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

July 18, 2019

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

RE: **Notice of Exempt Modification for T-Mobile:**
881541 - T-Mobile Site ID: CT11083Q
700 Grassy Hill Road, Orange, CT 06477
Latitude: 41° 17′ 7.75″ / Longitude: -73° 2′ 33.27″

Dear Ms. Bachman:

T-Mobile currently maintains nine (9) total antennas at the 110-foot mount on the existing 140-foot Monopole Tower, located at 700 Grassy Hill Road, Orange, CT. The tower is owned by Crown Castle and the property is owned by the Town of Orange. T-Mobile now intends to replace three (3) existing antennas with three (3) new 600/700 MHz antennas. T-Mobile is also proposing tower mount modifications as shown on the enclosed mount analysis.

Planned Modifications:
Tower:

Remove and Replace:
(3) LNX 6516DS-A1M Antenna **(REMOVE)** - (3) RFS-APXVAARR24_43-U-NA20 Antenna 600/700 MHz **(REPLACE)**

(3) RRUS11 B12 **(REMOVE) –** (3) Radio 4449 B71/B12 **(REPLACE)**

Install New:
(3) 1 5/8" Hybrid Fiber Line

Existing to Remain:
(7) 1 5/8" Coax
(3) AIR21 KRC118023-1_B2P_B4A Antenna 1900/2100 MHz
(3) TMA

Ground:

Upgrade: Internal upgrade to existing ground cabinet.

The facility was approved by the Connecticut Siting Council in Docket No. 262 on January 12, 2004. This approval included conditions which this proposed exempt modification complies with.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to James Zeoli, First Selectman, Town of Orange, as the municipality as well as the property owner, and the Zoning Administrator and Enforcement Officer, Paul Dinice. Crown Castle is the tower owner.

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

2. The proposed modifications will not require the extension of the site boundary.

3. The proposed modification will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

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

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

Sincerely,

Anne Marie Zsamba
Real Estate Specialist
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065
(201) 236-9224
AnneMarie.Zsamba@crowncastle.com

Attachments

cc:

James M. Zeoli, First Selectman
Town of Orange
Town Hall – Selectman's Office
617 Orange Center Road
Orange, CT 06477
203.891.4737

Paul Dinice, ZEO
Town of Orange
Town Hall – Plan & Zoning Dept.
617 Orange Center Road
Orange, CT 06477
203.891.4737

Crown Castle, Tower Owner

ORIGIN ID:GFLA (518) 373-3523
ANNE MARIE ZSAMBA
CROWN CASTLE
3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065
UNITED STATES US

SHIP DATE: 15JUL19
ACTWGT: 1.50 LB
CAD: 104924194/INET4160

BILL SENDER

TO **PAUL DINICE, ZEO**
TOWN OF ORANGE
TOWN HALL - PLAN & ZONING
617 ORANGE CENTER ROAD
ORANGE CT 06477
(203) 891-4737

REF: 1734.7680
INV:
PO:
DEPT:

567J2/A6F9/05A2

J192019062401uv

FedEx Express

TUE - 16 JUL 10:30A
PRIORITY OVERNIGHT

TRK# 0201 **7757 4128 6188**

EB EFBA

06477
BDL
CT-US

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
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Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.
Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

ORIGIN ID:GFLA (518) 373-3523
ANNE MARIE ZSAMBA
CROWN CASTLE
3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065
UNITED STATES US

SHIP DATE: 15JUL19
ACTWGT: 1.50 LB
CAD: 104924194/INET4160

BILL SENDER

TO **JAMES M. ZEOLI, FIRST SELECTMAN**
TOWN OF ORANGE
TOWN HALL - SELECTMAN'S OFFICE
617 ORANGE CENTER ROAD
ORANGE CT 06477
(203) 891-4737

REF: 1734.7680
INV:
PO:
DEPT:

J192019062401uv

FedEx Express

567J2/A6F9/05A2

TRK# 0201 **7757 4127 3074**

TUE - 16 JUL 10:30A
PRIORITY OVERNIGHT

EB EFBA

06477
BDL
CT-US

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Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

ORIGIN ID:GFLA (518) 373-3523
ANNE MARIE ZSAMBA
CROWN CASTLE
3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065
UNITED STATES US

SHIP DATE: 15JUL19
ACTWGT: 4.00 LB
CAD: 104924194/INET4160

BILL SENDER

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

NEW BRITAIN CT 06051
(860) 827-2951
INV:
PO:
REF: 1765.6680
DEPT:

567J2/A6F9/05A2

J192019062401uv

FedEx Express

TUE - 16 JUL 10:30A
PRIORITY OVERNIGHT

TRK# 0201 **7757 4125 1058**

EB BDLA

06051
BDL
CT-US

After printing this label:
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3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.
Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

Exhibit A

Original Facility Approval

Connecticut Siting Council
Decisions

DOCKET NO. 262 - Sprint Spectrum, L.P. d/b/a Sprint PCS application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a wireless telecommunications facility at 707 Cranberry Lane or off of Grassy Hill Road, Orange, Connecticut.	}	Connecticut
	}	Siting
	}	Council
	}	January 12, 2004

Decision and Order

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, operation, and maintenance of a wireless telecommunications facility including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate either alone or cumulatively with other effects when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application and therefore directs that a Certificate of Environmental Compatibility and Public Need, as provided by General Statutes § 16-50k, be issued to Sprint Spectrum, L.P. d/b/a Sprint PCS (Sprint) for the construction, maintenance and operation of a wireless telecommunications facility at Site C off of Grassy Hill Road, Orange, Connecticut. The Council denies certification of Site A located at 707 Cranberry Lane and Site B located off of Grassy Hill Road, Orange, Connecticut.

The facility shall be constructed, operated, and maintained substantially as specified in the Council's record in this matter, and subject to the following conditions:

1. The tower shall be constructed as a monopole, no taller than necessary to provide the proposed telecommunications services, sufficient to accommodate the antennas of Sprint and other entities, both public and private, but such tower shall not exceed a height of 140 feet above ground level, with a total overall height of 143 feet above ground level including appurtenances. Antennas to be installed on the tower shall be on a T-bar antenna platform or flush mounted.

2. The Certificate Holder shall prepare a D&M Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D&M Plan shall be submitted to and approved by the Council prior to the commencement of facility construction and shall include:
   a) a final site plan(s) of site development to include specifications for the tower, tower location, tower foundation, antennas, equipment building, access road, provisions for underground utilities, utility line, and landscaping; and
   b) construction plans for site clearing, water drainage, and erosion and sedimentation control consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended.

3. The Certificate Holder shall, prior to the commencement of operation, provide the Council worst-case modeling of electromagnetic radio frequency power densities of all proposed entities'

antennas at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin No. 65, August 1997. The Certificate Holder shall provide a recalculated report of electromagnetic radio frequency power density if and when circumstances in operation cause a change in power density above the levels calculated and provided pursuant to this Decision and Order.

4. Upon the establishment of any new State or federal radio frequency standards applicable to frequencies of this facility, the facility granted herein shall be brought into compliance with such standards.

5. The Certificate Holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing. The Certificate Holder shall provide reasonable space on the tower for no compensation for any municipal antennas, provided such antennas are compatible with the structural integrity of the tower.

6. If the facility does not initially provide wireless services within one year of completion of construction or ceases to provide wireless services for a period of one year, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made.

7. Any antenna that becomes obsolete and ceases to function shall be removed within 60 days after such antenna becomes obsolete and ceases to function.

8. Unless otherwise approved by the Council, this Decision and Order shall be void if the facility authorized herein is not operational within one year of the effective date of this Decision and Order or within one year after all appeals to this Decision and Order have been resolved.

Pursuant to General Statutes § 16-50p, we hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed below, and notice of issuance shall be published in The New Haven Register, the Amity Observer and The Bulletin (Orange).

By this Decision and Order, the Council disposes of the legal rights, duties, and privileges of each party named or admitted to the proceeding in accordance with Section 16-50j-17 of the Regulations of Connecticut State Agencies.

The parties and intervenors to this proceeding are:

Applicant	**Its Representative**
Sprint Spectrum, L.P. d/b/a Sprint PCS	Thomas J. Regan, Esquire Brown Rudnick Berlack Israels LLP CityPlace I, 38th Floor 185 Asylum Street Hartford, CT 06103-3402
Intervenor	**Its Representative**
AT&T Wireless PCS, LLC d/b/a AT&T Wireless	Christopher B. Fisher, Esq. Cuddy & Feder LLP 90 Maple Avenue White Plains, NY 10601

Intervenor	**Its Representative**
Cellco Partnership d/b/a Verison Wireless	Kenneth C. Baldwin, Esq. Robinson & Cole LLP 280 Trumbull Street Hartford, CT 06103-3597

Content Last Modified on 1/15/2004 8:25:11 AM

Exhibit B

Property Card

700 GRASSY HILL RD

Location	700 GRASSY HILL RD	**Mblu**	60/ 6/ 1A/ /
Acct#	00182505	**Owner**	TOWN OF ORANGE
Assessment	$119,300	**Appraisal**	$170,400
PID	5703	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$13,500	$156,900	$170,400
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$9,500	$109,800	$119,300

Owner of Record

Owner	TOWN OF ORANGE	**Sale Price**	$25,000
Co-Owner		**Certificate**	
Address	617 ORANGE CENTER ROAD ORANGE, CT 06477	**Book & Page**	520/ 156
		Sale Date	05/28/2004
		Instrument	00

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
TOWN OF ORANGE	$25,000		520/ 156	00	05/28/2004
SCHEN JULIA ROGERS & SAYLOR ELLEN &	$0				

Building Information

Building 1 : Section 1

Year Built:
Living Area: 0
Replacement Cost
Less Depreciation: $0

Building Attributes	
Field	**Description**
Style	Outbuildings
Model	
Stories	

Building Photo

Exterior Wall 1	
Exterior Wall 2	
Roof Structure	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Floor 1	
Interior Floor 2	
Heat Fuel	
Heat Type	
AC Type	
Bedrooms	
Full Baths	
Half Baths	
Extra Fixtures	
Total Rooms	
Stacks	
Fireplace(s)	
Gas Fireplace(s)	
Attic	
Frame	
Traffic	
Bsmt Gar(s)	
SF FBM	
Basement	
Bsmt Floor	

60-6-1A 03/05/2017

(http://images.vgsi.com/photos/OrangeCTPhotos//\00\01\70/98.JPG)

Building Layout

Building

(http://images.vgsi.com/photos/OrangeCTPhotos//Sketches/5703

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

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	510E
Description	Exempt Vac
Zone	RES
Neighborhood	010
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	0.62
Frontage	
Depth	
Assessed Value	$109,800
Appraised Value	$156,900

Outbuildings

Outbuildings	Legend

Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
SHD7	Cell Shed			240 UNITS	$13,500	1

Valuation History

Appraisal			
Valuation Year	Improvements	Land	Total
2017	$13,500	$156,900	$170,400
2016	$13,500	$151,400	$164,900
2015	$13,500	$151,400	$164,900

Assessment			
Valuation Year	Improvements	Land	Total
2017	$9,500	$109,800	$119,300
2016	$9,500	$106,000	$115,500
2015	$9,500	$106,000	$115,500

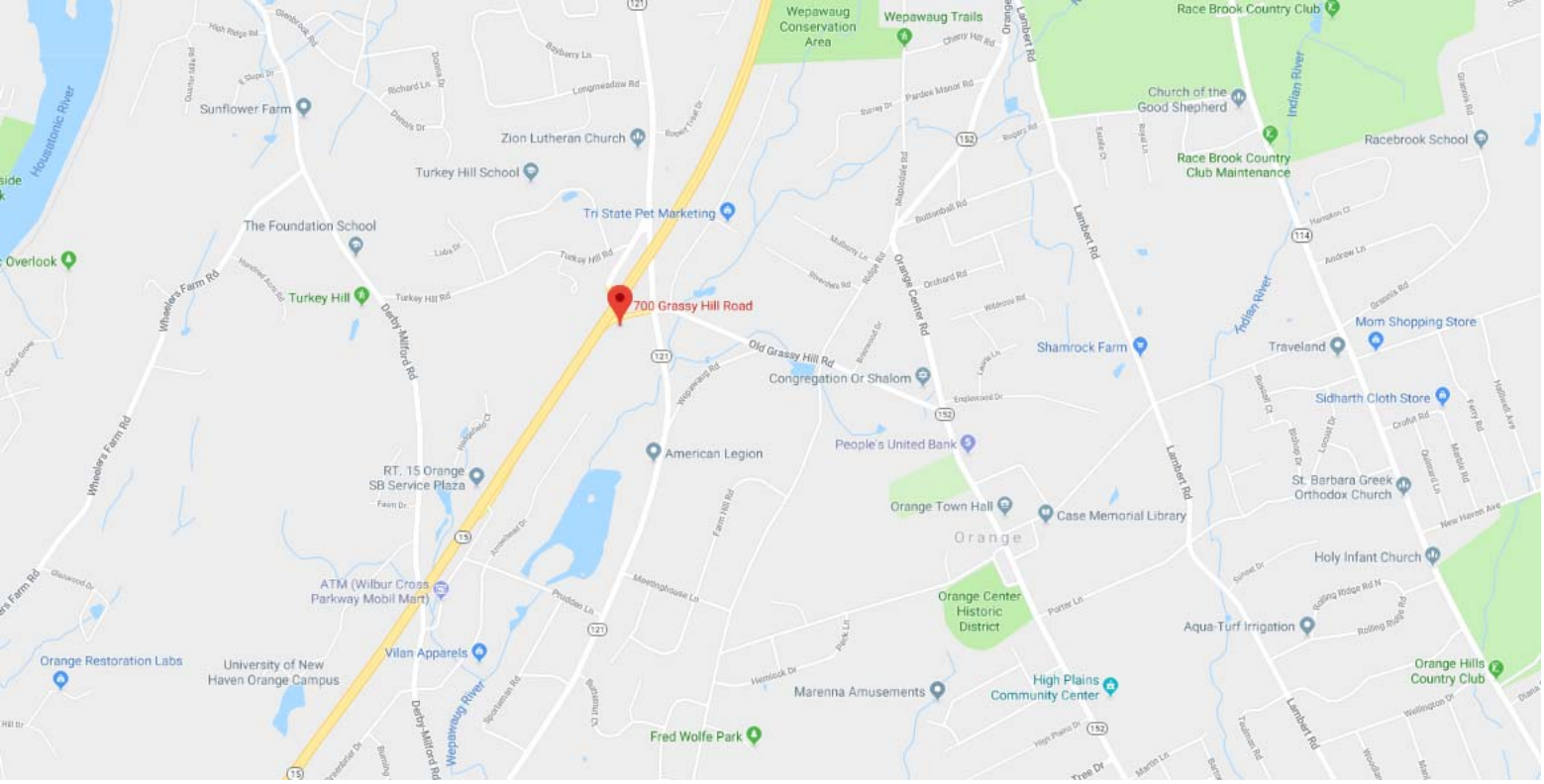

700 Grassy Hill Road
Wepawaug Conservation Area
Wepawaug Trails
Race Brook Country Club
Church of the Good Shepherd
Racebrook School
Race Brook Country Club Maintenance
Sunflower Farm
Zion Lutheran Church
Turkey Hill School
Tri State Pet Marketing
The Foundation School
Turkey Hill
Shamrock Farm
Traveland
Mom Shopping Store
Congregation Or Shalom
Sidharth Cloth Store
American Legion
People's United Bank
RT. 15 Orange SB Service Plaza
St. Barbara Greek Orthodox Church
Orange Town Hall
Case Memorial Library
Orange
Holy Infant Church
ATM (Wilbur Cross Parkway Mobil Mart)
Orange Center Historic District
Aqua-Turf Irrigation
Orange Restoration Labs
University of New Haven Orange Campus
Vilan Apparels
Orange Hills Country Club
Marenna Amusements
High Plains Community Center
Fred Wolfe Park
Housatonic River
Indian River
Wepawaug River
Lambert Rd
Orange Center Rd
Derby Milford Rd
Wheelers Farm Rd
Old Grassy Hill Rd

Exhibit C

Construction Drawings

T-Mobile

T-MOBILE SITE NUMBER: CT11083Q
T-MOBILE SITE NAME: CT083/SPRINT/GRASSY HILL
T-MOBILE PROJECT: L600

BUSINESS UNIT #: 881541
SITE ADDRESS: 700 GRASSY HILL RD, ORANGE, CT 06477
COUNTY: NEW HAVEN
SITE TYPE: MONOPOLE
TOWER HEIGHT: 140'-0"

SITE INFORMATION

CROWN CASTLE USA INC. SITE NAME:	ROGERS PROPERTY
SITE ADDRESS:	700 GRASSY HILL RD ORANGE, CT 06477
COUNTY:	NEW HAVEN
MAP/PARCEL #:	N/A
AREA OF CONSTRUCTION:	EXISTING
LATITUDE:	41°17'7.75"
LONGITUDE:	-73°2'33.27"
LAT/LONG TYPE:	NAD83
GROUND ELEVATION:	87'-0"
CURRENT ZONING:	TOWN OF ORANGE
JURISDICTION:	CT-CONNECTICUT SITTING COUNCIL
OCCUPANCY CLASSIFICATION:	U
TYPE OF CONSTRUCTION:	IIB
A.D.A. COMPLIANCE:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION
PROPERTY OWNER:	N/A N/A N/A
TOWER OWNER:	CROWN CASTLE 2000 CORPORATE DRIVE CANONSBURG, PA 15317
CARRIER/APPLICANT:	T-MOBILE 12920 SE 38TH STREET BELLEVUE, WA 98006
ELECTRIC PROVIDER:	UNITED ILLUMINATING CO. 800-722-5584
TELCO PROVIDER:	AT&T MOBILITY NONE

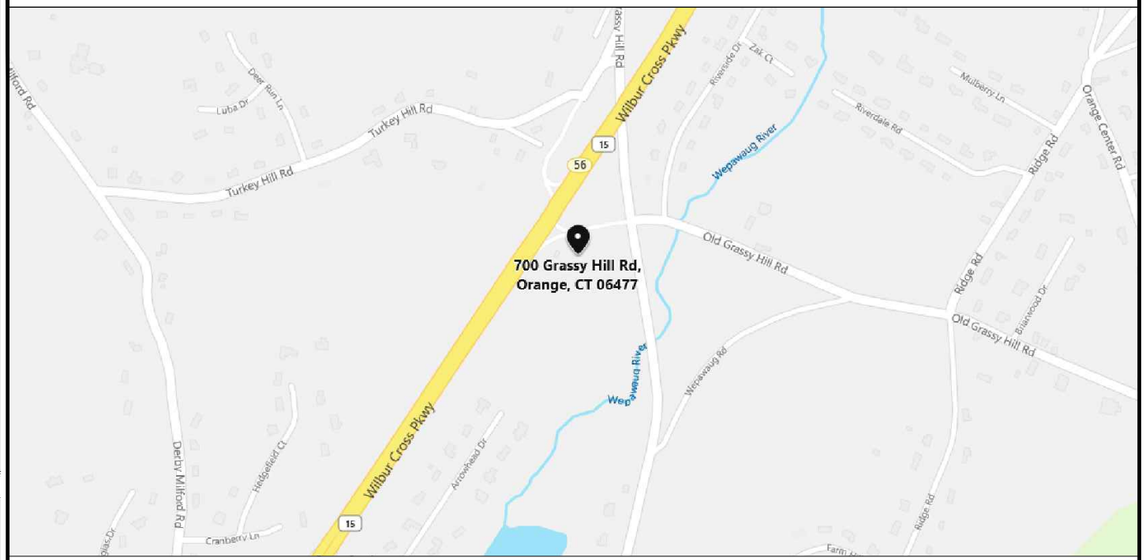
DRAWING INDEX

SHEET #	SHEET DESCRIPTION
T-1	TITLE SHEET
T-2	GENERAL NOTES
C-1.1	SITE PLAN
C-1.2	EXISTING & FINAL EQUIPMENT PLANS
C-2	FINAL ELEVATION & ANTENNA PLANS
C-3	EQUIPMENT DETAILS & COAX COLOR CODING
C-4	EQUIPMENT SPECS
G-1	TYPICAL FINAL GROUNDING SCHEMATIC
G-2	GROUNDING DETAILS
E-1	ONE LINE DIAGRAM

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

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

LOCATION MAP



NO SCALE

PROJECT TEAM

A&E FIRM:	KIMLEY-HORN AND ASSOCIATES, INC. COA #: PEC.0000738 4807 ROCKSIDE RD, SUITE 430 INDEPENDENCE, OH 44131 KEVIN.CLEMENTS@KIMLEY-HORN.COM
CROWN CASTLE USA INC. DISTRICT CONTACTS:	3 CORPORATE PARK DRIVE, SUITE 101 CLIFTON PARK, NY 12065 CATHERINE COVINGTON - PROJECT MANAGER CATHERINE.COVINGTON@CROWNCASTLE.COM ALLISON SQUIRES - A&E SPECIALIST 518-653-2598 ALLISON.SQUIRES.CONTRACTOR@CROWNCASTLE.COM

PROJECT DESCRIPTION

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

TOWER SCOPE OF WORK:
- REMOVE (3) ANTENNAS
- REMOVE (3) RRUS11 B12
- INSTALL (3) ANTENNAS
- INSTALL (3) RADIO 4449 B71+B12
- INSTALL (3) ERICSSON 6X12 HCS+AWG
- INSTALL SITE PRO PRK-SFS & PV-PKPB-M MODIFICATIONS PER MA BY MASTEC (DATED 6/3/19)

GROUND SCOPE OF WORK:
- REMOVE (1) DUS41
- REMOVE (1) XMU
- INSTALL (2) BB 6630

APPLICABLE CODES/REFERENCE DOCUMENTS

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

CODE TYPE	CODE
BUILDING	2018 CT STATE BUILDING CODE (2015 IBC)
MECHANICAL	2015 IMC
ELECTRICAL	2017 NEC

REFERENCE DOCUMENTS:

STRUCTURAL ANALYSIS:	BY OTHERS
DATED:	
MOUNT ANALYSIS:	BY MASTEC
DATED:	6/3/2019
RFDS REVISION:	2.1
DATED:	03/27/19
ORDER ID:	----
REVISION:	0

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

T-Mobile
12920 SE 38TH STREET
BELLEVUE, WA 98006

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

Kimley»Horn
COA #PEC.0000738
421 FAYETTEVILLE ST, SUITE 600
RALEIGH, NC 27601

T-MOBILE SITE NUMBER:
CT11083Q

BU #: **881541**
ROGERS PROPERTY

700 GRASSY HILL RD
ORANGE, CT 06477

EXISTING 140'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	05/31/19	JW	ISSUED FOR PERMITTING	MCK
0	07/17/19	JW	ISSUED FOR CONSTR.	MCK

STATE OF CONNECTICUT
BRIAN J. BREWER
29510
LICENSED
PROFESSIONAL ENGINEER
7-18-19

SHEET NUMBER: T-1
REVISION: 0

CROWN CASTLE USA INC. SITE ACTIVITY REQUIREMENTS:

1. NOTICE TO PROCEED– NO WORK SHALL COMMENCE PRIOR TO CROWN CASTLE USA INC. WRITTEN NOTICE TO PROCEED (NTP) AND THE ISSUANCE OF A PURCHASE ORDER. PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE CROWN CASTLE USA INC. NOC AT 800–788–7011 & THE CROWN CASTLE USA INC. CONSTRUCTION MANAGER.
2. "LOOK UP" – CROWN CASTLE USA INC. SAFETY CLIMB REQUIREMENT:
   THE INTEGRITY OF THE SAFETY CLIMB AND ALL COMPONENTS OF THE CLIMBING FACILITY SHALL BE CONSIDERED DURING ALL STAGES OF DESIGN, INSTALLATION, AND INSPECTION. TOWER MODIFICATION, MOUNT REINFORCEMENTS, AND/OR EQUIPMENT INSTALLATIONS SHALL NOT COMPROMISE THE INTEGRITY OR FUNCTIONAL USE OF THE SAFETY CLIMB OR ANY COMPONENTS OF THE CLIMBING FACILITY ON THE STRUCTURE. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO: PINCHING OF THE WIRE ROPE, BENDING OF THE WIRE ROPE FROM ITS SUPPORTS, DIRECT CONTACT OR CLOSE PROXIMITY TO THE WIRE ROPE WHICH MAY CAUSE FRICTIONAL WEAR, IMPACT TO THE ANCHORAGE POINTS IN ANY WAY, OR TO IMPEDE/BLOCK ITS INTENDED USE. ANY COMPROMISED SAFETY CLIMB, INCLUDING EXISTING CONDITIONS MUST BE TAGGED OUT AND REPORTED TO YOUR CROWN CASTLE USA INC. POC OR CALL THE NOC TO GENERATE A SAFETY CLIMB MAINTENANCE AND CONTRACTOR NOTICE TICKET.
3. PRIOR TO THE START OF CONSTRUCTION, ALL REQUIRED JURISDICTIONAL PERMITS SHALL BE OBTAINED. THIS INCLUDES, BUT IS NOT LIMITED TO, BUILDING, ELECTRICAL, MECHANICAL, FIRE, FLOOD ZONE, ENVIRONMENTAL, AND ZONING. AFTER ONSITE ACTIVITIES AND CONSTRUCTION ARE COMPLETED, ALL REQUIRED PERMITS SHALL BE SATISFIED AND CLOSED OUT ACCORDING TO LOCAL JURISDICTIONAL REQUIREMENTS.
4. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN, AND SHALL MEET ANSI/ASSE A10.48 (LATEST EDITION); FEDERAL, STATE, AND LOCAL REGULATIONS; AND ANY APPLICABLE INDUSTRY CONSENSUS STANDARDS RELATED TO THE CONSTRUCTION ACTIVITIES BEING PERFORMED. ALL RIGGING PLANS SHALL ADHERE TO ANSI/ASSE A10.48 (LATEST EDITION) AND CROWN CASTLE USA INC. STANDARD CED–STD–10253, INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION, TO CERTIFY THE SUPPORTING STRUCTURE(S) IN ACCORDANCE WITH ANSI/TIA–322 (LATEST EDITION).
5. ALL SITE WORK TO COMPLY WITH QAS–STD–10068 "INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON CROWN CASTLE USA INC. TOWER SITE" AND LATEST VERSION OF ANSI/TIA–1019–A–2012 "STANDARD FOR INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS."
6. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY CROWN CASTLE USA INC. PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
7. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
8. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
9. THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
10. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY CONTRACTOR. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING AND EXCAVATION E) CONSTRUCTION SAFETY PROCEDURES.
11. ALL SITE WORK SHALL BE AS INDICATED ON THE STAMPED CONSTRUCTION DRAWINGS AND PROJECT SPECIFICATIONS, LATEST APPROVED REVISION.
12. CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH AT THE COMPLETION OF THE WORK. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
13. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF CONTRACTOR, TOWER OWNER, CROWN CASTLE USA INC., AND/OR LOCAL UTILITIES.
14. THE CONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE REQUIRED BY LOCAL JURISDICTION AND SIGNAGE REQUIRED ON INDIVIDUAL PIECES OF EQUIPMENT, ROOMS, AND SHELTERS.
15. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE CARRIER'S EQUIPMENT AND TOWER AREAS.
16. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
17. THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION AS SPECIFIED ON THE CONSTRUCTION DRAWINGS AND/OR PROJECT SPECIFICATIONS.
18. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
19. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
20. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
21. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.
22. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.

GENERAL NOTES:

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

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

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

   CONCRETE NOT EXPOSED TO EARTH OR WEATHER:
   - SLAB AND WALLS . . . . 3/4"
   - BEAMS AND COLUMNS . . . . 1–1/2"
7. A TOOLED EDGE OR A 3/4" CHAMFER SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNLESS NOTED OTHERWISE, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

ELECTRICAL INSTALLATION NOTES:

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

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

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

GREENFIELD GROUNDING NOTES:

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

ABBREVIATIONS:

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

T-Mobile

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CROWN CASTLE

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

Kimley»Horn

COA #PEC.0000738
421 FAYETTEVILLE ST, SUITE 600
RALEIGH, NC 27601

T-MOBILE SITE NUMBER:
CT11083Q

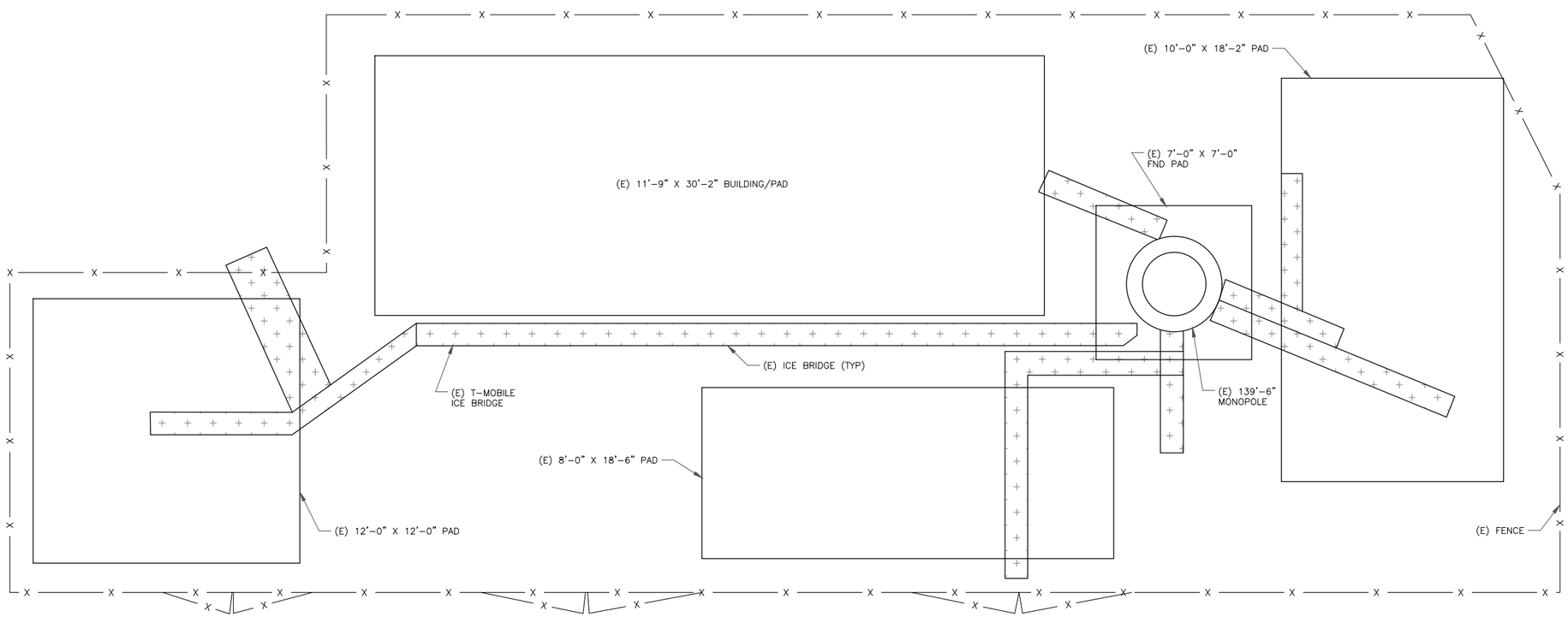
BU #: **881541**
ROGERS PROPERTY

700 GRASSY HILL RD
ORANGE, CT 06477

EXISTING 140'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	05/31/19	JW	ISSUED FOR PERMITTING	MCK
0	07/17/19	JW	ISSUED FOR CONSTR.	MCK



1 SITE PLAN
SCALE: 4' 2' 0 4' 3/16"=1'-0" (FULL SIZE) 3/32"=1'-0" (11x17)

N

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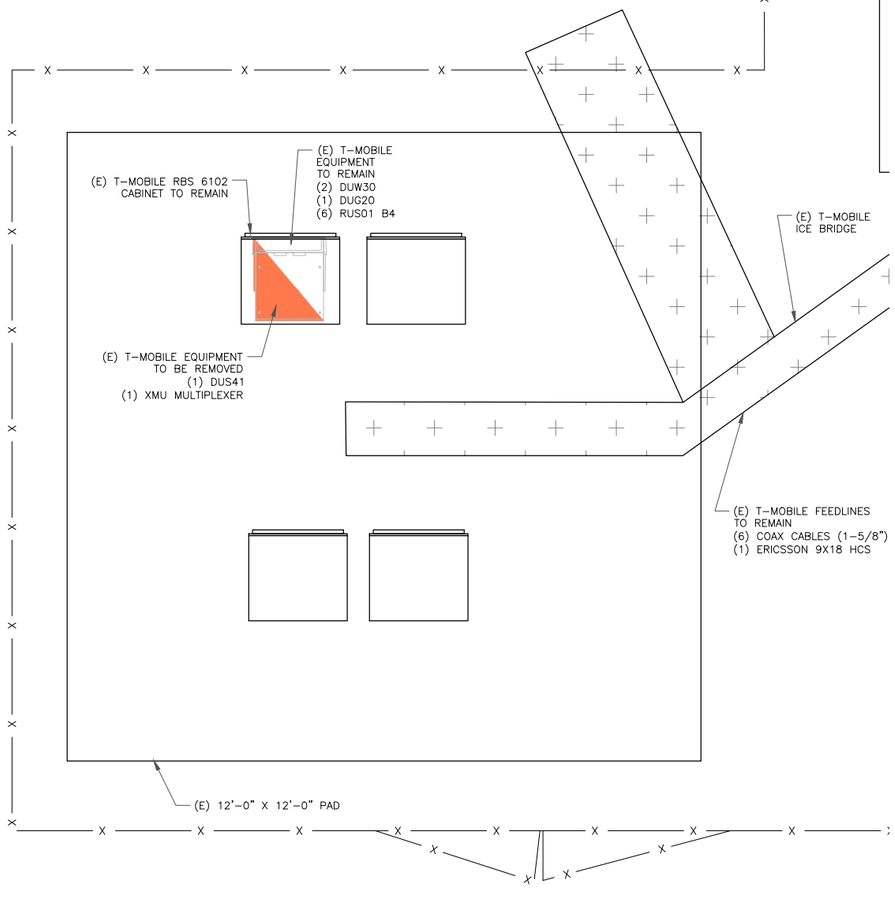
STATE OF CONNECTICUT
BRIAN J. BREWER
29510
LICENSED
PROFESSIONAL ENGINEER
7-18-19

SHEET NUMBER: C-1.1
REVISION: 0

EQUIPMENT LEGEND:

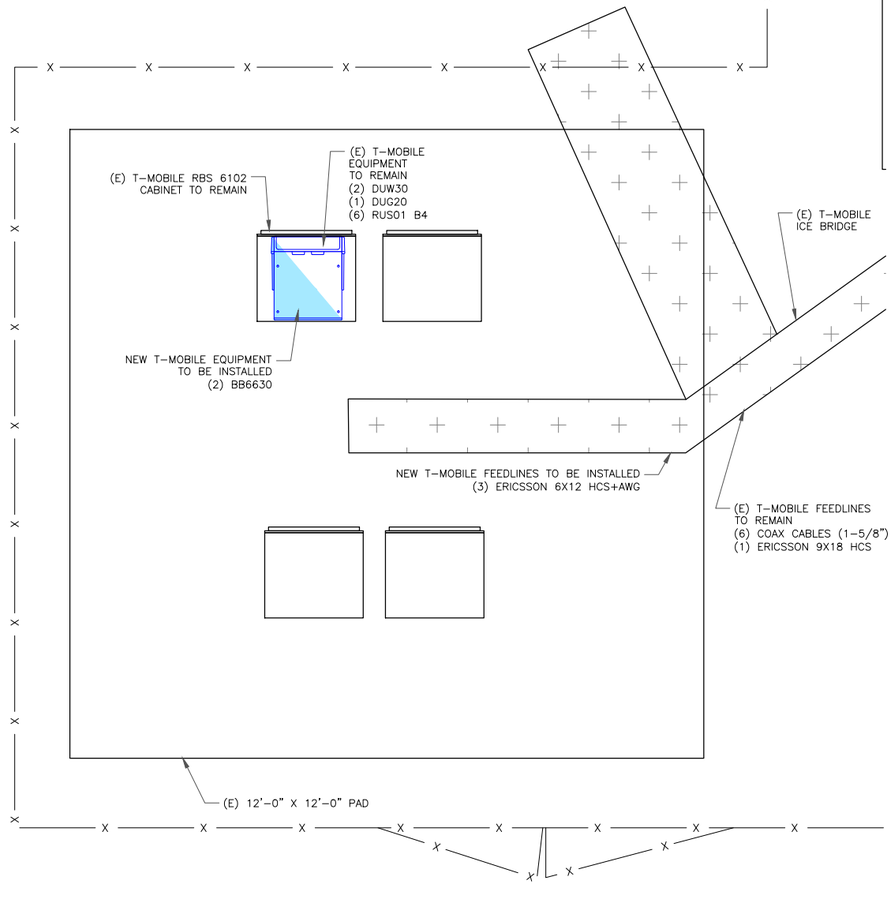
- EXISTING
- TO BE RELOCATED/REMOVED
- NEW



1 EXISTING EQUIPMENT PLAN

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

N



2 FINAL EQUIPMENT PLAN

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

N

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Kimley»Horn
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421 FAYETTEVILLE ST, SUITE 600
RALEIGH, NC 27601

T-MOBILE SITE NUMBER:
CT11083Q

BU #: **881541**
ROGERS PROPERTY

700 GRASSY HILL RD
ORANGE, CT 06477

EXISTING 140'-0" MONOPOLE

ISSUED FOR:

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BRIAN J. BRENNER
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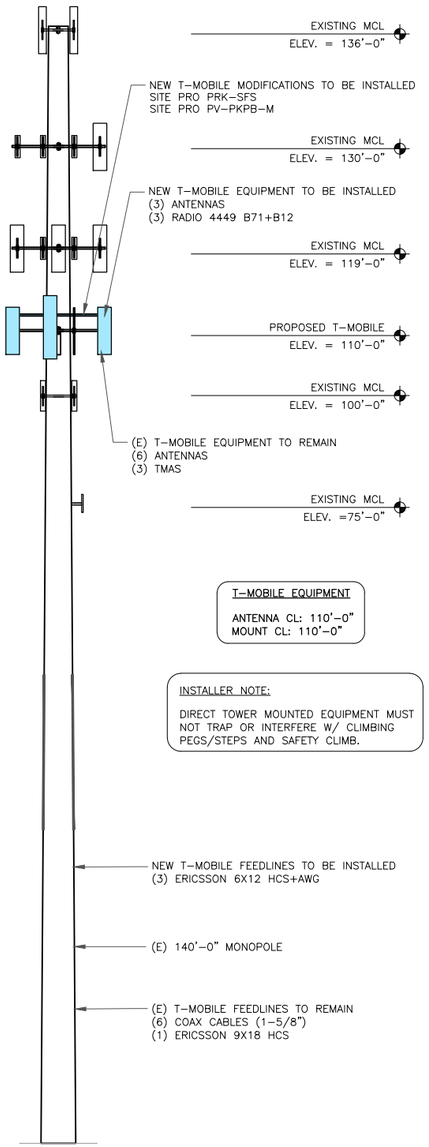
7-18-19

SHEET NUMBER: C-1.2

REVISION: 0



1 FINAL ELEVATION
SCALE: NOT TO SCALE

EQUIPMENT LEGEND:

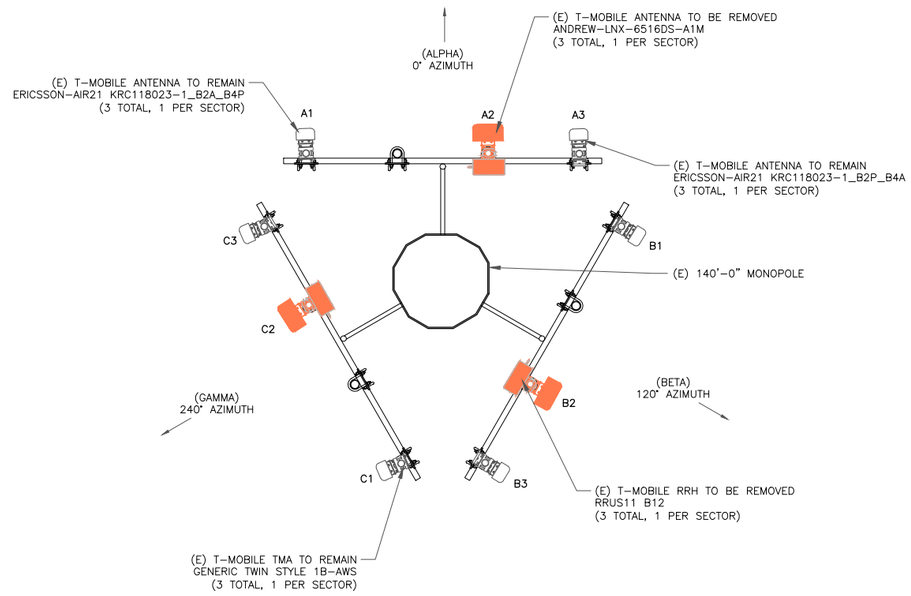
- EXISTING
- TO BE RELOCATED/REMOVED
- NEW

MOUNT ANALYSIS NOTES:

1. THE DESIGN DEPICTED IN THESE DRAWINGS IS VALID WHEN ACCOMPANIED BY A CORRESPONDING PASSING MOUNT ANALYSIS.
2. CONSTRUCTION MANAGER / GENERAL CONTRACTOR SHALL REVIEW THE MOUNT ANALYSIS FOR ANY CONDITIONS PRIOR TO INSTALLATION.
3. ANY REQUIRED MOUNT MODIFICATION DESIGN OR MOUNT REPLACEMENT SHALL BE APPROVED BY EOR.

