JAMES AVENUE, 5TH FLOOR
 BOSTON, MA 02116



PROJECT NO.	ERCC0004
DRAWN BY:	CM
CHECKED BY:	CAT

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FA# 10071277
 SITE# CTL05156
 THOMPSONVILLE
 588 ENFIELD STREET
 ENFIELD, CT 06082

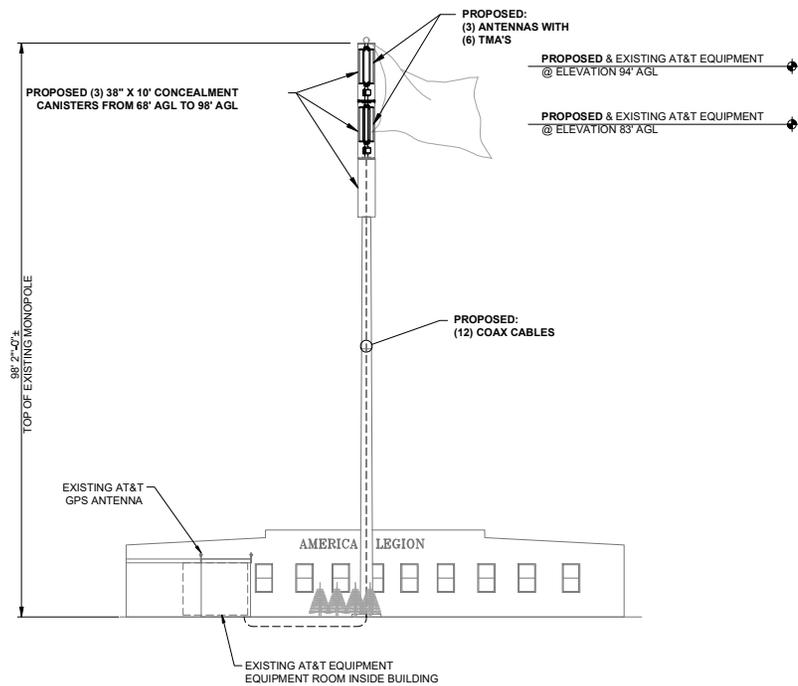
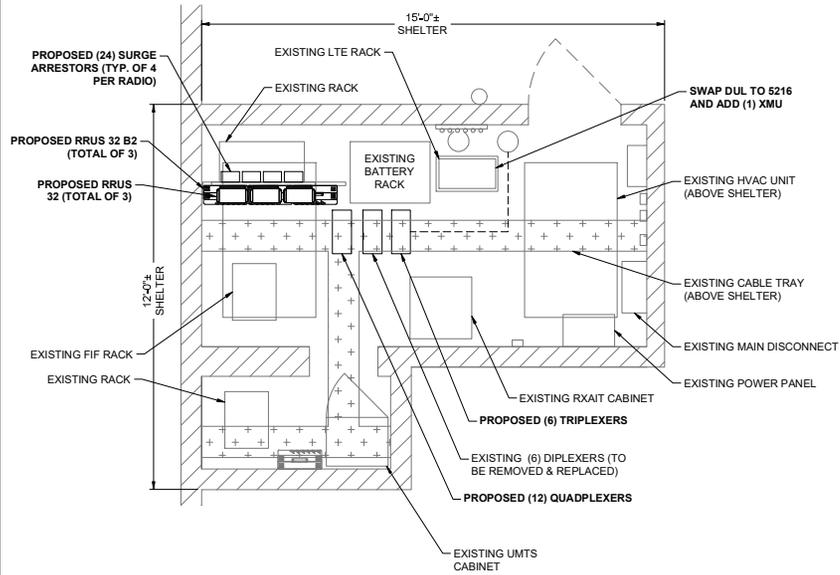
SITE PLAN

C-1

NOTES:

1. PLAN BASED ON CONSTRUCTION DRAWINGS ISSUED BY HUDSON DESIGN GROUP ON 03/08/18. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS AND LOCATION/ORIENTATION OF EXISTING EQUIPMENT.

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



1. CONTRACTOR TO VERIFY FINAL RF CONFIGURATION AND NOTIFY CARRIER AND ENGINEER W/ ANY DISCREPANCIES PRIOR TO THE INSTALLATION.
2. AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.
3. CONTRACTOR SHALL REFER TO THE STRUCTURAL MODIFICATION REPORT; SITE NUMBER: CTL05156; SITE NAME: THOMPSONVILLE; FA LOCATION: 10071277; CROWN BU NUMBER: 842874; CROWN SITE NAME: THOMPSONVILLE; CROWN ORDER NUMBER: 421210; ISSUED BY GPD ENGINEERING AND ARCHITECTURE PROFESSIONAL CORPORATION, DATED ON 04/02/19. THE CONTRACTOR SHALL VERIFY ALL EXISTING MEMBERS AND HARDWARE ARE INSTALLED PROPERLY AS DESCRIBED IN THIS REPORT.
4. CONTRACTOR SHALL VERIFY THE EXISTING ANTENNA CENTERLINE HEIGHT ABOVE GROUND LEVEL. PROPOSED ANTENNA CENTERLINE SHALL MATCH EXISTING.



5841 BRIDGE STREET
EAST SYRACUSE, NY 13057



3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065



JACOBS ENGINEERING GROUP, INC.
100 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116



PROJECT NO.	ERCC0004
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FA# 10071277
SITE# CTL05156
THOMPSONVILLE
588 ENFIELD STREET
ENFIELD, CT 06062

EQUIPMENT LAYOUT & PROPOSED TOWER ELEVATION

C-2

1 EQUIPMENT LAYOUT

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

2 TOWER ELEVATION

SCALE: 3/32" = 1'-0"

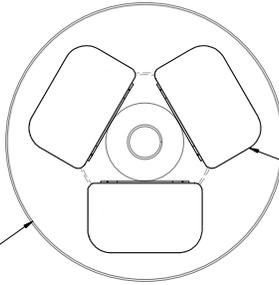


SECTOR C

C1
AZIMUTH
300°

SECTOR A

A1
AZIMUTH
60°



SECTOR B

B1
AZIMUTH
180°

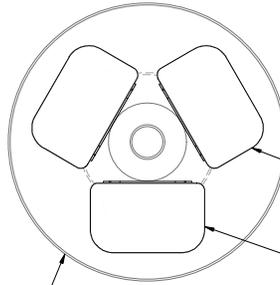
ELEVATION 85'

SECTOR C

C1
AZIMUTH
300°

SECTOR A

A1
AZIMUTH
60°



SECTOR B

B1
AZIMUTH
180°

ELEVATION 94'

NOTES:

- CONTRACTOR SHALL REFER TO THE MOUNT MODIFICATION REPORT; SITE NUMBER: CTL05156, SITE NAME: THOMPSONVILLE; FA LOCATION: 10071277; CROWN BU NUMBER: 842874; CROWN SITE NAME: THOMPSONVILLE; CROWN ORDER NUMBER: 421210; ISSUED BY GPD ENGINEERING AND ARCHITECTURE PROFESSIONAL CORPORATION, DATED ON 04/02/19. THE MOUNT MODIFICATIONS MUST BE PERFORMED PRIOR TO THE INSTALLATION OF THE EQUIPMENT SHOWN ON THE DRAWINGS. THE CONTRACTOR SHALL VERIFY ALL EXISTING MEMBERS AND HARDWARE ARE INSTALLED PROPERLY AS DESCRIBED IN THIS REPORT.
- CONTRACTOR TO VERIFY FINAL RF CONFIGURATION AND NOTIFY CARRIER AND ENGINEER W/ ANY DISCREPANCIES PRIOR TO THE INSTALLATION.
- CONTRACTOR SHALL NOT EXCEED MOUNTING MORE THAN (2) RRHS PER ANTENNA MOUNTING PIPE - RELOCATE TO AN ADJACENT ANTENNA MOUNTING PIPE AS NEEDED.



5841 BRIDGE STREET
EAST SYRACUSE, NY 13057



3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065



JACOBS ENGINEERING GROUP, INC.
120 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116



1 EXISTING ANTENNA LAYOUT

SCALE: N.T.S.

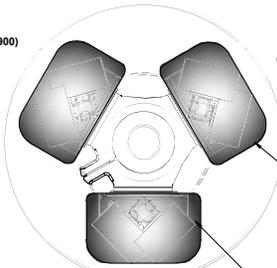


SECTOR C

C1
(LTE WCS/LTE 1900/LTE 1900)
AZIMUTH
300°

SECTOR A

A1
(LTE WCS/LTE 1900/LTE 1900)
AZIMUTH
60°



SECTOR B

B1
(LTE WCS/LTE 1900/LTE 1900)
AZIMUTH
180°

ELEVATION 94'

2 PROPOSED ANTENNA LAYOUT

SCALE: N.T.S.

PROJECT NO: ERCC004

DRAWN BY: CM

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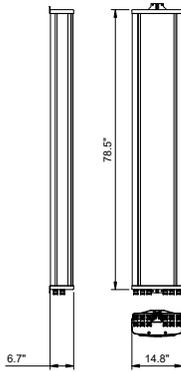
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SITE# CTL05156
THOMPSONVILLE
588 ENFIELD STREET
ENFIELD, CT 06062

EXISTING & PROPOSED ANTENNA LAYOUT

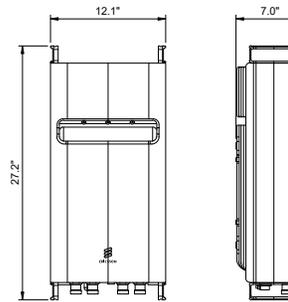
C-3

MANUFACTURER: KATHREIN
 MODEL NO.: 80010798
 RADOME MATERIAL: FIBERGLASS, UV RESISTANT
 COLOR: LIGHT GRAY
 DIMENSIONS (LxWxD): 78.5" x 14.8" x 6.7"
 1995mm x 377mm x 169mm
 WEIGHT (lbs): 81.5
 CONNECTOR: 12 x 4.3-10 FEMALE
 FRONT WIND LOAD: 148 LBF @ 93 MPH
 660 N @ 150 KMH
 SIDE WIND LOAD: 171 LBF @ 93 MPH
 760 N @ 150 KMH
 WIND SPEED MAX.: >150 MPH (>241 KMH)



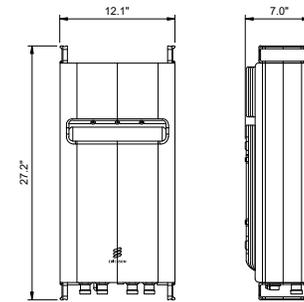
MANUFACTURER: ERICSSON
 MODEL NO.: RRUS-32 B2
 TECHNOLOGY: PCS
 DIMENSIONS (HxWxD): 27.2" x 12.1" x 7.0"
 WEIGHT (lbs): 53
 POWER SUPPLY: -48V
 TEMPERATURE: -40 °C TO 55 °C

NOTE:
 PENDING FINAL PRODUCT SPECIFICATION



MANUFACTURER: ERICSSON
 MODEL NO.: RRUS-32
 TECHNOLOGY: WCS
 DIMENSIONS (HxWxD): 27.2" x 12.1" x 7.0"
 WEIGHT (lbs): 53
 POWER SUPPLY: -48V
 TEMPERATURE: -40 °C TO 55 °C

NOTE:
 PENDING FINAL PRODUCT SPECIFICATION



1 ANTENNA SPECIFICATIONS

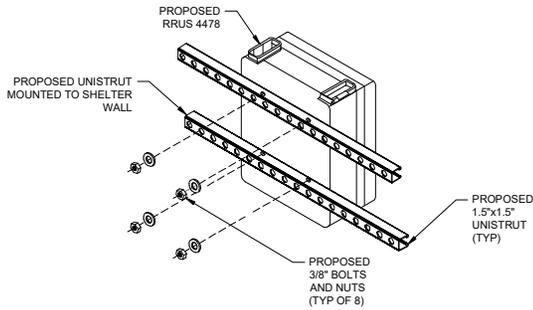
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2 RRUS SPECIFICATIONS

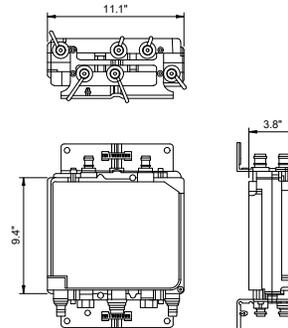
SCALE: N.T.S.

3 RRUS SPECIFICATIONS

SCALE: N.T.S.

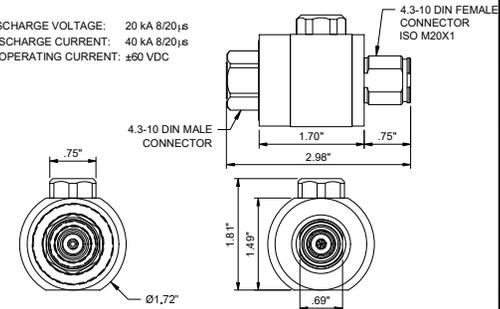


MANUFACTURER: COMMSCOPE
 MODEL: TMAT192123B68-31
 DIMENSIONS (HxWxD): 11.1" x 9.4" x 3.8"
 TOTAL WEIGHT (lbs): 20.7
 TEMPERATURE: -40 °C TO +65 °C
 POWER CONSUMPTION: 200 W



POLYPHASER TSXDC-4310FM
 DIMENSIONS (HxWxD): 1.81" x 1.72" x 2.98"

NOMINAL DISCHARGE VOLTAGE: 20 kA 8/20_μs
 MAXIMUM DISCHARGE CURRENT: 40 kA 8/20_μs
 MAX. CONT. OPERATING CURRENT: ±60 VDC



4 RRU MOUNTING DETAIL ON UNISTRUT

SCALE: N.T.S.

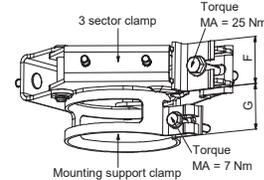
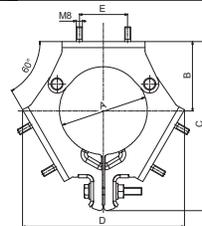
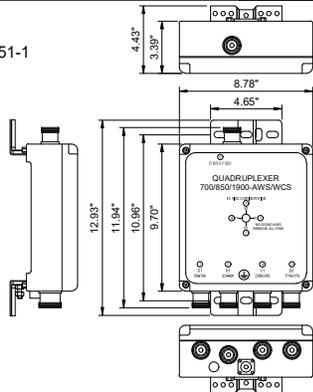
5 TMA SPECIFICATIONS

SCALE: N.T.S.

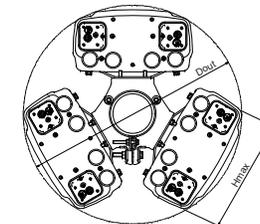
6 COAXIAL SURGE ARRESTOR SPECIFICATIONS

SCALE: N.T.S.

MANUFACTURER: KAELUS
 MODEL: QBC0007F1V51-1
 DIMENSIONS (HxWxD): 9.73" x 8.78" x 3.39"
 TOTAL WEIGHT (lbs): 18.7
 TEMPERATURE: -40 °C TO +65 °C



Type No.	A	B	C	D	E	F	G	H (max.)	Weight
742263	88.9	65	180	168	64	50	45	280	4 lg
742317	88.9	88	213	199	64	50	45	361	4 lg
742033	114.3	92	217	207	64	50	45	375	4 lg
742034	139.7	100	236	228	64	50	45	400	4 lg
85010058	114.3	92	217	207	72	50	45	375	4 lg
85010059	139.7	100	236	228	72	50	45	400	4 lg



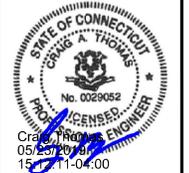
Bottom view without downtilt kit

7 QUADRUPLER SPECIFICATIONS

SCALE: N.T.S.

8 ANTENNA MOUNTING DETAIL

SCALE: N.T.S.



PROJECT NO:	ERC0004
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CHECKED BY:	CAT

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 THOMPSONVILLE
 588 ENFIELD STREET
 ENFIELD, CT 06062

EQUIPMENT
 DETAILS

C-4



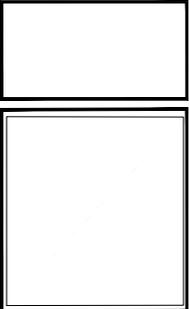
5841 BRIDGE STREET
EAST SYRACUSE, NY 13057



3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065



100 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116



PROJECT NO. ERCC0004

DRAWN BY: CM

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SUBMITTALS

NO.	DATE	DESCRIPTION
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FAR# 10071277
SITE# CTL05156
THOMPSONVILLE
588 ENFIELD STREET
ENFIELD, CT 06062

STRUCTURAL DETAILS

S-1

SCALE: NONE

SHAFT SECTION	SECTION LENGTH (FT)	POLE THICKNESS (IN)	LAP SPLICE (IN)	DIAMETER (IN)	
				@ TOP	@ BOTTOM
1	39.00	0.5000		5.900	5.000
2	22.25	0.1475		18.000	20.750
3	49.50	0.2188	45.00	19.800	25.845

NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

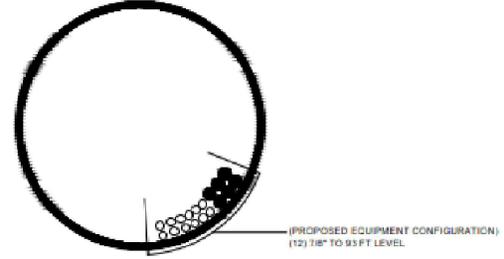
MANUFACTURER POLE SPECIFICATIONS	
POLE SHAPE TYPE:	16-SIDED & ROUND
TAPER:	0.1200 IN/FT
SHAFT STEEL:	ASTM A607 GRADE 85, ASTM A36, & ASTM A519 TYPE 5
BASE PL. STEEL:	ASTM A372 GRADE 50
ANCHOR RODS:	2 - 3/4" #16 ASTM A615 GR 75

POLE MODIFICATION SCHEDULE			
ELEVATION (FT)	MODIFICATION	REFERENCE SHEET	
96.0	REPLACE THE EXISTING TRUCK AND BALL ASSEMBLY WITH NEW.	S-5	
68.0 - 96.0	REMOVE EXISTING CONCEALMENT MAST AND CANISTERS AND ALL ASSOCIATED HARDWARE. INSTALL NEW CONCEALMENT CANISTER AND MAST ASSEMBLIES.	S-5, S-6, S-7, & S-8	
68.0	INSTALL CROWN CASTLE CONCEALMENT REINFORCEMENT SOLUTION.		
58.0	PAIN NEW EXISTING MATERIAL IN THE MODIFIED REGION TO MATCH EXISTING TOWER FINISH.		
78.0	CONTRACTOR SHALL PRE-TENSION NEW FLANGE BOLTS AND BRACKET BOLTS IN ACCORDANCE WITH AISC TURN-OF-THE-NUT METHOD OR OTHER INDUSTRY ACCEPTED MEANS. VERIFICATION OF PROPER PRE-TENSIONING SHALL BE COORDINATED WITH THE M/VENDOR.	S-5	
68.0	INSTALL NEW FLANGE BRACKETS TO THE TOP OF THE EXISTING TOWER.	S-5 & S-7	

FOR PARTS NOT DETAILED WITHIN THE DRAWING AND STARTING WITH "CCI-" SEE THE FOLLOWING CATALOG FOR DETAILS: CEC-CAT-19350, MONOPOLE STANDARD DRAWINGS AND APPROVED REINFORCEMENT COMPONENTS.

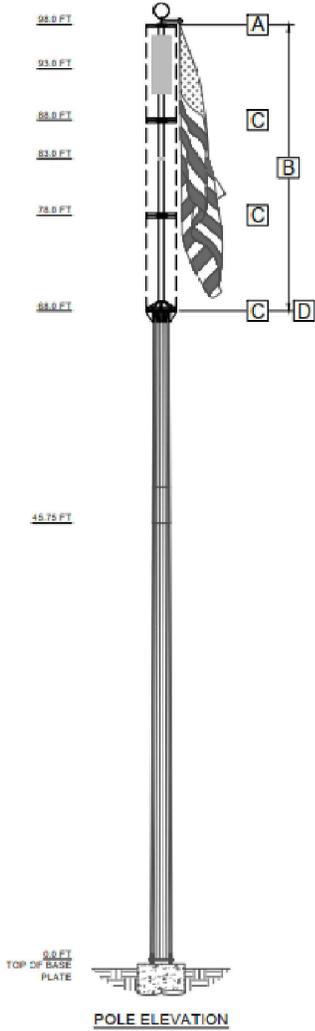
- NOTE:**
- ALL EXISTING MATERIAL REMOVED FROM THE TOWER SHALL BE DISPOSED OF BY THE CONTRACTOR OFF SITE.
 - NYLON FASTENERS ARE NOT PERMITTED FOR SECURING CONCEALMENT CANISTERS.
 - IF A NEW FLAG IS BEING INSTALLED, CROWN CASTLE REQUESTS THE FLAG AND ALL ASSOCIATED HARDWARE BE PURCHASED FROM THE FOLLOWING SUPPLIER:

THE FLAG LOFT
1900 DELMAR STREET
ST. LOUIS, MO 63113
(880)-995-3524 (ATTN: RICK KELLY)



COAX LAYOUT

<p>100 South Main Street, Suite 200 Enfield, CT 06033 (860) 872-1000 (860) 872-2100</p>	
<p>NO. DATE DESCRIPTION BY</p> <p>REVISIONS</p>	
<p>GPD PROJECT NUMBER 2016777-842974-04</p> <p>SITE NAME: THOMPSONVILLE</p> <p>BU NUMBER: 342874</p> <p>W/O NUMBER: 1705798</p> <p>SITE ADDRESS: 588 ENFIELD STREET ENFIELD, CT 06062 HARTFORD COUNTY, USA</p> <p>ENGINA BY: BD DATE: 4/2/19</p> <p>DFT BY: RR DATE: 4/2/19</p> <p>DFTQA BY: CB DATE: 4/2/19</p> <p>APRVD BY: CJS DATE: 4/2/19</p> <p>SCALE: N.T.S.</p>	
<p>TOWER ELEVATION</p> <p>S-4</p> <p>REV 0</p>	



POLE ELEVATION



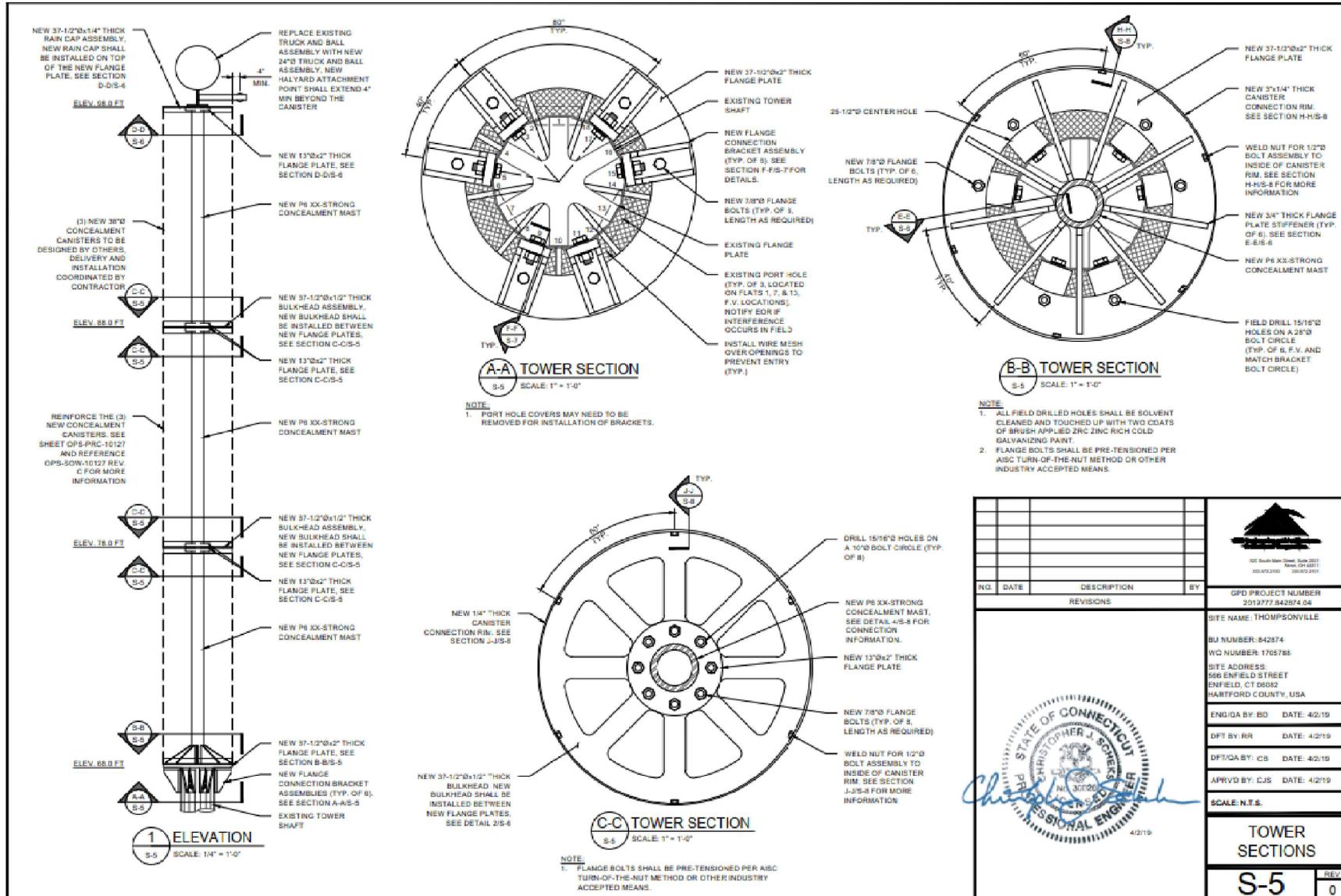
5841 BRIDGE STREET
EAST SYRACUSE, NY 13057



3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065



100 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116



102 South Main Street, Hartford, CT 06111 860.426.2200 860.524.2500			
REVISIONS			
NO.	DATE	DESCRIPTION	BY
GPD PROJECT NUMBER 2013777-842874.04			
SITE NAME: THOMPSONVILLE			
BU NUMBER: 842874			
WC NUMBER: 1705785			
SITE ADDRESS: 586 ENFIELD STREET ENFIELD, CT 06082 HARTFORD COUNTY, USA			
ENG/DA BY: BD		DATE: 4/2/19	
DFT BY: RR		DATE: 4/2/19	
DFT/QA BY: CS		DATE: 4/2/19	
APPRVD BY: CJS		DATE: 4/2/19	
SCALE: N.T.S.			
TOWER SECTIONS			
S-5			REV 0

PROJECT NO. ERCC004

DRAWN BY: CM

CHECKED BY: CAT

SUBMITTALS

1	05/03/19	ISSUED FOR CONSTRUCTION
0	05/15/19	ISSUED FOR PERMITTING

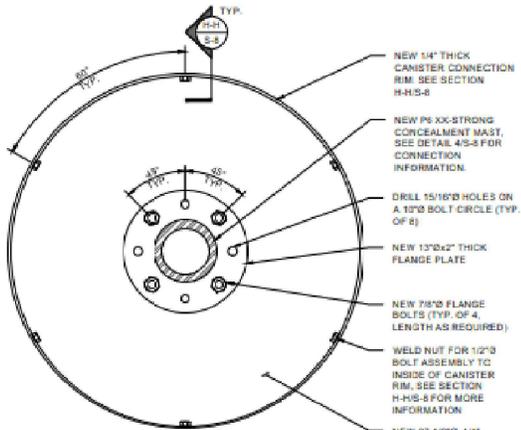
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FAR# 10071277
SITE# CTLO5156
THOMPSONVILLE
586 ENFIELD STREET
ENFIELD, CT 06082

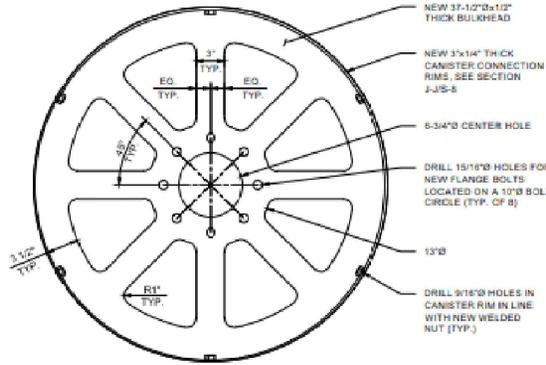
STRUCTURAL DETAILS

S-2

SCALE: NONE

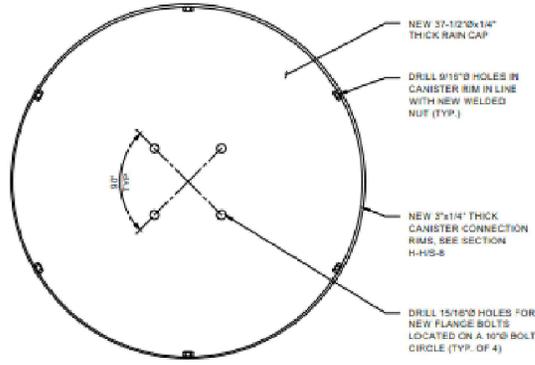


D-D TOWER SECTION
S-6 SCALE: 1" = 1'-0"



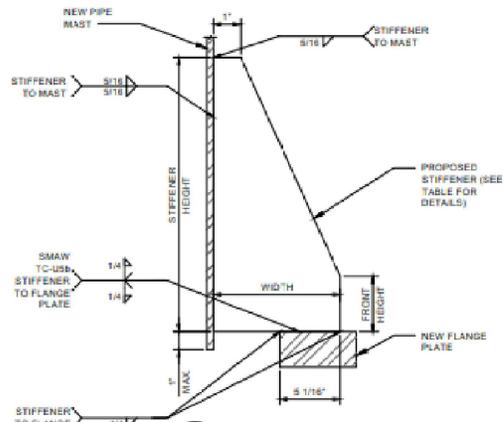
2 BULKHEAD
S-6 SCALE: 1" = 1'-0"

NOTE:
1. DETAIL IS TYPICAL FOR THE BULKHEAD ASSEMBLIES AT 76.0' AND 88.0'.



