CROWN CASTLE

1 Cityplace Dr, Suite 490

Creve Coeur, MO 63141

Phone: (314) 513-0147

www.crowncastle.com

October 19, 2021

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

RE: **Notice of Exempt Modification for Verizon**
Crown Site ID# 806369; Verizon Site ID# 469115
439-455 Homestead Ave Hartford, CT 06238
Latitude: 41.783711 / Longitude: -72.703788

Ms. Bachman:

Verizon currently maintains twelve (12) antennas at the 140-foot mount on the existing 140-foot Monopole Tower located at 439-455 Homestead Ave Hartford, CT. The property is owned by Talar Properties LLC and the Tower by Crown Castle. Verizon now intends to replace nine (9) existing antennas. This modification/proposal includes hardware that is both 4G(LTE) and 5G capable through remote software configuration and either or both services may be turned on or off at various times.

Planned Modifications:
Tower:

Remove and Replace:
(3) Amphenol BXA 171063 8CF EDIN-2 Antennas **(REMOVE) –** Samsung MT6407 77A Antennas **(REPLACE)**

(3) Amphenol BXA 171063 8CF EDIN-2 Antennas **(REMOVE) -** Commscope NHHSS-65B-R2BTO Antennas **(REPLACE)**

(3) CSS X7C-FRO-660-V-08 Antennas **(REMOVE)** Commscope NHH-65B-R2B Antennas **(REPLACE)**

(3) Nokia UHBA B13 RRH 4X30 Radios Radios **(REMOVE) -** (3) Samsung RRH RF4440d-13A Radios **(REPLACE)**

(3) Nokia UHID B4 RRH 2X40 (**REMOVE) -** (3) Samsung RF4439D-25A Radios **(REPLACE)**

Remove:
(6) RFS FD9R6004 2C-3L TMAs

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Install New:
(3) Samsung RF4441D-48A Radios
(3) Samsung RRH RF4440d-13A Radios
(2) 6 OVP Pendant
(3) Commscope BASMNT SBS 1-2 Mounts

Ground:

Install New:
(2) Hybrid Cables (6x12)

Remove:
(6) Coax cables (1 5/8")
(1) Hybrid Cable

The facility was approved by The Connecticut Siting Council by way of a Certificate of Environmental Compatibility Docket No. 126 on April 9, 1990.

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 Luke Bronin, Mayor of the City of Hartford and I. Charles Mathews, Development Services Acting Director for the City of Hartford. A copy will also be sent to the property 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, Verizon 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).

1 Cityplace Dr, Suite 490
Creve Coeur, MO 63141

Phone: (314) 513-0147
www.crowncastle.com

Sincerely,

Colin Robinson

Colin Robinson
Project Manager
NETWORK BUILDING + CONSULTING
100 Apollo Drive Suite 303
Chelmsford, MA 01824
crobinson@nbcllc.com
(360) 561-3311

cc:

Luke Bronin, Mayor *(Via Federal Express)*
Hartford City Hall
550 Main Street, 2nd Floor, Room 200 06103
(860) 757-9500

I. Charles Mathews, Acting Director *(Via Federal Express)*
260 Constitution Plaza, 1st Fl
Hartford 06103
(860) 757-9040

Talar Properties LLC *(Via Federal Express)*
705 N Mountain RD
Newington, CT 06111

Colin Robinson

From: TrackingUpdates@fedex.com
Sent: Thursday, October 21, 2021 9:49 AM
To: Colin Robinson
Subject: FedEx Shipment 285098533308: Your package has been delivered

Hi. Your package was delivered Thu, 10/21/2021 at 9:47am.

Delivered to 260 CONSTITUTION PLZ 1, HARTFORD, CT 06103
Received by C.MATHEWS

OBTAIN PROOF OF DELIVERY

TRACKING NUMBER	285098533308
FROM	NB+C 100 Apollo Dr. Suite 303 CHELMSFORD, MA, US, 01824
TO	I. Charles Mathews 260 Constitution Plaza

	1st Floor HARTFORD, CT, US, 06103
REFERENCE	100788 806369 Hartford CT
SHIPPER REFERENCE	100788 806369 Hartford CT
SHIP DATE	Wed 10/20/2021 04:48 PM
DELIVERED TO	Receptionist/Front Desk
PACKAGING TYPE	FedEx Envelope
ORIGIN	CHELMSFORD, MA, US, 01824
DESTINATION	HARTFORD, CT, US, 06103
SPECIAL HANDLING	Deliver Weekday
NUMBER OF PIECES	1
TOTAL SHIPMENT WEIGHT	1.00 LB
SERVICE TYPE	FedEx Priority Overnight

Colin Robinson

From: TrackingUpdates@fedex.com
Sent: Thursday, October 21, 2021 10:01 AM
To: Colin Robinson
Subject: FedEx Shipment 285098724294: Your package has been delivered

Hi. Your package was delivered Thu, 10/21/2021 at 9:59am.

Delivered to 705 N MOUNTAIN RD, NEWINGTON, CT 06111
Received by F.RECEPTION COUNTER

OBTAIN PROOF OF DELIVERY

TRACKING NUMBER 285098724294

FROM NB+C
100 Apollo Dr.
Suite 303
CHELMSFORD, MA, US, 01824

TO	Talar Properties LLC 705 N Mountain RD NEWINGTON, CT, US, 06111
REFERENCE	100788 806369 Hartord CT
SHIPPER REFERENCE	100788 806369 Hartord CT
SHIP DATE	Wed 10/20/2021 04:48 PM
DELIVERED TO	Receptionist/Front Desk
PACKAGING TYPE	FedEx Envelope
ORIGIN	CHELMSFORD, MA, US, 01824
DESTINATION	NEWINGTON, CT, US, 06111
SPECIAL HANDLING	Deliver Weekday
NUMBER OF PIECES	1
TOTAL SHIPMENT WEIGHT	1.00 LB
SERVICE TYPE	FedEx Priority Overnight

Colin Robinson

From: TrackingUpdates@fedex.com
Sent: Thursday, October 21, 2021 9:54 AM
To: Colin Robinson
Subject: FedEx Shipment 285098337915: Your package has been delivered

Hi. Your package was delivered Thu, 10/21/2021 at 9:37am.

Delivered to 555 MAIN ST, HARTFORD, CT 06103

OBTAIN PROOF OF DELIVERY

TRACKING NUMBER	285098337915
FROM	NB+C 100 Apollo Dr. Suite 303 CHELMSFORD, MA, US, 01824
TO	Hartford City Hall Luke Bronin 550 Main Street

	2nd Floor, Room 200 HARTFORD, CT, US, 06103
REFERENCE	100788 806369 Harford CT
SHIPPER REFERENCE	100788 806369 Harford CT
SHIP DATE	Wed 10/20/2021 04:48 PM
PACKAGING TYPE	FedEx Envelope
ORIGIN	CHELMSFORD, MA, US, 01824
DESTINATION	HARTFORD, CT, US, 06103
SPECIAL HANDLING	Deliver Weekday
NUMBER OF PIECES	1
TOTAL SHIPMENT WEIGHT	1.00 LB
SERVICE TYPE	FedEx Priority Overnight

Exhibit A

Original Facility Approval

DOCKET NO. 126 - AN APPLICATION OF METRO MOBILE CTS OF HARTFORD, INC., FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED FOR THE CONSTRUCTION, OPERATION, AND MAINTENANCE OF A CELLULAR TELEPHONE TOWER AND ASSOCIATED EQUIPMENT IN THE CITY OF HARTFORD, CONNECTICUT.	:	Connecticut Siting Council
	:	April 9, 1990

D E C I S I O N A N D O R D E R

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council finds that the effects associated with the construction, operation, and maintenance of a cellular telephone facility at the proposed Hartford site, including effects on the natural environment; ecological integrity and balance; forests and parks; air and water purity; and fish and wildlife are not significant either alone or cumulatively with other effects, 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 Section 16-50k of the General Statutes of Connecticut (CGS), be issued to Metro Mobile CTS of Hartford, Inc., for the construction, operation, and maintenance of a cellular telecommunications tower, associated equipment, and building at the proposed site in Hartford, 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 monopole tower including antennas and associated equipment shall not exceed a height of 153 feet above ground level, 215 feet AMSL.

2. The facility shall be constructed in accordance with the State of Connecticut Basic Building Code.

3. The tower shall be designed and constructed to withstand 125 mph winds with two-inch radial ice accumulation.

4. The Certificate Holder shall prepare a Development and Management (D&M) plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of State Agencies. The D&M plan shall include detailed plans of the site preparation with a soil boring report; plans, design details, and specifications for the tower foundation; and a site plan with placement of the tower as far removed from abutting properties and structures as possible.

5. The Certificate Holder shall prepare the D&M plan in consultation with the City of Hartford, which may provide its comments to the Council within 20 days of submission to the City.

6. The Certificate Holder shall comply with existing and any future radio frequency (RF) standard promulgated by State or federal regulatory agencies. Upon the establishment of any new governmental RF standards, the facility granted in this Decision and Order shall be brought into compliance with such standards.

7. The Certificate Holder shall provide the Council a recalculated report of power density if and when additional channels over the proposed 90 channels, higher wattage over the proposed 100 watts per channel, or if other circumstances in operation cause a change in power density above the levels originally calculated in the application.

8. The Certificate Holder shall permit public or private entities to share space on the tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing.

9. If this facility does not initially provide, or permanently ceases to provide, cellular service following the completion of construction, this Decision and Order shall be void, and the tower and all associated equipment in this application shall be dismantled and removed or reapplication of any new use shall be made to the Council before any such new use is made.

10. Unless otherwise approved by the Council, this Decision and Order shall be void if construction authorized herein is not completed within three years of the effective date of this Decision and Order.

Pursuant to Section 16-50p of the CGS, we hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed below. A notice of issuance shall be published in the Hartford Courant.

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 State Agencies.

The parties or intervenors to this proceeding are:

(Applicant)

Metro Mobile CTS of
Hartford, Inc.
100 Corporate Drive
Windsor, CT 06095
Attn: Gary N. Schulman
Vice President and
General Manager

(Its Representative)

Robinson & Cole
One Commercial Plaza
Hartford, CT 06103-3597
Attn: Earl W. Phillips
Jr., Esq.

(Intervenor)

SNET Cellular, Inc.
227 Church Street
New Haven, CT 06506

(Its Representative)

Peter J. Tyrrell
Senior Attorney
SNET Cellular, Inc.
227 Church Street
Room 1021
New Haven, CT 06506

JAW

4248E

CERTIFICATION

The undersigned members of the Connecticut Siting Council hereby certify that they have heard this case in Docket No. 126 - An application of Metro Mobile CTS of Hartford, Inc., for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance, and operation of a cellular telephone tower and associated equipment in the City of Hartford, Connecticut, or read the record thereof, and that we voted as follows:

Dated at New Britain, Connecticut the 9th day of April, 1990.

Council Members	Vote Cast
Gloria Dibble Pond Chairperson	Yes
Commissioner Peter Boucher Designee: Robert A. Pulito	Yes
Commissioner Leslie Carothers Designee: Brian Emerick	Yes
Harry E. Covey	Yes
Mortimer A. Gelston	Yes
Daniel P. Lynch, Jr.	Yes
Paulann H. Sheets	Abstain
William H. Smith	Yes
Colin C. Tait	Yes

Exhibit B

Property Card

Card 1 of 1

Location 441-455 HOMESTEAD AVE	Property Account Number	Parcel ID 152-181-002

Old Parcel ID -26331-

Current Property Mailing Address

Owner TALAR PROPERTIES LLC	City NEWINGTON
	State CT
Address 705 N MOUNTAIN RD	Zip 06111-1412
	Zoning CX-1

Current Property Sales Information

Sale Date 3/7/2001	Legal Reference 04350-0044
Sale Price 0	Grantor(Seller) HUDSON ASSOCIATES

Current Property Assessment

	Card 1 Value
Year 2021	Building Value 0
	Xtra Features Value 0
Land Area 79715 -	Land Value 213,360
	Total Value 213,360

Narrative Description

This property contains 79715 - of land mainly classified as VAC LAND IND with a(n) N/A style building, built about N/A , having N/A exterior and N/A roof cover, with 0 commercial unit(s) and 0 residential unit(s), 0 total room(s), 0 total bedroom(s), 0 total bath(s), 0 total half bath(s), 0 total 3/4 bath(s).

Legal Description

Property Images


Exhibit C

Construction Drawings

verizon

180 WASHINGTON VALLEY ROAD
BEDMINSTER, NJ 07921

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

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

VERIZON SITE NUMBER: 469115
VERIZON SITE NAME: HARTFORD NW CT
SITE TYPE: MONOPOLE
TOWER HEIGHT: 140'-0"

BUSINESS UNIT #: 806369
SITE ADDRESS: 439-455 HOMESTEAD AVE HARTFORD, CT 06105
COUNTY: HARTFORD
JURISDICTION: CONNECTICUT SITING COUNCIL

VERIZON 5G L-SUB6 - CARRIER ADD 16272354

SITE INFORMATION

CROWN CASTLE USA INC. SITE NAME:	HRT 094 943225
SITE ADDRESS:	439-455 HOMESTEAD AVE HARTFORD, CT 06105
COUNTY:	HARTFORD
MAP/PARCEL #:	152181002
AREA OF CONSTRUCTION:	EXISTING
LATITUDE:	41.783711°
LONGITUDE:	-72.703788°
LAT/LONG TYPE:	NAD83
GROUND ELEVATION:	63'
CURRENT ZONING:	CX-1
JURISDICTION:	CONNECTICUT SITING COUNCIL
OCCUPANCY CLASSIFICATION:	U
TYPE OF CONSTRUCTION:	IIB
A.D.A. COMPLIANCE:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION
PROPERTY OWNER:	TALAR PROPERTIES LLC 705 N MOUNTAIN ROAD NEWINGTON, CT 06111-1412
TOWER OWNER:	CROWN CASTLE 2000 CORPORATE DRIVE CANONSBURG, PA 15317
CARRIER/APPLICANT:	VERIZON WIRELESS 20 ALEXANDER DRIVE, 2ND FLOOR WALLINGFORD, CT 06492
ELECTRIC PROVIDER:	NOT PROVIDED
TELCO PROVIDER:	NOT PROVIDED

PROJECT TEAM

A&E FIRM:	B+T GROUP 1717 S. BOULDER AVE. TULSA, OK 74119 MARVIN PHILLIPS marvin.phillips@btgrp.com
CROWN CASTLE USA INC. DISTRICT CONTACTS:	1505 WESTLAKE AVENUE NORTH, SUITE 800 SEATTLE, WA 98109 N/A - PROJECT MANAGER N/A - CONSTRUCTION MANAGER
VERIZON CONTACT:	ANDREW LEONE ALEONE@STRUCTURECONSULTING.NET

DRAWING INDEX

SHEET #	SHEET DESCRIPTION
T-1	TITLE SHEET
T-2	GENERAL NOTES
C-1	SITE PLAN
C-2	TOWER ELEVATION & ANTENNA PLANS
C-3	EQUIPMENT SCHEDULES
C-4	EQUIPMENT DETAILS
C-5	EQUIPMENT DETAILS
C-5.1	EQUIPMENT DETAILS
C-6	PLUMBING DIAGRAM
G-1	GROUNDING DETAILS
G-2	GROUNDING DETAILS

ALL DRAWINGS CONTAINED HEREIN ARE FORMATTED FOR 22X34. 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.

APPROVALS

SIGNATURE	DATE

CONTRACTOR PMI REQUIREMENTS

PMI ACCESSED AT	https://pmi.vzwsmart.com
SMART TOOL VENDOR PROJECT NUMBER	----
VzW LOCATION CODE (PSLC)	469115

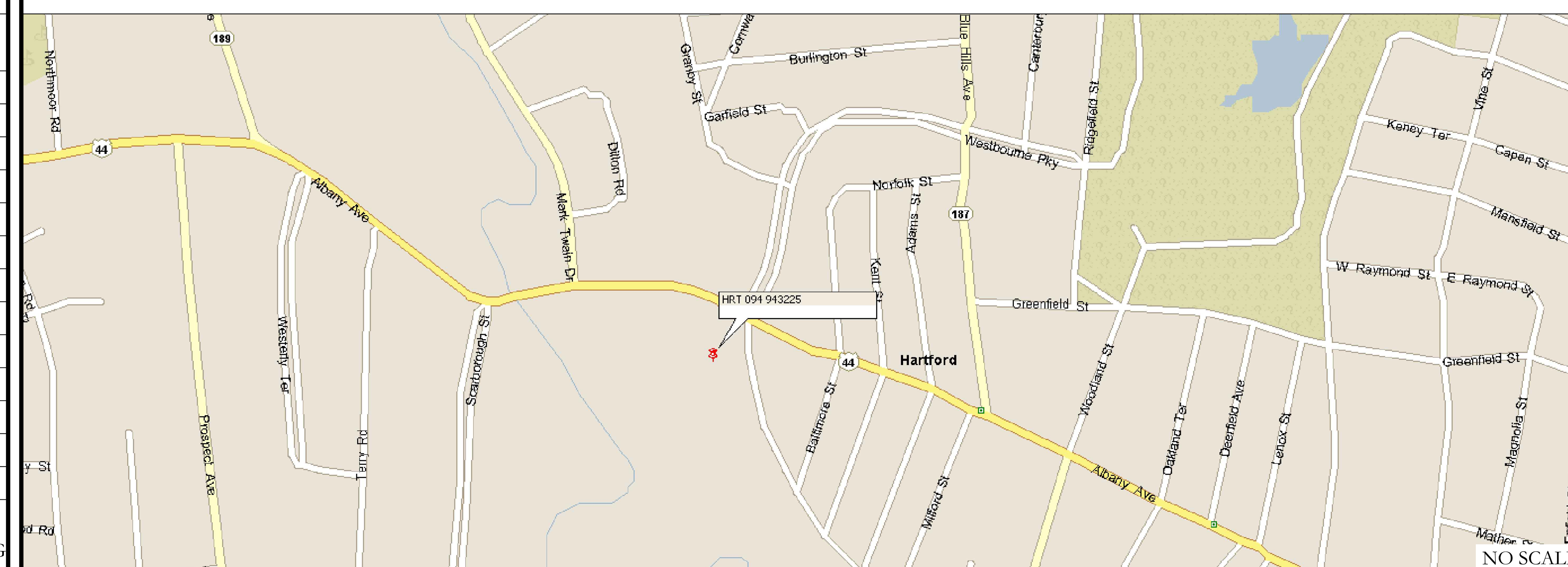
*** PMI AND REQUIREMENTS ALSO EMBEDDED IN MOUNT ANALYSIS REPORT

MOUNT MODIFICATION REQUIRED	Y

VzW APPROVED SMART KIT VENDORS

REFER TO MOUNT MODIFICATION DRAWINGS PAGE FOR VzW SMART KIT APPROVED VENDORS

LOCATION MAP



GET ON WHITEHEAD HWY FROM RESERVE RD, VAN DYKE AVE AND SHELDON ST HEAD NORTH ON LINDBERGH DR TOWARD MAXIM RD TURN LEFT ONTO MAXIM RD TURN RIGHT ONTO RESERVE RD RESERVE RD TURNS RIGHT AND BECOMES VAN DYKE AVE TURN RIGHT ONTO SHELDON ST CONTINUE STRAIGHT TO STAY ON SHELDON ST SHARP RIGHT ONTO THE RAMP TO I-91/SPRINGFIELD/NEW HAVEN TAKE EXIT 32A AND I-84 TO SPRING ST. TAKE EXIT 48 FROM I-84 MERGE WITH WHITEHEAD HWY KEEP LEFT AT THE Y JUNCTION, FOLLOW SIGNS FOR I-91 N/SPRINGFIELD/BRADLEY INT'L AIRPORT KEEP LEFT AT THE Y JUNCTION TO CONTINUE ON EXIT 32A, FOLLOW SIGNS FOR I-84 W/WATERBURY AND MERGE WITH I-84 TAKE EXIT 48 TOWARD ASYLUM STREET FOLLOW GARDEN ST TO HOMESTEAD AVE MERGE WITH SPRING ST TURN RIGHT ONTO GARDEN ST TURN LEFT ONTO HOMESTEAD AVE TURN LEFT.

APPLICABLE CODES/REFERENCE DOCUMENTS

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

CODE TYPE	CODE
BUILDING	2015 IBC
MECHANICAL	2015 IMC
ELECTRICAL	2017 NEC

REFERENCE DOCUMENTS:

STRUCTURAL ANALYSIS:	MORRISON HERSHFIELD
DATED:	8/19/21
MOUNT ANALYSIS:	NETWORK BUILDING + CONSULTING
DATED:	8/16/21
RFDS REVISION:	N/A
DATED:	7/26/21
ORDER ID:	583426
REVISION:	0

CALL CONNECTICUT ONE CALL
(800) 922-4455 CBYD.COM
CALL 2 WORKING DAYS
BEFORE YOU DIG!

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 (9) ANTENNAS
- REMOVE (6) COAX CABLES
- REMOVE (6) RADIOs
- REMOVE (6) DIPLEXERs
- REMOVE (1) OVP BOX
- REMOVE (1) HYBRID CABLE
- INSTALL (9) ANTENNAS
- INSTALL (12) RADIOs
- INSTALL (2) OVP
- INSTALL (2) HYBRID CABLES

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

VERIZON SITE NUMBER:
469115

BU #: **806369**
HRT 094 943225

439-455 HOMESTEAD AVE
HARTFORD, CT 06105

EXISTING 140'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	9/13/21	JJR	PRELIMINARY REVIEW	JJR
0	9/27/21	JJR	CONSTRUCTION	JJR

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

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SHEET NUMBER:	REVISION:
T-1	0

89233.008.01_HRT 094 943225.dwg — Sheet:T-1 — User: jrichardson — Sep 27, 2021 — 12:20pm

CROWN CASTLE USA INC. SITE ACTIVITY REQUIREMENTS:

1. NOTICE TO PROCEED– NO WORK SHALL COMMENCE PRIOR TO CROWN CASTLE USA INC. WRITTEN NOTICE TO PROCEED (NTP) AND THE ISSUANCE OF A PURCHASE ORDER. PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE CROWN CASTLE USA INC. NOC AT 800–788–7011 & THE CROWN CASTLE USA INC. CONSTRUCTION MANAGER.
2. "LOOK UP" – CROWN CASTLE USA INC. SAFETY CLIMB REQUIREMENT:
THE INTEGRITY OF THE SAFETY CLIMB AND ALL COMPONENTS OF THE CLIMBING FACILITY SHALL BE CONSIDERED DURING ALL STAGES OF DESIGN, INSTALLATION, AND INSPECTION. TOWER MODIFICATION, MOUNT REINFORCEMENTS, AND/OR EQUIPMENT INSTALLATIONS SHALL NOT COMPROMISE THE INTEGRITY OR FUNCTIONAL USE OF THE SAFETY CLIMB OR ANY COMPONENTS OF THE CLIMBING FACILITY ON THE STRUCTURE. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO: PINCHING OF THE WIRE ROPE, BENDING OF THE WIRE ROPE FROM ITS SUPPORTS, DIRECT CONTACT OR CLOSE PROXIMITY TO THE WIRE ROPE WHICH MAY CAUSE FRICTIONAL WEAR, IMPACT TO THE ANCHORAGE POINTS IN ANY WAY, OR TO IMPEDE/BLOCK ITS INTENDED USE. ANY COMPROMISED SAFETY CLIMB, INCLUDING EXISTING CONDITIONS MUST BE TAGGED OUT AND REPORTED TO YOUR CROWN CASTLE USA INC. POC OR CALL THE NOC TO GENERATE A SAFETY CLIMB MAINTENANCE AND CONTRACTOR NOTICE TICKET.
3. PRIOR TO THE START OF CONSTRUCTION, ALL REQUIRED JURISDICTIONAL PERMITS SHALL BE OBTAINED. THIS INCLUDES, BUT IS NOT LIMITED TO, BUILDING, ELECTRICAL, MECHANICAL, FIRE, FLOOD ZONE, ENVIRONMENTAL, AND ZONING. AFTER ONSITE ACTIVITIES AND CONSTRUCTION ARE COMPLETED, ALL REQUIRED PERMITS SHALL BE SATISFIED AND CLOSED OUT ACCORDING TO LOCAL JURISDICTIONAL REQUIREMENTS.
4. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN, AND SHALL MEET ANSI/ASSE A10.48 (LATEST EDITION); FEDERAL, STATE, AND LOCAL REGULATIONS; AND ANY APPLICABLE INDUSTRY CONSENSUS STANDARDS RELATED TO THE CONSTRUCTION ACTIVITIES BEING PERFORMED. ALL RIGGING PLANS SHALL ADHERE TO ANSI/ASSE A10.48 (LATEST EDITION) AND CROWN CASTLE USA INC. STANDARD CED–STD–10253, INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION, TO CERTIFY THE SUPPORTING STRUCTURE(S) IN ACCORDANCE WITH ANSI/TIA–322 (LATEST EDITION).
5. ALL SITE WORK TO COMPLY WITH QAS–STD–10068 "INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON CROWN CASTLE USA INC. TOWER SITE," CED–STD–10294 "STANDARD FOR INSTALLATION OF MOUNTS AND APPURTENANCES," AND LATEST VERSION OF ANSI/TIA–1019–A–2012 "STANDARD FOR INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS."
6. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY CROWN CASTLE USA INC. PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
7. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
8. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
9. THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
10. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY CONTRACTOR. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING AND EXCAVATION E) CONSTRUCTION SAFETY PROCEDURES.
11. ALL SITE WORK SHALL BE AS INDICATED ON THE STAMPED CONSTRUCTION DRAWINGS AND PROJECT SPECIFICATIONS, LATEST APPROVED REVISION.
12. CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH AT THE COMPLETION OF THE WORK. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
13. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF CONTRACTOR, TOWER OWNER, CROWN CASTLE USA INC., AND/OR LOCAL UTILITIES.
14. THE CONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE REQUIRED BY LOCAL JURISDICTION AND SIGNAGE REQUIRED ON INDIVIDUAL PIECES OF EQUIPMENT, ROOMS, AND SHELTERS.
15. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE CARRIER'S EQUIPMENT AND TOWER AREAS.
16. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
17. THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION AS SPECIFIED ON THE CONSTRUCTION DRAWINGS AND/OR PROJECT SPECIFICATIONS.
18. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
19. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
20. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
21. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.
22. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.