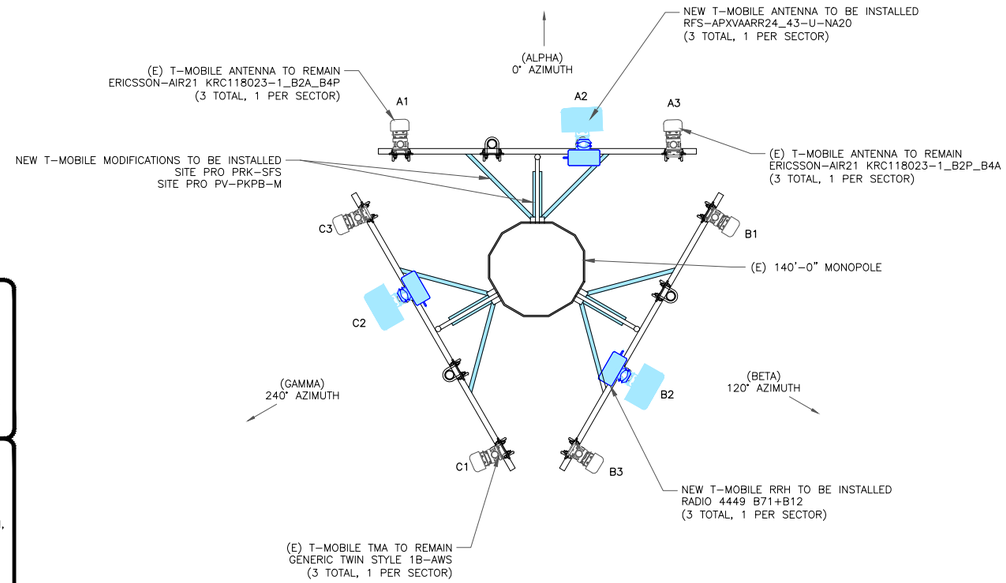
"LOOK UP" – CROWN CASTLE USA INC.
SAFETY CLIMB REQUIREMENT:

THE INTEGRITY OF THE SAFETY CLIMB AND ALL COMPONENTS OF THE CLIMBING FACILITY SHALL BE CONSIDERED DURING ALL STAGES OF DESIGN, INSTALLATION, AND INSPECTION. TOWER MODIFICATION, MOUNT REINFORCEMENTS, AND/OR EQUIPMENT INSTALLATIONS SHALL NOT COMPROMISE THE INTEGRITY OR FUNCTIONAL USE OF THE SAFETY CLIMB OR ANY COMPONENTS OF THE CLIMBING FACILITY ON THE STRUCTURE. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO: PINCHING OF THE WIRE ROPE, BENDING OF THE WIRE ROPE FROM ITS SUPPORTS, DIRECT CONTACT OR CLOSE PROXIMITY TO THE WIRE ROPE WHICH MAY CAUSE FRICTIONAL WEAR, IMPACT TO THE ANCHORAGE POINTS IN ANY WAY, OR TO IMPEDE/BLOCK ITS INTENDED USE. ANY COMPROMISED SAFETY CLIMB, INCLUDING EXISTING CONDITIONS MUST BE TAGGED OUT AND REPORTED TO YOUR CROWN CASTLE USA INC. POC OR CALL THE NOC TO GENERATE A SAFETY CLIMB MAINTENANCE AND CONTRACTOR NOTICE TICKET.



2 EXISTING ANTENNA PLAN
SCALE: NOT TO SCALE

N



3 FINAL ANTENNA PLAN
SCALE: NOT TO SCALE

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BU #: **881541**
ROGERS PROPERTY

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EXISTING 140'-0" MONOPOLE

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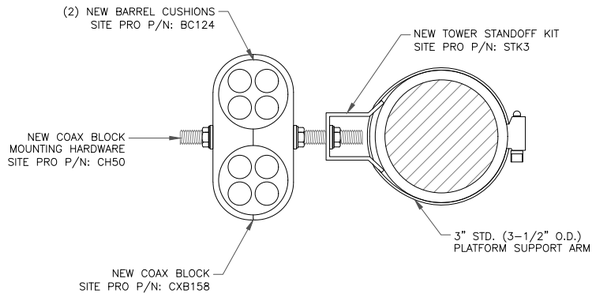
SHEET NUMBER: C-2

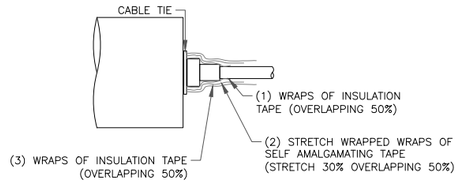
REVISION: 0



1 RF JUMPER DETAIL
SCALE: NOT TO SCALE

INSTALLER NOTE:

JUMPERS TO BE TORQUED TO 221.27 IN/LBS



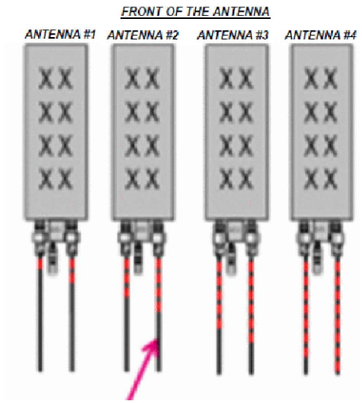
2 RF JUMPER CONNECTION
SCALE: NOT TO SCALE

3 NOT USED
SCALE: NOT TO SCALE

Coax Color Coding

- Antennas will be labeled (back of antenna view) Right to left 1 - X ports
- Coax/Jumper lines will be identified by sector color and by number of bands around the coax/jumper

SECTOR A	RED
SECTOR B	GREEN
SECTOR C	BLUE
SECTOR D	YELLOW
SECTOR E	WHITE
SECTOR F	PURPLE
LMU	BROWN + SECTOR COLOR BANDS (1 & 2)
FIBER ID	GRAY
UNUSED COAX	PINK
MICROWAVE	ORANGE
DWE T-1'S + GPS DOWNLINK CABLE	ID W/LABEL MAKER

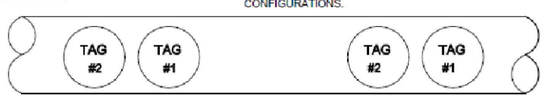


COLOR CODING NOTES:

color	GSM
color	UMTS 1900
color	UMTS AWS
color	LTE
color	FIBER CABLE

METALLIC TAG NOTES:

1. TWO METALLIC TAGS SHALL BE ATTACHED AT EACH END OF EVERY CABLE LONGER THAN (3) THREE FEET
2. CABLE LESS THAN (3) THREE FEET WILL HAVE TWO METALLIC TAGS ATTACHED AT THE CENTER OF THE CABLE.
3. TAGS WILL BE FASTENED WITH STAINLESS STEEL ZIP TIES APPROPRIATE FOR CABLE DIAMETER.
4. STANDARDIZED METALLIC TAG KIT WILL BE ASSEMBLED WITH TAGS ALREADY ENGRAVED TO ACCOMMODATE ALL CONFIGURATIONS.



ANTENNA AND COAXIAL CABLE SCHEDULE

1. ALL ANTENNAS SHALL BE FURNISHED WITH DOWNTILT BRACKETS. CONTRACTOR SHALL COORDINATE REQUIRED MECHANICAL DOWNTILT FOR EACH ANTENNA WITH RF ENGINEER. ANTENNA DOWNTILT SHALL BE SET AND VERIFIED BY A SMART LEVEL.
2. CONTRACTOR SHALL INSTALL COLOR CODE RINGS ON EACH OF THE HYBRID CABLES AND JUMPER CABLES WITH UV RESISTANT TAPE. ALL CABLE SHALL BE MARKED AT TOP AND BOTTOM WITH 2" COLOR TAPE OR STENCIL TAG. COLOR TAPE MAY BE OBTAINED FROM GRAYBAR ELECTRONICS.

4 COAX COLOR CODING
SCALE: NOT TO SCALE

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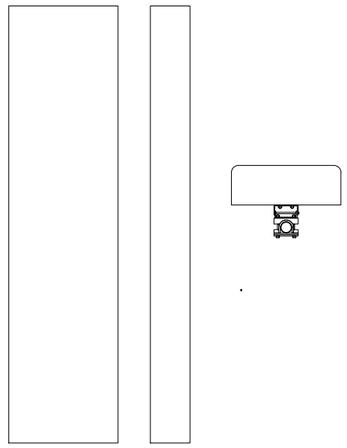
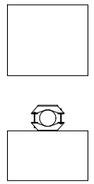
SHEET NUMBER: C-3

REVISION: 0



RFS – APXVAARR24_43-U-NA20
WEIGHT: 128 LBS.
SIZE (HxWxD): 95.9x24x8.7 IN.

1 RFS-APXVAARR24-43-U-NA20
SCALE: NOT TO SCALE



ERICSSON – 4449 B71 + B12
WEIGHT: 74 LBS.
SIZE (HxWxD): 13.1x14.9x9.2 IN.

2 RADIO 4449 B71+B12
SCALE: NOT TO SCALE

3 NOT USED
SCALE: NOT TO SCALE

4 NOT USED
SCALE: NOT TO SCALE

5 NOT USED
SCALE: NOT TO SCALE

6 NOT USED
SCALE: NOT TO SCALE

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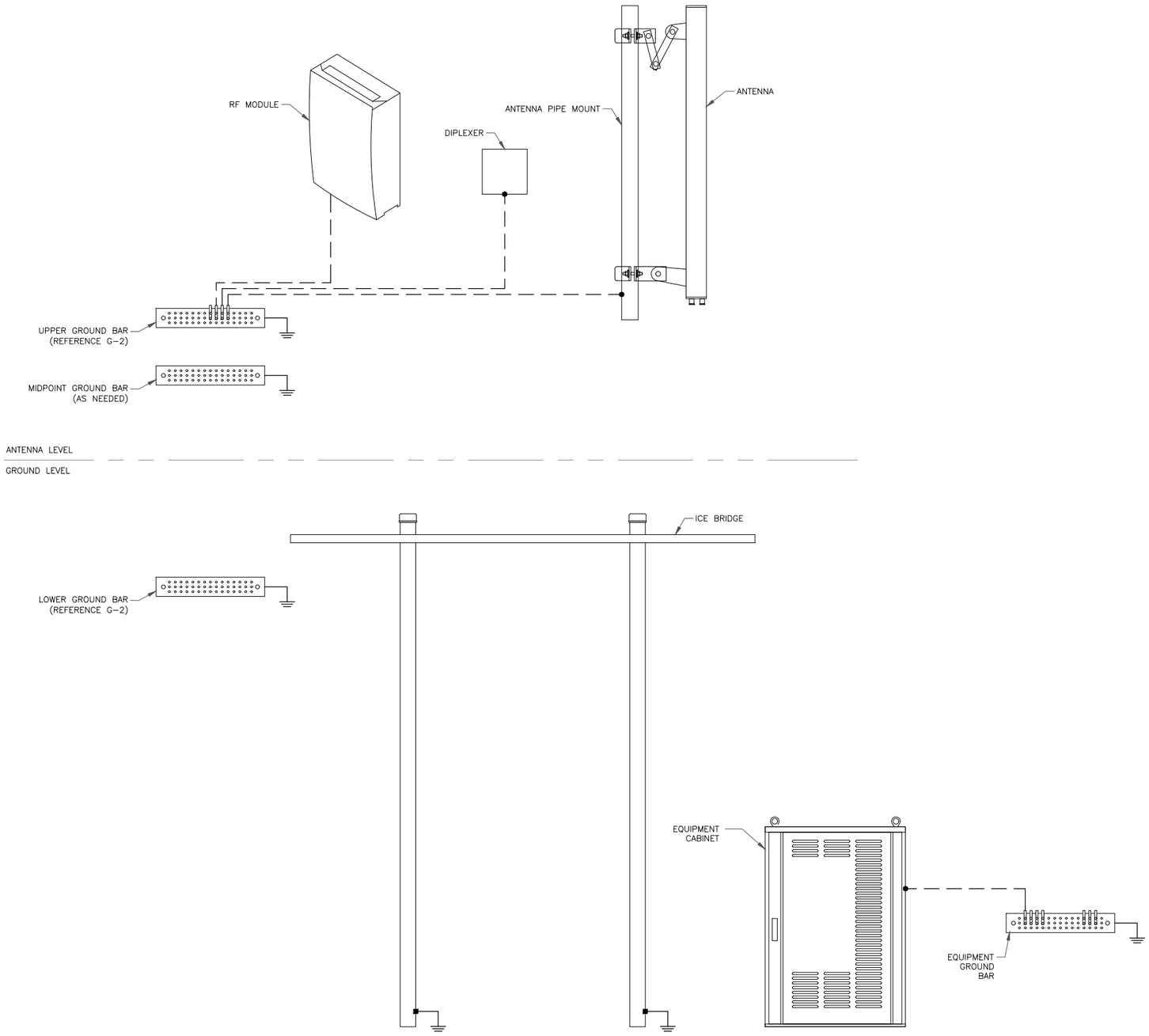
BRIAN J. BREWER
29510
LICENSED
PROFESSIONAL ENGINEER
7-18-19

SHEET NUMBER: C-4

REVISION: 0



1 TYPICAL FINAL GROUNDING SCHEMATIC
SCALE: NOT TO SCALE

GROUNDING PLAN LEGEND:

- #6 STRANDED COPPER WITH GREEN INSULATION GROUND WIRE
- #2 STRANDED COPPER WITH GREEN INSULATION GROUND WIRE
- #2 BARE, SOLID, TINNED COPPER GROUND WIRE
- EXOTHERMIC WELD
- MECHANICAL CONNECTION
- COPPER GROUND ROD
- GROUND ROD W/ TEST WELL

NOTE:

SEE FINAL EQUIPMENT PLAN FOR PROPOSED EQUIPMENT REQUIRING GROUNDING. CONTRACTOR TO VERIFY EXISTING EQUIPMENT GROUNDING IN FIELD. CONTRACTOR TO VERIFY IN FIELD AND INSTALL ANY MISSING T-MOBILE GROUND BARS ON SITE.

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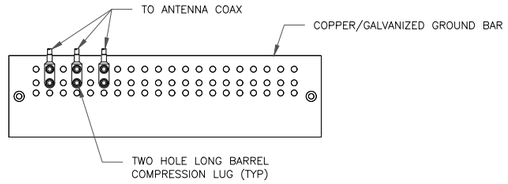
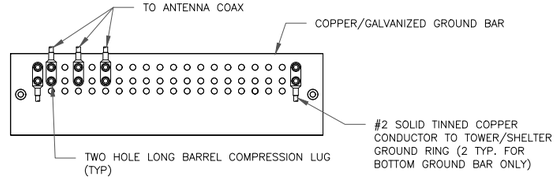
REVISION: 0



NOTES:

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

1 ANTENNA GROUND BAR DETAIL
SCALE: NOT TO SCALE

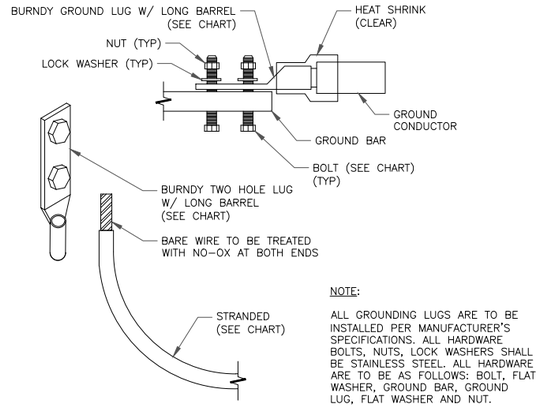


NOTES:

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

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

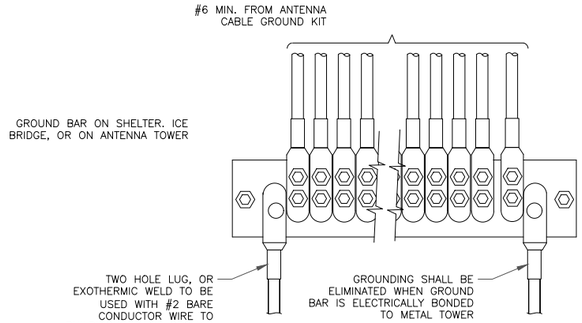
WIRE SIZE	BURNDY LUG	BOLT SIZE
#6 GREEN INSULATED	YA6C-2TC38	3/8" - 16 NC SS 2 BOLT
#2 SOLID TINNED	YA3C-2TC38	3/8" - 16 NC SS 2 BOLT
#2 STRANDED	YA2C-2TC38	3/8" - 16 NC SS 2 BOLT
#2/0 STRANDED	YA26-2TC38	3/8" - 16 NC SS 2 BOLT
#4/0 STRANDED	YA28-2N	1/2" - 16 NC SS 2 BOLT



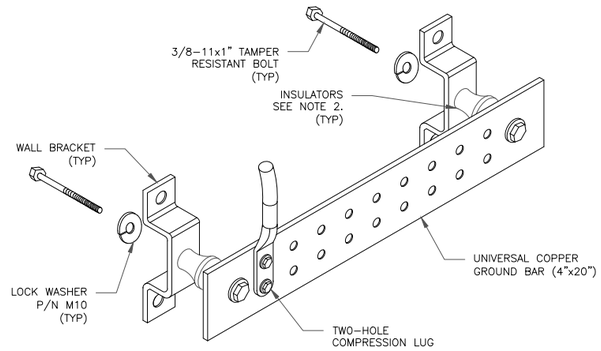
NOTE:

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

3 MECHANICAL LUG CONNECTION
SCALE: NOT TO SCALE



4 GROUNDWIRE INSTALLATION
SCALE: NOT TO SCALE

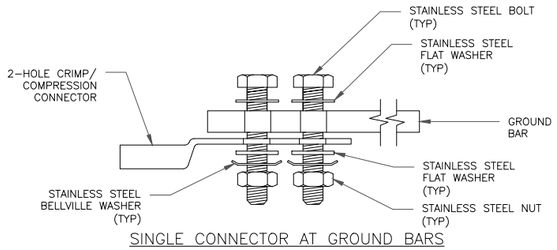


NOTES:

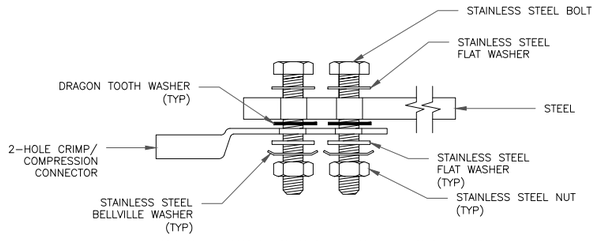
1. DOWN LEAD (HOME RUN) CONDUCTORS ARE NOT TO BE INSTALLED ON CROWN CASTLE USA INC. TOWER, PER THE GROUNDING DOWN CONDUCTOR POLICY QAS-STD-10091. NO MODIFICATION OR DRILLING TO TOWER STEEL IS ALLOWED IN ANY FORM OR FASHION, CAD-WELDING ON THE TOWER AND/OR IN THE AIR ARE NOT PERMITTED.

2. OMIT INSULATOR WHEN MOUNTING TO TOWER STEEL OR PLATFORM STEEL USE INSULATORS WHEN ATTACHING TO BUILDING OR SHELTERS.

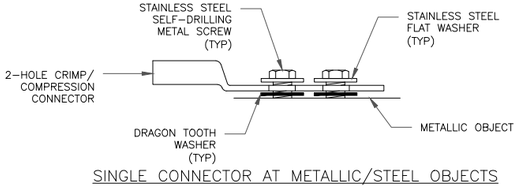
5 GROUND BAR DETAIL
SCALE: NOT TO SCALE



SINGLE CONNECTOR AT GROUND BARS

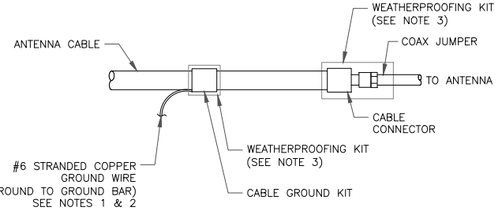


SINGLE CONNECTOR AT STEEL OBJECTS



SINGLE CONNECTOR AT METALLIC/STEEL OBJECTS

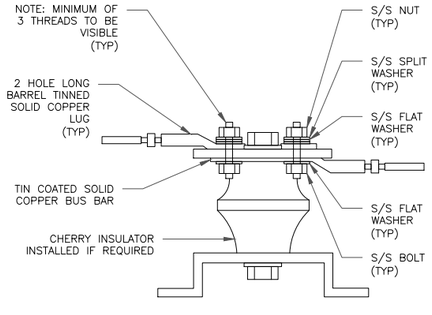
9 HARDWARE DETAIL FOR EXTERIOR CONNECTIONS
SCALE: NOT TO SCALE



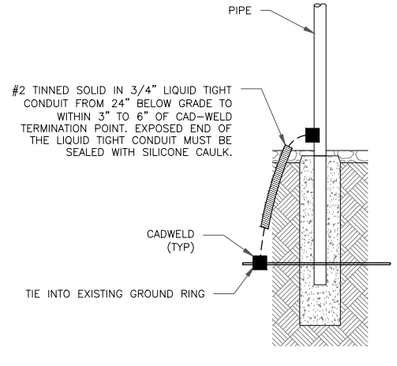
NOTES:

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

6 CABLE GROUND KIT CONNECTION
SCALE: NOT TO SCALE



7 LUG DETAIL
SCALE: NOT TO SCALE



8 TRANSITIONING GROUND DETAIL
SCALE: NOT TO SCALE

T-Mobile
12920 SE 38TH STREET
BELLEVUE, WA 98006

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

Kimley»Horn
COA #PEC.0000738
421 FAYETTEVILLE ST, SUITE 600
RALEIGH, NC 27601

T-MOBILE SITE NUMBER:
CT11083Q

BU #: **881541**
ROGERS PROPERTY

700 GRASSY HILL RD
ORANGE, CT 06477

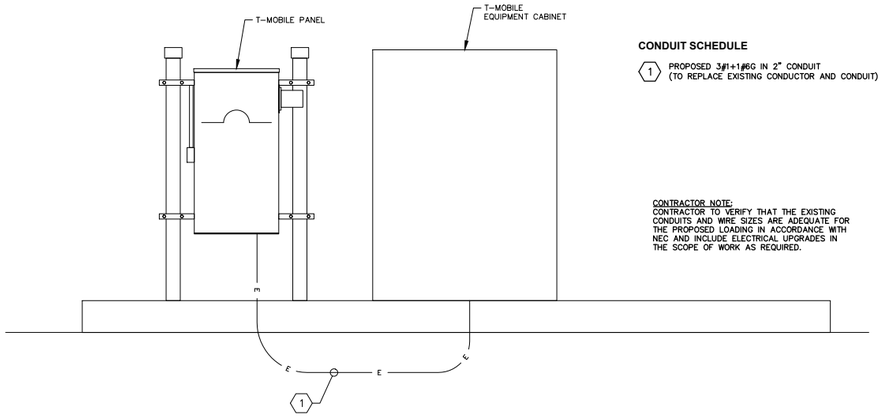
EXISTING 140'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	05/31/19	JW	ISSUED FOR PERMITTING	MCK
0	07/17/19	JW	ISSUED FOR CONSTR.	MCK

SHEET NUMBER: G-2

REVISION: 0

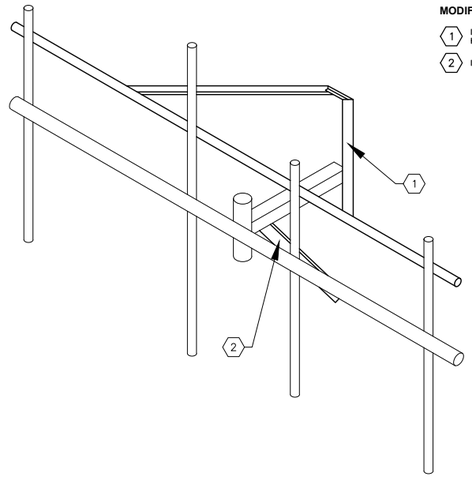


CONDUIT SCHEDULE

1. PROPOSED 3#1+1#6G IN 2" CONDUIT (TO REPLACE EXISTING CONDUCTOR AND CONDUIT)

CONTRACTOR NOTE:
CONTRACTOR TO VERIFY THAT THE EXISTING CONDUITS AND WIRE SIZES ARE ADEQUATE FOR THE PROPOSED LOADING IN ACCORDANCE WITH NEC AND INCLUDE ELECTRICAL UPGRADES IN THE SCOPE OF WORK AS REQUIRED.

1 ONE LINE DIAGRAM
SCALE: NOT TO SCALE



MODIFICATION SCHEDULE

1. INSTALLATION OF NEW PRK-SFS SECTOR FRAME HORIZONTAL STABILIZER KIT.
2. INSTALLATION OF NEW PV-PKPB-M KICKER

2 MOUNT DETAIL
SCALE: NOT TO SCALE

3 DETAIL NOT USED
SCALE: NOT TO SCALE

4 DETAIL NOT USED
SCALE: NOT TO SCALE

T-Mobile
12920 SE 38TH STREET
BELLEVUE, WA 98006

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

Kimley»Horn
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T-MOBILE SITE NUMBER:
CT11083Q

BU #: **881541**
ROGERS PROPERTY

700 GRASSY HILL RD
ORANGE, CT 06477

EXISTING 140'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	05/31/19	JW	ISSUED FOR PERMITTING	MCK
0	07/17/19	JW	ISSUED FOR CONSTR.	MCK

FOR REFERENCE ONLY

SHEET NUMBER: E-1

REVISION: 0

Exhibit D

Structural Analysis Report

Date: **June 14, 2019**

Heather Simeone
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

Destek Engineering, LLC.
1281 Kennestone Cir. Suite 100
Marietta, GA 30066
(770) 693-0835

Subject:	**Structural Analysis Report**	
Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CT11083Q
	Carrier Site Name:	CT083/Sprint/Grassy Hill
Crown Castle Designation:	**Crown Castle BU Number:**	881541
	Crown Castle Site Name:	ROGERS PROPERTY
	Crown Castle JDE Job Number:	559347
	Crown Castle Work Order Number:	1755309
	Crown Castle Order Number:	479806 Rev. 0
Engineering Firm Designation:	**Destek Engineering, LLC. Project Number:**	1902113
Site Data:	**700 Grassy Hill Road, Orange, New Haven County, CT**	
	Latitude *41° 17' 7.75"*, Longitude *-73° 2' 33.27"*	
	139.5 Foot - Monopole Tower	

Dear Heather Simeone,

Destek Engineering, LLC. is pleased to submit this **"Structural Analysis 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:

LC7: Proposed Equipment Configuration **Sufficient Capacity, 79.3%**

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.

Structural analysis prepared by: Mehmet Ali Zeytun

Respectfully submitted by: 06/14/2018

Ahmet Colakoglu, PE
President

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 139.5 ft Monopole tower designed by Engineered Endeavors, Inc. The tower has been modified per reinforcement drawing prepared by B+T Group, in October of 2013. Reinforcement consist of addition of base plate stiffeners.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	125 mph
Exposure Category:	C
Topographic Factor:	1
Ice Thickness (Ultimate):	1.5 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
110.0	110.0	3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	10	1-5/8
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe		
		3	ericsson	KRY 112 144/1		
		3	ericsson	RADIO 4449 B12/B71		
		3	rfs celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe		
		1	site pro 1	PRK-SFS		
		1	perfect 10	PV-PKPB-M		
		1	tower mounts	T-Arm Mount [TA 602-3]		

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
136.0	140.0	3	ericsson	RRUS 11 B12	2 1 6	3/8 5/8 1-5/8
		3	ericsson	RRUS12/RRUS A2		
		6	powerwave technologies	LGP21401		
		1	raycap	DC6-48-60-18-8F		
	139.0	3	cci antennas	HPA-65R-BUU-H6 w/ Mount Pipe		
		3	kathrein	800 10121 w/ Mount Pipe		
	136.0	1	tower mounts	T-Arm Mount [TA 702-3]		
132.0	132.0	3	alcatel lucent	1900MHZ RRH (65MHZ)	-	-
		3	alcatel lucent	800MHZ RRH		
		1	tower mounts	Side Arm Mount [SO 102-3]		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
130.0	134.0	1	andrew	VHLP2-11	4 3 3	1-1/4 5/16 7983A
	132.0	1	dragonwave	A-ANT-23G-2-C		
		3	argus technologies	LLPX310R w/ Mount Pipe		
	130.0	3	alcatel lucent	800 EXTERNAL NOTCH FILTER		
		3	alcatel lucent	TD-RRH8X20-25		
		9	rfs celwave	ACU-A20-N		
		3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe		
		3	rfs celwave	APXVTM14-ALU-I20 w/ Mount Pipe		
		3	samsung telecommunications	FDD_R6_RRH		
		1	tower mounts	Sector Mount [SM 901-3]		
119.0	119.0	3	alcatel lucent	RRH2X40-AWS	1 12	1-1/4 1-5/8
		3	antel	BXA-171063-8BF-EDIN-0 w/ Mount Pipe		
		3	antel	BXA-70063-6CF-EDIN-0 w/ Mount Pipe		
		6	decibel	DB846F65ZAXY w/ Mount Pipe		
		3	rymsa wireless	MG D3-800TX w/ Mount Pipe		
		1	tower mounts	T-Arm Mount [TA 602-3]		
100.0	100.0	3	rfs celwave	APXV18-206517S-C w/ Mount Pipe	6	1-5/8
75.0	77.0	1	lucent	KS24019-L112A	1	1/2
	75.0	1	tower mounts	Side Arm Mount [SO 701-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Dr. Clarence Welti, P.E., P.C., dated 2/16/2004	2245154	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Engineered Endeavors Incorporated, Proj.# 12364, dated 8/9/2004	2208511	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Engineered Endeavors Incorporated, Proj.# 12364, dated 8/9/2004	2207700	CCISITES
4-MOUNT REINFORCEMENT DESIGN/DRAWINGS/DATA	MasTec Network Solutions, Proj.# 18545-MOD1, dated 04/26/2019	8447364	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	B+T GRP, WO# 661413, dated 10/24/2013	4024239	CCISITES
4-POST-MODIFICATION INSPECTION	SGS, Proj.# 130629, dated 2/6/2014	4432995	CCISITES
4-TOWER STRUCTURAL ANALYSIS REPORTS	Jacobs Engineering Group, Inc., Proj.# 1419636, dated 6/21/2017	6928837	CCISITES

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 in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	139.5 - 93.04	Pole	TP26.99x15.5x0.25	1	-12.43	1256.07	68.5	Pass
L2	93.04 - 46.38	Pole	TP37.91x25.5205x0.375	2	-23.49	2650.21	68.2	Pass
L3	46.38 - 0	Pole	TP48.5x35.874x0.375	3	-39.74	3518.48	79.3	Pass
							Summary	
						Pole (L3)	79.3	Pass
						Rating =	79.3	Pass

Table 5 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	66.1	Pass
1	Base Plate	0	69.0	Pass
1	Base Foundation	0	42.6	Pass
1	Base Foundation Soil Interaction	0	43.5	Pass

Structure Rating (max from all components) =	79.3%

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

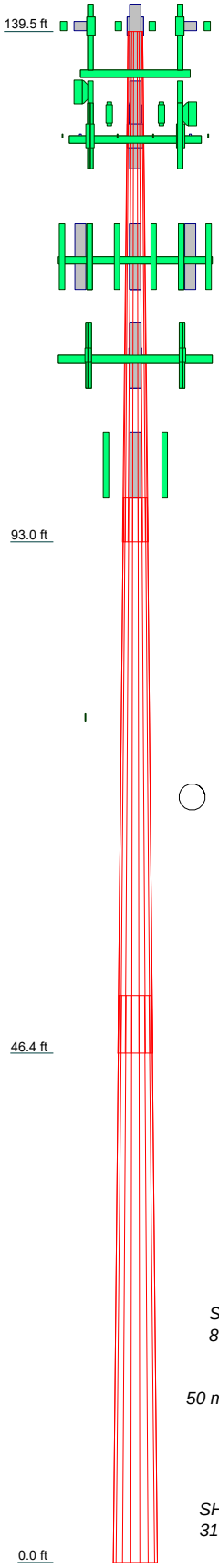
4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the proposed load configuration. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	46.46	18	0.2500	3.92	15.5000	26.9900		2.6
2	50.58	18	0.3750	5.25	25.5205	37.9100	A572-65	6.4
3	51.63	18	0.3750		35.8740	48.5000		8.7
								17.8



ALL REACTIONS ARE FACTORED

AXIAL 66 K
SHEAR 8 K
MOMENT 850 kip-ft
TORQUE 1 kip-ft
50 mph WIND - 1.5000 in ICE

AXIAL 40 K
SHEAR 31 K
MOMENT 3164 kip-ft
TORQUE 1 kip-ft
REACTIONS - 125 mph WIND

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure C 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 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TIA-222-H Annex S
9. TOWER RATING: 79.3%

DESTEK ENGINEERING
Destek Engineering, LLC.
1281 Kennestone Cir. Suite 100
Marietta, GA 30066
Phone: (770) 693-0835
FAX:

Job: ***881541 - ROGERS PROPOERTY***			
Project: ***1902113***			
Client: Crown Castle	Drawn by:	App'd:	
Code: TIA-222-H	Date: 06/14/19	Scale: NTS	
Path: C:\Users\desan3\Desktop\CROWN 2019\Crown\1902113 - 881541 ROGERS PROPERTY WO 1729908\WO 1755309\TNXTower\881541.eri		Dwg No. E-1	