3 RAIN CAP
S-6 SCALE: 1" = 1'-0"

NOTE:
1. DETAIL IS TYPICAL FOR THE RAIN CAP ASSEMBLY AT 98.0'.
2. NEW TRUCK AND BALL ATTACHMENT NOT SHOWN FOR DETAIL CLARITY. ALL CHANGES TO THIS DETAIL DUE TO SUCH CONNECTIONS SHALL BE REVIEWED PRIOR TO FABRICATION.



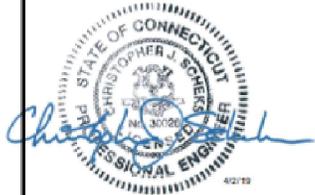
E-E SECTION
S-6 SCALE: N.T.S.

NOTE:
1. FABRICATION ADE SHALL BE REQUIRED FOR ALL FILLET WELDS BETWEEN THE MAST PIPE AND STIFFENERS. THESE WELDS SHALL BE 100% INSPECTED BY MT.
2. FABRICATION ADE SHALL BE REQUIRED FOR ALL FULL PENETRATION WELDS BETWEEN THE STIFFENERS AND FLANGE PLATE. THESE WELDS SHALL BE 100% INSPECTED BY MT AND UT.

STIFFENER	
DESCRIPTION	MEASUREMENT (IN.)
STIFFENER HEIGHT	10
FRONT HEIGHT	1
WIDTH	14.50
THICKNESS	3/4
QUANTITY	9

NOTE:
1. ALL SIZES AND QUANTITIES SHALL BE VERIFIED PRIOR TO FABRICATION. CONTRACTOR IS REQUIRED TO PROVIDE FINAL SHOP DRAWINGS TO ENGINEER FOR APPROVAL.
2. ALL DIMENSIONS/MEASUREMENTS ARE SHOWN IN INCHES.

60 South Main Street, Suite 202 Thompsonville, CT 06082			
NO.	DATE	DESCRIPTION	BY
REVISIONS			
GPD PROJECT NUMBER 2019777-842874-02			
SITE NAME: THOMPSONVILLE			
BL NUMBER: 842874			
IVO NUMBER: 1705788			
SITE ADDRESS: 585 ENFIELD STREET ENFIELD, CT 06082 HARTFORD COUNTY, USA			
ENG'D BY: BD		DATE: 4/2/19	
DPT BY: FR		DATE: 4/2/19	
DFT/VA BY: CB		DATE: 4/2/19	
APPR'D BY: CJS		DATE: 4/2/19	
SCALE: N.T.S.			
ADDITIONAL SECTIONS			
S-6			REV 0



PROJECT NO.	ERCC004
DRAWN BY:	CM
CHECKED BY:	CAT

SUBMITTALS	
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0	05/15/19 ISSUED FOR PERMITTING

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FAR 10071277
SITE# CTL05156
THOMPSONVILLE
585 ENFIELD STREET
ENFIELD, CT 06082

STRUCTURAL DETAILS

S-3



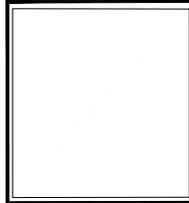
5841 BRIDGE STREET
EAST SYRACUSE, NY 13057



3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065



JACOBS ENGINEERING GROUP, INC.
120 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116



PROJECT NO. ERCC004

DRAWN BY: CM

CHECKED BY: CAT

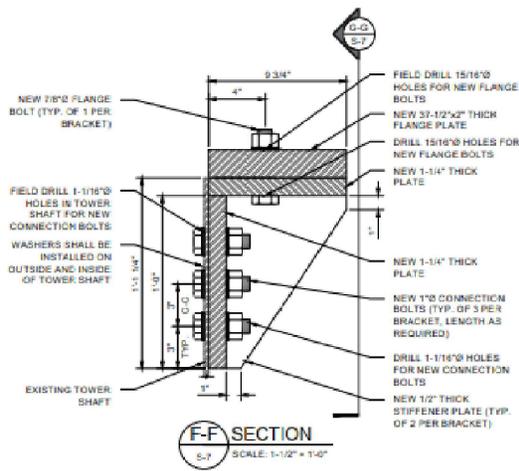
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SITE# CTL05156
THOMPSONVILLE
588 ENFIELD STREET
ENFIELD, CT 06062

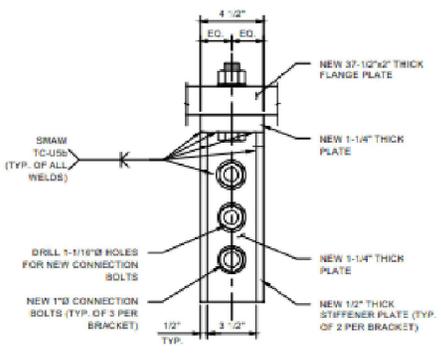
STRUCTURAL DETAILS

S-4



F-F SECTION
S-7 SCALE: 1-1/2" = 1'-0"

- NOTE:**
1. NEW BRACKET CONNECTION BOLTS AND FLANGE BOLTS SHALL BE PRE-TENSIONED PER AISC TURN-OF-THE-NUT METHOD OR OTHER INDUSTRY ACCEPTED MEANS.
 2. ALL FIELD DRILLED HOLES SHALL BE SOLVENT CLEANED AND TOUCHED UP WITH 2 COATS OF BRUSH APPLIED ZINC RICH COLD GALVANIZING PAINT.



G-G SECTION
S-7 SCALE: 1-1/2" = 1'-0"

- NOTE:**
1. NEW BRACKET CONNECTION BOLTS AND FLANGE BOLTS SHALL BE PRE-TENSIONED PER AISC TURN-OF-THE-NUT METHOD OR OTHER INDUSTRY ACCEPTED MEANS.
 2. FABRICATION JOBS SHALL BE REQUIRED FOR ALL CJP WELDS IN THE FLANGE BRACKET ASSEMBLIES. THESE WELDS SHALL BE 100% INSPECTED BY MT. F.V. THE EXISTING HARDWARE LOCATIONS PRIOR TO INSTALLATION TO AVOID INTERFERENCE. NOTIFY EOR IF INTERFERENCE IS FOUND IN THE FIELD.

 <small>500 South Main Street, Suite 2001 Enfield, CT 06033 860.872.2100 860.872.2101</small>										
REVISONS <table border="1"> <thead> <tr> <th>NO.</th> <th>DATE</th> <th>DESCRIPTION</th> <th>BY</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>			NO.	DATE	DESCRIPTION	BY				
NO.	DATE	DESCRIPTION	BY							
<p>GPD PROJECT NUMBER: 2019377-042874-04</p> <p>SITE NAME: THOMPSONVILLE</p> <p>BU NUMBER: 842874 WO NUMBER: 1785788</p> <p>SITE ADDRESS: 588 ENFIELD STREET ENFIELD, CT 06062 HARTFORD COUNTY, USA</p> <p>EN/DIA BY: BD DATE: 4/2/19 DFT BY: RR DATE: 4/2/19 DFT/QA BY: CB DATE: 4/2/19 APRVD BY: CJS DATE: 4/2/19</p> <p>SCALE: N.T.S.</p>										
<p>ADDITIONAL SECTIONS</p> <p>S-7 REV 0</p>										





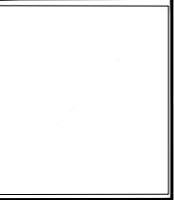
5841 BRIDGE STREET
EAST SYRACUSE, NY 13057



3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065



JACOBS ENGINEERING GROUP, INC.
100 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116



PROJECT NO. ERCC004

DRAWN BY: CM

CHECKED BY: CAT

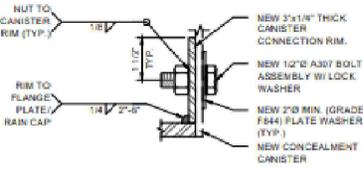
SUBMITTALS	
NO.	DESCRIPTION
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0	05/15/19 ISSUED FOR PERMITTING

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FAR 10071277
SITE# CTL05156
THOMPSONVILLE
588 ENFIELD STREET
ENFIELD, CT 06062

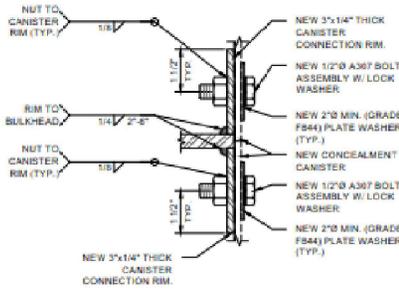
STRUCTURAL DETAILS

S-5



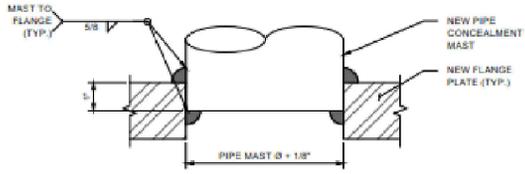
H-H SECTION
SCALE: N.T.S.

- NOTE:**
- CANISTER CONNECTION ALTERNATIVE MUST BE APPROVED PRIOR TO FABRICATION.
 - DETAIL IS TYPICAL FOR THE FLANGE PLATE AT 68.0'. THE RAIN CAP SECTION AT 98.0' IS SIMILAR BUT OF OPPOSITE HAND.



J-J SECTION
SCALE: N.T.S.

- NOTE:**
- CANISTER CONNECTION ALTERNATIVE MUST BE APPROVED PRIOR TO FABRICATION.
 - DETAIL IS TYPICAL FOR THE BULKHEAD ASSEMBLIES AT 78.0' AND 88.0'.



4 SOCKET DETAIL
SCALE: N.T.S.

- NOTE:**
- FABRICATION NDE SHALL BE REQUIRED FOR ALL FILLET WELDS BETWEEN THE MAST PIPES AND FLANGE PLATES. THESE WELDS SHALL BE 100% INSPECTED BY MT.

NO.	DATE	DESCRIPTION	BY
REVISIONS			



GPD PROJECT NUMBER
2019777-842874-24

SITE NAME: THOMPSONVILLE

BU NUMBER: 842874

WFO NUMBER: 1785788

SITE ADDRESS:
588 ENFIELD STREET
ENFIELD, CT 06062
HARTFORD COUNTY, USA

ENGR BY: BD DATE: 4/2/19

OFF BY: RR DATE: 4/2/19

DFT/OA BY: CB DATE: 4/2/19

APPROV BY: CJS DATE: 4/2/19

SCALE: N.T.S.

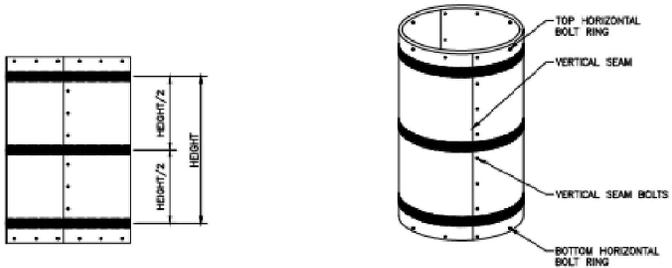
ADDITIONAL SECTIONS

S-8 REV 0



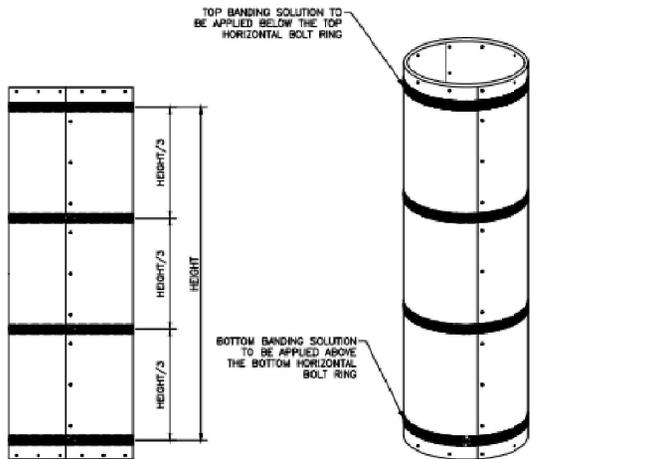
CONCEALMENT REINFORCEMENT SOLUTION - PARTS LIST

NO.	MANUFACTURER	DESCRIPTION	SIZE	PRODUCT NO.
(1)	USA STRAPPING	WOVEN POLYESTER STRAPPING	3/4"x250 FT. COIL	2700-34
(2)	MCCNETT GEAR AID	DUAL-ADJUST BUCKLE	3/4" SIZE	80305
(3)	BLUNKER INDUSTRIES	HURRICANE TAPE	3"x60 YD. ROLL	00101
(4)	RUST-OLEUM	GLOSS CLEAR SPRAY	12 OZ.	249117



≤ 10'-0" CONCEALMENT COVER LEVEL HEIGHT

NOT TO SCALE



> 10'-0" CONCEALMENT COVER LEVEL HEIGHT

NOT TO SCALE

NOTES:

- THE REINFORCEMENT SOLUTION IS ONLY TO BE APPLIED TO VERTICALLY FASTENED BOLT PANEL OR SECTIONIZED CONCEALMENT COVER. SELFING PRESSURE CONCEALMENT COVERS ARE NOT TO BE TREATED WITH THIS SOLUTION.
- FOR CONCEALMENT COVER LEVELS MEASURING 10 FT. IN HEIGHT OR LESS, EQUALLY SPACED BANDING APPLICATIONS ARE TO BE INSTALLED AT THE TOP, MIDDLE, AND BOTTOM REGIONS. FOR LEVELS GREATER THAN 10 FT. IN HEIGHT, EQUALLY SPACED BANDING APPLICATIONS ARE TO BE INSTALLED AT THE TOP, UPPER MIDDLE, LOWER MIDDLE, AND BOTTOM REGIONS.
- FOR CONCEALMENT COVER ALL HEIGHTS THE TOP BANDING APPLICATION IS TO BE POSITIONED DIRECTLY BELOW THE TOP CONCEALMENT COVER HORIZONTAL BOLT RING AND THE BOTTOM BANDING APPLICATION DIRECTLY ABOVE THE BOTTOM HORIZONTAL BOLT RING.

4) BANDING APPLICATIONS SHALL NOT GENERATE ANY VERTICAL OR HORIZONTAL FASTENERS.

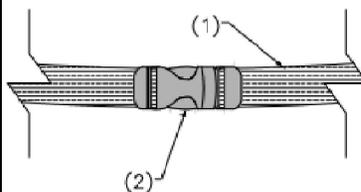
INSTALLATION:

- STRAPPING IS TO BE DESIGNED TO BE APPLIED TO THE CONCEALMENT COVER AND EACH END OF THE STRAPPING PERFORMS A PRESSURE-BREAK ON EACH END OF THE BULK-HEAD BUNDLE.
- STRAPPING IS TO BE HAND-TIGHTENED USING THE BUCKLE SUCH THAT THE STRAPPING LIES FLAT, UNWRITTEN, AND SQUARE TO THE CONCEALMENT COVER.
- AT LEAST EIGHT INCHES OF HURRICANE TAPE ARE TO BE APPLIED TO THE TOP OF THE TIGHTENED STRAPPING SUCH THAT 10% OF THE STRAPPING REMAINS EXPOSED TO THE FACE OF THE TAPE.
- THE CURRENT DATE IS TO BE MARKED WITH PERMANENT INK ON THE TOP LAYER OF TAPE TO RECORD INSTALLATION DATE.
- ENSURE THAT THE SURFACE OF THE CONCRETE IS FREE FROM OIL, GREASE, SOIL, DIRT, AND OTHER FOREIGN MATTER. THE SURFACE SHALL BE CLEAN DRY AND SMOOTH TO RECEIVE THE STRAPPING AND TAPE.
- HURRICANE TAPE SHALL BE TACKLED DOWN BY APPLYING SEVERAL COATS OF RUST-OLEUM GLOSS CLEAR SPRAY OVER THE TAIL END OF THE TAPE AFTER IT IS SECURELY TAPED DOWN. SECOND COAT SHALL BE APPLIED ONCE THE FIRST COAT IS DRY TO TOUCH.

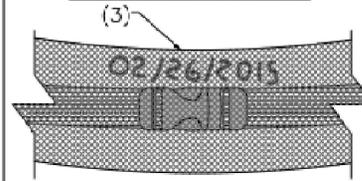
PAINTING HURRICANE TAPE IF REQUIRED:

- AFTER FULL INSTALLATION OF THE THE REINFORCEMENT SOLUTION, THE TAPE SHALL BE COATED TO MATCH THE COLOR OF THE EXISTING CONCEALMENT COVER.
 - AS AN EXAMPLE, IF THE EXISTING CONCEALMENT COVER IS WHITE, PAINTING WOULD NOT BE REQUIRED SINCE THE TAPE COLOR IS ALSO WHITE. HOWEVER, IF THE COVER IS BLACK, PAINT THE TAPE TO MATCH THE COVER COLOR.
- PAINT SHALL BE APPLIED WITH A BRUSH FOR A CLEAN EDGE ON THE TAPE. SPRAY PAINT IS PERMISSIBLE PROVIDED THAT PAINTERS TAPE IS UTILIZED TO PROTECT PAINTING THE COVER. SPRAYING SHALL BE APPLIED AFTER THE FIRST COAT DRIES. THE EDGE OF THE PAINT SHALL MATCH THE COVER.
- THE INSTALLATION DATE SHALL BE MARKED ON TOP OF THE COATED SURFACE.

STRAPPING INSTALLATION DETAIL



TAPE INSTALLATION DETAIL



CROWN CASTLE CONCEALMENT REINFORCEMENT SOLUTION

SCALE: NONE



REVISIONS

NO.	DATE	DESCRIPTION
1		ISSUED FOR CONSTRUCTION
0		ISSUED FOR PERMITTING

PROJECT TITLE:
TYPE:
PROJECT NUMBER:

OPS-PRC-1012P

CARRIER LOGO



CONCEALMENT REINFORCEMENT SOLUTION

SPACE RESERVED FOR PROFESSIONAL SEAL

FOR REFERENCE ONLY

NO.	DATE	DESCRIPTION
1		ISSUED FOR CONSTRUCTION
0		ISSUED FOR PERMITTING

PROJECT NO. ERCC0004



PROJECT NO. ERCC0004
 DRAWN BY: CM
 CHECKED BY: CAT

SUBMITTALS

NO.	DATE	DESCRIPTION
1	05/03/19	ISSUED FOR CONSTRUCTION
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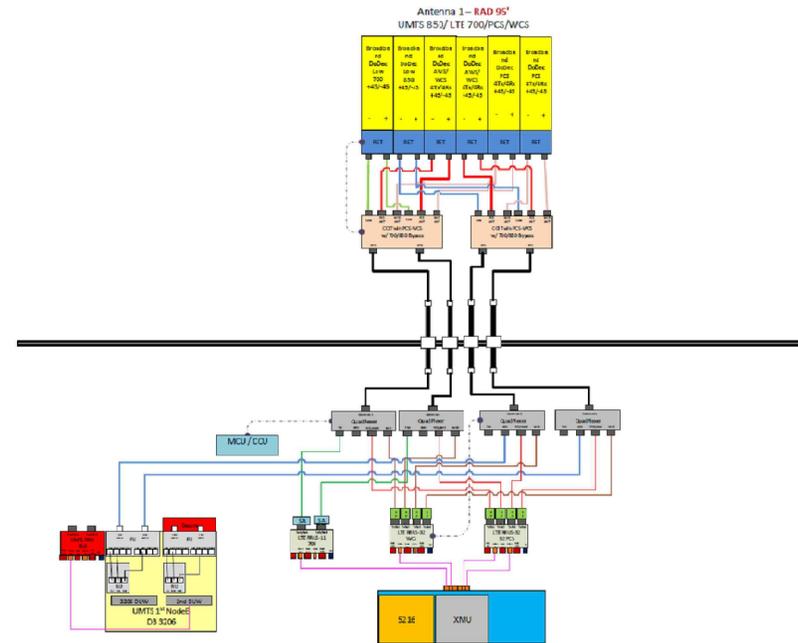
FAR# 10071277
 SITE# CT05156
 THOMPSONVILLE
 588 ERIEFIELD STREET
 ERIEFIELD, CT 06062

STRUCTURAL DETAILS

S-6

ANTENNA NUMBER	ANTENNA MODEL (78.5"x14.8"x6.7")	ANTENNA BAND	AZIMUTH	ANTENNA CENTERLINE FROM GROUND	TMA's	RRH's	FEEDER	RAYCAP
A1	800-10798	UMTS 850 LTE WCS LTE 700 LTE 1900	60°	94'	(2) TMA21X23B68-31-43	(1) RRUS-32 B2 (PCS)* (1) RRUS-32 (WCS)*	(12) 7/8 PROPOSED (LENGTH @ XXX')	
-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	
B1	800-10798	LTE	180°	94'	(2) TMA21X23B68-31-43	(1) RRUS-32 B2 (PCS)* (1) RRUS-32 (WCS)*	(12) 7/8 PROPOSED (LENGTH @ XXX')	
-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	
G1	800-10798	LTE	300°	94'	(2) TMA21X23B68-31-43	(1) RRUS-32 B2 (PCS)* (1) RRUS-32 (WCS)*	(12) 7/8 PROPOSED (LENGTH @ XXX')	
-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	

(24) TSX
DC-4310PIM



5841 BRIDGE STREET
EAST SYRACUSE, NY 13057



3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065



120 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116



PROJECT NO. ERCC004

DRAWN BY: CM

CHECKED BY: CAT

SUBMITTALS	
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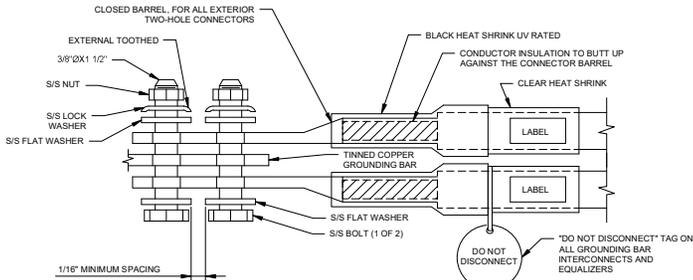
FA# 10071277
SITE# CTL05156
THOMPSONVILLE
588 ENFIELD STREET
ENFIELD, CT 06082

ANTENNA CHART &
RF EQUIPMENT
SCHEMATIC

RF-1

NOTES:

1. EXOTHERMIC WELD (2) TWO, #2 AWG BARE TINNED SOLID COPPER CONDUCTORS TO GROUNDING BAR. ROUTE CONDUCTORS TO BURIED GROUNDING RING AND PROVIDE PARALLEL, EXOTHERMIC WELD.
2. ALL GROUNDING BARS SHALL BE STAMPED IN TO THE METAL "IF STOLEN DO NOT RECYCLE." THE CONTRACTOR SHALL USE PERMANENT MARKER TO DRAW THE LINES BETWEEN EACH SECTION AND LABEL EACH SECTION ("P", "X", "N", "T") WITH 1" HIGH LETTERS.
3. ALL HARDWARE SHALL BE STAINLESS STEEL 3/8" DIAMETER OR LARGER. ALL HARDWARE 18-8 STAINLESS STEEL INCLUDING LOCK WASHERS. COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING.
4. FOR GROUND BOND TO STEEL ONLY, INSERT A CADMIUM FLAT WASHER BETWEEN LUG AND STEEL, COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING.
5. DO NOT INSTALL CABLE GROUNDING KIT AT A BEND AND ALWAYS DIRECT GROUNDING CONDUCTOR DOWN TO GROUNDING BUS.
6. NUT & WASHER SHALL BE PLACED ON THE FRONT SIDE OF THE GROUNDING BAR AND BOLTED ON THE BACK SIDE. INSTALL BLACK HEAT-SHRINKING TUBE, 600 VOLT INSULATION, ON ALL GROUNDING TERMINATIONS. THE INTENT IS TO WEATHERPROOF THE COMPRESSION CONNECTION.
7. SUPPLIED AND INSTALLED BY CONTRACTOR.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ADDITIONAL GROUNDING BAR AS REQUIRED, PROVIDING 50% SPARE CONNECTION POINTS.
9. ENSURE THE WIRE INSULATION TERMINATION IS WITHIN 1/8" OF THE BARREL (NO SHINERS).