GENERAL NOTES:

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

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

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

GREENFIELD GROUNDING NOTES:

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

ELECTRICAL INSTALLATION NOTES:

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

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

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

APWA UNIFORM COLOR CODE:

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

ABBREVIATIONS:

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

verizon
180 WASHINGTON VALLEY ROAD
BEDMINSTER, NJ 07921

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

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

VERIZON SITE NUMBER:
469115

BU #: **806369**
HRT 094 943225

439-455 HOMESTEAD AVE
HARTFORD, CT 06105

EXISTING 140'-0" MONOPOLE

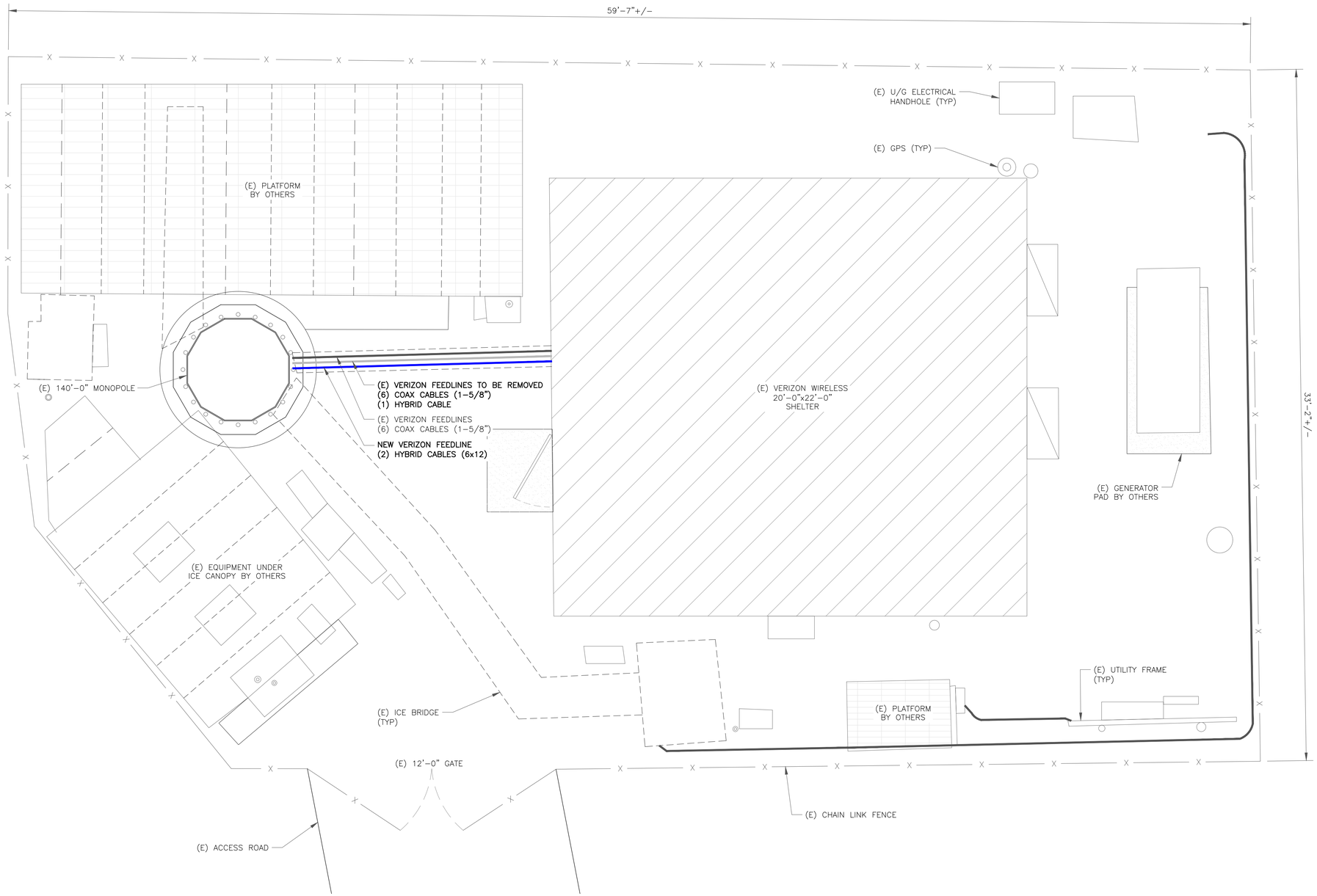
ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	9/13/21	JJR	PRELIMINARY REVIEW	JJR
0	9/27/21	JJR	CONSTRUCTION	JJR

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

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SHEET NUMBER: **T-2**
REVISION: **0**



1 SITE PLAN
SCALE: 2' 1' 0 2' 3/8"=1'-0" (FULL SIZE) 3/16"=1'-0" (11x17)

N

verizon
180 WASHINGTON VALLEY ROAD
BEDMINSTER, NJ 07921

CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
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EXISTING 140'-0" MONOPOLE

ISSUED FOR:

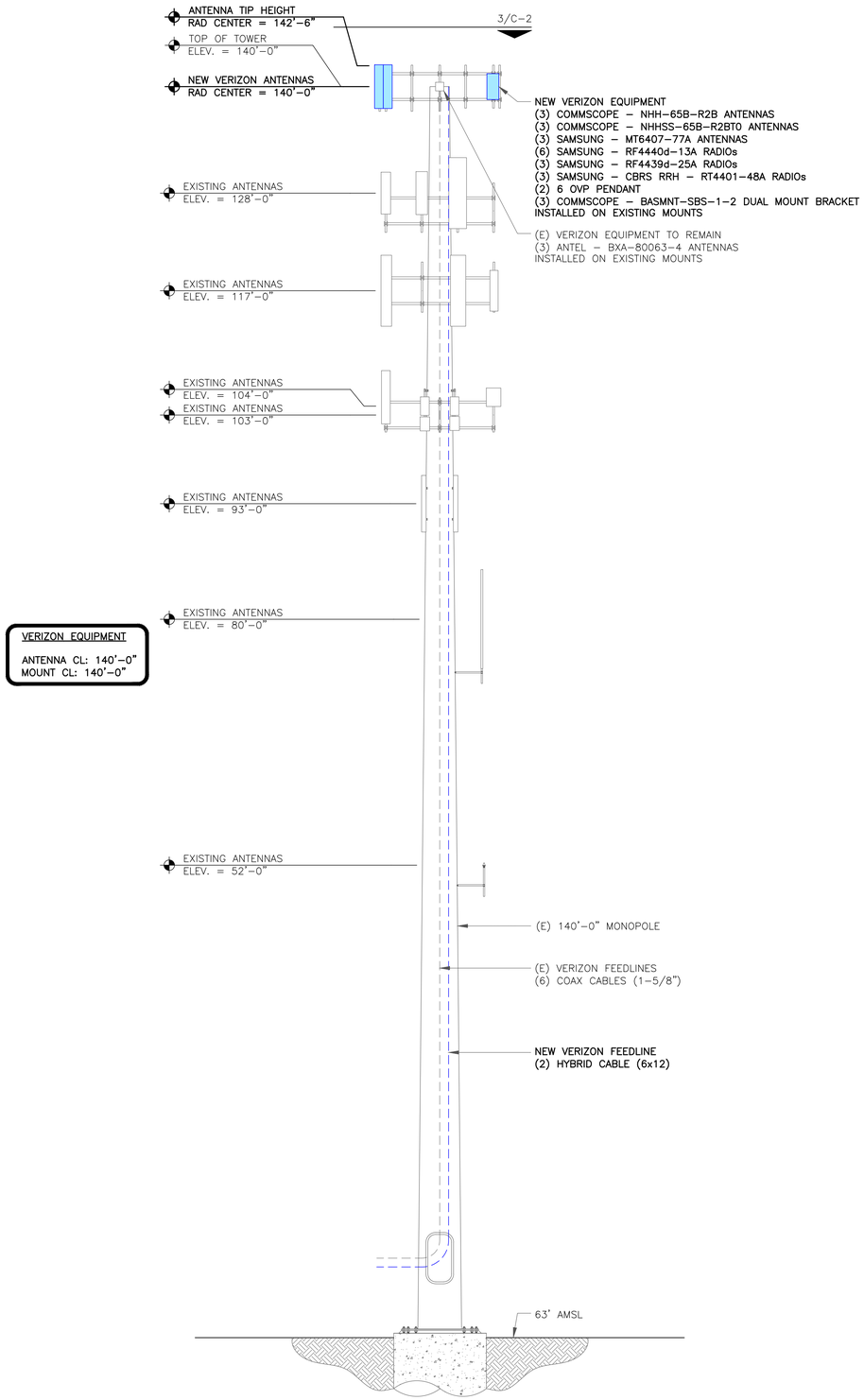
REV	DATE	DRWN	DESCRIPTION	DES./QA
A	9/13/21	JJR	PRELIMINARY REVIEW	JJR
0	9/27/21	JJR	CONSTRUCTION	JJR

STATE OF CONNECTICUT
CHRISTOPHER S. CLEMONS
No. 23924
LICENSED
PROFESSIONAL ENGINEER
9/27/21

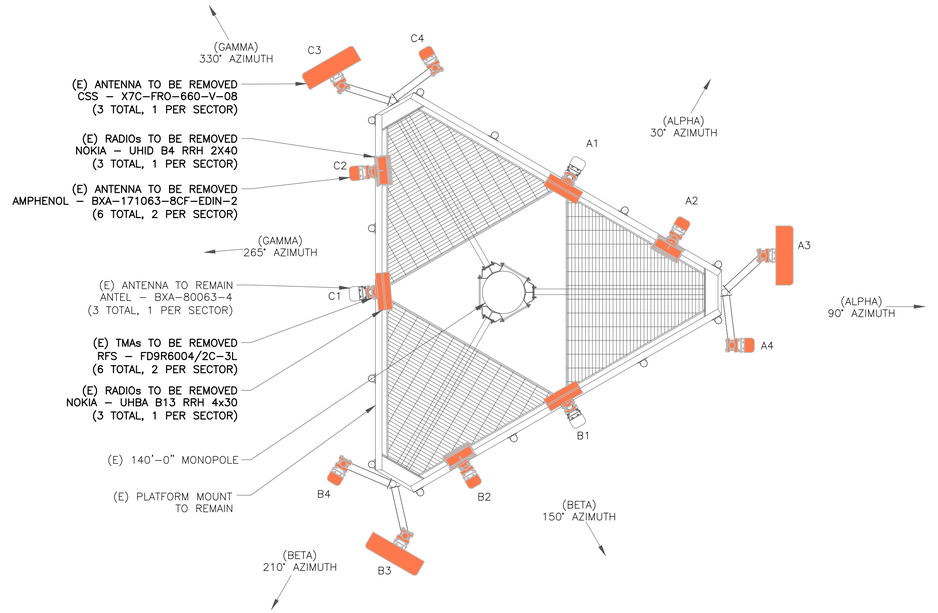
B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/22

SHEET NUMBER: C-1

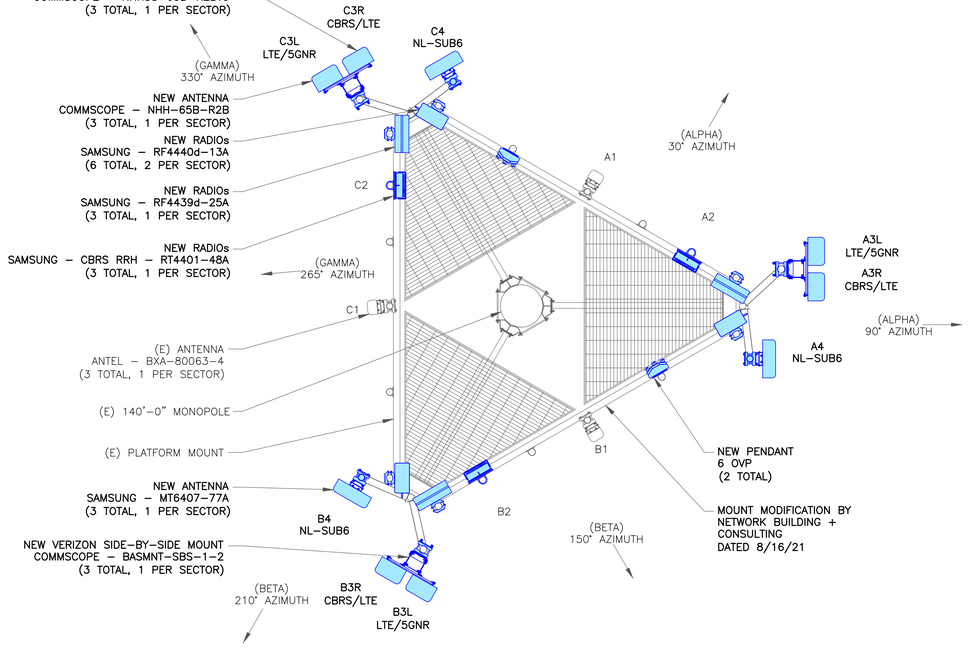
REVISION: 0



1 TOWER ELEVATION
SCALE: NOT TO SCALE



2 EXISTING ANTENNA PLAN
SCALE: NOT TO SCALE



3 NEW ANTENNA PLAN
SCALE: NOT TO SCALE

verizon
180 WASHINGTON VALLEY ROAD
BEDMINSTER, NJ 07921

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

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

VERIZON SITE NUMBER:
469115

BU #: **806369**
HRT 094 943225

439-455 HOMESTEAD AVE
HARTFORD, CT 06105

EXISTING 140'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	9/13/21	JJR	PRELIMINARY REVIEW	JJR
0	9/27/21	JJR	CONSTRUCTION	JJR

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

SHEET NUMBER: C-2

REVISION: 0

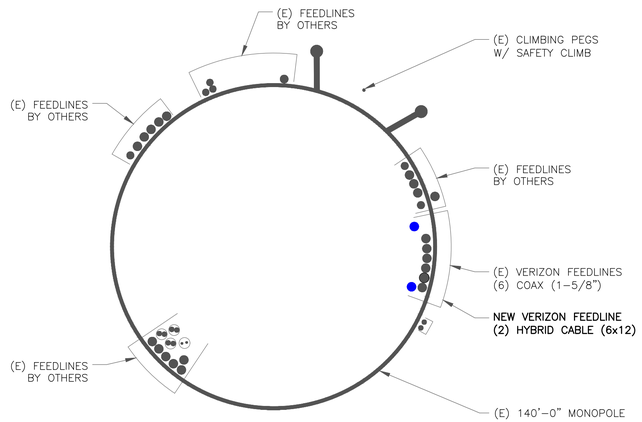
ANTENNA/RRH SCHEDULE

SECTOR	STATUS	ANTENNA MANUFACTURER	ANTENNA MODEL	ANTENNA CENTERLINE	AZIMUTH	MECHANICAL DOWNTILTS	ELECTRICAL DOWNTILTS	TOWER EQUIPMENT MANUFACTURER	TOWER EQUIPMENT QTY/MODEL
A1	EXISTING	ANTEL	BXA-80063-4	140'-0"	30°	-	-	-	-
A2	-	-	-	-	-	-	-	-	-
A3L	NEW	COMMSCOPE	NHH-65B-R2B	140'-0"	90°	0°	9°/9°/3°	SAMSUNG	(2) RF4440d-13A
A3R	NEW	COMMSCOPE	NHHSS-65B-R2BT0	140'-0"	90°	0°	0°/3°	SAMSUNG	(1) RF4439d-25A (1) CBRS RRH - RT4401-48A
A4	NEW	SAMSUNG	MT6407-77A	140'-0"	90°	0°	6°	-	(1) 6 OVP
B1	EXISTING	ANTEL	BXA-80063-4	140'-0"	150°	-	-	-	-
B2	-	-	-	-	-	-	-	-	-
B3L	NEW	COMMSCOPE	NHH-65B-R2B	140'-0"	210°	0°	4°/4°/1°	SAMSUNG	(2) RF4440d-13A
B3R	NEW	COMMSCOPE	NHHSS-65B-R2BT0	140'-0"	210°	0°	0°/1°	SAMSUNG	(1) RF4439d-25A (1) CBRS RRH - RT4401-48A
B4	NEW	SAMSUNG	MT6407-77A	140'-0"	210°	0°	6°	-	(1) 6 OVP
C1	EXISTING	ANTEL	BXA-80063-4	140'-0"	265°	-	-	-	-
C2	-	-	-	-	-	-	-	-	-
C3L	NEW	COMMSCOPE	NHH-65B-R2B	140'-0"	330°	0°	9°/9°/3°	SAMSUNG	(2) RF4440d-13A
C3R	NEW	COMMSCOPE	NHHSS-65B-R2BT0	140'-0"	330°	0°	0°/3°	SAMSUNG	(1) RF4439d-25A (1) CBRS RRH - RT4401-48A
C4	NEW	SAMSUNG	MT6407-77A	140'-0"	330°	0°	6°	-	-

1 VERIZON TOWER EQUIPMENT SCHEDULE
SCALE: NOT TO SCALE

CABLE SCHEDULE

STATUS	CABLE TYPE	SIZE	LENGTH	QTY
EXISTING	COAX	1-5/8"	190'-0"±	6
NEW	HYBRID	6x12	190'-0"±	2
TOTAL CABLE QTY:				8



2 BASE LEVEL DETAIL
SCALE: NOT TO SCALE

N

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SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
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VERIZON SITE NUMBER:
469115

BU #: **806369**
HRT 094 943225

439-455 HOMESTEAD AVE
HARTFORD, CT 06105

EXISTING 140'-0" MONOPOLE

ISSUED FOR:

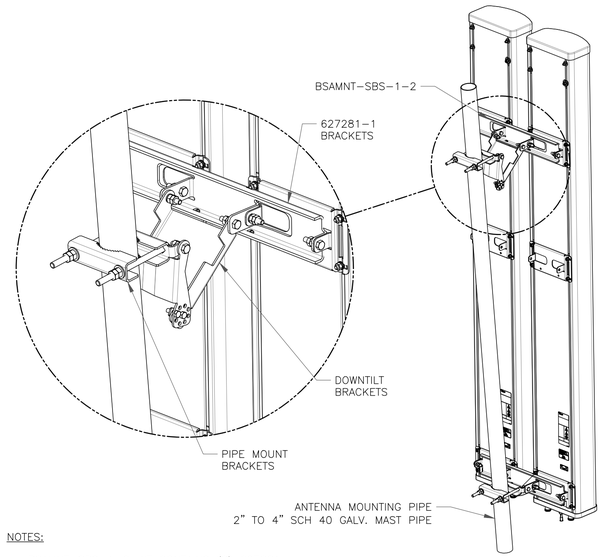
REV	DATE	DRWN	DESCRIPTION	DES./QA
A	9/13/21	JJR	PRELIMINARY REVIEW	JJR
0	9/27/21	JJR	CONSTRUCTION	JJR

STATE OF CONNECTICUT
No. 23924
LICENSED
PROFESSIONAL ENGINEER
9/27/21

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

SHEET NUMBER: C-3

REVISION: 0

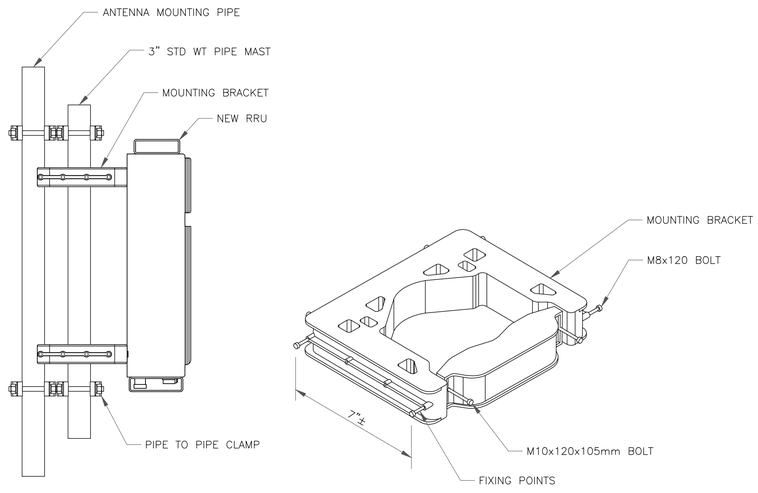


NOTES:

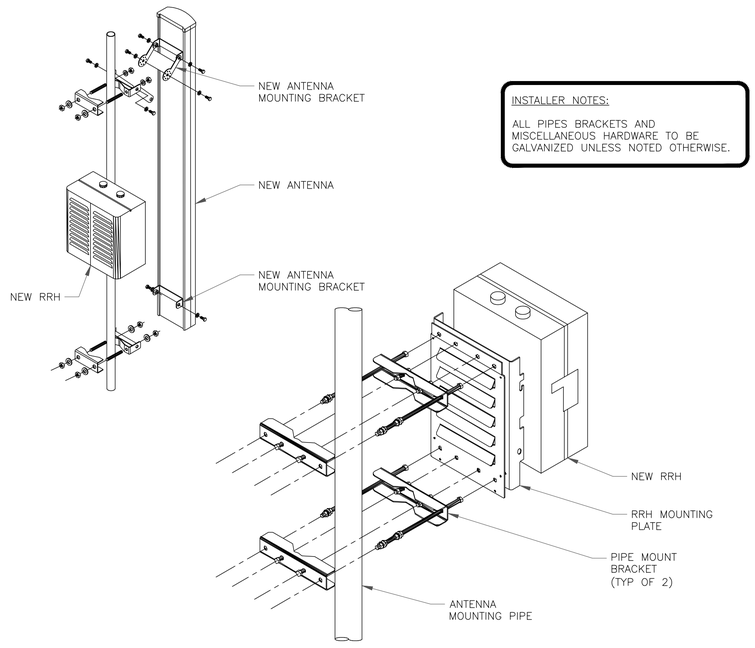
- BSAMNT-SBS-1-2 KIT CONTAINS (2) 627281 MOUNTING BRACKETS.
- TORQUE THE M10 BOLT ASSEMBLY TO 37 N.m. PER MANUFACTURE'S RECOMMENDATIONS.

1 COMMSCOPE – BSAMNT-SBS-1-2
SCALE: NOT TO SCALE

2 NOT USED
SCALE: NOT TO SCALE



3 NOKIA – FPKA BRACKET MOUNTING DETAIL
SCALE: NOT TO SCALE



INSTALLER NOTES:

ALL PIPES BRACKETS AND MISCELLANEOUS HARDWARE TO BE GALVANIZED UNLESS NOTED OTHERWISE.

4 ANTENNA & RRH MOUNTING DETAIL
SCALE: NOT TO SCALE

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www.btgrp.com

VERIZON SITE NUMBER:
469115

BU #: **806369**
HRT 094 943225

439-455 HOMESTEAD AVE
HARTFORD, CT 06105

EXISTING 140'-0" MONOPOLE

ISSUED FOR:

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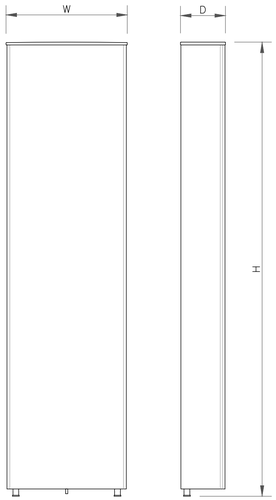
A	9/13/21	JJR	PRELIMINARY REVIEW	JJR
0	9/27/21	JJR	CONSTRUCTION	JJR

STATE OF CONNECTICUT
JOHN J. RICHARDSON
No. 23924
LICENSED
PROFESSIONAL ENGINEER
9/27/21

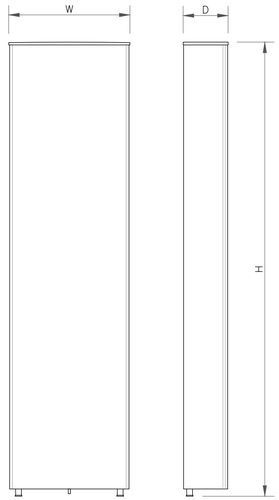
B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/22

SHEET NUMBER: C-4
REVISION: 0



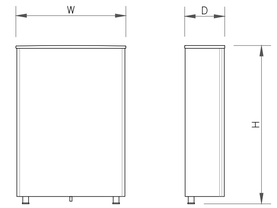
ANTENNA SPECS	
MANUFACTURER	COMMSCOPE
MODEL #	NHHSS-65B-R2B
WIDTH	11.9"
DEPTH	7.1"
HEIGHT	72"
WEIGHT	65.5 LBS

1 ANTENNA SPECS
SCALE: NOT TO SCALE



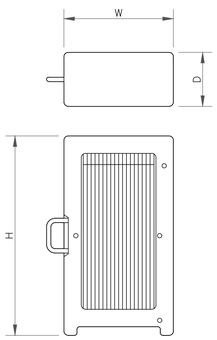
ANTENNA SPECS	
MANUFACTURER	COMMSCOPE
MODEL #	NHH-65B-R2B
WIDTH	11.9"
DEPTH	7.1"
HEIGHT	72"
WEIGHT	43.7 LBS

2 ANTENNA SPECS
SCALE: NOT TO SCALE



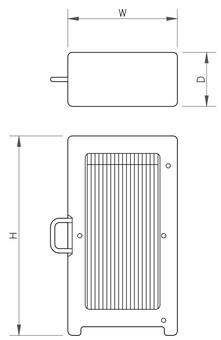
ANTENNA SPECS	
MANUFACTURER	SAMSUNG
MODEL #	MT6407-77A
WIDTH	16.06"
DEPTH	5.51"
HEIGHT	35.06"
WEIGHT	81.57 LBS

3 ANTENNA SPECS
SCALE: NOT TO SCALE



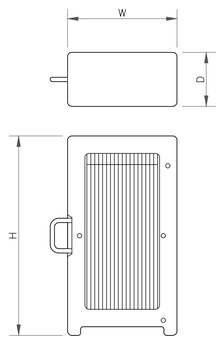
RRU SPECIFICATIONS	
MANUFACTURER	SAMSUNG
MODEL #	RF4440D-13A
WIDTH	14.96"
DEPTH	9.06"
HEIGHT	14.96"
WEIGHT	72.5 LBS

4 RRU SPECS
SCALE: NOT TO SCALE



RRU SPECIFICATIONS	
MANUFACTURER	SAMSUNG
MODEL #	RF4439D-25A
WIDTH	14.96"
DEPTH	10.04"
HEIGHT	14.96"
WEIGHT	74.7 LBS

5 RRU SPECS
SCALE: NOT TO SCALE



RRU SPECIFICATIONS	
MANUFACTURER	SAMSUNG
MODEL #	CBRS RRH -RT4401-48A
WIDTH	8.55"
DEPTH	4.15"
HEIGHT	13.91"
WEIGHT	18.64 LBS

6 RRU SPECS
SCALE: NOT TO SCALE

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SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

VERIZON SITE NUMBER:
469115

BU #: **806369**
HRT 094 943225

439-455 HOMESTEAD AVE
HARTFORD, CT 06105

EXISTING 140'-0" MONOPOLE

ISSUED FOR:

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

SHEET NUMBER: C-5

REVISION: 0

JUNCTION BOX SPECIFICATIONS	
MANUFACTURER	RAYCAP
MODEL #	RRFDC-3315-PF-48
WIDTH	15.73"
DEPTH	10.25"
HEIGHT	25.66"
WEIGHT	32.0 LBS

1 JUNCTION BOX SPECS
SCALE: NOT TO SCALE

2 NOT USED
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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439-455 HOMESTEAD AVE
HARTFORD, CT 06105

EXISTING 140'-0" MONOPOLE

ISSUED FOR:

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A	9/13/21	JJR	PRELIMINARY REVIEW	JJR
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STATE OF CONNECTICUT
CHAD TUTTLE
No. 23924
LICENSED
PROFESSIONAL ENGINEER
9/27/21

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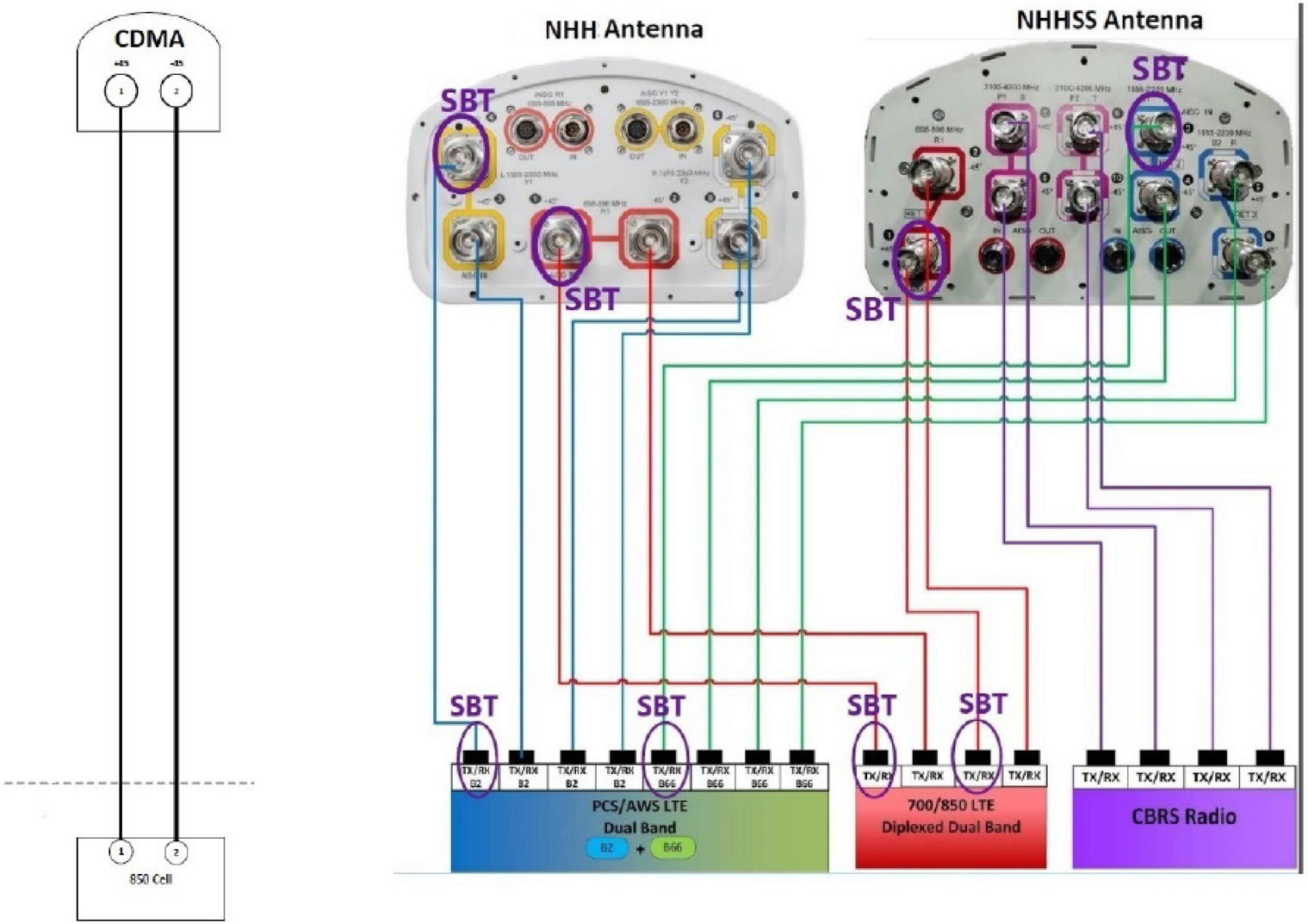
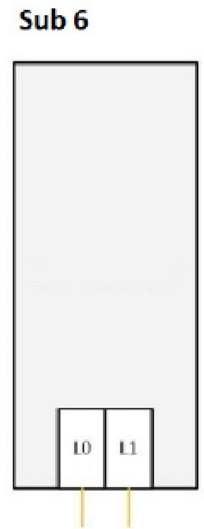
SHEET NUMBER: C-5.1