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 New Haven County, Connecticut.
2) Tower base elevation above sea level: 91.00 ft.
3) Basic wind speed of 125 mph.
4) Risk Category II.
5) Exposure Category C.
6) Simplified Topographic Factor Procedure for wind speed-up calculations is used.
7) Topographic Category: 1.
8) Crest Height: 0.00 ft.
9) Nominal ice thickness of 1.5000 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) TIA-222-H Annex S.
16) A non-linear (P-delta) analysis was used.
17) Pressures are calculated at each section.
18) Stress ratio used in pole design is 1.05.
19) Tower analysis based on target reliabilities in accordance with Annex S.
20) Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
21) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	*Elevation*	*Section Length*	*Splice Length*	*Number of Sides*	*Top Diameter*	*Bottom Diameter*	*Wall Thickness*	*Bend Radius*	*Pole Grade*
	ft	*ft*	*ft*		*in*	*in*	*in*	*in*	
L1	139.50-93.04	46.46	3.92	18	15.5000	26.9900	0.2500	0.3750	A572-65 (65 ksi)

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
L2	93.04-46.38	50.58	5.25	18	25.5205	37.9100	0.3750	0.5625	A572-65 (65 ksi)
L3	46.38-0.00	51.63		18	35.8740	48.5000	0.3750	0.5625	A572-65 (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	15.7198	12.1009	355.5445	5.4138	7.8740	45.1542	711.5567	6.0516	2.5080	10.032
	27.3871	21.2182	1916.7638	9.4927	13.7109	139.7983	3836.0497	10.6111	4.5302	18.121
L2	26.8603	29.9295	2390.8862	8.9267	12.9644	184.4188	4784.9184	14.9676	4.1616	11.098
	38.4659	44.6760	7952.1562	13.3249	19.2583	412.9214	15914.7760	22.3423	6.3422	16.912
L3	37.7022	42.2527	6727.0540	12.6022	18.2240	369.1315	13462.9597	21.1304	5.9838	15.957
	49.2193	57.2808	16760.5346	17.0844	24.6380	680.2717	33543.1232	28.6458	8.2060	21.883

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	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 139.50-93.04				1	1	1			
L2 93.04-46.38				1	1	1			
L3 46.38-0.00				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
HB114-21U3M12-XXXF(1-1/4)	A	No	Surface Ar (CaAa)	130.00 - 0.00	1	1	0.490 0.490	1.5400		1.22
7983A(ELLIPTICAL)	A	No	Surface Ar (CaAa)	130.00 - 0.00	1	1	0.000 0.000	0.0000		0.08
7983A(ELLIPTICAL)	A	No	Surface Ar (CaAa)	130.00 - 0.00	2	2	0.200 0.230	0.5730		0.08
2" Rigid Conduit	A	No	Surface Ar (CaAa)	130.00 - 0.00	2	2	0.150 0.200	2.0000		2.80
HCS 6X12 4AWG(1-5/8) ***	B	No	Surface Ar (CaAa)	110.00 - 0.00	4	4	0.050 0.200	1.6600		2.40

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
Safety Line 3/8	C	No	No	CaAa (Out Of Face)	139.50 - 0.00	1	No Ice 1/2" Ice 1" Ice	0.04 0.14 0.24	0.22 0.75 1.28

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
							2" Ice	0.44	2.34
***136' ***									
LDF7-50A(1-5/8)	B	No	No	Inside Pole	136.00 - 0.00	6	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
							2" Ice	0.00	0.82
FB-L98B-002-75000(3/8)	B	No	No	Inside Pole	136.00 - 0.00	2	No Ice	0.00	0.06
							1/2" Ice	0.00	0.06
							1" Ice	0.00	0.06
							2" Ice	0.00	0.06
WR-VG82ST-BRDA(5/8)	B	No	No	Inside Pole	136.00 - 0.00	1	No Ice	0.00	0.31
							1/2" Ice	0.00	0.31
							1" Ice	0.00	0.31
							2" Ice	0.00	0.31
2" Rigid Conduit	B	No	No	Inside Pole	136.00 - 0.00	1	No Ice	0.00	2.80
							1/2" Ice	0.00	2.80
							1" Ice	0.00	2.80
							2" Ice	0.00	2.80
***130' ***									
HB114-1-0813U4-M5J(1-1/4)	A	No	No	Inside Pole	130.00 - 0.00	3	No Ice	0.00	1.20
							1/2" Ice	0.00	1.20
							1" Ice	0.00	1.20
							2" Ice	0.00	1.20
9207(5/16)	A	No	No	Inside Pole	130.00 - 0.00	3	No Ice	0.00	0.06
							1/2" Ice	0.00	0.06
							1" Ice	0.00	0.06
							2" Ice	0.00	0.06
***119' **									
561(1-5/8)	A	No	No	Inside Pole	119.00 - 0.00	12	No Ice	0.00	1.35
							1/2" Ice	0.00	1.35
							1" Ice	0.00	1.35
							2" Ice	0.00	1.35
LDF6-50A(1-1/4)	A	No	No	Inside Pole	119.00 - 0.00	1	No Ice	0.00	0.60
							1/2" Ice	0.00	0.60
							1" Ice	0.00	0.60
							2" Ice	0.00	0.60
***110' **									
LDF7-50A(1-5/8)	B	No	No	Inside Pole	110.00 - 0.00	6	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
							2" Ice	0.00	0.82
***100' ***									
CR 50 1873(1-5/8)	B	No	No	Inside Pole	100.00 - 0.00	6	No Ice	0.00	0.83
							1/2" Ice	0.00	0.83
							1" Ice	0.00	0.83
							2" Ice	0.00	0.83
***75' **									
LDF4-50A(1/2)	B	No	No	Inside Pole	75.00 - 0.00	1	No Ice	0.00	0.15
							1/2" Ice	0.00	0.15
							1" Ice	0.00	0.15
							2" Ice	0.00	0.15
***									

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	139.50-93.04	A	0.000	0.000	24.711	0.000	0.84
		B	0.000	0.000	11.261	0.000	0.63
		C	0.000	0.000	0.000	1.742	0.01
L2	93.04-46.38	A	0.000	0.000	31.197	0.000	1.29
		B	0.000	0.000	30.982	0.000	1.29

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C	0.000	0.000	0.000	1.750	0.01
L3	46.38-0.00	A	0.000	0.000	31.010	0.000	1.28
		B	0.000	0.000	30.796	0.000	1.29
		C	0.000	0.000	0.000	1.739	0.01

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	139.50-93.04	A	1.444	0.000	0.000	77.493	0.000	1.60
		B		0.000	0.000	20.199	0.000	0.83
		C		0.000	0.000	0.000	15.158	0.08
L2	93.04-46.38	A	1.372	0.000	0.000	97.831	0.000	2.26
		B		0.000	0.000	55.570	0.000	1.84
		C		0.000	0.000	0.000	15.223	0.08
L3	46.38-0.00	A	1.231	0.000	0.000	94.250	0.000	2.17
		B		0.000	0.000	54.405	0.000	1.80
		C		0.000	0.000	0.000	14.467	0.08

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	139.50-93.04	-0.1420	-2.8203	-1.2857	-2.6359
L2	93.04-46.38	1.4657	-3.5960	-0.3604	-3.4911
L3	46.38-0.00	1.6093	-3.9516	-0.3808	-4.0499

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	9	HB114-21U3M12-XXXF(1-1/4)	93.04 - 130.00	1.0000	1.0000
L1	11	7983A(ELLIPTICAL)	93.04 - 130.00	1.0000	1.0000
L1	12	7983A(ELLIPTICAL)	93.04 - 130.00	1.0000	1.0000
L1	13	2" Rigid Conduit	93.04 - 130.00	1.0000	1.0000
L1	20	HCS 6X12 4AWG(1-5/8)	93.04 - 110.00	1.0000	1.0000
L2	9	HB114-21U3M12-XXXF(1-1/4)	46.38 - 93.04	1.0000	1.0000
L2	11	7983A(ELLIPTICAL)	46.38 - 93.04	1.0000	1.0000
L2	12	7983A(ELLIPTICAL)	46.38 - 93.04	1.0000	1.0000
L2	13	2" Rigid Conduit	46.38 - 93.04	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L2	20	HCS 6X12 4AWG(1-5/8)	46.38 - 93.04	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
***136' ***									
800 10121 w/ Mount Pipe	A	From Leg	4.00 0.00 3.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.39 5.81 6.23 7.10	4.60 5.35 6.05 7.48	0.07 0.11 0.17 0.30
800 10121 w/ Mount Pipe	B	From Leg	4.00 0.00 3.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.39 5.81 6.23 7.10	4.60 5.35 6.05 7.48	0.07 0.11 0.17 0.30
800 10121 w/ Mount Pipe	C	From Leg	4.00 0.00 3.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.39 5.81 6.23 7.10	4.60 5.35 6.05 7.48	0.07 0.11 0.17 0.30
HPA-65R-BUU-H6 w/ Mount Pipe	A	From Leg	4.00 0.00 3.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice	9.22 9.98 10.76 12.36	6.25 6.96 7.70 9.22	0.07 0.14 0.22 0.42
HPA-65R-BUU-H6 w/ Mount Pipe	B	From Leg	4.00 0.00 3.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice	9.22 9.98 10.76 12.36	6.25 6.96 7.70 9.22	0.07 0.14 0.22 0.42
HPA-65R-BUU-H6 w/ Mount Pipe	C	From Leg	4.00 0.00 3.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice	9.22 9.98 10.76 12.36	6.25 6.96 7.70 9.22	0.07 0.14 0.22 0.42
(2) LGP21401	A	From Leg	4.00 0.00 4.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.10 1.24 1.38 1.69	0.21 0.27 0.35 0.52	0.01 0.02 0.03 0.05
(2) LGP21401	B	From Leg	4.00 0.00 4.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.10 1.24 1.38 1.69	0.21 0.27 0.35 0.52	0.01 0.02 0.03 0.05
(2) LGP21401	C	From Leg	4.00 0.00 4.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.10 1.24 1.38 1.69	0.21 0.27 0.35 0.52	0.01 0.02 0.03 0.05
RRUS 11 B12	A	From Leg	4.00 0.00 4.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.83 3.04 3.26 3.71	1.18 1.33 1.48 1.83	0.05 0.07 0.10 0.15

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
RRUS 11 B12	B	From Leg	4.00 0.00 4.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.83 3.04 3.26 3.71	1.18 1.33 1.48 1.83	0.05 0.07 0.10 0.15
RRUS 11 B12	C	From Leg	4.00 0.00 4.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.83 3.04 3.26 3.71	1.18 1.33 1.48 1.83	0.05 0.07 0.10 0.15
RRUS12/RRUS A2	A	From Leg	4.00 0.00 4.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.14 3.36 3.59 4.07	1.84 2.01 2.20 2.59	0.07 0.10 0.13 0.20
RRUS12/RRUS A2	B	From Leg	4.00 0.00 4.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.14 3.36 3.59 4.07	1.84 2.01 2.20 2.59	0.07 0.10 0.13 0.20
RRUS12/RRUS A2	C	From Leg	4.00 0.00 4.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.14 3.36 3.59 4.07	1.84 2.01 2.20 2.59	0.07 0.10 0.13 0.20
DC6-48-60-18-8F	A	From Leg	4.00 0.00 4.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.79 1.27 1.45 1.83	0.79 1.27 1.45 1.83	0.02 0.03 0.05 0.09
T-Arm Mount [TA 702-3]	C	None		0.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.64 6.55 7.46 9.28	5.64 6.55 7.46 9.28	0.34 0.43 0.52 0.70
***132' ***									
1900MHZ RRH (65MHZ)	A	From Leg	2.00 0.00 0.00	0.0000	132.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.32 2.53 2.74 3.19	2.24 2.44 2.65 3.09	0.06 0.08 0.11 0.17
1900MHZ RRH (65MHZ)	B	From Leg	2.00 0.00 0.00	0.0000	132.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.32 2.53 2.74 3.19	2.24 2.44 2.65 3.09	0.06 0.08 0.11 0.17
1900MHZ RRH (65MHZ)	C	From Leg	2.00 0.00 0.00	0.0000	132.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.32 2.53 2.74 3.19	2.24 2.44 2.65 3.09	0.06 0.08 0.11 0.17
800MHZ RRH	A	From Leg	2.00 0.00 0.00	0.0000	132.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.13 2.32 2.51 2.92	1.77 1.95 2.13 2.51	0.05 0.07 0.10 0.16
800MHZ RRH	B	From Leg	2.00 0.00 0.00	0.0000	132.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.13 2.32 2.51 2.92	1.77 1.95 2.13 2.51	0.05 0.07 0.10 0.16
800MHZ RRH	C	From Leg	2.00 0.00 0.00	0.0000	132.00	No Ice 1/2" Ice 1" Ice	2.13 2.32 2.51 2.92	1.77 1.95 2.13 2.51	0.05 0.07 0.10 0.16

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
							2" Ice			
Side Arm Mount [SO 102-3]	C	None			0.0000	132.00	No Ice	3.00	3.00	0.08
							1/2" Ice	3.48	3.48	0.11
							1" Ice	3.96	3.96	0.14
							2" Ice	4.92	4.92	0.20
***130' ***										
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.00	0.00	0.0000	130.00	No Ice	4.60	4.01	0.09
			0.00				1/2" Ice	5.05	4.45	0.15
			0.00				1" Ice	5.50	4.89	0.23
							2" Ice	6.44	5.82	0.41
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.00	0.00	0.0000	130.00	No Ice	4.60	4.01	0.09
			0.00				1/2" Ice	5.05	4.45	0.15
			0.00				1" Ice	5.50	4.89	0.23
							2" Ice	6.44	5.82	0.41
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00	0.00	0.0000	130.00	No Ice	4.60	4.01	0.09
			0.00				1/2" Ice	5.05	4.45	0.15
			0.00				1" Ice	5.50	4.89	0.23
							2" Ice	6.44	5.82	0.41
LLPX310R w/ Mount Pipe	A	From Leg	4.00	0.00	0.0000	130.00	No Ice	4.54	2.98	0.05
			0.00				1/2" Ice	4.89	3.53	0.08
			2.00				1" Ice	5.25	4.09	0.13
							2" Ice	6.01	5.24	0.23
LLPX310R w/ Mount Pipe	B	From Leg	4.00	0.00	0.0000	130.00	No Ice	4.54	2.98	0.05
			0.00				1/2" Ice	4.89	3.53	0.08
			2.00				1" Ice	5.25	4.09	0.13
							2" Ice	6.01	5.24	0.23
LLPX310R w/ Mount Pipe	C	From Leg	4.00	0.00	0.0000	130.00	No Ice	4.54	2.98	0.05
			0.00				1/2" Ice	4.89	3.53	0.08
			2.00				1" Ice	5.25	4.09	0.13
							2" Ice	6.01	5.24	0.23
APXVTM14-ALU-I20 w/ Mount Pipe	A	From Leg	4.00	0.00	0.0000	130.00	No Ice	6.58	4.96	0.08
			0.00				1/2" Ice	7.03	5.75	0.13
			0.00				1" Ice	7.47	6.47	0.19
							2" Ice	8.38	7.94	0.34
APXVTM14-ALU-I20 w/ Mount Pipe	B	From Leg	4.00	0.00	0.0000	130.00	No Ice	6.58	4.96	0.08
			0.00				1/2" Ice	7.03	5.75	0.13
			0.00				1" Ice	7.47	6.47	0.19
							2" Ice	8.38	7.94	0.34
APXVTM14-ALU-I20 w/ Mount Pipe	C	From Leg	4.00	0.00	0.0000	130.00	No Ice	6.58	4.96	0.08
			0.00				1/2" Ice	7.03	5.75	0.13
			0.00				1" Ice	7.47	6.47	0.19
							2" Ice	8.38	7.94	0.34
(3) ACU-A20-N	A	From Leg	4.00	0.00	0.0000	130.00	No Ice	0.07	0.12	0.00
			0.00				1/2" Ice	0.10	0.16	0.00
			0.00				1" Ice	0.15	0.21	0.00
							2" Ice	0.26	0.34	0.01
(3) ACU-A20-N	B	From Leg	4.00	0.00	0.0000	130.00	No Ice	0.07	0.12	0.00
			0.00				1/2" Ice	0.10	0.16	0.00
			0.00				1" Ice	0.15	0.21	0.00
							2" Ice	0.26	0.34	0.01
(3) ACU-A20-N	C	From Leg	4.00	0.00	0.0000	130.00	No Ice	0.07	0.12	0.00
			0.00				1/2" Ice	0.10	0.16	0.00
			0.00				Ice	0.15	0.21	0.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice	0.26	0.34	0.01
						2" Ice			
800 EXTERNAL NOTCH FILTER	A	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.66 0.76 0.87 1.11	0.32 0.40 0.48 0.67	0.01 0.02 0.02 0.04
800 EXTERNAL NOTCH FILTER	B	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.66 0.76 0.87 1.11	0.32 0.40 0.48 0.67	0.01 0.02 0.02 0.04
800 EXTERNAL NOTCH FILTER	C	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.66 0.76 0.87 1.11	0.32 0.40 0.48 0.67	0.01 0.02 0.02 0.04
FDD_R6_RRH	A	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.53 1.69 1.85 2.20	0.68 0.80 0.92 1.19	0.03 0.04 0.06 0.09
FDD_R6_RRH	B	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.53 1.69 1.85 2.20	0.68 0.80 0.92 1.19	0.03 0.04 0.06 0.09
FDD_R6_RRH	C	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.53 1.69 1.85 2.20	0.68 0.80 0.92 1.19	0.03 0.04 0.06 0.09
TD-RRH8X20-25	A	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.05 4.30 4.56 5.10	1.53 1.71 1.90 2.30	0.07 0.10 0.13 0.20
TD-RRH8X20-25	B	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.05 4.30 4.56 5.10	1.53 1.71 1.90 2.30	0.07 0.10 0.13 0.20
TD-RRH8X20-25	C	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.05 4.30 4.56 5.10	1.53 1.71 1.90 2.30	0.07 0.10 0.13 0.20
6'-P2x0.154	B	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	0.02 0.03 0.05 0.09
6'-P2x0.154	C	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	0.02 0.03 0.05 0.09
Sector Mount [SM 901-3]	C	None		0.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice	11.91 15.84 19.77 27.64	11.91 15.84 19.77 27.64	1.16 1.32 1.48 1.81
***119' ***									
(2) DB846F65ZAXY w/ Mount Pipe	A	From Leg	4.00 0.00	0.0000	119.00	No Ice	7.27 7.83	7.82 9.01	0.05 0.11

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice	8.35 9.40	9.91 11.73	0.19 0.37
						1" Ice 2" Ice			
(2) DB846F65ZAXY w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.27 7.83 8.35 9.40	7.82 9.01 9.91 11.73	0.05 0.11 0.19 0.37
(2) DB846F65ZAXY w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.27 7.83 8.35 9.40	7.82 9.01 9.91 11.73	0.05 0.11 0.19 0.37
BXA-171063-8BF-EDIN-0 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.18 3.56 3.93 4.69	3.35 3.97 4.60 5.89	0.03 0.06 0.10 0.19
BXA-171063-8BF-EDIN-0 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.18 3.56 3.93 4.69	3.35 3.97 4.60 5.89	0.03 0.06 0.10 0.19
BXA-171063-8BF-EDIN-0 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.18 3.56 3.93 4.69	3.35 3.97 4.60 5.89	0.03 0.06 0.10 0.19
BXA-70063-6CF-EDIN-0 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.81 8.36 8.87 9.93	5.80 6.95 7.82 9.60	0.04 0.10 0.17 0.34
BXA-70063-6CF-EDIN-0 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.81 8.36 8.87 9.93	5.80 6.95 7.82 9.60	0.04 0.10 0.17 0.34
BXA-70063-6CF-EDIN-0 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.81 8.36 8.87 9.93	5.80 6.95 7.82 9.60	0.04 0.10 0.17 0.34
MG D3-800TX w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.57 3.98 4.39 5.20	3.42 4.12 4.78 6.16	0.03 0.07 0.11 0.21
MG D3-800TX w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.57 3.98 4.39 5.20	3.42 4.12 4.78 6.16	0.03 0.07 0.11 0.21
MG D3-800TX w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.57 3.98 4.39 5.20	3.42 4.12 4.78 6.16	0.03 0.07 0.11 0.21
RRH2X40-AWS	A	From Leg	4.00 0.00 0.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.16 2.36 2.57 3.00	1.42 1.59 1.77 2.14	0.04 0.06 0.08 0.13
RRH2X40-AWS	B	From Leg	4.00	0.0000	119.00	No Ice	2.16	1.42	0.04

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00 0.00			1/2" Ice 1" Ice 2" Ice	2.36 2.57 3.00	1.59 1.77 2.14	0.06 0.08 0.13
RRH2X40-AWS	C	From Leg	4.00 0.00 0.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.16 2.36 2.57 3.00	1.42 1.59 1.77 2.14	0.04 0.06 0.08 0.13
T-Arm Mount [TA 602-3]	C	None		0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice	13.04 17.37 21.70 30.36	13.04 17.37 21.70 30.36	0.87 1.11 1.36 1.84
***110' ***									
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.33 6.78 7.21 8.12	5.64 6.43 7.13 8.59	0.11 0.17 0.23 0.38
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.33 6.78 7.21 8.12	5.64 6.43 7.13 8.59	0.11 0.17 0.23 0.38
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.33 6.78 7.21 8.12	5.64 6.43 7.13 8.59	0.11 0.17 0.23 0.38
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.32 6.76 7.20 8.10	5.63 6.41 7.12 8.57	0.11 0.17 0.23 0.38
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.32 6.76 7.20 8.10	5.63 6.41 7.12 8.57	0.11 0.17 0.23 0.38
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.32 6.76 7.20 8.10	5.63 6.41 7.12 8.57	0.11 0.17 0.23 0.38
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	20.48 21.23 21.99 23.44	11.02 12.55 14.10 16.45	0.16 0.30 0.44 0.78
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	20.48 21.23 21.99 23.44	11.02 12.55 14.10 16.45	0.16 0.30 0.44 0.78
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	20.48 21.23 21.99 23.44	11.02 12.55 14.10 16.45	0.16 0.30 0.44 0.78
KRY 112 144/1	A	From Leg	4.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.35 0.43 0.51 0.70	0.17 0.23 0.30 0.46	0.01 0.01 0.02 0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
KRY 112 144/1	B	From Leg	4.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.35 0.43 0.51 0.70	0.17 0.23 0.30 0.46	0.01 0.01 0.02 0.03
KRY 112 144/1	C	From Leg	4.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.35 0.43 0.51 0.70	0.17 0.23 0.30 0.46	0.01 0.01 0.02 0.03
RADIO 4449 B12/B71	A	From Leg	4.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.65 1.81 1.98 2.34	1.30 1.44 1.60 1.92	0.08 0.09 0.11 0.16
RADIO 4449 B12/B71	B	From Leg	4.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.65 1.81 1.98 2.34	1.30 1.44 1.60 1.92	0.08 0.09 0.11 0.16
RADIO 4449 B12/B71	C	From Leg	4.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.65 1.81 1.98 2.34	1.30 1.44 1.60 1.92	0.08 0.09 0.11 0.16
6'-P2x0.154	A	From Leg	4.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	0.02 0.03 0.05 0.09
6'-P2x0.154	B	From Leg	4.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	0.02 0.03 0.05 0.09
6'-P2x0.154	C	From Leg	4.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	0.02 0.03 0.05 0.09
13.25'-P2x0.154 H	A	From Leg	4.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.15 4.50 5.87 8.66	0.01 0.11 0.21 0.40	0.05 0.07 0.10 0.19
13.25'-P2x0.154 H	B	From Leg	4.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.15 4.50 5.87 8.66	0.01 0.11 0.21 0.40	0.05 0.07 0.10 0.19
13.25'-P2x0.154 H	C	From Leg	4.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.15 4.50 5.87 8.66	0.01 0.11 0.21 0.40	0.05 0.07 0.10 0.19
PRK-SFS	C	None		0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	13.13 17.83 22.54 31.96	13.13 17.83 22.54 31.96	0.25 0.27 0.28 0.32
Miscellaneous [NA 509-3]	C	None		0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	11.84 16.96 22.08 32.32	11.84 16.96 22.08 32.32	0.28 0.30 0.32 0.36

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
T-Arm Mount [TA 602-3]	C	None		0.0000	110.00	No Ice	12.88	12.88	0.86
						1/2" Ice	17.16	17.16	1.10
						1" Ice	21.43	21.43	1.34
						2" Ice	29.99	29.99	1.82
***100' ***									
APXV18-206517S-C w/ Mount Pipe	A	From Leg	2.00 / 0.00	0.0000	100.00	No Ice	3.79	3.16	0.05
			0.00			1/2" Ice	4.38	3.75	0.09
						1" Ice	4.99	4.35	0.15
						2" Ice	6.25	5.59	0.28
APXV18-206517S-C w/ Mount Pipe	B	From Leg	2.00 / 0.00	0.0000	100.00	No Ice	3.79	3.16	0.05
			0.00			1/2" Ice	4.38	3.75	0.09
						1" Ice	4.99	4.35	0.15
						2" Ice	6.25	5.59	0.28
APXV18-206517S-C w/ Mount Pipe	C	From Leg	2.00 / 0.00	0.0000	100.00	No Ice	3.79	3.16	0.05
			0.00			1/2" Ice	4.38	3.75	0.09
						1" Ice	4.99	4.35	0.15
						2" Ice	6.25	5.59	0.28
***75' ***									
KS24019-L112A	C	From Leg	4.00 / 0.00	0.0000	75.00	No Ice	0.14	0.14	0.01
			2.00			1/2" Ice	0.20	0.20	0.01
						1" Ice	0.26	0.26	0.01
						2" Ice	0.41	0.41	0.02
Side Arm Mount [SO 701-1]	C	None		0.0000	75.00	No Ice	0.85	1.67	0.07
						1/2" Ice	1.14	2.34	0.08
						1" Ice	1.43	3.01	0.09
						2" Ice	2.01	4.35	0.12

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
A-ANT-23G-2-C	B	Paraboloid w/Shroud (HP)	From Leg	4.00 / 0.00 / 2.00	10.0000		130.00	2.17	No Ice	3.72	0.03
									1/2" Ice	4.01	0.05
									1" Ice	4.30	0.07
									2" Ice	4.88	0.11
VHLP2-11	C	Paraboloid w/Shroud (HP)	From Leg	4.00 / 0.00 / 4.00	-20.0000		130.00	2.17	No Ice	3.72	0.03
									1/2" Ice	4.01	0.05
									1" Ice	4.30	0.07
									2" Ice	4.88	0.11

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

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	139.5 - 93.04	Pole	Max Tension	14	0.00	-0.00	0.00
			Max. Compression	26	-30.88	0.64	0.32
			Max. Mx	20	-12.44	553.56	0.41
			Max. My	2	-12.43	0.64	554.68
			Max. Vy	20	-22.67	553.56	0.41
			Max. Vx	2	-22.70	0.64	554.68
			Max. Torque	3			0.59
L2	93.04 - 46.38	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-45.25	1.20	1.93
			Max. Mx	20	-23.49	1672.86	1.67
			Max. My	2	-23.49	1.56	1676.03
			Max. Vy	20	-26.74	1672.86	1.67

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	2	-26.77	1.56	1676.03
			Max. Torque	11			-0.63
L3	46.38 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-65.53	1.74	4.20
			Max. Mx	20	-39.74	3158.24	3.34
			Max. My	2	-39.74	2.46	3164.07
			Max. Vy	20	-30.58	3158.24	3.34
			Max. Vx	2	-30.60	2.46	3164.07
			Max. Torque	13			-0.74

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	27	65.53	0.00	8.05
	Max. H_x	20	39.78	30.53	0.01
	Max. H_z	2	39.78	0.02	30.56
	Max. M_x	2	3164.07	0.02	30.56
	Max. M_z	8	3157.06	-30.52	0.04
	Max. Torsion	23	0.69	26.46	15.25
	Min. Vert	7	29.83	-26.46	15.26
	Min. H_x	8	39.78	-30.52	0.04
	Min. H_z	14	39.78	-0.01	-30.49
	Min. M_x	14	-3151.33	-0.01	-30.49
	Min. M_z	20	-3158.24	30.53	0.01
	Min. Torsion	13	-0.74	-15.22	-26.42

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	33.15	0.00	0.00	-1.31	-0.20	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	39.78	-0.02	-30.56	-3164.07	2.46	-0.43
0.9 Dead+1.0 Wind 0 deg - No Ice	29.83	-0.02	-30.56	-3123.83	2.48	-0.43
1.2 Dead+1.0 Wind 30 deg - No Ice	39.78	15.26	-26.45	-2738.30	-1578.88	0.01
0.9 Dead+1.0 Wind 30 deg - No Ice	29.83	15.26	-26.45	-2703.41	-1558.94	0.01
1.2 Dead+1.0 Wind 60 deg - No Ice	39.78	26.46	-15.26	-1580.46	-2737.99	0.25
0.9 Dead+1.0 Wind 60 deg - No Ice	29.83	26.46	-15.26	-1560.15	-2703.45	0.25
1.2 Dead+1.0 Wind 90 deg - No Ice	39.78	30.52	-0.04	-7.82	-3157.06	0.24
0.9 Dead+1.0 Wind 90 deg - No Ice	29.83	30.52	-0.04	-7.30	-3117.26	0.24
1.2 Dead+1.0 Wind 120 deg - No Ice	39.78	26.41	15.23	1572.03	-2731.15	0.74
0.9 Dead+1.0 Wind 120 deg - No Ice	29.83	26.41	15.23	1552.65	-2696.70	0.74
1.2 Dead+1.0 Wind 150 deg - No Ice	39.78	15.22	26.42	2730.59	-1573.32	0.74
0.9 Dead+1.0 Wind 150 deg - No Ice	29.83	15.22	26.42	2696.60	-1553.46	0.74
1.2 Dead+1.0 Wind 180 deg - No Ice	39.78	0.01	30.49	3151.33	-0.96	0.35

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
0.9 Dead+1.0 Wind 180 deg - No Ice	29.83	0.01	30.49	3112.07	-0.89	0.35
1.2 Dead+1.0 Wind 210 deg - No Ice	39.78	-15.22	26.42	2731.02	1572.51	-0.11
0.9 Dead+1.0 Wind 210 deg - No Ice	29.83	-15.22	26.42	2697.03	1552.78	-0.11
1.2 Dead+1.0 Wind 240 deg - No Ice	39.78	-26.43	15.20	1568.24	2733.81	-0.24
0.9 Dead+1.0 Wind 240 deg - No Ice	29.83	-26.43	15.20	1548.91	2699.44	-0.24
1.2 Dead+1.0 Wind 270 deg - No Ice	39.78	-30.53	-0.01	-3.34	3158.24	-0.34
0.9 Dead+1.0 Wind 270 deg - No Ice	29.83	-30.53	-0.01	-2.89	3118.54	-0.34
1.2 Dead+1.0 Wind 300 deg - No Ice	39.78	-26.46	-15.25	-1578.84	2737.88	-0.69
0.9 Dead+1.0 Wind 300 deg - No Ice	29.83	-26.46	-15.25	-1558.55	2703.46	-0.69
1.2 Dead+1.0 Wind 330 deg - No Ice	39.78	-15.23	-26.47	-2741.17	1574.59	-0.66
0.9 Dead+1.0 Wind 330 deg - No Ice	29.83	-15.23	-26.47	-2706.24	1554.83	-0.66
1.2 Dead+1.0 Ice+1.0 Temp	65.53	-0.00	-0.00	-4.20	1.74	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	65.53	-0.00	-8.05	-850.04	2.37	-0.40
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	65.53	4.02	-6.97	-736.29	-420.49	-0.18
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	65.53	6.97	-4.02	-426.69	-730.35	0.05
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	65.53	8.04	-0.01	-5.65	-842.69	0.23
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	65.53	6.96	4.01	416.89	-728.91	0.46
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	65.53	4.01	6.96	726.64	-419.32	0.51
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	65.53	0.00	8.04	839.33	1.66	0.38
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	65.53	-4.01	6.96	726.73	422.87	0.15
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	65.53	-6.96	4.01	416.10	733.19	-0.05
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	65.53	-8.04	-0.00	-4.71	846.66	-0.25
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	65.53	-6.97	-4.02	-426.35	734.05	-0.45
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	65.53	-4.02	-6.97	-736.89	423.31	-0.49
Dead+Wind 0 deg - Service	33.15	-0.00	-6.63	-683.61	0.38	-0.10
Dead+Wind 30 deg - Service	33.15	3.31	-5.74	-591.75	-340.77	0.00
Dead+Wind 60 deg - Service	33.15	5.74	-3.31	-341.96	-590.83	0.06
Dead+Wind 90 deg - Service	33.15	6.62	-0.01	-2.69	-681.23	0.05
Dead+Wind 120 deg - Service	33.15	5.73	3.30	338.13	-589.34	0.16
Dead+Wind 150 deg - Service	33.15	3.30	5.73	588.07	-339.56	0.16
Dead+Wind 180 deg - Service	33.15	0.00	6.62	678.84	-0.35	0.08
Dead+Wind 210 deg - Service	33.15	-3.30	5.73	588.16	339.09	-0.03
Dead+Wind 240 deg - Service	33.15	-5.74	3.30	337.31	589.62	-0.05
Dead+Wind 270 deg - Service	33.15	-6.62	-0.00	-1.72	681.19	-0.07
Dead+Wind 300 deg - Service	33.15	-5.74	-3.31	-341.61	590.51	-0.15
Dead+Wind 330 deg - Service	33.15	-3.31	-5.74	-592.37	339.55	-0.15

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.00	-33.15	0.00	0.00	33.15	0.00	0.000%
2	-0.02	-39.78	-30.56	0.02	39.78	30.56	0.000%
3	-0.02	-29.83	-30.56	0.02	29.83	30.56	0.000%
4	15.26	-39.78	-26.45	-15.26	39.78	26.45	0.000%
5	15.26	-29.83	-26.45	-15.26	29.83	26.45	0.000%
6	26.46	-39.78	-15.26	-26.46	39.78	15.26	0.000%
7	26.46	-29.83	-15.26	-26.46	29.83	15.26	0.000%
8	30.52	-39.78	-0.04	-30.52	39.78	0.04	0.000%
9	30.52	-29.83	-0.04	-30.52	29.83	0.04	0.000%
10	26.41	-39.78	15.23	-26.41	39.78	-15.23	0.000%
11	26.41	-29.83	15.23	-26.41	29.83	-15.23	0.000%
12	15.22	-39.78	26.42	-15.22	39.78	-26.42	0.000%
13	15.22	-29.83	26.42	-15.22	29.83	-26.42	0.000%
14	0.01	-39.78	30.49	-0.01	39.78	-30.49	0.000%
15	0.01	-29.83	30.49	-0.01	29.83	-30.49	0.000%
16	-15.22	-39.78	26.42	15.22	39.78	-26.42	0.000%
17	-15.22	-29.83	26.42	15.22	29.83	-26.42	0.000%
18	-26.43	-39.78	15.20	26.43	39.78	-15.20	0.000%
19	-26.43	-29.83	15.20	26.43	29.83	-15.20	0.000%
20	-30.53	-39.78	-0.01	30.53	39.78	0.01	0.000%
21	-30.53	-29.83	-0.01	30.53	29.83	0.01	0.000%
22	-26.46	-39.78	-15.25	26.46	39.78	15.25	0.000%
23	-26.46	-29.83	-15.25	26.46	29.83	15.25	0.000%
24	-15.23	-39.78	-26.47	15.23	39.78	26.47	0.000%
25	-15.23	-29.83	-26.47	15.23	29.83	26.47	0.000%
26	0.00	-65.53	0.00	0.00	65.53	0.00	0.000%
27	-0.00	-65.53	-8.05	0.00	65.53	8.05	0.000%
28	4.02	-65.53	-6.97	-4.02	65.53	6.97	0.000%
29	6.97	-65.53	-4.02	-6.97	65.53	4.02	0.000%
30	8.04	-65.53	-0.01	-8.04	65.53	0.01	0.000%
31	6.96	-65.53	4.01	-6.96	65.53	-4.01	0.000%
32	4.01	-65.53	6.96	-4.01	65.53	-6.96	0.000%
33	0.00	-65.53	8.04	-0.00	65.53	-8.04	0.000%
34	-4.01	-65.53	6.96	4.01	65.53	-6.96	0.000%
35	-6.96	-65.53	4.01	6.96	65.53	-4.01	0.000%
36	-8.04	-65.53	-0.00	8.04	65.53	0.00	0.000%
37	-6.97	-65.53	-4.02	6.97	65.53	4.02	0.000%
38	-4.02	-65.53	-6.97	4.02	65.53	6.97	0.000%
39	-0.00	-33.15	-6.63	0.00	33.15	6.63	0.000%
40	3.31	-33.15	-5.74	-3.31	33.15	5.74	0.000%
41	5.74	-33.15	-3.31	-5.74	33.15	3.31	0.000%
42	6.62	-33.15	-0.01	-6.62	33.15	0.01	0.000%
43	5.73	-33.15	3.30	-5.73	33.15	-3.30	0.000%
44	3.30	-33.15	5.73	-3.30	33.15	-5.73	0.000%
45	0.00	-33.15	6.62	-0.00	33.15	-6.62	0.000%
46	-3.30	-33.15	5.73	3.30	33.15	-5.73	0.000%
47	-5.74	-33.15	3.30	5.74	33.15	-3.30	0.000%
48	-6.62	-33.15	-0.00	6.62	33.15	0.00	0.000%
49	-5.74	-33.15	-3.31	5.74	33.15	3.31	0.000%
50	-3.31	-33.15	-5.74	3.31	33.15	5.74	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00095638
3	Yes	4	0.00000001	0.00030590
4	Yes	6	0.00000001	0.00007887
5	Yes	5	0.00000001	0.00060854
6	Yes	6	0.00000001	0.00007840
7	Yes	5	0.00000001	0.00060480
8	Yes	4	0.00000001	0.00091710
9	Yes	4	0.00000001	0.00025798
10	Yes	6	0.00000001	0.00007925
11	Yes	5	0.00000001	0.00061191
12	Yes	6	0.00000001	0.00007761
13	Yes	5	0.00000001	0.00059877
14	Yes	4	0.00000001	0.00092148
15	Yes	4	0.00000001	0.00026751
16	Yes	6	0.00000001	0.00007810
17	Yes	5	0.00000001	0.00060278
18	Yes	6	0.00000001	0.00007870
19	Yes	5	0.00000001	0.00060752
20	Yes	4	0.00000001	0.00092022
21	Yes	4	0.00000001	0.00026529
22	Yes	6	0.00000001	0.00007795
23	Yes	5	0.00000001	0.00060122
24	Yes	6	0.00000001	0.00007939
25	Yes	5	0.00000001	0.00061268
26	Yes	4	0.00000001	0.00001548
27	Yes	5	0.00000001	0.00037070
28	Yes	5	0.00000001	0.00057174
29	Yes	5	0.00000001	0.00057337
30	Yes	5	0.00000001	0.00036711
31	Yes	5	0.00000001	0.00056948
32	Yes	5	0.00000001	0.00056025
33	Yes	5	0.00000001	0.00036650
34	Yes	5	0.00000001	0.00057035
35	Yes	5	0.00000001	0.00056900
36	Yes	5	0.00000001	0.00036941
37	Yes	5	0.00000001	0.00057362
38	Yes	5	0.00000001	0.00058246
39	Yes	4	0.00000001	0.00005412
40	Yes	4	0.00000001	0.00044582
41	Yes	4	0.00000001	0.00043854
42	Yes	4	0.00000001	0.00005192
43	Yes	4	0.00000001	0.00045111
44	Yes	4	0.00000001	0.00042464
45	Yes	4	0.00000001	0.00005235
46	Yes	4	0.00000001	0.00043253
47	Yes	4	0.00000001	0.00044217
48	Yes	4	0.00000001	0.00005273
49	Yes	4	0.00000001	0.00043169
50	Yes	4	0.00000001	0.00045483