1 EXTERIOR TWO HOLE LUG DETAIL

SCALE: NONE

GENERAL NOTES:

1. CONTRACTOR SHALL HAVE A COMPLETE UNDERSTANDING OF THE CONTENTS OF AT&T STANDARD TP-76416.
2. ALL INSTALLATIONS SHALL BE FIELD VERIFIED.
3. ALL GROUND CONNECTIONS FOR ALL RELOCATED EQUIPMENT SHALL BE RE-ESTABLISHED BY THE CONTRACTOR. CONTRACTOR SHALL FURNISH ALL MATERIALS AS REQUIRED.

GROUNDING NOTES:

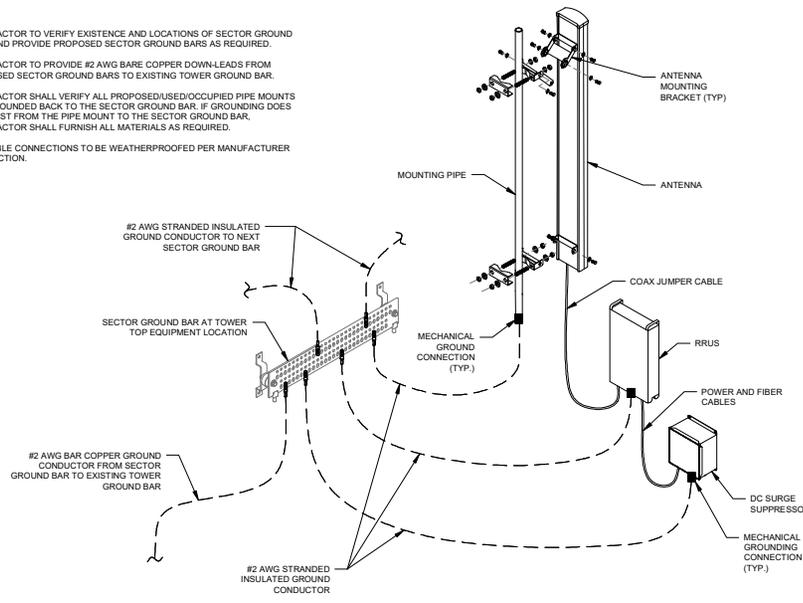
1. TOWER GROUNDING BAR: EXTEND (2) #2 AWG TINNED CU WIRE FROM BURIED GROUND RING UP TO THE TOWER GROUND BAR AND MAKE A MECHANICAL CONNECTION. SECURE GROUND BAR DIRECTLY TO TOWER WITH STAINLESS STEEL MOUNTING MATERIAL.
2. ANTENNA GROUNDING BAR: ANDREW CORPORATION PART #UGBKIT-0424-T MOUNT GROUND BAR DIRECTLY TO TOWER. SECURE TO TOWER WITH STAINLESS STEEL MOUNTING MATERIAL.
3. GROUNDING BAR: LOCATED CLOSE TO GRADE LOCK BOX TESSCO PART #351546. INSTALL PER MANUFACTURER GUIDELINES.
4. EXOTHERMIC OR COMPRESSION CONNECTION FOR PIPE MOUNT TO ANTENNA ROUTE CONDUCTOR TO NEAREST GROUNDING BAR SO THE GROUNDING CONDUCTORS PROVIDE A STRAIGHT DOWNWARD PATH TO GROUND. USE #2 AWG SOLID TINNED COPPER CONDUCTOR. GROUNDING CONNECTION SHALL BE LOCATED AT THE TOP 2" OF PIPE.
5. ALL GROUNDING CONDUCTORS SHALL BE #2 AWG COPPER TINNED UNLESS NOTED OTHERWISE.
6. ALL GROUNDING CONDUCTORS SHALL PROVIDE A STRAIGHT DOWNWARD PATH TO GROUND WITH GRADUAL BEND AS REQUIRED. GROUND WIRES SHALL NOT BE LOOPED OR SHARPLY BENT.
7. KOPR-SHIELD ANTI-OXIDATION COMPOUND SHALL BE USED ON ALL COMPRESSION GROUNDING CONNECTIONS.
8. ALL EXOTHERMIC CONNECTIONS SHALL BE INSTALLED UTILIZING THE PROPER CONNECTION MOLD AND MATERIALS FOR THE PARTICULAR APPLICATION.
9. ALL BOLTED GROUNDING CONNECTIONS SHALL BE INSTALLED WITH AN EXTERNAL TOOTHED LOCK WASHER. GROUNDING BUS BARS MAY HAVE PRE-PUNCHED HOLES OR TAPPED HOLES. ALL HARDWARE SHALL BE SECURITY TORQUE HARDWARE 3/8" STAINLESS STEEL.
10. EXTERNAL GROUNDING CONDUCTOR SHALL NOT BE INSTALLED OR ROUTED THROUGH HOLES IN ANY METAL OBJECTS, CONDUITS, OR SUPPORTS TO PRECLUDE ESTABLISHING A MAGNETIC CHOKE POINT.
11. PLASTIC CLIPS SHALL BE USED TO FASTEN AND SUPPORT GROUNDING CONDUCTORS. FERROUS METAL CLIPS WHICH COMPLETELY SURROUND THE GROUNDING CONDUCTOR SHALL NOT BE USED.
12. IF COAX ON ICE BRIDGE IS MORE THAN 6' FROM THE GROUND BAR AT THE BASE OF THE TOWER, A SECOND GROUND BAR WILL BE NEEDED AT THE END OF THE ICE BRIDGE RUN TO GROUND THE COAX GROUND KIT AND THE IN-LINE SURGE ARRESTORS (SURGE ARRESTORS INSTALLED BY LUCCENT ONLY HAVE 6' GROUND TAILS).
13. CONTRACTOR SHALL REPAIR/PLACE EXISTING GROUNDING SYSTEM COMPONENTS DAMAGED DURING CONSTRUCTION AT THE CONTRACTORS EXPENSE.
14. DO NOT ALLOW THE COPPER CONDUCTOR TO TOUCH THE GALVANIZED GUY WIRE AT THE CONNECTION POINT OR AT ANY OTHER POINT. NO EXOTHERMICALLY WELDED CONNECTION SHALL BE MADE TO THE GUY WIRE.
15. CONTRACTOR SHALL VERIFY EXISTING SECTOR GROUNDING CONDITION AND GROUND THE PROPOSED EQUIPMENT IN THE SAME MANNER. A PROPOSED SECTOR GROUND BAR SHALL BE INSTALLED IF REQUIRED.

2 GROUNDING NOTES

SCALE: NONE

NOTES:

1. CONTRACTOR TO VERIFY EXISTENCE AND LOCATIONS OF SECTOR GROUND BARS AND PROVIDE PROPOSED SECTOR GROUND BARS AS REQUIRED.
2. CONTRACTOR TO PROVIDE #2 AWG BARE COPPER DOWN-LEADS FROM PROPOSED SECTOR GROUND BARS TO EXISTING TOWER GROUND BAR.
3. CONTRACTOR SHALL VERIFY ALL PROPOSED/USED/OCCUPIED PIPE MOUNTS ARE GROUNDED BACK TO THE SECTOR GROUND BAR. IF GROUNDING DOES NOT EXIST FROM THE PIPE MOUNT TO THE SECTOR GROUND BAR, CONTRACTOR SHALL FURNISH ALL MATERIALS AS REQUIRED.
4. ALL CABLE CONNECTIONS TO BE WEATHERPROOFED PER MANUFACTURER INSTRUCTION.



3 TYPICAL ANTENNA GROUNDING SCHEMATIC

SCALE: NONE

4 DETAIL NOT USED

SCALE: NONE



5841 BRIDGE STREET
EAST SYRACUSE, NY 13057



3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065



120 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116



PROJECT NO.	ERCC004
DRAWN BY:	CM
CHECKED BY:	CAT

SUBMITTALS	
1	05/23/19 ISSUED FOR CONSTRUCTION
0	05/15/19 ISSUED FOR PERMITTING

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FA# 10071277
SITE# CTL05156
THOMPSONVILLE
588 ENFIELD STREET
ENFIELD, CT 06082

GROUNDING DETAILS

G-1

Exhibit D

Structural Analysis Report

Date: April 2, 2019

Andrew Bazinet
Crown Castle
3530 Toringdon Way
Charlotte, NC 28277



GPD Engineering and Architecture
Professional Corporation

520 South Main Street Suite 2531
Akron, Ohio 44311
(216) 927-8663

Subject: Structural Modification Report

Carrier Designation: AT&T Mobility Co-Locate
Carrier Site Number: 10071277
Carrier Site Name: CT5156

Crown Castle Designation: Crown Castle BU Number: 842874
Crown Castle Site Name: THOMPSONVILLE
Crown Castle JDE Job Number: 478171
Crown Castle Work Order Number: 1705788
Crown Castle Order Number: 421210 Rev. 6

Engineering Firm Designation: GPD Project Number: 2019777.842874.04

Site Data: 566 Enfield Street, Enfield, Hartford County, CT 06082
Latitude 42° 0' 29.71", Longitude -72° 35' 36.67"
98 Foot - Stealth Concealment Monopole Tower w/
Proposed Canister Expansion

Dear Andrew Bazinet,

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

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

LC4.5: Modified Structure w/ Proposed Equipment Configuration **Sufficient Capacity**

This analysis utilizes an ultimate 3-second gust wind speed of 125 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

All modifications designed by GPD (Project #: 2019777.842874.04, dated 4/2/2019, see Appendix D) and equipment proposed in this report shall be installed in accordance with the attached design drawings for the determined available structural capacity to be effective.

Structural analysis prepared by: Benjamin Darkow

Respectfully submitted by:

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



4/2/2019

TABLE OF CONTENTS

1) INTRODUCTION

2) ANALYSIS CRITERIA

Table 1 - Proposed Equipment Configuration

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

3.1) Analysis Method

3.2) Assumptions

4) ANALYSIS RESULTS

Table 3 - Section Capacity (Summary)

Table 4 – Tower Component Stresses vs. Capacity - LC4.5

4.1) Recommendations

5) DISCLAIMER OF WARRANTIES

6) APPENDIX A

tnxTower Output

7) APPENDIX B

Base Level Drawing

8) APPENDIX C

Additional Calculations

9) APPENDIX D

Modification Drawings

1) INTRODUCTION

This tower is a 98.0 ft concealment monopole tower designed by Stealth Network Technologies Inc. in June of 2000. The tower was originally designed for a wind speed of 80 mph per TIA/EIA-222-F.

The existing tower consists of three major sections connected by a flange plate and slip joint. The bottom 68' of the tower has an 18-sided cross section and is evenly tapered from 18.0" (flat-flat) at 68' to 25.845" (flat-flat) at the bottom. The top 30.0' of the tower consists of a mast pipe surrounded by concealment canisters. The tower is painted and does not have aviation lighting.

The modifications designed by GPD (Project #: 2019777.842874.04, dated 4/2/2019, see Appendix D) have been considered in this analysis. They consisted of replacing the tower mast and concealment canisters from 68.0' to 98.0'. The proposed concealment canisters have a diameter of 38.0".

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	125 mph
Exposure Category:	B
Topographic Factor:	1
Ice Thickness:	2 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)
93.0	94.0	3	Kathrein	80010798	12	7/8
	93.0	1	-	38.0" x 10.0' Concealment Canister		
83.0	86.0	3	Commscope	TMAT21X23B68-31-43	-	-
	83.0	3	Commscope	TMAT21X23B68-31-43		
		1	-	38.0" x 10.0' Concealment Canister		
73.0	73.0	1	-	38.0" x 10.0' Concealment Canister	-	-

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
Geotechnical Report	Criscuolo Shepard Site #: CT-156, dated 02/21/2000	5167296	CCISITES
Tower Foundation Drawings	Stealth Job #: ATTW-00036C-02, dated 03/05/2000	5167351	CCISITES
Tower Mapping Report	TEP #: 132260.160727, dated 03/09/2018	5167222	CCISITES
Tower Manufacturer Drawings	Stealth Job #: ATTW-00036C-02, dated 06/15/2000	5167222	CCISITES
Tower Reinforcement Design	GPD Project #: 2019777.842874.04, dated 4/2/2019	D Palkovic	GPD

3.1) Analysis Method

tnxTower (version 8.0.5.0), 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.

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

4) ANALYSIS RESULTS

Table 3 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	98 - 88	Pole	TP6.625x6.625x0.864	1	-1.17	517.20	15.5	Pass
L2	88 - 78	Pole	TP6.625x6.625x0.864	2	-2.37	517.20	39.8	Pass
L3	78 - 68	Pole	TP6.625x6.625x0.864	3	-3.47	517.20	74.0	Pass
L4	68 - 45.75	Pole	TP20.73x18x0.1875	4	-5.66	406.59	57.9	Pass
L5	45.75 - 0	Pole	TP25.845x19.8949x0.2188	5	-9.43	1092.91	50.1	Pass
							Summary	
						Pole (L3)	74.0	Pass
						Rating =	74.0	Pass

Table 4 - Tower Component Stresses vs. Capacity - LC4.5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Flange Connection	88	16.3	Pass
1	Flange Connection	78	42.2	Pass
1	Flange Connection	68	70.9	Pass
1	Anchor Rods	0	49.1	Pass
1	Base Plate	0	41.8	Pass
1	Base Foundation Structural	0	18.5	Pass
1	Base Foundation Soil Interaction	0	31.2	Pass

Structure Rating (max from all components) =	74.0%
---	--------------

Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
- 2) Ratings per TIA-222-H, Section 15.5

4.1) Recommendations

The designs of the modified tower and its foundation will be sufficient for the proposed loading once the modifications by GPD (Project #: 2019777.842874.04, dated 4/2/2019, see Appendix D) are installed.

5) DISCLAIMER OF WARRANTIES

GPD has not performed a site visit to the tower to verify the member sizes or antenna/coax loading. If the existing conditions are not as represented on the tower elevation contained in this report, we should be contacted immediately to evaluate the significance of the discrepancy. This is not a condition assessment of the tower or foundation. This report does not replace a full tower inspection. The tower and foundations are assumed to have been properly fabricated, erected, maintained, in good condition, twist free, and plumb.

The engineering services rendered by GPD in connection with this Structural Analysis are limited to a computer analysis of the tower structure and theoretical capacity of its main structural members. No allowance was made for any damaged, bent, missing, loose, or rusted members (above and below ground). No allowance was made for loose bolts or cracked welds.

This analysis is limited to the designated maximum wind and seismic conditions per the governing tower standards and code. Wind forces resulting in tower vibrations near the structure's resonant frequencies were not considered in this analysis and are outside the scope of this analysis. Lateral loading from any dynamic response was not evaluated under a time-domain based fatigue analysis.

GPD does not analyze the fabrication of the structure (including welding). It is not possible to have all the very detailed information needed to perform a thorough analysis of every structural sub-component and connection of an existing tower. GPD provides a limited scope of service in that we cannot verify the adequacy of every weld, plate connection detail, etc. The purpose of this report is to assess the capability of adding appurtenances usually accompanied by transmission lines to the structure.

It is the owner's responsibility to determine the amount of ice accumulation in excess of the code specified amount, if any, that should be considered in the structural analysis.

The attached sketches are a schematic representation of the analyzed tower. If any material is fabricated from these sketches, the contractor shall be responsible for field verifying the existing conditions, proper fit, and clearance in the field. Any mentions of structural modifications are reasonable estimates and should not be used as a precise construction document. Precise modification drawings are obtainable from GPD, but are beyond the scope of this report.

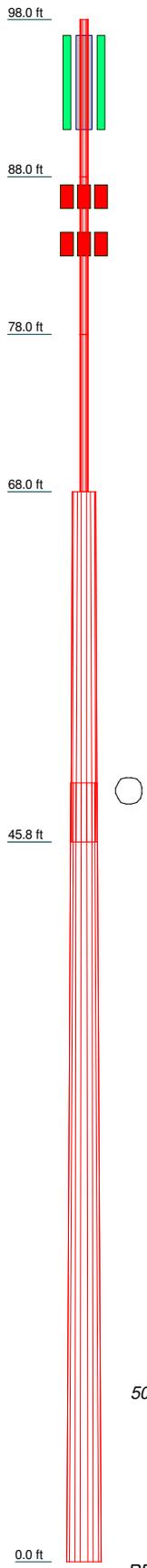
Miscellaneous items such as antenna mounts, etc., have not been designed or detailed as a part of our work. We recommend that material of adequate size and strength be purchased from a reputable tower manufacturer.

Towers are designed to carry gravity, wind, and ice loads. All members, legs, diagonals, struts, and redundant members provide structural stability to the tower with little redundancy. Absence or removal of a member can trigger catastrophic failure unless a substitute is provided before any removal. Legs carry axial loads and derive their strength from shorter unbraced lengths by the presence of redundant members and their connection to the diagonals with bolts or welds. If the bolts or welds are removed without providing any substitute to the frame, the leg is subjected to a higher unbraced length that immediately reduces its load carrying capacity. If a diagonal is also removed in addition to the connection, the unbraced length of the leg is greatly increased, jeopardizing its load carrying capacity. Failure of one leg can result in a tower collapse because there is no redundancy. Redundant members and diagonals are critical to the stability of the tower.

GPD makes no warranties, expressed and/or implied, in connection with this report and disclaims any liability arising from material, fabrication, and erection of this tower. GPD will not be responsible whatsoever for, or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data or conclusions contained in this report. The maximum liability of GPD pursuant to this report will be limited to the total fee received for preparation of this report.

APPENDIX A
TNXTOWER OUTPUT

Section	5	4	3	2	1
Length (ft)	49.50	22.25	10.00	10.00	10.00
Number of Sides	18	18	0	0	0
Thickness (in)	0.2188	0.1875	0.8640	0.8640	0.8640
Socket Length (ft)		3.75			
Top Dia (in)	19.8949	18.0000	6.6250	6.6250	6.6250
Bot Dia (in)	25.8450	20.7300	6.6250	6.6250	6.6250
Grade	A607-65	A53-B-35			
Weight (K)	2.6	0.9	0.5	0.5	0.5



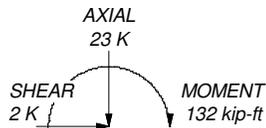
MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	63 ksi	A607-65	65 ksi	80 ksi
A36	36 ksi	58 ksi			

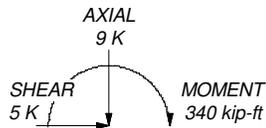
TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 125 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 2.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 74%

ALL REACTIONS ARE FACTORED



50 mph WIND - 2.0000 in ICE



REACTIONS - 125 mph WIND

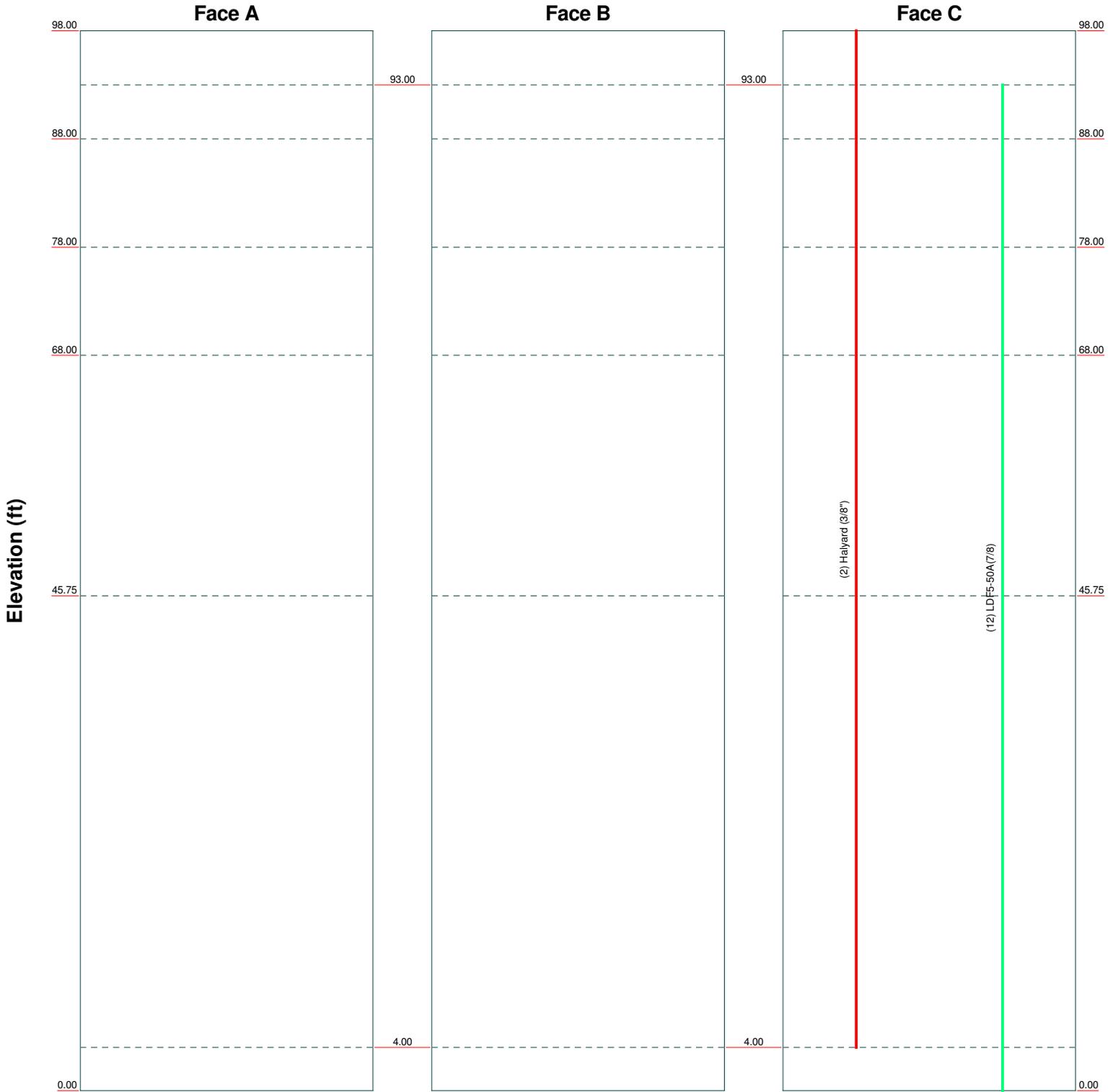
GPD
 520 South Main Street Suite 2531
 Akron, Ohio 44311
 Phone: (330) 572-2100
 FAX: (330) 572-2101

Job: BU #: 842874, THOMPSONVILLE		
Project: 2019777.842874.04		
Client: Crown Castle International, Inc.	Drawn by: bdarkow	App'd:
Code: TIA-222-H	Date: 04/02/19	Scale: NTS
Path: \\AKR\N5.gpdco.com\TELECOM\Crown\842874\04.Mods\Rev. 0\trn\842874.Modified.eri		Dwg No. E-1

Feed Line Distribution Chart

0' - 98'

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



<p>GPD 520 South Main Street Suite 2531 Akron, Ohio 44311 Phone: (330) 572-2100 FAX: (330) 572-2101</p>	Job: BU #: 842874, THOMPSONVILLE		
	Project: 2019777.842874.04		
	Client: Crown Castle International, Inc.	Drawn by: bdarkow	App'd:
	Code: TIA-222-H	Date: 04/02/19	Scale: NTS
Path: \\AKR\N05.gpdco.com\TELECOM\Crown\842874\04.Mods\Rev. 0\trn\842874.Modified.eri		Dwg No. E-7	

Tower Input Data

The tower is a monopole.