REVISION: 0





1 PLUMBING DIAGRAM
SCALE: NOT TO SCALE

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HARTFORD, CT 06105

EXISTING 140'-0" MONOPOLE

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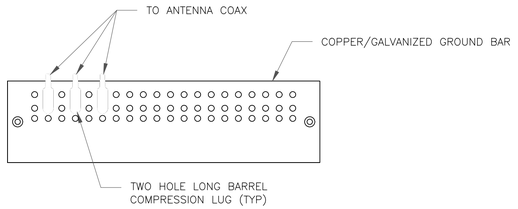
SHEET NUMBER: C-6

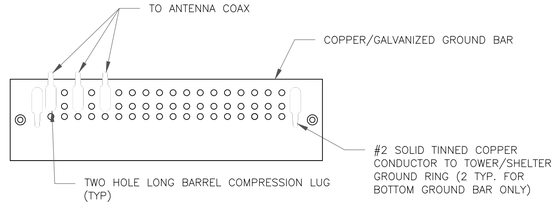
REVISION: 0



NOTES:

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

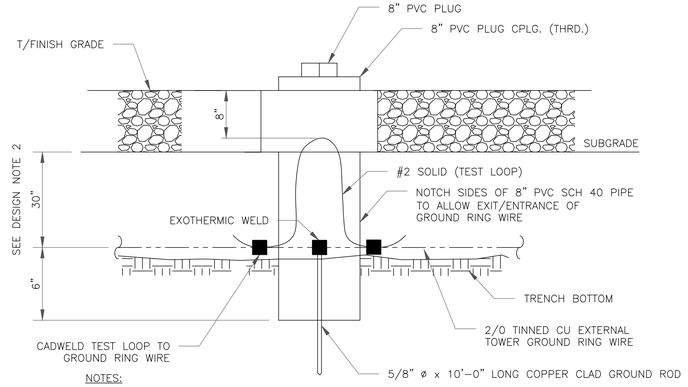
1 ANTENNA SECTOR GROUND BAR DETAIL
SCALE: NOT TO SCALE



NOTES:

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

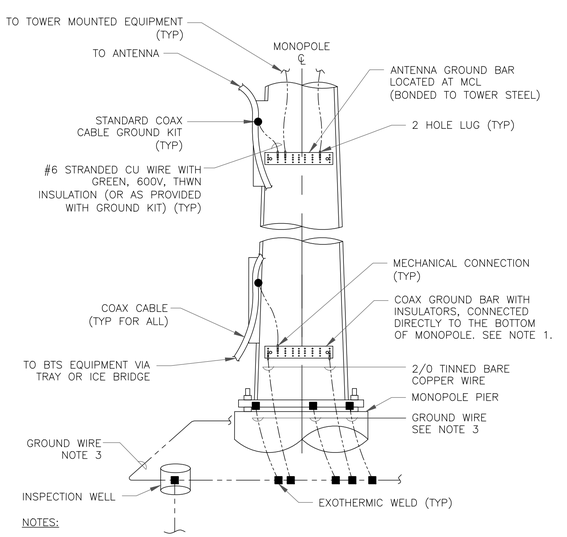
2 TOWER/SHELTER GROUND BAR DETAIL
SCALE: NOT TO SCALE



NOTES:

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

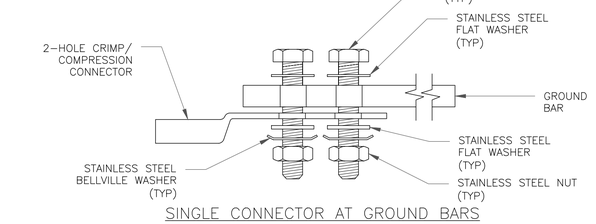
3 INSPECTION WELL DETAIL
SCALE: NOT TO SCALE



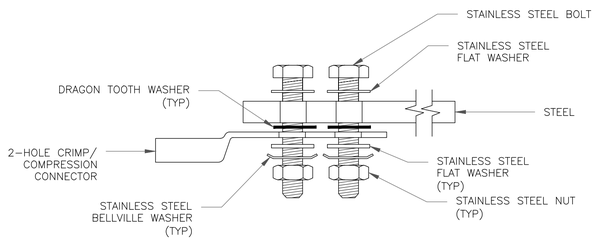
NOTES:

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

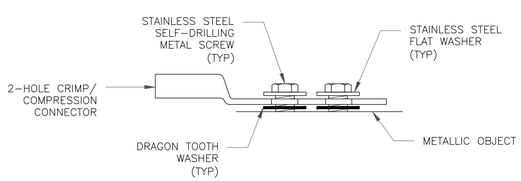
4 TYPICAL ANTENNA CABLE GROUNDING
SCALE: NOT TO SCALE



SINGLE CONNECTOR AT GROUND BARS

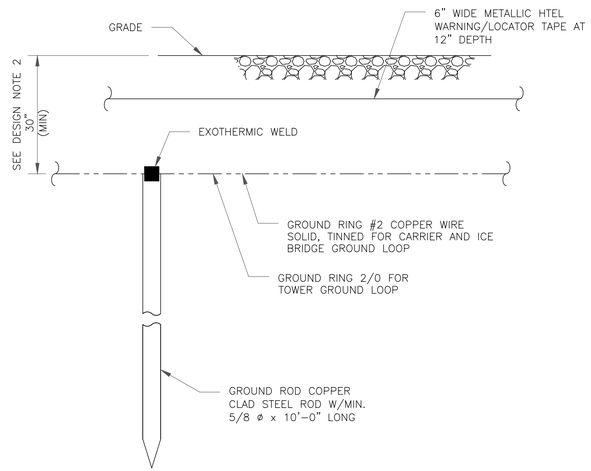


SINGLE CONNECTOR AT STEEL OBJECTS



SINGLE CONNECTOR AT METALLIC/STEEL OBJECTS

5 HARDWARE DETAIL FOR EXTERIOR CONNECTIONS
SCALE: NOT TO SCALE



NOTES:

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

6 GROUND ROD DETAIL
SCALE: NOT TO SCALE

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VERIZON SITE NUMBER:
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BU #: **806369**
HRT 094 943225

439-455 HOMESTEAD AVE
HARTFORD, CT 06105

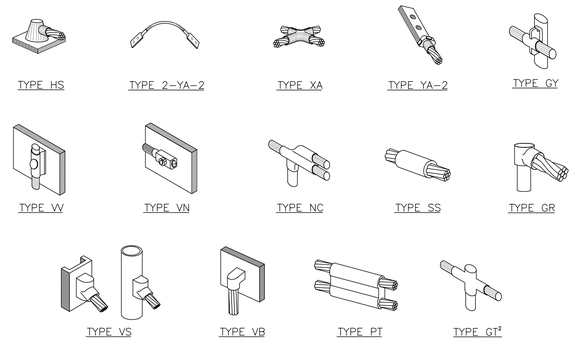
EXISTING 140'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	9/13/21	JJR	PRELIMINARY REVIEW	JJR
0	9/27/21	JJR	CONSTRUCTION	JJR

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

SHEET NUMBER: G-1
REVISION: 0

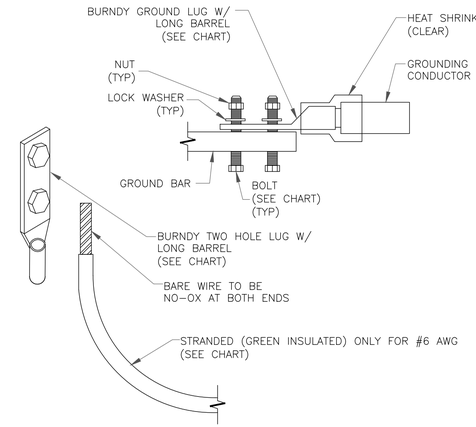


NOTE:

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

1 CADWELD GROUNDING CONNECTIONS
SCALE: NOT TO SCALE

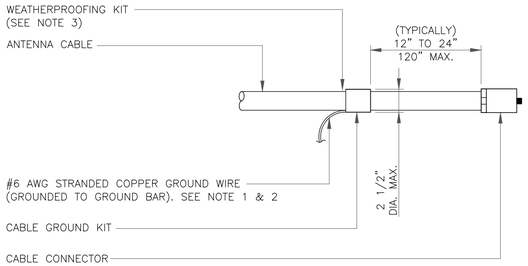
WIRE SIZE	BURNDY LUG	BOLT SIZE
#6 AWG GREEN INSULATED	YA6C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG SOLID TINNED	YA3C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG STRANDED	YA2C-2TC38	3/8" - 16 NC S 2 BOLT
#2/0 AWG STRANDED	YA26-2TC38	3/8" - 16 NC S 2 BOLT
#4/0 AWG STRANDED	YA28-2N	1/2" - 16 NC S 2 BOLT



NOTES:

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

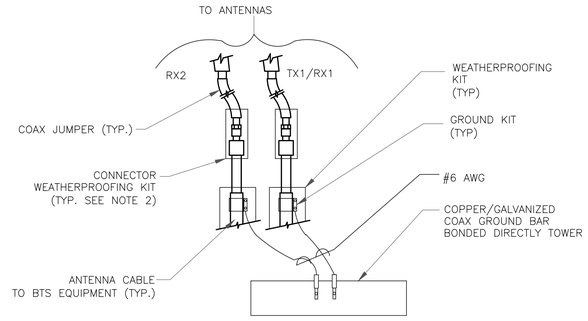
2 MECHANICAL LUG CONNECTION
SCALE: NOT TO SCALE



NOTES:

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

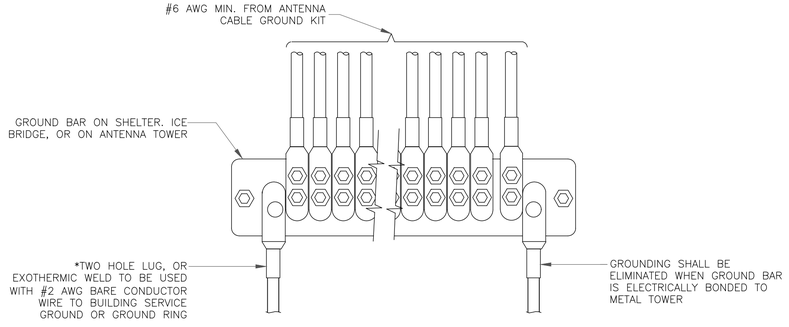
3 CABLE GROUND KIT CONNECTION
SCALE: NOT TO SCALE



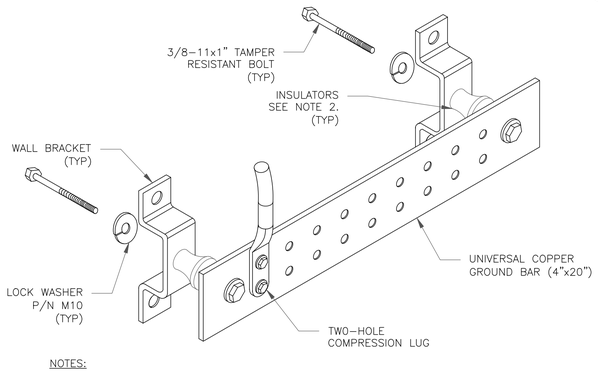
NOTES:

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

4 GROUND CABLE CONNECTION
SCALE: NOT TO SCALE



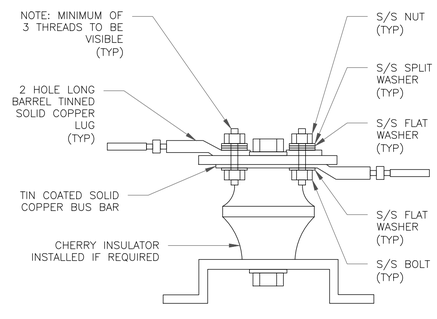
5 GROUNDWIRE INSTALLATION
SCALE: NOT TO SCALE



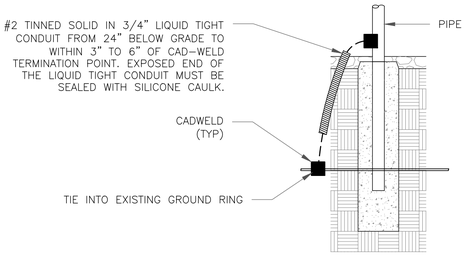
NOTES:

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

6 GROUND BAR DETAIL
SCALE: NOT TO SCALE



7 LUG DETAIL
SCALE: NOT TO SCALE



8 TRANSITIONING GROUND DETAIL
SCALE: NOT TO SCALE

verizon
180 WASHINGTON VALLEY ROAD
BEDMINSTER, NJ 07921

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

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

VERIZON SITE NUMBER:
469115

BU #: **806369**
HRT 094 943225

439-455 HOMESTEAD AVE
HARTFORD, CT 06105

EXISTING 140'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	9/13/21	JJR	PRELIMINARY REVIEW	JJR
0	9/27/21	JJR	CONSTRUCTION	JJR

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

SHEET NUMBER: G-2
REVISION: 0

Exhibit D

Structural Analysis Report

Date: **August 19, 2021**

MORRISON HERSHFIELD

Morrison Hershfield
1455 Lincoln Parkway, Suite 500
Atlanta, GA 30346
(770) 379-8500

Subject:	**Structural Analysis Report**	
Carrier Designation:	***Verizon Wireless* Co-Locate**	
	Site Number:	469115
	Site Name:	Hartford NW CT
Crown Castle Designation:	**BU Number:**	806369
	Site Name:	HRT 094 943225
	JDE Job Number:	683753
	Work Order Number:	2009977
	Order Number:	583426 Rev. 0
Engineering Firm Designation:	**Morrison Hershfield Project Number:** CN9-394 / 2101398	
Site Data:	**439-455 Homestead Ave, Hartford, Hartford County, CT 06105** **Latitude *41° 47' 1.61"*, Longitude *-72° 42' 13.66"*** **140 Foot – Valmont Monopole Tower**	

Morrison Hershfield 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 – 56.4%**

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.

Respectfully submitted by:

G. Lance Cooke, P.E. (CT License No. PEN.0028133)
Senior Engineer

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 140 ft Monopole tower designed by Valmont Microflect and mapped by Tower Engineering Professionals, Inc., in July of 2008.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	125 mph
Exposure Category:	B
Topographic Factor:	1
Ice Thickness:	2 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
140.0	142.0	2	raycap	RRFDC-3315-PF-48	8	1-5/8
	140.0	3	samsung telecommunications	MT6407-77A w/ Mount Pipe		
		3	amphenol	BXA-80063-4BF-EDIN-X w/ Mount Pipe		
		3	commscope	NHH-65B-R2B		
		3	commscope	NHHSS-65B-R2B		
		3	samsung telecommunications	CBRS RT4401-48A		
		3	samsung telecommunications	RF4439D-25A		
		6	samsung telecommunications	RF4440D-13A		
		3	Commscope	Side-By-Side Mounting Kit [#BSAMNT-SBS-1-2]		
		1	-	Platform Mount [LP 713-1]		

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)
126.0	128.0	3	ericsson	AIR -32 B2A/B66AA w/ Mount Pipe	9 3	1-5/8 1-3/8
		3	ericsson	AIR6449 B41 w/ Mount Pipe		
		3	rfs celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe		
		3	ericsson	ERICSSON AIR 21 B2A B4P_T-MOBILE w/ Mount Pipe		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
126.0	128.0	3	ericsson	RADIO 4449 B71 B85A_T-MOBILE	-	-
		3	ericsson	RRUS 4415 B25_CCIV2		
	126.0	3	rfs celwave	ATMAA1412D-1A20		
		1	Site Pro 1	Platform Reinforcement Kit [#PRK-1245]		
		1	-	Platform Mount [LP 713-1]		
117.0	120.0	2	cci antennas	DMP65R-BU6D w/ Mount Pipe	12 4 2 2 3	1-5/8 3/4 3/8 7/8 2C
		1	cci antennas	DMP65R-BU8D w/ Mount Pipe		
		1	cci antennas	TPA-65R-LCUUUU-H8 w/ Mount Pipe		
		3	powerwave technologies	7770.00 w/ Mount Pipe		
		2	quintel technology	QS66512-3 w/ Mount Pipe		
		3	ericsson	RRUS 8843 B2/B66A_CCIV2		
		3	ericsson	RRUS 32 B30		
		6	powerwave technologies	LGP21401		
		3	ericsson	RRUS 4449 B5/B12		
		1	raycap	DC6-48-60-0-8C-EV		
		2	raycap	DC6-48-60-18-8F		
	117.0	1	-	Platform Mount [LP 713-1]		
104.0	104.0	3	alcatel lucent	800MHz 2X50W RRH W/FILTER	-	-
		3	alcatel lucent	PCS 1900MHz 4x45W-65MHz		
		1	-	Pipe Mount [PM 601-3]		
103.0	105.0	3	nokia	AAHC w/ Mount Pipe	3 1	1-1/4 1-1/2
		3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe		
	104.0	3	rfs celwave	IBC1900BB-1		
		3	rfs celwave	IBC1900HG-2A		
	103.0	1	-	Platform Mount [LP 713-1]		
93.0	93.0	3	jma wireless	MX08FRO665-21 w/ Mount Pipe	6 1	1-5/8 1-1/2
		3	fujitsu	TA08025-B605		
		3	fujitsu	TA08025-B604		
		1	raycap	RDIDC-9181-PF-48		
		1	tower mounts	Commscope MC-PK8-DSH		
74.0	80.0	1	antel	BCD-87010	1	7/8
	74.0	1	-	Side Arm Mount [SO 701-1]		
50.0	52.0	1	lucent	KS24019-L112A	1	7/8
	50.0	1	-	Side Arm Mount [SO 701-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
4-GEOTECHNICAL REPORTS	2294838	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	2294380	CCISITES
4-TOWER MANUFACTURER DRAWINGS	2294379	CCISITES

3.1) Analysis Method

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

3.2) Assumptions

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

This analysis may be affected if any assumptions are not valid or have been made in error. Morrison Hershfield 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	140 - 86.83	Pole	TP39.223x26.216x0.3125	1	-27.48	2319.28	40.5	Pass
L2	86.83 - 38	Pole	TP50.56x37.2109x0.4063	2	-43.22	3892.16	54.2	Pass
L3	38 - 0	Pole	TP59.05x48.0329x0.5	3	-64.78	5790.26	52.5	Pass
							Summary	
						Pole (L2)	54.2	Pass
						Rating =	54.2	Pass

Table 5 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	56.4	Pass
1	Base Plate		18.3	Pass
1	Base Foundation (Structure)	0	39.3	Pass
1	Base Foundation (Soil Interaction)		42.7	Pass

Structure Rating (max from all components) =	56.4%*

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

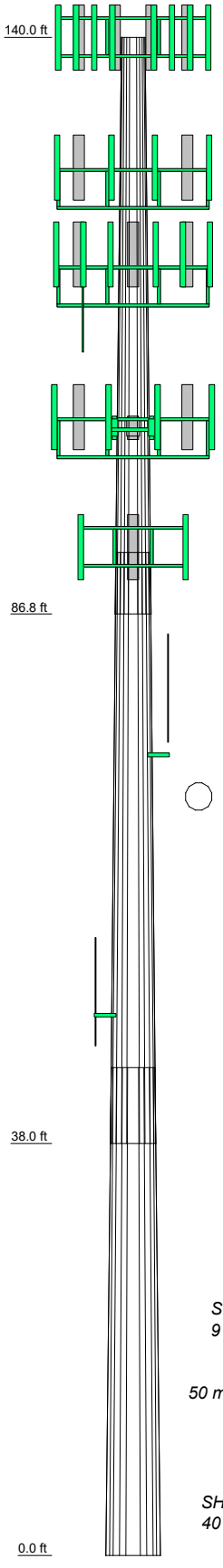
4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT

Section	1	2	3
Length (ft)	53.17	54.50	45.00
Number of Sides	12	12	12
Thickness (in)	0.3125	0.4063	0.5000
Socket Length (ft)	5.67	7.00	
Top Dia (in)	26.2160	37.2109	48.0329
Bot Dia (in)	39.2230	50.5600	59.0500
Grade	A572-65		
Weight (K)	5.9	10.5	13.1



ALL REACTIONS ARE FACTORED

AXIAL 128 K

SHEAR 9 K

MOMENT 1010 kip-ft

TORQUE 0 kip-ft
50 mph WIND - 2.0000 in ICE

AXIAL 65 K

SHEAR 40 K

MOMENT 3906 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 Hartford County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 125 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 2.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 54.2%

Morrison Hershfield
Consulting Engineers
1455 Lincoln Parkway, Suite 500
Atlanta, GA 30346
Phone: (770) 379-8500
FAX: (770) 379-8501

Job: CN9-394 / 2101398			
Project: 806369 / HRT 094 943225			
Client: Crown Castle USA	Drawn by: ANS	App'd:	
Code: TIA-222-H	Date: 08/19/21	Scale: NTS	
Path: C:\Users\ASabbavarapu\Desktop\To Be Corrected\CN9-394 SA\Analysis\CN9-394 BU_806369 WO_2009977.eri		Dwg No. E-1	

APPENDIX A

TNXTOWER OUTPUT

Tower Input Data

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

Tower is located in Hartford County, Connecticut.
Tower base elevation above sea level: 60.00 ft.
Basic wind speed of 125 mph.
Risk Category II.
Exposure Category B.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0.00 ft.
Nominal ice thickness of 2.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Tower analysis based on target reliabilities in accordance with Annex S.
Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
Maximum demand-capacity ratio is: 1.05.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	140.00-86.83	53.17	5.67	12	26.2160	39.2230	0.3125	1.2500	A572-65 (65 ksi)
L2	86.83-38.00	54.50	7.00	12	37.2109	50.5600	0.4063	1.6250	A572-65 (65 ksi)
L3	38.00-0.00	45.00		12	48.0329	59.0500	0.5000	2.0000	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	27.0306	26.0654	2232.3752	9.2735	13.5799	164.3883	4523.3974	12.8286	6.1884	19.803
	40.4964	39.1537	7566.4519	13.9300	20.3175	372.4103	15331.6830	19.2703	9.6743	30.958
L2	39.8181	48.1451	8324.2452	13.1761	19.2753	431.8614	16867.1776	23.6956	8.8838	21.868
	52.2003	65.6074	21064.2222	17.9550	26.1901	804.2825	42681.8251	32.2900	12.4613	30.674
L3	51.3252	76.5280	22069.6751	17.0168	24.8811	887.0069	44719.1451	37.6648	11.5328	23.066
	60.9567	94.2655	41247.0150	20.9609	30.5879	1348.4749	83577.6350	46.3946	14.4854	28.971

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 140.00-86.83				1	1	1			
L2 86.83-38.00				1	1	1			
L3 38.00-0.00				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
******										
Climbing Pegs	A	No	Surface Ar (CaAa)	140.00 - 0.00	1	1	-0.050 0.050	0.7050		1.80
Safety Line 3/8"	A	No	Surface Ar (CaAa)	140.00 - 0.00	1	1	0.000 0.000	0.3750		0.22
LCF158-50JA(1-5/8)	A	No	Surface Ar (CaAa)	126.00 - 0.00	1	1	0.470 0.470	1.9800		0.80
LCF158-50JA(1-5/8)	B	No	Surface Ar (CaAa)	126.00 - 0.00	2	2	0.270 0.370	1.9800		0.80
HCS 6X12 6AWG(1-3/8)	B	No	Surface Ar (CaAa)	126.00 - 0.00	1	1	0.250 0.250	1.3800		1.70
***										
HCS 6X12 4AWG(1-5/8)	B	No	Surface Ar (CaAa)	126.00 - 0.00	3	3	0.370 0.500	1.6600		2.40
******										
MLC6C-06C-008R-008R(1-1/2)	A	No	Surface Ar (CaAa)	103.00 - 0.00	1	1	-0.200 -0.200	1.4800		1.52

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
HB114-1-08U4-M5J(1-1/4)	A	No	Surface Ar (CaAa)	103.00 - 0.00	3	2	-0.400 -0.300	1.5400		1.08
******										
AVA7-50(1-5/8)	B	No	Surface Ar (CaAa)	93.00 - 0.00	6	6	-0.500 -0.200	2.0100		0.70
***										
CU12PSM9P6XXX(1-1/2)	B	No	Surface Ar (CaAa)	93.00 - 0.00	1	1	0.000 0.000	1.6000		2.35
******										
LDF5-50A(7/8)	B	No	Surface Ar (CaAa)	74.00 - 50.00	1	1	-0.100 -0.100	1.0900		0.33
LDF5-50A(7/8)	B	No	Surface Ar (CaAa)	50.00 - 0.00	2	2	-0.150 -0.100	1.0900		0.33
******										

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
******									
LDF7-50A(1-5/8)	B	No	No	Inside Pole	140.00 - 0.00	6	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.82 0.82 0.82 0.82
HB158-1-08U8-S8J18(1-5/8)	B	No	No	Inside Pole	140.00 - 0.00	1	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	1.30 1.30 1.30 1.30
***									
HB158-21U6S12-XXXM-01(1-5/8)	B	No	No	Inside Pole	140.00 - 0.00	1	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	1.90 1.90 1.90 1.90
******									
HCS 6X12 6AWG(1-3/8)	A	No	No	Inside Pole	126.00 - 0.00	2	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	1.70 1.70 1.70 1.70
LCF158-50JA(1-5/8)	A	No	No	Inside Pole	126.00 - 0.00	3	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.80 0.80 0.80 0.80
******									
LDF7-50A(1-5/8)	C	No	No	Inside Pole	117.00 - 0.00	12	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.82 0.82 0.82 0.82
FB-L98B-034-XXX(3/8)	C	No	No	Inside Pole	117.00 - 0.00	1	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.06 0.06 0.06 0.06
FB-L98B-034-XXXXXX(3/8)	C	No	No	Inside Pole	117.00 - 0.00	1	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.05 0.05 0.05 0.05
WR-VG66ST-BRD_CCIV2(7/8)	C	No	No	Inside Pole	117.00 - 0.00	2	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.88 0.88 0.88 0.88
WR-VG86ST-BRD(3/4)	C	No	No	Inside Pole	117.00 - 0.00	4	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.58 0.58 0.58 0.58

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
CONDUIT(2)	C	No	No	Inside Pole	117.00 - 0.00	3	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
******									

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	140.00-86.83	A	0.000	0.000	20.872	0.000	0.44
		B	0.000	0.000	48.852	0.000	0.88
		C	0.000	0.000	0.000	0.000	0.68
L2	86.83-38.00	A	0.000	0.000	37.208	0.000	0.65
		B	0.000	0.000	122.326	0.000	1.24
		C	0.000	0.000	0.000	0.000	1.10
L3	38.00-0.00	A	0.000	0.000	28.956	0.000	0.51
		B	0.000	0.000	99.408	0.000	0.98
		C	0.000	0.000	0.000	0.000	0.85

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	140.00-86.83	A	1.921	0.000	0.000	92.004	0.000	1.75
		B		0.000	0.000	117.476	0.000	2.43
		C		0.000	0.000	0.000	0.000	0.68
L2	86.83-38.00	A	1.811	0.000	0.000	139.467	0.000	2.67
		B		0.000	0.000	271.480	0.000	4.85
		C		0.000	0.000	0.000	0.000	1.10
L3	38.00-0.00	A	1.604	0.000	0.000	104.129	0.000	1.94
		B		0.000	0.000	217.758	0.000	3.69
		C		0.000	0.000	0.000	0.000	0.85

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	140.00-86.83	2.3528	-0.6732	1.6075	-1.3207
L2	86.83-38.00	3.0253	-3.7353	2.4665	-3.9617
L3	38.00-0.00	3.6165	-4.4174	3.0351	-4.6601