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	139.5 - 93.04	27.266	39	1.7532	0.0022
L2	96.96 - 46.38	12.952	39	1.3103	0.0007
L3	51.63 - 0	3.548	39	0.6512	0.0003

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
136.00	800 10121 w/ Mount Pipe	39	26.002	1.7208	0.0020	29128
134.00	VHLP2-11	39	25.281	1.7023	0.0020	26480
132.00	A-ANT-23G-2-C	39	24.562	1.6837	0.0019	19419
130.00	APXVSPP18-C-A20 w/ Mount Pipe	39	23.845	1.6649	0.0018	15330
119.00	(2) DB846F65ZAXY w/ Mount Pipe	39	19.976	1.5583	0.0014	7104
110.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	39	16.959	1.4641	0.0011	4936
100.00	APXV18-206517S-C w/ Mount Pipe	39	13.839	1.3483	0.0008	3690
75.00	KS24019-L112A	39	7.500	1.0000	0.0004	3438

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	139.5 - 93.04	126.113	2	8.1232	0.0101
L2	96.96 - 46.38	59.960	2	6.0722	0.0033
L3	51.63 - 0	16.431	2	3.0174	0.0011

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
136.00	800 10121 w/ Mount Pipe	2	120.272	7.9735	0.0095	6502
134.00	VHLP2-11	2	116.941	7.8877	0.0091	5911
132.00	A-ANT-23G-2-C	2	113.618	7.8014	0.0087	4334
130.00	APXVSPP18-C-A20 w/ Mount Pipe	2	110.306	7.7147	0.0083	3421
119.00	(2) DB846F65ZAXY w/ Mount Pipe	2	92.431	7.2211	0.0064	1582
110.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	2	78.484	6.7848	0.0050	1096
100.00	APXV18-206517S-C w/ Mount Pipe	2	64.064	6.2486	0.0036	817
75.00	KS24019-L112A	2	34.735	4.6344	0.0018	752

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	139.5 - 93.04 (1)	TP26.99x15.5x0.25	46.46	0.00	0.0	20.4489	-12.43	1196.26	0.010
L2	93.04 - 46.38 (2)	TP37.91x25.5205x0.375	50.58	0.00	0.0	43.1454	-23.49	2524.01	0.009
L3	46.38 - 0 (3)	TP48.5x35.874x0.375	51.63	0.00	0.0	57.2808	-39.74	3350.93	0.012

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	139.5 - 93.04 (1)	TP26.99x15.5x0.25	554.68	787.46	0.704	0.00	787.46	0.000
L2	93.04 - 46.38 (2)	TP37.91x25.5205x0.375	1676.03	2373.92	0.706	0.00	2373.92	0.000
L3	46.38 - 0 (3)	TP48.5x35.874x0.375	3164.07	3860.34	0.820	0.00	3860.34	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	139.5 - 93.04 (1)	TP26.99x15.5x0.25	22.70	358.88	0.063	0.21	809.94	0.000
L2	93.04 - 46.38 (2)	TP37.91x25.5205x0.375	26.77	757.20	0.035	0.32	2403.74	0.000
L3	46.38 - 0 (3)	TP48.5x35.874x0.375	30.60	1005.28	0.030	0.43	4236.79	0.000

Pole Interaction Design Data

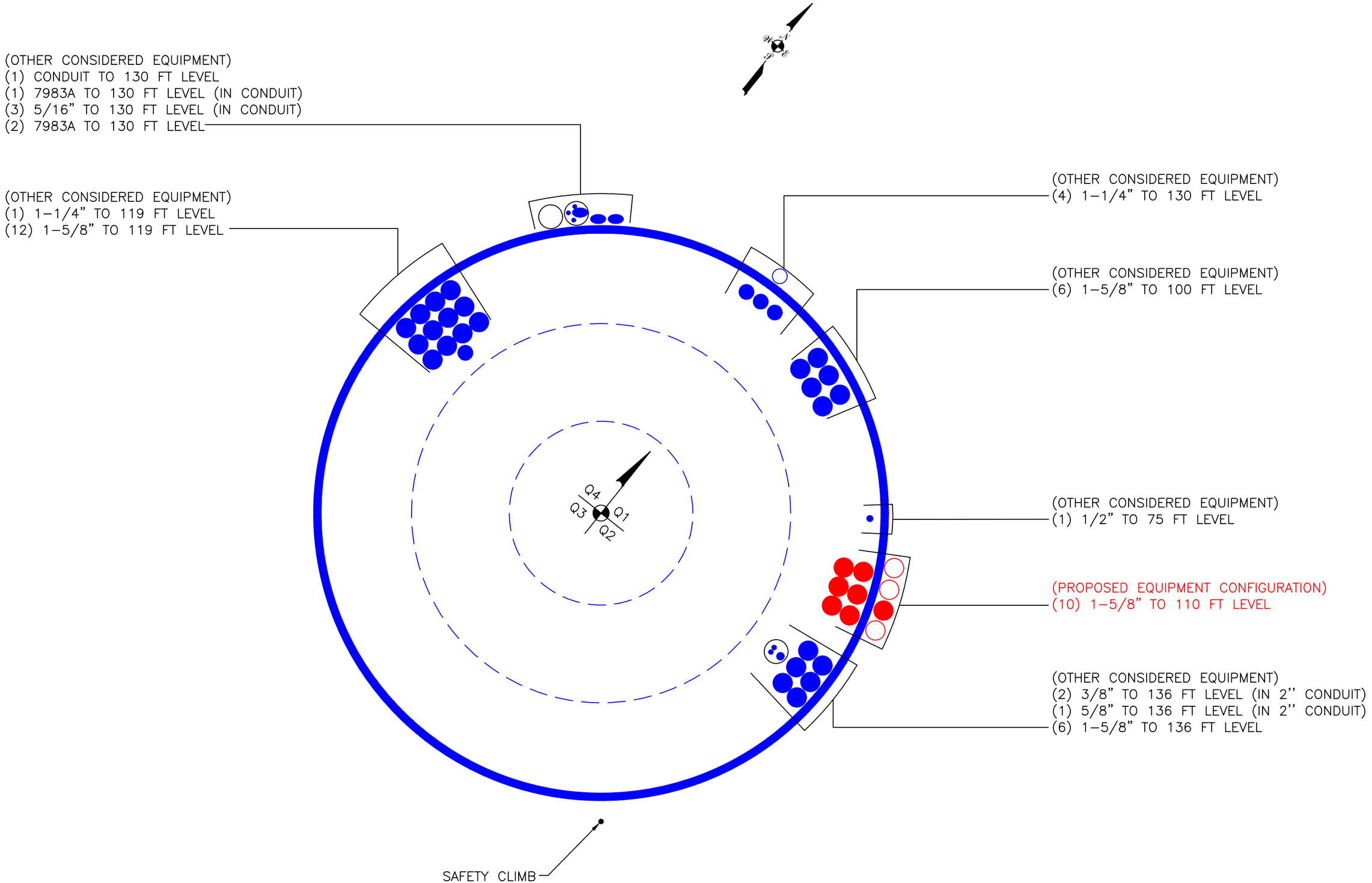
Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	139.5 - 93.04 (1)	0.010	0.704	0.000	0.063	0.000	0.719	1.050	4.8.2
L2	93.04 - 46.38 (2)	0.009	0.706	0.000	0.035	0.000	0.717	1.050	4.8.2
L3	46.38 - 0 (3)	0.012	0.820	0.000	0.030	0.000	0.832	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	139.5 - 93.04	Pole	TP26.99x15.5x0.25	1	-12.43	1256.07	68.5	Pass
L2	93.04 - 46.38	Pole	TP37.91x25.5205x0.375	2	-23.49	2650.21	68.2	Pass
L3	46.38 - 0	Pole	TP48.5x35.874x0.375	3	-39.74	3518.48	79.3	Pass
							Summary	
						Pole (L3)	79.3	Pass
						RATING =	**79.3**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 881541 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

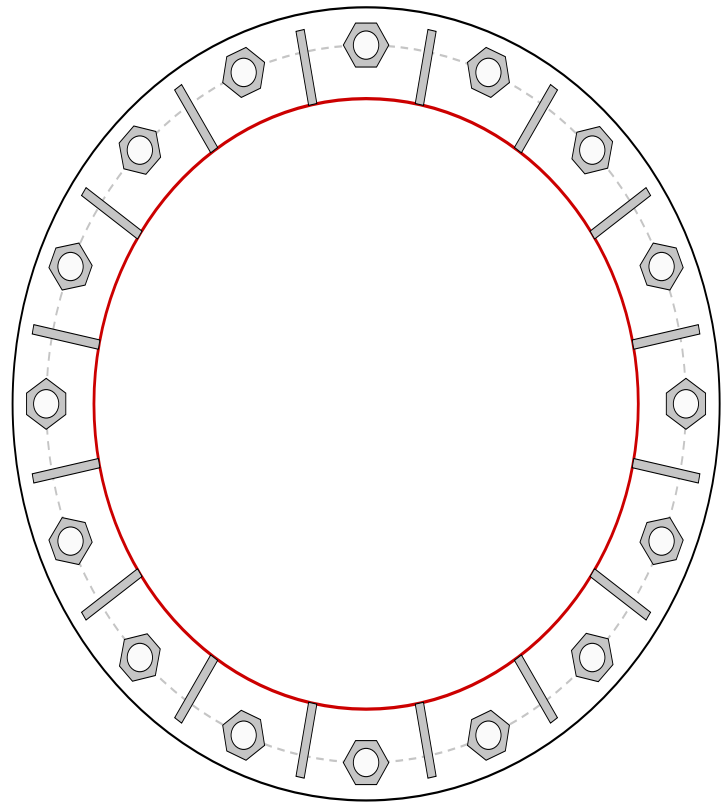
Monopole Base Plate Connection

Site Info	
BU #	881541
Site Name	ROGERS PROPERTY
Order #	479806 Rev.0

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	1

Applied Loads	
Moment (kip-ft)	3164.07
Axial Force (kips)	39.74
Shear Force (kips)	30.60

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

(16) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 57" BC

Base Plate Data

63" OD x 2" Plate (A572-60; Fy=60 ksi, Fu=75 ksi)

Stiffener Data

(16) 15"H x 6"W x 0.75"T, Notch: 0.75"
plate: Fy= 50 ksi ; weld: Fy= 70 ksi
horiz. weld: 0.375" groove, 45° dbl bevel, 0.3125" fillet
vert. weld: 0.3125" fillet

Pole Data

48.5" x 0.375" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

Anchor Rod Summary		*(units of kips, kip-in)*
Pu_c = 168.91	ϕPn_c = 243.75	**Stress Rating**
Vu = 1.91	ϕVn = 73.13	**66.1%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary		
Max Stress (ksi):	29.13	(Roark's Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	**51.4%**	**Pass**

Stiffener Summary		
Horizontal Weld:	**62.4%**	**Pass**
Vertical Weld:	**58.4%**	**Pass**
Plate Flexure+Shear:	**22.7%**	**Pass**
Plate Tension+Shear:	**63.1%**	**Pass**
Plate Compression:	**69.0%**	**Pass**

Pole Summary		
Punching Shear:	**15.0%**	**Pass**

Pier and Pad Foundation

BU # :	881541
Site Name:	ROGERS PROPER
App. Number:	479806 Rev.0

TIA-222 Revision:	H
Tower Type:	Monopole

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

Superstructure Analysis Reactions

Compression, P_{comp}:	39	kips
Base Shear, Vu_comp:	30	kips
Moment, M_u:	2090	ft-kips
Tower Height, **H**:	139.5	ft
BP Dist. Above Fdn, bp_{dist}:	3.25	in

Pier Properties

Pier Shape:	Square	
Pier Diameter, **dpier**:	6.5	ft
Ext. Above Grade, **E**:	1	ft
Pier Rebar Size, **Sc**:	11	
Pier Rebar Quantity, **mc**:	22	
Pier Tie/Spiral Size, **St**:	5	
Pier Tie/Spiral Quantity, **mt**:	11	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier}:	4	in

Pad Properties

Depth, **D**:	7	ft
Pad Width, **W**:	23	ft
Pad Thickness, **T**:	3	ft
Pad Rebar Size (Bottom), **Sp**:	8	
Pad Rebar Quantity (Bottom), **mp**:	45	
Pad Clear Cover, cc_{pad}:	3	in

Material Properties

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

Soil Properties

Total Soil Unit Weight, γ:	125	pcf
Ultimate Net Bearing, Qnet:	8.000	ksf
Cohesion, **Cu**:	0.000	ksf
Friction Angle, φ:	34	degrees
SPT Blow Count, N_{blows}:		
Base Friction, μ:	0.6	
Neglected Depth, **N**:	3.50	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, **gw**:	7	ft

<--Toggle between Gross and Net

Foundation Analysis Checks

	Capacity	Demand	Rating*	Check
Lateral (Sliding) (kips)	350.86	30.00	**8.1%**	**Pass**
Bearing Pressure (ksf)	6.66	2.04	**29.2%**	**Pass**
*Overturning (kip*ft)*	5370.99	2338.13	**43.5%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	5006.11	2240.00	**42.6%**	**Pass**
Pier Compression (kip)	26891.28	77.03	**0.3%**	**Pass**
*Pad Flexure (kip*ft)*	4857.40	763.13	**15.0%**	**Pass**
Pad Shear - 1-way (kips)	824.79	125.33	**14.5%**	**Pass**
Pad Shear - 2-way (Comp) (ksi)	0.190	0.026	**13.0%**	**Pass**
*Flexural 2-way (Comp) (kip*ft)*	6567.23	1344.00	**19.5%**	**Pass**

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

Soil Rating*:	**43.5%**
Structural Rating*:	**42.6%**

Drilled Pier Foundation

BU # :	881541
Site Name:	ROGERS PROPERTY
Order Number:	479806 Rev.0

TIA-222 Revison:	H
Tower Type:	Monopole

Applied Loads	Comp.	Uplift
Moment (kip-ft)	1272	
Axial Force (kips)	39	
Shear Force (kips)	30	

Material Properties		
Concrete Strength, f'c:	4	ksi
Rebar Strength, Fy:	60	ksi

Pier Design Data		
Depth	20	ft
Ext. Above Grade	1	ft
Pier Section 1		
From 1' above grade to 20' below grade		
Pier Diameter	6.5	ft
Rebar Quantity	22	
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)	6.70	-
Soil Safety Factor	2.91	-
Max Moment (kip-ft)	1444.87	-
Rating*	*43.5%*	-
Soil Vertical Capacity	*Compression*	*Uplift*
Skin Friction (kips)	298.12	-
End Bearing (kips)	995.49	-
Weight of Concrete (kips)	93.13	-
Total Capacity (kips)	1293.62	-
Axial (kips)	132.13	-
Rating*	*9.7%*	-
Reinforced Concrete Capacity	*Compression*	*Uplift*
Critical Depth (ft from TOC)	6.58	-
Critical Moment (kip-ft)	1444.76	-
Critical Moment Capacity	5063.18	-
Rating*	*27.2%*	-

Soil Interaction Rating*	**43.5%**
Structural Foundation Rating*	**27.2%**

Check Limitation	
Apply TIA-222-H Section 15.5:	☑
N/A	☐

*Rating per TIA-222-H Section 15.5

Soil Profile

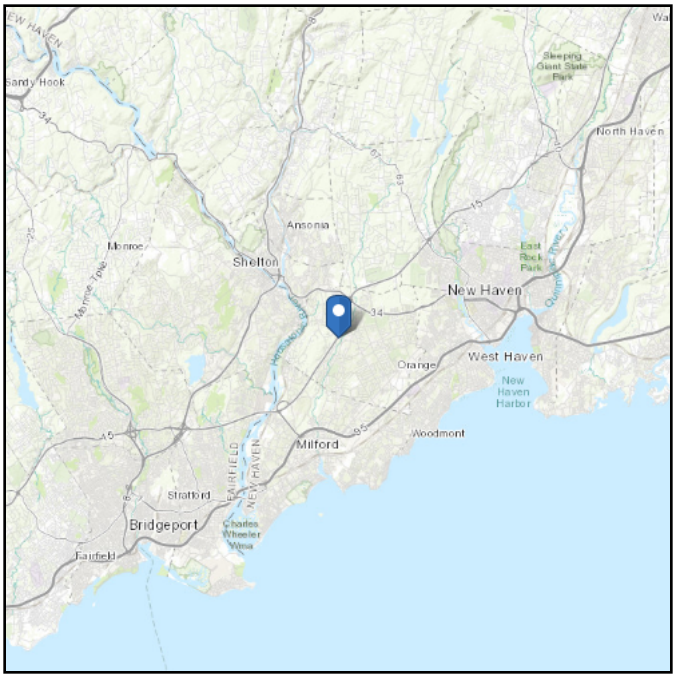
Groundwater Depth	7	ft	# of Layers	3

Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ_{soil} (pcf)	$\gamma_{concrete}$ (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	3.5	3.5	125	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
2	3.5	7	3.5	125	150	0	34	0.781	0.781				28	Cohesionless
3	7	20	13	62.6	87.6	0	34	1.287	1.287			40	50	Cohesionless

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard:	ASCE/SEI 7-10	**Elevation:**	91.22 ft (NAVD 88)
Risk Category:	II	**Latitude:**	41.285486
Soil Class:	D - Stiff Soil	**Longitude:**	-73.042575



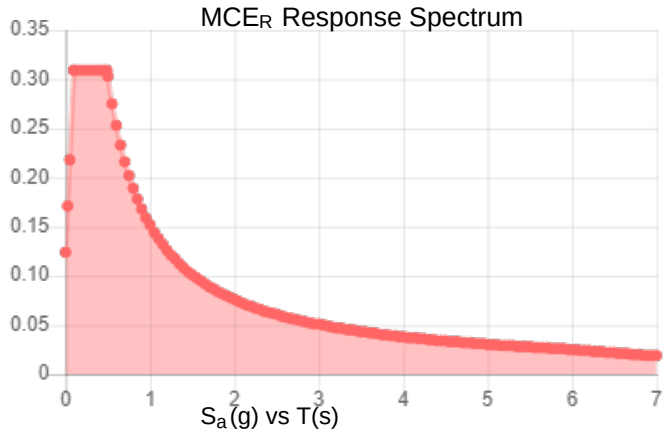
Seismic

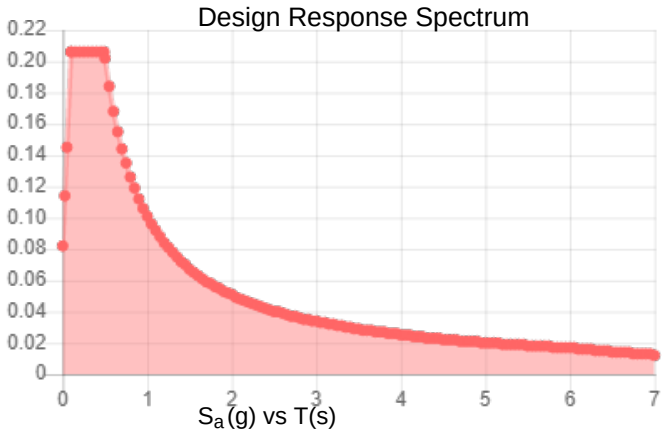
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.193	S_{DS} :	0.206
S_1 :	0.063	S_{D1} :	0.101
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.102
S_{MS} :	0.309	PGA_M :	0.163
S_{M1} :	0.152	F_{PGA} :	1.596
		I_e :	1

Seismic Design Category B





Data Accessed: Fri Jun 14 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:	0.75 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Fri Jun 14 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.

Exhibit E

Mount Analysis

Date: **June 3, 2019**

Charles McGuirt
Crown Castle
3530 Torringdon Way Suite 300
Charlotte, NC 28277

Mastec Network Solutions
507 Airport Blvd, Suite 111
Morrisville, NC 27560
(919) 674-5895

Subject:	**Mount Modification Analysis**	
Carrier Designation:	**T-Mobile Equipment Change-Out**	
	Carrier Site Number:	CT11083Q
	Carrier Site Name:	CT083/Sprint/Grassy Hill
Crown Castle Designation:	**Crown Castle BU Number:**	881541
	Crown Castle Site Name:	Rogers Property
	Crown Castle JDE Number:	559347
	Crown Castle Order Number:	479806 Revision 0
Engineering Firm Designation:	**Mastec Network Solutions Project Number:**	18545-MOD1
Site Data:	**700 Grassy Hill Road, Orange, New Haven County, CT, 06477** **Latitude: 41° 17' 7.74" Longitude: -73° 2' 33.27"**	
Structure Information	**Tower Height & Type:**	139.5 ft Monopole
	Mount Elevation:	110 ft
	Mount Width & Type:	13'-4" ft T-Arm Mount W/ Modifications

Dear Charles McGuirt,

Mastec Network Solutions is pleased to submit this **"Mount Modification Analysis Report"** to determine the structural integrity of T-Mobile's antenna mounting system with the proposed appurtenance and equipment addition on the above mentioned supporting tower structure. Analysis of the existing supporting tower structure is to be completed by others and therefore is not part of this analysis. Analysis of the antenna mounting system as a tie-off point for fall protection or rigging is not part of this document.

The purpose of the analysis is to determine acceptability of the mount stress level. Based on our analysis we have determined the mount stress level to be:

T-Arm Mount W/ Modifications **Sufficient**

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.

Mount analysis prepared by: Noah Noxon

Respectfully Submitted by:

Raphael Mohamed

Digitally signed by Raphael Mohamed
DN: E=Raphael.Mohamed@mastec.com, CN=Raphael Mohamed, OU=Users, OU=MasTec Network Solutions, OU=Service Lines, DC=mastec, DC=local
Date: 2019.06.03 22:11:05-04'00'

STATE OF CONNECTICUT
RAPHAEL MOHAMED
No. 25112
LICENSED
PROFESSIONAL ENGINEER

Raphael Mohamed, PE, Peng
Senior Director of Engineering
CT PE License No. 25112

TABLE OF CONTENTS

1) INTRODUCTION

This is a 13'-4" ft T-Arm Mount mapped by P-Sec in April of 2019. It is installed at the 110ft elevation of a 139.5 ft Monopole.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category	II
an ultimate:	125 mph
Exposure Category:	C
Topographic Category:	1
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Seismic Ss:	0.193
Seismic S1:	0.063
Live Loading Wind Speed:	30 mph
Live Loading at Mid/End-Points:	500 lb
Man Live Loading at Mount Pipes	250 lb

Table 1 - Proposed Loading Configuration

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount / Modification Details
110.0	110.0	3	ericsson	Air 21 B2A B4P	(3) 13'-4" T-Arm W/ Modifications
		3	ericsson	Air 21 B4A B2P	
		3	rfs celwave	APXVAARR24-43-U-NA20	
		3	ericsson	KRY 112 144/1	
		3	ericsson	RADIO 4449 B12/B71	

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-MOUNT MAPPING	P-Sec	8347381	CCIsites
4-MOUNT ANALYSIS REPORT	Mastec	8366040	CCIsites
4-MOUNT REINFORCEMENT DESIGN DRAWINGS	Mastec	-	On File
4-ORDER INFORMATION	CROWN CASTLE	ORDER NO. 479806, REV 0	CCIsites

3.1) Analysis Method

RISA-3D (Version No. 17.0.2), a commercially available analysis software package, was used to create a three-dimensional model of the antenna mounting system and calculate member stresses for various loading cases.

This analysis was performed in accordance with Crown Castle's ENG-SOW-10208 *Tower Mount Analysis* (Revision C).

3.2) Assumptions

1) The antenna mounting system was properly fabricated, installed and maintained in good condition in accordance with its original design and manufacturer's specifications.
2) The configuration of antennas, mounts, and other appurtenances are as specified in Tables 1 and the referenced drawings.
3) All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
4) Steel grades have been assumed as follows, unless noted otherwise:

Channel, Solid Round, Angle, Plate	ASTM A36 (GR 36)
HSS (Rectangular)	ASTM 500 (GR B-46)
Pipe	ASTM A53 (GR B-35)
Connection Bolts	ASTM A325

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

4) ANALYSIS RESULTS

Table 4 - Mount Component Stresses vs. Capacity (T-Arm Mount, All Sectors)

Notes	Component	Beam No.	Centerline (ft)	% Capacity	Pass / Fail
1,2	Standoff	--	110	23.6	Pass
1,2	Support Pipe	--	110	0.1	Pass
1,2	Face Horizontal	--	110	44.2	Pass
1,2	Mount Pipes	--	110	43.7	Pass
1,2	PRK-SFS	--	110	49.7	Pass
1,2	P2174	--	110	38.8	Pass
1,2	PV-PKBK-M	--	110	26.1	Pass
1,2	Mount to Tower Connection Plate		110	30.9	Pass
1,2	Mount to Tower Connection Bolts		-	16.8	Pass

Structure Rating (max from all components) =	49.7%

Notes:
1) See additional documentation in "Appendix C - Software Analysis Output" for calculations supporting the % capacity consumed.
2) All sectors are typical

4.1) Recommendations

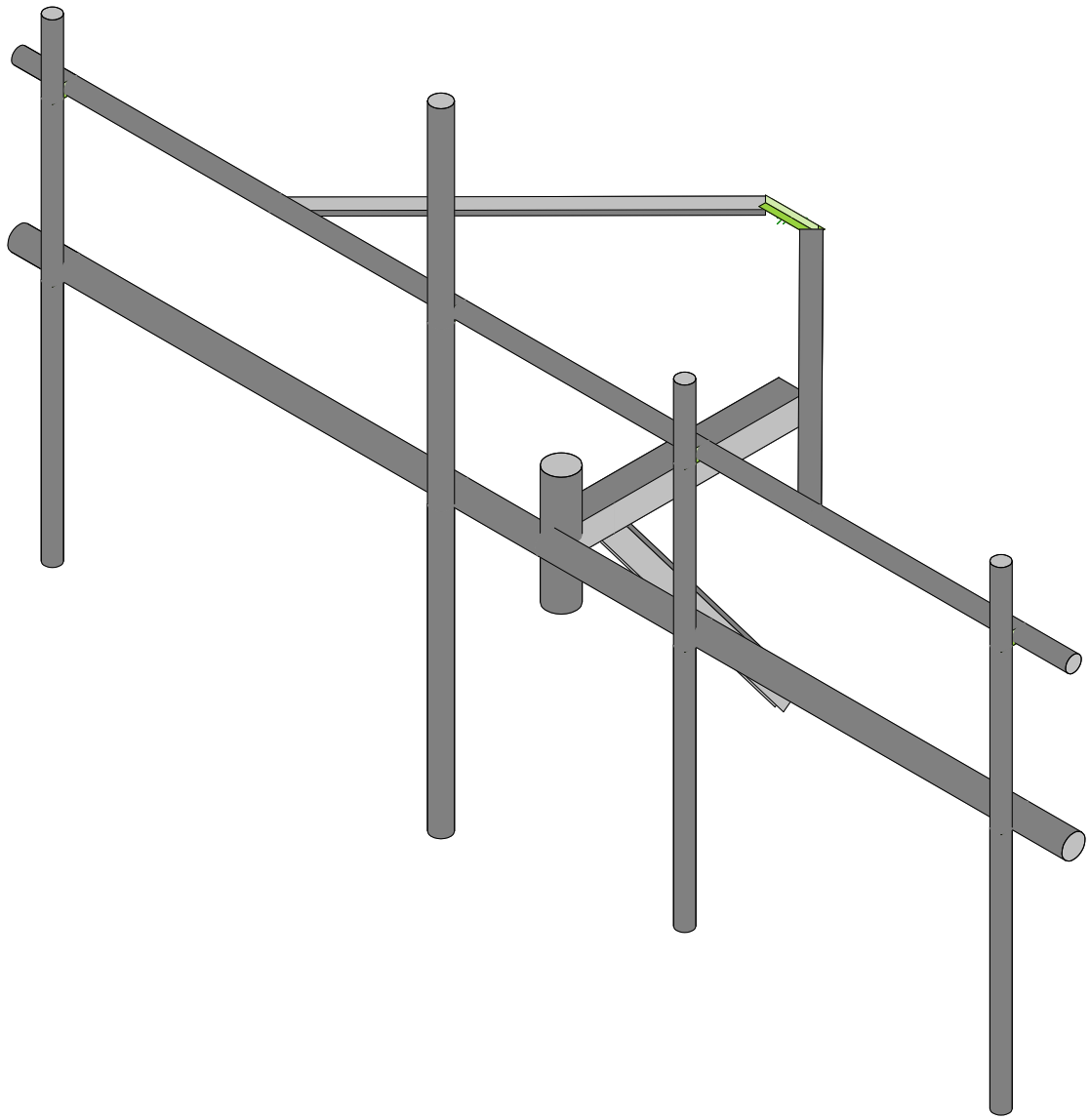
The mount has sufficient capacity to carry the proposed loading configuration. In order for the results of the analysis to be considered valid, the structural modifications listed below must be completed.

1. Site Pro PRK-SFS
2. PV- PKPB-M

Engineering Detail Drawings have been provided in Appendix E- Mount Modification Drawings. Connection from the mount to the tower and local stresses on the tower are sufficient.

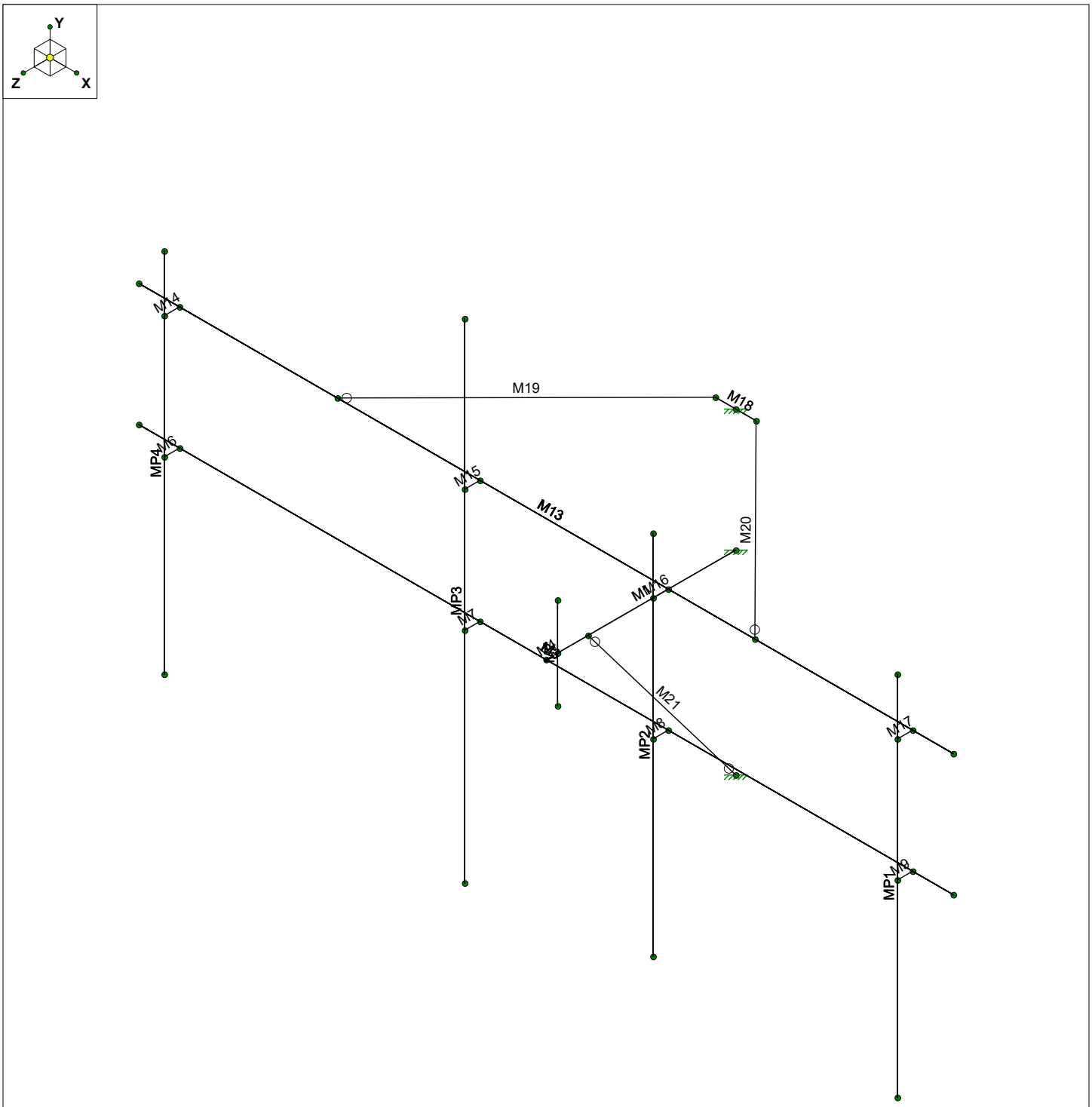
APPENDIX A

WIRE FRAME AND RENDERED MODELS



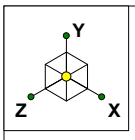
Envelope Only Solution

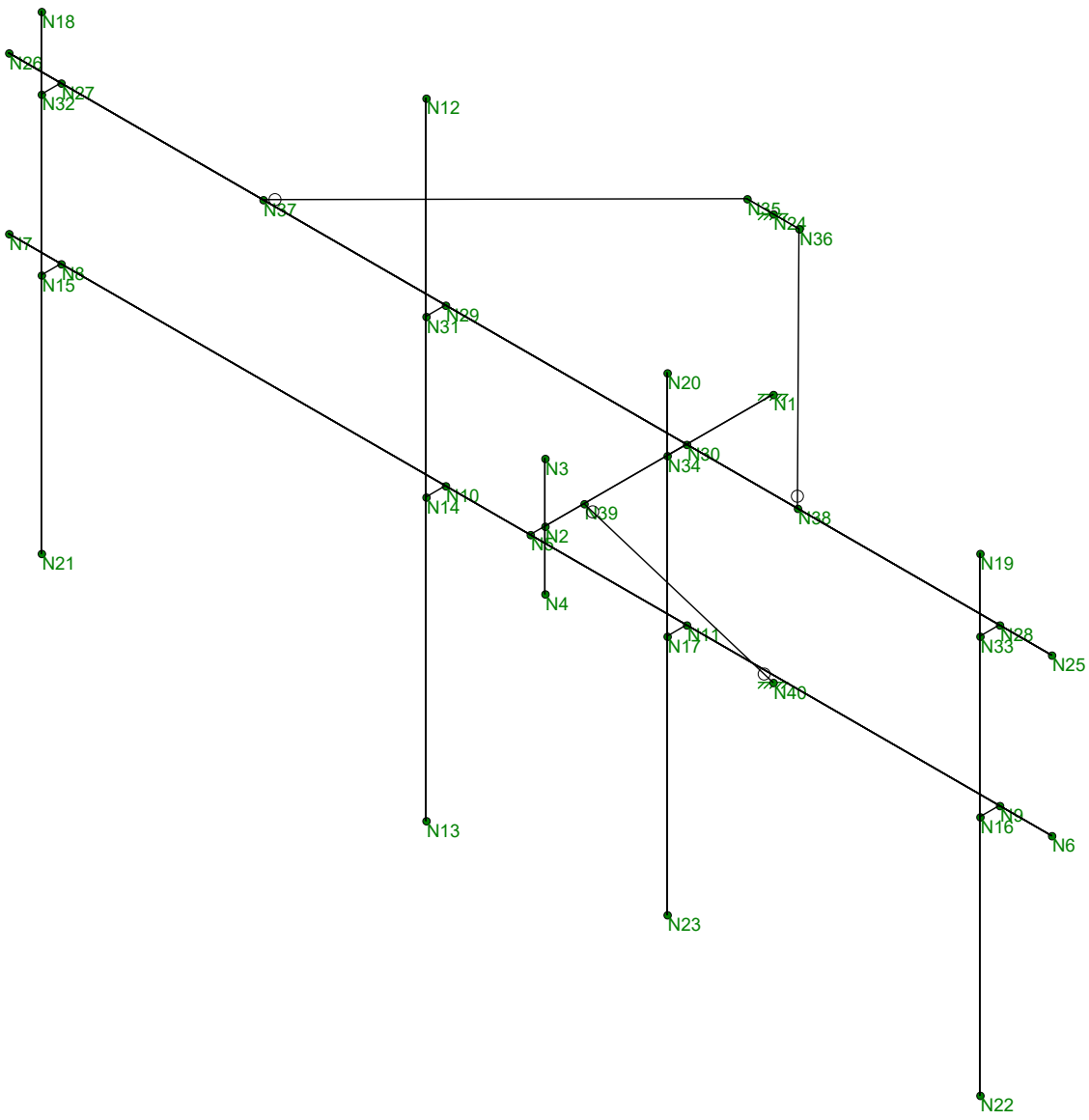
Mastec	881541 Rogers Property	Render
NDN		June 3, 2019 at 3:58 PM
18545-MOD1		T-Arm.r3d