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

The following design criteria apply:

- 1) Tower is located in Hartford County, Connecticut.
- 2) Tower base elevation above sea level: 71.00 ft.
- 3) Basic wind speed of 125 mph.
- 4) Risk Category II.
- 5) Exposure Category B.
- 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 2.0000 in.
- 10) Ice thickness is considered to increase with height.
- 11) Ice density of 56 pcf.
- 12) A wind speed of 50 mph is used in combination with ice.
- 13) Temperature drop of 50 °F.
- 14) Deflections calculated using a wind speed of 60 mph.
- 15) A non-linear (P-delta) analysis was used.
- 16) Pressures are calculated at each section.
- 17) Stress ratio used in pole design is 1.05.
- 18) Tower analysis based on target reliabilities in accordance with Annex S.
- 19) Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
- 20) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification Use Code Stress Ratios ✓ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) SR Members Have Cut Ends SR Members Are Concentric	Distribute Leg Loads As Uniform Assume Legs Pinned ✓ Assume Rigid Index Plate ✓ Use Clear Spans For Wind Area ✓ Use Clear Spans For KL/r Retension Guys To Initial Tension ✓ Bypass Mast Stability Checks ✓ Use Azimuth Dish Coefficients ✓ Project Wind Area of Appurt. Autocalc Torque Arm Areas Add IBC .6D+W Combination ✓ Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Treat Feed Line Bundles As Cylinder Ignore KL/ry For 60 Deg. Angle Legs	Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation ✓ Consider Feed Line Torque Include Angle Block Shear Check Use TIA-222-H Bracing Resist. Exemption Use TIA-222-H Tension Splice Exemption <div style="background-color: #e0e0e0; padding: 2px; text-align: center; font-weight: bold;">Poles</div> ✓ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets ✓ Pole Without Linear Attachments ✓ Pole With Shroud Or No Appurtenances Outside and Inside Corner Radii Are Known
--	---	---

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	98.00-88.00	10.00	0.00	Round	6.6250	6.6250	0.8640		A53-B-35 (35 ksi)
L2	88.00-78.00	10.00	0.00	Round	6.6250	6.6250	0.8640		A53-B-35 (35 ksi)
L3	78.00-68.00	10.00	0.00	Round	6.6250	6.6250	0.8640		A53-B-35 (35 ksi)
L4	68.00-45.75	22.25	3.75	18	18.0000	20.7300	0.1875	0.7500	A36 (36 ksi)
L5	45.75-0.00	49.50		18	19.8949	25.8450	0.2188	0.8750	A607-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	It/Q in ²	w in	w/t
L1	6.6250	15.6373	66.3326	2.0596	3.3125	20.0249	132.6653	7.8140	0.0000	0
	6.6250	15.6373	66.3326	2.0596	3.3125	20.0249	132.6653	7.8140	0.0000	0
L2	6.6250	15.6373	66.3326	2.0596	3.3125	20.0249	132.6653	7.8140	0.0000	0
	6.6250	15.6373	66.3326	2.0596	3.3125	20.0249	132.6653	7.8140	0.0000	0
L3	6.6250	15.6373	66.3326	2.0596	3.3125	20.0249	132.6653	7.8140	0.0000	0
	6.6250	15.6373	66.3326	2.0596	3.3125	20.0249	132.6653	7.8140	0.0000	0
L4	18.2488	10.6007	424.9328	6.3234	9.1440	46.4712	850.4248	5.3013	2.8380	15.136
	21.0209	12.2254	651.7868	7.2926	10.5308	61.8931	1304.4311	6.1138	3.3185	17.699
L5	20.6258	13.6614	668.2085	6.9850	10.1066	66.1160	1337.2963	6.8320	3.1165	14.247
	26.2100	17.7926	1476.2082	9.0973	13.1293	112.4365	2954.3588	8.8980	4.1637	19.034

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	Gusset Grade	Adjust. Factor A _r	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 98.00-88.00				1	0	1			
L2 88.00-78.00				1	0	1			
L3 78.00-68.00				1	0	1			
L4 68.00-45.75				1	1	1			
L5 45.75-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
Halyard (3/8")	C	No	Surface Ar (CaAa)	98.00 - 4.00	2	2	0.000 0.000	0.3750		0.04

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Componen t Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight plf
LDF5-50A(7/8)	C	No	No	Inside Pole	93.00 - 0.00	12	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 ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	98.00-88.00	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	0.750	0.000	0.02
L2	88.00-78.00	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	0.750	0.000	0.04
L3	78.00-68.00	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	0.750	0.000	0.04
L4	68.00-45.75	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	1.669	0.000	0.09
L5	45.75-0.00	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	3.131	0.000	0.18

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Sectio n	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	98.00-88.00	A	1.886	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	5.651	0.000	0.08
L2	88.00-78.00	A	1.864	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	5.598	0.000	0.10
L3	78.00-68.00	A	1.840	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	5.539	0.000	0.10
L4	68.00-45.75	A	1.794	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	12.067	0.000	0.21
L5	45.75-0.00	A	1.634	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	22.642	0.000	0.41

Feed Line Center of Pressure

Section	Elevation ft	CP _x in	CP _z in	CP _x Ice in	CP _z Ice in
L1	98.00-88.00	0.0000	3.5000	0.0000	1.8257
L2	88.00-78.00	0.0000	3.5000	0.0000	1.8265
L3	78.00-68.00	0.0000	3.5000	0.0000	1.8273
L4	68.00-45.75	0.0000	0.6694	0.0000	1.6904
L5	45.75-0.00	0.0000	0.6125	0.0000	1.6795

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

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L1	2	Halyard (3/8")	88.00 - 98.00	1.0000	1.0000
L2	2	Halyard (3/8")	78.00 - 88.00	1.0000	1.0000
L3	2	Halyard (3/8")	68.00 - 78.00	1.0000	1.0000
L4	2	Halyard (3/8")	45.75 - 68.00	1.0000	1.0000

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 ²	
Flag (20'x30')	98.00	0.00	0.0000	No Ice	0.06	0.00	0.00	0.77	18.79
				Ice	2.56	0.00	0.00	0.13	19.37
				Service	0.06	0.00	0.00	0.18	21.00
Flag (5'x8')	78.00	0.00	0.0000	No Ice	0.00	0.00	0.00	0.20	5.19
				Ice	0.17	0.00	0.00	0.04	5.86
				Service	0.00	0.00	0.00	0.05	5.81

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	C _A A _A Front	C _A A _A Side	Weight	
			ft ft ft	°	ft	ft ²	ft ²	K	
Truck Ball	B	None		0.0000	99.00	No Ice	1.57	1.57	0.05
						1/2" Ice	2.39	2.39	0.08
						Ice	2.58	2.58	0.11
						1" Ice	2.99	2.99	0.19
						2" Ice			
Canister Load1	B	None		0.0000	98.00	No Ice	7.13	7.13	0.10
						1/2" Ice	17.88	17.88	0.22
						Ice	18.33	18.33	0.34
						1" Ice	19.25	19.25	0.59
						2" Ice			
Canister Load2	B	None		0.0000	88.00	No Ice	14.25	14.25	0.33
						1/2" Ice	35.75	35.75	0.57
						Ice	36.67	36.67	0.81
						1" Ice	38.50	38.50	1.28
						2" Ice			
Canister Load3	B	None		0.0000	78.00	No Ice	14.25	14.25	0.33
						1/2" Ice	35.75	35.75	0.57
						Ice	36.67	36.67	0.81
						1" Ice	38.50	38.50	1.28
						2" Ice			
Canister Load4	B	None		0.0000	68.00	No Ice	7.13	7.13	1.04
						1/2" Ice	17.88	17.88	1.16
						Ice	18.33	18.33	1.27
						1" Ice	19.25	19.25	1.51
						2" Ice			
80010798 w/ Mount Pipe	A	From Leg	1.00	0.0000	93.00	No Ice	0.00	0.00	0.11
			0.00			1/2" Ice	0.00	0.00	0.19
			1.00			Ice	0.00	0.00	0.28

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K
80010798 w/ Mount Pipe	B	From Leg	1.00 0.00 1.00	0.0000	93.00	1" Ice	0.00	0.49
						2" Ice	0.00	0.11
						No Ice	0.00	0.19
						1/2" Ice	0.00	0.28
						1" Ice	0.00	0.49
80010798 w/ Mount Pipe	C	From Leg	1.00 0.00 1.00	0.0000	93.00	2" Ice	0.00	0.11
						No Ice	0.00	0.19
						1/2" Ice	0.00	0.28
						1" Ice	0.00	0.49
						2" Ice	0.00	0.11
TMAT21X23B68-31-43	A	From Leg	1.00 0.00 3.00	0.0000	83.00	No Ice	0.00	0.02
						1/2" Ice	0.00	0.16
						Ice	0.00	0.25
						1" Ice	0.00	0.46
						2" Ice	0.00	0.02
TMAT21X23B68-31-43	B	From Leg	1.00 0.00 3.00	0.0000	83.00	No Ice	0.00	0.02
						1/2" Ice	0.00	0.16
						Ice	0.00	0.25
						1" Ice	0.00	0.46
						2" Ice	0.00	0.02
TMAT21X23B68-31-43	C	From Leg	1.00 0.00 3.00	0.0000	83.00	No Ice	0.00	0.02
						1/2" Ice	0.00	0.16
						Ice	0.00	0.25
						1" Ice	0.00	0.46
						2" Ice	0.00	0.02
TMAT21X23B68-31-43	A	From Leg	1.00 0.00 0.00	0.0000	83.00	No Ice	0.00	0.02
						1/2" Ice	0.00	0.16
						Ice	0.00	0.25
						1" Ice	0.00	0.46
						2" Ice	0.00	0.02
TMAT21X23B68-31-43	B	From Leg	1.00 0.00 0.00	0.0000	83.00	No Ice	0.00	0.02
						1/2" Ice	0.00	0.16
						Ice	0.00	0.25
						1" Ice	0.00	0.46
						2" Ice	0.00	0.02
TMAT21X23B68-31-43	C	From Leg	1.00 0.00 0.00	0.0000	83.00	No Ice	0.00	0.02
						1/2" Ice	0.00	0.16
						Ice	0.00	0.25
						1" Ice	0.00	0.46
						2" Ice	0.00	0.02

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

Comb. No.	Description
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 Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	98 - 88	14.183	45	1.4786	0.0000
L2	88 - 78	11.126	45	1.4216	0.0000
L3	78 - 68	8.330	45	1.2192	0.0000
L4	68 - 45.75	6.168	45	0.8049	0.0000
L5	49.5 - 0	3.398	45	0.6138	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
99.00	Truck Ball	45	14.183	1.4786	0.0000	12285
98.00	Canister Load1	45	14.183	1.4786	0.0000	12285
93.00	80010798 w/ Mount Pipe	45	12.642	1.4576	0.0000	12285
88.00	Canister Load2	45	11.126	1.4216	0.0000	5261
83.00	TMAT21X23B68-31-43	45	9.667	1.3524	0.0000	2452
78.00	Canister Load3	45	8.330	1.2192	0.0000	1695
68.00	Canister Load4	45	6.168	0.8049	0.0000	2469

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	98 - 88	66.636	14	6.9093	0.0000
L2	88 - 78	52.378	14	6.6520	0.0000
L3	78 - 68	39.302	14	5.7219	0.0000
L4	68 - 45.75	29.145	14	3.7968	0.0000
L5	49.5 - 0	16.075	14	2.9012	0.0000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
99.00	Truck Ball	14	66.636	6.9093	0.0000	2814
98.00	Canister Load1	14	66.636	6.9093	0.0000	2814
93.00	80010798 w/ Mount Pipe	14	59.452	6.8150	0.0000	2814
88.00	Canister Load2	14	52.378	6.6520	0.0000	1192
83.00	TMAT21X23B68-31-43	14	45.560	6.3363	0.0000	545
78.00	Canister Load3	14	39.302	5.7219	0.0000	373
68.00	Canister Load4	14	29.145	3.7968	0.0000	536

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
L1	98 - 88 (1)	TP6.625x6.625x0.864	10.00	0.00	0.0	15.637 3	-1.17	492.57	0.002
L2	88 - 78 (2)	TP6.625x6.625x0.864	10.00	0.00	0.0	15.637 3	-2.37	492.57	0.005
L3	78 - 68 (3)	TP6.625x6.625x0.864	10.00	0.00	0.0	15.637 3	-3.47	492.57	0.007
L4	68 - 45.75 (4)	TP20.73x18x0.1875	22.25	0.00	0.0	11.951 5	-5.66	387.23	0.015
L5	45.75 - 0 (5)	TP25.845x19.8949x0.218 8	49.50	0.00	0.0	17.792 6	-9.43	1040.87	0.009

Pole Bending Design Data

Section No.	Elevation ft	Size	M _{ux} kip-ft	φM _{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M _{uy} kip-ft	φM _{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	98 - 88 (1)	TP6.625x6.625x0.864	12.17	75.84	0.161	0.00	75.84	0.000
L2	88 - 78 (2)	TP6.625x6.625x0.864	31.31	75.84	0.413	0.00	75.84	0.000
L3	78 - 68 (3)	TP6.625x6.625x0.864	58.38	75.84	0.770	0.00	75.84	0.000
L4	68 - 45.75 (4)	TP20.73x18x0.1875	120.05	202.79	0.592	0.00	202.79	0.000
L5	45.75 - 0 (5)	TP25.845x19.8949x0.218 8	339.72	657.57	0.517	0.00	657.57	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio V_u ϕV_n	Actual T_u kip-ft	ϕT_n kip-ft	Ratio T_u ϕT_n
L1	98 - 88 (1)	TP6.625x6.625x0.864	1.27	147.77	0.009	0.00	74.85	0.000
L2	88 - 78 (2)	TP6.625x6.625x0.864	1.94	147.77	0.013	0.00	74.85	0.000
L3	78 - 68 (3)	TP6.625x6.625x0.864	2.68	147.77	0.018	0.00	74.85	0.000
L4	68 - 45.75 (4)	TP20.73x18x0.1875	3.66	116.17	0.031	0.00	204.31	0.000
L5	45.75 - 0 (5)	TP25.845x19.8949x0.2188	5.19	312.26	0.017	0.00	700.78	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio P_u ϕP_n	Ratio M_{ux} ϕM_{nx}	Ratio M_{uy} ϕM_{ny}	Ratio V_u ϕV_n	Ratio T_u ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	98 - 88 (1)	0.002	0.161	0.000	0.009	0.000	0.163	1.050	4.8.2
L2	88 - 78 (2)	0.005	0.413	0.000	0.013	0.000	0.418	1.050	4.8.2
L3	78 - 68 (3)	0.007	0.770	0.000	0.018	0.000	0.777	1.050	4.8.2
L4	68 - 45.75 (4)	0.015	0.592	0.000	0.031	0.000	0.608	1.050	4.8.2
L5	45.75 - 0 (5)	0.009	0.517	0.000	0.017	0.000	0.526	1.050	4.8.2

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	98 - 88	Pole	TP6.625x6.625x0.864	1	-1.17	517.20	15.5	Pass
L2	88 - 78	Pole	TP6.625x6.625x0.864	2	-2.37	517.20	39.8	Pass
L3	78 - 68	Pole	TP6.625x6.625x0.864	3	-3.47	517.20	74.0	Pass
L4	68 - 45.75	Pole	TP20.73x18x0.1875	4	-5.66	406.59	57.9	Pass
L5	45.75 - 0	Pole	TP25.845x19.8949x0.2188	5	-9.43	1092.91	50.1	Pass
Summary							ELC:	Load Case 5
Pole (L3)							74.0	Pass
Rating =							74.0	Pass

APPENDIX B
BASE LEVEL DRAWING

APPENDIX C
ADDITIONAL CALCULATIONS

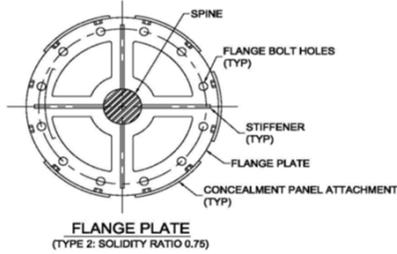
CCI Flagpole Tool



Site Data	
BU#:	842874
Site Name:	THOMPSONVILLE
Order #:	421210 Rev 6

Code	
Code:	TIA-222-H
Ice Thickness:	2 in
Windspeed (V):	125 mph
Ice Wind Speed (V):	50 mph
Exposure Category:	B
Topographic Feature:	N/A
Risk Category:	II

Tower Information	
Total Tower Height:	98 ft
Base Tower Height:	68 ft
Total Canister Length:	30 ft
Number of Canister Assembly Sections:	3



Canister Section Number *	Canister Assembly Length (ft):	Canister Assembly Diameter (in):	Number of Sides Canister Section	Plate Type:	Mating Flange Plate Thickness (in)**:	Mating Flange Plate Diameter (in):	Solidity Ratio	Plate Weight (Kip):	Canister Weight (Kip)	Vent Length (ft):
1	10	38	Round	5	2.00	13	0.9	0.135	0.199	0-0
2	10	38	Round	5	2.00	13	0.9	0.135	0.199	0-0
3	10	38	Round	2	2.00	37.5	0.75	0.940	0.199	0-0

* Sections are numbered from the top of the tower down ** Mating Flange Plate Thickness at the bottom of canister section

Flag on Tower:	Yes
Flag Width:	30 ft
Flag Height:	20 ft
Flag Elevation(z):	98 ft

Truck Ball on Tower:	Yes
Diameter of Ball:	24 in

Geometry : Base Tower + Spine				842874 Modified Import.eri (last saved 03/13 11:07 am)					
Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material	Delete
98	10	0	0	6.625	6.625	0.864	n/a	A53-B-35	[x]
88	10	0	0	6.625	6.625	0.864	n/a	A53-B-35	[x]
78	10	0	0	6.625	6.625	0.864	n/a	A53-B-35	[x]
68	22.25	3.75	18	18	20.73	0.1875	0.75	A36	[x]
49.5	49.5	0	18	19.894888	25.845	0.21875	0.875	A607-65	[x]

Discrete Loads: Truck Ball	Apply C _f A _f at Elevation(z) (ft)	C _f A _f No Ice (ft ²)	C _f A _f 1/2" Ice (ft ²)	C _f A _f 1" Ice (ft ²)	C _f A _f 2" Ice (ft ²)	C _f A _f 4" Ice (ft ²)	Weight No Ice (Kip)	Weight 1/2" Ice (Kip)
	99	1.571	2.386	2.581	2.993	3.910	0.05	0.081

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 ²)	C _f A _f 1/2" Ice (ft ²)	C _f A _f 1" Ice (ft ²)	C _f A _f 2" Ice (ft ²)	C _f A _f 4" Ice (ft ²)	Canister Assembly Weight No Ice (Kip)	Canister Assembly Weight 1/2" Ice (Kip)
Canister Load 1	98	7.125	17.875	18.333	19.250	21.083	0.099	0.217
Canister Load 2	88	14.250	35.750	36.667	38.500	42.167	0.334	0.570
Canister Load 3	78	14.250	35.750	36.667	38.500	42.167	0.334	0.570
Canister Load 4	68	7.125	17.875	18.333	19.250	21.083	1.039	1.157

User Forces: Flag Force Calculation Per ANSI/NAAMM FP 1001-07	
Wind _{FORCE} =	0.770 Kip
Weight=	0.063 Kip
Wind _{FORCE, ICE} =	0.127 Kip
Weight _{ICE} =	2.561 Kip
W _{FORCE, SERVICE WIND} =	0.177 Kip
Weight=	0.063 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 trnx file.

Deflection Check Required:	Yes	Import Deflection Results
3% Spine Deflection Check		
Allowable (3%) Horizontal Spine Deflection (inches)	Actual Deflection *** (inches)	Sufficient/ Insufficient
10.800	8.015	Sufficient

*** Relative deflection under service level wind speed

Monopole Flange Plate Connection

Elevation = 88 ft.

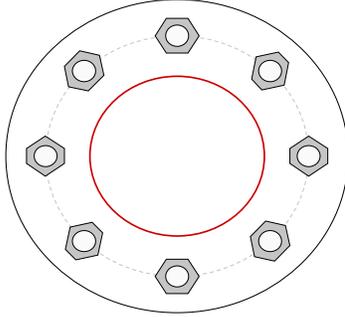


BU #	842874
Site Name	THOMPSONVILLE
Order #	421210 Rev 6
TIA-222 Revision	H

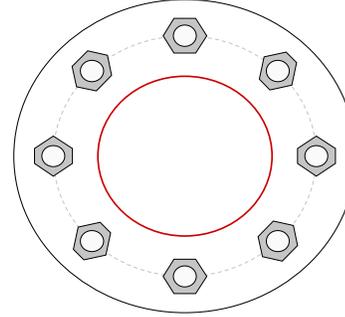
Applied Loads	
Moment (kip-ft)	12.17
Axial Force (kips)	1.17
Shear Force (kips)	1.27

*TIA-222-H Section 15.5 Applied

Top Plate - External



Bottom Plate - External



Connection Properties

Bolt Data

(8) 7/8" ϕ bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 10" BC

Top Plate Data

13" OD x 2" Plate (A572-50; Fy=50 ksi, Fu=65 ksi)

Bottom Plate Data

13" OD x 2" Plate (A572-50; Fy=50 ksi, Fu=65 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

6.625" x 0.864" round pole (A53-B-35; Fy=35 ksi, Fu=60 ksi)

Bottom Pole Data

6.625" x 0.864" round pole (A53-B-35; Fy=35 ksi, Fu=60 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	7.13
Allowable (kips)	41.58
Stress Rating:	16.3% Pass

Top Plate Capacity

Max Stress (ksi):	2.40	(Flexural)
Allowable Stress (ksi):	45.00	
Stress Rating:	5.1%	Pass
Tension Side Stress Rating:	3.4%	Pass

Bottom Plate Capacity

Max Stress (ksi):	2.40	(Flexural)
Allowable Stress (ksi):	45.00	
Stress Rating:	5.1%	Pass
Tension Side Stress Rating:	3.4%	Pass

Monopole Flange Plate Connection

Elevation = 78 ft.

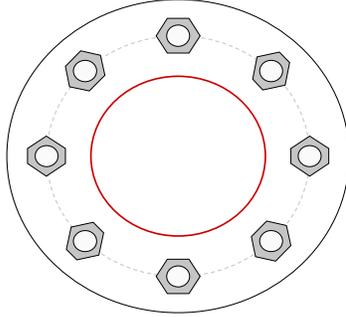


BU #	842874
Site Name	THOMPSONVILLE
Order #	421210 Rev 6
TIA-222 Revision	H

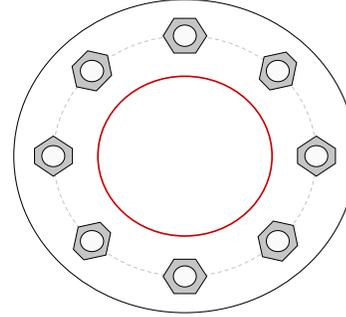
Applied Loads	
Moment (kip-ft)	31.31
Axial Force (kips)	2.37
Shear Force (kips)	1.94

*TIA-222-H Section 15.5 Applied

Top Plate - External



Bottom Plate - External



Connection Properties

Bolt Data

(8) 7/8" ϕ bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 10" BC

Top Plate Data

13" OD x 2" Plate (A572-50; Fy=50 ksi, Fu=65 ksi)

Bottom Plate Data

13" OD x 2" Plate (A572-50; Fy=50 ksi, Fu=65 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

6.625" x 0.864" round pole (A53-B-35; Fy=35 ksi, Fu=60 ksi)

Bottom Pole Data

6.625" x 0.864" round pole (A53-B-35; Fy=35 ksi, Fu=60 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	18.43
Allowable (kips)	41.58
Stress Rating:	42.2% Pass

Top Plate Capacity

Max Stress (ksi):	6.14	(Flexural)
Allowable Stress (ksi):	45.00	
Stress Rating:	13.0%	Pass
Tension Side Stress Rating:	8.8%	Pass

Bottom Plate Capacity

Max Stress (ksi):	6.14	(Flexural)
Allowable Stress (ksi):	45.00	
Stress Rating:	13.0%	Pass
Tension Side Stress Rating:	8.8%	Pass

Pipe Mast Fillet Weld Check

Overturning Moment =	31.31	k*ft
Axial Force =	2.37	k
Shear Force =	1.94	k

Overturning Moment =	17.86	k*ft
Axial Force =	1.24	k
Shear Force =	1.02	k

Pipe Diameter =	6.63	in
Top Fillet Size =	0.6250	in
Weld Strength, F_{exx} =	70	ksi
ϕ =	0.75	

Overturning Moment =	13.45	k*ft
Axial Force =	1.13	k
Shear Force =	0.92	k

Pipe Diameter =	6.63	in
Bottom Fillet Size =	0.6250	in
Weld Strength, F_{exx} =	70	ksi
ϕ =	0.75	

Top Weld Check		
S_{weld} =	37.800	in ²
R_M =	5.669	k/in
R_p =	0.057	k/in
R_v =	0.047	k/in
R_{total} =	5.669	k/in
ϕR_n =	13.921	k/in
Mast Weld Capacity =	40.7%	OK

Bottom Weld Check		
S_{weld} =	31.296	in ²
R_M =	5.158	k/in
R_p =	0.057	k/in
R_v =	0.047	k/in
R_{total} =	5.159	k/in
ϕR_n =	13.921	k/in
Mast Weld Capacity =	37.1%	OK

Monopole Flange Plate Connection

Elevation = 68 ft.