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

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	2	Climbing Pegs	86.83 - 140.00	1.0000	1.0000
L1	3	Safety Line 3/8"	86.83 - 140.00	1.0000	1.0000
L1	13	LCF158-50JA(1-5/8)	86.83 - 126.00	1.0000	1.0000
L1	14	LCF158-50JA(1-5/8)	86.83 - 126.00	1.0000	1.0000
L1	15	HCS 6X12 6AWG(1-3/8)	86.83 - 126.00	1.0000	1.0000
L1	19	HCS 6X12 4AWG(1-5/8)	86.83 - 126.00	1.0000	1.0000
L1	28	MLC6C-06C-008R-008R(1-1/2)	86.83 - 103.00	1.0000	1.0000
L1	29	HB114-1-08U4-M5J(1-1/4)	86.83 - 103.00	1.0000	1.0000
L1	31	AVA7-50(1-5/8)	86.83 - 93.00	1.0000	1.0000
L1	33	CU12PSM9P6XXX(1-1/2)	86.83 - 93.00	1.0000	1.0000
L2	2	Climbing Pegs	38.00 - 86.83	1.0000	1.0000
L2	3	Safety Line 3/8"	38.00 - 86.83	1.0000	1.0000
L2	13	LCF158-50JA(1-5/8)	38.00 - 86.83	1.0000	1.0000
L2	14	LCF158-50JA(1-5/8)	38.00 - 86.83	1.0000	1.0000
L2	15	HCS 6X12 6AWG(1-3/8)	38.00 - 86.83	1.0000	1.0000
L2	19	HCS 6X12 4AWG(1-5/8)	38.00 - 86.83	1.0000	1.0000
L2	28	MLC6C-06C-008R-008R(1-1/2)	38.00 - 86.83	1.0000	1.0000
L2	29	HB114-1-08U4-M5J(1-1/4)	38.00 - 86.83	1.0000	1.0000
L2	31	AVA7-50(1-5/8)	38.00 - 86.83	1.0000	1.0000
L2	33	CU12PSM9P6XXX(1-1/2)	38.00 - 86.83	1.0000	1.0000
L2	35	LDF5-50A(7/8)	50.00 - 74.00	1.0000	1.0000
L2	36	LDF5-50A(7/8)	38.00 - 50.00	1.0000	1.0000
L3	2	Climbing Pegs	0.00 - 38.00	1.0000	1.0000
L3	3	Safety Line 3/8"	0.00 - 38.00	1.0000	1.0000
L3	13	LCF158-50JA(1-5/8)	0.00 - 38.00	1.0000	1.0000
L3	14	LCF158-50JA(1-5/8)	0.00 - 38.00	1.0000	1.0000
L3	15	HCS 6X12 6AWG(1-3/8)	0.00 - 38.00	1.0000	1.0000
L3	19	HCS 6X12 4AWG(1-5/8)	0.00 - 38.00	1.0000	1.0000
L3	28	MLC6C-06C-008R-008R(1-1/2)	0.00 - 38.00	1.0000	1.0000
L3	29	HB114-1-08U4-M5J(1-1/4)	0.00 - 38.00	1.0000	1.0000
L3	31	AVA7-50(1-5/8)	0.00 - 38.00	1.0000	1.0000
L3	33	CU12PSM9P6XXX(1-1/2)	0.00 - 38.00	1.0000	1.0000
L3	36	LDF5-50A(7/8)	0.00 - 38.00	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
******									
BXA-80063-4BF-EDIN-X w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.62 4.99 5.36 6.13	3.47 4.04 4.63 5.83	0.03 0.07 0.12 0.23
BXA-80063-4BF-EDIN-X w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.62 4.99 5.36 6.13	3.47 4.04 4.63 5.83	0.03 0.07 0.12 0.23
BXA-80063-4BF-EDIN-X w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.62 4.99 5.36 6.13	3.47 4.04 4.63 5.83	0.03 0.07 0.12 0.23
RRFDC-3315-PF-48	A	From Leg	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.79 4.04 4.30 4.84	2.51 2.73 2.95 3.42	0.03 0.06 0.10 0.18
Side Arm Mount [SO 203-3]	A	None		0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.68 8.05 9.55 12.80	6.68 8.05 9.55 12.80	0.38 0.46 0.57 0.87
Platform Mount [LP 713-1]	C	None		0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice	32.89 35.76 38.76 45.26	32.89 35.76 38.76 45.26	1.51 2.23 3.03 4.86
***									
NHH-65B-R2B	A	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.16 4.56 4.98 5.84	2.49 2.88 3.27 4.08	0.04 0.09 0.15 0.28
NHH-65B-R2B	B	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.16 4.56 4.98 5.84	2.49 2.88 3.27 4.08	0.04 0.09 0.15 0.28
NHH-65B-R2B	C	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.16 4.56 4.98 5.84	2.49 2.88 3.27 4.08	0.04 0.09 0.15 0.28
NHHSS-65B-R2B	A	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.97 4.36 4.76 5.58	2.38 2.75 3.12 3.90	0.07 0.12 0.17 0.30
NHHSS-65B-R2B	B	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.97 4.36 4.76 5.58	2.38 2.75 3.12 3.90	0.07 0.12 0.17 0.30
NHHSS-65B-R2B	C	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.97 4.36 4.76 5.58	2.38 2.75 3.12 3.90	0.07 0.12 0.17 0.30

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
MT6407-77A w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.91 5.26 5.61 6.36	2.68 3.14 3.62 4.63	0.10 0.14 0.18 0.29
MT6407-77A w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.91 5.26 5.61 6.36	2.68 3.14 3.62 4.63	0.10 0.14 0.18 0.29
MT6407-77A w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.91 5.26 5.61 6.36	2.68 3.14 3.62 4.63	0.10 0.14 0.18 0.29
CBRS RT4401-48A	A	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.99 1.12 1.26 1.55	0.50 0.60 0.70 0.94	0.02 0.03 0.04 0.06
CBRS RT4401-48A	B	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.99 1.12 1.26 1.55	0.50 0.60 0.70 0.94	0.02 0.03 0.04 0.06
CBRS RT4401-48A	C	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.99 1.12 1.26 1.55	0.50 0.60 0.70 0.94	0.02 0.03 0.04 0.06
RF4439D-25A	A	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.87 2.03 2.21 2.59	1.25 1.39 1.54 1.87	0.07 0.09 0.11 0.17
RF4439D-25A	B	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.87 2.03 2.21 2.59	1.25 1.39 1.54 1.87	0.07 0.09 0.11 0.17
RF4439D-25A	C	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.87 2.03 2.21 2.59	1.25 1.39 1.54 1.87	0.07 0.09 0.11 0.17
(2) RF4440D-13A	A	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.87 2.03 2.21 2.59	1.13 1.27 1.41 1.72	0.07 0.09 0.11 0.16
(2) RF4440D-13A	B	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.87 2.03 2.21 2.59	1.13 1.27 1.41 1.72	0.07 0.09 0.11 0.16
(2) RF4440D-13A	C	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.87 2.03 2.21 2.59	1.13 1.27 1.41 1.72	0.07 0.09 0.11 0.16
RRFDC-3315-PF-48	B	From Leg	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.79 4.04 4.30 4.84	2.51 2.73 2.95 3.42	0.03 0.06 0.10 0.18

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
Side-By-Side Mounting Kit [#BSAMNT-SBS-1-2]	A	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.38 3.40 4.45 5.91	2.38 3.40 4.45 5.91	0.04 0.05 0.08 0.15
Side-By-Side Mounting Kit [#BSAMNT-SBS-1-2]	B	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.38 3.40 4.45 5.91	2.38 3.40 4.45 5.91	0.04 0.05 0.08 0.15
Side-By-Side Mounting Kit [#BSAMNT-SBS-1-2]	C	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.38 3.40 4.45 5.91	2.38 3.40 4.45 5.91	0.04 0.05 0.08 0.15
Mount Reinforcement Specifications	A	None		0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice	28.63 37.31 45.80 62.38	28.63 37.31 45.80 62.38	0.28 0.67 0.94 1.63
******									
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice	14.69 15.46 16.23 17.82	6.87 7.55 8.25 9.67	0.19 0.31 0.46 0.79
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice	14.69 15.46 16.23 17.82	6.87 7.55 8.25 9.67	0.19 0.31 0.46 0.79
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice	14.69 15.46 16.23 17.82	6.87 7.55 8.25 9.67	0.19 0.31 0.46 0.79
AIR -32 B2A/B66AA w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.76 4.12 4.48 5.24	3.15 3.49 3.84 4.58	0.19 0.25 0.32 0.48
AIR -32 B2A/B66AA w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.76 4.12 4.48 5.24	3.15 3.49 3.84 4.58	0.19 0.25 0.32 0.48
AIR -32 B2A/B66AA w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.76 4.12 4.48 5.24	3.15 3.49 3.84 4.58	0.19 0.25 0.32 0.48
RADIO 4449 B71 B85A_T-MOBILE	A	From Leg	4.00 0.00 2.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.97 2.15 2.33 2.72	1.59 1.75 1.92 2.28	0.07 0.09 0.12 0.17
RADIO 4449 B71 B85A_T-MOBILE	B	From Leg	4.00 0.00 2.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.97 2.15 2.33 2.72	1.59 1.75 1.92 2.28	0.07 0.09 0.12 0.17
RADIO 4449 B71 B85A_T-MOBILE	C	From Leg	4.00 0.00 2.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice	1.97 2.15 2.33 2.72	1.59 1.75 1.92 2.28	0.07 0.09 0.12 0.17

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice			
ATMAA1412D-1A20	A	From Leg	4.00 0.00 0.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.41 0.50 0.59 0.81	1.00 1.13 1.26 1.55	0.01 0.02 0.03 0.06
ATMAA1412D-1A20	B	From Leg	4.00 0.00 0.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.41 0.50 0.59 0.81	1.00 1.13 1.26 1.55	0.01 0.02 0.03 0.06
ATMAA1412D-1A20	C	From Leg	4.00 0.00 0.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.41 0.50 0.59 0.81	1.00 1.13 1.26 1.55	0.01 0.02 0.03 0.06
12' Hor x 2.5" x 2.5" Angle Mount	A	From Leg	4.00 0.00 2.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.00 6.23 7.48 9.62	0.02 0.07 0.14 0.32	0.07 0.10 0.14 0.24
12' Hor x 2.5" x 2.5" Angle Mount	B	From Leg	4.00 0.00 2.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.00 6.23 7.48 9.62	0.02 0.07 0.14 0.32	0.07 0.10 0.14 0.24
12' Hor x 2.5" x 2.5" Angle Mount	C	From Leg	4.00 0.00 2.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.00 6.23 7.48 9.62	0.02 0.07 0.14 0.32	0.07 0.10 0.14 0.24
Platform Mount [LP 713-1]	C	None		0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice	32.89 35.76 38.76 45.26	32.89 35.76 38.76 45.26	1.51 2.23 3.03 4.86
***									
ERICSSON AIR 21 B2A B4P_T-MOBILE w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.14 3.45 3.77 4.43	2.59 2.88 3.19 3.84	0.11 0.16 0.23 0.38
ERICSSON AIR 21 B2A B4P_T-MOBILE w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.14 3.45 3.77 4.43	2.59 2.88 3.19 3.84	0.11 0.16 0.23 0.38
ERICSSON AIR 21 B2A B4P_T-MOBILE w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.14 3.45 3.77 4.43	2.59 2.88 3.19 3.84	0.11 0.16 0.23 0.38
AIR6449 B41 w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.18 5.59 6.01 6.90	2.72 3.05 3.39 4.13	0.12 0.16 0.22 0.34
AIR6449 B41 w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.18 5.59 6.01 6.90	2.72 3.05 3.39 4.13	0.12 0.16 0.22 0.34
AIR6449 B41 w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	126.00	No Ice 1/2" Ice	5.18 5.59 6.01	2.72 3.05 3.39	0.12 0.16 0.22

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Offsets: ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
								1" Ice	6.90	4.13	0.34
								2" Ice			
RRUS 4415 B25_CCIV2	A	From Leg	4.00	0.00	2.00	0.0000	126.00	No Ice	1.84	0.82	0.05
								1/2" Ice	2.01	0.94	0.06
								1" Ice	2.19	1.07	0.08
								2" Ice	2.57	1.37	0.12
RRUS 4415 B25_CCIV2	B	From Leg	4.00	0.00	2.00	0.0000	126.00	No Ice	1.84	0.82	0.05
								1/2" Ice	2.01	0.94	0.06
								1" Ice	2.19	1.07	0.08
								2" Ice	2.57	1.37	0.12
RRUS 4415 B25_CCIV2	C	From Leg	4.00	0.00	2.00	0.0000	126.00	No Ice	1.84	0.82	0.05
								1/2" Ice	2.01	0.94	0.06
								1" Ice	2.19	1.07	0.08
								2" Ice	2.57	1.37	0.12
Platform Reinforcement Kit [#PRK-1245]	C	None				0.0000	126.00	No Ice	11.84	11.84	0.28
								1/2" Ice	16.96	16.96	0.30
								1" Ice	22.08	22.08	0.32
								2" Ice	32.32	32.32	0.36
******											
7770.00 w/ Mount Pipe	A	From Leg	4.00	0.00	3.00	0.0000	117.00	No Ice	5.75	4.25	0.06
								1/2" Ice	6.18	5.01	0.10
								1" Ice	6.61	5.71	0.16
								2" Ice	7.49	7.16	0.29
7770.00 w/ Mount Pipe	B	From Leg	4.00	0.00	3.00	0.0000	117.00	No Ice	5.75	4.25	0.06
								1/2" Ice	6.18	5.01	0.10
								1" Ice	6.61	5.71	0.16
								2" Ice	7.49	7.16	0.29
7770.00 w/ Mount Pipe	C	From Leg	4.00	0.00	3.00	0.0000	117.00	No Ice	5.75	4.25	0.06
								1/2" Ice	6.18	5.01	0.10
								1" Ice	6.61	5.71	0.16
								2" Ice	7.49	7.16	0.29
TPA-65R-LCUUUU-H8 w/ Mount Pipe	A	From Leg	4.00	0.00	3.00	0.0000	117.00	No Ice	11.85	8.99	0.11
								1/2" Ice	12.77	9.88	0.21
								1" Ice	13.71	10.79	0.32
								2" Ice	15.64	12.66	0.58
QS66512-3 w/ Mount Pipe	B	From Leg	4.00	0.00	3.00	0.0000	117.00	No Ice	4.04	4.18	0.13
								1/2" Ice	4.42	4.57	0.20
								1" Ice	4.82	4.97	0.28
								2" Ice	5.63	5.79	0.48
QS66512-3 w/ Mount Pipe	C	From Leg	4.00	0.00	3.00	0.0000	117.00	No Ice	4.04	4.18	0.13
								1/2" Ice	4.42	4.57	0.20
								1" Ice	4.82	4.97	0.28
								2" Ice	5.63	5.79	0.48
DMP65R-BU8D w/ Mount Pipe	A	From Leg	4.00	0.00	3.00	0.0000	117.00	No Ice	15.89	7.89	0.14
								1/2" Ice	16.81	8.74	0.25
								1" Ice	17.76	9.60	0.38
								2" Ice	19.70	11.37	0.68
DMP65R-BU6D w/ Mount Pipe	B	From Leg	4.00	0.00	3.00	0.0000	117.00	No Ice	11.96	5.97	0.11
								1/2" Ice	12.70	6.63	0.20
								1" Ice	13.46	7.30	0.30
								2" Ice	15.02	8.69	0.53
DMP65R-BU6D w/ Mount Pipe	C	From Leg	4.00	0.00		0.0000	117.00	No Ice	11.96	5.97	0.11
								1/2" Ice	12.70	6.63	0.20

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
			3.00			1/2" Ice	13.46 15.02	7.30 8.69	0.30 0.53
						1" Ice 2" Ice			
RRUS 32 B30	A	From Leg	4.00 0.00 3.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.69 2.91 3.14 3.61	1.57 1.76 1.95 2.35	0.06 0.08 0.10 0.16
RRUS 32 B30	B	From Leg	4.00 0.00 3.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.69 2.91 3.14 3.61	1.57 1.76 1.95 2.35	0.06 0.08 0.10 0.16
RRUS 32 B30	C	From Leg	4.00 0.00 3.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.69 2.91 3.14 3.61	1.57 1.76 1.95 2.35	0.06 0.08 0.10 0.16
RRUS 8843 B2/B66A_CCIV2	A	From Leg	4.00 0.00 3.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.98 2.16 2.34 2.73	1.70 1.86 2.04 2.41	0.08 0.10 0.12 0.18
RRUS 8843 B2/B66A_CCIV2	B	From Leg	4.00 0.00 3.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.98 2.16 2.34 2.73	1.70 1.86 2.04 2.41	0.08 0.10 0.12 0.18
RRUS 8843 B2/B66A_CCIV2	C	From Leg	4.00 0.00 3.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.98 2.16 2.34 2.73	1.70 1.86 2.04 2.41	0.08 0.10 0.12 0.18
RRUS 4449 B5/B12	A	From Leg	4.00 0.00 3.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.97 2.14 2.33 2.72	1.41 1.56 1.73 2.07	0.07 0.09 0.11 0.16
RRUS 4449 B5/B12	B	From Leg	4.00 0.00 3.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.97 2.14 2.33 2.72	1.41 1.56 1.73 2.07	0.07 0.09 0.11 0.16
RRUS 4449 B5/B12	C	From Leg	4.00 0.00 3.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.97 2.14 2.33 2.72	1.41 1.56 1.73 2.07	0.07 0.09 0.11 0.16
(2) LGP21401	A	From Leg	4.00 0.00 3.00	0.0000	117.00	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 3.00	0.0000	117.00	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 3.00	0.0000	117.00	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
DC6-48-60-0-8C-EV	A	From Leg	4.00	0.0000	117.00	No Ice	2.74	4.78	0.03

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		*C_AA_A Front* *ft²*	*C_AA_A Side* *ft²*	*Weight* *K*
			0.00			1/2"	2.96	5.06	0.06
			3.00			Ice	3.20	5.35	0.10
						1" Ice	3.68	5.95	0.20
						2" Ice			
DC6-48-60-18-8F	B	From Leg	4.00	0.0000	117.00	No Ice	0.92	0.92	0.02
			0.00			1/2"	1.46	1.46	0.04
			3.00			Ice	1.64	1.64	0.06
						1" Ice	2.04	2.04	0.11
						2" Ice			
DC6-48-60-18-8F	C	From Leg	4.00	0.0000	117.00	No Ice	0.92	0.92	0.02
			0.00			1/2"	1.46	1.46	0.04
			3.00			Ice	1.64	1.64	0.06
						1" Ice	2.04	2.04	0.11
						2" Ice			
6' x 2" Mount Pipe	A	From Leg	4.00	0.0000	117.00	No Ice	1.43	1.43	0.02
			0.00			1/2"	1.92	1.92	0.03
			0.00			Ice	2.29	2.29	0.05
						1" Ice	3.06	3.06	0.09
						2" Ice			
6' x 2" Mount Pipe	B	From Leg	4.00	0.0000	117.00	No Ice	1.43	1.43	0.02
			0.00			1/2"	1.92	1.92	0.03
			0.00			Ice	2.29	2.29	0.05
						1" Ice	3.06	3.06	0.09
						2" Ice			
6' x 2" Mount Pipe	C	From Leg	4.00	0.0000	117.00	No Ice	1.43	1.43	0.02
			0.00			1/2"	1.92	1.92	0.03
			0.00			Ice	2.29	2.29	0.05
						1" Ice	3.06	3.06	0.09
						2" Ice			
Transition Ladder	C	From Leg	4.00	0.0000	117.00	No Ice	6.00	6.00	0.16
			0.00			1/2"	8.00	8.00	0.24
			-3.00			Ice	10.00	10.00	0.32
						1" Ice	14.00	14.00	0.48
						2" Ice			
Platform Mount [LP 713-1]	C	None		0.0000	117.00	No Ice	32.89	32.89	1.51
						1/2"	35.76	35.76	2.23
						Ice	38.76	38.76	3.03
						1" Ice	45.26	45.26	4.86
						2" Ice			
******									
PCS 1900MHz 4x45W-65MHz	A	From Leg	0.50	0.0000	104.00	No Ice	2.32	2.24	0.06
			0.00			1/2"	2.53	2.44	0.08
			0.00			Ice	2.74	2.65	0.11
						1" Ice	3.19	3.09	0.17
						2" Ice			
PCS 1900MHz 4x45W-65MHz	B	From Leg	0.50	0.0000	104.00	No Ice	2.32	2.24	0.06
			0.00			1/2"	2.53	2.44	0.08
			0.00			Ice	2.74	2.65	0.11
						1" Ice	3.19	3.09	0.17
						2" Ice			
PCS 1900MHz 4x45W-65MHz	C	From Leg	0.50	0.0000	104.00	No Ice	2.32	2.24	0.06
			0.00			1/2"	2.53	2.44	0.08
			0.00			Ice	2.74	2.65	0.11
						1" Ice	3.19	3.09	0.17
						2" Ice			
800MHz 2X50W RRH W/FILTER	A	From Leg	0.50	0.0000	104.00	No Ice	2.06	1.93	0.06
			0.00			1/2"	2.24	2.11	0.09
			0.00			Ice	2.43	2.29	0.11
						1" Ice	2.83	2.68	0.17
						2" Ice			
800MHz 2X50W RRH W/FILTER	B	From Leg	0.50	0.0000	104.00	No Ice	2.06	1.93	0.06
			0.00			1/2"	2.24	2.11	0.09
			0.00			Ice	2.43	2.29	0.11
						1" Ice	2.83	2.68	0.17
						2" Ice			

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
800MHz 2X50W RRH W/FILTER	C	From Leg	0.50 0.00 0.00	0.0000	104.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.06 2.24 2.43 2.83	1.93 2.11 2.29 2.68	0.06 0.09 0.11 0.17
Pipe Mount [PM 601-3]	C	None		0.0000	104.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.17 3.79 4.42 5.76	3.17 3.79 4.42 5.76	0.20 0.23 0.28 0.40
******									
AAHC w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	103.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.41 4.73 5.06 5.74	2.69 3.08 3.49 4.36	0.12 0.16 0.20 0.31
AAHC w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	103.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.41 4.73 5.06 5.74	2.69 3.08 3.49 4.36	0.12 0.16 0.20 0.31
AAHC w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	103.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.41 4.73 5.06 5.74	2.69 3.08 3.49 4.36	0.12 0.16 0.20 0.31
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	103.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.60 5.05 5.50 6.44	4.01 4.45 4.89 5.82	0.10 0.16 0.23 0.42
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	103.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.60 5.05 5.50 6.44	4.01 4.45 4.89 5.82	0.10 0.16 0.23 0.42
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	103.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.60 5.05 5.50 6.44	4.01 4.45 4.89 5.82	0.10 0.16 0.23 0.42
IBC1900BB-1	A	From Leg	4.00 0.00 1.00	0.0000	103.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.97 1.09 1.22 1.51	0.46 0.56 0.66 0.89	0.02 0.03 0.04 0.06
IBC1900BB-1	B	From Leg	4.00 0.00 1.00	0.0000	103.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.97 1.09 1.22 1.51	0.46 0.56 0.66 0.89	0.02 0.03 0.04 0.06
IBC1900BB-1	C	From Leg	4.00 0.00 1.00	0.0000	103.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.97 1.09 1.22 1.51	0.46 0.56 0.66 0.89	0.02 0.03 0.04 0.06
IBC1900HG-2A	A	From Leg	4.00 0.00 1.00	0.0000	103.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.97 1.09 1.22 1.51	0.46 0.56 0.66 0.89	0.02 0.03 0.04 0.06
IBC1900HG-2A	B	From Leg	4.00 0.00 1.00	0.0000	103.00	No Ice 1/2" Ice 1" Ice	0.97 1.09 1.22 1.51	0.46 0.56 0.66 0.89	0.02 0.03 0.04 0.06

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
						2" Ice			
IBC1900HG-2A	C	From Leg	4.00 0.00 1.00	0.0000	103.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.97 1.09 1.22 1.51	0.46 0.56 0.66 0.89	0.02 0.03 0.04 0.06
6' x 2" Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	103.00	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' x 2" Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	103.00	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' x 2" Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	103.00	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
Platform Mount [LP 713-1]	C	None		0.0000	103.00	No Ice 1/2" Ice 1" Ice 2" Ice	32.89 35.76 38.76 45.26	32.89 35.76 38.76 45.26	1.51 2.23 3.03 4.86
****** *******									
MX08FRO665-21 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	93.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.01 8.52 9.04 10.11	4.23 4.69 5.16 6.12	0.11 0.19 0.29 0.52
MX08FRO665-21 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	93.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.01 8.52 9.04 10.11	4.23 4.69 5.16 6.12	0.11 0.19 0.29 0.52
MX08FRO665-21 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	93.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.01 8.52 9.04 10.11	4.23 4.69 5.16 6.12	0.11 0.19 0.29 0.52
TA08025-B604	A	From Leg	4.00 0.00 0.00	0.0000	93.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.96 2.14 2.32 2.71	0.98 1.11 1.25 1.55	0.06 0.08 0.10 0.15
TA08025-B604	B	From Leg	4.00 0.00 0.00	0.0000	93.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.96 2.14 2.32 2.71	0.98 1.11 1.25 1.55	0.06 0.08 0.10 0.15
TA08025-B604	C	From Leg	4.00 0.00 0.00	0.0000	93.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.96 2.14 2.32 2.71	0.98 1.11 1.25 1.55	0.06 0.08 0.10 0.15
TA08025-B605	A	From Leg	4.00 0.00 0.00	0.0000	93.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.96 2.14 2.32 2.71	1.13 1.27 1.41 1.72	0.08 0.09 0.11 0.16
TA08025-B605	B	From Leg	4.00 0.00	0.0000	93.00	No Ice	1.96 2.14	1.13 1.27	0.08 0.09

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral ft* *Vert ft* *ft*	*Azimuth Adjustment* °	*Placement* *ft*		*C_AA_A Front* ft^2	*C_AA_A Side* ft^2	*Weight* *K*
			0.00			1/2" Ice	2.32 2.71	1.41 1.72	0.11 0.16
						1" Ice			
						2" Ice			
TA08025-B605	C	From Leg	4.00	0.0000	93.00	No Ice	1.96	1.13	0.08
			0.00			1/2" Ice	2.14 2.32	1.27 1.41	0.09 0.11
			0.00			1" Ice	2.71	1.72	0.16
						2" Ice			
RDIDC-9181-PF-48	A	From Leg	4.00	0.0000	93.00	No Ice	2.01	1.17	0.02
			0.00			1/2" Ice	2.19 2.37	1.31 1.46	0.04 0.06
			0.00			1" Ice	2.76	1.78	0.11
						2" Ice			
(2) 8' x 2" Mount Pipe	A	From Leg	4.00	0.0000	93.00	No Ice	1.90	1.90	0.03
			0.00			1/2" Ice	2.73 3.40	2.73 3.40	0.04 0.06
			0.00			1" Ice	4.40	4.40	0.12
						2" Ice			
(2) 8' x 2" Mount Pipe	B	From Leg	4.00	0.0000	93.00	No Ice	1.90	1.90	0.03
			0.00			1/2" Ice	2.73 3.40	2.73 3.40	0.04 0.06
			0.00			1" Ice	4.40	4.40	0.12
						2" Ice			
(2) 8' x 2" Mount Pipe	C	From Leg	4.00	0.0000	93.00	No Ice	1.90	1.90	0.03
			0.00			1/2" Ice	2.73 3.40	2.73 3.40	0.04 0.06
			0.00			1" Ice	4.40	4.40	0.12
						2" Ice			
Commscope MC-PK8-DSH	C	None		0.0000	93.00	No Ice	34.24	34.24	1.75
						1/2" Ice	62.95 91.66	62.95 91.66	2.10 2.45
						1" Ice	149.08	149.08	3.15
						2" Ice			
*******									
BCD-87010	B	From Leg	2.00	60.0000	74.00	No Ice	2.90	2.90	0.03
			0.00			1/2" Ice	4.05 5.21	4.05 5.21	0.05 0.08
			6.00			1" Ice	7.01	7.01	0.16
						2" Ice			
Side Arm Mount [SO 701-1]	B	From Leg	1.00	0.0000	74.00	No Ice	0.85	1.67	0.07
			0.00			1/2" Ice	1.14 1.43	2.34 3.01	0.08 0.09
			0.00			1" Ice	2.01	4.35	0.12
						2" Ice			
******									
KS24019-L112A	C	From Leg	2.00	0.0000	50.00	No Ice	0.14	0.14	0.01
			0.00			1/2" Ice	0.20 0.26	0.20 0.26	0.01 0.01
			2.00			1" Ice	0.41	0.41	0.02
						2" Ice			
Side Arm Mount [SO 701-1]	C	From Leg	1.00	0.0000	50.00	No Ice	0.85	1.67	0.07
			0.00			1/2" Ice	1.14 1.43	2.34 3.01	0.08 0.09
			0.00			1" Ice	2.01	4.35	0.12
						2" Ice			
*******									

Load Combinations

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	140 - 86.83	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-70.56	0.75	4.52
			Max. Mx	20	-27.55	739.79	1.58
			Max. My	2	-27.48	1.60	755.69
			Max. Vy	8	26.72	-739.01	-0.88
			Max. Vx	2	-27.38	1.60	755.69
			Max. Torque	18			-1.78

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L2	86.83 - 38	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-96.61	-3.03	10.63
			Max. Mx	8	-43.29	-2145.62	-0.71
			Max. My	2	-43.22	1.54	2224.51
			Max. Vy	8	32.36	-2145.62	-0.71
			Max. Vx	2	-34.43	1.54	2224.51
			Max. Torque	18			-1.78
L3	38 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-128.21	-7.06	17.80
			Max. Mx	8	-64.78	-3711.01	-0.18
			Max. My	2	-64.78	1.50	3905.83
			Max. Vy	8	37.10	-3711.01	-0.18
			Max. Vx	2	-40.09	1.50	3905.83
			Max. Torque	20			-1.32