Envelope Only Solution

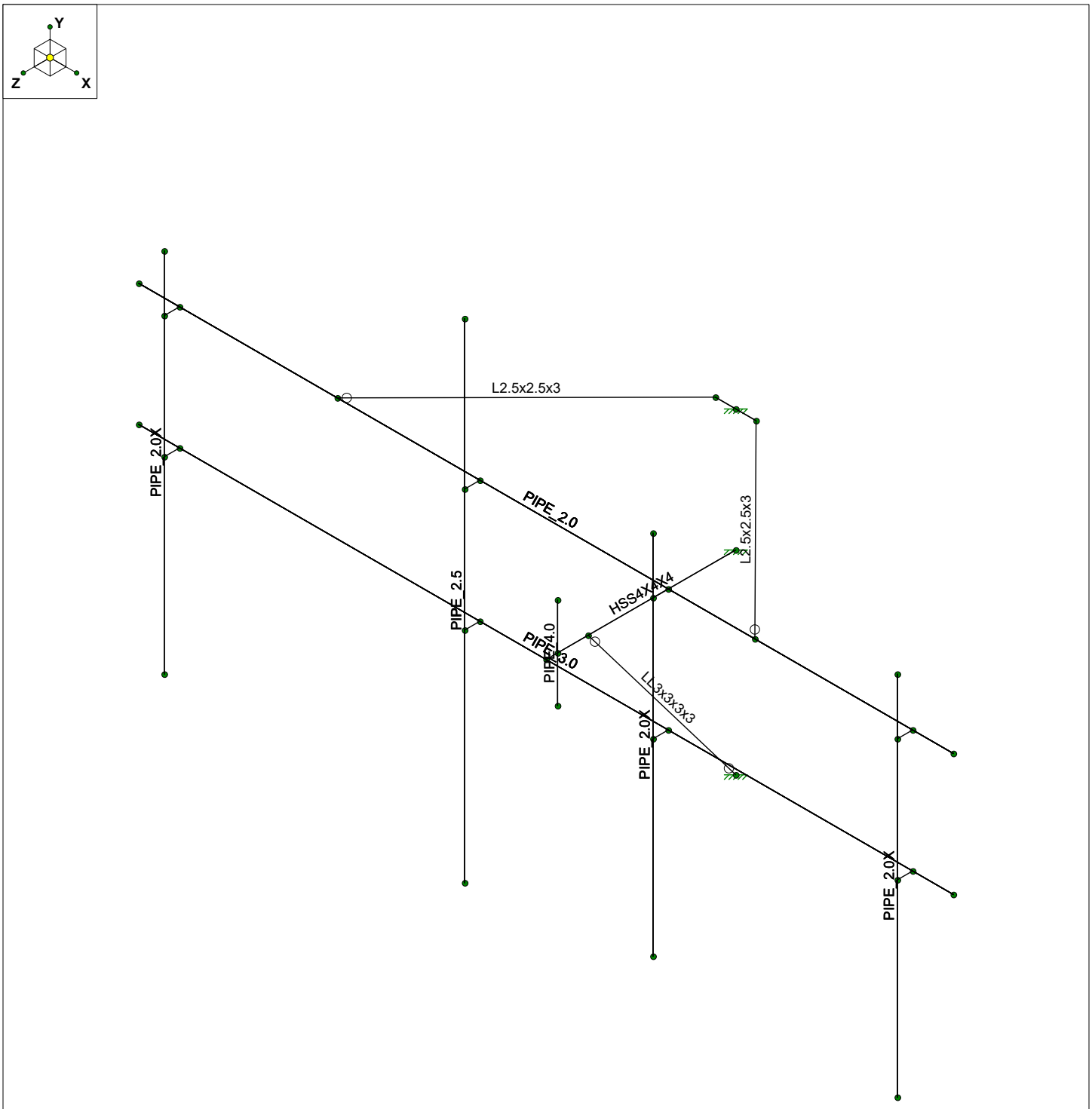
Mastec	881541 Rogers Property	Member Labels
NDN		June 3, 2019 at 3:59 PM
18545-MOD1		T-Arm.r3d





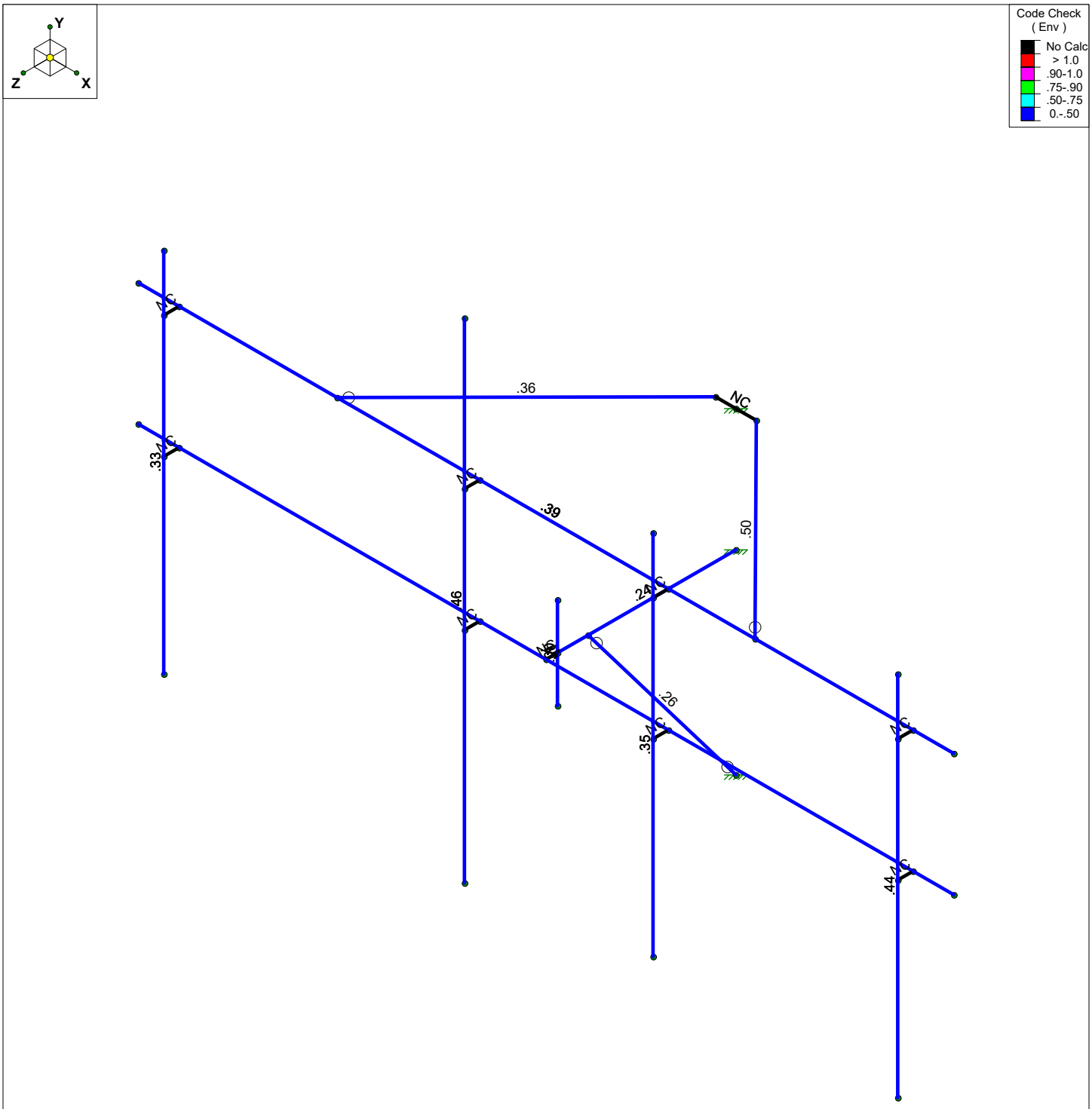
Envelope Only Solution

Mastec	881541 Rogers Property	Joint Labels
NDN		June 3, 2019 at 3:59 PM
18545-MOD1		T-Arm.r3d



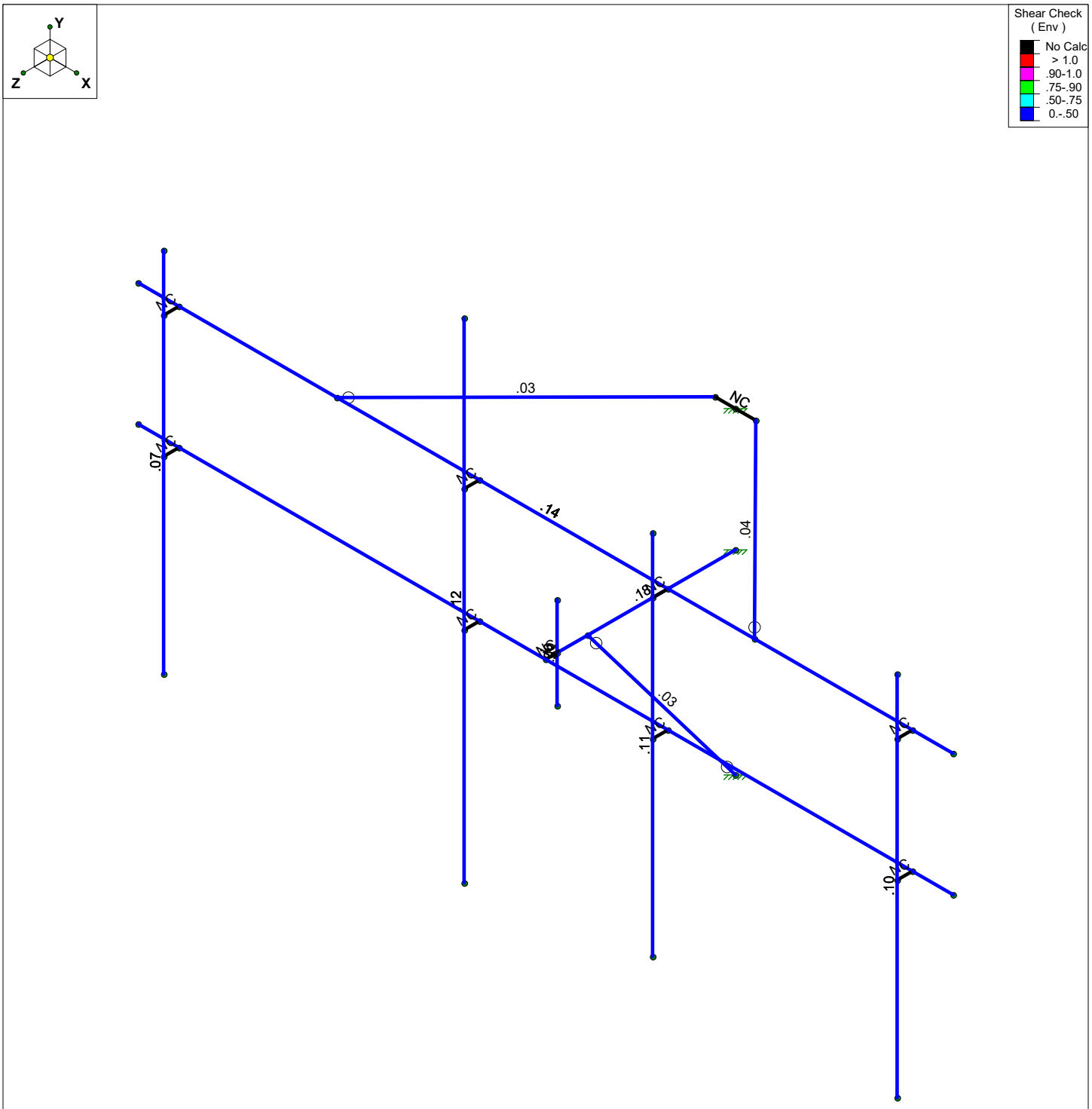
Envelope Only Solution

Mastec	881541 Rogers Property	Shapes
NDN		June 3, 2019 at 3:59 PM
18545-MOD1		T-Arm.r3d



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Mastec	881541 Rogers Property	Unity Bending Check
NDN		June 3, 2019 at 5:03 PM
18545-MOD1		T-Arm.r3d



Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

Mastec	881541 Rogers Property	Shear Check
NDN		June 3, 2019 at 5:03 PM
18545-MOD1		T-Arm.r3d

APPENDIX B

SOFTWARE INPUT CALCULATIONS

MasTec Network Solutions

Mount Analysis Tool

Site Name	Rogers Property		
Site ID	881541		
Job Number	18545-MOD1	Mount Existing?	Crown
Code	H	Risk Category	II

Legend
Input
Calculated
Notes

Maximum Capacity		
Controlling Capacity	49.7%	PASS

Analysis Parameters		
Mount Height	110	ft
Exposure Category	C	(B,C, or D)
Ultimate Wind Speed	125	mph
Ice Wind Speed	50	mph
Design Ice Thickness, t_i	1.5	in
Maintenance Wind Speed	30	mph
Run Earthquake Analysis?	Yes	
Ground Elevation	91.22	ft, Google Earth
S_1	0.063	USGS
S_{DS}	0.206	2.7.5
Vertical Seismic Loads, E_v	0.041	2.7.6
Seismic Response Coefficient, C_s	0.103	2.7.7.1.1
C_s Min	0.030	2.7.7.1.1

Wind Parameters					
Gust Effect Factor, G_h	1.000	2.6.9	K_s	1.000	2.6.7
K_Z	1.291	2.6.5.2	K_e	0.997	2.6.8
K_{Zt}	1.000	2.6.6	K_a	0.900	16.6
K_d	0.950	Table 2-2	*Note for Rooftop Structures greater than 50', unobstructed for 90 deg and protruding 50' above surrounding buildings Ks must be calculated.		
q_z	44.153	psf, 2.6.11.6			
C/D	142.043	Table 2-9			
t_{iz}	1.692	in, 2.6.10			
q_{iz}	7.065	psf, 2.6.9.6	I, Ice	1.000	Table 2-3
C/D_{iz}	56.817	Table 2-9	I, EQ	1.000	Table 2-3
$q_{Maintenance}$	2.544	psf, 2.6.9.6	$K_{es\ (Wind)}$	1.000	Table S-1
$C/D_{Maintenance}$	34.090	Table 2-9	$K_{es\ (ice)}$	1.000	Table S-1
Ice Dead, Grating	0.015791228	ksf			

Pipe Mounts (Orientation Drawn Top-Down)			
Risa 3D Label	Elevation (ft)	Length (in)	Diameter (in)
MP1	110	72	2.375
MP3	110	96	2.875
MP4	110	72	2.375

Appurtenances					
Model	Type	Height (in)	Width (in)	Depth (in)	Weight (lbs)
Ericsson Air 21 B2A B4P	Antenna	56	12.1	7.87	91.5
Ericsson Air 21 B4A B2P	Antenna	55.9	12.1	7.87	91.5
RFS CELWAVE APXVAARR24-43-U-I	Antenna	95.9	24	8.7	128
Ericsson RADIO 4449 B12/B71	RRU, TMA, Etc.	14.95	13.19	9.25	75
Ericsson KRY 112 144/1	Antenna	7	6	3	11

MasTec
Network Solutions

Pipe Mount	Antenna	Elevation (ft)	Quantity	Orientation (deg)	Front Exposed (%)	Side Exposed (%)	Type	Height (in)	Width (in)	Depth (in)	Weight (lbs)	Front CaAa (ft^2)	Side CaAa (ft^2)	Front F_A (kips)	Side F_A (kips)	Top %	Bottom %
MP1	Ericsson Air 21 B2A B4P	110	1	0	100.0%	100.0%	Antenna	56.000	12.100	7.870	91.500	6.092	4.297	0.269	0.190	11.1%	88.9%
MP1	Ericsson KRY 112 144/1	110	1	0	0.0%	100.0%	Antenna	7.000	6.000	3.000	11.000	0.350	0.175	0.000	0.008	45.1%	54.9%
MP1																	
MP1																	
MP1																	
MP1																	
MP3	CELWAVE APXVAARR24-43-U-I	110	1	0	100.0%	100.0%	Antenna	95.900	24.000	8.700	128.000	20.243	8.889	0.894	0.392	0.1%	99.9%
MP3																	
MP3																	
MP3																	
MP3																	
MP3																	
MP4	Ericsson Air 21 B4A B2P	110	1	0	100.0%	100.0%	Antenna	55.900	12.100	7.870	91.500	6.079	4.288	0.268	0.189	11.2%	88.8%
MP4	Ericsson RADIO 4449 B12/B71	110	1	0	10.0%	100.0%	RRU, TMA, Etc.	14.950	13.190	9.250	75.000	1.643	1.152	0.007	0.051	39.6%	60.4%
MP4																	
MP4																	
MP4																	
MP4																	

Member	Section Set	Member Length (ft)	Flat/Round	Wind Projection (in)	D_c (in)	A_{γ} (in^2)	C_F	Front Wind (klf)	Side Wind (klf)	Front Ice Wind (klf)	Side Ice Wind (klf)	Ice Dead (klf)	Front Maint Wind (klf)	Side Maint Wind (klf)
M1	Standoff	2.916667	Flat	4.000	5.657	39.061	2.000	0.000	0.029	0.000	0.005	0.015	0.000	0.002
M2	Support Pipe	1.5	Round	4.500	4.500	32.912	1.200	0.020	0.020	0.008	0.008	0.013	0.001	0.001
M3	Face Horizontal	13.333334	Round	3.500	3.500	27.597	1.200	0.015	0.000	0.005	0.002	0.011	0.001	0.000
M4	RIGID	0.1875	Flat	0.000	0.000	8.993	2.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000
MP3	Position 3 Mount Pipe	8	Round	2.880	2.880	24.301	1.200	0.013	0.013	0.005	0.005	0.009	0.001	0.001
M6	RIGID	0.25	Flat	0.000	0.000	8.993	2.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000
M7	RIGID	0.25	Flat	0.000	0.000	8.993	2.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000
M8	RIGID	0.25	Flat	0.000	0.000	8.993	2.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000
M9	RIGID	0.25	Flat	0.000	0.000	8.993	2.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000
MP4	Mount Pipes	6	Round	2.380	2.380	21.644	1.200	0.011	0.011	0.004	0.004	0.008	0.001	0.001
MP2	Mount Pipes	6	Round	2.380	2.380	21.644	1.200	0.011	0.011	0.004	0.004	0.008	0.001	0.001
MP1	Mount Pipes	6	Round	2.380	2.380	21.644	1.200	0.011	0.011	0.004	0.004	0.008	0.001	0.001
M13	P2174	13.333334	Round	2.380	2.380	21.644	1.200	0.011	0.000	0.004	0.002	0.008	0.001	0.000
M14	RIGID	0.25	Flat	0.000	0.000	8.993	2.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000
M15	RIGID	0.25	Flat	0.000	0.000	8.993	2.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000
M16	RIGID	0.25	Flat	0.000	0.000	8.993	2.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000
M17	RIGID	0.25	Flat	0.000	0.000	8.993	2.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000
M18	RIGID	0.666666	Flat	0.000	0.000	8.993	2.000	0.000	0.000	0.003	0.003	0.003	0.000	0.000
M19	SFS-H	4.375248715	Flat	2.500	3.536	27.786	2.000	0.009	0.009	0.003	0.003	0.011	0.001	0.001
M20	SFS-H	4.375248715	Flat	2.500	3.536	27.786	2.000	0.009	0.009	0.003	0.003	0.011	0.001	0.001
M21	PKBK	4.000054454	Flat	3.000	4.242	31.541	2.000	0.018	0.022	0.005	0.007	0.012	0.001	0.001

APPENDIX C

SOFTWARE ANALYSIS OUTPUT

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E...	Density[k/ft...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A992	29000	11154	.3	.65	.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	.3	.65	.527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	.527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	.3	.65	.49	35	1.6	60	1.2
7	A1085	29000	11154	.3	.65	.49	50	1.4	65	1.3

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Standoff	HSS4X4X4	Beam	Tube	A500 Gr....	Typical	3.37	7.8	7.8	12.8
2	Support Pipe	PIPE_4.0	Beam	Pipe	A53 Gr.B	Typical	2.96	6.82	6.82	13.6
3	Face Horizontal	PIPE_3.0	Beam	Pipe	A53 Gr.B	Typical	2.07	2.85	2.85	5.69
4	Mount Pipes	PIPE_2.0X	Beam	Pipe	A53 Gr.B	Typical	1.4	.827	.827	1.65
5	Position 3 Mount Pipe	PIPE_2.5	Beam	Pipe	A53 Gr.B	Typical	1.61	1.45	1.45	2.89
6	SFS-H	L2.5x2.5x3	Beam	Single Angle	A36 Gr.36	Typical	.901	.535	.535	.011
7	P2174	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
8	PKBK	LL3x3x3x3	Beam	Double Angle (3...	A53 Gr.B	Typical	2.18	4.09	1.9	.027

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	N1	0	0	0	0	
2	N2	0	0	2.916667	0	
3	N3	0	.75	2.916667	0	
4	N4	0	-.75	2.916667	0	
5	N5	0	0	3.104167	0	
6	N6	6.666667	0	3.104167	0	
7	N7	-6.666667	0	3.104167	0	
8	N8	-6	0	3.104167	0	
9	N9	6	0	3.104167	0	
10	N10	-1.083333	0	3.104167	0	
11	N11	2	0	3.104167	0	
12	N12	-1.083333	4.416667	3.354167	0	
13	N13	-1.083333	-3.583333	3.354167	0	
14	N14	-1.083333	0	3.354167	0	
15	N15	-6	0	3.354167	0	
16	N16	6	0	3.354167	0	
17	N17	2	0	3.354167	0	
18	N18	-6	2.916667	3.354167	0	
19	N19	6	2.916667	3.354167	0	
20	N20	2	2.916667	3.354167	0	
21	N21	-6	-3.083333	3.354167	0	
22	N22	6	-3.083333	3.354167	0	
23	N23	2	-3.083333	3.354167	0	
24	N24	0	2	0	0	
25	N25	6.666667	2	3.104167	0	
26	N26	-6.666667	2	3.104167	0	
27	N27	-6	2	3.104167	0	
28	N28	6	2	3.104167	0	
29	N29	-1.083333	2	3.104167	0	
30	N30	2	2	3.104167	0	
31	N31	-1.083333	2	3.354167	0	
32	N32	-6	2	3.354167	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
33	N33	6	2	3.354167	0	
34	N34	2	2	3.354167	0	
35	N35	-0.333333	2	0	0	
36	N36	0.333333	2	0	0	
37	N37	-3.416667	2	3.104167	0	
38	N38	3.416667	2	3.104167	0	
39	N39	0	0	2.416667	0	
40	N40	0	-3.1875	0	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N24	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N35						
4	N36						
5	N40	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N2	N1			Standoff	Beam	Tube	A500 Gr.B...	Typical
2	M2	N3	N4			Support Pipe	Beam	Pipe	A53 Gr.B	Typical
3	M3	N7	N6			Face Horizontal	Beam	Pipe	A53 Gr.B	Typical
4	M4	N5	N2			RIGID	None	None	RIGID	Typical
5	MP3	N12	N13			Position 3 Mou...	Beam	Pipe	A53 Gr.B	Typical
6	M6	N15	N8			RIGID	None	None	RIGID	Typical
7	M7	N14	N10			RIGID	None	None	RIGID	Typical
8	M8	N17	N11			RIGID	None	None	RIGID	Typical
9	M9	N16	N9			RIGID	None	None	RIGID	Typical
10	MP4	N18	N21			Mount Pipes	Beam	Pipe	A53 Gr.B	Typical
11	MP2	N20	N23			Mount Pipes	Beam	Pipe	A53 Gr.B	Typical
12	MP1	N19	N22			Mount Pipes	Beam	Pipe	A53 Gr.B	Typical
13	M13	N26	N25			P2174	Beam	Pipe	A53 Gr.B	Typical
14	M14	N32	N27			RIGID	None	None	RIGID	Typical
15	M15	N31	N29			RIGID	None	None	RIGID	Typical
16	M16	N34	N30			RIGID	None	None	RIGID	Typical
17	M17	N33	N28			RIGID	None	None	RIGID	Typical
18	M18	N35	N36			RIGID	None	None	RIGID	Typical
19	M19	N37	N35		90	SFS-H	Beam	Single Angle	A36 Gr.36	Typical
20	M20	N38	N36		180	SFS-H	Beam	Single Angle	A36 Gr.36	Typical
21	M21	N39	N40			PKBK	Beam	Double Angle (...	A53 Gr.B	Typical

Joint Loads and Enforced Displacements (BLC 42 : Man 1 (500 lbs))

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/f...
1	N9	L	Y	-.5

Joint Loads and Enforced Displacements (BLC 43 : Man 2 (500 lbs))

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/f...
1	N28	L	Y	-.5

Joint Loads and Enforced Displacements (BLC 44 : Man 3 (500 lbs))

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/f...

Joint Loads and Enforced Displacements (BLC 44 : Man 3 (500 lbs)) (Continued)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/f...
1	N10	L	Y	-.5

Joint Loads and Enforced Displacements (BLC 45 : Man 4 (250 lbs))

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/f...
1	N29	L	Y	-.25

Joint Loads and Enforced Displacements (BLC 46 : Man 5 (250 lbs))

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/f...
1	N8	L	Y	-.25

Joint Loads and Enforced Displacements (BLC 47 : Man 6 (250 lbs))

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/f...
1	N27	L	Y	-.25

Member Point Loads (BLC 1 : Dead)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP1	Y	-.092	%50
2	MP1	Y	-.011	%50
3	MP3	Y	-.128	%50
4	MP4	Y	-.092	%50
5	MP4	Y	-.075	%50

Member Point Loads (BLC 2 : Ice Dead)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP1	Y	-.156	%50
2	MP1	Y	-.01	%50
3	MP3	Y	-.45	%50
4	MP4	Y	-.155	%50
5	MP4	Y	-.046	%50

Member Point Loads (BLC 3 : Full Wind Antenna (0 Deg))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP1	Z	-.134	%11.1
2	MP3	Z	-.447	%.1
3	MP4	Z	-.134	%11.2
4	MP4	Z	-.007	%50
5	MP1	Z	-.134	%88.9
6	MP3	Z	-.447	%99.9
7	MP4	Z	-.134	%88.8

Member Point Loads (BLC 4 : Full Wind Antenna (30 Deg))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP1	Z	-.108	%11.1
2	MP3	Z	-.333	%.1
3	MP4	Z	-.108	%11.2
4	MP4	Z	-.006	%50
5	MP1	Z	-.108	%88.9
6	MP3	Z	-.333	%99.9
7	MP4	Z	-.108	%88.8
8	MP1	X	.062	%11.1
9	MP1	X	0	%45.1
10	MP3	X	.192	%.1

Member Point Loads (BLC 4 : Full Wind Antenna (30 Deg)) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
11	MP4	X	.062	%11.2
12	MP4	X	.009	%50
13	MP1	X	.062	%88.9
14	MP1	X	0	%54.9
15	MP3	X	.192	%99.9
16	MP4	X	.062	%88.8

Member Point Loads (BLC 5 : Full Wind Antenna (60 Deg))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP1	Z	-.052	%11.1
2	MP3	Z	-.129	%.1
3	MP4	Z	-.052	%11.2
4	MP4	Z	-.003	%50
5	MP1	Z	-.052	%88.9
6	MP3	Z	-.129	%99.9
7	MP4	Z	-.052	%88.8
8	MP1	X	.091	%11.1
9	MP1	X	.003	%45.1
10	MP3	X	.224	%.1
11	MP4	X	.091	%11.2
12	MP4	X	.035	%50
13	MP1	X	.091	%88.9
14	MP1	X	.003	%54.9
15	MP3	X	.224	%99.9
16	MP4	X	.091	%88.8

Member Point Loads (BLC 6 : Full Wind Antenna (90 Deg))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP1	Z	0	%11.1
2	MP3	Z	0	%.1
3	MP4	Z	0	%11.2
4	MP4	Z	0	%50
5	MP1	Z	0	%88.9
6	MP3	Z	0	%99.9
7	MP4	Z	0	%88.8
8	MP1	X	.095	%11.1
9	MP1	X	.004	%45.1
10	MP3	X	.196	%.1
11	MP4	X	.095	%11.2
12	MP4	X	.051	%50
13	MP1	X	.095	%88.9
14	MP1	X	.004	%54.9
15	MP3	X	.196	%99.9
16	MP4	X	.095	%88.8

Member Point Loads (BLC 7 : Full Wind Antenna (120 Deg))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP1	Z	.052	%11.1
2	MP3	Z	.129	%.1
3	MP4	Z	.052	%11.2
4	MP4	Z	.003	%50
5	MP1	Z	.052	%88.9
6	MP3	Z	.129	%99.9
7	MP4	Z	.052	%88.8
8	MP1	X	.091	%11.1

Member Point Loads (BLC 7 : Full Wind Antenna (120 Deg)) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
9	MP1	X	.003	%45.1
10	MP3	X	.224	%.1
11	MP4	X	.091	%11.2
12	MP4	X	.035	%50
13	MP1	X	.091	%88.9
14	MP1	X	.003	%54.9
15	MP3	X	.224	%99.9
16	MP4	X	.091	%88.8

Member Point Loads (BLC 8 : Full Wind Antenna (150 Deg))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP1	Z	.108	%11.1
2	MP3	Z	.333	%.1
3	MP4	Z	.108	%11.2
4	MP4	Z	.006	%50
5	MP1	Z	.108	%88.9
6	MP3	Z	.333	%99.9
7	MP4	Z	.108	%88.8
8	MP1	X	.062	%11.1
9	MP1	X	0	%45.1
10	MP3	X	.192	%.1
11	MP4	X	.062	%11.2
12	MP4	X	.009	%50
13	MP1	X	.062	%88.9
14	MP1	X	0	%54.9
15	MP3	X	.192	%99.9
16	MP4	X	.062	%88.8

Member Point Loads (BLC 15 : Ice Wind Antenna (0 Deg))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP1	Z	-.028	%11.1
2	MP3	Z	-.083	%.1
3	MP4	Z	-.028	%11.2
4	MP4	Z	-.002	%50
5	MP1	Z	-.028	%88.9
6	MP3	Z	-.083	%99.9
7	MP4	Z	-.028	%88.8

Member Point Loads (BLC 16 : Ice Wind Antenna (30 Deg))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP1	Z	-.023	%11.1
2	MP3	Z	-.063	%.1
3	MP4	Z	-.023	%11.2
4	MP4	Z	-.001	%50
5	MP1	Z	-.023	%88.9
6	MP3	Z	-.063	%99.9
7	MP4	Z	-.023	%88.8
8	MP1	X	.013	%11.1
9	MP1	X	0	%45.1
10	MP3	X	.037	%.1
11	MP4	X	.013	%11.2
12	MP4	X	.002	%50
13	MP1	X	.013	%88.9
14	MP1	X	0	%54.9
15	MP3	X	.037	%99.9

Member Point Loads (BLC 16 : Ice Wind Antenna (30 Deg)) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
16	MP4	X	.013	%88.8

Member Point Loads (BLC 17 : Ice Wind Antenna (60 Deg))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP1	Z	-.012	%11.1
2	MP3	Z	-.026	%.1
3	MP4	Z	-.012	%11.2
4	MP4	Z	-.001	%50
5	MP1	Z	-.012	%88.9
6	MP3	Z	-.026	%99.9
7	MP4	Z	-.012	%88.8
8	MP1	X	.02	%11.1
9	MP1	X	.001	%45.1
10	MP3	X	.046	%.1
11	MP4	X	.02	%11.2
12	MP4	X	.009	%50
13	MP1	X	.02	%88.9
14	MP1	X	.001	%54.9
15	MP3	X	.046	%99.9
16	MP4	X	.02	%88.8

Member Point Loads (BLC 18 : Ice Wind Antenna (90 Deg))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP1	Z	0	%11.1
2	MP3	Z	0	%.1
3	MP4	Z	0	%11.2
4	MP4	Z	0	%50
5	MP1	Z	0	%88.9
6	MP3	Z	0	%99.9
7	MP4	Z	0	%88.8
8	MP1	X	.022	%11.1
9	MP1	X	.002	%45.1
10	MP3	X	.042	%.1
11	MP4	X	.022	%11.2
12	MP4	X	.014	%50
13	MP1	X	.022	%88.9
14	MP1	X	.002	%54.9
15	MP3	X	.042	%99.9
16	MP4	X	.022	%88.8

Member Point Loads (BLC 19 : Ice Wind Antenna (120 Deg))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP1	Z	.012	%11.1
2	MP3	Z	.026	%.1
3	MP4	Z	.012	%11.2
4	MP4	Z	.001	%50
5	MP1	Z	.012	%88.9
6	MP3	Z	.026	%99.9
7	MP4	Z	.012	%88.8
8	MP1	X	.02	%11.1
9	MP1	X	.001	%45.1
10	MP3	X	.046	%.1
11	MP4	X	.02	%11.2
12	MP4	X	.009	%50
13	MP1	X	.02	%88.9

Member Point Loads (BLC 19 : Ice Wind Antenna (120 Deg)) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
14	MP1	X	.001	%54.9
15	MP3	X	.046	%99.9
16	MP4	X	.02	%88.8

Member Point Loads (BLC 20 : Ice Wind Antenna (150 Deg))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP1	Z	.023	%11.1
2	MP3	Z	.026	%.1
3	MP4	Z	.012	%11.2
4	MP4	Z	.001	%50
5	MP1	Z	.023	%88.9
6	MP3	Z	.026	%99.9
7	MP4	Z	.012	%88.8
8	MP1	X	.013	%11.1
9	MP1	X	.001	%45.1
10	MP3	X	.046	%.1
11	MP4	X	.02	%11.2
12	MP4	X	.009	%50
13	MP1	X	.013	%88.9
14	MP1	X	.001	%54.9
15	MP3	X	.046	%99.9
16	MP4	X	.02	%88.8

Member Point Loads (BLC 27 : Seismic Antenna (0 Deg))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP1	Z	-.009	%50
2	MP1	Z	-.001	%50
3	MP3	Z	-.013	%50
4	MP4	Z	-.009	%50
5	MP4	Z	-.008	%50

Member Point Loads (BLC 28 : Seismic Antenna (90 Deg))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP1	X	.009	%50
2	MP1	X	.001	%50
3	MP3	X	.013	%50
4	MP4	X	.009	%50
5	MP4	X	.008	%50

Member Point Loads (BLC 41 : Seismic Vertical Antennas)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP1	Y	-.018	%50
2	MP1	Y	-.002	%50
3	MP3	Y	-.026	%50
4	MP4	Y	-.018	%50
5	MP4	Y	-.015	%50

Member Distributed Loads (BLC 2 : Ice Dead)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,...	End Location[ft,%]
1	M1	Y	-.015	-.015	0	%100
2	M2	Y	-.013	-.013	0	%100
3	M3	Y	-.011	-.011	0	%100
4	M4	Y	-.003	-.003	0	%100

Member Distributed Loads (BLC 2 : Ice Dead) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,...	End Location[ft,%]
5	MP3	Y	-.009	-.009	0	%100
6	M6	Y	-.003	-.003	0	%100
7	M7	Y	-.003	-.003	0	%100
8	M8	Y	-.003	-.003	0	%100
9	M9	Y	-.003	-.003	0	%100
10	MP4	Y	-.008	-.008	0	%100
11	MP2	Y	-.008	-.008	0	%100
12	MP1	Y	-.008	-.008	0	%100
13	M13	Y	-.008	-.008	0	%100
14	M14	Y	-.003	-.003	0	%100
15	M15	Y	-.003	-.003	0	%100
16	M16	Y	-.003	-.003	0	%100
17	M17	Y	-.003	-.003	0	%100
18	M18	Y	-.003	-.003	0	%100
19	M19	Y	-.011	-.011	0	%100
20	M20	Y	-.011	-.011	0	%100
21	M21	Y	-.012	-.012	0	%100