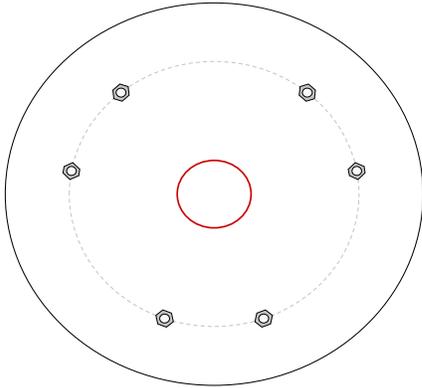


BU #	842874
Site Name	THOMPSONVILLE
Order #	421210 Rev 6
TIA-222 Revision	H

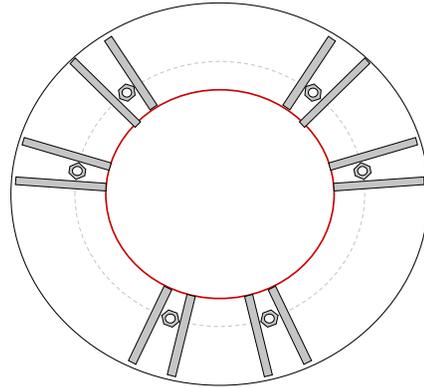
Applied Loads	
Moment (kip-ft)	58.38
Axial Force (kips)	3.47
Shear Force (kips)	2.68

*TIA-222-H Section 15.5 Applied

Top Plate - External



Bottom Plate - External



Connection Properties

Bolt Data

(6) 7/8" ϕ bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 26" BC

Top Plate Data

37.5" OD x 2" Plate (A572-50; Fy=50 ksi, Fu=65 ksi)

Top Stiffener Data

N/A

Top Pole Data

6.625" x 0.864" round pole (A53-B-35; Fy=35 ksi, Fu=60 ksi)

Bottom Plate Data

37.5" OD x 1.25" Plate (A572-50; Fy=50 ksi, Fu=65 ksi)

Bottom Stiffener Data

(12) 12"H x 8.125"W x 0.75"T, Notch: 0"
 plate: Fy= 50 ksi ; weld: Fy= 70 ksi
 horiz. weld: 0.375" groove, 45° dbl bevel, 0" fillet
 vert. weld: 0.53" fillet

Bottom Pole Data

20.5" x 0.1875" 18-sided pole (A36; Fy=36 ksi, Fu=58 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	21.47
Allowable (kips)	41.57
Stress Rating:	49.2% Pass

Top Plate Capacity

Max Stress (ksi):	12.36	(Flexural)
Allowable Stress (ksi):	45.00	
Stress Rating:	26.2%	Pass
Tension Side Stress Rating:	70.9%	Pass

Top Stiffener Capacity

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

Top Pole Capacity

Punching Shear:	N/A
-----------------	-----

Bottom Plate Capacity

Max Stress (ksi):	1.06	(Shear)
Allowable Stress (ksi):	29.25	
Stress Rating:	3.4%	Pass
Tension Side Stress Rating:	N/A	

Bottom Stiffener Capacity

Horizontal Weld:	3.3%	Pass
Vertical Weld:	4.4%	Pass
Plate Flexure+Shear:	2.3%	Pass
Plate Tension+Shear:	3.3%	Pass
Plate Compression:	7.9%	Pass

Bottom Pole Capacity

Punching Shear:	9.2%	Pass
-----------------	-------------	------

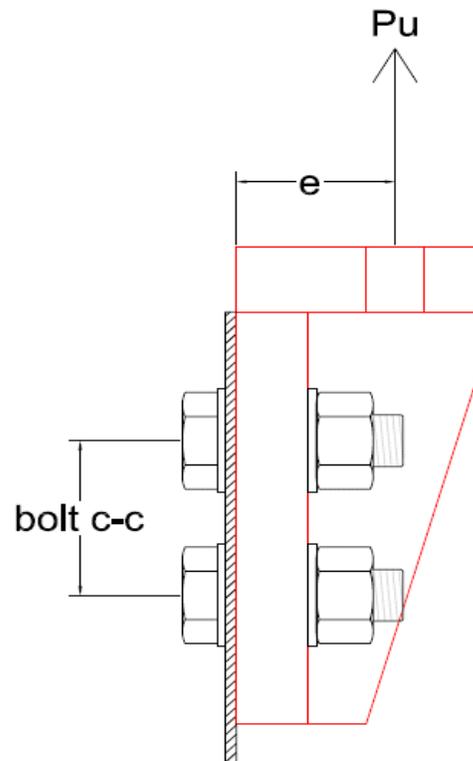
EXTENSION BRACKET BOLT ANALYSIS - TIA-222-H

Site Name: BU #: 842874, THOMPSONVILLE
GPD Project No: 2019777.842874.04
Sheet Application: Analysis
Apply TIA-222-H Section 15.5? Yes

Loading Information		
Elevation =	68	ft
Flange Bolt Compression Force =	21.47	kips
Flange Bolt Tension Force =	21.47	kips
Flange Bolt Eccentricity, e =	4	in

Tower Information		
Shaft Thickness, t =	0.1875	in
Shaft Fu =	58	ksi

Bolt Calculations		
Bolt Type =	A325N	
# Bolts in Connection =	3	
Bolt C-C Spacing =	3	in
Bolts Above Neutral Axis, n' =	1	
Moment Arm, dm =	6	in
Bolt/Shear Sleeve ϕ =	1	in
Bolt Hole ϕ =	1.0625	in
Bolt Head ϕ (Flat-Flat) =	1.625	in
Does Bolt Have a Washer?	Yes	
Washer ϕ =	2	in
$\phi R_{n, shear}$ =	35.34	kips/bolt
$\phi R_{n, bearing}$ =	20.88	kips/bolt
$\phi R_{n, tension}$ =	54.54	kips/bolt
$\phi R_{n, pull-out}$ =	27.47	kips/bolt
$V_{u, bolt}$ =	7.16	kips/bolt
$T_{u, bolt}$ =	14.31	kips/bolt
Connection Capacity =	49.6%	OK



Monopole Base Plate Connection

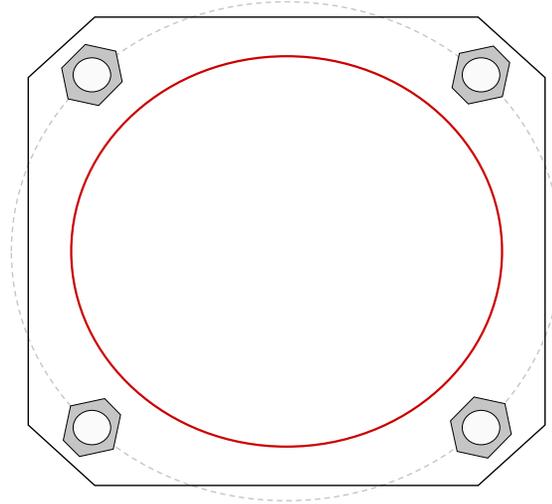


Site Info	
BU #	842874
Site Name	THOMPSONVILLE
Order #	421210 Rev 6

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
I_{ar} (in)	1.25

Applied Loads	
Moment (kip-ft)	339.72
Axial Force (kips)	9.43
Shear Force (kips)	5.19

*TIA-222-H Section 15.5 Applied



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

Anchor Rod Data
(4) 2-1/4" ϕ bolts (A615-75 N; $F_y=75$ ksi, $F_u=100$ ksi) on 33" BC
Base Plate Data
31" OD x 2.25" Plate (A572-50; $F_y=50$ ksi, $F_u=65$ ksi)
Stiffener Data
N/A
Pole Data
25.845" x 0.21875" 18-sided pole (A607-65; $F_y=65$ ksi, $F_u=80$ ksi)

Anchor Rod Summary		<i>(units of kips, kip-in)</i>
$P_u_c = 125.66$	$\phi P_n_c = 243.75$	Stress Rating
$V_u = 1.3$	$\phi V_n = 73.13$	49.1%
$M_u = n/a$	$\phi M_n = n/a$	Pass
Base Plate Summary		
Max Stress (ksi):	19.74	(Flexural)
Allowable Stress (ksi):	45	
Stress Rating:	41.8%	Pass

Pier and Pad Foundation



BU #: 842874
 Site Name: THOMPSONVILLE
 App. Number: 421210 Rev 6

TIA-222 Revision: H
 Tower Type: Monopole

Top & Bot. Pad Rein. Different?:
 Block Foundation?:

Superstructure Analysis Reactions		
Compression, P_{comp} :	9.43	kips
Base Shear, V_{u_comp} :	5.19	kips
Moment, M_u :	339.72	ft-kips
Tower Height, H :	98	ft
BP Dist. Above Fdn, bp_{dist} :	3.5	in

Foundation Analysis Checks				
	Capacity	Demand	Rating*	Check
<i>Lateral (Sliding) (kips)</i>	232.96	5.19	2.1%	Pass
<i>Bearing Pressure (ksf)</i>	10.12	3.32	31.2%	Pass
<i>Overtuning (kip*ft)</i>	1512.63	411.30	27.2%	Pass
<i>Pier Flexure (Comp.) (kip*ft)</i>	2027.08	394.22	18.5%	Pass
<i>Pier Compression (kip)</i>	9372.94	46.54	0.5%	Pass
<i>Pad Flexure (kip*ft)</i>	1201.52	83.04	6.6%	Pass
<i>Pad Shear - 1-way (kips)</i>	341.61	8.05	2.2%	Pass
<i>Pad Shear - 2-way (Comp) (ksi)</i>	0.164	0.010	5.9%	Pass
<i>Flexural 2-way (Comp) (kip*ft)</i>	2403.04	236.53	9.4%	Pass

Pier Properties		
Pier Shape:	Circular	
Pier Diameter, $dpier$:	5	ft
Ext. Above Grade, E :	0.5	ft
Pier Rebar Size, Sc :	11	
Pier Rebar Quantity, mc :	12	
Pier Tie/Spiral Size, St :	5	
Pier Tie/Spiral Quantity, mt :	28	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier} :	3	in

*Rating per TIA-222-H Section 15.5

Soil Rating*:	31.2%
Structural Rating*:	18.5%

Pad Properties		
Depth, D :	13	ft
Pad Width, W :	11	ft
Pad Thickness, T :	3	ft
Pad Rebar Size (Bottom), Sp :	8	
Pad Rebar Quantity (Bottom), mp :	11	
Pad Clear Cover, cc_{pad} :	3	in

Material Properties		
Rebar Grade, Fy :	60	ksi
Concrete Compressive Strength, $F'c$:	3	ksi
Dry Concrete Density, δc :	150	pcf

Soil Properties		
Total Soil Unit Weight, γ :	115	pcf
Ultimate Net Bearing, Q_{net} :	12.000	ksf
Cohesion, Cu :		ksf
Friction Angle, ϕ :	31	degrees
SPT Blow Count, N_{blows} :	18	
Base Friction, μ :	0.5	
Neglected Depth, N :	3.33	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, gw :	18	ft

<--Toggle between Gross and Net

Drilled Pier Foundation

BU # :	842874
Site Name:	THOMPSONVILLE
Order Number:	421210 Rev 6

TIA-222 Revison:	H
Tower Type:	Monopole



Applied Loads		
	Comp.	Uplift
Moment (kip-ft)	339.72	
Axial Force (kips)	9.43	
Shear Force (kips)	5.19	

Material Properties		
Concrete Strength, f _c :	3	ksi
Rebar Strength, F _y :	60	ksi

Pier Design Data		
Depth	26.5	ft
Ext. Above Grade	0.5	ft
Pier Section 1		
<i>From 0.5' above grade to 26.5' below grade</i>		
Pier Diameter	5	ft
Rebar Quantity	12	
Rebar Size	11	
Clear Cover to Ties	4	in
Tie Size	5	

Analysis Results		
Soil Lateral Capacity	Compression	Uplift
D _{v=0} (ft from TOC)	7.75	-
Soil Safety Factor	20.54	-
Max Moment (kip-ft)	373.66	-
Rating*	6.2%	-
Soil Vertical Capacity	Compression	Uplift
Skin Friction (kips)	385.24	-
End Bearing (kips)	632.79	-
Weight of Concrete (kips)	82.93	-
Total Capacity (kips)	1018.03	-
Axial (kips)	92.36	-
Rating*	8.6%	-
Reinforced Concrete Capacity	Compression	Uplift
Critical Depth (ft from TOC)	7.30	-
Critical Moment (kip-ft)	373.49	-
Critical Moment Capacity	2024.35	-
Rating*	17.6%	-
Soil Interaction Rating*		8.6%
Structural Foundation Rating*		17.6%

Check Limitation	
Apply TIA-222-H Section 15.5:	<input checked="" type="checkbox"/>
	N/A <input type="checkbox"/>

*Rating per TIA-222-H Section 15.5

Soil Profile			
Groundwater Depth	18	ft	# of Layers
			6

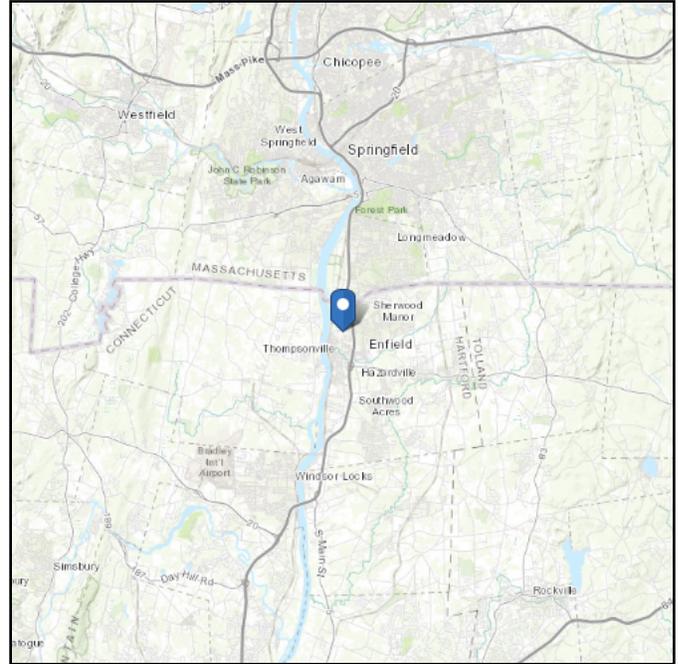
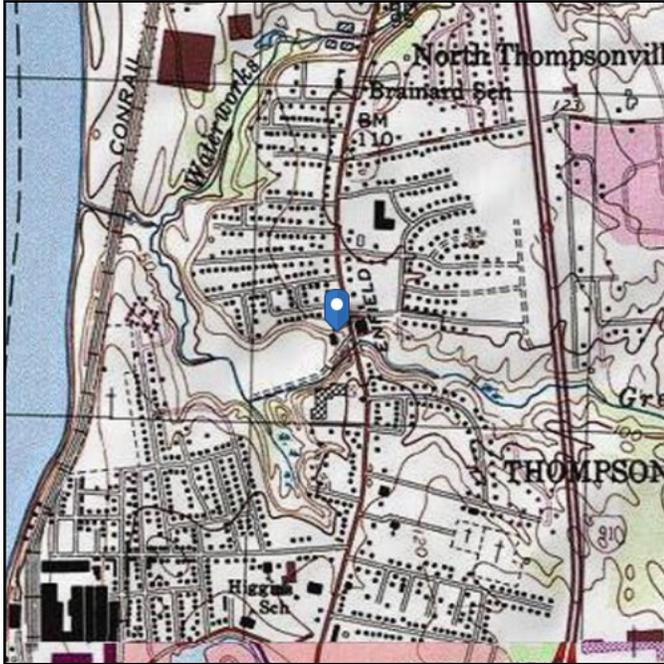
Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ _{soil} (pcf)	γ _{concrete} (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	3.333	3.333	115	150			0.000	0.000					Cohesionless
2	3.333	7	3.667	115	150		30	0.000	0.000	0.00	0.00			Cohesionless
3	7	10	3	116	150		28	0.000	0.000	0.00	0.00			Cohesionless
4	10	18	8	135	150		35	0.000	0.000	0.55	0.55			Cohesionless
5	18	24	6	80	87.6		35	0.000	0.000	0.55	0.55			Cohesionless
6	24	26.5	2.5	103	87.6	2		1.100	1.100	10.00	10.00	42.9705		Cohesive

ASCE 7 Hazards Report

Address:
No Address at This
Location

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

Elevation: 70.81 ft (NAVD 88)
Latitude: 42.008253
Longitude: -72.593519

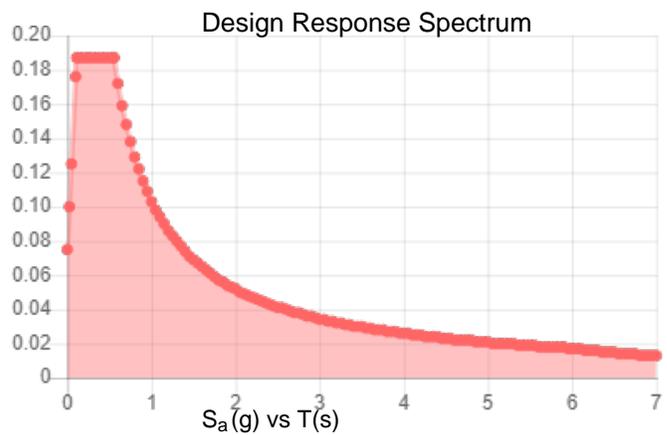
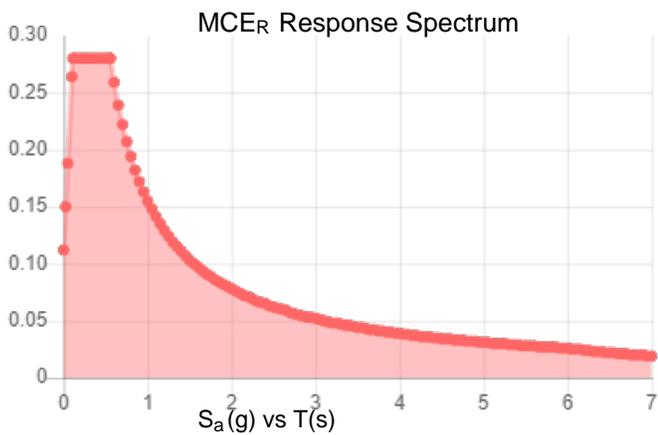


Site Soil Class: D - Stiff Soil

Results:

S_S :	0.175	S_{DS} :	0.187
S_1 :	0.065	S_{D1} :	0.103
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.086
S_{MS} :	0.28	PGA _M :	0.137
S_{M1} :	0.155	F _{PGA} :	1.6
		I_e :	1

Seismic Design Category B



Data Accessed:

Thu Mar 07 2019

Date Source:

USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-10 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness: 1.00 in.
Concurrent Temperature: 5 F
Gust Speed: 50 mph

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

Date Accessed: Thu Mar 07 2019

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.

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.

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APPENDIX D
MODIFICATION DRAWINGS

MONOPOLE REINFORCEMENT DRAWINGS

PREPARED FOR CROWN CASTLE

SITE NAME: THOMPSONVILLE

BU NUMBER: 842874

SITE ADDRESS:

566 ENFIELD STREET
ENFIELD, CT 06082
HARTFORD COUNTY, USA

PROJECT CONTACTS:

1. CROWN PROJECT MANAGER

DAN VADNEY
(518) 373-3510
DAN.VADNEY@CROWNCastle.COM
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

2. CROWN CONSTRUCTION MANAGER

JASON D'AMICO
(860) 209-0104
JASON.DAMICO@CROWNCastle.COM
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

3. ENGINEER OF RECORD:

GPD ENGINEERING AND ARCHITECTURE
PROFESSIONAL CORPORATION
520 SOUTH MAIN STREET, SUITE 2531
AKRON, OH 44311
FOR QUESTIONS PLEASE EMAIL:
CROWNMODS@GPDGROUP.COM

TOWER INFORMATION

TOWER MAPPING: DOC ID #: 5767222
TOWER HEIGHT / TYPE: 98 FT CONCEALMENT TOWER
TOWER LOCATION: LAT: 42° 0' 29.71"
DATUM: (NAD 1983) LONG: -72° 35' 36.67"
ELEV: 71 FT AMSL
STRUCTURAL DESIGN DRAWING: CCI/WO #: 1705788
STRUCTURAL ANALYSIS REPORT: GPD/WO #: 1703440
STRUCTURAL ANALYSIS DATE: 3/8/2019
CCI ORDER NUMBER: 421210 REV #: 6
CCISITES DOCUMENT ID: 8273282

CODE COMPLIANCE

GOVERNING CODES: TIA-222-H & 2018 CSBC
WIND SPEEDS: 125 MPH 3 SECOND GUST
50 MPH 3 SECOND GUST (W/ ICE)
ICE THICKNESS: 2"
STRUCTURE CLASS: II
EXPOSURE CATEGORY: B
TOPO CATEGORY: 1

DIRECTIONS: I-91 NORTH TO EXIT 48, TAKE A LEFT OFF THE EXIT ONTO ELM STREET, FOLLOW TO ROUTE 5 AND TAKE A RIGHT ONTO ROUTE FIVE. FOLLOW ABOUT A MILE; TAKE A LEFT INTO THE DRIVEWAY TO THE AMERICAN LEGION HALL. ANTENNA IS THE FLAG POLE IN THE FRONT OF THE BUILDING.



SAFETY CLIMB: 'LOOK UP'

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

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

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

HOT WORK INCLUDED

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

DRAWINGS INCLUDED

SHEET NUMBER	DESCRIPTION
S-1	TITLE PAGE
S-2	MODIFICATION INSPECTION CHECKLIST
S-3	NOTES
S-4	TOWER ELEVATION
S-5	TOWER SECTIONS
S-6	ADDITIONAL SECTIONS
S-7	ADDITIONAL SECTIONS
S-8	ADDITIONAL SECTIONS
OPS-PRC-10127	CROWN CASTLE CONCEALMENT REINFORCEMENT SOLUTION

 <small>520 South Main Street, Suite 2531 Akron, OH 44311 330.572.2100 330.572.2101</small>				
NO.		DATE	DESCRIPTION	BY
REVISIONS				
GPD PROJECT NUMBER				2019777.842874.04
SITE NAME: THOMPSONVILLE				
BU NUMBER: 842874				
WO NUMBER: 1705788				
SITE ADDRESS: 566 ENFIELD STREET ENFIELD, CT 06082 HARTFORD COUNTY, USA				
ENG/QA BY: BD		DATE: 4/2/19		
DFT BY: RR		DATE: 4/2/19		
DFT/QA BY: CB		DATE: 4/2/19		
APRVD BY: CJS		DATE: 4/2/19		
SCALE: N.T.S.				
				
TITLE PAGE				REV
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MODIFICATION INSPECTION NOTES

GENERAL

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

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

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

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

TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PURCHASE ORDER (PO) IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY. IF CONTACT INFORMATION IS NOT KNOWN THE GC AND/OR INSPECTOR SHALL CONTACT THE CROWN POINT OF CONTACT (POC).

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

SERVICE LEVEL COMMITMENT

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

- THE GC SHALL PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLY 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
- THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY MINOR DEFICIENCIES CORRECTED DURING THE INITIAL MI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MI CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON SITE.

REQUIRED PHOTOS

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

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

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

THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS, PLEASE REFER TO CROWN DOCUMENT # CED-SOW-10007.

			
520 South Main Street, Suite 2531 Avon, CT 04631 330.572.2100 330.572.2101			

NO.	DATE	DESCRIPTION	BY
REVISIONS			

SITE NAME: THOMPSONVILLE

BU NUMBER: 842874

WO NUMBER: 1705788

SITE ADDRESS:
566 ENFIELD STREET
ENFIELD, CT 06082
HARTFORD COUNTY, USA

ENG/QA BY: BD DATE: 4/2/19

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DFT/QA BY: CB DATE: 4/2/19

APRVD BY: CJS DATE: 4/2/19

SCALE: N.T.S.



MODIFICATION INSPECTION CHECKLIST

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MI CHECKLIST			
REQUIRED	REPORT ITEM	APPLICABLE CROWN DOC #	BRIEF DESCRIPTION
PRE-CONSTRUCTION			
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, THE CONTRACTOR SHALL PROVIDE DETAILED ASSEMBLY DRAWINGS AND/OR SHOP DRAWINGS. THESE ARE TO INCLUDE, BUT ARE NOT LIMITED TO, A VISUAL LAYOUT OF NEW REINFORCEMENT, EXISTING REINFORCEMENT CONFIGURATION, PORTHOLES, MOUNTS, STEP PEGS, SAFETY CLIMBS AND ANY OTHER MISCELLANEOUS ITEMS WHICH MAY AFFECT SUCCESSFUL INSTALLATION OF MODIFICATIONS ON THE TOWER. THESE DRAWINGS SHALL BE SUBMITTED TO THE EOR FOR APPROVAL. APPROVED ASSEMBLY/SHOP 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 INDUSTRY STANDARDS AND THE CONTRACT DOCUMENTS, SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	FABRICATOR CERTIFIED WELD INSPECTION	CED-SOW-10007 CED-STD-10069	A CWI SHALL INSPECT ALL WELDING PERFORMED ON STRUCTURAL MEMBERS DURING FABRICATION. A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	MATERIAL TEST REPORTS (MTR)	CED-SOW-10007	MATERIAL TEST REPORTS SHALL BE PROVIDED FOR MATERIAL USED AS REQUIRED PER SECTION 9.2.5 OF CED-SOW-10007. MTRS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	FABRICATOR NDE INSPECTION REPORT	CED-SOW-10066 CED-STD-10069	CRITICAL SHOP WELDS THAT REQUIRE TESTING ARE NOTED ON THESE CONTRACT DRAWINGS. A CERTIFIED NDT INSPECTOR SHALL PERFORM NON-DESTRUCTIVE EXAMINATION AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	NDE OF MONOPOLE BASE PLATE	ENG-SOW-10033	A NDE OF THE POLE TO BASE PLATE CONNECTION IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	PACKING SLIPS	CED-SOW-10007	THE MATERIAL SHIPPING LIST SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
ADDITIONAL TESTING AND INSPECTIONS:			
NA			
CONSTRUCTION			
NA	FOUNDATION INSPECTIONS	CED-SOW-10144	A VISUAL OBSERVATION OF THE EXCAVATION AND REBAR SHALL BE PERFORMED BEFORE PLACING THE CONCRETE. A VISUAL OBSERVATION OF THE REBAR SHALL BE PERFORMED BEFORE PLACING THE EPOXY. A SEALED WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	CONCRETE COMP. STRENGTH AND SLUMP TEST	CED-SOW-10144	THE CONCRETE MIX DESIGN, SLUMP TEST, AND COMPRESSIVE STRENGTH TESTS SHALL BE PROVIDED AS PART OF THE FOUNDATION REPORT.
NA	EARTHWORK	CED-SOW-10144	FOUNDATION SUB-GRADES SHALL BE INSPECTED AND APPROVED BY AN APPROVED FOUNDATION INSPECTOR AND RESULTS INCLUDED AS PART OF THE FOUNDATION REPORT.
NA	MICROPILE/ROCK ANCHOR	CED-SOW-10144	MICROPILES/ROCK ANCHORS SHALL BE INSPECTED BY THE FOUNDATION INSPECTION VENDOR AND SHALL BE INCLUDED AS PART OF THE FOUNDATION INSPECTION REPORT, ADDITIONAL TESTING AND/OR INSPECTION REQUIREMENTS ARE NOTED IN THESE CONTRACT DOCUMENTS.
NA	POST-INSTALLED ANCHOR ROD VERIFICATION	CED-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	BASE PLATE GROUT VERIFICATION	ENG-STD-10323	THE GENERAL CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE MI INSPECTOR THAT CERTIFIES THAT THE GROUT WAS REMOVED AND/OR INSTALLED IN ACCORDANCE WITH CROWN REQUIREMENTS FOR INCLUSION IN THE MI REPORT.
NA	FIELD CERTIFIED WELD INSPECTION	CED-SOW-10066 CED-STD-10069	A CROWN APPROVED CERTIFIED WELD INSPECTOR SHALL INSPECT AND TEST FIELD WELDS, FOLLOWING ALL PROCEDURES SPECIFIED IN CROWN STANDARD DOCUMENTS APPLICABLE TO WELD INSPECTIONS. A REPORT SHALL BE PROVIDED. NDE OF FIELD WELDS SHALL BE PERFORMED AS REQUIRED BY CROWN STANDARDS AND CONTRACT DOCUMENTS. THE NDE REPORT SHALL BE INCLUDED IN THE CWI REPORT.
X	ON-SITE COLD GALVANIZING VERIFICATION	ENG-STD-10149 ENG-BUL-10149	THE GENERAL CONTRACTOR SHALL PROVIDE WRITTEN AND PHOTOGRAPHIC DOCUMENTATION TO THE MI INSPECTOR VERIFYING THAT ANY ON-SITE COLD GALVANIZING WAS APPLIED PER MANUFACTURER SPECIFICATIONS AND APPLICABLE STANDARDS.
NA	TENSION TWIST AND PLUMB	CED-PRC-10182 CED-STD-10261	THE GENERAL CONTRACTOR SHALL PROVIDE A REPORT IN ACCORDANCE WITH APPLICABLE STANDARDS DOCUMENTING TENSION TWIST AND PLUMB.
X	GC AS-BUILT DRAWINGS	CED-SOW-10007	THE GENERAL CONTRACTOR SHALL SUBMIT A LEGIBLE COPY OF THE ORIGINAL DESIGN DRAWINGS EITHER STATING "INSTALLED AS DESIGNED" OR NOTING ANY CHANGES THAT WERE REQUIRED AND APPROVED BY THE ENGINEER OF RECORD. EOR/RFI FORMS APPROVING ALL CHANGES SHALL BE SUBMITTED WHEN THE EOR IS SPECIFYING ADDITIONAL INSPECTIONS DESCRIPTION AND APPLICABLE STANDARDS SHALL BE APPLIED.
ADDITIONAL TESTING AND INSPECTIONS:			
X	BOLT PRE-TENSION VERIFICATION		THE CONTRACTOR SHALL COORDINATE DIRECTLY WITH THE MI INSPECTOR TO DETERMINE THE NECESSARY CLOSEOUTS AND/OR INSPECTIONS REQUIRED TO ENSURE BOLT PRE-TENSIONING WAS SUCCESSFULLY PERFORMED AT ALL LOCATIONS NOTED IN THESE PLANS.
POST-CONSTRUCTION			
X	CONSTRUCTION COMPLIANCE LETTER	CED-SOW-10007	A LETTER FROM THE GENERAL CONTRACTOR STATING THAT THE WORKMANSHIP WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THESE CONTRACT DRAWINGS, INCLUDING LISTING ADDITIONAL PARTIES TO THE MODIFICATION PROCESS.
NA	POST-INSTALLED ANCHOR ROD PULL TESTS	CED-PRC-10119	POST-INSTALLED ANCHOR RODS SHALL BE TESTED BY A CROWN APPROVED PULL TEST INSPECTOR AND A REPORT SHALL BE PROVIDED INDICATING TESTING RESULTS.
X	PHOTOGRAPHS	CED-SOW-10007	PHOTOGRAPHS SHALL BE SUBMITTED TO THE MI. PHOTOS SHALL DOCUMENT ALL PHASES OF THE CONSTRUCTION. THE PHOTOS SHALL BE ORGANIZED IN A MANNER THAT EASILY IDENTIFIES THE EXACT LOCATION OF THE PHOTO.
NA	BOLT INSTALLATION VERIFICATION REPORT	CED-SOW-10007	THE MI INSPECTOR SHALL VERIFY THE INSTALLATION AND TIGHTNESS 10% OF ALL NON PRE-TENSIONED BOLTS INSTALLED AS PART OF THE MODIFICATION. THE MI INSPECTOR SHALL LOOSEN THE NUT AND VERIFY THE BOLT HOLE SIZE AND CONDITION. THE MI REPORT SHALL CONTAIN THE COMPLETED BOLT INSTALLATION VERIFICATION REPORT, INCLUDING THE SUPPORTING PHOTOGRAPHS.
X	PUNCHLIST DEVELOPMENT AND CORRECTION DOCUMENTATION	CED-PRC-10283 CED-FRM-10285	FINAL PUNCHLIST INDICATING ALL NONCONFORMANCE(S) IDENTIFIED AND THE FINAL RESOLUTION AND APPROVAL.
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)	CED-SOW-10007	THE MI INSPECTOR SHALL OBSERVE AND REPORT ANY DISCREPANCIES BETWEEN THE CONTRACTOR'S REDLINE DRAWING AND THE ACTUAL COMPLETED INSTALLATION.
ADDITIONAL TESTING AND INSPECTIONS:			
X	FACT TIA INSPECTION & CROWN CASTLE CONCEALMENT REINFORCEMENT SOLUTION	(OPS-SOW-1012 7 REV. C & OPS-PRC-10127 REV. C)	UNLESS EXPLICITLY WAIVED BY THE CROWN CASTLE MOD PM, ALL NEW CANISTER SHROUDS ARE TO BE INSTALLED WITH THE STANDARD REINFORCING SOLUTION (I.E. BANDING KIT) AND INSPECTED PER FACT TIA REQUIREMENTS.