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	27	128.21	0.00	9.30
	Max. H_x	20	64.80	37.07	0.02
	Max. H_z	2	64.80	0.02	40.06
	Max. M_x	2	3905.83	0.02	40.06
	Max. M_z	8	3711.01	-37.07	-0.02
	Max. Torsion	8	1.32	-37.07	-0.02
	Min. Vert	19	48.60	32.09	-18.60
	Min. H_x	8	64.80	-37.07	-0.02
	Min. H_z	14	64.80	-0.02	-40.06
	Min. M_x	14	-3899.88	-0.02	-40.06
	Min. M_z	20	-3707.72	37.07	0.02
	Min. Torsion	20	-1.32	37.07	0.02

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	54.00	0.00	0.00	-2.41	-1.35	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	64.80	-0.02	-40.06	-3905.83	1.50	-0.31
0.9 Dead+1.0 Wind 0 deg - No Ice	48.60	-0.02	-40.06	-3874.49	1.89	-0.31
1.2 Dead+1.0 Wind 30 deg - No Ice	64.80	18.51	-32.25	-3231.51	-1853.60	-0.93
0.9 Dead+1.0 Wind 30 deg - No Ice	48.60	18.51	-32.25	-3205.14	-1838.50	-0.93
1.2 Dead+1.0 Wind 60 deg - No Ice	64.80	32.09	-18.60	-1865.16	-3212.49	-1.30
0.9 Dead+1.0 Wind 60 deg - No Ice	48.60	32.09	-18.60	-1849.63	-3186.60	-1.30
1.2 Dead+1.0 Wind 90 deg - No Ice	64.80	37.07	0.02	0.18	-3711.01	-1.32
0.9 Dead+1.0 Wind 90 deg - No Ice	48.60	37.07	0.02	0.90	-3681.17	-1.32
1.2 Dead+1.0 Wind 120 deg - No Ice	64.80	32.11	18.64	1864.66	-3215.62	-0.99
0.9 Dead+1.0 Wind 120 deg - No Ice	48.60	32.11	18.64	1850.60	-3189.70	-0.98
1.2 Dead+1.0 Wind 150 deg - No Ice	64.80	18.55	32.27	3228.71	-1859.05	-0.39

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 150 deg - No Ice	48.60	18.55	32.27	3203.82	-1843.89	-0.39
1.2 Dead+1.0 Wind 180 deg - No Ice	64.80	0.02	40.06	3899.88	-4.79	0.31
0.9 Dead+1.0 Wind 180 deg - No Ice	48.60	0.02	40.06	3870.06	-4.34	0.31
1.2 Dead+1.0 Wind 210 deg - No Ice	64.80	-18.51	32.25	3225.57	1850.31	0.93
0.9 Dead+1.0 Wind 210 deg - No Ice	48.60	-18.51	32.25	3200.72	1836.04	0.93
1.2 Dead+1.0 Wind 240 deg - No Ice	64.80	-32.09	18.60	1859.22	3209.19	1.30
0.9 Dead+1.0 Wind 240 deg - No Ice	48.60	-32.09	18.60	1845.21	3184.14	1.30
1.2 Dead+1.0 Wind 270 deg - No Ice	64.80	-37.07	-0.02	-6.12	3707.72	1.32
0.9 Dead+1.0 Wind 270 deg - No Ice	48.60	-37.07	-0.02	-5.33	3678.72	1.32
1.2 Dead+1.0 Wind 300 deg - No Ice	64.80	-32.11	-18.64	-1870.61	3212.33	0.99
0.9 Dead+1.0 Wind 300 deg - No Ice	48.60	-32.11	-18.64	-1855.02	3187.25	0.99
1.2 Dead+1.0 Wind 330 deg - No Ice	64.80	-18.55	-32.27	-3234.66	1855.76	0.39
0.9 Dead+1.0 Wind 330 deg - No Ice	48.60	-18.55	-32.27	-3208.25	1841.43	0.39
1.2 Dead+1.0 Ice+1.0 Temp	128.21	0.00	-0.00	-17.80	-7.06	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	128.21	-0.00	-9.30	-1009.60	-6.67	-0.18
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	128.21	4.63	-8.05	-876.52	-500.50	-0.21
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	128.21	8.02	-4.65	-513.41	-862.15	-0.19
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	128.21	9.26	0.00	-17.57	-994.69	-0.11
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	128.21	8.02	4.65	478.14	-862.63	-0.01
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	128.21	4.63	8.06	840.89	-501.35	0.10
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	128.21	0.00	9.30	973.49	-7.64	0.18
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	128.21	-4.63	8.05	840.41	486.19	0.21
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	128.21	-8.02	4.65	477.30	847.84	0.19
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	128.21	-9.26	-0.00	-18.54	980.39	0.11
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	128.21	-8.02	-4.65	-514.25	848.32	0.01
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	128.21	-4.63	-8.06	-877.00	487.03	-0.10
Dead+Wind 0 deg - Service	54.00	-0.00	-8.69	-845.64	-0.69	-0.07
Dead+Wind 30 deg - Service	54.00	4.02	-7.00	-699.90	-401.43	-0.20
Dead+Wind 60 deg - Service	54.00	6.97	-4.04	-404.74	-694.98	-0.28
Dead+Wind 90 deg - Service	54.00	8.05	0.00	-1.79	-802.67	-0.28
Dead+Wind 120 deg - Service	54.00	6.97	4.05	400.98	-695.65	-0.21
Dead+Wind 150 deg - Service	54.00	4.03	7.00	695.64	-402.61	-0.08
Dead+Wind 180 deg - Service	54.00	0.00	8.69	840.70	-2.05	0.07
Dead+Wind 210 deg - Service	54.00	-4.02	7.00	694.97	398.70	0.20
Dead+Wind 240 deg - Service	54.00	-6.97	4.04	399.80	692.24	0.28
Dead+Wind 270 deg - Service	54.00	-8.05	-0.00	-3.15	799.94	0.28
Dead+Wind 300 deg - Service	54.00	-6.97	-4.05	-405.92	692.92	0.21

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
Dead+Wind 330 deg - Service	54.00	-4.03	-7.00	-700.58	399.87	0.08

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-54.00	0.00	0.00	54.00	0.00	0.000%
2	-0.02	-64.80	-40.06	0.02	64.80	40.06	0.000%
3	-0.02	-48.60	-40.06	0.02	48.60	40.06	0.000%
4	18.51	-64.80	-32.25	-18.51	64.80	32.25	0.000%
5	18.51	-48.60	-32.25	-18.51	48.60	32.25	0.000%
6	32.09	-64.80	-18.60	-32.09	64.80	18.60	0.000%
7	32.09	-48.60	-18.60	-32.09	48.60	18.60	0.000%
8	37.07	-64.80	0.02	-37.07	64.80	-0.02	0.000%
9	37.07	-48.60	0.02	-37.07	48.60	-0.02	0.000%
10	32.11	-64.80	18.64	-32.11	64.80	-18.64	0.000%
11	32.11	-48.60	18.64	-32.11	48.60	-18.64	0.000%
12	18.55	-64.80	32.27	-18.55	64.80	-32.27	0.000%
13	18.55	-48.60	32.27	-18.55	48.60	-32.27	0.000%
14	0.02	-64.80	40.06	-0.02	64.80	-40.06	0.000%
15	0.02	-48.60	40.06	-0.02	48.60	-40.06	0.000%
16	-18.51	-64.80	32.25	18.51	64.80	-32.25	0.000%
17	-18.51	-48.60	32.25	18.51	48.60	-32.25	0.000%
18	-32.09	-64.80	18.60	32.09	64.80	-18.60	0.000%
19	-32.09	-48.60	18.60	32.09	48.60	-18.60	0.000%
20	-37.07	-64.80	-0.02	37.07	64.80	0.02	0.000%
21	-37.07	-48.60	-0.02	37.07	48.60	0.02	0.000%
22	-32.11	-64.80	-18.64	32.11	64.80	18.64	0.000%
23	-32.11	-48.60	-18.64	32.11	48.60	18.64	0.000%
24	-18.55	-64.80	-32.27	18.55	64.80	32.27	0.000%
25	-18.55	-48.60	-32.27	18.55	48.60	32.27	0.000%
26	0.00	-128.21	0.00	-0.00	128.21	0.00	0.000%
27	-0.00	-128.21	-9.30	0.00	128.21	9.30	0.000%
28	4.63	-128.21	-8.05	-4.63	128.21	8.05	0.000%
29	8.02	-128.21	-4.65	-8.02	128.21	4.65	0.000%
30	9.26	-128.21	0.00	-9.26	128.21	-0.00	0.000%
31	8.02	-128.21	4.65	-8.02	128.21	-4.65	0.000%
32	4.63	-128.21	8.06	-4.63	128.21	-8.06	0.000%
33	0.00	-128.21	9.30	-0.00	128.21	-9.30	0.000%
34	-4.63	-128.21	8.05	4.63	128.21	-8.05	0.000%
35	-8.02	-128.21	4.65	8.02	128.21	-4.65	0.000%
36	-9.26	-128.21	-0.00	9.26	128.21	0.00	0.000%
37	-8.02	-128.21	-4.65	8.02	128.21	4.65	0.000%
38	-4.63	-128.21	-8.06	4.63	128.21	8.06	0.000%
39	-0.00	-54.00	-8.69	0.00	54.00	8.69	0.000%
40	4.02	-54.00	-7.00	-4.02	54.00	7.00	0.000%
41	6.97	-54.00	-4.04	-6.97	54.00	4.04	0.000%
42	8.05	-54.00	0.00	-8.05	54.00	-0.00	0.000%
43	6.97	-54.00	4.05	-6.97	54.00	-4.05	0.000%
44	4.03	-54.00	7.00	-4.03	54.00	-7.00	0.000%
45	0.00	-54.00	8.69	-0.00	54.00	-8.69	0.000%
46	-4.02	-54.00	7.00	4.02	54.00	-7.00	0.000%
47	-6.97	-54.00	4.04	6.97	54.00	-4.04	0.000%
48	-8.05	-54.00	-0.00	8.05	54.00	0.00	0.000%
49	-6.97	-54.00	-4.05	6.97	54.00	4.05	0.000%
50	-4.03	-54.00	-7.00	4.03	54.00	7.00	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	0.00008501
3	Yes	4	0.00000001	0.00004441
4	Yes	5	0.00000001	0.00008772
5	Yes	5	0.00000001	0.00004164
6	Yes	5	0.00000001	0.00009258
7	Yes	5	0.00000001	0.00004412
8	Yes	4	0.00000001	0.00015998
9	Yes	4	0.00000001	0.00010063
10	Yes	5	0.00000001	0.00008779
11	Yes	5	0.00000001	0.00004171
12	Yes	5	0.00000001	0.00009090
13	Yes	5	0.00000001	0.00004325
14	Yes	4	0.00000001	0.00008012
15	Yes	4	0.00000001	0.00004030
16	Yes	5	0.00000001	0.00009157
17	Yes	5	0.00000001	0.00004363
18	Yes	5	0.00000001	0.00008657
19	Yes	5	0.00000001	0.00004114
20	Yes	4	0.00000001	0.00016991
21	Yes	4	0.00000001	0.00010748
22	Yes	5	0.00000001	0.00009229
23	Yes	5	0.00000001	0.00004394
24	Yes	5	0.00000001	0.00008932
25	Yes	5	0.00000001	0.00004243
26	Yes	4	0.00000001	0.00002450
27	Yes	5	0.00000001	0.00012840
28	Yes	5	0.00000001	0.00013828
29	Yes	5	0.00000001	0.00013789
30	Yes	5	0.00000001	0.00012610
31	Yes	5	0.00000001	0.00013425
32	Yes	5	0.00000001	0.00013382
33	Yes	5	0.00000001	0.00012362
34	Yes	5	0.00000001	0.00013294
35	Yes	5	0.00000001	0.00013292
36	Yes	5	0.00000001	0.00012503
37	Yes	5	0.00000001	0.00013692
38	Yes	5	0.00000001	0.00013778
39	Yes	4	0.00000001	0.00001358
40	Yes	4	0.00000001	0.00003166
41	Yes	4	0.00000001	0.00003624
42	Yes	4	0.00000001	0.00001477
43	Yes	4	0.00000001	0.00003145
44	Yes	4	0.00000001	0.00003389
45	Yes	4	0.00000001	0.00001350
46	Yes	4	0.00000001	0.00003497
47	Yes	4	0.00000001	0.00003086
48	Yes	4	0.00000001	0.00001480
49	Yes	4	0.00000001	0.00003547
50	Yes	4	0.00000001	0.00003256

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	140 - 86.83	12.080	39	0.7265	0.0013
L2	92.5 - 38	5.413	39	0.5573	0.0006
L3	45 - 0	1.258	39	0.2528	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
140.00	BXA-80063-4BF-EDIN-X w/ Mount Pipe	39	12.080	0.7265	0.0013	89836
126.00	APXVAARR24_43-U-NA20 w/ Mount Pipe	39	9.987	0.6870	0.0010	32084
117.00	7770.00 w/ Mount Pipe	39	8.675	0.6589	0.0009	19529
104.00	PCS 1900MHz 4x45W-65MHz	39	6.873	0.6107	0.0007	12477
103.00	AAHC w/ Mount Pipe	39	6.741	0.6066	0.0007	12139
93.00	MX08FRO665-21 w/ Mount Pipe	39	5.473	0.5599	0.0006	9648
74.00	BCD-87010	39	3.413	0.4471	0.0004	8574
50.00	KS24019-L112A	39	1.538	0.2854	0.0002	7649

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	140 - 86.83	55.878	2	3.3622	0.0059
L2	92.5 - 38	25.033	2	2.5789	0.0026
L3	45 - 0	5.816	2	1.1690	0.0007

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
140.00	BXA-80063-4BF-EDIN-X w/ Mount Pipe	2	55.878	3.3622	0.0060	19500
126.00	APXVAARR24_43-U-NA20 w/ Mount Pipe	2	46.192	3.1796	0.0049	6963
117.00	7770.00 w/ Mount Pipe	2	40.123	3.0495	0.0043	4237
104.00	PCS 1900MHz 4x45W-65MHz	2	31.788	2.8265	0.0033	2705
103.00	AAHC w/ Mount Pipe	2	31.174	2.8071	0.0033	2632
93.00	MX08FRO665-21 w/ Mount Pipe	2	25.311	2.5909	0.0027	2091
74.00	BCD-87010	2	15.780	2.0684	0.0017	1856
50.00	KS24019-L112A	2	7.111	1.3198	0.0008	1655

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	140 - 86.83 (1)	TP39.223x26.216x0.3125	53.17	0.00	0.0	37.7580	-27.48	2208.84	0.012
L2	86.83 - 38 (2)	TP50.56x37.2109x0.4063	54.50	0.00	0.0	63.3645	-43.22	3706.82	0.012
L3	38 - 0 (3)	TP59.05x48.0329x0.5	45.00	0.00	0.0	94.2655	-64.78	5514.53	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	140 - 86.83 (1)	TP39.223x26.216x0.3125	755.70	1838.14	0.411	0.00	1838.14	0.000
L2	86.83 - 38 (2)	TP50.56x37.2109x0.4063	2224.51	3995.66	0.557	0.00	3995.66	0.000
L3	38 - 0 (3)	TP59.05x48.0329x0.5	3905.83	7247.00	0.539	0.00	7247.00	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	140 - 86.83 (1)	TP39.223x26.216x0.3125	27.38	662.65	0.041	0.64	2187.20	0.000
L2	86.83 - 38 (2)	TP50.56x37.2109x0.4063	34.43	1112.05	0.031	0.31	4738.27	0.000
L3	38 - 0 (3)	TP59.05x48.0329x0.5	40.09	1654.36	0.024	0.31	8520.33	0.000

Pole Interaction Design Data

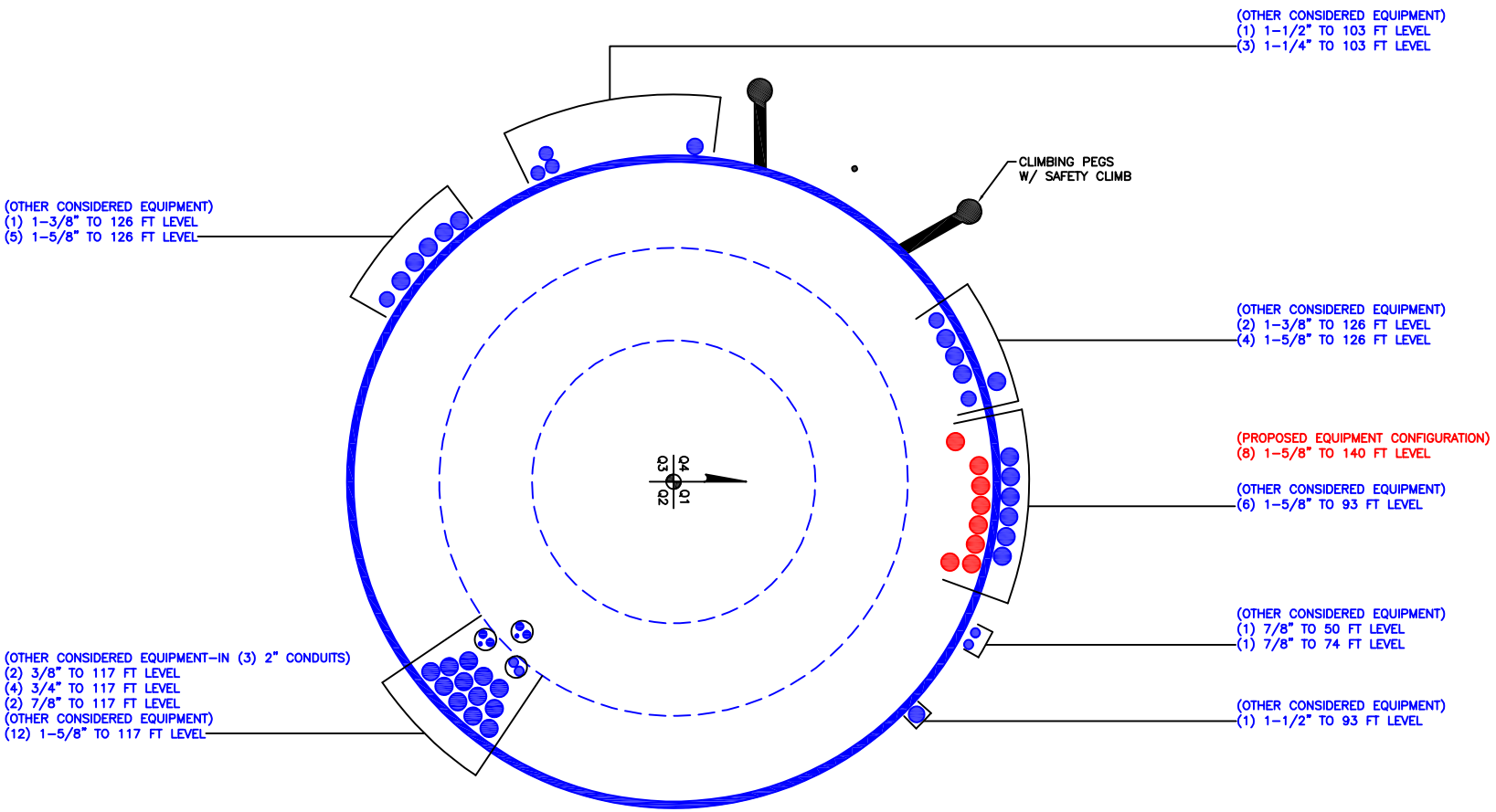
Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	140 - 86.83 (1)	0.012	0.411	0.000	0.041	0.000	0.425	1.050	4.8.2
L2	86.83 - 38 (2)	0.012	0.557	0.000	0.031	0.000	0.569	1.050	4.8.2
L3	38 - 0 (3)	0.012	0.539	0.000	0.024	0.000	0.551	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	140 - 86.83	Pole	TP39.223x26.216x0.3125	1	-27.48	2319.28	40.5	Pass
L2	86.83 - 38	Pole	TP50.56x37.2109x0.4063	2	-43.22	3892.16	54.2	Pass
L3	38 - 0	Pole	TP59.05x48.0329x0.5	3	-64.78	5790.26	52.5	Pass
							Summary	
						Pole (L2)	54.2	Pass
						RATING =	**54.2**	**Pass**

APPENDIX B

BASE LEVEL DRAWING


(OTHER CONSIDERED EQUIPMENT)
(1) 1-1/2" TO 103 FT LEVEL
(3) 1-1/4" TO 103 FT LEVEL
CLIMBING PEGS
W/ SAFETY CLIMB
(OTHER CONSIDERED EQUIPMENT)
(1) 1-3/8" TO 126 FT LEVEL
(5) 1-5/8" TO 126 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(2) 1-3/8" TO 126 FT LEVEL
(4) 1-5/8" TO 126 FT LEVEL
Q4
Q3
Q1
Q2
(PROPOSED EQUIPMENT CONFIGURATION)
(8) 1-5/8" TO 140 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(6) 1-5/8" TO 93 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(1) 7/8" TO 50 FT LEVEL
(1) 7/8" TO 74 FT LEVEL
(OTHER CONSIDERED EQUIPMENT-IN (3) 2" CONDUITS)
(2) 3/8" TO 117 FT LEVEL
(4) 3/4" TO 117 FT LEVEL
(2) 7/8" TO 117 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(12) 1-5/8" TO 117 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(1) 1-1/2" TO 93 FT LEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

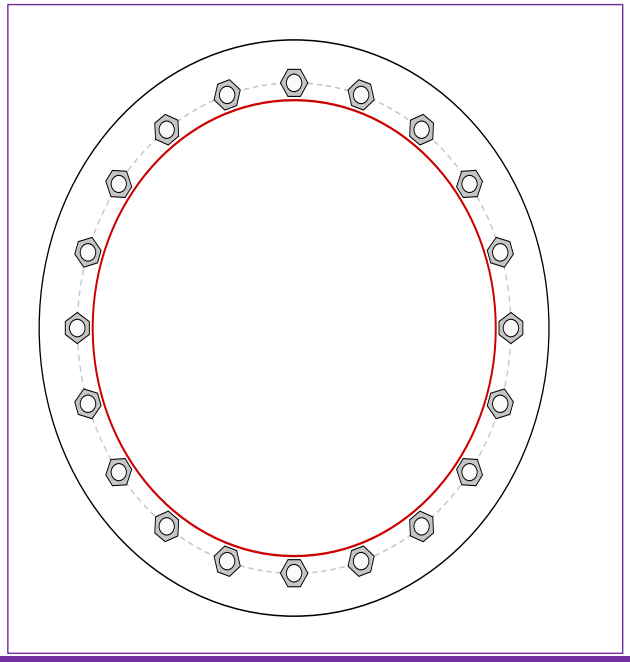
Monopole Base Plate Connection

Site Info	
BU #	806369
Site Name	HRT 094 943225
Order #	583426 Rev. 0

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	0.25

Applied Loads	
Moment (kip-ft)	3905.83
Axial Force (kips)	64.78
Shear Force (kips)	40.09

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

(20) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 63.5" BC

Base Plate Data

74.641" OD x 3" Plate (A572-60; Fy=60 ksi, Fu=75 ksi)

Stiffener Data

N/A

Pole Data

59.05" x 0.5" 12-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

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

Pu_t = 144.31	ϕPn_t = 243.75	**Stress Rating**
Vu = 2	ϕVn = 149.1	**56.4%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary

Max Stress (ksi):	10.4	(Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	**18.3%**	**Pass**

Drilled Pier Foundation

BU # :	806369
Site Name:	HRT 094 943225
Order Number:	583426 Rev. 0
TIA-222 Revison:	H
Tower Type:	Monopole

Check Limitation	
Apply TIA-222-H Section 15.5:	☑
N/A	☐
Additional Longitudinal Rebar	
Input Effective Depths (else Actual):	☐
Shear Design Options	
Check Shear along Depth of Pier:	☑
Utilize Shear-Friction Methodology:	☐
Override Critical Depth:	☐

Go to Soil Calculations

Applied Loads	Comp.	Uplift
Moment (kip-ft)	3905.83	
Axial Force (kips)	64.8	
Shear Force (kips)	40.06	

Material Properties		
Concrete Strength, f'c:	3	ksi
Rebar Strength, Fy:	60	ksi
Tie Yield Strength, Fyt:	40	ksi

Pier Design Data		
Depth	47	ft
Ext. Above Grade	0	ft
Pier Section 1		
From 0' below grade to 47' below grade		
Pier Diameter	7.5	ft
Rebar Quantity	52	
Rebar Size	10	
Rebar Cage Diameter	82	in
Tie Size	4	
Tie Spacing		in

Rebar & Pier Options
Embedded Pole Inputs
Belled Pier Inputs

Analysis Results		
Soil Lateral Check	*Compression*	*Uplift*
$D_{v=0}$ (ft from TOC)	7.54	-
Soil Safety Factor	6.51	-
Max Moment (kip-ft)	4152.53	-
Rating*	*19.5%*	-
Soil Vertical Check	*Compression*	*Uplift*
Skin Friction (kips)	406.44	-
End Bearing (kips)	298.21	-
Weight of Concrete (kips)	251.31	-
Total Capacity (kips)	704.65	-
Axial (kips)	316.11	-
Rating*	*42.7%*	-
Reinforced Concrete Flexure	*Compression*	*Uplift*
Critical Depth (ft from TOC)	7.45	-
Critical Moment (kip-ft)	4152.48	-
Critical Moment Capacity	10733.70	-
Rating*	*36.8%*	-
Reinforced Concrete Shear	*Compression*	*Uplift*
Critical Depth (ft from TOC)	25.52	-
Critical Shear (kip)	232.41	-
Critical Shear Capacity	562.52	-
Rating*	*39.3%*	-

Structural Foundation Rating*	**39.3%**
Soil Interaction Rating*	**42.7%**

*Rating per TIA-222-H Section 15.5

Soil Profile

Groundwater Depth	10

# of Layers	8

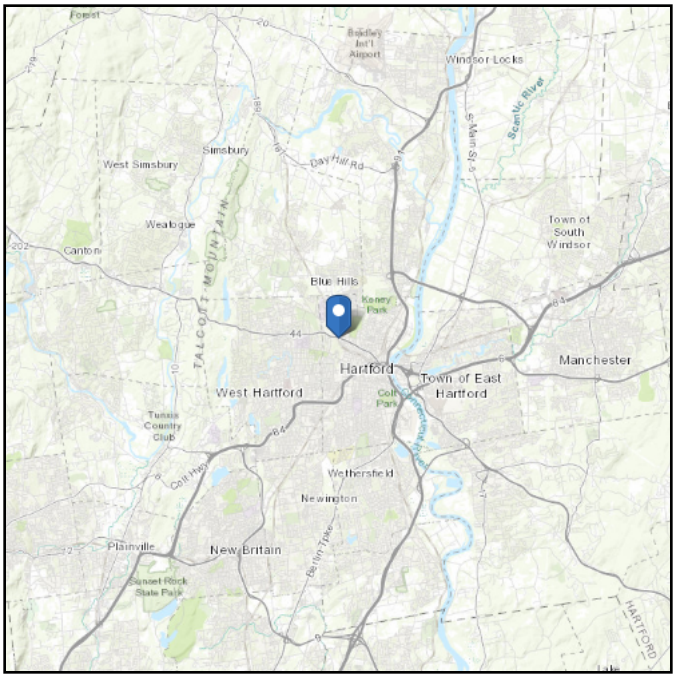
Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ_{soil} (pcf)	$\gamma_{concrete}$ (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	2	2	105	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
2	2	3.75	1.75	100	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
3	3.75	5	1.25	100	150	0.5	30	0.000	0.000	0.00	0.00			Cohesionless
4	5	10	5	100	150	0.5	30	0.000	0.000	0.60	0.60			Cohesionless
5	10	25	15	36	87.6	0.1	27	0.000	0.000	0.40	0.40			Cohesionless
6	25	35	10	36	87.6	0.1	27	0.000	0.000	0.60	0.60			Cohesionless
7	35	45	10	41	87.6	0.2	0	0.11	0.11	0.60	0.60			Cohesive
8	45	47	2	41	87.6	0	32	0.00	0.00	1.00	1.00	9		Cohesionless

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 60.06 ft (NAVD 88)
Latitude: 41.783781
Longitude: -72.703794



Wind

Results:

Wind Speed:	122 Vmph	*125 Vmph per jurisdictional requirement
10-year MRI	76 Vmph	
25-year MRI	86 Vmph	
50-year MRI	92 Vmph	
100-year MRI	99 Vmph	

Data Accessed: Thu Aug 19 2021

Date Source: ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, and Section 26.5.2, incorporating errata of March 12, 2014

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

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

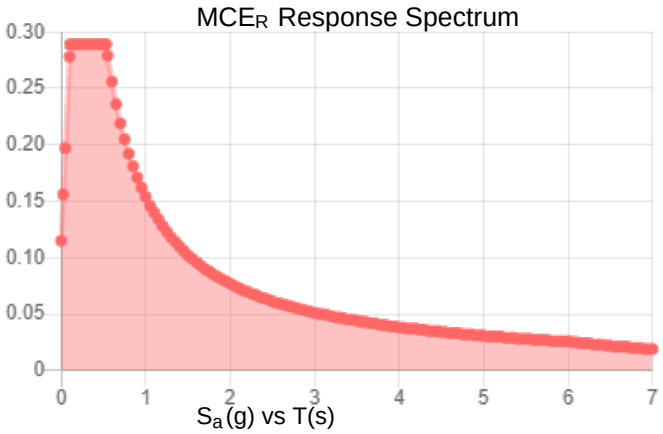
Seismic

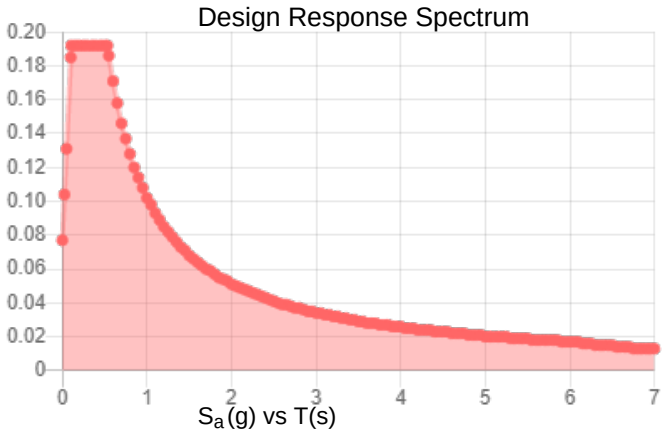
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.18	S_{DS} :	0.192
S_1 :	0.064	S_{D1} :	0.102
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.091
S_{MS} :	0.289	PGA_M :	0.145
S_{M1} :	0.154	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B





Data Accessed: Thu Aug 19 2021

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

Ice

Results:

Ice Thickness:	1.00 in.	Design Ice: 2*1 in. = 2 in.
Concurrent Temperature:	5 F	
Gust Speed:	50 mph	

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

Date Accessed: Thu Aug 19 2021

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

Network Building + Consulting, LLC
1777 Sentry Parkway W, Veva 17, Suite 400
Blue Bell, PA 19422
(267) 460-0122
NBC_SmartTool@nbcllc.com

Post-Mod Antenna Mount Analysis Report and PMI Requirements

Mount Fix

SMART Tool Project #: 10093320
NB+C Project #: 100820

August 16, 2021

Site Information	*Site ID:*	*469115-VZW / HARTFORD NW CT*
	Site Name:	*HARTFORD NW CT*
	Carrier Name:	*Verizon Wireless*
	Address:	*439 HOMESTEAD AVE* *HARTFORD, Connecticut 06112* *Hartford County*
	Latitude:	*41.783711°*
	Longitude:	*-72.703788°*
Structure Information	*Tower Type:*	*140-Ft Monopole*
	Mount Type:	*13.17-Ft Platform*

FUZE ID # 16272354

Analysis Results

Platform: **80.6% Pass**

******Contractor PMI Requirements***:
Included at the end of this MA report
Available & Submitted via portal at https://pmi.vzwsmart.com
Contractor - Please Review Specific Site PMI Requirements Upon Award
Requirements also Noted on Mount Modification Drawings
Requirements may also be Noted on A & E drawings

Report Prepared By: Philip Lin

STATE OF CONNECTICUT
PEN.0028997
LICENSED PROFESSIONAL ENGINEER

8/16/2021

DocuSigned by:
krupakaran kolandaivelu
81AC599182D841D...