Member Distributed Loads (BLC 9 : Full Wind Members (0 Deg))

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,...	End Location[ft,%]
1	M1	Z	0	0	0	%100
2	M2	Z	-.02	-.02	0	%100
3	M3	Z	-.015	-.015	0	%100
4	MP3	Z	-.013	-.013	0	%.1
5	MP4	Z	-.011	-.011	0	%11.2
6	MP2	Z	-.011	-.011	0	%100
7	MP1	Z	-.011	-.011	0	%11.1
8	M13	Z	-.011	-.011	0	%100
9	M19	Z	-.009	-.009	0	%100
10	M20	Z	-.009	-.009	0	%100
11	M21	Z	-.018	-.018	0	%100
12	MP3	Z	-.013	-.013	%99.9	%100
13	MP4	Z	-.011	-.011	%88.8	%100
14	MP1	Z	-.011	-.011	%88.9	%100
15	M1	X	0	0	0	%100
16	M2	X	0	0	0	%100
17	M3	X	0	0	0	%100
18	MP3	X	0	0	0	%100
19	MP4	X	0	0	0	%100
20	MP2	X	0	0	0	%100
21	MP1	X	0	0	0	%100
22	M13	X	0	0	0	%100
23	M19	X	0	0	0	%100
24	M20	X	0	0	0	%100
25	M21	X	0	0	0	%100

Member Distributed Loads (BLC 10 : Full Wind Members (30 Deg))

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,...	End Location[ft,%]
1	M1	Z	-.006	-.006	0	%100
2	M2	Z	-.017	-.017	0	%100
3	M3	Z	-.01	-.01	0	%100
4	MP3	Z	-.011	-.011	0	%.1
5	MP4	Z	-.009	-.009	0	%11.2
6	MP2	Z	-.009	-.009	0	%100
7	MP1	Z	-.009	-.009	0	%11.1
8	M13	Z	-.007	-.007	0	%100

Member Distributed Loads (BLC 10 : Full Wind Members (30 Deg)) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,...	End Location[ft,%]
9	M19	Z	-.001	-.001	0	%100
10	M20	Z	-.015	-.015	0	%100
11	M21	Z	-.016	-.016	0	%100
12	MP3	Z	-.011	-.011	%99.9	%100
13	MP4	Z	-.009	-.009	%88.8	%100
14	MP1	Z	-.009	-.009	%88.9	%100
15	M1	X	.004	.004	0	%100
16	M2	X	.01	.01	0	%100
17	M3	X	.006	.006	0	%100
18	MP3	X	.006	.006	0	%100
19	MP4	X	.005	.005	0	%100
20	MP2	X	.005	.005	0	%100
21	MP1	X	.005	.005	0	%100
22	M13	X	.004	.004	0	%100
23	M19	X	.001	.001	0	%100
24	M20	X	.009	.009	0	%100
25	M21	X	.009	.009	0	%100

Member Distributed Loads (BLC 11 : Full Wind Members (60 Deg))

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,...	End Location[ft,%]
1	M1	Z	-.011	-.011	0	%100
2	M2	Z	-.01	-.01	0	%100
3	M3	Z	-.002	-.002	0	%100
4	MP3	Z	-.006	-.006	0	%.1
5	MP4	Z	-.005	-.005	0	%11.2
6	MP2	Z	-.005	-.005	0	%100
7	MP1	Z	-.005	-.005	0	%11.1
8	M13	Z	-.001	-.001	0	%100
9	M19	Z	-.001	-.001	0	%100
10	M20	Z	-.009	-.009	0	%100
11	M21	Z	-.01	-.01	0	%100
12	MP3	Z	-.006	-.006	%99.9	%100
13	MP4	Z	-.005	-.005	%88.8	%100
14	MP1	Z	-.005	-.005	%88.9	%100
15	M1	X	.019	.019	0	%100
16	M2	X	.017	.017	0	%100
17	M3	X	.003	.003	0	%100
18	MP3	X	.011	.011	0	%100
19	MP4	X	.009	.009	0	%100
20	MP2	X	.009	.009	0	%100
21	MP1	X	.009	.009	0	%100
22	M13	X	.002	.002	0	%100
23	M19	X	.001	.001	0	%100
24	M20	X	.015	.015	0	%100
25	M21	X	.018	.018	0	%100

Member Distributed Loads (BLC 12 : Full Wind Members (90 Deg))

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,...	End Location[ft,%]
1	M1	Z	0	0	0	%100
2	M2	Z	0	0	0	%100
3	M3	Z	0	0	0	%100
4	MP3	Z	0	0	0	%.1
5	MP4	Z	0	0	0	%11.2
6	MP2	Z	0	0	0	%100
7	MP1	Z	0	0	0	%11.1
8	M13	Z	0	0	0	%100

Member Distributed Loads (BLC 12 : Full Wind Members (90 Deg)) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,...	End Location[ft,%]
9	M19	Z	0	0	0	%100
10	M20	Z	0	0	0	%100
11	M21	Z	0	0	0	%100
12	MP3	Z	0	0	%99.9	%100
13	MP4	Z	0	0	%88.8	%100
14	MP1	Z	0	0	%88.9	%100
15	M1	X	.029	.029	0	%100
16	M2	X	.02	.02	0	%100
17	M3	X	0	0	0	%100
18	MP3	X	.013	.013	0	%100
19	MP4	X	.011	.011	0	%100
20	MP2	X	.011	.011	0	%100
21	MP1	X	.011	.011	0	%100
22	M13	X	0	0	0	%100
23	M19	X	.009	.009	0	%100
24	M20	X	.009	.009	0	%100
25	M21	X	.022	.022	0	%100

Member Distributed Loads (BLC 13 : Full Wind Members (120 Deg))

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,...	End Location[ft,%]
1	M1	Z	.011	.011	0	%100
2	M2	Z	.01	.01	0	%100
3	M3	Z	.002	.002	0	%100
4	MP3	Z	.006	.006	0	%.1
5	MP4	Z	.005	.005	0	%11.2
6	MP2	Z	.005	.005	0	%100
7	MP1	Z	.005	.005	0	%11.1
8	M13	Z	.001	.001	0	%100
9	M19	Z	.009	.009	0	%100
10	M20	Z	.001	.001	0	%100
11	M21	Z	.01	.01	0	%100
12	MP3	Z	.006	.006	%99.9	%100
13	MP4	Z	.005	.005	%88.8	%100
14	MP1	Z	.005	.005	%88.9	%100
15	M1	X	.019	.019	0	%100
16	M2	X	.017	.017	0	%100
17	M3	X	.003	.003	0	%100
18	MP3	X	.011	.011	0	%100
19	MP4	X	.009	.009	0	%100
20	MP2	X	.009	.009	0	%100
21	MP1	X	.009	.009	0	%100
22	M13	X	.002	.002	0	%100
23	M19	X	.015	.015	0	%100
24	M20	X	.001	.001	0	%100
25	M21	X	.018	.018	0	%100

Member Distributed Loads (BLC 14 : Full Wind Members (150 Deg))

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,...	End Location[ft,%]
1	M1	Z	.006	.006	0	%100
2	M2	Z	.017	.017	0	%100
3	M3	Z	.01	.01	0	%100
4	MP3	Z	.011	.011	0	%.1
5	MP4	Z	.009	.009	0	%11.2
6	MP2	Z	.009	.009	0	%100
7	MP1	Z	.009	.009	0	%11.1
8	M13	Z	.007	.007	0	%100

Member Distributed Loads (BLC 14 : Full Wind Members (150 Deg)) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,...	End Location[ft,%]
9	M19	Z	.015	.015	0	%100
10	M20	Z	.001	.001	0	%100
11	M21	Z	.016	.016	0	%100
12	MP3	Z	.011	.011	%99.9	%100
13	MP4	Z	.009	.009	%88.8	%100
14	MP1	Z	.009	.009	%88.9	%100
15	M1	X	.004	.004	0	%100
16	M2	X	.01	.01	0	%100
17	M3	X	.006	.006	0	%100
18	MP3	X	.006	.006	0	%100
19	MP4	X	.005	.005	0	%100
20	MP2	X	.005	.005	0	%100
21	MP1	X	.005	.005	0	%100
22	M13	X	.004	.004	0	%100
23	M19	X	.009	.009	0	%100
24	M20	X	.001	.001	0	%100
25	M21	X	.009	.009	0	%100

Member Distributed Loads (BLC 21 : Ice Wind Members (0 Deg))

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,...	End Location[ft,%]
1	M1	Z	0	0	0	%100
2	M2	Z	-.008	-.008	0	%100
3	M3	Z	-.005	-.005	0	%100
4	M4	Z	0	0	0	%100
5	MP3	Z	-.005	-.005	0	%.1
6	M6	Z	0	0	0	%100
7	M7	Z	0	0	0	%100
8	M8	Z	0	0	0	%100
9	M9	Z	0	0	0	%100
10	MP4	Z	-.004	-.004	0	%11.2
11	MP2	Z	-.004	-.004	0	%100
12	MP1	Z	-.004	-.004	0	%11.1
13	M13	Z	-.004	-.004	0	%100
14	M14	Z	0	0	0	%100
15	M15	Z	0	0	0	%100
16	M16	Z	0	0	0	%100
17	M17	Z	0	0	0	%100
18	M18	Z	-.003	-.003	0	%100
19	M19	Z	-.003	-.003	0	%100
20	M20	Z	-.003	-.003	0	%100
21	M21	Z	-.005	-.005	0	%100
22	MP3	Z	-.005	-.005	%99.9	%100
23	MP4	Z	-.004	-.004	%88.8	%100
24	MP1	Z	-.004	-.004	%88.9	%100
25	M1	X	0	0	0	%100
26	M2	X	0	0	0	%100
27	M3	X	0	0	0	%100
28	M4	X	0	0	0	%100
29	MP3	X	0	0	0	%100
30	M6	X	0	0	0	%100
31	M7	X	0	0	0	%100
32	M8	X	0	0	0	%100
33	M9	X	0	0	0	%100
34	MP4	X	0	0	0	%100
35	MP2	X	0	0	0	%100
36	MP1	X	0	0	0	%100

Member Distributed Loads (BLC 21 : Ice Wind Members (0 Deg)) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,...	End Location[ft,%]
37	M13	X	0	0	0	%100
38	M14	X	0	0	0	%100
39	M15	X	0	0	0	%100
40	M16	X	0	0	0	%100
41	M17	X	0	0	0	%100
42	M18	X	0	0	0	%100
43	M19	X	0	0	0	%100
44	M20	X	0	0	0	%100
45	M21	X	0	0	0	%100

Member Distributed Loads (BLC 22 : Ice Wind Members (30 Deg))

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,...	End Location[ft,%]
1	M1	Z	-.001	-.001	0	%100
2	M2	Z	-.007	-.007	0	%100
3	M3	Z	-.004	-.004	0	%100
4	M4	Z	0	0	0	%100
5	MP3	Z	-.004	-.004	0	%.1
6	M6	Z	0	0	0	%100
7	M7	Z	0	0	0	%100
8	M8	Z	0	0	0	%100
9	M9	Z	0	0	0	%100
10	MP4	Z	-.004	-.004	0	%11.2
11	MP2	Z	-.004	-.004	0	%100
12	MP1	Z	-.004	-.004	0	%11.1
13	M13	Z	-.003	-.003	0	%100
14	M14	Z	0	0	0	%100
15	M15	Z	0	0	0	%100
16	M16	Z	0	0	0	%100
17	M17	Z	0	0	0	%100
18	M18	Z	-.003	-.003	0	%100
19	M19	Z	-.001	-.001	0	%100
20	M20	Z	-.004	-.004	0	%100
21	M21	Z	-.005	-.005	0	%100
22	MP3	Z	-.004	-.004	%99.9	%100
23	MP4	Z	-.004	-.004	%88.8	%100
24	MP1	Z	-.004	-.004	%88.9	%100
25	M1	X	.001	.001	0	%100
26	M2	X	.004	.004	0	%100
27	M3	X	.002	.002	0	%100
28	M4	X	0	0	0	%100
29	MP3	X	.002	.002	0	%100
30	M6	X	0	0	0	%100
31	M7	X	0	0	0	%100
32	M8	X	0	0	0	%100
33	M9	X	0	0	0	%100
34	MP4	X	.002	.002	0	%100
35	MP2	X	.002	.002	0	%100
36	MP1	X	.002	.002	0	%100
37	M13	X	.002	.002	0	%100
38	M14	X	0	0	0	%100
39	M15	X	0	0	0	%100
40	M16	X	0	0	0	%100
41	M17	X	0	0	0	%100
42	M18	X	.002	.002	0	%100
43	M19	X	.001	.001	0	%100
44	M20	X	.002	.002	0	%100

Member Distributed Loads (BLC 22 : Ice Wind Members (30 Deg)) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,...	End Location[ft,%]
45	M21	X	.003	.003	0	%100

Member Distributed Loads (BLC 23 : Ice Wind Members (60 Deg))

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,...	End Location[ft,%]
1	M1	Z	-.002	-.002	0	%100
2	M2	Z	-.004	-.004	0	%100
3	M3	Z	-.002	-.002	0	%100
4	M4	Z	0	0	0	%100
5	MP3	Z	-.002	-.002	0	%.1
6	M6	Z	0	0	0	%100
7	M7	Z	0	0	0	%100
8	M8	Z	0	0	0	%100
9	M9	Z	0	0	0	%100
10	MP4	Z	-.002	-.002	0	%11.2
11	MP2	Z	-.002	-.002	0	%100
12	MP1	Z	-.002	-.002	0	%11.1
13	M13	Z	-.001	-.001	0	%100
14	M14	Z	0	0	0	%100
15	M15	Z	0	0	0	%100
16	M16	Z	0	0	0	%100
17	M17	Z	0	0	0	%100
18	M18	Z	-.002	-.002	0	%100
19	M19	Z	-.001	-.001	0	%100
20	M20	Z	-.002	-.002	0	%100
21	M21	Z	-.003	-.003	0	%100
22	MP3	Z	-.002	-.002	%99.9	%100
23	MP4	Z	-.002	-.002	%88.8	%100
24	MP1	Z	-.002	-.002	%88.9	%100
25	M1	X	.003	.003	0	%100
26	M2	X	.007	.007	0	%100
27	M3	X	.003	.003	0	%100
28	M4	X	0	0	0	%100
29	MP3	X	.004	.004	0	%100
30	M6	X	0	0	0	%100
31	M7	X	0	0	0	%100
32	M8	X	0	0	0	%100
33	M9	X	0	0	0	%100
34	MP4	X	.004	.004	0	%100
35	MP2	X	.004	.004	0	%100
36	MP1	X	.004	.004	0	%100
37	M13	X	.003	.003	0	%100
38	M14	X	0	0	0	%100
39	M15	X	0	0	0	%100
40	M16	X	0	0	0	%100
41	M17	X	0	0	0	%100
42	M18	X	.003	.003	0	%100
43	M19	X	.001	.001	0	%100
44	M20	X	.004	.004	0	%100
45	M21	X	.005	.005	0	%100

Member Distributed Loads (BLC 24 : Ice Wind Members (90 Deg))

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,...	End Location[ft,%]
1	M1	Z	0	0	0	%100
2	M2	Z	0	0	0	%100
3	M3	Z	0	0	0	%100
4	M4	Z	0	0	0	%100

Member Distributed Loads (BLC 24 : Ice Wind Members (90 Deg)) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,...	End Location[ft,%]
5	MP3	Z	0	0	0	%.1
6	M6	Z	0	0	0	%100
7	M7	Z	0	0	0	%100
8	M8	Z	0	0	0	%100
9	M9	Z	0	0	0	%100
10	MP4	Z	0	0	0	%11.2
11	MP2	Z	0	0	0	%100
12	MP1	Z	0	0	0	%11.1
13	M13	Z	0	0	0	%100
14	M14	Z	0	0	0	%100
15	M15	Z	0	0	0	%100
16	M16	Z	0	0	0	%100
17	M17	Z	0	0	0	%100
18	M18	Z	0	0	0	%100
19	M19	Z	0	0	0	%100
20	M20	Z	0	0	0	%100
21	M21	Z	0	0	0	%100
22	MP3	Z	0	0	%99.9	%100
23	MP4	Z	0	0	%88.8	%100
24	MP1	Z	0	0	%88.9	%100
25	M1	X	.005	.005	0	%100
26	M2	X	.008	.008	0	%100
27	M3	X	.002	.002	0	%100
28	M4	X	0	0	0	%100
29	MP3	X	.005	.005	0	%100
30	M6	X	0	0	0	%100
31	M7	X	0	0	0	%100
32	M8	X	0	0	0	%100
33	M9	X	0	0	0	%100
34	MP4	X	.004	.004	0	%100
35	MP2	X	.004	.004	0	%100
36	MP1	X	.004	.004	0	%100
37	M13	X	.002	.002	0	%100
38	M14	X	0	0	0	%100
39	M15	X	0	0	0	%100
40	M16	X	0	0	0	%100
41	M17	X	0	0	0	%100
42	M18	X	.003	.003	0	%100
43	M19	X	.003	.003	0	%100
44	M20	X	.003	.003	0	%100
45	M21	X	.007	.007	0	%100

Member Distributed Loads (BLC 25 : Ice Wind Members (120 Deg))

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,...	End Location[ft,%]
1	M1	Z	.002	.002	0	%100
2	M2	Z	.004	.004	0	%100
3	M3	Z	.002	.002	0	%100
4	M4	Z	0	0	0	%100
5	MP3	Z	.002	.002	0	%.1
6	M6	Z	0	0	0	%100
7	M7	Z	0	0	0	%100
8	M8	Z	0	0	0	%100
9	M9	Z	0	0	0	%100
10	MP4	Z	.002	.002	0	%11.2
11	MP2	Z	.002	.002	0	%100
12	MP1	Z	.002	.002	0	%11.1

Member Distributed Loads (BLC 25 : Ice Wind Members (120 Deg)) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,...	End Location[ft,%]
13	M13	Z	.001	.001	0	%100
14	M14	Z	0	0	0	%100
15	M15	Z	0	0	0	%100
16	M16	Z	0	0	0	%100
17	M17	Z	0	0	0	%100
18	M18	Z	.002	.002	0	%100
19	M19	Z	.002	.002	0	%100
20	M20	Z	.001	.001	0	%100
21	M21	Z	.003	.003	0	%100
22	MP3	Z	.002	.002	%99.9	%100
23	MP4	Z	.002	.002	%88.8	%100
24	MP1	Z	.002	.002	%88.9	%100
25	M1	X	.003	.003	0	%100
26	M2	X	.007	.007	0	%100
27	M3	X	.003	.003	0	%100
28	M4	X	0	0	0	%100
29	MP3	X	.004	.004	0	%100
30	M6	X	0	0	0	%100
31	M7	X	0	0	0	%100
32	M8	X	0	0	0	%100
33	M9	X	0	0	0	%100
34	MP4	X	.004	.004	0	%100
35	MP2	X	.004	.004	0	%100
36	MP1	X	.004	.004	0	%100
37	M13	X	.003	.003	0	%100
38	M14	X	0	0	0	%100
39	M15	X	0	0	0	%100
40	M16	X	0	0	0	%100
41	M17	X	0	0	0	%100
42	M18	X	.003	.003	0	%100
43	M19	X	.004	.004	0	%100
44	M20	X	.001	.001	0	%100
45	M21	X	.005	.005	0	%100

Member Distributed Loads (BLC 26 : Ice Wind Members (150 Deg))

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,...	End Location[ft,%]
1	M1	Z	.001	.001	0	%100
2	M2	Z	.007	.007	0	%100
3	M3	Z	.004	.004	0	%100
4	M4	Z	0	0	0	%100
5	MP3	Z	.004	.004	0	%.1
6	M6	Z	0	0	0	%100
7	M7	Z	0	0	0	%100
8	M8	Z	0	0	0	%100
9	M9	Z	0	0	0	%100
10	MP4	Z	.004	.004	0	%11.2
11	MP2	Z	.004	.004	0	%100
12	MP1	Z	.004	.004	0	%11.1
13	M13	Z	.003	.003	0	%100
14	M14	Z	0	0	0	%100
15	M15	Z	0	0	0	%100
16	M16	Z	0	0	0	%100
17	M17	Z	0	0	0	%100
18	M18	Z	.003	.003	0	%100
19	M19	Z	.004	.004	0	%100
20	M20	Z	.001	.001	0	%100

Member Distributed Loads (BLC 26 : Ice Wind Members (150 Deg)) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,...	End Location[ft,%]
21	M21	Z	.005	.005	0	%100
22	MP3	Z	.004	.004	%99.9	%100
23	MP4	Z	.004	.004	%88.8	%100
24	MP1	Z	.004	.004	%88.9	%100
25	M1	X	.001	.001	0	%100
26	M2	X	.004	.004	0	%100
27	M3	X	.002	.002	0	%100
28	M4	X	0	0	0	%100
29	MP3	X	.002	.002	0	%100
30	M6	X	0	0	0	%100
31	M7	X	0	0	0	%100
32	M8	X	0	0	0	%100
33	M9	X	0	0	0	%100
34	MP4	X	.002	.002	0	%100
35	MP2	X	.002	.002	0	%100
36	MP1	X	.002	.002	0	%100
37	M13	X	.002	.002	0	%100
38	M14	X	0	0	0	%100
39	M15	X	0	0	0	%100
40	M16	X	0	0	0	%100
41	M17	X	0	0	0	%100
42	M18	X	.002	.002	0	%100
43	M19	X	.002	.002	0	%100
44	M20	X	.001	.001	0	%100
45	M21	X	.003	.003	0	%100

Member Area Loads

Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[ksf]
No Data to Print ...						

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(Me...	Surface(...
1	Dead	None		-1			5			
2	Ice Dead	None					5	21		
3	Full Wind Antenna (0 Deg)	None					7			
4	Full Wind Antenna (30 Deg)	None					16			
5	Full Wind Antenna (60 Deg)	None					16			
6	Full Wind Antenna (90 Deg)	None					16			
7	Full Wind Antenna (120 Deg)	None					16			
8	Full Wind Antenna (150 Deg)	None					16			
9	Full Wind Members (0 Deg)	None						25		
10	Full Wind Members (30 Deg)	None						25		
11	Full Wind Members (60 Deg)	None						25		
12	Full Wind Members (90 Deg)	None						25		
13	Full Wind Members (120 Deg)	None						25		
14	Full Wind Members (150 Deg)	None						25		
15	Ice Wind Antenna (0 Deg)	None					7			
16	Ice Wind Antenna (30 Deg)	None					16			
17	Ice Wind Antenna (60 Deg)	None					16			
18	Ice Wind Antenna (90 Deg)	None					16			
19	Ice Wind Antenna (120 Deg)	None					16			
20	Ice Wind Antenna (150 Deg)	None					16			
21	Ice Wind Members (0 Deg)	None						45		
22	Ice Wind Members (30 Deg)	None						45		

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(Me...	Surface(...
23	Ice Wind Members (60 Deg)	None						45		
24	Ice Wind Members (90 Deg)	None						45		
25	Ice Wind Members (120 Deg)	None						45		
26	Ice Wind Members (150 Deg)	None						45		
27	Seismic Antenna (0 Deg)	None					5			
28	Seismic Antenna (90 Deg)	None					5			
29	Seismic Members (0 Deg)	None		-.041	-.103					
30	Seismic Members (30 Deg)	None	.051	-.041	-.089					
31	Seismic Members (60 Deg)	None	.089	-.041	-.051					
32	Seismic Members (90 Deg)	None	.103	-.041						
33	Seismic Members (120 Deg)	None	.089	-.041	.051					
34	Seismic Members (150 Deg)	None	.051	-.041	.089					
35	Seismic Members (180 Deg)	None		-.041	.103					
36	Seismic Members (210 Deg)	None	-.051	-.041	.089					
37	Seismic Members (240 Deg)	None	-.089	-.041	.051					
38	Seismic Members (270 Deg)	None	-.103	-.041						
39	Seismic Members (300 Deg)	None	-.089	-.041	-.051					
40	Seismic Members (330 Deg)	None	-.051	-.041	-.089					
41	Seismic Vertical Antennas	None					5			
42	Man 1 (500 lbs)	None				1				
43	Man 2 (500 lbs)	None				1				
44	Man 3 (500 lbs)	None				1				
45	Man 4 (250 lbs)	None				1				
46	Man 5 (250 lbs)	None				1				
47	Man 6 (250 lbs)	None				1				

Load Combinations

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.4D	Yes	Y		1	1.4																				
2	1.2D + 1.0W 0°	Yes	Y		1	1.2	3	1	9	1																
3	1.2D + 1.0W 30°	Yes	Y		1	1.2	4	1	10	1																
4	1.2D + 1.0W 60°	Yes	Y		1	1.2	5	1	11	1																
5	1.2D + 1.0W 90°	Yes	Y		1	1.2	6	1	12	1																
6	1.2D + 1.0W 120°	Yes	Y		1	1.2	7	1	13	1																
7	1.2D + 1.0W 150°	Yes	Y		1	1.2	8	1	14	1																
8	1.2D + 1.0W 180°	Yes	Y		1	1.2	3	-1	9	-1																
9	1.2D + 1.0W 210°	Yes	Y		1	1.2	4	-1	10	-1																
10	1.2D + 1.0W 240°	Yes	Y		1	1.2	5	-1	11	-1																
11	1.2D + 1.0W 270°	Yes	Y		1	1.2	6	-1	12	-1																
12	1.2D + 1.0W 300°	Yes	Y		1	1.2	7	-1	13	-1																
13	1.2D + 1.0W 330°	Yes	Y		1	1.2	8	-1	14	-1																
14	1.2D + 1.0Di + 1.0Wi 0°	Yes	Y		1	1.2	2	1	15	1	21	1														
15	1.2D + 1.0Di + 1.0Wi 30°	Yes	Y		1	1.2	2	1	16	1	22	1														
16	1.2D + 1.0Di + 1.0Wi 60°	Yes	Y		1	1.2	2	1	17	1	23	1														
17	1.2D + 1.0Di + 1.0Wi 90°	Yes	Y		1	1.2	2	1	18	1	24	1														
18	1.2D + 1.0Di + 1.0Wi 120°	Yes	Y		1	1.2	2	1	19	1	25	1														
19	1.2D + 1.0Di + 1.0Wi 150°	Yes	Y		1	1.2	2	1	20	1	26	1														
20	1.2D + 1.0Di + 1.0Wi 180°	Yes	Y		1	1.2	2	1	15	-1	21	-1														
21	1.2D + 1.0Di + 1.0Wi 210°	Yes	Y		1	1.2	2	1	16	-1	22	-1														
22	1.2D + 1.0Di + 1.0Wi 240°	Yes	Y		1	1.2	2	1	17	-1	23	-1														
23	1.2D + 1.0Di + 1.0Wi 270°	Yes	Y		1	1.2	2	1	18	-1	24	-1														
24	1.2D + 1.0Di + 1.0Wi 300°	Yes	Y		1	1.2	2	1	19	-1	25	-1														
25	1.2D + 1.0Di + 1.0Wi 330°	Yes	Y		1	1.2	2	1	20	-1	26	-1														
26	1.2D + 1.5Lm_1 + 1.0Wm 0°	Yes	Y		1	1.2	3	.059	9	.059	42	1.5														
27	1.2D + 1.5Lm_1 + 1.0Wm 30°	Yes	Y		1	1.2	4	.059	10	.059	42	1.5														

Load Combinations (Continued)

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
28	1.2D + 1.5Lm_1 + 1.0Wm 60°	Yes	Y		1	1.2	5	.059	11	.059	42	1.5												
29	1.2D + 1.5Lm_1 + 1.0Wm 90°	Yes	Y		1	1.2	6	.059	12	.059	42	1.5												
30	1.2D + 1.5Lm_1 + 1.0Wm 120°	Yes	Y		1	1.2	7	.059	13	.059	42	1.5												
31	1.2D + 1.5Lm_1 + 1.0Wm 150°	Yes	Y		1	1.2	8	.059	14	.059	42	1.5												
32	1.2D + 1.5Lm_1 + 1.0Wm 180°	Yes	Y		1	1.2	3	-.0...	9	-.0...	42	1.5												
33	1.2D + 1.5Lm_1 + 1.0Wm 210°	Yes	Y		1	1.2	4	-.0...	10	-.0...	42	1.5												
34	1.2D + 1.5Lm_1 + 1.0Wm 240°	Yes	Y		1	1.2	5	-.0...	11	-.0...	42	1.5												
35	1.2D + 1.5Lm_1 + 1.0Wm 270°	Yes	Y		1	1.2	6	-.0...	12	-.0...	42	1.5												
36	1.2D + 1.5Lm_1 + 1.0Wm 300°	Yes	Y		1	1.2	7	-.0...	13	-.0...	42	1.5												
37	1.2D + 1.5Lm_1 + 1.0Wm 330°	Yes	Y		1	1.2	8	-.0...	14	-.0...	42	1.5												
38	1.2D + 1.5Lm_2 + 1.0Wm 0°	Yes	Y		1	1.2	3	.059	9	.059	43	1.5												
39	1.2D + 1.5Lm_2 + 1.0Wm 30°	Yes	Y		1	1.2	4	.059	10	.059	43	1.5												
40	1.2D + 1.5Lm_2 + 1.0Wm 60°	Yes	Y		1	1.2	5	.059	11	.059	43	1.5												
41	1.2D + 1.5Lm_2 + 1.0Wm 90°	Yes	Y		1	1.2	6	.059	12	.059	43	1.5												
42	1.2D + 1.5Lm_2 + 1.0Wm 120°	Yes	Y		1	1.2	7	.059	13	.059	43	1.5												
43	1.2D + 1.5Lm_2 + 1.0Wm 150°	Yes	Y		1	1.2	8	.059	14	.059	43	1.5												
44	1.2D + 1.5Lm_2 + 1.0Wm 180°	Yes	Y		1	1.2	3	-.0...	9	-.0...	43	1.5												
45	1.2D + 1.5Lm_2 + 1.0Wm 210°	Yes	Y		1	1.2	4	-.0...	10	-.0...	43	1.5												
46	1.2D + 1.5Lm_2 + 1.0Wm 240°	Yes	Y		1	1.2	5	-.0...	11	-.0...	43	1.5												
47	1.2D + 1.5Lm_2 + 1.0Wm 270°	Yes	Y		1	1.2	6	-.0...	12	-.0...	43	1.5												
48	1.2D + 1.5Lm_2 + 1.0Wm 300°	Yes	Y		1	1.2	7	-.0...	13	-.0...	43	1.5												
49	1.2D + 1.5Lm_2 + 1.0Wm 330°	Yes	Y		1	1.2	8	-.0...	14	-.0...	43	1.5												
50	1.2D + 1.5Lm_3 + 1.0Wm 0°	Yes	Y		1	1.2	3	.059	9	.059	44	1.5												
51	1.2D + 1.5Lm_3 + 1.0Wm 30°	Yes	Y		1	1.2	4	.059	10	.059	44	1.5												
52	1.2D + 1.5Lm_3 + 1.0Wm 60°	Yes	Y		1	1.2	5	.059	11	.059	44	1.5												
53	1.2D + 1.5Lm_3 + 1.0Wm 90°	Yes	Y		1	1.2	6	.059	12	.059	44	1.5												
54	1.2D + 1.5Lm_3 + 1.0Wm 120°	Yes	Y		1	1.2	7	.059	13	.059	44	1.5												
55	1.2D + 1.5Lm_3 + 1.0Wm 150°	Yes	Y		1	1.2	8	.059	14	.059	44	1.5												
56	1.2D + 1.5Lm_3 + 1.0Wm 180°	Yes	Y		1	1.2	3	-.0...	9	-.0...	44	1.5												
57	1.2D + 1.5Lm_3 + 1.0Wm 210°	Yes	Y		1	1.2	4	-.0...	10	-.0...	44	1.5												
58	1.2D + 1.5Lm_3 + 1.0Wm 240°	Yes	Y		1	1.2	5	-.0...	11	-.0...	44	1.5												
59	1.2D + 1.5Lm_3 + 1.0Wm 270°	Yes	Y		1	1.2	6	-.0...	12	-.0...	44	1.5												
60	1.2D + 1.5Lm_3 + 1.0Wm 300°	Yes	Y		1	1.2	7	-.0...	13	-.0...	44	1.5												
61	1.2D + 1.5Lm_3 + 1.0Wm 330°	Yes	Y		1	1.2	8	-.0...	14	-.0...	44	1.5												
62	1.2D + 1.5Lv_1 0°	Yes	Y		1	1.2	45	1.5																
63	1.2D + 1.5Lv_1 30°	Yes	Y		1	1.2	45	1.5																
64	1.2D + 1.5Lv_1 60°	Yes	Y		1	1.2	45	1.5																
65	1.2D + 1.5Lv_1 90°	Yes	Y		1	1.2	45	1.5																
66	1.2D + 1.5Lv_1 120°	Yes	Y		1	1.2	45	1.5																
67	1.2D + 1.5Lv_1 150°	Yes	Y		1	1.2	45	1.5																
68	1.2D + 1.5Lv_1 180°	Yes	Y		1	1.2	45	1.5																
69	1.2D + 1.5Lv_1 210°	Yes	Y		1	1.2	45	1.5																
70	1.2D + 1.5Lv_1 240°	Yes	Y		1	1.2	45	1.5																
71	1.2D + 1.5Lv_1 270°	Yes	Y		1	1.2	45	1.5																
72	1.2D + 1.5Lv_1 300°	Yes	Y		1	1.2	45	1.5																
73	1.2D + 1.5Lv_1 330°	Yes	Y		1	1.2	45	1.5																
74	1.2D + 1.5Lv_2 0°	Yes	Y		1	1.2	46	1.5																
75	1.2D + 1.5Lv_2 30°	Yes	Y		1	1.2	46	1.5																
76	1.2D + 1.5Lv_2 60°	Yes	Y		1	1.2	46	1.5																
77	1.2D + 1.5Lv_2 90°	Yes	Y		1	1.2	46	1.5																
78	1.2D + 1.5Lv_2 120°	Yes	Y		1	1.2	46	1.5																
79	1.2D + 1.5Lv_2 150°	Yes	Y		1	1.2	46	1.5																
80	1.2D + 1.5Lv_2 180°	Yes	Y		1	1.2	46	1.5																
81	1.2D + 1.5Lv_2 210°	Yes	Y		1	1.2	46	1.5																
82	1.2D + 1.5Lv_2 240°	Yes	Y		1	1.2	46	1.5																
83	1.2D + 1.5Lv_2 270°	Yes	Y		1	1.2	46	1.5																
84	1.2D + 1.5Lv_2 300°	Yes	Y		1	1.2	46	1.5																

Load Combinations (Continued)

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
85	1.2D + 1.5Lv_2_330°	Yes	Y		1	1.2	46	1.5																
86	1.2D + 1.5Lv_3_0°	Yes	Y		1	1.2	47	1.5																
87	1.2D + 1.5Lv_3_30°	Yes	Y		1	1.2	47	1.5																
88	1.2D + 1.5Lv_3_60°	Yes	Y		1	1.2	47	1.5																
89	1.2D + 1.5Lv_3_90°	Yes	Y		1	1.2	47	1.5																
90	1.2D + 1.5Lv_3_120°	Yes	Y		1	1.2	47	1.5																
91	1.2D + 1.5Lv_3_150°	Yes	Y		1	1.2	47	1.5																
92	1.2D + 1.5Lv_3_180°	Yes	Y		1	1.2	47	1.5																
93	1.2D + 1.5Lv_3_210°	Yes	Y		1	1.2	47	1.5																
94	1.2D + 1.5Lv_3_240°	Yes	Y		1	1.2	47	1.5																
95	1.2D + 1.5Lv_3_270°	Yes	Y		1	1.2	47	1.5																
96	1.2D + 1.5Lv_3_300°	Yes	Y		1	1.2	47	1.5																
97	1.2D + 1.5Lv_3_330°	Yes	Y		1	1.2	47	1.5																
98	1.2D + 1.0EV +1.0 EH 0°	Yes	Y		1	1.2	27	1	28		29	1	40	1										
99	1.2D + 1.0EV +1.0 EH 30°	Yes	Y		1	1.2	27	.866	28	.5	30	1	40	1										
100	1.2D + 1.0EV +1.0 EH 60°	Yes	Y		1	1.2	27	.5	28	.866	31	1	40	1										
101	1.2D + 1.0EV +1.0 EH 90°	Yes	Y		1	1.2	27		28	1	32	1	40	1										
102	1.2D + 1.0EV +1.0 EH 120°	Yes	Y		1	1.2	27	-.5	28	.866	33	1	40	1										
103	1.2D + 1.0EV +1.0 EH 150°	Yes	Y		1	1.2	27	-.8...	28	.5	34	1	40	1										
104	1.2D + 1.0EV +1.0 EH 180°	Yes	Y		1	1.2	27	-1	28		35	1	40	1										
105	1.2D + 1.0EV +1.0 EH 210°	Yes	Y		1	1.2	27	-.8...	28	-.5	36	1	40	1										
106	1.2D + 1.0EV +1.0 EH 240°	Yes	Y		1	1.2	27	-.5	28	-.8...	37	1	40	1										
107	1.2D + 1.0EV +1.0 EH 270°	Yes	Y		1	1.2	27		28	-1	38	1	40	1										
108	1.2D + 1.0EV +1.0 EH 300°	Yes	Y		1	1.2	27	.5	28	-.8...	39	1	40	1										
109	1.2D + 1.0EV +1.0 EH 330°	Yes	Y		1	1.2	27	.866	28	-.5	40	1	40	1										

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N1	max	1.167	12	.477	8	-.454	2	.665	2	3.453	12	.997	39
2		min	-1.216	6	-1.028	2	-2.22	20	-.382	8	-3.548	6	-.716	86
3	N24	max	.462	85	.13	19	1.006	2	-.051	13	.752	13	.688	43
4		min	-.624	27	-.014	13	-1.13	8	-.243	43	-.713	43	-.516	86
5	N40	max	.485	47	3.243	14	2.437	14	0	109	.421	48	.658	6
6		min	-.343	86	.384	8	.242	8	0	1	-.501	6	-.553	48
7	Totals:	max	1.414	11	2.433	15	2.06	2						
8		min	-1.414	5	.93	9	-2.06	8						

Envelope AISC 14th(360-10): LRFD Steel Code Checks

	Mem...	Shape	Code Check	Loc[ft]	LC	Shear C...	Loc[ft]	Dir	LC	phi*...	phi*...	phi*...	phi*...	Cb	Eqn
1	M1	HSS4X4X4	.236	2.917	12	.184	.486	y	31	119...	139...	16.1...	16.1...	1.725	H1...
2	M2	PIPE_4.0	.001	.75	11	.001	.75		11	92.5...	93.24	10.6...	10.6...	1.562	H1...
3	M3	PIPE_3.0	.442	6.667	27	.240	6.667		8	22.8...	65.2...	5.749	5.749	1.748	H1...
4	MP3	PIPE_2.5	.460	4.417	8	.116	2.417		8	31.9...	50.7...	3.596	3.596	2.36	H1...
5	MP4	PIPE_2.0X	.331	2.875	97	.072	.938		97	26.1...	44.1	2.531	2.531	4.304	H1...
6	MP2	PIPE_2.0X	.346	2.875	37	.115	2.875		45	26.1...	44.1	2.531	2.531	1	H1...
7	MP1	PIPE_2.0X	.437	2.875	47	.101	2.875		49	26.1...	44.1	2.531	2.531	1	H1...
8	M13	PIPE_2.0	.388	12.639	47	.140	3.333		8	18.3...	32.13	1.872	1.872	1	H1...
9	M19	L2.5x2.5x3	.360	4.375	97	.025	4.375	z	97	15.5...	29.1...	.873	1.863	1.689	H2...
10	M20	L2.5x2.5x3	.497	4.375	43	.036	4.375	y	43	15.5...	29.1...	.873	1.918	2.015	H2...
11	M21	LL3x3x3x3	.261	0	40	.026	4	z	48	45.5...	68.67	5.389	3.647	2.175	H1...