GENERAL NOTES:

- ALL WORK PRESENTED ON THESE DRAWINGS MUST BE COMPLETED BY THE CONTRACTOR UNLESS NOTED OTHERWISE. THE CONTRACTOR MUST BE EXPERIENCED IN THE PERFORMANCE OF WORK SIMILAR TO THAT DESCRIBED HEREIN. BY ACCEPTANCE OF THIS ASSIGNMENT, THE CONTRACTOR IS ATTESTING THAT HE DOES HAVE SUFFICIENT EXPERIENCE AND ABILITY, THAT HE IS KNOWLEDGEABLE OF THE WORK TO BE PERFORMED, THAT HE IS PROPERLY LICENSED, AND THAT HE IS PROPERLY REGISTERED TO DO THIS WORK IN THE STATE AND/OR COUNTY IN WHICH IT IS TO BE PERFORMED.
- THE GENERAL NOTES AND TYPICAL DETAILS ARE APPLICABLE TO ALL PARTS OF THE STRUCTURE AND SHALL BE READ IN CONJUNCTION WITH THE STRUCTURAL DRAWINGS AND PROJECT SPECIFICATIONS.
- THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING APPROVALS FROM ALL AUTHORITIES HAVING JURISDICTION FOR THIS PROJECT AND SHALL NOTIFY THE APPLICABLE JURISDICTIONAL (STATE, COUNTY, OR CITY) ENGINEER 24 HOURS PRIOR TO THE BEGINNING OF CONSTRUCTION.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ABIDING BY ALL CONDITIONS AND REQUIREMENTS OF THE PERMITS.
- ERECT GUARDS AND BARRIERS PER APPLICABLE LABOR AND CONSTRUCTION SAFETY REGULATIONS.
- THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS, POSSIBLE INTERFERENCES, AND DIMENSIONS BEFORE PROCEEDING WITH THE WORK. REPORT ANY AND ALL DISCREPANCIES TO THE ENGINEER OF RECORD (EOR) AND FIELD PERSONNEL IMMEDIATELY. ANY AND ALL FIELD CHANGES SHALL BE APPROVED AND DOCUMENTED BY THE EOR PRIOR TO FIELD IMPLEMENTATION.
- ALL MATERIALS AND WORKMANSHIP SHALL BE WARRANTED FOR TWO (2) YEARS FROM THE DATE OF COMPLETED CONSTRUCTION.
- USE ONLY THE LATEST ISSUES OF ANY APPLICABLE CODES, STANDARDS, OR REGULATIONS MENTIONED IN THE FOLLOWING NOTES AND SPECIFICATIONS, UNO.
- ALL WORKMANSHIP SHALL BE IN ACCORDANCE WITH ANSI, ASTM, ACI, TIA, AND AISC STANDARDS AS REFERENCED IN THE APPLICABLE CODE.
- STRUCTURAL ELEMENTS SHOWN ON THESE DRAWINGS ARE DESIGNED IN ACCORDANCE WITH APPLICABLE BUILDING CODES/STANDARDS. ALL CONSTRUCTION, EXCEPT WHERE NOTED OTHERWISE, SHALL COMPLY WITH THOSE CODES/STANDARDS.
- ALL MATERIALS AND EQUIPMENT FURNISHED SHALL BE NEW AND OF GOOD QUALITY, FREE FROM FAULTS AND DEFECTS, AND IN CONFORMANCE WITH THE DRAWINGS. ANY AND ALL SUBSTITUTIONS MUST BE DULY APPROVED AND AUTHORIZED IN WRITING BY THE OWNER AND ENGINEER OF RECORD PRIOR TO FABRICATION AND INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF THE MATERIALS AND EQUIPMENT BEING SUBSTITUTED.
- ALL MANUFACTURER'S HARDWARE ASSEMBLY INSTRUCTIONS SHALL BE FOLLOWED EXACTLY AND SHALL SUPERSEDE ANY CONFLICTING NOTES ENCLOSED HEREIN.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THE CONTRACTOR IS ALSO RESPONSIBLE FOR ENSURING THAT ALL CONSTRUCTION PROCEDURES MEET THE REQUIREMENTS OF OSHA, THE OWNER, AND ALL OTHER APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY REGULATIONS.
- 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 ANSII/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 ANSII/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 ANSII/TIA-322 (LATEST EDITION).
- ACCESS TO THE PROPOSED WORK SITE MAY BE RESTRICTED. THE CONTRACTOR SHALL COORDINATE INTENDED CONSTRUCTION ACTIVITY, INCLUDING WORK SCHEDULE AND MATERIAL ACCESS, WITH THE RESIDENT LEASING AGENT.
- IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO SAFEGUARD ALL EXISTING STRUCTURES OR BURIED SERVICES AFFECTED BY THIS CONSTRUCTION. CONTRACTOR IS ALSO RESPONSIBLE FOR TEMPORARILY RELOCATING ANY LINES OR STRUTS AS NECESSARY TO COMPLETE THE REQUIRED WORK.
- STRUCTURAL DESIGN IS FOR THE COMPLETE CONDITION ONLY. THE CONTRACTOR MUST BE COGNIZANT THAT THE REMOVAL OF ANY STRUCTURAL COMPONENT OF AN EXISTING TOWER HAS THE POTENTIAL TO CAUSE THE PARTIAL OR COMPLETE COLLAPSE OF THE STRUCTURE. ALL NECESSARY PRECAUTIONS MUST BE TAKEN TO ENSURE STRUCTURAL INTEGRITY, INCLUDING, BUT NOT LIMITED TO, ENGINEERING ASSESSMENT OF CONSTRUCTION STRESSES WITH INSTALLATION MAXIMUM WIND SPEED AND/OR TEMPORARY BRACING AND SHORING.
- DO NOT SCALE DRAWINGS.
- THE DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF CROWN CASTLE. THEY MAY NOT BE REPRODUCED IN ANY FORM WITHOUT THE EXPRESSED WRITTEN CONSENT/PERMISSION OF CROWN CASTLE
- FOR THIS ANALYSIS AND MODIFICATION, THE TOWER HAS BEEN ASSUMED TO BE IN GOOD CONDITION WITHOUT ANY DEFECTS. IF THE CONTRACTOR DISCOVERS ANY INDICATION OF AN EXISTING STRUCTURAL DEFECT, CONTACT THE ENGINEER OF RECORD IMMEDIATELY.
- MODIFICATION WORK SHALL BE COMPLETED IN CALM WIND CONDITIONS / OR APPROPRIATE WIND SPEED FOR THE TYPE OF MODIFICATION WORK TO BE INSTALLED.
- THE CLIMBING FACILITIES, SAFETY CLIMB AND ALL PARTS THEREOF SHALL NOT BE IMPDED, MODIFIED OR ALTERED WITHOUT THE EXPRESS WRITTEN APPROVAL OF 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 TE CROWN POC TO DETERMINE A METHOD OF RESOLUTION.
- ANY WORK PERFORMED WITHOUT A PREFABRICATION MAPPING IS DONE AT THE RISK OF THE GC AND/OR FABRICATOR.
- IMPROPER FIT-UP OF NEW BOLTED HARDWARE DUE TO OVERSIZED, DOUBLE-PUNCHED, OR SLOTTED HOLES FOUND ON THE EXISTING STRUCTURE SHALL BE REPORTED TO GPD AND THE TOWER OWNER IMMEDIATELY. INSTALLATION OF SUCH HARDWARE WILL NOT BE ACCEPTABLE AND ALL COSTS ASSOCIATED WITH REMEDYING THE INSTALLATION WILL BE THE RESPONSIBILITY OF THE GC.

WELDING NOTES:

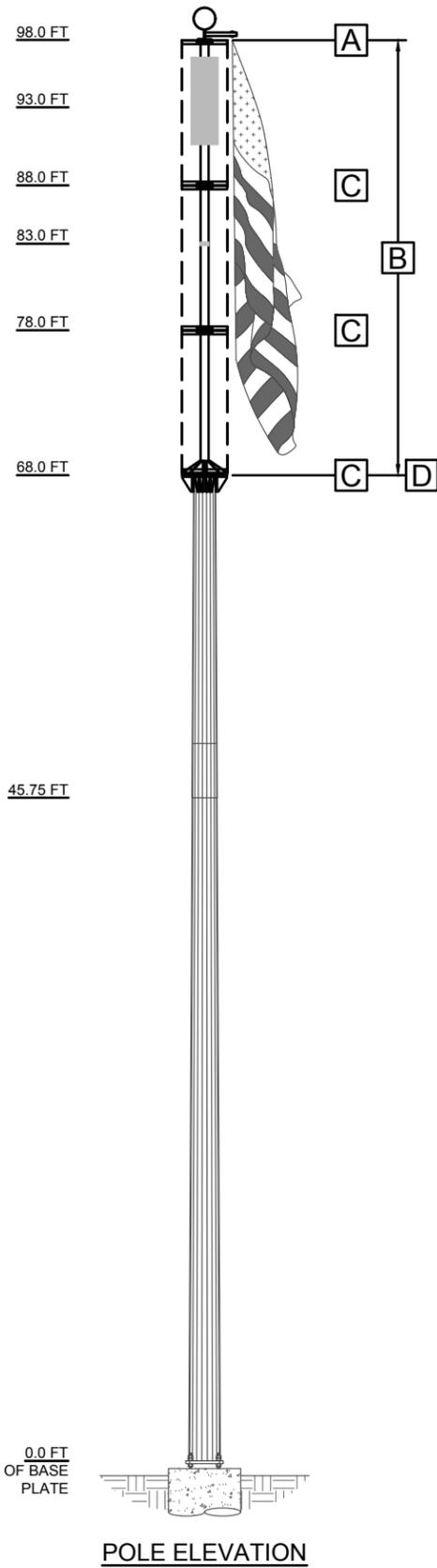
- ALL WELDING SHALL BE IN ACCORDANCE WITH THE AWS D1.1/D1.1M, "STRUCTURAL WELDING CODE-STEEL".
- THE CERTIFIED WELD INSPECTOR SHALL INDICATE, IN A WRITTEN CWI REPORT, THAT ALL WELDING OPERATIONS, PRE-DURING-POST, WERE CONDUCTED IN ACCORDANCE WITH AWS D1.1 WITH PHOTOGRAPHS AND DOCUMENTATION SUPPORTING THE ACCEPTANCE OR REJECTION OF ALL WELDING. FOR INFORMATION, SEE ENG-STD-10069; GC INSPECTION STANDARD FOR FABRICATION AND FIELD WELDING OF STRUCTURAL STEEL AND ENG-SOW-10007 POST MODIFICATION INSPECTION SOW. ALL CWI WELD INSPECTION DOCUMENTATION AND PHOTOS SHALL BE SUBMITTED TO THE PMI INSPECTOR.
- ALL NDE SHALL BE IN ACCORDANCE WITH AWS D1.1.
- FOR NEW BASE STIFFENERS (INCLUSIVE OF TRANSITION STIFFENERS) AND ANCHOR ROD BRACKETS, COMPLETE JOINT PENETRATION WELDS SHALL BE 100% INSPECTED BY UT. ALL PARTIAL JOINT PENETRATION AND FILLET WELDS SHALL BE 100% INSPECTED BY MT.
- 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".
- FOR NDE OF THE EXISTING BASE PLATE CIRCUMFERENTIAL WELD, GC SHALL REFERENCE THE MI CHECKLIST FOR APPLICABILITY. PLEASE SEE ENG-SOW-10033: TOWER BASE PLATE NDE, AND ENG-BUL-10051: NDE REQUIREMENTS FOR MONOPOLE BASEPLATE TO PREVENT CONNECTION FAILURE. NOTIFY THE EOR AND CROWN ENGINEERING IMMEDIATELY IF ANY CRACKS ARE SUSPECTED OR HAVE BEEN IDENTIFIED. THE NDE SHALL INCLUDE ALL EXISTING MODIFICATIONS THAT HAVE BEEN WELDED TO THE BASE PLATE.
- ALL TESTING LIMITATIONS SHALL BE DETAILED IN THE NDE REPORT.
- ALL WELDING SHALL BE PERFORMED BY AWS CERTIFIED WELDERS.
- ALL ARC WELDING ON CROWN STRUCTURES SHALL BE DONE IN ACCORDANCE WITH THE CROWN ENG-PLN-10015, "CUTTING AND WELDING SAFETY PLAN" AND AWS D1.1 (LATEST EDITION). THIS SHALL INCLUDE A CERTIFIED WELDING INSPECTOR (CWI) FOR ACCEPTANCE OR REJECTION OF ALL WELDING OPERATIONS, PRE-DURING-POST, USING THE ACCEPTANCE CRITERIA OF AWS D1.1. THE CWI SHALL WORK WITH THE GC ON THE LEVEL OF INTERACTION NEEDED TO CONDUCT THE WELDING INSPECTION. THE CERTIFIED WELDING INSPECTION IS THE RESPONSIBILITY OF THE GC.
- FOR ALL WELDING, USE E80XX ELECTRODES FOR SMAW PROCESS AND E8XT-XX ELECTRODES FOR FCAW PROCESS, UNO.
- SURFACES TO BE WELDED SHALL BE FREE FROM SCALE, SLAG, RUST, MOISTURE, GREASE OR ANY OTHER FOREIGN MATERIAL THAT WOULD PREVENT PROPER WELDING. GRIND THE SURFACE ADJACENT TO THE WELD FOR A DISTANCE OF 2" MINIMUM ALL AROUND. ENSURE BOTH AREAS ARE 100% FREE OF ALL GALVANIZING.
- DO NOT WELD IF THE TEMPERATURE OF THE STEEL IN THE VICINITY OF THE WELD AREA IS BELOW 0° F. WHEN THE TEMPERATURE IS BETWEEN 0° F AND 32° F, PREHEAT AND MAINTAIN THE STEEL IN THE VICINITY OF THE WELD AREA AT 70° F DURING THE WELDING PROCESS.
- DO NOT WELD ON WET OR FROST-COVERED SURFACES & PROVIDE ADEQUATE PROTECTION FROM HIGH WINDS.
- WELDING CERTIFICATES MUST BE PROVIDED TO CWI AND GPD PRIOR TO WELDING CONTRACTOR BEGINNING WORK ON SITE. CERTIFICATE WILL BE ASKED FOR AS PART OF INSPECTION PROCESS. ALL WELDING SHOULD BE PERFORMED BY AN AWS QUALIFIED WELDER WHO HAS EXPERIENCE WITH GALVANIZED SURFACES AND IN ACCORDANCE WITH ANSII/AWS D1.1 AND ANSII Z 49.1 OR LATEST EDITIONS.
- OXY FUEL GAS WELDING OR BRAZING IS STRICTLY PROHIBITED. SPECIFICALLY, NO TORCH CUTTING IS PERMITTED ON SITE. ALL HOLES SHALL BE CUT WITH A GRINDER.
- INSTALL 3000° (NFPA 701) FIRE BLANKET AROUND ALL COAX.
- MORE SPLATTER AND SPARKS SHALL BE ANTICIPATED GIVEN THE PREVIOUSLY GALV. SURFACE.
- COAX IS FLAMMABLE AND CAN CATCH FIRE IF PROPER PRECAUTIONS ARE NOT MADE TO SHIELD COAX FROM ALL WELDING PROCEDURES. ALL COAX SHALL BE SHIELDED AT AND BELOW EACH WELDING PROCEDURE AND ELEVATION. IN ADDITION, COAX SHALL BE PUSHED AWAY FROM TOWER FACE WHERE WELDING IS BEING PERFORMED.
- FUMES CREATED FROM WELDING ON A PREVIOUSLY GALV. SURFACE CAN BE HAZARDOUS.
- PRIOR TO WELDING, ALL SURFACES SHALL BE PROPERLY GROUND TO REMOVE GALVANIZING.
- ALL FIELD WELDS SHALL BE TOUCHED UP WITH A GALVANIZING PAINT REPAIR (ZRC OR APPROVED EQUIVALENT).
- WATER SHALL BE ON SITE, OF ADEQUATE AMOUNT, AND AVAILABLE AT SHORT NOTICE AT ALL TIMES DURING WELDING ACTIVITY. A MINIMUM OF 500 GAL. OF WATER SHALL BE PROVIDED. WATER SHALL BE CAPABLE OF REACHING HEIGHT WHERE WELDING IS BEING PERFORMED. IN ADDITION, A MINIMUM OF SIX (6) 10 LB. CLASS ABC MULTIPURPOSE FIRE EXTINGUISHERS FULLY CHARGED AND CAPABLE OF DISCHARGE WITHIN 30 SECONDS OF DETECTING A FIRE SHALL BE PROVIDED. FIRE EXTINGUISHERS SHALL BE STRATEGICALLY LOCATED AROUND COMPOUND AND IN THE AIR (I.E. ON THE MAN LIFT WHERE WELDING IS BEING PERFORMED).
- FABRICATION NDE SHALL BE REQUIRED FOR ALL FILLET WELDS BETWEEN THE MAST PIPE AND STIFFENERS. THESE WELDS SHALL BE 100% INSPECTED BY MT.
- FABRICATION NDE SHALL BE REQUIRED FOR ALL FILLET WELDS BETWEEN THE MAST PIPE AND FLANGE PLATES. THESE WELDS SHALL BE 100% INSPECTED BY MT.
- FABRICATION NDE SHALL BE REQUIRED FOR ALL FULL PENETRATION WELDS BETWEEN THE STIFFENERS AND FLANGE PLATE. THESE WELDS SHALL BE 100% INSPECTED BY MT & UT.
- FABRICATION NDE SHALL BE REQUIRED FOR ALL CJP WELDS IN THE FLANGE BRACKET ASSEMBLIES. THESE WELDS SHALL BE 100% INSPECTED BY MT.

STRUCTURAL STEEL NOTES:

- DESIGN, FABRICATION, ERECTION, ALTERATION AND MAINTENANCE SHALL CONFORM TO THE FOLLOWING, UNLESS NOTED OTHERWISE (UNO).
 - TIA-222-H: STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS
 - ANSI TIA-322: INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS
 - AISC: MANUAL OF STEEL CONSTRUCTION
- ALL STRUCTURAL ELEMENTS SHALL CONFORM TO THE FOLLOWING REQUIREMENTS, UNO.
 - PLATE, ASTM A572 GRADE 50
 - PIPE, ASTM A53 GRADE B (Fy= 35 KSI)
 - ALL BOLTS, ASTM A325 TYPE 1 GALVANIZED HIGH STRENGTH BOLTS
 - ALL NUTS, ASTM A563 CARBON AND ALLOY STEEL NUTS
 - ALL WASHERS, ASTM F436 HARDENED STEEL WASHERS
 - LOCKING DEVICES, SPLIT WASHER/PAL NUT
- HOLES SHALL NOT BE FLAME CUT THRU STEEL UNLESS APPROVED BY THE ENGINEER OF RECORD.
- ALL FASTENERS SHALL NOT BE REUSED.
- A NUT LOCKING DEVICE SHALL BE INSTALLED ON ALL PROPOSED AND/OR REPLACED ASTM A325 BOLTS. ALL BOLTS, INCLUDING U-BOLTS, SHALL BE TIGHTENED IN ACCORDANCE WITH AISC "SNUG TIGHT" REQUIREMENTS, U.N.O.
- ALL PROPOSED AND/OR REPLACED BOLTS SHALL BE OF SUFFICIENT LENGTH SUCH THAT THE END OF THE BOLT BE AT LEAST FLUSH WITH THE FACE OF THE NUT. IT IS NOT PERMITTED FOR THE BOLT END TO BE BELOW THE FACE OF THE NUT AFTER TIGHTENING IS COMPLETED.
- HOT-DIP GALVANIZE ALL ITEMS, UNO., GALVANIZE PER ASTM A123, ASTM A153/A153M OR ASTM A653 G90, AS APPLICABLE. FOR HIGH STRENGTH STEEL FASTENERS WHERE HOT-DIPPED GALVANIZING IS NOT PERMITTED MAGNI 565 COATING (OR ENGINEER APPROVED EQUIVALENT) SHALL BE USED.
- FOR A LIST OF CROWN APPROVED COLD GALVANIZING COMPOUNDS, REFER TO CROWN ENG-BUL-10149, "TOWER PROTECTIVE COATINGS BULLETIN".
- AFTER FINAL INSPECTION, ALL EXPOSED STRUCTURAL STEEL AS THE RESULT OF THIS SCOPE OF WORK INCLUDING WELDS, FIELD DRILLED HOLES, AND SHAFT INTERIORS (WHERE ACCESSIBLE), SHALL BE CLEANED AND COLD GALVANIZING APPLIED BY BRUSH IN ACCORDANCE WITH CROWN ENG-BUL-10149, "TOWER PROTECTIVE COATINGS BULLETIN". PHOTO DOCUMENTATION IS REQUIRED TO BE SUBMITTED TO THE MI INSPECTOR
- ALL NEW STEEL SHALL BE PAINTED TO MATCH EXISTING PAINTED STEEL. FOR A LIST OF CROWN APPROVED PAINT COATINGS, REFER TO CROWN ENG-BUL-10149, "TOWER PROTECTIVE COATINGS BULLETIN".

 520 South Main Street, Suite 2531 Avon, CT 04631 330.572.2100 330.572.2101				
NO.		DATE	DESCRIPTION	BY
REVISIONS				
GPD PROJECT NUMBER				2019777.842874.04
SITE NAME: THOMPSONVILLE				
BU NUMBER: 842874				
WO NUMBER: 1705788				
SITE ADDRESS:				
566 ENFIELD STREET				
ENFIELD, CT 06082				
HARTFORD COUNTY, USA				
ENG/QA BY: BD		DATE: 4/2/19		
DFT BY: RR		DATE: 4/2/19		
DFT/QA BY: CB		DATE: 4/2/19		
APRVD BY: CJS		DATE: 4/2/19		
SCALE: N.T.S.				
NOTES				
S-3				REV 0



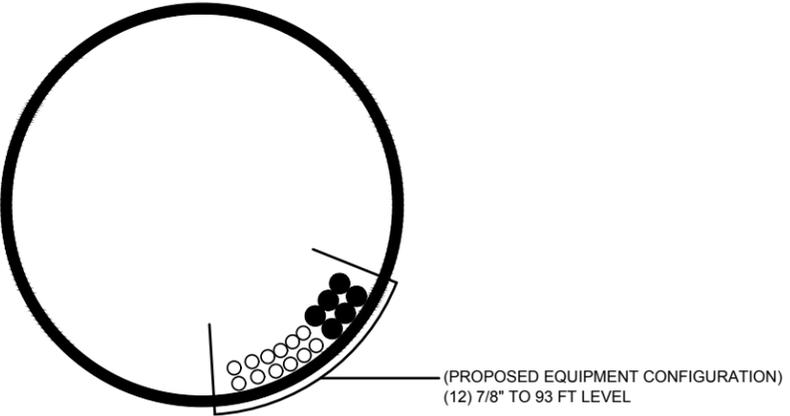


MANUFACTURER POLE SPECIFICATIONS	
POLE SHAPE TYPE:	18-SIDED & ROUND
TAPER:	0.1200 IN/FT
SHAFT STEEL:	ASTM A607 GRADE 65, ASTM A36, & ASTM A519 TYPE B
BASE PL STEEL:	ASTM A572 GRADE 50
ANCHOR RODS:	2-1/4"Ø #18J ASTM A615 GR 75

POLE MODIFICATION SCHEDULE			
	ELEVATION (FT)	MODIFICATION	REFERENCE SHEET
A	98.0	REPLACE THE EXISTING TRUCK AND BALL ASSEMBLY WITH NEW.	S-5
B	68.0 - 98.0	REMOVE EXISTING CONCEALMENT MAST AND CANISTERS AND ALL ASSOCIATED HARDWARE.	S-5, S-6, S-7, & S-8
		INSTALL NEW CONCEALMENT CANISTER AND MAST ASSEMBLIES.	
		INSTALL CROWN CASTLE CONCEALMENT REINFORCEMENT SOLUTION.	
C	88.0 78.0 68.0	PAINT NEW/EXISTING MATERIAL IN THE MODIFIED REGION TO MATCH EXISTING TOWER FINISH.	S-5
		CONTRACTOR SHALL PRE-TENSION NEW FLANGE BOLTS AND BRACKET BOLTS IN ACCORDANCE W/ AISC TURN-OF-THE-NUT METHOD OR OTHER INDUSTRY ACCEPTED MEANS. VERIFICATION OF PROPER PRE-TENSIONING SHALL BE COORDINATED WITH THE MI VENDOR.	
		INSTALL NEW FLANGE BRACKETS TO THE TOP OF THE EXISTING TOWER.	
D	68.0	INSTALL NEW FLANGE BRACKETS TO THE TOP OF THE EXISTING TOWER.	S-5 & S-7

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

- NOTE:**
- ALL EXISTING MATERIAL REMOVED FROM THE TOWER SHALL BE DISPOSED OF BY THE CONTRACTOR OFF SITE.
 - NYLON FASTENERS ARE NOT PERMITTED FOR SECURING CONCEALMENT CANISTERS.
 - IF A NEW FLAG IS BEING INSTALLED, CROWN CASTLE REQUESTS THE FLAG AND ALL ASSOCIATED HARDWARE BE PURCHASED FROM THE FOLLOWING SUPPLIER
- THE FLAG LOFT
1900 DELMAR STREET
ST. LOUIS, MO 63103
(800)-995-3524 (ATTN. RICK KELLY)

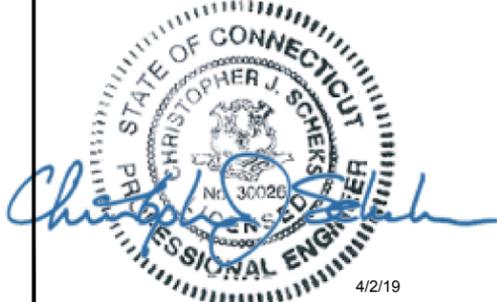


COAX LAYOUT

ORIGINAL MANUFACTURER SHAFT SECTION DATA					
SHAFT SECTION	SECTION LENGTH (FT)	POLE THICKNESS (IN)	LAP SPLICE (IN)	DIAMETER (IN)	
				@ TOP	@ BOTTOM
1	30.00	0.5000	45.00	5.000	5.000
2	22.25	0.1875		18.000	20.730
3	49.50	0.2188		19.895	25.845

NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

<p>520 South Main Street, Suite 2531 Akron, OH 44311 330.572.2100 330.572.2101</p>			
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<p>SITE NAME: THOMPSONVILLE</p>			
<p>BU NUMBER: 842874 WO NUMBER: 1705788</p>			
<p>SITE ADDRESS: 566 ENFIELD STREET ENFIELD, CT 06082 HARTFORD COUNTY, USA</p>			
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<p>APRVD BY: CJS DATE: 4/2/19</p>			
<p>SCALE: N.T.S.</p>			
<p>TOWER ELEVATION</p>			
<p>S-4</p>			<p>REV 0</p>



NEW 37-1/2"Øx1/4" THICK RAIN CAP ASSEMBLY, NEW RAIN CAP SHALL BE INSTALLED ON TOP OF THE NEW FLANGE PLATE, SEE SECTION D-D/S-6

ELEV. 98.0 FT

4" MIN.