Executive Summary:

The objective of this report is to summarize the analysis results of the antenna support mount including the proposed modifications at the subject facility for the final wireless telecommunications configuration, per the applicable codes and standards.

This analysis is inclusive of the mount structure only and does not address the structural capacity of the supporting structure. This mounting frame was not analyzed as an anchor attachment point for fall protection. All climbing activities are required to have a fall protection plan completed by a competent person.

Sources of Information:

Document Type	Remarks
Radio Frequency Data Sheet	*Verizon RFDS, Site ID: 324055, dated July 26, 2021*
Mount Mapping Form	*Roaming Networks Inc., Site No.: 469115, dated April 6, 2021*
Previous Mount Analysis Report	*NB+C Project #: 100820, dated August 3, 2021*
Mount Modification Drawings	*NB+C Project #: 100820, dated August 16, 2021*

Analysis Criteria:

Codes and Standards:	ANSI/TIA-222-H	
Wind Parameters:	Basic Wind Speed (Ultimate 3-sec. Gust), V_{ULT}:	117 mph
	Ice Wind Speed (3-sec. Gust):	50 mph
	Design Ice Thickness:	1.50 in
	Risk Category:	II
	Exposure Category:	B
	Topographic Category:	1
	Topographic Feature Considered:	N/A
	Topographic Method:	N/A
	Ground Elevation Factor, K_e:	0.998
Seismic Parameters:	S_S:	0.186
	S_1:	0.055
Maintenance Parameters:	Wind Speed (3-sec. Gust):	30 mph
	Maintenance Live Load, Lv:	250 lbs.
	Maintenance Live Load, Lm:	500 lbs.
Analysis Software:	RISA-3D (V19)	

Final Loading Configuration:

The following equipment has been considered for the analysis of the mount:

Mount Elevation (ft)	Equipment Elevation (ft)	Quantity	Manufacturer	Model	Status
135.0	137.0	3	Commscope	NHH-65B-R2B	Added
		3	Commscope	NHHSS-65B-R2BT0	
		3	Samsung	MT6407-77A	
		3	Samsung	CBRS RRH - RT4401-48A	
		3	Samsung	RF4439d-25A	
		3	Samsung	RF4440d-13A	
		2	Raycap	OVP-6	
		3	Antel	BXA-80063/4	Retained

The recent mount mapping reported existing OVP units. It is acceptable to install up to any three (3) of the OVP model numbers listed below as required at any location other than the mount face without affecting the structural capacity of the mount. If OVP units are installed on the mount face, a mount re-analysis may be required unless replacing an existing OVP.

Model Number	Ports	AKA
RHSDC-1064-PF-48	2	OVP-2
RC3DC-3315-PF-48	6	OVP-6
RC3DC-3300-PF-48	6	OVP-6
RC3DC-4750-PF-48	6	OVP-6
RHSDC-6627-PF-48	12	OVP-12
RHSDC-6600-PF-48	12	OVP-12

Standard Conditions:

1. All engineering services are performed on the basis that the information provided to Network Building + Consulting and used in this analysis is current and correct. The existing equipment loading has been applied at locations determined from the supplied documentation. Any deviation from the loading locations specified in this report shall be communicated to Network Building + Consulting to verify deviation will not adversely impact the analysis.

2. Mounts are assumed to have been properly fabricated, installed and maintained in good condition, twist free and plumb in accordance with its original design and manufacturer's specifications.

   Obvious safety and structural issues/deficiencies noticed at the time of the mount mapping and reported in the Mount Mapping Report are assumed to be corrected and documented as part of the PMI process and are not considered in the mount analysis.

   The mount analysis and the mount mapping are not a condition assessment of the mount. Proper maintenance and condition assessments are still required post analysis.

3. For mount analyses completed from other data sources (including new replacement mounts) and not specifically mapped by Network Building + Consulting, the mounts are assumed to have been properly fabricated, installed and maintained in good condition, twist free and plumb in accordance with its original design and manufacturer's specifications.

4. 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.

5. The mount was checked up to, and including, the bolts that fasten it to the mount collar/attachment and threaded rod connections in collar members if applicable. Local deformation and interaction between the mount collar/attachment and the supporting tower structure are outside the scope of this analysis.

6. All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. Network Building + Consulting is not responsible for the conclusion, opinions, and recommendations made by others based on the information supplied.

7. Structural Steel Grades have been assumed as follows, if applicable, unless otherwise noted in this analysis:
    - Channel, Solid Round, Angle, Plate — ASTM A36 (Gr. 36)
    - HSS (Rectangular) — ASTM 500 (Gr. B-46)
    - Pipe — ASTM A53 (Gr. B-35)
    - Threaded Rod — F1554 (Gr. 36)
    - Bolts — ASTM A325

8. Any mount modifications listed under Sources of Information are assumed to have been installed per the design specifications.

Discrepancies between in-field conditions and the assumptions listed above may render this analysis invalid unless explicitly approved by Network Building + Consulting.

Analysis Results:

Component	Utilization %	Pass/Fail
Antenna Pipe Mod	45.1 %	Pass
Corner Plate 1	76.4 %	Pass
Corner Plate 2	67.2 %	Pass
Grate Bracing	41.4 %	Pass
Horizontal	41.6 %	Pass
Kicker Mod	24.6 %	Pass
SR Corner Bracing Mod	10.2 %	Pass
Standoff	19.8 %	Pass
Support Rail	80.6 %	Pass
Vertical	56.5 %	Pass
Connection (Weld)	17.4 %	Pass

Structure Rating – *(Controlling Utilization of all Components)*	**80.6%**

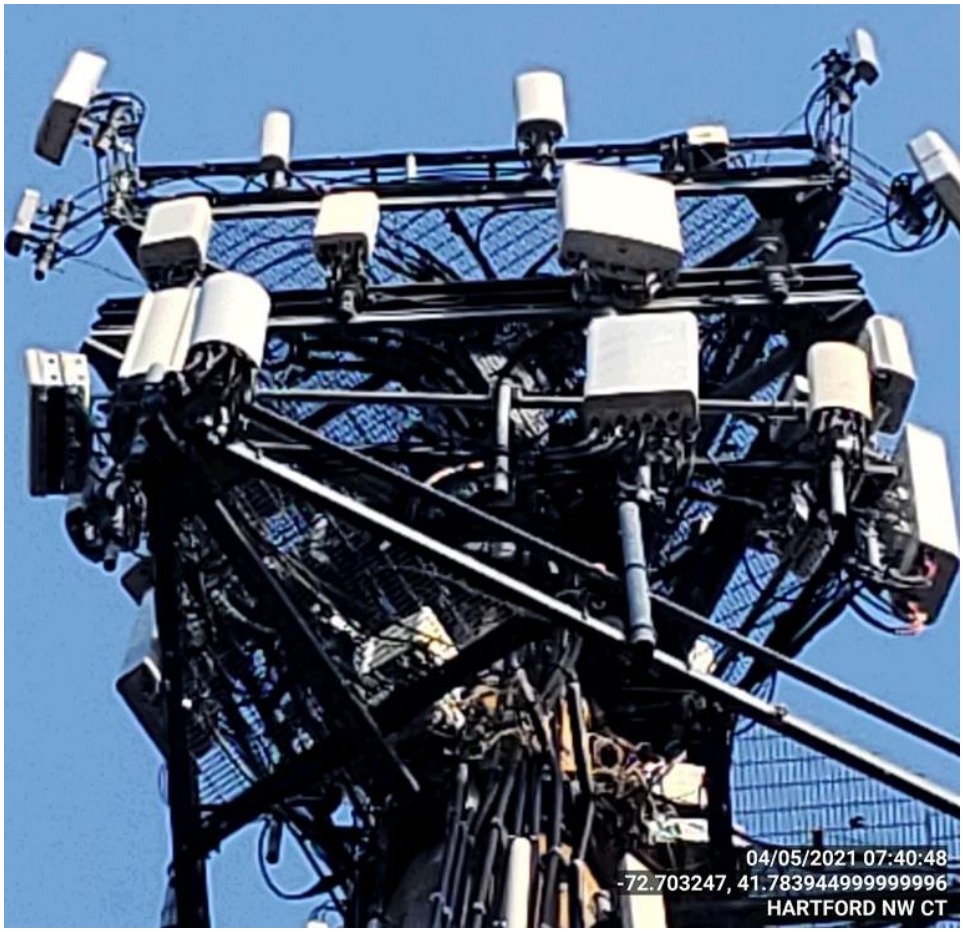
Recommendation:

The existing mount will be **SUFFICIENT** for the final loading after the proposed modifications are successfully completed.

ANSI/ASSP rigging plan review services compliant with the requirements of ANSI/TIA 322 are available for a Construction Class IV site or other, if required. Separate review fees will apply.

Attachments:

1. Mount Photos
2. Mount Mapping Report (for reference only)
3. Analysis Calculations
4. **Contractor Required PMI Report Deliverables**
5. Antenna Placement Diagrams



V3.0 Updated on 8-31-2020

PAUL J. FORD & COMPANY

Antenna Mount Mapping Form (PATENT PENDING)

FCC #
N/A

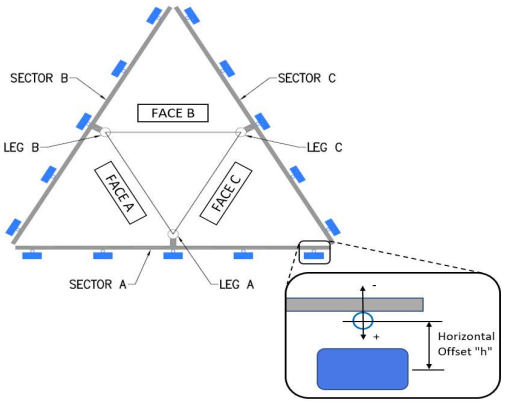
Tower Owner:	Crown Castle	**Mapping Date:**	4/6/2021
Site Name:	HARTFORD NW CT	**Tower Type:**	Monopole
Site Number or ID:	469115	**Tower Height (Ft.):**	132
Mapping Contractor:	Roaming Networks Inc.	**Mount Elevation (Ft.):**	129

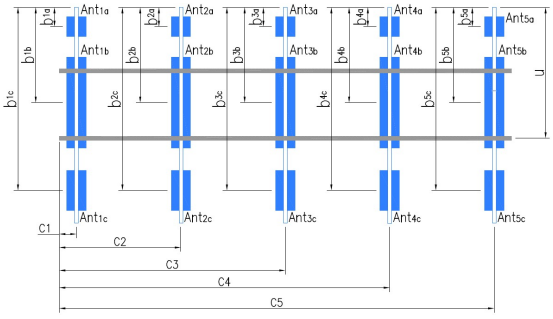
Mount Pipe Configuration and Geometries [Unit = Inches]

Sector / Position	Mount Pipe Size & Length	Vertical Offset Dimension "u"	Horizontal Offset "C1, C2, C3, etc."	Sector / Position	Mount Pipe Size & Length	Vertical Offset Dimension "u"	Horizontal Offset "C1, C2, C3, etc."
A1	PIPE 2.375"Ø X 45" LONG	45.00	34.00	C1	PIPE 2.375"Ø X 45" LONG	45.00	34.00
A2	PIPE 2.375"Ø X 0.17" X 84" LONG	62.00	64.00	C2	PIPE 2.375"Ø X 0.17" X 84" LONG	62.00	64.00
A3	PIPE 2.375"Ø X 45" LONG	45.00	94.00	C3	PIPE 2.375"Ø X 45" LONG	45.00	94.00
A4	PIPE 2.375"Ø X 45" LONG	45.00	124.00	C4	PIPE 2.375"Ø X 45" LONG	45.00	124.00
A5	PIPE 2.375"Ø X 0.17" X 84" LONG	70.00	160.00	C5	PIPE 2.375"Ø X 0.17" X 84" LONG	70.00	160.00
A6	PIPE 2.375"Ø X 0.17" X 84" LONG	67.00	160.00	C6	PIPE 2.375"Ø X 0.17" X 84" LONG	67.00	160.00
B1	PIPE 2.375"Ø X 45" LONG	45.00	34.00	D1			
B2	PIPE 2.375"Ø X 0.17" X 84" LONG	62.00	64.00	D2			
B3	PIPE 2.375"Ø X 45" LONG	45.00	94.00	D3			
B4	PIPE 2.375"Ø X 45" LONG	45.00	124.00	D4			
B5	PIPE 2.375"Ø X 0.17" X 84" LONG	70.00	160.00	D5			
B6	PIPE 2.375"Ø X 0.17" X 84" LONG	67.00	160.00	D6			

Distance between bottom rail and mount CL elevation (dim d). Unit is inches. See 'Mount Elev Ref' tab for details. :	0.00
Distance from top of bottom support rail to lowest tip of ant./eqpt. of Carrier above. (N/A if > 10 ft.) :	
Distance from top of bottom support rail to highest tip of ant./eqpt. of Carrier below. (N/A if > 10 ft.) :	6
Please enter additional infomation or comments below.	

Tower Face Width at Mount Elev. (ft.):		Tower Leg Size or Pole Shaft Diameter at Mount Elev. (in.):	27.7



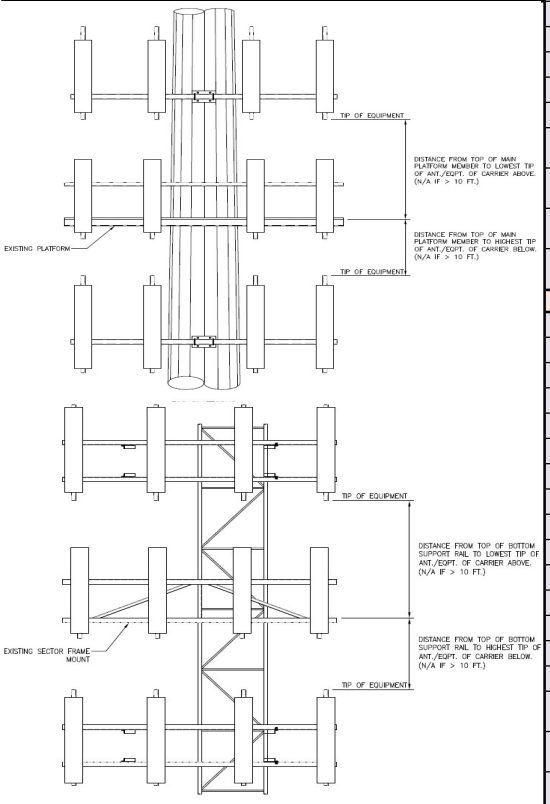


Antenna Layout (Looking Out From Tower)

Ants. Items	Enter antenna model. If not labeled, enter "Unknown". Antenna Models if Known	Width (in.)	Depth (in.)	Height (in.)	Coax Size and Qty	Antenna Center-line (Ft.)	Mounting Locations [Units are inches and degrees] Vertical Distances"b_{1a}, b_{2a}, b_{3a}, b_{1b}...." (Inches)	Horiz. Offset "h" (Use "-" if Ant. is behind)	Antenna Azimuth (Degrees)	Photos of antennas Photo Numbers
	Sector A									
Ant_{1a}	9442 RRH2x40-AWS	10.63	6.70	24.40		130.75	24.00			8
Ant_{1b}	Unknown	6.50	0.75	5.50		132.75				9
Ant_{1c}										
Ant_{2a}	BXA-80063-4BF-EDIN-	11.20	5.00	47.40		130.833	40.00	10.00	33.00	10
Ant_{2b}										
Ant_{2c}										
Ant_{3a}										
Ant_{3b}										
Ant_{3c}										
Ant_{4a}	Unknown	6.50	0.75	5.50		132.75		-2.00		6
Ant_{4b}	BXA-171063-8CF-EDIN	11.20	5.20	94.70		131.167	19.00	10.00	33.00	5
Ant_{4c}										
Ant_{5a}	X7C-FRO-660-VR0	14.60	8.20	72.00		130.5	52.00	10.00	101.00	13
Ant_{5b}										
Ant_{5c}										
Ant on Standoff	BXA-171063-8CF-EDIN	11.20	5.20	94.70		130.833	48.00	8.00	101.00	15
Ant on Standoff										
Ant on Tower	RRFDC-3315-PF-48									227
Ant on Tower										

Mount Azimuth (Degree) for Each Sector				Tower Leg Azimuth (Degree) for Each Sector	
Sector A:	33.00	Deg	Leg A:		Deg
Sector B:	153.00	Deg	Leg B:		Deg
Sector C:	173.00	Deg	Leg C:		Deg
Sector D:		Deg	Leg D:		Deg

Climbing Facility Information		
Location:	173.00 Deg	Sector C
Climbing Facility	Corrosion Type:	N/A
	Access:	Climbing path was obstructed.
	Condition:	Good condition.



Sector B										
Ant_{1a}	9442 RRH2x40-AWS	10.63	6.70	24.40		130.75	24.00			188
Ant_{1b}	Unknown	6.50	0.75	5.50		132.75				188
Ant_{1c}										
Ant_{2a}	BXA-80063-4BF-EDIN-	11.20	5.00	47.40		130.833	40.00	10.00	158.00	188
Ant_{2b}										
Ant_{2c}										
Ant_{3a}										
Ant_{3b}										
Ant_{3c}										
Ant_{4a}	Unknown	6.50	0.75	5.50		132.75		-2.00		189
Ant_{4b}	BXA-171063-8CF-EDIN	11.20	5.20	94.70		131.167	19.00	10.00	158.00	189
Ant_{4c}										
Ant_{5a}	X7C-FRO-660-VR0	14.60	8.20	72.00		130.5	52.00	10.00	226.00	189
Ant_{5b}										
Ant_{5c}										
Ant on Standoff	BXA-171063-8CF-EDIN	11.20	5.20	94.70		130.833	48.00	8.00	226.00	189
Ant on Standoff										
Ant on Tower										
Ant on Tower										
Sector C										
Ant_{1a}	9442 RRH2x40-AWS	10.63	6.70	24.40		130.75	24.00			198
Ant_{1b}	Unknown	6.50	0.75	5.50		132.75				198
Ant_{1c}										
Ant_{2a}	BXA-80063-4BF-EDIN-	11.20	5.00	47.40		130.833	40.00	10.00	274.00	198
Ant_{2b}										
Ant_{2c}										
Ant_{3a}										
Ant_{3b}										
Ant_{3c}										
Ant_{4a}	Unknown	6.50	0.75	5.50		132.75		-2.00		199
Ant_{4b}	BXA-171063-8CF-EDIN	11.20	5.20	94.70		131.167	19.00	10.00	274.00	199
Ant_{4c}										
Ant_{5a}	X7C-FRO-660-VR0	14.60	8.20	72.00		130.5	52.00	10.00	342.00	199
Ant_{5b}										
Ant_{5c}										
Ant on Standoff	BXA-171063-8CF-EDIN	11.20	5.20	94.70		130.833	48.00	8.00	342.00	199
Ant on Standoff										
Ant on Tower										
Ant on Tower										
Sector D										
Ant_{1a}										
Ant_{1b}										
Ant_{1c}										
Ant_{2a}										
Ant_{2b}										
Ant_{2c}										
Ant_{3a}										
Ant_{3b}										
Ant_{3c}										
Ant_{4a}										
Ant_{4b}										
Ant_{4c}										
Ant_{5a}										
Ant_{5b}										
Ant_{5c}										
Ant on Standoff										
Ant on Standoff										
Ant on Tower										
Ant on Tower										

Observed Safety and Structural Issues During the Mount Mapping		
Issue #	Description of Issue	Photo #

1		
2		
3		
4		
5		
6		
7		
8		

Mapping Notes
1. Please report any visible structural or safety issues observed on the antenna mounts (Damaged members, loose connections, tilting mounts, safety climb issues, etc.)
2. If the thickness of the existing pipes or tubing can't be obtained from a general tool (such as Caliper), please use an ultrasonic measurement tool (thickness gauge) to measure the thickness.
3. Please create all required detail sketches of the mounts and insert them into the "Sketches" tab.
4. Please measure and enter the bolt sizes and types under the Members Box in the spreadsheet of the mount type.
5. Take and label the photos of the tower, mounts, connections, antennas and all measurements. Minimum 50 photos are required.
6. Please measure and report the size and length of all existing antenna mounting pipes.
7. Please measure and report the antenna information for all sectors.
8. Don't delete or rearrange any sheet or contents of any sheet from this mapping form.

Standard Conditions
1. Obvious safety and structural issues/deficiencies noticed at the time of the mount mapping are to be reported in this mapping. However, this mount mapping is not a condition assessment of the mount.

V3.0 Updated on 8-31-2020

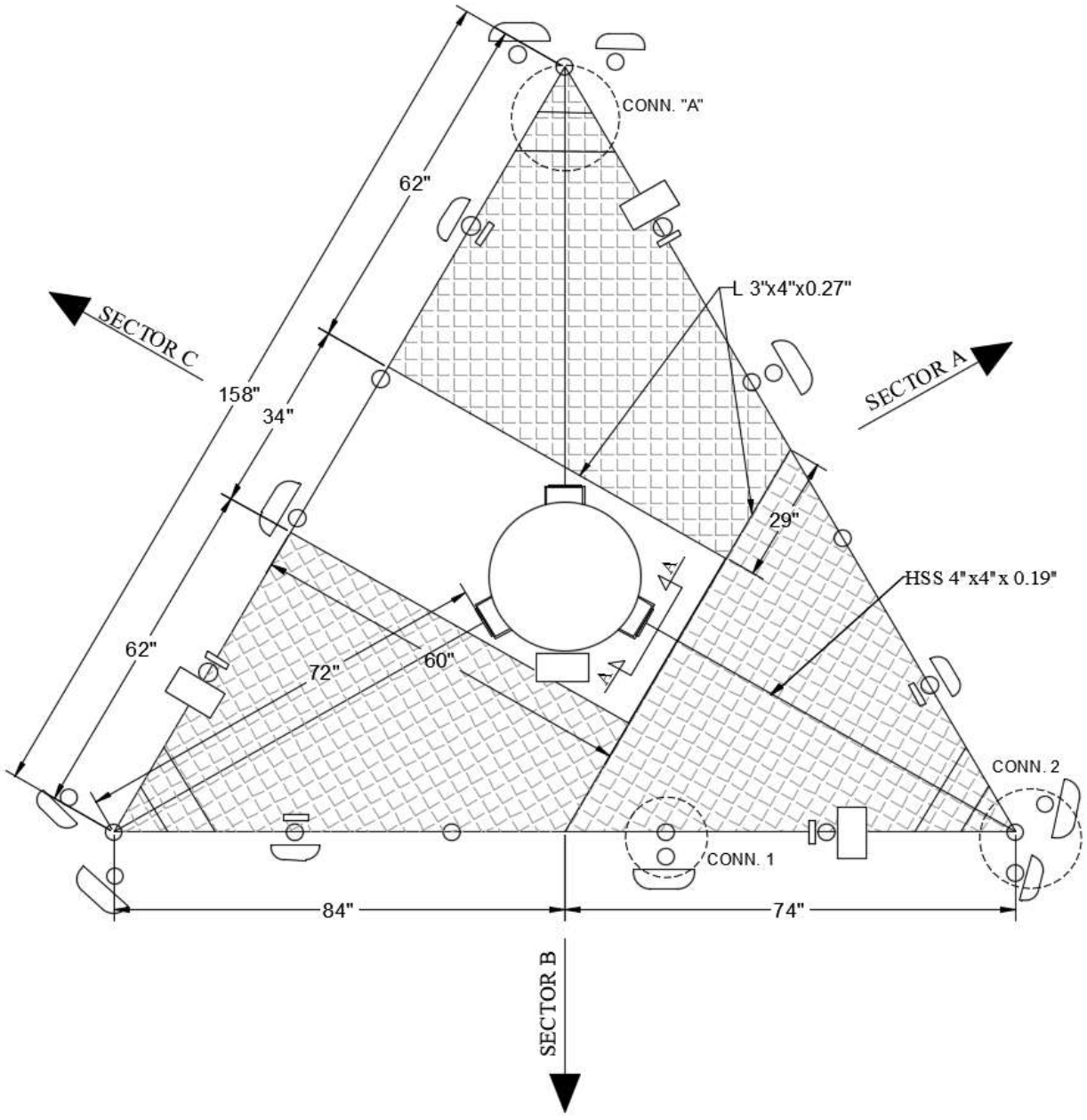
PAUL J. FORD & COMPANY

Antenna Mount Mapping Form (PATENT PENDING)

FCC # N/A

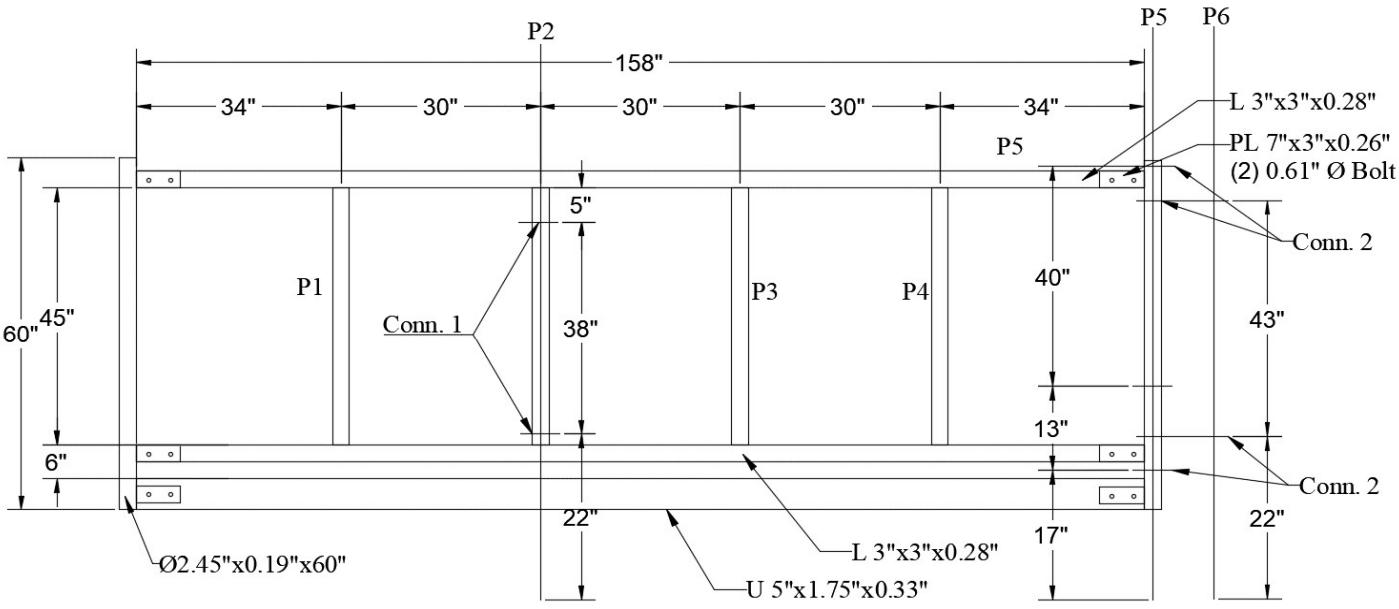
Tower Owner:	Crown Castle	**Mapping Date:**	4/6/2021
Site Name:	HARTFORD NW CT	**Tower Type:**	Monopole
Site Number or ID:	469115	**Tower Height (Ft.):**	132
Mapping Contractor:	Roaming Networks Inc.	**Mount Elevation (Ft.):**	129