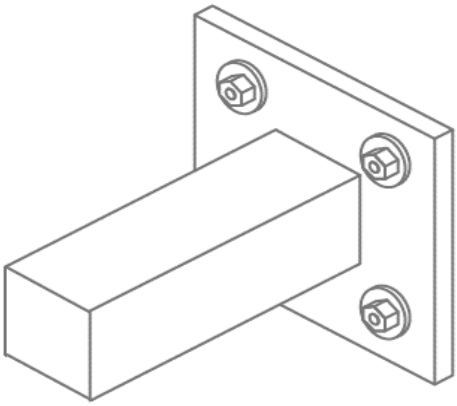
APPENDIX D

ADDITIONAL CALCUATIONS

MasTec
Network Solutions

Bolt Calcuations:

Bolt Size:	5/8	in
# Bolts:	4	
Plate Width:	10	in
Plate Height:	10	in
Bolt H Gap:	7	in
Bolt V Gap:	7	in
Plate T:	0.625	in
Bolt Grade:	A325N	
Fu_{bolt}	120	ksi
r:	4.950	in
J:	98.000	in^4/in^2
Bolt Area, $_{Normal}$:	0.307	
Bolt Area, $_{Net\ Tensile}$:	0.226	in^2



Allowable Shear:	12.4	kip
Allowable Tension:	20.3	kip

Tension Capacity:	16.8%
Shear Capacity:	7.9%
Combined Capacity:	2.9%

Bolt Capacity:	16.8%

Plate Calculations:

Horizontal Member Height:	4	in
Horizontal Member Width:	4	in
Plate Grade:	A36	
Plate Fy:	36	ksi

Mx =	9.783	k*in
Mz =	2.834	k*in

Zx =	0.977	in^3
Zz =	0.977	in^3

ØMpy (X) =	31.641	k - in
ØMpx (X) =	31.641	k - in

Plate Capacity:	30.9%

APPENDIX E

MODIFICATION DRAWINGS

MOUNT REINFORCEMENT DRAWINGS PREPARED FOR CROWN CASTLE

SITE NAME: ROGERS PROPERTY
BU NUMBER: 881541

SITE ADDRESS:
700 GRASSY HILL ROAD, ORANGE,
NEW HAVEN COUNTY, CT 06477

PROJECT CONTACTS:

1. CROWN PROJECT MANAGER
   CHARLES MCGUIRT
   CHARLES.MCGUIRT@CROWNCASTLE.COM

2. DESIGN ENGINEER - MAIN RFI CONTACT
   NOAH NOXON
   919-674-5889
   NOAH.NOXON@MASTEC.COM

3. ENGINEER OF RECORD
   RAPHAEL I. MOHAMED, PE, PEng
   919-674-5895
   507 AIRPORT BLVD.
   SUITE 111
   MORRISVILLE, NC 27560
   RAPHAEL.MOHAMED@MASTEC.COM

4. FOR FABRICATION AND CONSTRUCTION RELATED INQUIRIES: CONTACT MASTEC DESIGN ENGINEER AND ENGINEER OF RECORD.

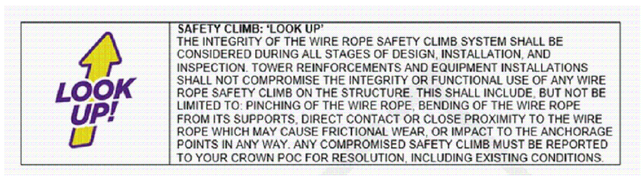
TOWER INFORMATION

TOWER HEIGHT / TYPE:	139.5 FT MONOPOLE TOWER
MOUNT HEIGHT/TYPE:	110 FT 13'-4" T-ARM
TOWER LOCATION:	LAT: 41.2855°
	LONG: -73.0425°
MODIFICATION DRAWINGS:	MASTEC
MASTEC PROJECT NUMBER:	18545-MOD1
MA FAILING CCI DOCUMENT ID:	8366040
MOUNT ANALYSIS DATE:	04/26/2019
ORDER NUMBER:	479806, REV. 0
JDE JOB NUMBER:	559347

CODE COMPLIANCE

ANSI/TIA-222-H
2018 CONNECTICUT STATE BUILDING
2015 INTERNATIONAL BUILDING CODE

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 MASTEC NETWORK SOLUTIONS TO ASSIST CONTRACTORS IN CLASS IV RIGGING PLAN REVIEWS. FOR REQUESTED QUALIFIED ENGINEERING SERVICES, PLEASE CONTACT RAPHAEL MOHAMED AT (919) 244-5207.

DRAWINGS INCLUDED

SHEET NO.	DESCRIPTION	SHEET NO.	DESCRIPTION
T-1	TITLE SHEET		
N-1	MODIFICATION INSPECTION CHECKLIST		
N-2	GENERAL NOTES		
S-1	MODIFICATION SCHEDULE		
S-2	T-ARM REINFORCEMENT DETAILS I		
S-3	T-ARM REINFORCEMENT DETAILS II		
A-1	MANUFACTURER SPECIFICATIONS I		
A-1	MANUFACTURER SPECIFICATIONS II		
A-1	MANUFACTURER SPECIFICATIONS III		

NO.	DATE	DESCRIPTION	BY
0	06/03/19	FIRST ISSUE	NDN

REVISIONS

RAPHAEL I. MOHAMED, PE,PEng
SENIOR DIRECTOR OF ENGINEERING
CT PE LICENSE NO. 25112

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF CONNECTICUT.

MasTec Network Solutions
507 AIRPORT BLVD., SUITE 111
MORRISVILLE, NC 27560

SITE NAME: ROGERS PROPERTY

BU NUMBER:881541

WO NUMBER: 479806
MNS ENG. NUMBER: 18545 - MOD1

SITE ADDRESS:
700 GRASSY HILL ROAD, ORANGE, CT 06477

DRAWN BY: NDN

CHECKED BY: CG

APPROVED BY: RIM

SCALE: N.T.S

TITLE SHEET

T-1

REV 0

MI CHECKLIST

CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY EOR)	REPORT ITEM
PRE-CONSTRUCTION	
X	MI CHECKLIST DRAWING
N/A	EOR APPROVAL
X	FABRICATION INSPECTION
N/A	FABRICATOR CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT (MTR)
N/A	FABRICATOR NDE INSPECTION
N/A	NDE REPORT OF BASE PLATE
X	PACKING SLIPS
ADDITIONAL TESTING AND INSPECTIONS:	
CONSTRUCTION	
X	CONSTRUCTION INSPECTIONS
N/A	CONTINUOUS FOUNDATION INSPECTIONS
N/A	CONCRETE COMP. STRENGTH AND SLUMP TESTS
N/A	GROUT COMP. STRENGTH (ASTM C109)
N/A	POST INSTALLED ANCHOR ROD VERIFICATION
N/A	BASE PLATE GROUT VERIFICATION
N/A	CONTRACTOR'S CERTIFIED WELD INSPECTION AND NDE REPORTS
N/A	EARTHWORK: LIFT AND DENSITY
X	ON SITE COLD GALVANIZING VERIFICATION
N/A	GUY WIRE TENSION REPORT
X	GC AS-BUILT DOCUMENTS
ADDITIONAL TESTING AND INSPECTIONS:	
POST-CONSTRUCTION	
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
N/A	POST INSTALLED ANCHOR ROD PULL-OUT TESTING
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

NOTE: X DENOTES A DOCUMENT NEEDED FOR THE PMI REPORT
N/A DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE PMI REPORT

MODIFICATION INSPECTION NOTES:

GENERAL:

1. THE MODIFICATION INSPECTION (MI) IS A VISUAL INSPECTION OF THE TOWER MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTIONS AND OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS, AS DESIGNED BY THE ENGINEER OF RECORD (EOR)
2. THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, NOR DOES THE MI INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES.
3. TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PO IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY. IF CONTACT INFORMATION IS NOT KNOWN, CONTACT YOUR POINT OF CONTACT (POC).

MI INSPECTOR:

1. THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO FOR THE MI TO, AT A MINIMUM

   REVIEW THE REQUIREMENTS OF THE MI CHECKLIST WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS.
2. THE MI IS RESPONSIBLE FOR COLLECTING ALL GENERAL CONTRACTORS (GC) INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING THE IN-FIELD INSPECTIONS. AND SUBMITTING THE MI REPORT.

GENERAL CONTRACTOR:

1. THE GC IS REQUIRED TO CONTACT THE MI INSPECTOR AS SOON AS RECEIVING A PO FOR THE MODIFICATION INSTALLATION OR TURNKEY PROJECT TO, AT A MINIMUM:
   - REVIEW THE REQUIREMENTS OF THE MI CHECKLIST.
   - WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT
   - ON-SITE MI INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS.
   - BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS.
2. THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST.

MI VERIFICATION INSPECTIONS:

VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE OF AN ACCEPTED "PASSING MI" OR "PASS AS NOTED MI" REPORT FOR THE ORIGINAL PROJECT.

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/ERECTIONS AND INSPECTION:
- RAW MATERIALS
- PHOTOS OF ALL CRITICAL DETAILS
- FOUNDATION MODIFICATIONS
- WELD PREPARATION
- BOLT INSTALLATION AND TORQUE
- FINAL INSTALLED CONDITION
- SURFACE COATING REPAIR
- POST CONSTRUCTION PHOTOGRAPHS
- FINAL IN FIELD CONDITIONS

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

CORRECTION OF FAILING MI'S:

IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI ("FAILED MI"), THE GC SHALL WORK WITH THE TOWER OWNER TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:

- CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI.
- OR, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/ENFORCEMENT USING THE AS-BUILT CONDITION.

RECOMMENDATIONS:

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

- IT IS SUGGESTED THAT THE GC 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.
- IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND MI INSPECTION(S) TO COMMENCE WITH ONE SITE VISIT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY DEFICIENCIES CORRECTED DURING THE INITIAL MI, THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MI CAREFULLY TO ENSURE ALL CONSTRUCTION FACULTIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON SITE.

CANCELLATION OR DELAYS IN SCHEDULED MI:

IF THE GC AND MI INSPECTOR AGREE TO A DATE ON WHICH THE MI WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, TOWER OWNER SHALL NOT BE RESPONSIBLE FOR ANY COSTS, FEES, LOSS OF DEPOSITS AND/OR OTHER PENALTIES RELATED TO THE CANCELLATION OR DELAY INCURRED BY EITHER PARTY FOR ANY TIME (E.G. TRAVEL AND LODGING, COSTS OF KEEPING EQUIPMENT ON-SITE, ETC.). IF TOWER OWNER CONTRACTS DIRECTLY FOR A THIRD PARTY MI, EXCEPTIONS MAY BE MADE IN THE EVENT THAT THE DELAY/CANCELLATION IS CAUSED BY WEATHER OR OTHER CONDITIONS THAT MAY COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.

NO.	DATE	DESCRIPTION	BY
0	06/03/19	FIRST ISSUE	NDN

REVISIONS

STATE OF CONNECTICUT
RAPHAEL MOHAMED
No. 25112
LICENSED
PROFESSIONAL ENGINEER

RAPHAEL I. MOHAMED, PE,PEng
SENIOR DIRECTOR OF ENGINEERING
CT PE LICENSE NO. 25112

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF CONNECTICUT.

MasTec Network Solutions
507 AIRPORT BLVD., SUITE 111
MORRISVILLE, NC 27560

SITE NAME: ROGERS PROPERTY

BU NUMBER:881541

WO NUMBER: 479806
MNS ENG. NUMBER: 18545 - MOD1

SITE ADDRESS:
700 GRASSY HILL ROAD, ORANGE, CT 06477

DRAWN BY: NDN

CHECKED BY: CG

APPROVED BY: RIM

SCALE: N.T.S

MODIFICATION INSPECTION CHECKLIST

N-1

REV 0

GENERAL NOTES:

1. ALL WORK PRESENTED IN THESE DRAWINGS MUST BE COMPLETED BY THE CONTRACTOR UNLESS OTHERWISE SPECIFIED.
2. THE CONTRACTOR MUST HAVE A MINIMUM OF 5 YEARS OF EXPERIENCE IN TOWER ERECTION AND RETROFIT SIMILAR TO THAT DESCRIBED HEREIN.
3. ALL CONSTRUCTION IS TO BE COMPLETE IN ACCORDANCE WITH THE ANSI/ASSE A10.48 AND ANSI/TIA-322 STANDARDS. THE CONTRACTOR MUST HAVE CONSIDERABLE WORKING KNOWLEDGE IN THESE STANDARDS TO ACCEPT THIS WORK. BY ACCEPTING THIS PROJECT, THE CONTRACTOR IS ATTESTING THAT HE HAS SUFFICIENT EXPERIENCE, ABILITY, AND KNOWLEDGE OF THE WORK TO BE PERFORMED AND IS PROPERLY LICENSED AND REGISTERED TO COMPLETE THIS WORK.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL DIMENSIONS, ELEVATIONS, AND EXISTING CONDITIONS PRIOR TO BEGINNING ANY MATERIAL ORDERS, FABRICATION OR CONSTRUCTION WORK ON THIS PROJECT. ANY DISCREPANCIES SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE EOR. THE DISCREPANCIES MUST BE RESOLVED BEFORE THE CONTRACTOR MAY PROCEED WITH THE PROJECT.
5. ANY WORK PERFORMED WITHOUT A PREFABRICATION MAPPING IS DONE AT THE RISK OF THE CONTRACTOR AND/OR FABRICATOR.
6. ALL MANUFACTURERS' INSTRUCTIONS FOR INSTALLATION MUST BE FOLLOWED EXACTLY AS SPECIFIED. WHEN CONFLICTING WITH THESE DRAWINGS, THE MANUFACTURER SPECIFICATIONS SHALL GOVERN.
7. ALL MATERIALS AND EQUIPMENT USED IN THE INSTALLATION OF THESE DRAWINGS SHALL BE IN NEW OR GOOD WORKING QUALITY, FREE FROM DEFECTS AND FAULTS AND IN CONFORMANCE WITH THE CONTRACT DOCUMENTS. ALL SUBSTITUTIONS MUST BE GIVEN WRITTEN APPROVAL FROM THE EOR PRIOR TO INSTALLATION. ALL MATERIALS SHALL BE WARRANTED FOR ONE YEAR FROM ACCEPTANCE DATE.
8. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL INTENDED CONSTRUCTION ACTIVITY INCLUDING MATERIALS, ACCESS AND WORK SCHEDULE. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS AND WILL BE RESPONSIBLE FOR ABIDING BY ALL REQUIREMENTS AND CONDITIONS OF THE PERMITS. WHEN APPLICABLE, THE CONTRACTOR MUST NOTIFY THE APPLICABLE JURISDICTION PRIOR TO BEGINNING OF ANY CONSTRUCTION.
9. THE CONTRACTOR IS RESPONSIBLE FOR ALL CONSTRUCTION MEANS AND METHODS. INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS. CONSTRUCTION OF THE PROPOSED WORK SHALL MEET ANSI/ASSE A10.48, OSHA, AND GENERAL INDUSTRY STANDARDS. ALL RIGGING PLANS SHALL ADHERE TO ANSI/TIA-322 INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION.
10. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE INSTALLATION PROCEDURE AND SEQUENCE TO INSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENTS DURING ERECTION AND/OR FIELD ALTERATIONS. THIS INCLUDES, BUT IS NOT LIMITED TO, THE ADDITION OF TEMPORARY BRACING, GUYS OR TIE-DOWNS THAT MAY BE NECESSARY; SUCH MATERIAL SHALL BE REMOVED AFTER THE COMPLETION OF THE PROJECT.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THIS PROJECT. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT THIS PROJECT AND RELATED WORK COMPLIES WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY CODES AND REGULATIONS GOVERNING THIS WORK.
12. THE CLIMBING FACILITIES, SAFETY CLIMB AND ALL PARTS THEREOF SHALL NOT BE IMPEDED, MODIFIED OR ALTERED WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE EOR.
13. INCORRECTLY FABRICATED, DAMAGED, MIS-FITTING, OR NON-CONFORMING MATERIALS AND CONDITIONS SHALL BE REPORTED TO THE EOR PRIOR TO ANY REMEDIAL OR CORRECTING ACTION. ALL ACTIONS SHALL REQUIRE EOR APPROVAL.

STEEL:

1. THE FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL CONFORM TO THE LATEST AISC CODE AND ASTM SPECIFICATIONS.
2. HOLES SHALL NOT BE TORCH CUT THROUGH STRUCTURAL STEEL FOR FABRICATION. ALL STEEL FABRICATION MUST FOLLOW AISC SPECIFICATIONS.
3. HOT-DIP GALVANIZE ALL ITEMS AFTER FABRICATION IN COMPLIANCE WITH ASTM A-123 UNLESS OTHERWISE SPECIFIED. ALL NEW STEEL IS TO BE PAINTED TO MATCH THE EXISTING STEEL.
4. NEW STEEL MEMBERS MUST HAVE SINGLE DRILLED HOLES. SLOTTED AND DOUBLY DRILLED HOLES ARE NOT ACCEPTABLE MEANS OF FABRICATION UNLESS OTHERWISE SPECIFIED.
5. ALL CONNECTIONS NOT DETAILED IN THESE DRAWINGS MUST BE DETAILED BY THE STEEL FABRICATOR IN ACCORDANCE WITH THE LATEST AISC SPECIFICATIONS.
6. ALL BOLTED CONNECTIONS MUST BE INSTALLED TO A SNUG-TIGHTENED CONDITION PER AISC “SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM 325 OR A490 BOLTS” SECTION 8.1 UNLESS OTHERWISE SPECIFIED.
7. CONTRACTOR MAY BE REQUIRED TO STACK WASHERS FOR BOLTS WHERE THREADS ARE EXCLUDED FROM SHEAR PLANE TO OBTAIN SNUG TIGHT INSTALLATION. A NUT LOCKING DEVICE MUST BE INSTALLED ON ALL PROPOSED AND/OR REPLACED BOLTS. GALVANIZED ASTM 325 OR A490 BOLTS SHALL NOT BE REUSED.

COLD GALVANIZATION:

1. ALL DAMAGED SURFACES SHALL BE REPAIRED WITH A COLD-GALVANIZING COATING CONFORMING TO ASTM 780. THIS COATING SHALL BE APPLIED BY BRUSH. THE GALVANIZING COMPOUND SHALL CONTAIN A MINIMUM OF 95% ± PURE ZINC. THE FINISHED COATING SHALL BE A MINIMUM THICKNESS OF 4 MILS.
2. CONTRACTOR TO USE ZINGA OR ZRC COLD GALVANIZATION COMPOUNDS OR APPROVED EQUIVALENTS.
3. CLEAN AREAS TO BE PREPARED AND REMOVE SLAG FROM WELDS FOR TREATMENT ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
4. IF THE TOWER IS PAINTED, ALL TREATED AREAS ARE TO BE BRUSH PAINTED TO MATCH THE TOWER AFTER COLD GALVANIZING COMPOUND IS ALLOWED TO CURE.

U-BOLTS:

1. ALL U-BOLTS ARE TO BE ASTM A36/A307, SAE 429 GR. 2 UNLESS OTHERWISE SPECIFIED.
2. U-BOLTS SHALL MEET REQUIREMENTS OF ASME B18.31.5-2011 BENT BOLTS.
3. U-BOLT ASSEMBLY SHALL COME COMPLETE WITH NUTS (ASTM A563), WASHERS (ASTM F436), AND LOCK WASHERS.
4. FULL U-BOLT ASSEMBLY TO BE HOT-DIP GALVANIZED PER ASTM A153/A153M OR A123, AS APPLICABLE.

MODIFICATION MATERIALS

SCOPE	SHAPE	GRADE	YIELD STRENGTH (Fy)	ULTIMATE STRENGTH (Fu)
ALL	PIPE	A53 GR. B	35 KSI	60 KSI
ALL	ANGLE	A36	36 KSI	58 KSI

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DRAWN BY: NDN

CHECKED BY: CG

APPROVED BY: RIM

SCALE: N.T.S

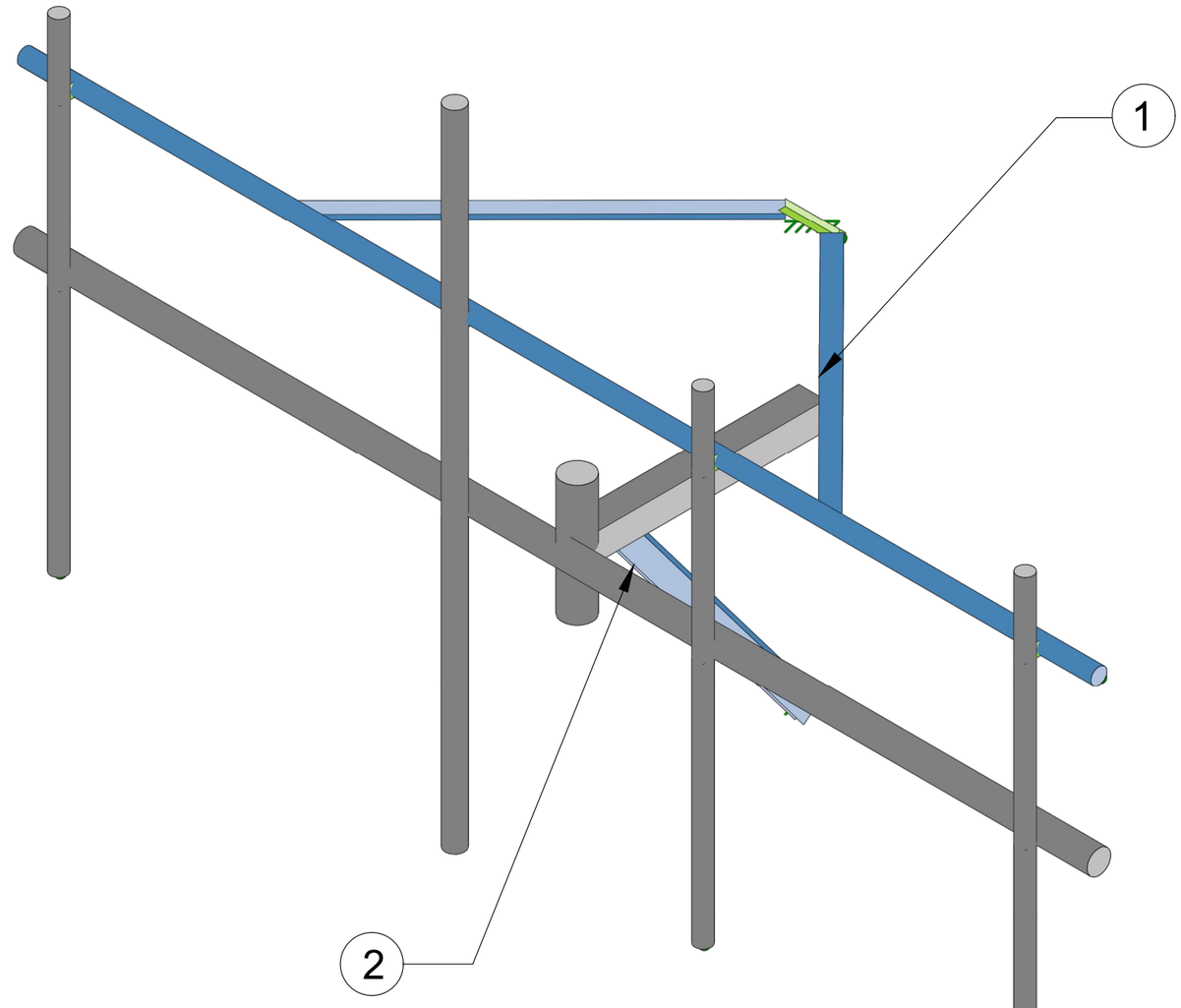
NOTES

N-2

REV 0

MODIFICATION SCHEDULE

SCOPE NO.	MODIFICATION DESCRIPTION	BOTTOM ELEVATION	TOP ELEVATION	SHEET NO.
1	INSTALLATION OF NEW PRK-SFS SECTOR FRAME HORIZONTAL STABILIZER KIT	-	110'-0" ±	S-2
2	INSTALLATION OF NEW PV-PKPB-M KICKER KIT	-	110'-0" ±	S-3



NOTES:

1. APPURTENANCES MAY INTERFERE WITH PROPOSED MODIFICATIONS.
2. ALL MODIFICATIONS TO BE INSTALLED CONTINUOUSLY THROUGH EXISTING EQUIPMENT. ALL EXISTING EQUIPMENT MUST NOT BE DAMAGED OR TAKEN OFF AIR DURING INSTALLATION OF PROPOSED MODIFICATIONS.
3. ANTENNA AND COAX NOT SHOWN FOR CLARITY. SEE STRUCTURAL ANALYSIS REPORT FOR EXISTING ANTENNA LOADING AND COAX CONFIGURATION.
4. PRIOR TO FABRICATION AND INSTALLATION , CONTRACTOR SHALL FIELD VERIFY ALL LENGTHS AND QUANTITIES GIVEN. INFORMATION PROVIDED IS FOR QUOTING PURPOSES ONLY, AND SHALL NOT BE USED FOR FABRICATION.
5. EXISTING RRU'S AND ANCILLARY EQUIPMENT MAY NEED TO BE TEMPORARILY RELOCATED AS NECESSARY TO COMPLETE THIS MODIFICATION. EQUIPMENT IS NOT TO BE TAKEN OFF AIR AT ANY TIME DURING INSTALLATION. PLEASE CONTACT EOR IF THIS CANNOT BE MET.
6. CONTACT EOR IF PROPOSED MOUNT REINFORCEMENT DIMENSIONS CANNOT BE MET.

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SCALE: N.T.S

MODIFICATION SCHEDULE

S-1

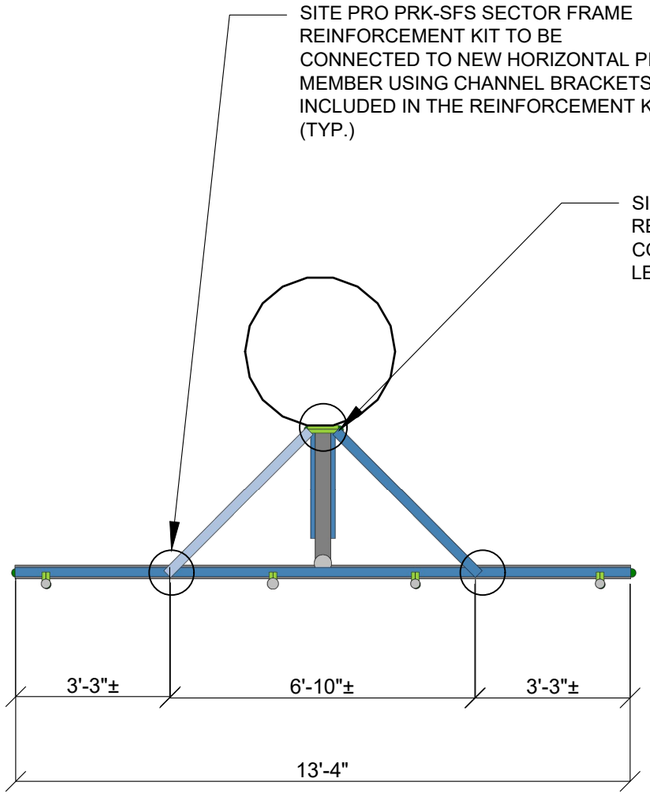
REV 0

NOTES:

1. CONTRACTOR TO FIELD VERIFY THE REQUIRED LENGTH OF THE NEW FACE HORIZONTALS PIPES AND MAY CUT ENDS AS REQUIRED TO AVOID UNNECESSARY OVERHANG AND OVERLAP.
2. TWO COATS OF COLD GALVANIZING COATING MUST BE APPLIED TO ALL CUT ENDS IN ACCORDANCE TO ASTM A780 PRIOR TO INSTALLATION.

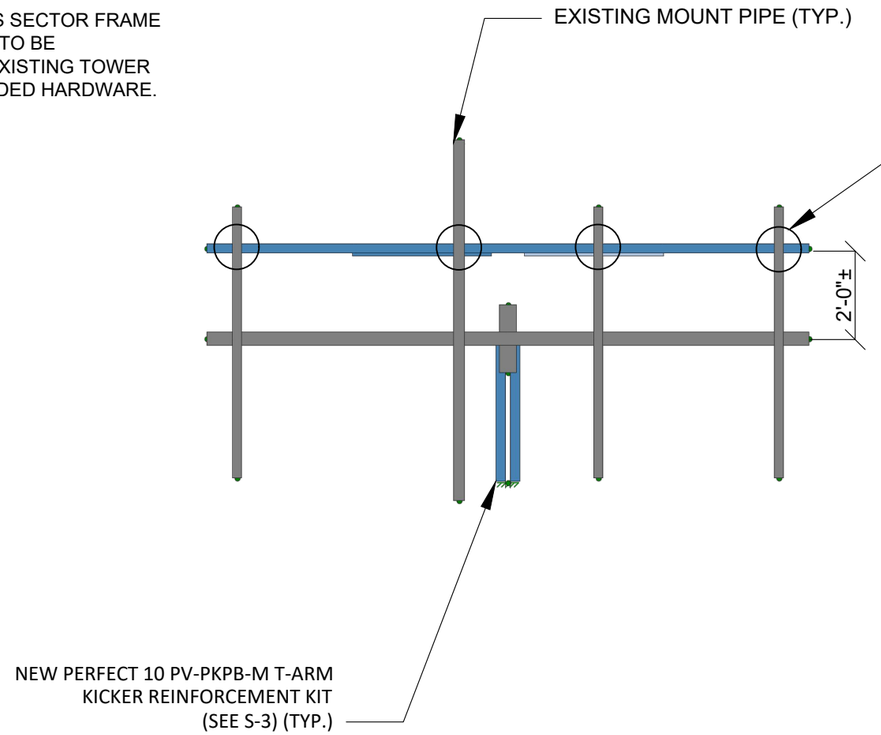
NEW T-ARM STABILIZER KIT MATERIAL LIST

SITE PRO PART NO.	QTY.	LENGTH	DESCRIPTION
PRK-SFS	1	4'-4.5"	HORIZONTAL SECTOR FRAME STABILIZER REINFORCEMENT KIT
P2174	3	14'-6"	NEW FACE HORIZONTAL
SCX1-K	12	-	CROSSOVER PLATE



2 / S-2

1 / S-2 INSTALLATION OF NEW SFS-H HORIZONTAL STABILIZER KIT
PLAN VIEW
NTS



2 / S-2 INSTALLATION OF NEW SFS-H HORIZONTAL STABILIZER KIT
FRONT VIEW
NTS

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700 GRASSY HILL ROAD, ORANGE, CT 06477

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APPROVED BY: RIM

SCALE: N.T.S

T-ARM REINFORCEMENT DETAILS I

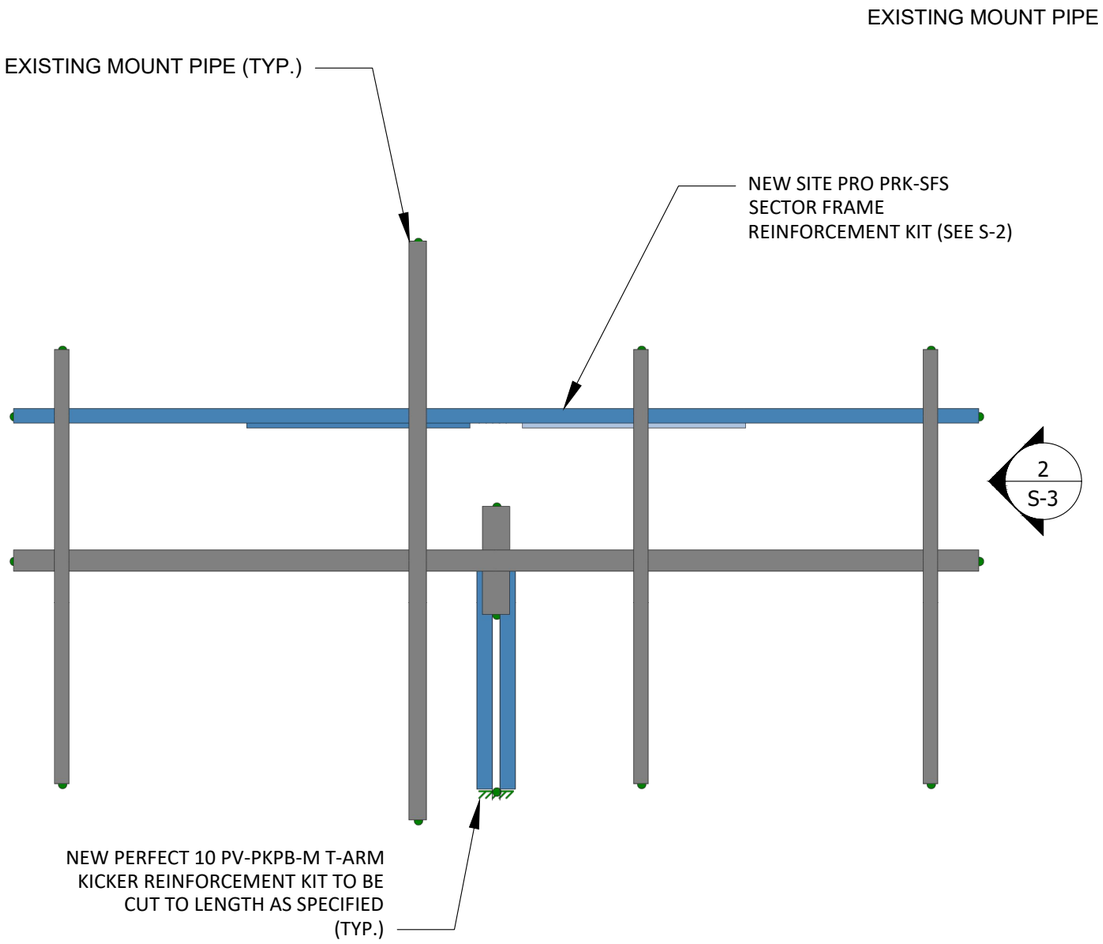
S-2 | REV 0

NOTES:

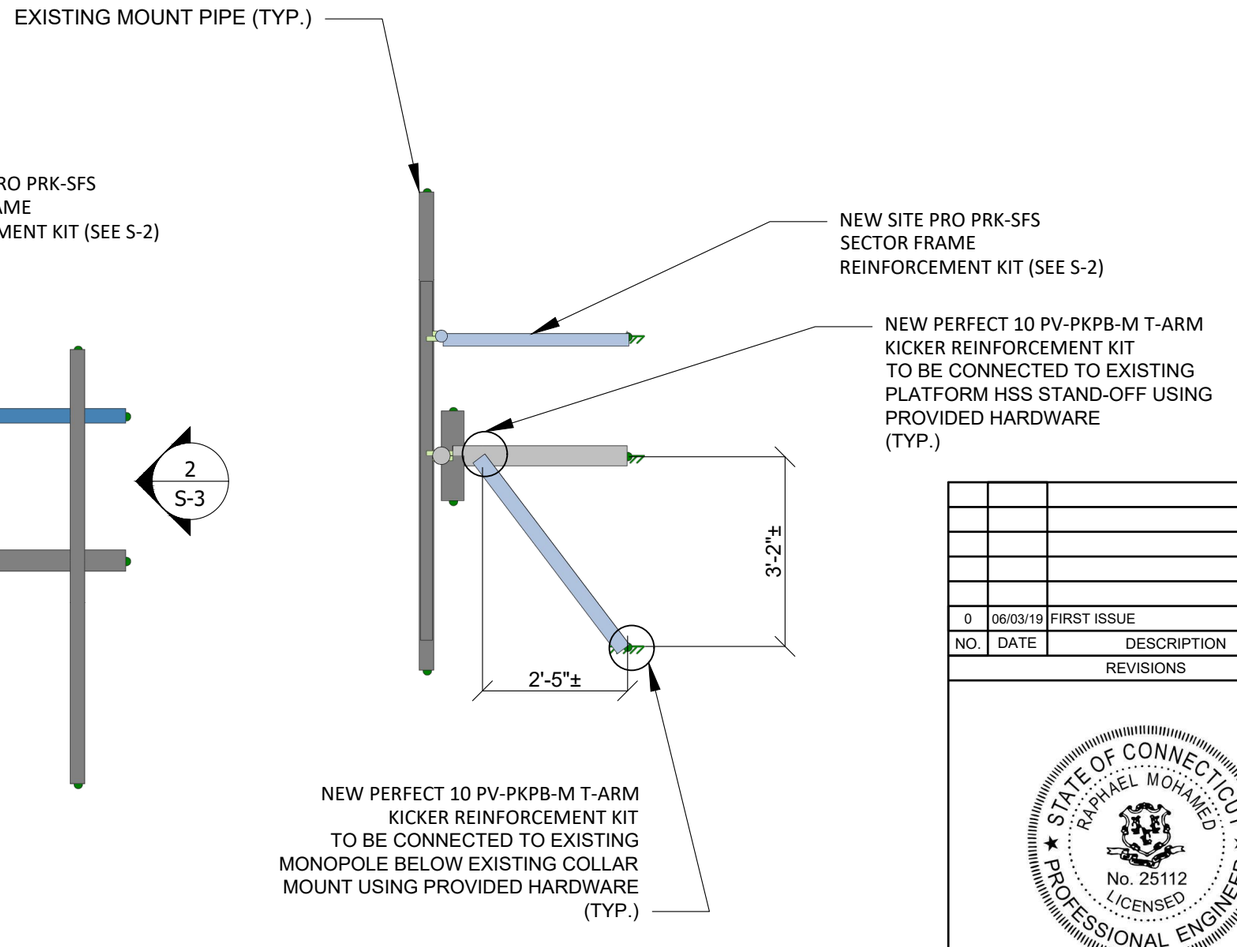
1. CONTRACTOR TO FIELD VERIFY THE REQUIRED LENGTH OF THE NEW KICKER KIT AND MAY CUT ENDS AND FIELD DRILL HOLES AS REQUIRED TO AVOID UNNECESSARY OVERHANG AND OVERLAP.
2. TWO COATS OF COLD GALVANIZING COATING MUST BE APPLIED TO ALL CUT ENDS IN ACCORDANCE TO ASTM A780 PRIOR TO INSTALLATION.