REPLACE EXISTING TRUCK AND BALL ASSEMBLY WITH NEW 24"Ø TRUCK AND BALL ASSEMBLY, NEW HALYARD ATTACHMENT POINT SHALL EXTEND 4" MIN BEYOND THE CANISTER

NEW 13"Øx2" THICK FLANGE PLATE, SEE SECTION D-D/S-6

NEW P6 XX-STRONG CONCEALMENT MAST

(3) NEW 38"Ø CONCEALMENT CANISTERS TO BE DESIGNED BY OTHERS, DELIVERY AND INSTALLATION COORDINATED BY CONTRACTOR

NEW 37-1/2"Øx1/2" THICK BULKHEAD ASSEMBLY, NEW BULKHEAD SHALL BE INSTALLED BETWEEN NEW FLANGE PLATES, SEE SECTION C-C/S-5

NEW 13"Øx2" THICK FLANGE PLATE, SEE SECTION C-C/S-5

REINFORCE THE (3) NEW CONCEALMENT CANISTERS. SEE SHEET OPS-PRC-10127 AND REFERENCE OPS-SOW-10127 REV. C FOR MORE INFORMATION

NEW P6 XX-STRONG CONCEALMENT MAST

NEW 37-1/2"Øx1/2" THICK BULKHEAD ASSEMBLY, NEW BULKHEAD SHALL BE INSTALLED BETWEEN NEW FLANGE PLATES, SEE SECTION C-C/S-5

NEW 13"Øx2" THICK FLANGE PLATE, SEE SECTION C-C/S-5

NEW P6 XX-STRONG CONCEALMENT MAST

NEW 37-1/2"Øx2" THICK FLANGE PLATE, SEE SECTION B-B/S-5

NEW FLANGE CONNECTION BRACKET ASSEMBLIES (TYP. OF 6). SEE SECTION A-A/S-5

EXISTING TOWER SHAFT

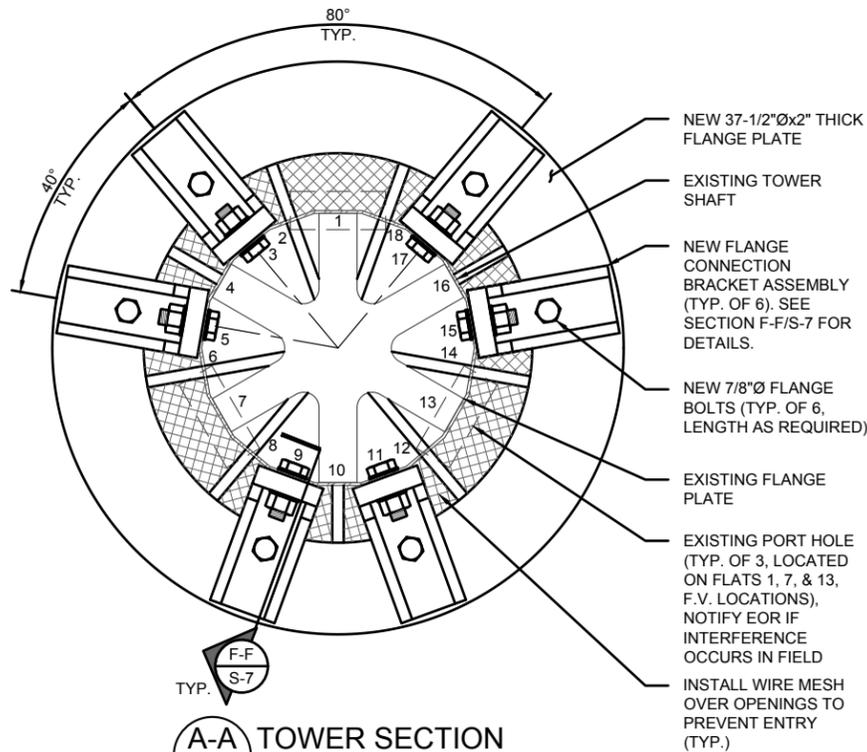
1 ELEVATION

S-5 SCALE: 1/4" = 1'-0"

ELEV. 68.0 FT

ELEV. 78.0 FT

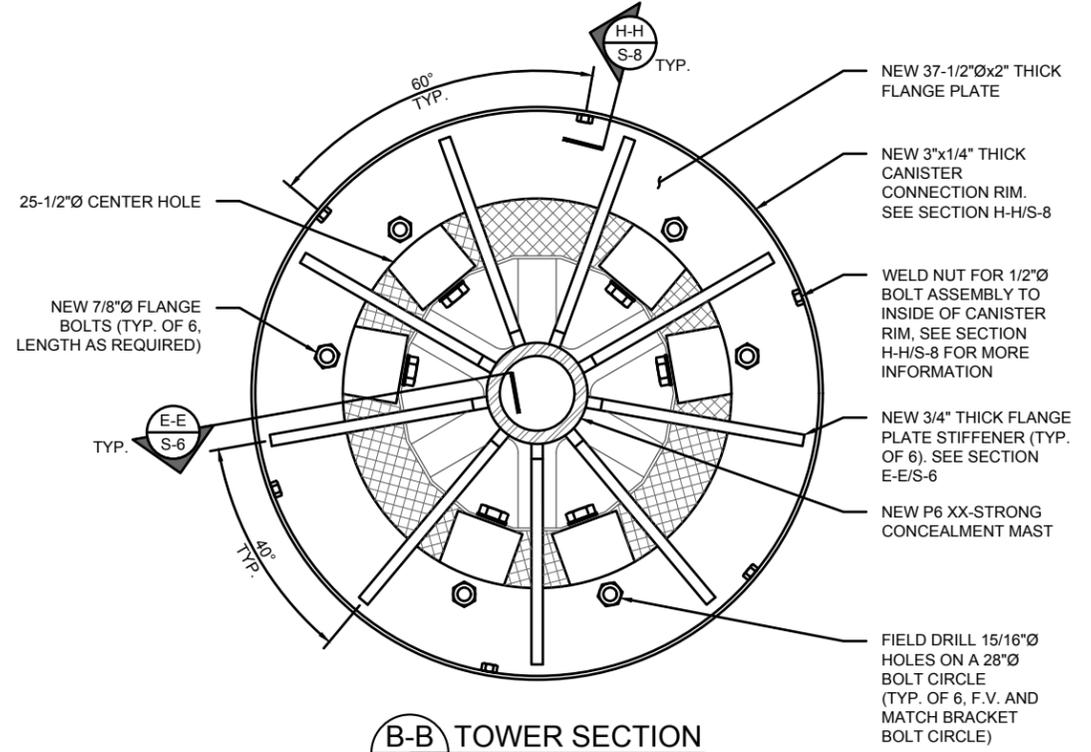
ELEV. 88.0 FT



A-A TOWER SECTION

S-5 SCALE: 1" = 1'-0"

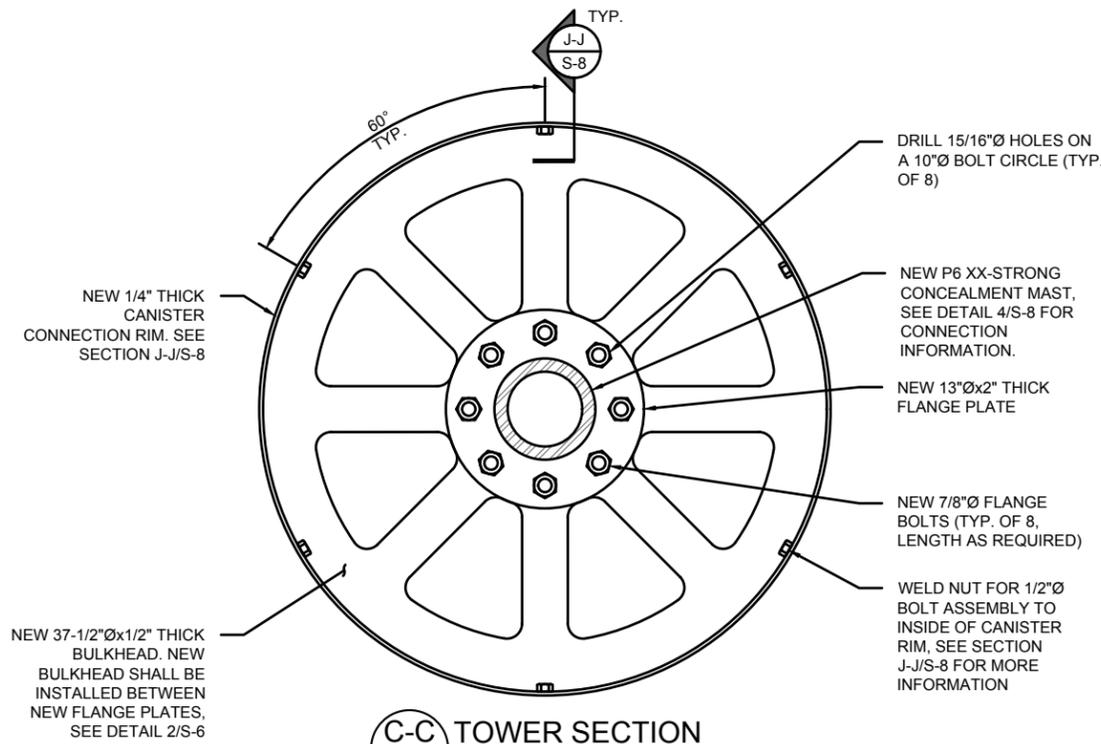
NOTE:
1. PORT HOLE COVERS MAY NEED TO BE REMOVED FOR INSTALLATION OF BRACKETS.



B-B TOWER SECTION

S-5 SCALE: 1" = 1'-0"

NOTE:
1. ALL FIELD DRILLED HOLES SHALL BE SOLVENT CLEANED AND TOUCHED UP WITH TWO COATS OF BRUSH APPLIED ZRC ZINC RICH COLD GALVANIZING PAINT.
2. FLANGE BOLTS SHALL BE PRE-TENSIONED PER AISC TURN-OF-THE-NUT METHOD OR OTHER INDUSTRY ACCEPTED MEANS.

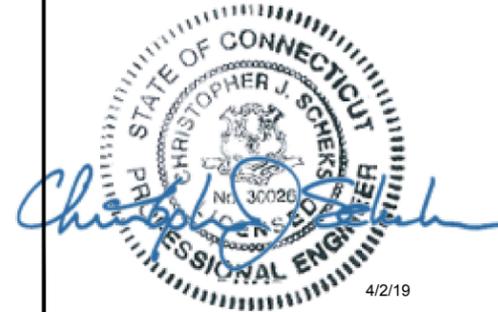


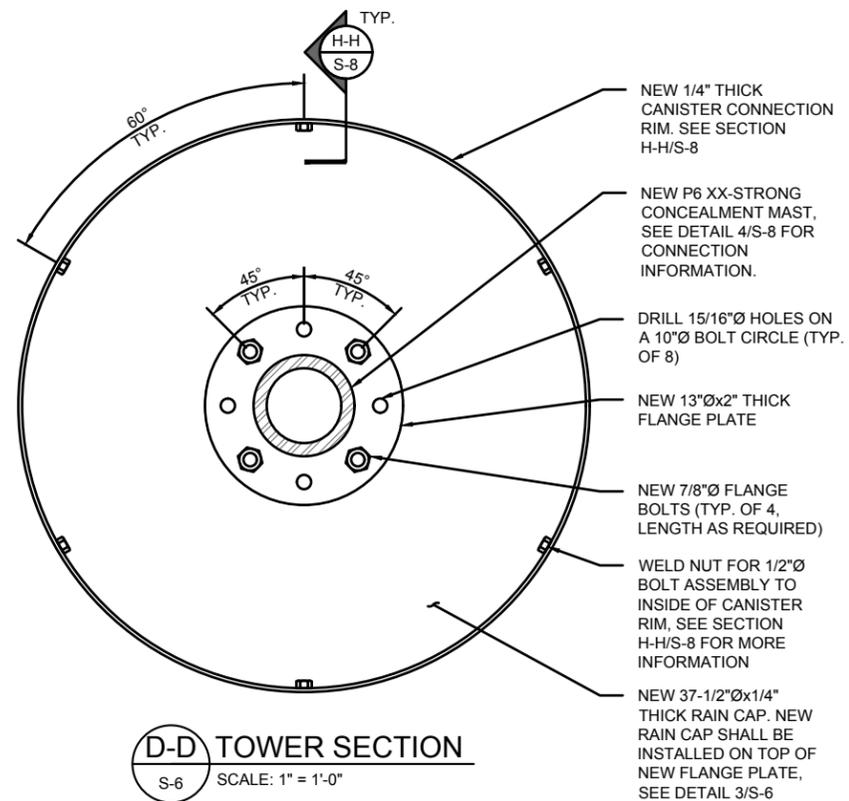
C-C TOWER SECTION

S-5 SCALE: 1" = 1'-0"

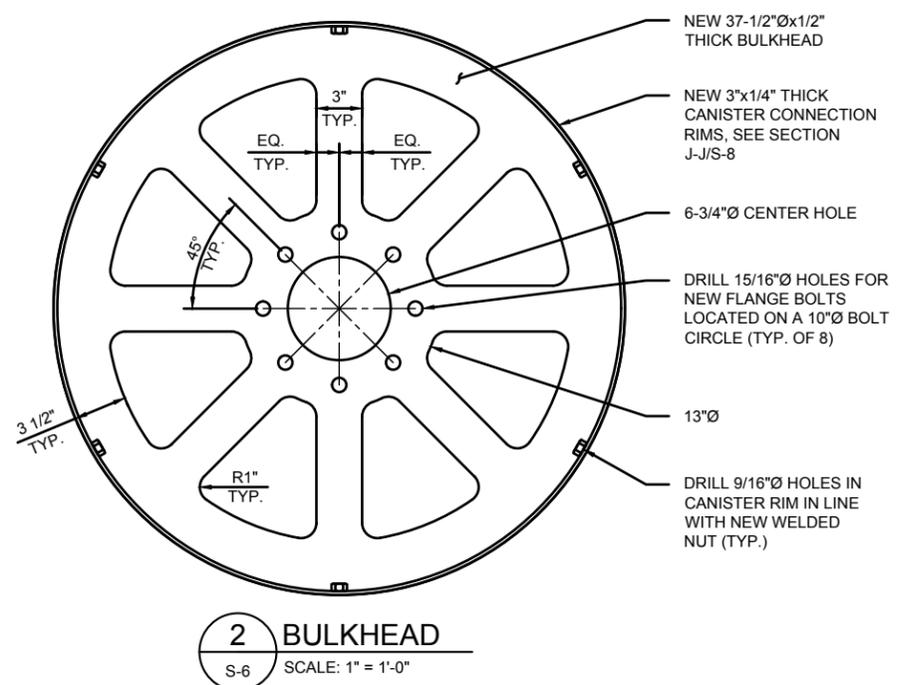
NOTE:
1. FLANGE BOLTS SHALL BE PRE-TENSIONED PER AISC TURN-OF-THE-NUT METHOD OR OTHER INDUSTRY ACCEPTED MEANS.

 <p>520 South Main Street, Suite 2531 Astor, OH 44311 330.572.2100 330.572.2101</p>			
<p>GPD PROJECT NUMBER 2019777.842874.04</p>			
<p>SITE NAME: THOMPSONVILLE</p>			
<p>BU NUMBER: 842874 WO NUMBER: 1705788</p>			
<p>SITE ADDRESS: 566 ENFIELD STREET ENFIELD, CT 06082 HARTFORD COUNTY, USA</p>			
<p>ENG/QA BY: BD DATE: 4/2/19</p>		<p>DFT BY: RR DATE: 4/2/19</p>	
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<p>SCALE: N.T.S.</p>			
<p>TOWER SECTIONS</p>			
<p>S-5</p>			<p>REV 0</p>

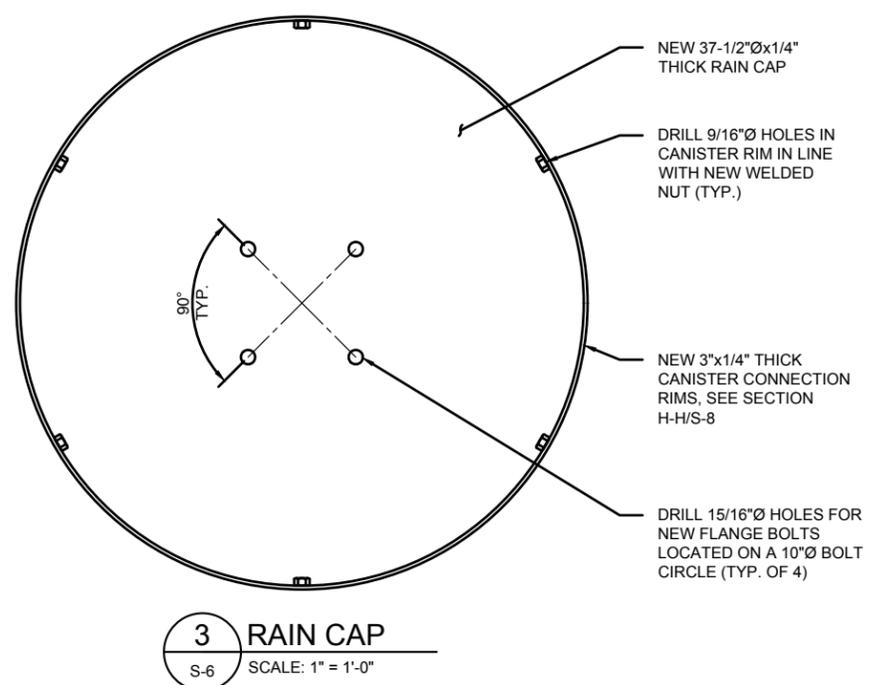




D-D TOWER SECTION
S-6 SCALE: 1" = 1'-0"



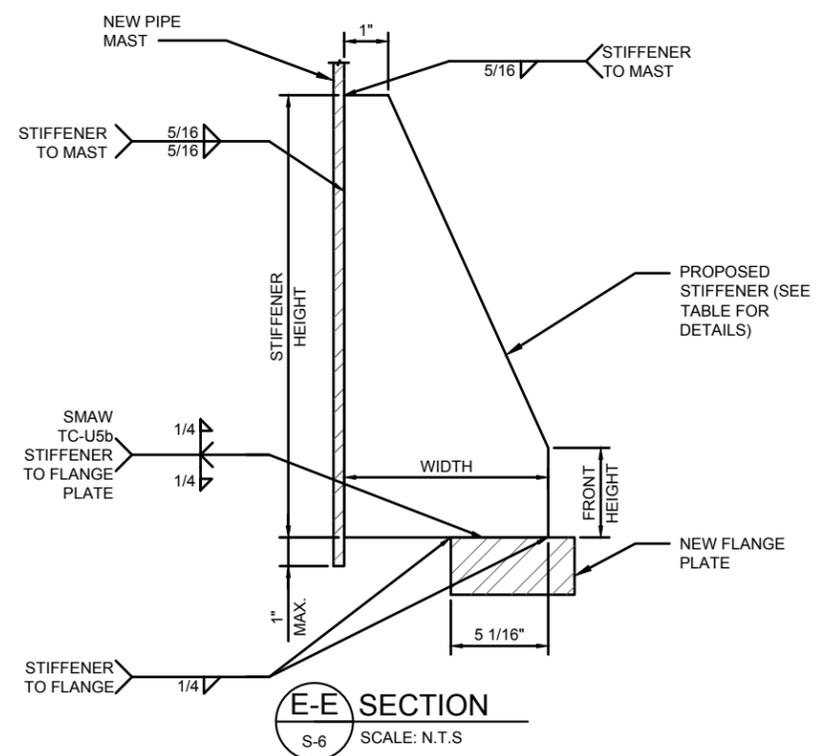
2 BULKHEAD
S-6 SCALE: 1" = 1'-0"



3 RAIN CAP
S-6 SCALE: 1" = 1'-0"

NOTE:
1. DETAIL IS TYPICAL FOR THE BULKHEAD ASSEMBLIES AT 78.0' AND 88.0'.

NOTE:
1. DETAIL IS TYPICAL FOR THE RAIN CAP ASSEMBLY AT 98.0'.
2. NEW TRUCK AND BALL ATTACHMENT NOT SHOWN FOR DETAIL CLARITY. ALL CHANGES TO THIS DETAIL DUE TO SUCH CONNECTIONS SHALL BE REVIEWED PRIOR TO FABRICATION.



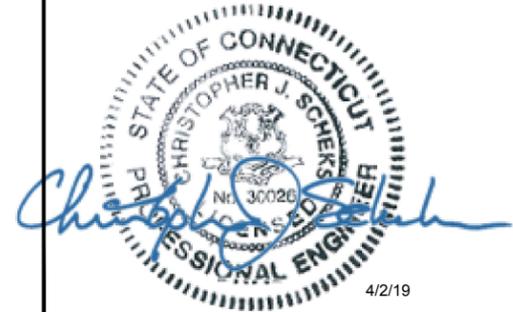
E-E SECTION
S-6 SCALE: N.T.S.

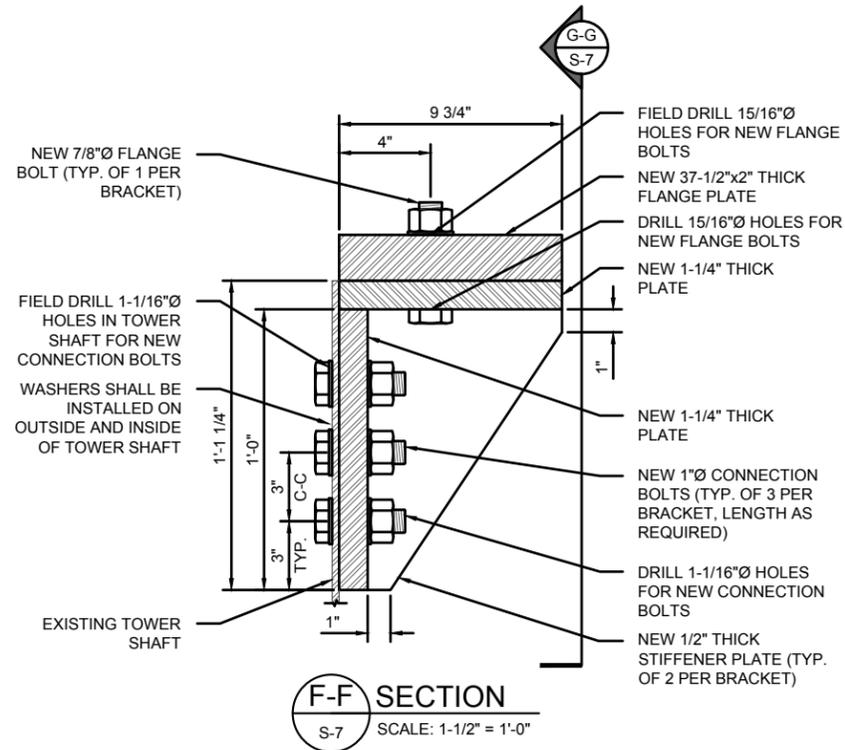
NOTE:
1. FABRICATION NDE SHALL BE REQUIRED FOR ALL FILLET WELDS BETWEEN THE MAST PIPE AND STIFFENERS. THESE WELDS SHALL BE 100% INSPECTED BY MT.
2. FABRICATION NDE SHALL BE REQUIRED FOR ALL FULL PENETRATION WELDS BETWEEN THE STIFFENERS AND FLANGE PLATE. THESE WELDS SHALL BE 100% INSPECTED BY MT AND UT.