Please Insert Sketches of the Antenna Mount

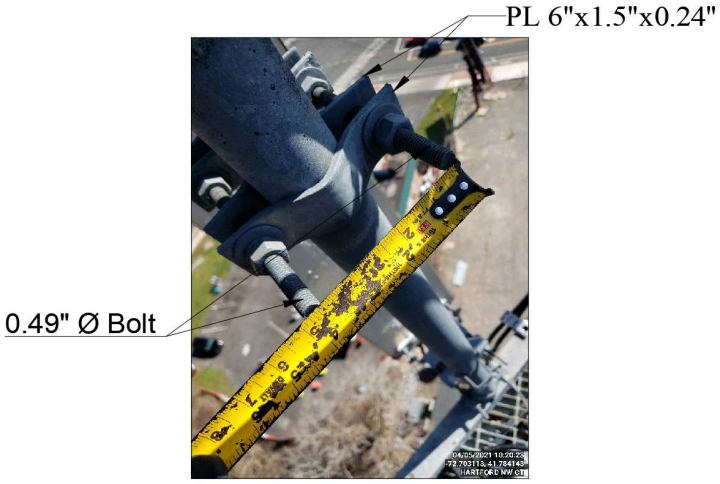


ANTENNA PLAN VIEW

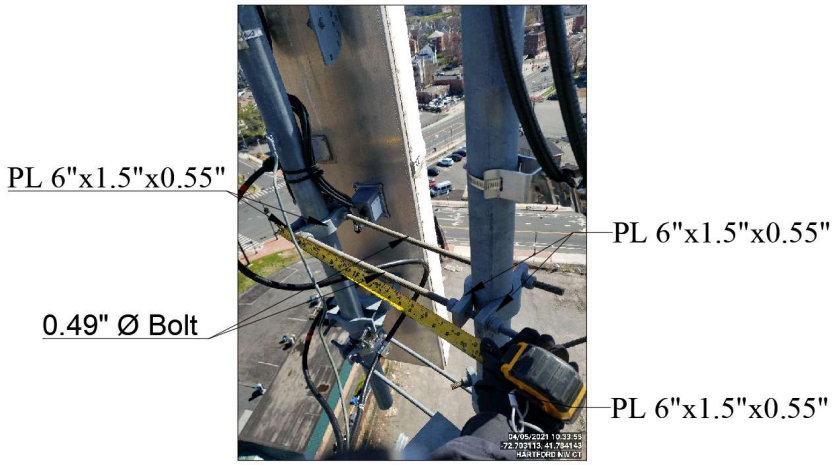
Please Insert Sketches of the Antenna Mount, cont'd



Back View

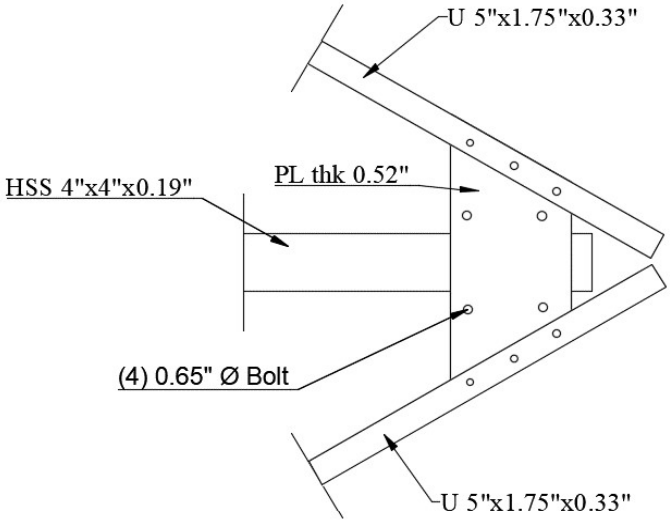


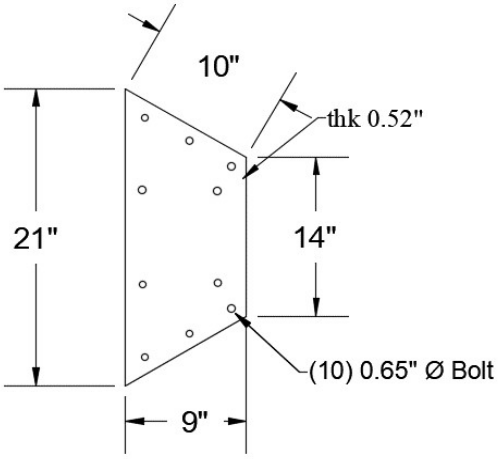
Conn. 1

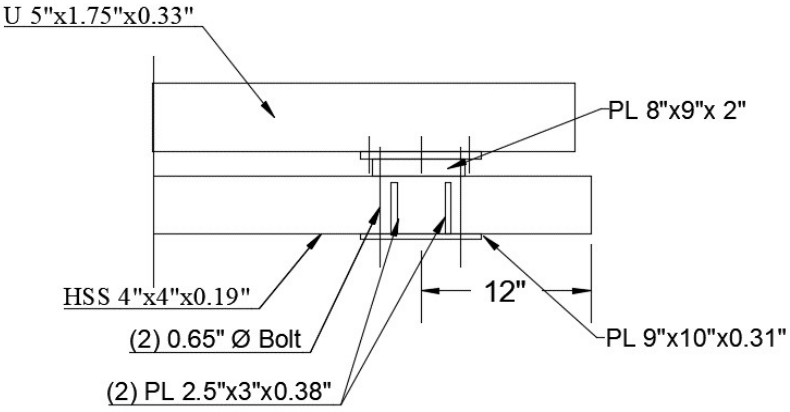


Conn. 2

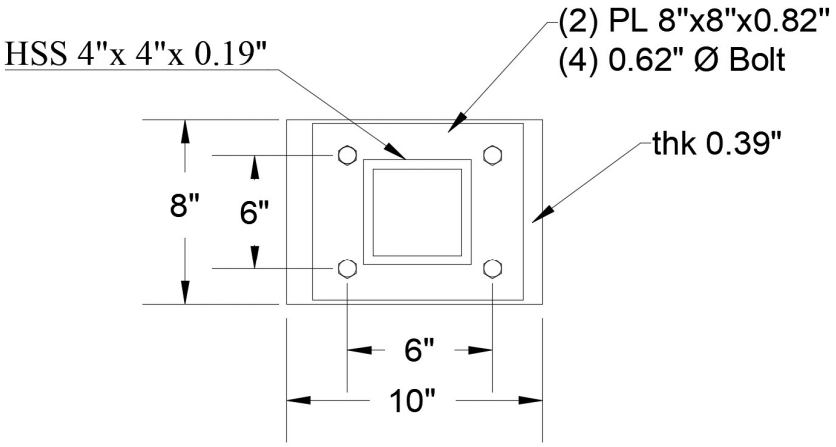
Please Insert Sketches of the Antenna Mount, cont'd



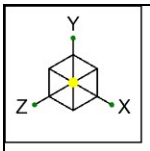


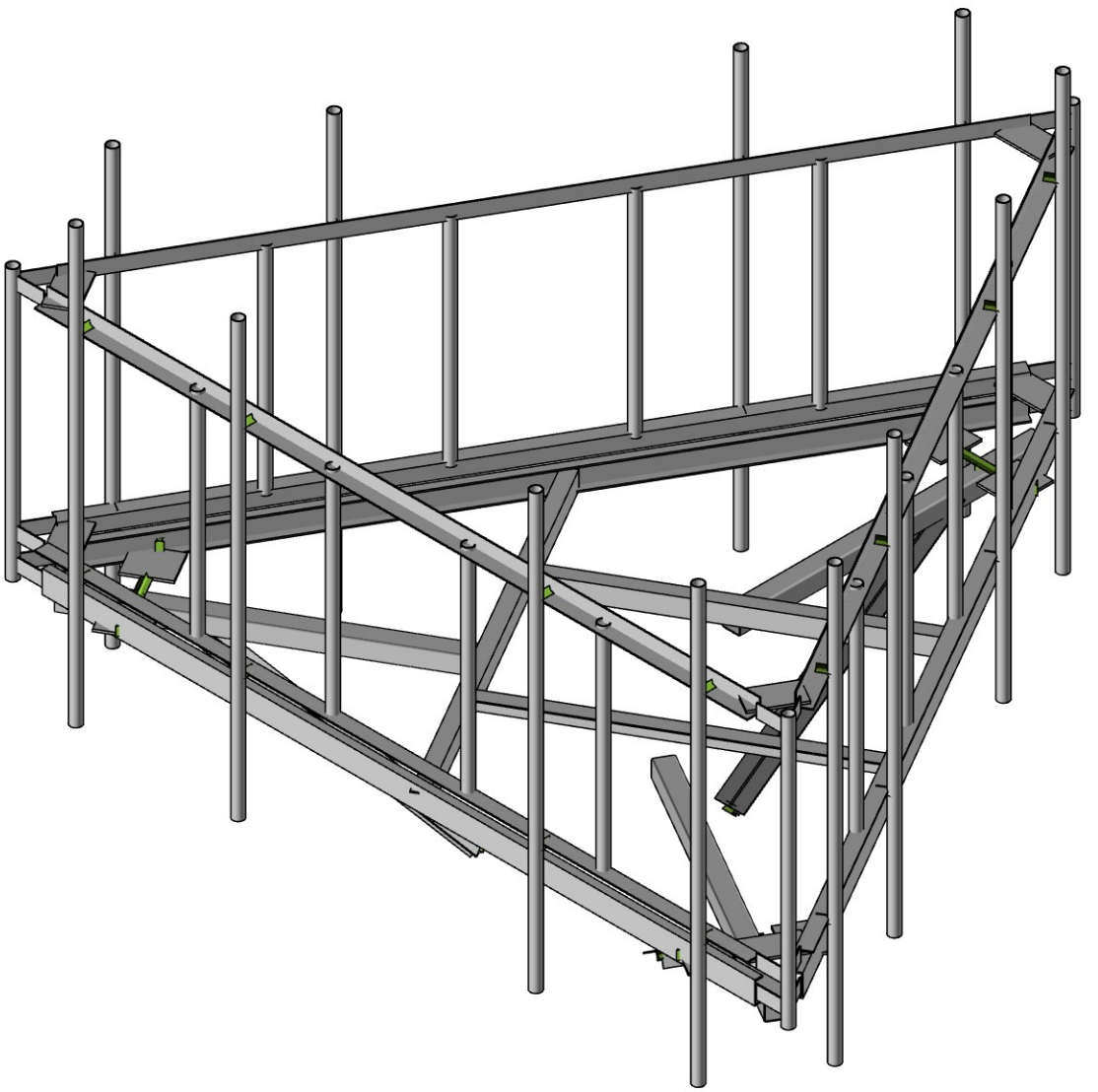


CONN. "A"



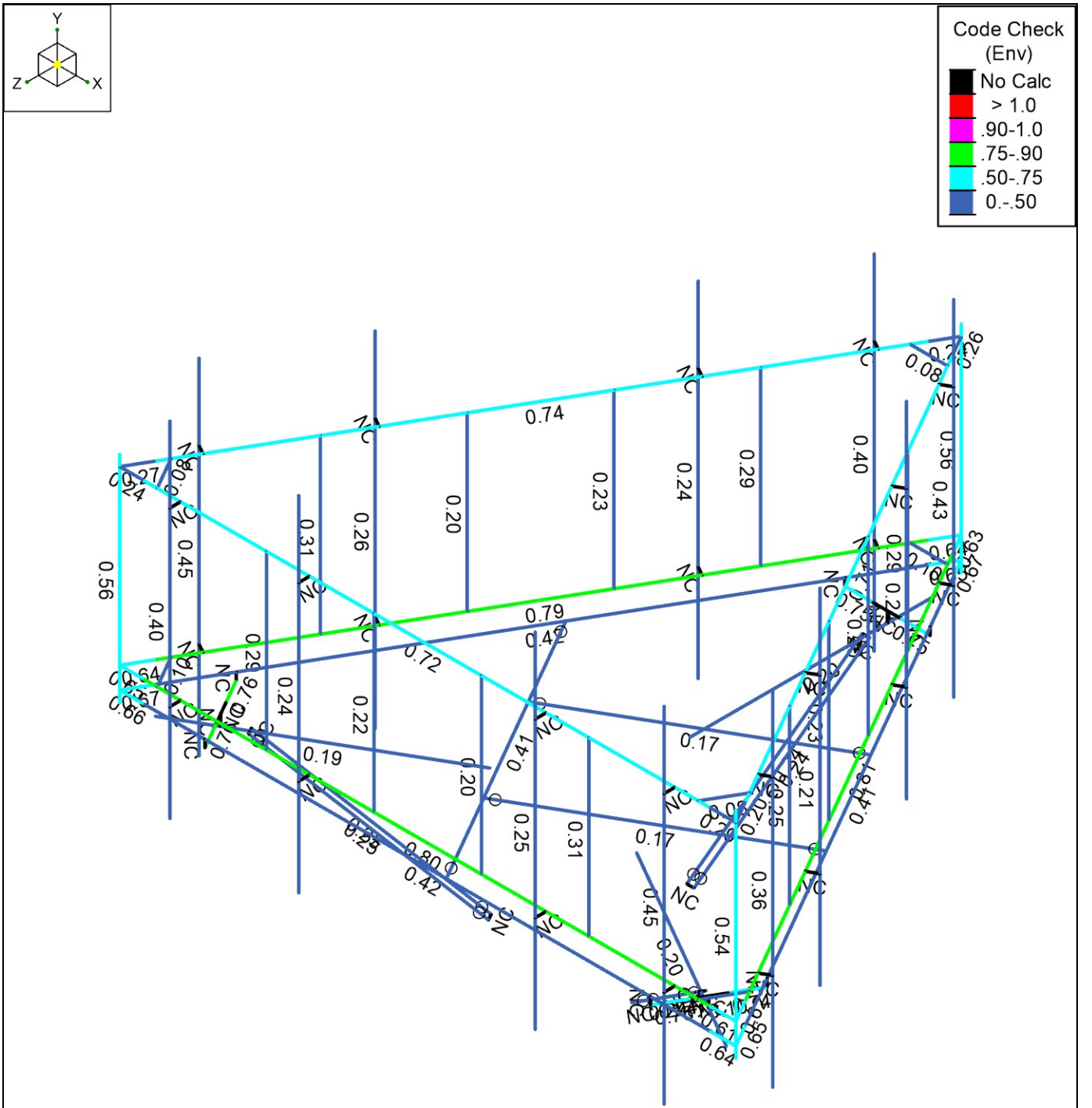
VIEW "A"





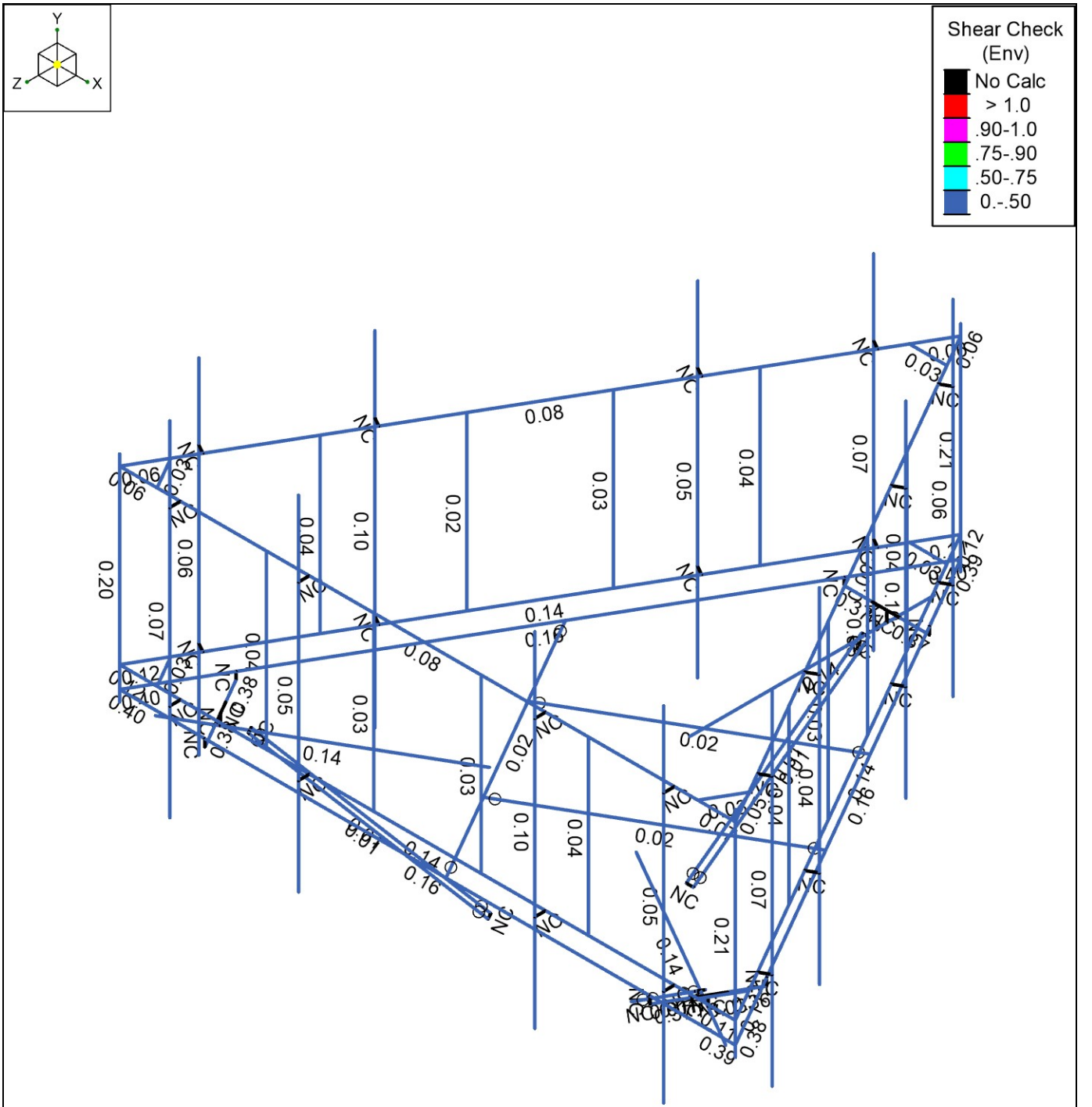
Envelope Only Solution

Network Building + Consulting	469115-VZW_MT_LO_H	SK-1
Philip Lin		Aug 13, 2021
Project No. 10093320		469115-VZW_MT_LO_H.r3d



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Network Building + Consulting	469115-VZW_MT_LO_H	SK-2
Philip Lin		Aug 13, 2021
Project No. 10093320		469115-VZW_MT_LO_H.r3d



Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

Network Building + Consulting	469115-VZW_MT_LO_H	SK-3
Philip Lin		Aug 13, 2021
Project No. 10093320		469115-VZW_MT_LO_H.r3d

Model Settings

Solution

Members

Number of Reported Sections	5
Number of Internal Sections	100
Member Area Load Mesh Size (in^2)	144
Consider Shear Deformation	Yes
Consider Torsional Warping	Yes

Wall Panels

Approximate Mesh Size (in)	24
Transfer Forces Between Intersecting Wood Walls	Yes
Increase Wood Wall Nailing Capacity for Wind Loads	Yes
Include P-Delta for Walls	Yes
Optimize Masonry and Wood Walls	Yes
Maximum Number of Iterations	3

Processor Core Utilization

Single	No
Multiple (Optimum)	Yes
Maximum	No

Axis

Vertical Global Axis

Global Axis corresponding to vertical direction	Y
Convert Existing Data	Yes

Default Member Orientation

Default Global Plane for z-axis	XZ

Plate Axis

Plate Local Axis Orientation	Global

Codes

Hot Rolled Steel	AISC 15th (360-16): LRFD
Stiffness Adjustment	Yes (Iterative)
Notional Annex	None
Connections	AISC 14th (360-10): ASD
Cold Formed Steel	AISI S100-16: LRFD
Stiffness Adjustment	Yes (Iterative)
Wood	AWC NDS-18: ASD
Temperature	< 100F
Concrete	ACI 318-14
Masonry	TMS 402-16: ASD
Aluminum	AA ADM1-15: ASD
Structure Type	Building
Stiffness Adjustment	Yes (Iterative)
Stainless	AISC 14th (360-10): ASD
Stiffness Adjustment	Yes (Iterative)

Concrete

Column Design

Analysis Methodology	Exact Integration Method
Parme Beta Factor	0.65

Model Settings (Continued)

Compression Stress Block	Rectangular Stress Block
Analyze using Cracked Sections	Yes
Leave room for horizontal rebar splices (2*d bar spacing)	No
List forces which were ignored for design in the Detail Report	Yes

Rebar

Column Min Steel	1
Column Max Steel	8
Rebar Material Spec	ASTM A615
Warn if beam-column framing arrangement is not understood	No

Shear Reinforcement

Number of Shear Regions	4
Region 2 & 3 Spacing Increase Increment (in)	4

Seismic

RISA-3D Seismic Load Options

Code	ASCE 7-16
Risk Category	I or II
Drift Cat	Other
Base Elevation (ft)	
Include the weight of the structure in base shear calcs	Yes

Site Parameters

S_1 (g)	1
SD_1 (g)	1
SD_S (g)	1
T_L (sec)	5

Structure Characteristics

T Z (sec)	
T X (sec)	
C_tX	0.02
C_tExp. Z	0.75
C_tExp. X	0.75
R Z	3
R X	3
Ω_0Z	1
Ω_0X	1
C_dZ	4
C_dX	4
ρ Z	1
ρ X	1

Basic Load Cases

	BLC Description	Category	Y Gravity	Point	Distributed	Area(Member)
1	Antenna D	None		105		
2	Antenna Di	None		105		
3	Antenna Wo (0 Deg)	None		105		
4	Antenna Wo (30 Deg)	None		105		
5	Antenna Wo (60 Deg)	None		105		
6	Antenna Wo (90 Deg)	None		105		
7	Antenna Wo (120 Deg)	None		105		
8	Antenna Wo (150 Deg)	None		105		
9	Antenna Wo (180 Deg)	None		105		
10	Antenna Wo (210 Deg)	None		105		
11	Antenna Wo (240 Deg)	None		105		
12	Antenna Wo (270 Deg)	None		105		
13	Antenna Wo (300 Deg)	None		105		
14	Antenna Wo (330 Deg)	None		105		
15	Antenna Wi (0 Deg)	None		105		
16	Antenna Wi (30 Deg)	None		105		
17	Antenna Wi (60 Deg)	None		105		
18	Antenna Wi (90 Deg)	None		105		
19	Antenna Wi (120 Deg)	None		105		
20	Antenna Wi (150 Deg)	None		105		
21	Antenna Wi (180 Deg)	None		105		
22	Antenna Wi (210 Deg)	None		105		
23	Antenna Wi (240 Deg)	None		105		
24	Antenna Wi (270 Deg)	None		105		
25	Antenna Wi (300 Deg)	None		105		
26	Antenna Wi (330 Deg)	None		105		
27	Antenna Wm (0 Deg)	None		105		
28	Antenna Wm (30 Deg)	None		105		
29	Antenna Wm (60 Deg)	None		105		
30	Antenna Wm (90 Deg)	None		105		
31	Antenna Wm (120 Deg)	None		105		
32	Antenna Wm (150 Deg)	None		105		
33	Antenna Wm (180 Deg)	None		105		
34	Antenna Wm (210 Deg)	None		105		
35	Antenna Wm (240 Deg)	None		105		
36	Antenna Wm (270 Deg)	None		105		
37	Antenna Wm (300 Deg)	None		105		
38	Antenna Wm (330 Deg)	None		105		
39	Structure D	None	-1			1
40	Structure Di	None			129	1
41	Structure Wo (0 Deg)	None			258	
42	Structure Wo (30 Deg)	None			258	
43	Structure Wo (60 Deg)	None			258	
44	Structure Wo (90 Deg)	None			258	
45	Structure Wo (120 Deg)	None			258	
46	Structure Wo (150 Deg)	None			258	
47	Structure Wo (180 Deg)	None			258	
48	Structure Wo (210 Deg)	None			258	
49	Structure Wo (240 Deg)	None			258	
50	Structure Wo (270 Deg)	None			258	
51	Structure Wo (300 Deg)	None			258	
52	Structure Wo (330 Deg)	None			258	
53	Structure Wi (0 Deg)	None			258	
54	Structure Wi (30 Deg)	None			258	
55	Structure Wi (60 Deg)	None			258	

Basic Load Cases (Continued)

	BLC Description	Category	Y Gravity	Point	Distributed	Area(Member)
56	Structure Wi (90 Deg)	None			258	
57	Structure Wi (120 Deg)	None			258	
58	Structure Wi (150 Deg)	None			258	
59	Structure Wi (180 Deg)	None			258	
60	Structure Wi (210 Deg)	None			258	
61	Structure Wi (240 Deg)	None			258	
62	Structure Wi (270 Deg)	None			258	
63	Structure Wi (300 Deg)	None			258	
64	Structure Wi (330 Deg)	None			258	
65	Structure Wm (0 Deg)	None			258	
66	Structure Wm (30 Deg)	None			258	
67	Structure Wm (60 Deg)	None			258	
68	Structure Wm (90 Deg)	None			258	
69	Structure Wm (120 Deg)	None			258	
70	Structure Wm (150 Deg)	None			258	
71	Structure Wm (180 Deg)	None			258	
72	Structure Wm (210 Deg)	None			258	
73	Structure Wm (240 Deg)	None			258	
74	Structure Wm (270 Deg)	None			258	
75	Structure Wm (300 Deg)	None			258	
76	Structure Wm (330 Deg)	None			258	
77	Lm1	None		1		
78	Lm2	None		1		
79	Lv1	None		1		
80	Lv2	None		1		
81	BLC 39 Transient Area Loads	None			35	
82	BLC 40 Transient Area Loads	None			35	

Load Combinations

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	1.2D+1.0Wo (0 Deg)	Yes	Y	1	1.2	39	1.2	3	1	41	1				
2	1.2D+1.0Wo (30 Deg)	Yes	Y	1	1.2	39	1.2	4	1	42	1				
3	1.2D+1.0Wo (60 Deg)	Yes	Y	1	1.2	39	1.2	5	1	43	1				
4	1.2D+1.0Wo (90 Deg)	Yes	Y	1	1.2	39	1.2	6	1	44	1				
5	1.2D+1.0Wo (120 Deg)	Yes	Y	1	1.2	39	1.2	7	1	45	1				
6	1.2D+1.0Wo (150 Deg)	Yes	Y	1	1.2	39	1.2	8	1	46	1				
7	1.2D+1.0Wo (180 Deg)	Yes	Y	1	1.2	39	1.2	9	1	47	1				
8	1.2D+1.0Wo (210 Deg)	Yes	Y	1	1.2	39	1.2	10	1	48	1				
9	1.2D+1.0Wo (240 Deg)	Yes	Y	1	1.2	39	1.2	11	1	49	1				
10	1.2D+1.0Wo (270 Deg)	Yes	Y	1	1.2	39	1.2	12	1	50	1				
11	1.2D+1.0Wo (300 Deg)	Yes	Y	1	1.2	39	1.2	13	1	51	1				
12	1.2D+1.0Wo (330 Deg)	Yes	Y	1	1.2	39	1.2	14	1	52	1				
13	1.2D + 1.0Di + 1.0Wi (0 Deg)	Yes	Y	1	1.2	39	1.2	2	1	40	1	15	1	53	1
14	1.2D + 1.0Di + 1.0Wi (30 Deg)	Yes	Y	1	1.2	39	1.2	2	1	40	1	16	1	54	1
15	1.2D + 1.0Di + 1.0Wi (60 Deg)	Yes	Y	1	1.2	39	1.2	2	1	40	1	17	1	55	1
16	1.2D + 1.0Di + 1.0Wi (90 Deg)	Yes	Y	1	1.2	39	1.2	2	1	40	1	18	1	56	1
17	1.2D + 1.0Di + 1.0Wi (120 Deg)	Yes	Y	1	1.2	39	1.2	2	1	40	1	19	1	57	1
18	1.2D + 1.0Di + 1.0Wi (150 Deg)	Yes	Y	1	1.2	39	1.2	2	1	40	1	20	1	58	1
19	1.2D + 1.0Di + 1.0Wi (180 Deg)	Yes	Y	1	1.2	39	1.2	2	1	40	1	21	1	59	1
20	1.2D + 1.0Di + 1.0Wi (210 Deg)	Yes	Y	1	1.2	39	1.2	2	1	40	1	22	1	60	1
21	1.2D + 1.0Di + 1.0Wi (240 Deg)	Yes	Y	1	1.2	39	1.2	2	1	40	1	23	1	61	1
22	1.2D + 1.0Di + 1.0Wi (270 Deg)	Yes	Y	1	1.2	39	1.2	2	1	40	1	24	1	62	1
23	1.2D + 1.0Di + 1.0Wi (300 Deg)	Yes	Y	1	1.2	39	1.2	2	1	40	1	25	1	63	1
24	1.2D + 1.0Di + 1.0Wi (330 Deg)	Yes	Y	1	1.2	39	1.2	2	1	40	1	26	1	64	1
25	1.2D + 1.5Lm1 + 1.0Wm (0 Deg)	Yes	Y	1	1.2	39	1.2	77	1.5	27	1	65	1		