NEW T-ARM STABILIZER KIT MATERIAL LIST

PERFECT 10 PART NO.	QTY.	LENGTH	DESCRIPTION
PV-PKPB-M	1	4'-0"	T-ARM KICKER KIT



1 S-3 INSTALLATION OF NEW PV-PKPB-M KICKER KIT
FRONT VIEW
NTS



2 S-3 INSTALLATION OF NEW PV-PKPB-M KICKER KIT
SIDE VIEW
NTS

NO.	DATE	DESCRIPTION	BY
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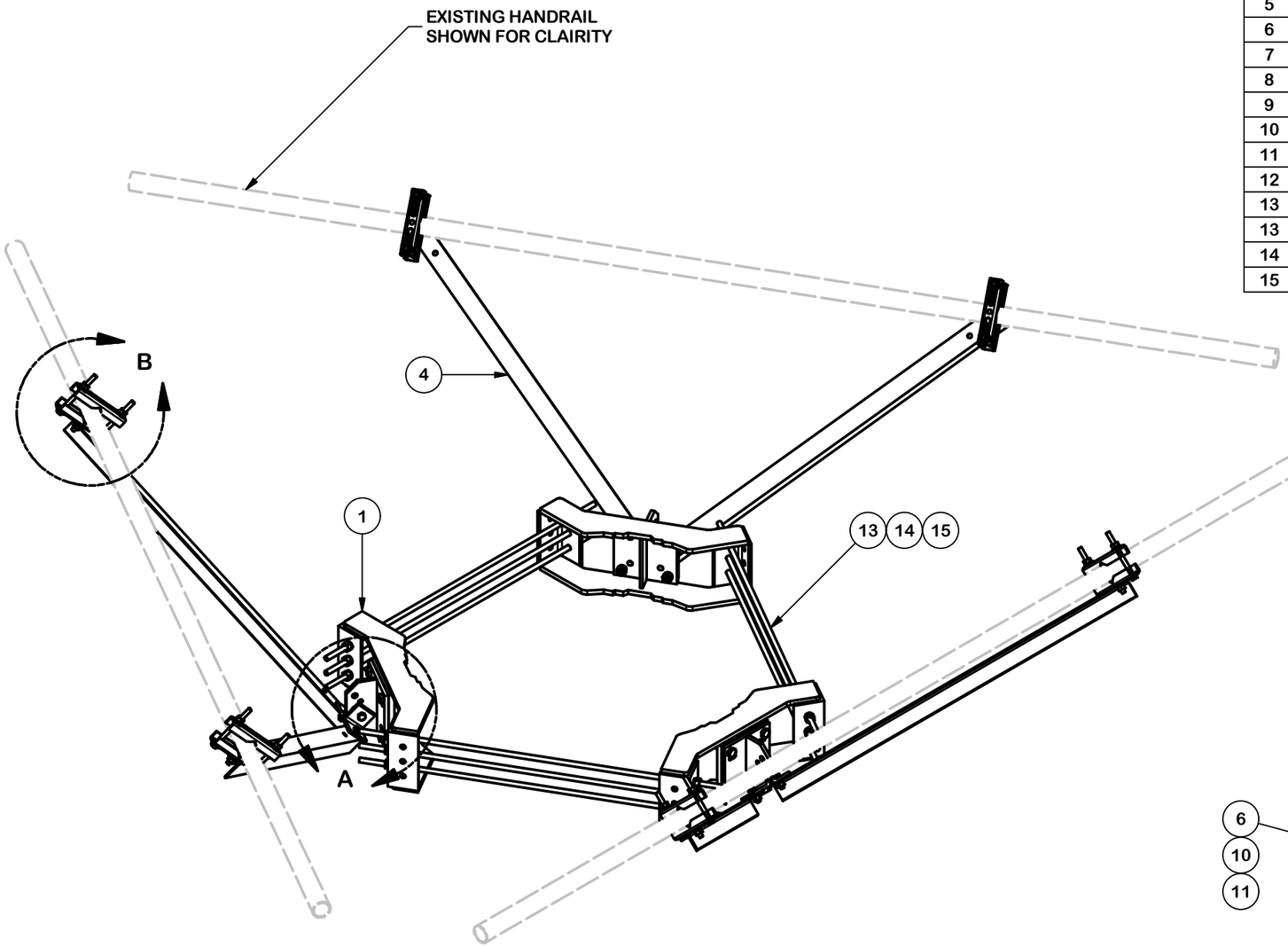
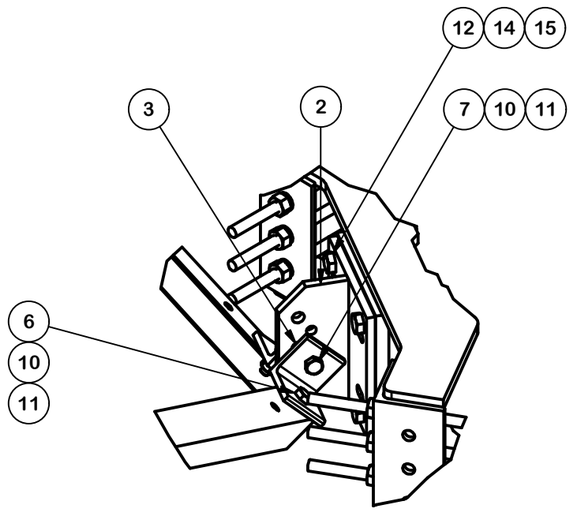
T-ARM REINFORCEMENT DETAILS II

S-3

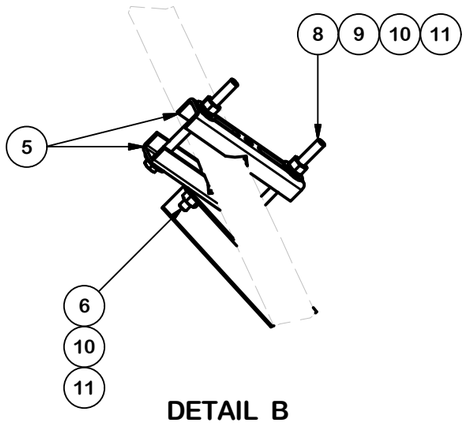
REV 0

PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	3	X-LWRM	RING MOUNT WELDMENT		68.81	206.42
2	3	X-TBW	T-BRACKET WELDMENT		13.60	40.80
3	6	SHCM-T	CHAIN MOUNT TIGHTENER BRACKET	3 in	1.86	11.15
4	6	X-232697	TRPD-HD DIAGONAL ANGLE - SITE PRO 1	52 1/2 in	14.35	86.08
5	12	X-STU	STIFF ARM CHANNEL BRACKET	8 1/2 in	1.37	16.46
6	12	G12112	1/2" x 1-1/2" HDG HEX BOLT GR5	1/2 in	0.15	1.77
7	3	G12212	1/2" x 2-1/2" HDG HEX BOLT GR5	2 1/2 in	0.20	0.61
8	12	G12065	1/2" x 6-1/2" HDG HEX BOLT GR5 FULL THREAD	6 1/2 in	0.41	4.91
9	24	G12FW	1/2" HDG USS FLATWASHER	3/32 in	0.03	0.82
10	27	G12LW	1/2" HDG LOCKWASHER	1/8 in	0.01	0.38
11	27	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	1.93
12	12	A582114	5/8" x 2-1/4" HDG A325 HEX BOLT	2 1/4 in	0.31	3.75
13	9	G58R-24	5/8" x 24" THREADED ROD (HDG.)	24 in	0.40	3.59
13	9	G58R-48	5/8" x 48" THREADED ROD (HDG.)	48 in	0.40	3.59
14	30	G58LW	5/8" HDG LOCKWASHER		0.03	0.78
15	30	G58NUT	5/8" HDG HEAVY 2H HEX NUT		0.13	3.90
					TOTAL WT. #	587.71





DETAIL A



DETAIL B

TOLERANCE NOTES

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

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
A	CHANGED MAX. DIA. FOR HANDRAIL CONNECTION	SP1	BC	10/23/2017

REVISION HISTORY

DESCRIPTION: HANDRAIL REINFORCEMENT KIT

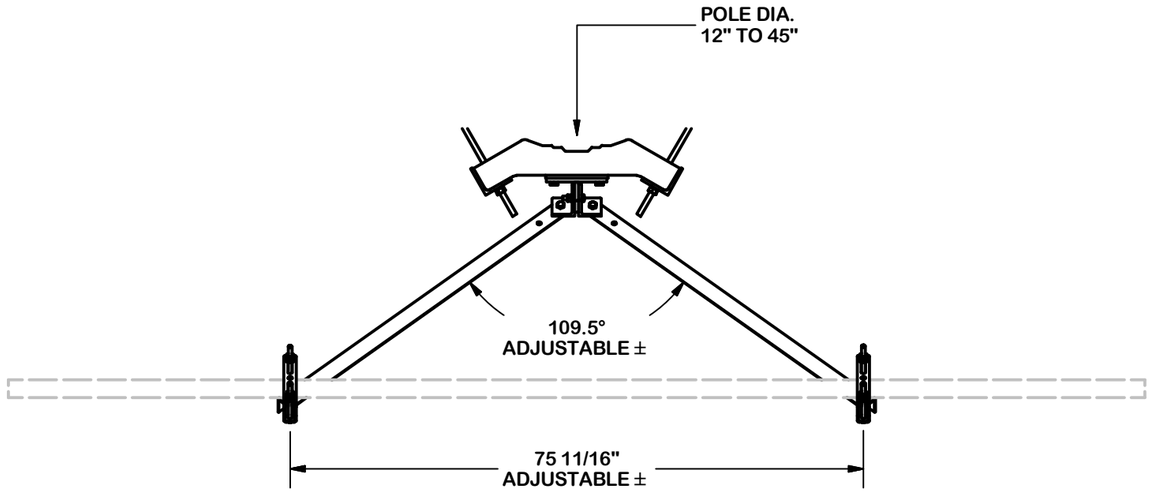
SITE PRO 1 — A valmont COMPANY

Engineering Support Team:
1-888-753-7446

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

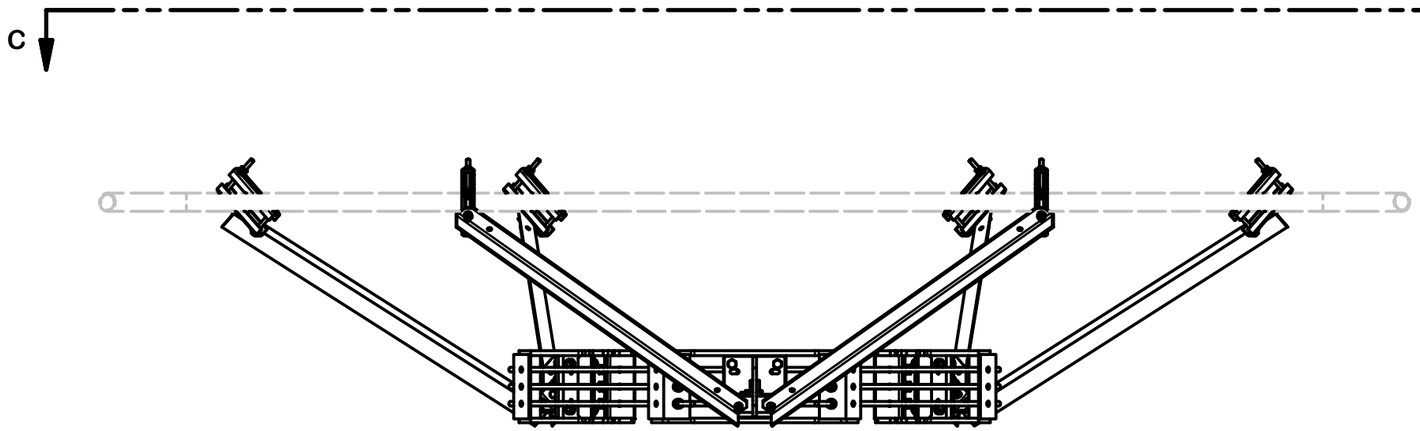
CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.	PAGE
SP1	CSL3 2/23/2017	3RD PARTY	PRK-SFS	1 OF 3

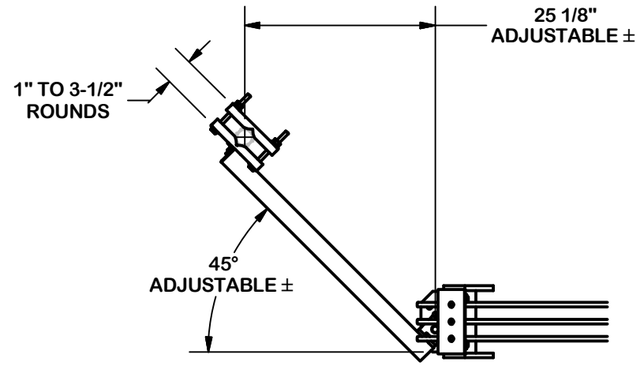
CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	02	SHOP	BMC 3/16/2017	PRK-SFS



PARTIAL VIEW C-C

VERTICAL POSITION





PARTIAL VIEW D-D

TOLERANCE NOTES

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DRILLED AND GAS CUT HOLES (± 0.030") - NO CONING OF HOLES
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REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
A	CHANGED MAX. DIA. FOR HANDRAIL CONNECTION	SP1	BC	10/23/2017

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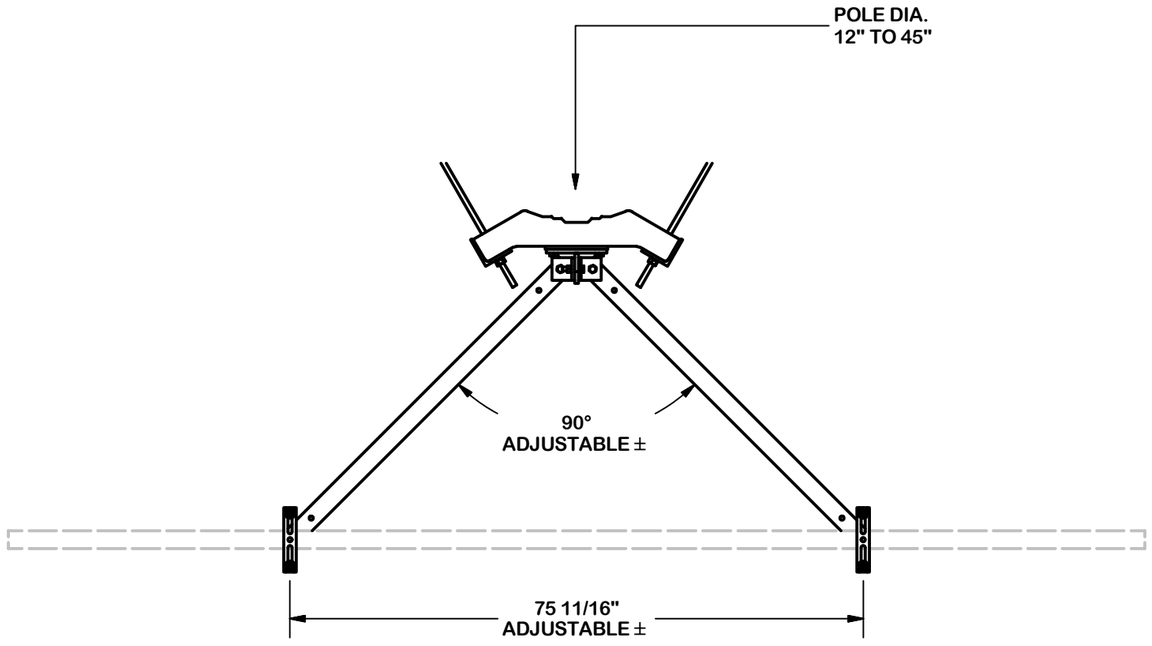
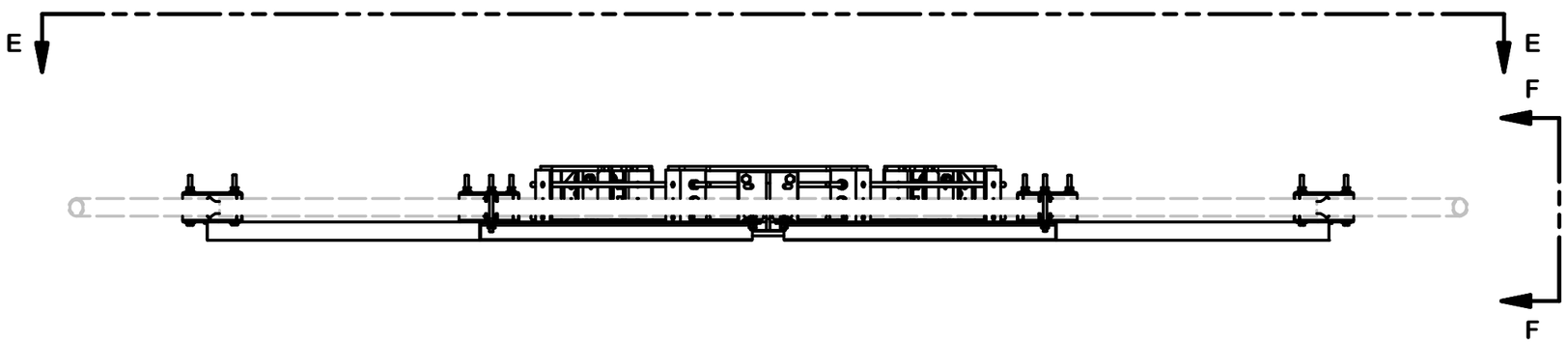
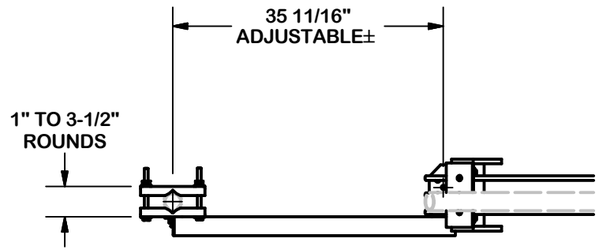


PARTIAL VIEW E-E

HORIZONTAL POSITION





PARTIAL VIEW F-F

TOLERANCE NOTES

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

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
A	CHANGED MAX. DIA. FOR HANDRAIL CONNECTION	SP1	BC	10/23/2017

REVISION HISTORY

DESCRIPTION: HANDRAIL REINFORCEMENT KIT

SITE PRO 1 — A valmont COMPANY

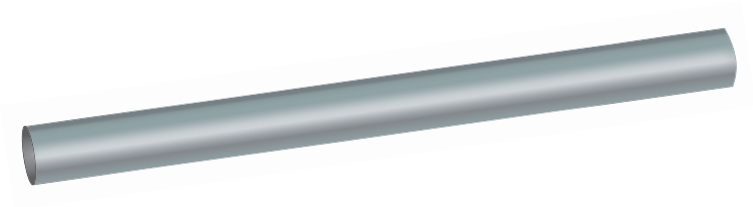
Engineering Support Team:
1-888-753-7446

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

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.
SP1	CSL3 2/23/2017	3RD PARTY	PRK-SFS

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	02	SHOP	BMC 3/16/2017	PRK-SFS

Pxxx: Bulk Pipe



Features:

- Factory cut end, hot-dip galvanized pipe

Construction:

- ASTM A53 Grade B
- Schedule 40

Design Criteria:

- ASTM A53 Grade B (Yield Fy = 35 ksi [240 MPa] / Tensile Fu = 60 ksi [415 MPa])
- Hot dip galvanized in accordance with ASTM A123 requirements

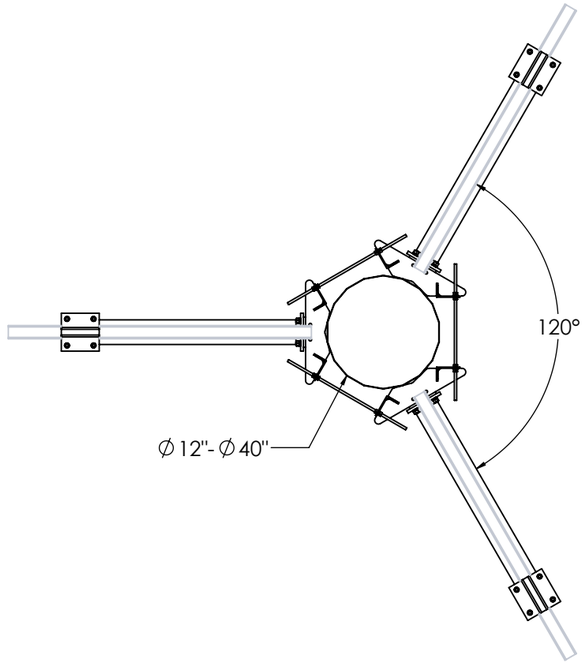
Part #	Length	OD x Length (in)
P263	5′-3″	2-3/8″ x 63″
P272	6′-0″	2-3/8″ x 72″
P284	7′-0″	2-3/8″ x 84″
P296	8′-0″	2-3/8″ x 96″
P2120	10′-0″	2-3/8″ x 120″
P2126	10′-6″	2-3/8″ x 126″
P2150	12′-6″	2-3/8″ x 150″
P2174	14′-6″	2-3/8″ x 174″
P3084	7′-0″	2-7/8″ x 84″
P3096	8′-0″	2-7/8″ x 96″
P30120	10'-0"	2-7/8" x 120"
P30126	10′-6″	2-7/8″ x 126″
P30150	12′-6″	2-7/8″ x 150″
P30174	14′-6″	2-7/8″ x 174″
P360	5′-0″	3-1/2″ x 60″
P372	6′-0″	3-1/2″ x 72″
P396	8′-0″	3-1/2″ x 96″
P3150	12′-6″	3-1/2″ x 150″
P3160	13′-4″	3-1/2″ x 160″
P3174	14′-6″	3-1/2″ x 174″
P3216	18′-0″	3-1/2″ x 216″
P472	6′-0″	4-1/2″ x 72″
P4126	10′-6″	4-1/2″ x 126″

created on: 01/05/2018

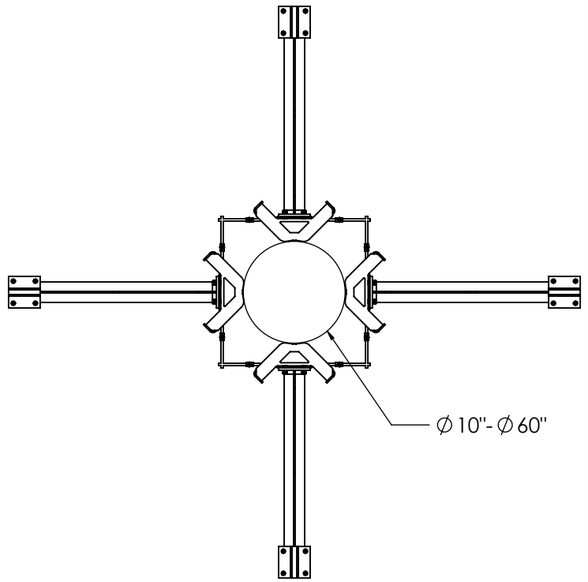
PKBK-ENG-01-R1
MONOPOLE KICKER BRACE KIT

Table 1: Monopole Kicker Brace Kit

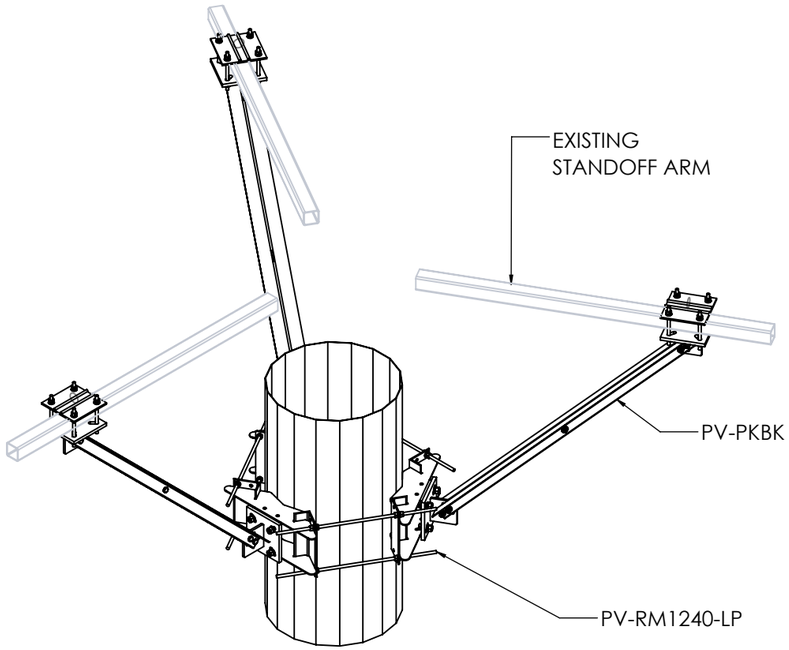
Part Number	Description	Weight (lbs)	Included Parts				
			PV-RM1240-LP	PV-RM3060	PV-RM1060-4	PV-PKBK	PV-PKBK-4
PV-PKBK-M	Brace Kit fits round Pipe OD up to 12"-40", 3 Sector	510	1	-	-	1	-
PV-PKBK-ML	Brace Kit fits round Pipe OD up to 30"-60", 3 Sector	695	-	1	-	1	-
PV-PKBK-4-M	Brace Kit fits round Pipe OD up to 10"-60", 4 Sector	903	-	-	1	-	1



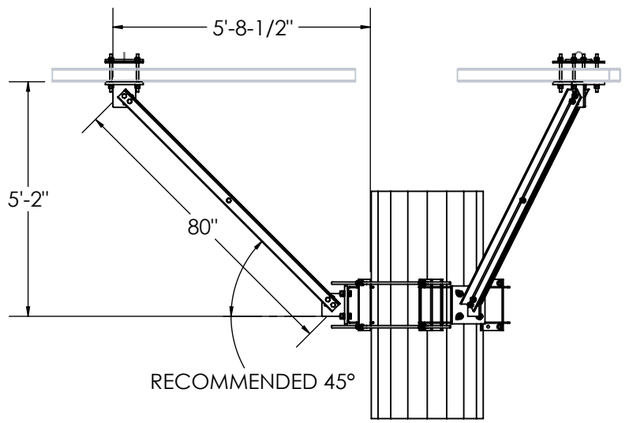
PV-PKBK-M
3-SECTOR KICKER BRACE

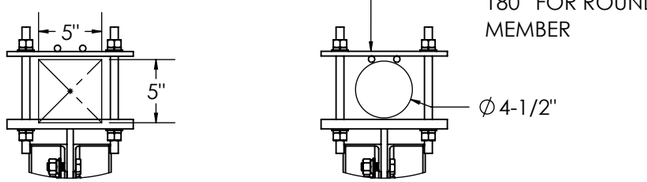


PV-PKBK-4-M
4-SECTOR KICKER BRACE



KICKER BRACE (AS SHOWN)
PV-PKBK-M





ARM ATTACHMENT
CLAMPS TO RECT HSS UP TO 5"X5" & ROUND PIPE UP TO 4-1/2" OD

SHEET 1 OF 1	THIRD ANGLE PROJECTION	CATEGORY 02_Monopole	4		
		SERIES 04_Platform Reinforcement	3		
5/17/2018	SCALE 1:48	TYPE PV-PKBK_Monopole Platform Kicker	2		
DIMENSIONS ARE IN INCHES TOLERANCES U.N.O. HOLES: +1/16", -1/32" ANGULAR: PROFILE ±1/4°, BEND ±2° ALL OTHERS: ±1/16"		BY INT	1	5/15/18	
		CHECKED DJN	0	INITIAL RELEASE	
		STATUS APPROVED	REV	DESCRIPTION	DATE

PERFECTVISION MANUFACTURING

MONOPOLE KICKER BRACE KIT

DOCUMENT NUMBER PKBK-ENG-01-R1 | REV 1

C:\PVMSteel\PVM Sales Catalog\SW Working Files\Engineering Details\

Exhibit F

Power Density/RF Emissions Report

Transcom Engineering, Inc.

Wireless Network Design and Deployment

Radio Frequency Emissions Analysis Report

T-MOBILE Existing Facility

Site ID: CT11083Q

CT083/Sprint/Grassy Hill
700 Grassy Hill Road
Orange, CT 06477

July 16, 2019

Transcom Engineering Project Number: 737001-0010

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**14.48 %**

July 16, 2019

T-MOBILE
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, CT 6009

Emissions Analysis for Site: **CT11083Q – CT083/Sprint/Grassy Hill**

Transcom Engineering, Inc ("Transcom") was directed to analyze the proposed upgrades to the T-MOBILE facility located at **700 Grassy Hill Road, Orange, CT**, for the purpose of determining whether the emissions from the Proposed T-MOBILE Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were performed for the proposed upgrades to the T-MOBILE antenna facility located at **700 Grassy Hill Road, Orange, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-MOBILE is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. All power values expressed and analyzed are maximum power levels expected to be used on all radios.

All emissions values for additional carriers were taken from the Connecticut Siting Council (CSC) active MPE database. Values in this database are provided by the individual carriers themselves

For each sector the following channel counts, frequency bands and power levels were utilized as shown in *Table 1*:

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
UMTS	1900 MHz (PCS)	1	40
GSM	1900 MHz (PCS)	1	15
LTE	2100 MHz (AWS)	2	60
LTE / 5G NR	600 MHz	2	20
LTE	700 MHz	2	40

Table 1: Channel Data Table

The following antennas listed in *Table 2* were used in the modeling for transmission in the 600, 700 MHz, 1900 MHz (PCS) and 2100 MHz (AWS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	Ericsson AIR21 B2A/B4P	110
A	2	Ericsson AIR21 B4A/B2P	110
A	3	RFS APXVAARR24_43-U-NA20	110
B	1	Ericsson AIR21 B2A/B4P	110
B	2	Ericsson AIR21 B4A/B2P	110
B	3	RFS APXVAARR24_43-U-NA20	110
C	1	Ericsson AIR21 B2A/B4P	110
C	2	Ericsson AIR21 B4A/B2P	110
C	3	RFS APXVAARR24_43-U-NA20	110

Table 2: Antenna Data

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

Cable losses were factored in the calculations for this site. Since all **2100 MHz UMTS** radios are ground mounted the following cable loss values were used. For each ground mounted **2100 MHz (AWS) UMTS** radio there was **1.80 dB** of cable loss calculated into the system gains / losses for this site. These values were calculated based upon the manufacturers specifications for **170 feet** of **1-5/8”** coax

RESULTS

Per the calculations completed for the proposed T-MOBILE configurations *Table 3* shows resulting emissions power levels and percentages of the FCC's allowable general population limit.

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	Ericsson AIR21 B2A/B4P	1900 MHz (PCS) / 2100 MHz (AWS)	15.9	3	95	3,167.91	1.05
Antenna A2	Ericsson AIR21 B4A/B2P	2100 MHz (AWS)	15.9	2	120	4,668.54	1.55
Antenna A3	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	12.95 / 13.35	4	120	2,443.03	1.95
						Sector A Composite MPE%	**4.55**
Antenna B1	Ericsson AIR21 B2A/B4P	1900 MHz (PCS) / 2100 MHz (AWS)	15.9	3	95	3,167.91	1.05
Antenna B2	Ericsson AIR21 B4A/B2P	2100 MHz (AWS)	15.9	2	120	4,668.54	1.55
Antenna B3	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	12.95 / 13.35	4	120	2,443.03	1.93
						Sector B Composite MPE%	**4.53**
Antenna C1	Ericsson AIR21 B2A/B4P	1900 MHz (PCS) / 2100 MHz (AWS)	15.9	3	95	3,167.91	1.05
Antenna C2	Ericsson AIR21 B4A/B2P	2100 MHz (AWS)	15.9	2	120	4,668.54	1.55
Antenna C3	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	12.95 / 13.35	4	120	2,443.03	1.93
						Sector C Composite MPE%	**4.53**

Table 3: T-MOBILE Emissions Levels

The Following table (*table 4*) shows all additional carriers on site and their MPE% as recorded in the CSC active MPE database for this facility along with the newly calculated maximum T-MOBILE MPE contributions per this report. FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. For this site, all three sectors have the same configuration yielding the same results on all three sectors. *Table 5* below shows a summary for each T-MOBILE Sector as well as the composite MPE value for the site.

Site Composite MPE%	
Carrier	**MPE%**
T-MOBILE – Max Per Sector Value	**4.55 %**
Sprint	3.85 %
Verizon Wireless	2.75 %
MetroPCS	0.77 %
Clearwire	0.12 %
AT&T	2.44 %
Site Total MPE %:	**14.48 %**

Table 4: All Carrier MPE Contributions

T-MOBILE Sector A Total:	4.55 %
T-MOBILE Sector B Total:	4.53 %
T-MOBILE Sector C Total:	4.53 %
Site Total:	14.48 %

Table 5: Site MPE Summary

FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. *Table 6* below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated T-MOBILE sector(s). For this site, all three sectors have the same configuration yielding the same results on all three sectors.

T-MOBILE _ Frequency Band / Technology Max Power Values (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile 1900 MHz (PCS) UMTS	1	583.57	110	1.94	1900 MHz (PCS)	1000	0.19%
T-Mobile 1900 MHz (PCS) GSM	1	1,556.18	110	5.17	1900 MHz (PCS)	1000	0.52%
T-Mobile 2100 MHz (AWS) UMTS	1	1,028.16	110	3.42	2100 MHz (AWS)	1000	0.34%
T-Mobile 2100 MHz (AWS) LTE	2	2,334.27	110	15.52	2100 MHz (AWS)	1000	1.55%
T-Mobile 600 MHz LTE / 5G NR	2	788.97	110	5.33	600 MHz	400	1.33%
T-Mobile 700 MHz LTE	2	432.54	110	2.88	700 MHz	467	0.62%
						Total:	**4.55%**

Table 6: T-MOBILE Maximum Sector MPE Power Values

Summary

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

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

T-MOBILE Sector	Power Density Value (%)
Sector A:	4.55 %
Sector B:	4.53 %
Sector C:	4.53 %
T-MOBILE Maximum Total (per sector):	4.55 %
Site Total:	14.48 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **14.48 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

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PO Box 1048
Sterling, MA 01564