STIFFENER	
DESCRIPTION	MEASUREMENT (IN.)
STIFFENER HEIGHT	10
FRONT HEIGHT	1
WIDTH	14 1/2
THICKNESS	3/4
QUANTITY	9

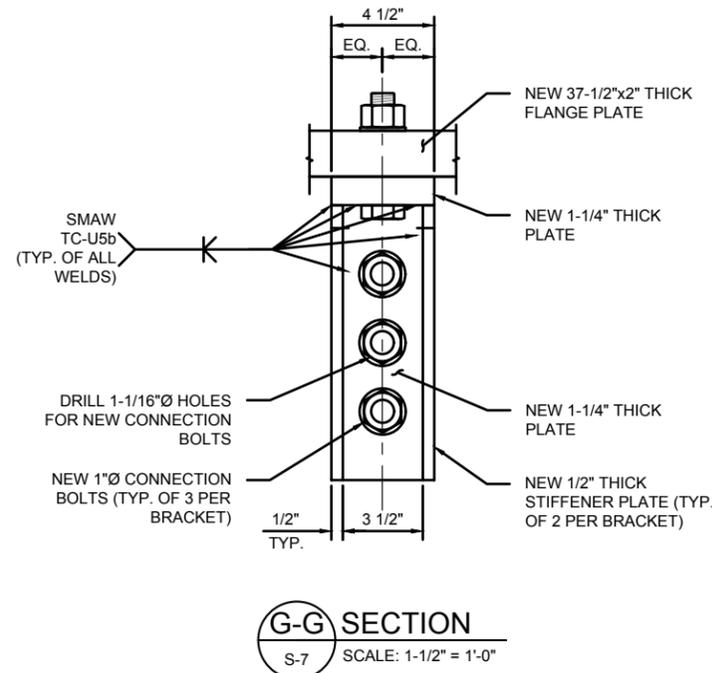
NOTES:
1. ALL SIZES AND QUANTITIES SHALL BE VERIFIED PRIOR TO FABRICATION. CONTRACTOR IS REQUIRED TO PROVIDE FINAL SHOP DRAWINGS TO ENGINEER FOR APPROVAL.
2. ALL DIMENSIONS/MEASUREMENTS ARE SHOWN IN INCHES.

 520 South Main Street, Suite 2531 Avon, OH 44311 330.572.2100 330.572.2101			
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APRVD BY: CJS		DATE: 4/2/19	
SCALE: N.T.S.			
ADDITIONAL SECTIONS			
S-6			REV 0



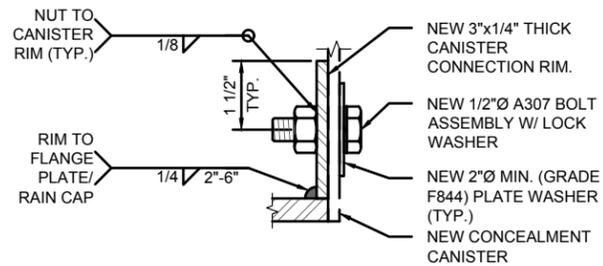


- NOTE:**
1. NEW BRACKET CONNECTION BOLTS AND FLANGE BOLTS SHALL BE PRE-TENSIONED PER AISC TURN-OF-THE-NUT METHOD OR OTHER INDUSTRY ACCEPTED MEANS.
 2. ALL FIELD DRILLED HOLES SHALL BE SOLVENT CLEANED AND TOUCHED UP WITH 2 COATS OF BRUSH APPLIED ZRC ZINC RICH COLD GALVANIZING PAINT.



- NOTE:**
1. NEW BRACKET CONNECTION BOLTS AND FLANGE BOLTS SHALL BE PRE-TENSIONED PER AISC TURN-OF-THE-NUT METHOD OR OTHER INDUSTRY ACCEPTED MEANS.
 2. FABRICATION NDE SHALL BE REQUIRED FOR ALL CJP WELDS IN THE FLANGE BRACKET ASSEMBLIES. THESE WELDS SHALL BE 100% INSPECTED BY MT.
 3. F.V. THE EXISTING HARDWARE LOCATIONS PRIOR TO INSTALLATION TO AVOID INTERFERENCE. NOTIFY EOR IF INTERFERENCE IS FOUND IN THE FIELD.

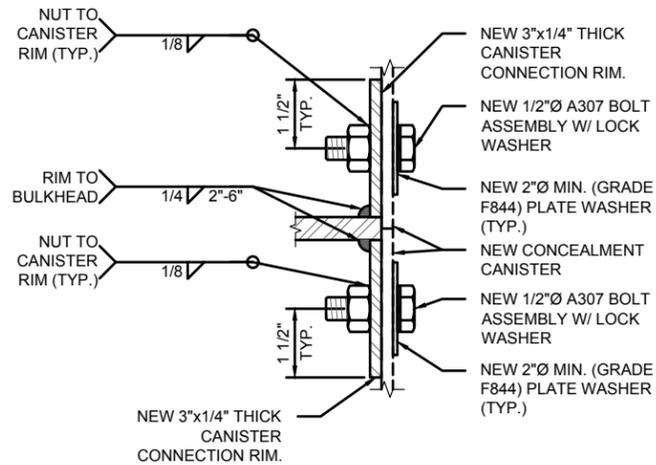
				 520 South Main Street, Suite 2531 Akron, OH 44311 330.572.2100 330.572.2101									
						GPD PROJECT NUMBER 2019777.842874.04							
<table border="1"> <thead> <tr> <th>NO.</th> <th>DATE</th> <th>DESCRIPTION</th> <th>BY</th> </tr> </thead> <tbody> <tr> <td colspan="4" style="text-align: center;">REVISIONS</td> </tr> </tbody> </table>				NO.	DATE	DESCRIPTION	BY	REVISIONS				SITE NAME: THOMPSONVILLE BU NUMBER: 842874 WO NUMBER: 1705788 SITE ADDRESS: 566 ENFIELD STREET ENFIELD, CT 06082 HARTFORD COUNTY, USA	
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 4/2/19				ADDITIONAL SECTIONS									
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S-7	REV												
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H-H SECTION
S-8 SCALE: N.T.S.

NOTE:

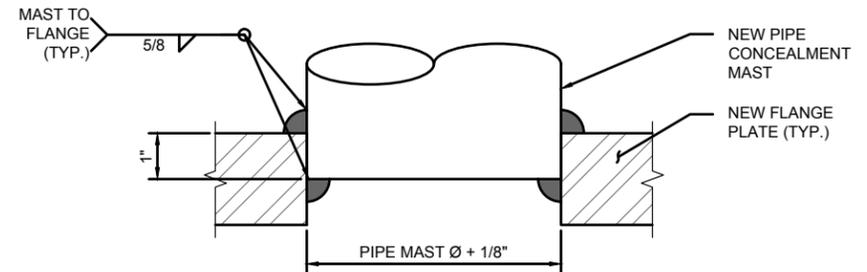
- CANISTER CONNECTION ALTERNATIVE MUST BE APPROVED PRIOR TO FABRICATION.
- DETAIL IS TYPICAL FOR THE FLANGE PLATE AT 68.0'. THE RAIN CAP SECTION AT 98.0' IS SIMILAR BUT OF OPPOSITE HAND.



J-J SECTION
S-8 SCALE: N.T.S.

NOTE:

- CANISTER CONNECTION ALTERNATIVE MUST BE APPROVED PRIOR TO FABRICATION.
- DETAIL IS TYPICAL FOR THE BULKHEAD ASSEMBLIES AT 78.0' AND 88.0'.



4 SOCKET DETAIL
S-8 N.T.S.

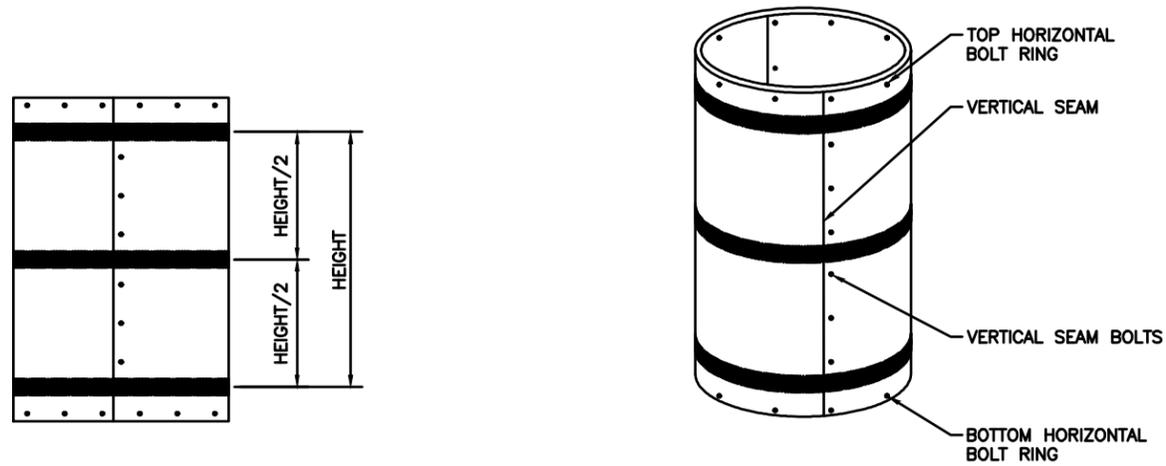
NOTE:

- FABRICATION NDE SHALL BE REQUIRED FOR ALL FILLET WELDS BETWEEN THE MAST PIPES AND FLANGE PLATES. THESE WELDS SHALL BE 100% INSPECTED BY MT.

				 520 South Main Street, Suite 2531 Akron, OH 44311 330.572.2100 330.572.2101									
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				SCALE: N.T.S.									
				ADDITIONAL SECTIONS									
				S-8	REV 0								

CONCEALMENT REINFORCEMENT SOLUTION – PARTS LIST

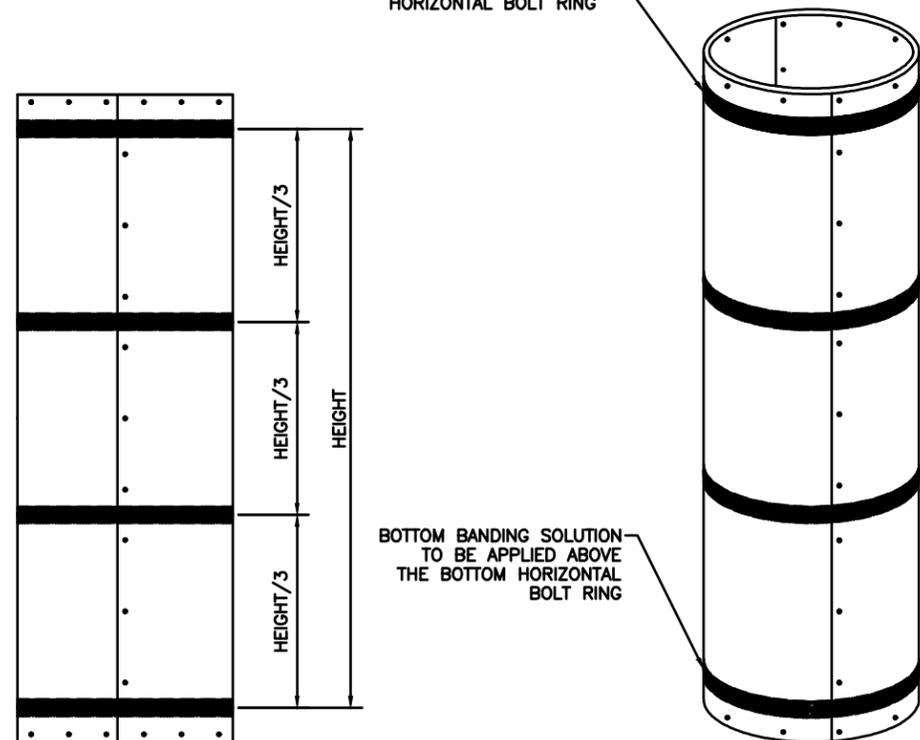
NO.	MANUFACTURER	DESCRIPTION	SIZE	PRODUCT NO.
(1)	USA STRAPPING	WOVEN POLYESTER STRAPPING	3/4"x250 FT. COIL	2700-34
(2)	MCNETT GEAR AID	DUAL-ADJUST BUCKLE	3/4" SIZE	80355
(3)	BUNKER INDUSTRIES	HURRICANE TAPE	3"x60 YD. ROLL	00101
(4)	RUST-OLEUM	GLOSS CLEAR SPRAY	12 OZ.	249117



≤ 10'-0" CONCEALMENT COVER LEVEL HEIGHT

NOT TO SCALE

TOP BANDING SOLUTION TO BE APPLIED BELOW THE TOP HORIZONTAL BOLT RING



> 10'-0" CONCEALMENT COVER LEVEL HEIGHT

NOT TO SCALE

NOTES:

- 1.) THE REINFORCEMENT SOLUTION IS ONLY TO BE APPLIED TO VERTICALLY-FASTENED MULTI-PANEL OR "SECTORIZED" CONCEALMENT COVERS. SOLID ONE-PIECE CONCEALMENT COVERS ARE NOT TO BE TREATED WITH THIS SOLUTION.
- 2.) FOR CONCEALMENT COVER LEVELS MEASURING 10 FT. IN HEIGHT OR LESS, (3) EQUALLY-SPACED BANDING APPLICATIONS ARE TO BE INSTALLED AT THE TOP, MID-SPAN, AND BOTTOM REGIONS. FOR LEVELS GREATER THAN 10 FT. IN HEIGHT, (4) EQUALLY-SPACED BANDING APPLICATIONS ARE TO BE INSTALLED, AT THE TOP, UPPER MIDDLE, LOWER MIDDLE, AND BOTTOM REGIONS.
- 3.) FOR CONCEALMENT COVERS OF ALL HEIGHTS, THE TOP BANDING APPLICATION IS TO BE POSITIONED DIRECTLY BELOW THE TOP CONCEALMENT COVER HORIZONTAL BOLT RING AND THE BOTTOM BANDING APPLICATION DIRECTLY ABOVE THE BOTTOM HORIZONTAL BOLT RING.
- 4.) BANDING APPLICATION SHALL NOT COVER ANY VERTICAL OR HORIZONTAL FASTENERS.

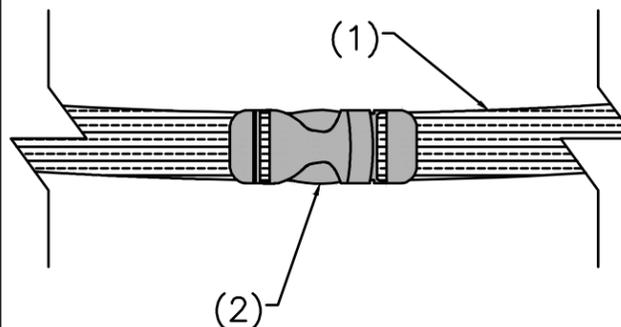
INSTALLATION:

- 1.) STRAPPING IS TO BE LOOPED AROUND THE CONCEALMENT COVER AND EACH CUT END OF THE STRAPPING FED AROUND A CROSS BAR ON EACH END OF THE DUAL-ADJUST BUCKLE.
- 2.) STRAPPING IS TO BE HAND-TIGHTENED USING THE BUCKLE SUCH THAT THE STRAPPING LIES FLAT, UNTWISTED, AND SQUARE TO THE CONCEALMENT COVER.
- 3.) AT LEAST (2) CONTINUOUS LAYERS OF HURRICANE TAPE ARE TO BE APPLIED ON TOP OF THE TIGHTENED STRAPPING SUCH THAT NO TAIL OF THE STRAPPING IS SHOWING OUTSIDE THE LAYERS OF TAPE.
- 4.) THE CURRENT DATE IS TO BE MARKED WITH PERMANENT INK ON THE TOP LAYER OF TAPE TO RECORD INSTALLATION DATE.
- 5.) ENSURE THAT THE SURFACE OF THE CANISTER IS FREE FROM OIL, GREASE, SOIL, DIRT, AND OTHER FOREIGN MATTER. THE SURFACE SHALL BE CLEAN, DRY AND SMOOTH TO RECEIVE THE STRAPPING AND THE TAPE.
- 6.) HURRICANE TAPE SHALL BE TACKED DOWN BY APPLYING (2) COATS OF NON-YELLOWING CLEAR COAT SPRAY OVER THE TAIL END OF THE TAPE AFTER IT IS SECURELY TAPED DOWN. SECOND COAT SHALL BE APPLIED ONCE THE FIRST COAT IS DRY TO TOUCH

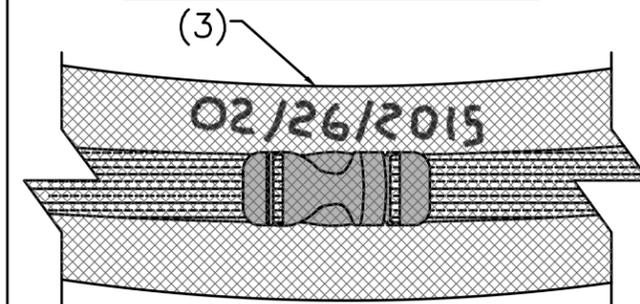
PAINTING HURRICANE TAPE [IF REQUIRED]:

- 1.) AFTER FULL INSTALLATION OF THE THE REINFORCEMENT SOLUTION, THE TAPE SHALL BE COATED TO MATCH THE COLOR OF THE EXISTING CONCEALMENT CANISTER
 - 1.1) AS AN EXAMPLE, IF THE EXISTING CONCEALMENT CANISTER IS WHITE, PAINTING WOULD NOT BE REQUIRED SINCE THE TAPE COLOR IS ALSO WHITE. HOWEVER, IF THE CANISTER IS BLACK, PAINT THE TAPE TO MATCH THE CANISTER COLOR.
- 2.) PAINT SHALL BE APPLIED WITH A BRUSH FOR A CLEAN EDGE ON THE TAPE. SPRAY PAINT IS PERMISSIBLE PROVIDED THAT PAINTER'S TAPE IS UTILIZED TO AVOID PAINTING THE CANISTER. SECOND COAT SHALL BE APPLIED AFTER THE FIRST COAT IS DRY. THE SHEEN OF THE PAINT SHALL MATCH THE CANISTER
- 3.) THE INSTALLATION DATE SHALL BE MARKED ON TOP OF THE COATED SURFACE.

STRAPPING INSTALLATION DETAIL



TAPE INSTALLATION DETAIL



CARRIERS LOGO



2000 CORPORATE DRIVE
CANONSBURG PA, 15317

SPACE RESERVED FOR PROFESSIONAL SEALS

FOR REFERENCE ONLY

REVISIONS	NO.	DATE	DESCRIPTION	BY						
				MAJ	MAJ	MAJ				
	1	02/09/16	CONCEALMENT SOLUTION							
	2	02/04/16	CONCEALMENT SOLUTION							
	3	01/09/17	CONCEALMENT SOLUTION							

DRAWN BY: MAJ
CHECKED BY:
DRAWING DATE: 02/04/16

SHEET TITLE
TYPE
SHEET NUMBER

Exhibit E

Power Density/RF Emissions Report



RF EMISSIONS COMPLIANCE REPORT

Crown Castle on behalf of AT&T Mobility, LLC

Crown Castle Site Name: THOMPSONVILLE
Crown Castle BU: 842874
AT&T Mobility, LLC Site FA #: 10071277
566 ENFIELD STREET
ENFIELD, CT
3/11/2019

Report Status:

AT&T Mobility, LLC Is Compliant



Michael Fischer, P.E.
Registered Professional Engineer (Electrical)
Pennsylvania License Number PE076436
Expires September 30, 2019

Prepared By:

Sitesafe, LLC

Engineering Statement in Re:
Electromagnetic Energy Analysis
Crown Castle
ENFIELD, CT

My signature on the cover of this document indicates:

That I am registered as a Professional Engineer in the jurisdiction indicated; and

That I have extensive professional experience in the wireless communications engineering industry; and

That I am an employee of Sitesafe, LLC in Vienna, Virginia; and

That I am thoroughly familiar with the Rules and Regulations of the Federal Communications Commission ("the FCC" and "the FCC Rules") both in general and specifically as they apply to the FCC's Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; and

That the technical information serving as the basis for this report was supplied by Crown Castle (See attached Site Summary and Carrier documents), and that AT&T Mobility, LLC's installations involve communications equipment, antennas and associated technical equipment at a location referred to as the "THOMPSONVILLE" ("the site"); and

That AT&T Mobility, LLC proposes to operate at the site with transmit antennas listed in the carrier summary and with a maximum effective radiated power as specified by AT&T Mobility, LLC and shown on the worksheet, and that worst-case 100% duty cycle have been assumed; and

That this analysis has been performed with the assumption that the ground immediately surrounding the tower is primarily flat or falling; and

That at this time, the FCC requires that certain licensees address specific levels of radio-frequency energy to which workers or members of the public might possibly be exposed (at §1.1307(b) of the FCC Rules); and

That such consideration of possible exposure of humans to radio-frequency radiation must utilize the standards set by the FCC, which is the Federal Agency having jurisdiction over communications facilities; and

That the FCC rules define two tiers of permissible exposure guidelines: 1) "uncontrolled environments," defined as situations in which persons may not be aware of (the "general public"), or may not be able to control their exposure to a transmission facility; and (2) "controlled environments," which defines situations in which persons are aware of their potential for exposure (industry personnel); and

That this statement specifically addresses the uncontrolled environment (which is more conservative than the controlled environment) and the limit set forth in the FCC rules for licensees of AT&T Mobility, LLC's operating frequency as shown on the attached antenna worksheet; and

That when applying the uncontrolled environment standards, the predicted Maximum Power Density at two meters above ground level from the proposed AT&T Mobility, LLC operation is no more than 3.281% of the maximum in any accessible area on the ground and

That it is understood per FCC Guidelines and OET65 Appendix A, that regardless of the existent radio-frequency environment, only those licenses whose contributions exceed five percent of the exposure limit pertinent to their operation(s) bear any responsibility for bringing any non-compliant area(s) into compliance; and

That when applying the uncontrolled environment standards, the cumulative predicted energy density from the proposed operation is no more than 3.281% of the maximum in any accessible area up to two meters above the ground per OET-65; and

That the calculations provided in this report are based on data provided by the client and antenna pattern data supplied by the antenna manufacturer, in accordance with FCC guidelines listed in OET-65. Horizontal and vertical antenna patterns are combined for modeling purposes to accurately reflect the energy two meters above ground level where on-axis energy refers to maximum energy two meters above the ground along the azimuth of the antenna and where area energy refers to the maximum energy anywhere two meters above the ground regardless of the antenna azimuth, accounting for cumulative energy from multiple antennas for the carrier and frequency range indicated; and

That the Occupational Safety and Health Administration has policies in place which address worker safety in and around communications sites, thus individual companies will be responsible for their employees' training regarding Radio Frequency Safety.

In summary, it is stated here that the proposed operation at the site would not result in exposure of the Public to excessive levels of radio-frequency energy as defined in the FCC Rules and Regulations, specifically 47 CFR 1.1307 and that AT&T Mobility, LLC's proposed operation is completely compliant.

Finally, it is stated that access to the tower should be restricted to communication industry professionals, and approved contractor personnel trained in radio-frequency safety; and that the instant analysis addresses exposure levels at two meters above ground level and does not address exposure levels on the tower, or in the immediate proximity of the antennas.

**Crown Castle
THOMPSONVILLE
Site Summary**

Carrier	Area Maximum Percentage MPE
AT&T Mobility, LLC (Proposed)	0.431 %
AT&T Mobility, LLC (Proposed)	0.509 %
AT&T Mobility, LLC (Proposed)	0.759 %
AT&T Mobility, LLC (Proposed)	0.777 %
AT&T Mobility, LLC (Proposed)	0.805 %
 Composite Site MPE:	 3.281 %

**AT&T Mobility, LLC (Proposed)
THOMPSONVILLE
Carrier Summary**

Frequency: 2300 MHz
 Maximum Permissible Exposure (MPE): 1000 $\mu\text{W}/\text{cm}^2$
 Maximum power density at ground level: 4.311 $\mu\text{W}/\text{cm}^2$
 Highest percentage of Maximum Permissible Exposure: 0.4311 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE	Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE
Kathrein-Scala	800-10798	94	60	2099	2.19925	0.219925	4.185471	0.418547
Kathrein-Scala	800-10798	94	180	2099	2.19925	0.219925	4.185472	0.418547
Kathrein-Scala	800-10798	94	300	2099	2.230865	0.223086	4.185472	0.418547

**AT&T Mobility, LLC (Proposed)
THOMPSONVILLE
Carrier Summary**

Frequency: 1900 MHz
 Maximum Permissible Exposure (MPE): 1000 $\mu\text{W}/\text{cm}^2$
 Maximum power density at ground level: 5.09468 $\mu\text{W}/\text{cm}^2$
 Highest percentage of Maximum Permissible Exposure: 0.50947 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE	Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE
Kathrein-Scala	800-10798	94	60	3751	2.727633	0.272763	4.920584	0.492058
Kathrein-Scala	800-10798	94	180	3751	2.727633	0.272763	4.920584	0.492058
Kathrein-Scala	800-10798	94	300	3751	2.733896	0.27339	4.920585	0.492058

**AT&T Mobility, LLC (Proposed)
THOMPSONVILLE
Carrier Summary**

Frequency: 850 MHz
 Maximum Permissible Exposure (MPE): 566.67 $\mu\text{W}/\text{cm}^2$
 Maximum power density at ground level: 4.29966 $\mu\text{W}/\text{cm}^2$
 Highest percentage of Maximum Permissible Exposure: 0.75876 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE	Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE
Kathrein-Scala	800-10798	94	60	1596	3.468683	0.612121	4.242597	0.748694
Kathrein-Scala	800-10798	94	180	1596	3.468683	0.612121	4.242597	0.748694
Kathrein-Scala	800-10798	94	300	1596	3.523033	0.621712	4.242597	0.748694

**AT&T Mobility, LLC (Proposed)
THOMPSONVILLE
Carrier Summary**

Frequency: 763 MHz
 Maximum Permissible Exposure (MPE): 508.67 $\mu\text{W}/\text{cm}^2$
 Maximum power density at ground level: 3.95396 $\mu\text{W}/\text{cm}^2$
 Highest percentage of Maximum Permissible Exposure: 0.77732 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE	Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE
Kathrein-Scala	800-10798	94	60	2905	2.425619	0.476858	3.810767	0.749168
Kathrein-Scala	800-10798	94	180	2905	2.425619	0.476858	3.810767	0.749168
Kathrein-Scala	800-10798	94	300	2905	2.440501	0.479784	3.810767	0.749168

**AT&T Mobility, LLC (Proposed)
THOMPSONVILLE
Carrier Summary**

Frequency: 737 MHz
Maximum Permissible Exposure (MPE): 491.33 $\mu\text{W}/\text{cm}^2$
Maximum power density at ground level: 3.95396 $\mu\text{W}/\text{cm}^2$
Highest percentage of Maximum Permissible Exposure: 0.80474 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE	Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE
Kathrein-Scala	800-10798	94	60	2905	2.425619	0.493681	3.810767	0.775597
Kathrein-Scala	800-10798	94	180	2905	2.425619	0.493681	3.810767	0.775597
Kathrein-Scala	800-10798	94	300	2905	2.440501	0.49671	3.810767	0.775597