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
26	1.2D + 1.5Lm1 + 1.0Wm (30 Deg)	Yes	Y	1	1.2	39	1.2	77	1.5	28	1	66	1		
27	1.2D + 1.5Lm1 + 1.0Wm (60 Deg)	Yes	Y	1	1.2	39	1.2	77	1.5	29	1	67	1		
28	1.2D + 1.5Lm1 + 1.0Wm (90 Deg)	Yes	Y	1	1.2	39	1.2	77	1.5	30	1	68	1		
29	1.2D + 1.5Lm1 + 1.0Wm (120 Deg)	Yes	Y	1	1.2	39	1.2	77	1.5	31	1	69	1		
30	1.2D + 1.5Lm1 + 1.0Wm (150 Deg)	Yes	Y	1	1.2	39	1.2	77	1.5	32	1	70	1		
31	1.2D + 1.5Lm1 + 1.0Wm (180 Deg)	Yes	Y	1	1.2	39	1.2	77	1.5	33	1	71	1		
32	1.2D + 1.5Lm1 + 1.0Wm (210 Deg)	Yes	Y	1	1.2	39	1.2	77	1.5	34	1	72	1		
33	1.2D + 1.5Lm1 + 1.0Wm (240 Deg)	Yes	Y	1	1.2	39	1.2	77	1.5	35	1	73	1		
34	1.2D + 1.5Lm1 + 1.0Wm (270 Deg)	Yes	Y	1	1.2	39	1.2	77	1.5	36	1	74	1		
35	1.2D + 1.5Lm1 + 1.0Wm (300 Deg)	Yes	Y	1	1.2	39	1.2	77	1.5	37	1	75	1		
36	1.2D + 1.5Lm1 + 1.0Wm (330 Deg)	Yes	Y	1	1.2	39	1.2	77	1.5	38	1	76	1		
37	1.2D + 1.5Lm2 + 1.0Wm (0 Deg)	Yes	Y	1	1.2	39	1.2	78	1.5	27	1	65	1		
38	1.2D + 1.5Lm2 + 1.0Wm (30 Deg)	Yes	Y	1	1.2	39	1.2	78	1.5	28	1	66	1		
39	1.2D + 1.5Lm2 + 1.0Wm (60 Deg)	Yes	Y	1	1.2	39	1.2	78	1.5	29	1	67	1		
40	1.2D + 1.5Lm2 + 1.0Wm (90 Deg)	Yes	Y	1	1.2	39	1.2	78	1.5	30	1	68	1		
41	1.2D + 1.5Lm2 + 1.0Wm (120 Deg)	Yes	Y	1	1.2	39	1.2	78	1.5	31	1	69	1		
42	1.2D + 1.5Lm2 + 1.0Wm (150 Deg)	Yes	Y	1	1.2	39	1.2	78	1.5	32	1	70	1		
43	1.2D + 1.5Lm2 + 1.0Wm (180 Deg)	Yes	Y	1	1.2	39	1.2	78	1.5	33	1	71	1		
44	1.2D + 1.5Lm2 + 1.0Wm (210 Deg)	Yes	Y	1	1.2	39	1.2	78	1.5	34	1	72	1		
45	1.2D + 1.5Lm2 + 1.0Wm (240 Deg)	Yes	Y	1	1.2	39	1.2	78	1.5	35	1	73	1		
46	1.2D + 1.5Lm2 + 1.0Wm (270 Deg)	Yes	Y	1	1.2	39	1.2	78	1.5	36	1	74	1		
47	1.2D + 1.5Lm2 + 1.0Wm (300 Deg)	Yes	Y	1	1.2	39	1.2	78	1.5	37	1	75	1		
48	1.2D + 1.5Lm2 + 1.0Wm (330 Deg)	Yes	Y	1	1.2	39	1.2	78	1.5	38	1	76	1		
49	1.2D + 1.5Lv1	Yes	Y	1	1.2	39	1.2	79	1.5						
50	1.2D + 1.5Lv2	Yes	Y	1	1.2	39	1.2	80	1.5						
51	1.4D	Yes	Y	1	1.4	39	1.4								
52	Seismic Mass		Y	1	1	39	1								
53	1.2D + 1.0Ev + 1.0Eh (0 Deg)		Y	1	1.2	39	1.2	SX		SY	1	SZ	-1		
54	1.2D + 1.0Ev + 1.0Eh (30 Deg)		Y	1	1.2	39	1.2	SX	0.5	SY	1	SZ	-0.866		
55	1.2D + 1.0Ev + 1.0Eh (60 Deg)		Y	1	1.2	39	1.2	SX	0.866	SY	1	SZ	-0.5		
56	1.2D + 1.0Ev + 1.0Eh (90 Deg)		Y	1	1.2	39	1.2	SX	1	SY	1	SZ			
57	1.2D + 1.0Ev + 1.0Eh (120 Deg)		Y	1	1.2	39	1.2	SX	0.866	SY	1	SZ	0.5		
58	1.2D + 1.0Ev + 1.0Eh (150 Deg)		Y	1	1.2	39	1.2	SX	0.5	SY	1	SZ	0.866		
59	1.2D + 1.0Ev + 1.0Eh (180 Deg)		Y	1	1.2	39	1.2	SX		SY	1	SZ	1		
60	1.2D + 1.0Ev + 1.0Eh (210 Deg)		Y	1	1.2	39	1.2	SX	-0.5	SY	1	SZ	0.866		
61	1.2D + 1.0Ev + 1.0Eh (240 Deg)		Y	1	1.2	39	1.2	SX	-0.866	SY	1	SZ	0.5		
62	1.2D + 1.0Ev + 1.0Eh (270 Deg)		Y	1	1.2	39	1.2	SX	-1	SY	1	SZ			
63	1.2D + 1.0Ev + 1.0Eh (300 Deg)		Y	1	1.2	39	1.2	SX	-0.866	SY	1	SZ	-0.5		
64	1.2D + 1.0Ev + 1.0Eh (330 Deg)		Y	1	1.2	39	1.2	SX	-0.5	SY	1	SZ	-0.866		

Node Coordinates

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
1	N1	2.75	6.25	4.387677	
2	N2	2.42484	6.25	-4.575408	
3	N3	5.17484	6.25	0.187731	
4	N4	-5.75	6.25	4.387677	
5	N5	6.67484	6.25	2.785808	
6	N6	-5.17484	6.25	0.187731	
7	N7	-6.67484	6.25	2.785808	
8	N8	-2.42484	6.25	-4.575408	
9	N9	-0.92484	6.25	-7.173485	
10	N10	0.92484	6.25	-7.173485	
11	N11	-2.75	6.25	4.387677	
12	N12	5.75	6.25	4.387677	
13	N13	-8.465705	5.666667	3.387677	

Node Coordinates (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
14	N14	-4.641346	5.666667	-1.236307	
15	N15	1.25	5.666667	4.637677	
16	N16	1.299038	5.666667	-9.025354	
17	N17	-7.166667	5.666667	5.637677	
18	N18	8.465705	5.666667	3.387677	
19	N19	7.166667	5.666667	5.637677	
20	N20	3.391346	5.666667	-3.40137	
21	N21	-1.299038	5.666667	-9.025354	
22	N22	7.166667	4.75	4.137677	
23	N23	0	4.75	-8.275354	
24	N24	-7.166667	4.75	4.137677	
25	N25	-1.382371	4.666667	-8.881016	
26	N26	-7	4.666667	5.637677	
27	N27	8.465705	4.666667	3.387677	
28	N28	-7.333333	4.666667	5.637677	
29	N29	-7.333333	4.666667	4.137677	
30	N30	0	4.666667	-8.275354	
31	N31	-7.166667	4.666667	5.637677	
32	N32	-7	4.666667	4.137677	
33	N33	-1.215705	4.666667	-9.169691	
34	N34	8.549038	4.666667	3.532014	
35	N35	7.166667	4.666667	4.137677	
36	N36	-1.299038	4.666667	-9.025354	
37	N37	-0.083333	4.666667	-8.131016	
38	N38	-7.166667	4.666667	4.137677	
39	N39	7.25	4.666667	4.282014	
40	N40	7.083333	4.666667	3.993339	
41	N41	8.382371	4.666667	3.243339	
42	N42	0.083333	4.666667	-8.419691	
43	N43	6.875	4.5	3.632495	
44	N44	-0.291667	4.5	-7.770172	
45	N45	-2.958333	4.5	-3.15137	
46	N46	1.708333	4.5	-5.316434	
47	N47	1.25	4.5	4.137677	
48	N48	3.75	4.5	4.137677	
49	N49	0	4.5	-8.275354	
50	N50	-5.458333	4.5	1.178757	
51	N51	-6.875	4.5	3.632495	
52	N52	2.958333	4.5	-3.15137	
53	N53	4.208333	4.5	-0.986307	
54	N54	5.458333	4.5	1.178757	
55	N55	0.291667	4.5	-7.770172	
56	N56	-1.25	4.5	4.137677	
57	N57	7.166667	4.5	4.137677	
58	N58	-6.583333	4.5	4.137677	
59	N59	-4.208333	4.5	-0.986307	
60	N60	-1.708333	4.5	-5.316434	
61	N61	-3.75	4.5	4.137677	
62	N62	-0.436004	4.5	-7.520172	
63	N63	0.436004	4.5	-7.520172	
64	N64	-6.294658	4.5	4.137677	
65	N65	-6.730662	4.5	3.382495	
66	N66	6.730662	4.5	3.382495	
67	N67	6.294658	4.5	4.137677	
68	N68	-7.166667	4.5	4.137677	

Node Coordinates (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
69	N69	6.583333	4.5	4.137677	
70	N70	6.458333	4.5	2.910808	
71	N71	-2.147222	4.5	-4.556257	
72	N72	2.42484	4.5	-4.575408	
73	N73	2.75	4.5	4.137677	
74	N74	4.958333	4.5	0.312731	
75	N75	5.17484	4.5	0.187731	
76	N76	2.208333	4.5	-4.450408	
77	N77	2.147222	4.5	-4.556257	
78	N78	-2.75	4.5	4.137677	
79	N79	-2.872223	4.5	4.137677	
80	N80	-5.019445	4.5	0.41858	
81	N81	5.019445	4.5	0.41858	
82	N82	-2.75	4.5	4.387677	
83	N83	2.75	4.5	4.387677	
84	N84	6.67484	4.5	2.785808	
85	N85	-4.958333	4.5	0.312731	
86	N86	2.872223	4.5	4.137677	
87	N87	-2.208333	4.5	-4.450408	
88	N88	0.92484	4.5	-7.173485	
89	N89	0.708333	4.5	-7.048485	
90	N90	-0.92484	4.5	-7.173485	
91	N91	-2.42484	4.5	-4.575408	
92	N92	-0.708333	4.5	-7.048485	
93	N93	5.75	4.5	4.387677	
94	N94	5.75	4.5	4.137677	
95	N95	-6.458333	4.5	2.910808	
96	N96	-5.75	4.5	4.137677	
97	N97	-5.75	4.5	4.387677	
98	N98	-5.17484	4.5	0.187731	
99	N99	-6.67484	4.5	2.785808	
100	N100	-0.083333	4.333333	-8.419691	
101	N101	0.083333	4.333333	-8.131016	
102	N102	-7.25	4.333333	4.282014	
103	N103	1.382371	4.333333	-8.881016	
104	N104	1.299038	4.333333	-9.025354	
105	N105	7.166667	4.333333	4.137677	
106	N106	-7.166667	4.333333	4.137677	
107	N107	0	4.333333	-8.275354	
108	N108	7.333333	4.333333	5.637677	
109	N109	7	4.333333	5.637677	
110	N110	-8.549038	4.333333	3.532014	
111	N111	7.166667	4.333333	5.637677	
112	N112	7	4.333333	4.137677	
113	N113	7.333333	4.333333	4.137677	
114	N114	1.215705	4.333333	-9.169691	
115	N115	-8.465705	4.333333	3.387677	
116	N116	-8.382371	4.333333	3.243339	
117	N117	-7.083333	4.333333	3.993339	
118	N118	-4.125	4.166667	-1.130644	
119	N119	1.083333	4.166667	4.637677	
120	N120	1.25	4.166667	4.637677	
121	N121	1.416667	4.166667	4.637677	
122	N122	-4.558013	4.166667	-1.380644	
123	N123	1.25	4.166667	4.137677	

Node Coordinates (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
124	N124	3.041667	4.166667	-3.007033	
125	N125	1.416667	4.166667	4.137677	
126	N126	2.958333	4.166667	-3.15137	
127	N127	-4.208333	4.166667	-0.986307	
128	N128	3.474679	4.166667	-3.257033	
129	N129	-4.641346	4.166667	-1.236307	
130	N130	2.875	4.166667	-3.295708	
131	N131	3.308013	4.166667	-3.545708	
132	N132	1.083333	4.166667	4.137677	
133	N133	3.391346	4.166667	-3.40137	
134	N134	-4.724679	4.166667	-1.091969	
135	N135	-4.291667	4.166667	-0.841969	
136	N136	3.391346	0.833333	-3.40137	
137	N137	-4.208333	0.833333	-0.986307	
138	N138	-4.291667	0.833333	-0.841969	
139	N139	-4.125	0.833333	-1.130644	
140	N140	2.958333	0.833333	-3.15137	
141	N141	-4.724679	0.833333	-1.091969	
142	N142	3.041667	0.833333	-3.007033	
143	N143	1.083333	0.833333	4.137677	
144	N144	-4.558013	0.833333	-1.380644	
145	N145	2.875	0.833333	-3.295708	
146	N146	1.416667	0.833333	4.137677	
147	N147	1.25	0.833333	4.637677	
148	N148	1.416667	0.833333	4.637677	
149	N149	3.474679	0.833333	-3.257033	
150	N150	1.25	0.833333	4.137677	
151	N151	-4.641346	0.833333	-1.236307	
152	N152	3.308013	0.833333	-3.545708	
153	N153	1.083333	0.833333	4.637677	
154	N154	-7.083333	0.666667	3.993339	
155	N155	7	0.666667	5.637677	
156	N156	7	0.666667	4.137677	
157	N157	1.382371	0.666667	-8.881016	
158	N158	-7.166667	0.666667	4.137677	
159	N159	-8.465705	0.666667	3.387677	
160	N160	1.299038	0.666667	-9.025354	
161	N161	-7.25	0.666667	4.282014	
162	N162	-8.382371	0.666667	3.243339	
163	N163	0.083333	0.666667	-8.131016	
164	N164	-0.083333	0.666667	-8.419691	
165	N165	1.215705	0.666667	-9.169691	
166	N166	7.333333	0.666667	5.637677	
167	N167	-8.549038	0.666667	3.532014	
168	N168	0	0.666667	-8.275354	
169	N169	7.166667	0.666667	5.637677	
170	N170	7.333333	0.666667	4.137677	
171	N171	7.166667	0.666667	4.137677	
172	N172	-0.708333	0.5	-7.048485	
173	N173	-2.958333	0.5	-3.15137	
174	N174	6.583333	0.5	4.137677	
175	N175	-3.75	0.5	4.137677	
176	N176	5.458333	0.5	1.178757	
177	N177	7.166667	0.5	4.137677	
178	N178	-6.583333	0.5	4.137677	

Node Coordinates (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
179	N179	1.25	0.5	4.137677	
180	N180	-0.92484	0.5	-7.173485	
181	N181	6.458333	0.5	2.910808	
182	N182	-6.458333	0.5	2.910808	
183	N183	-7.166667	0.5	4.137677	
184	N184	4.208333	0.5	-0.986307	
185	N185	-6.67484	0.5	2.785808	
186	N186	1.708333	0.5	-5.316434	
187	N187	6.730662	0.5	3.382495	
188	N188	6.294658	0.5	4.137677	
189	N189	-0.436004	0.5	-7.520172	
190	N190	0.436004	0.5	-7.520172	
191	N191	-1.708333	0.5	-5.316434	
192	N192	2.958333	0.5	-3.15137	
193	N193	-2.42484	0.5	-4.575408	
194	N194	-0.291667	0.5	-7.770172	
195	N195	6.67484	0.5	2.785808	
196	N196	5.75	0.5	4.137677	
197	N197	0.708333	0.5	-7.048485	
198	N198	0.92484	0.5	-7.173485	
199	N199	2.75	0.5	4.137677	
200	N200	-4.958333	0.5	0.312731	
201	N201	-5.75	0.5	4.137677	
202	N202	-5.75	0.5	4.387677	
203	N203	-2.75	0.5	4.387677	
204	N204	-2.208333	0.5	-4.450408	
205	N205	0	0.5	-8.275354	
206	N206	-6.294658	0.5	4.137677	
207	N207	-5.17484	0.5	0.187731	
208	N208	-6.730662	0.5	3.382495	
209	N209	4.958333	0.5	0.312731	
210	N210	2.42484	0.5	-4.575408	
211	N211	2.208333	0.5	-4.450408	
212	N212	5.75	0.5	4.387677	
213	N213	-2.75	0.5	4.137677	
214	N214	-5.458333	0.5	1.178757	
215	N215	2.75	0.5	4.387677	
216	N216	3.75	0.5	4.137677	
217	N217	-6.875	0.5	3.632495	
218	N218	-1.25	0.5	4.137677	
219	N219	0.291667	0.5	-7.770172	
220	N220	-4.208333	0.5	-0.986307	
221	N221	6.875	0.5	3.632495	
222	N222	5.17484	0.5	0.187731	
223	N223	8.382371	0.333333	3.243339	
224	N224	8.465705	0.333333	3.387677	
225	N225	-1.299038	0.333333	-9.025354	
226	N226	7.083333	0.333333	3.993339	
227	N227	-1.215705	0.333333	-9.169691	
228	N228	-7.166667	0.333333	4.137677	
229	N229	-0.083333	0.333333	-8.131016	
230	N230	0	0.333333	-8.275354	
231	N231	-1.382371	0.333333	-8.881016	
232	N232	-7	0.333333	5.637677	
233	N233	-7.333333	0.333333	4.137677	

Node Coordinates (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
234	N234	0.083333	0.333333	-8.419691	
235	N235	-7.166667	0.333333	5.637677	
236	N236	8.549038	0.333333	3.532014	
237	N237	-7.333333	0.333333	5.637677	
238	N238	7.166667	0.333333	4.137677	
239	N239	7.25	0.333333	4.282014	
240	N240	-7	0.333333	4.137677	
241	N241	2.875	0	-3.295708	
242	N242	-6.875	0	3.632495	
243	N243	6.583333	0	4.137677	
244	N244	0.992521	0	-6.556257	
245	N245	-0.992521	0	-6.556257	
246	N246	-2.75	0	4.137677	
247	N247	-2.75	0	4.387677	
248	N248	0	0	0	
249	N249	5.181624	0	4.137677	
250	N250	-6.583333	0	4.137677	
251	N251	-7.166667	0	4.137677	
252	N252	-0.291667	0	-7.770172	
253	N253	0.291667	0	-7.770172	
254	N254	6.174145	0	2.41858	
255	N255	-3.798784	0	-1.695667	
256	N256	6.875	0	3.632495	
257	N257	0.430902	0	4.137677	
258	N258	2.75	0	4.387677	
259	N259	-6.67484	0	2.785808	
260	N260	-0.708333	0	-7.048485	
261	N261	5.75	0	4.387677	
262	N262	-0.92484	0	-7.173485	
263	N263	5.75	0	4.137677	
264	N264	-5.17484	0	0.187731	
265	N265	-6.458333	0	2.910808	
266	N266	0.708333	0	-7.048485	
267	N267	0.92484	0	-7.173485	
268	N268	6.458333	0	2.910808	
269	N269	-2.208333	0	-4.450408	
270	N270	2.208333	0	-4.450408	
271	N271	2.75	0	4.137677	
272	N272	4.958333	0	0.312731	
273	N273	5.17484	0	0.187731	
274	N274	-0.760157	0	2.074703	
275	N275	4.291667	0	-0.841969	
276	N276	0	0	-8.275354	
277	N277	-5.181624	0	4.137677	
278	N278	-2.42484	0	-4.575408	
279	N279	3.367882	0	-2.44201	
280	N280	-6.174145	0	2.41858	
281	N281	7.166667	0	4.137677	
282	N282	6.67484	0	2.785808	
283	N283	2.42484	0	-4.575408	
284	N284	-4.958333	0	0.312731	
285	N285	-3.367882	0	-2.44201	
286	N286	-2.176824	0	-0.379036	
287	N287	-5.512465	-0.166667	3.564645	
288	N288	5.512465	-0.166667	3.564645	

Node Coordinates (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
289	N289	5.843305	-0.166667	2.991612	
290	N290	-5.843305	-0.166667	2.991612	
291	N291	0.33084	-0.166667	-6.556257	
292	N292	-0.992521	-0.166667	-6.556257	
293	N293	0.992521	-0.166667	-6.556257	
294	N294	-6.174145	-0.166667	2.41858	
295	N295	-5.677885	-0.166667	3.278128	
296	N296	0	-0.166667	-6.556257	
297	N297	5.677885	-0.166667	3.278128	
298	N298	5.181624	-0.166667	4.137677	
299	N299	6.174145	-0.166667	2.41858	
300	N300	-0.33084	-0.166667	-6.556257	
301	N301	-5.181624	-0.166667	4.137677	
302	N302	0	-0.25	-8.275354	
303	N303	7.166667	-0.25	4.137677	
304	N304	-7.166667	-0.25	4.137677	
305	N305	-0.083333	-0.416667	-6.056257	
306	N306	6.639528	-0.416667	3.833333	
307	N307	0	-0.416667	-1.972923	
308	N308	5.677885	-0.416667	3.278128	
309	N309	-1.708602	-0.416667	0.986462	
310	N310	0.083333	-0.416667	-6.056257	
311	N311	-5.286539	-0.416667	2.95596	
312	N312	-5.244872	-0.416667	3.028128	
313	N313	-5.203206	-0.416667	3.100297	
314	N314	5.203206	-0.416667	3.100297	
315	N315	0	-0.416667	-6.056257	
316	N316	5.244872	-0.416667	3.028128	
317	N317	1.708602	-0.416667	0.986462	
318	N318	0	-0.416667	-7.666667	
319	N319	-5.677885	-0.416667	3.278128	
320	N320	0	-0.416667	-6.556257	
321	N321	-6.639528	-0.416667	3.833333	
322	N322	5.286539	-0.416667	2.95596	
323	N323	-8.465705	-1.333333	3.387677	
324	N324	-1.299038	-1.333333	-9.025354	
325	N325	-7.166667	-1.333333	5.637677	
326	N326	1.299038	-1.333333	-9.025354	
327	N327	1.25	-1.333333	4.637677	
328	N328	8.465705	-1.333333	3.387677	
329	N329	3.391346	-1.333333	-3.40137	
330	N330	-4.641346	-1.333333	-1.236307	
331	N331	7.166667	-1.333333	5.637677	
332	N332	5.17484	-1.75	0.187731	
333	N333	-2.42484	-1.75	-4.575408	
334	N334	0.92484	-1.75	-7.173485	
335	N335	-6.67484	-1.75	2.785808	
336	N336	2.42484	-1.75	-4.575408	
337	N337	-2.75	-1.75	4.387677	
338	N338	2.75	-1.75	4.387677	
339	N339	-5.17484	-1.75	0.187731	
340	N340	-5.75	-1.75	4.387677	
341	N341	-0.92484	-1.75	-7.173485	
342	N342	6.67484	-1.75	2.785808	
343	N343	5.75	-1.75	4.387677	

Node Coordinates (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
344	N344	-0.083333	-3.416667	-1.972923	
345	N345	1.666935	-3.416667	1.05863	
346	N346	1.708602	-3.416667	0.986462	
347	N347	0	-3.416667	-1.972923	
348	N348	-1.708602	-3.416667	0.986462	
349	N349	1.750268	-3.416667	0.914293	
350	N350	0.083333	-3.416667	-1.972923	
351	N351	-1.666935	-3.416667	1.05863	
352	N352	-1.750268	-3.416667	0.914293	

Node Boundary Conditions

	Node 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	N309	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N317	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N307	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
4	N346	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
5	N347	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
6	N348	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rule	Area [in²]	Iyy [in⁴]	Izz [in⁴]	J [in⁴]
1	Standoff	HSS4X4X3	Beam	SquareTube	A500 Gr.B Rect	Typical	2.58	6.21	6.21	10
2	Grate Bracing	L4X3X4	Beam	Single Angle	A36 Gr.36	Typical	1.69	1.33	2.75	0.039
3	Corner Plate 1	PL1/2x9	Beam	RECT	A36 Gr.36	Typical	4.5	0.094	30.375	0.362
4	Corner Plate 2	PL1/4x3	Beam	RECT	A36 Gr.36	Typical	0.75	0.004	0.563	0.015
5	Support Rail	L3X3X4	Beam	Single Angle	A36 Gr.36	Typical	1.44	1.23	1.23	0.031
6	Antenna Pipe	PIPE_2.0	Column	HSS Pipe	A53 Gr.B	Typical	1.02	0.627	0.627	1.25
7	Vertical	PIPE_2.0	Column	Pipe	A53 Gr.B	Typical	1.02	0.627	0.627	1.25
8	Horizontal	C5X6.7	Beam	Channel	A36 Gr.36	Typical	1.97	0.47	7.48	0.055
9	Threaded Rod	SR_0.5	Beam	BAR	A36 Gr.36	Typical	0.196	0.003	0.003	0.006
10	Kicker Mod	L3X3X3	VBrace	Single Angle	A36 Gr.36	Typical	1.09	0.948	0.948	0.014
11	SR Corner Bracing Mod	PL1/2X6	Beam	RECT	A36 Gr.36	Typical	3	0.063	9	0.237
12	Antenna Pipe Mod	PIPE_2.0	Column	HSS Pipe	A53 Gr.B	Typical	1.02	0.627	0.627	1.25

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [1e⁵°F⁻¹]	Density [k/ft³]	Yield [ksi]	Ry	Fu [ksi]	Rt
1	A992	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	0.3	0.65	0.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	0.3	0.65	0.527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	0.3	0.65	0.527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	0.3	0.65	0.49	35	1.6	60	1.2
7	A1085	29000	11154	0.3	0.65	0.49	50	1.25	65	1.15
8	A913 Gr.65	29000	11154	0.3	0.65	0.49	65	1.1	80	1.1

Member Primary Data

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
1	MQ13	N19	N331		Antenna Pipe	Column	HSS Pipe	A53 Gr.B	Typical
2	MQ14	N13	N323		Antenna Pipe	Column	HSS Pipe	A53 Gr.B	Typical
3	MQ15	N16	N326		Antenna Pipe	Column	HSS Pipe	A53 Gr.B	Typical

Member Primary Data (Continued)

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
4	MQ16	N15	N327		Antenna Pipe	Column	HSS Pipe	A53 Gr.B	Typical
5	MQ17	N14	N330		Antenna Pipe	Column	HSS Pipe	A53 Gr.B	Typical
6	MQ18	N20	N329		Antenna Pipe	Column	HSS Pipe	A53 Gr.B	Typical
7	MQ19	N18	N328		Antenna Pipe	Column	HSS Pipe	A53 Gr.B	Typical
8	MQ20	N21	N324		Antenna Pipe	Column	HSS Pipe	A53 Gr.B	Typical
9	MQ21	N17	N325		Antenna Pipe	Column	HSS Pipe	A53 Gr.B	Typical
10	MP3A	N11	N337		Antenna Pipe Mod	Column	HSS Pipe	A53 Gr.B	Typical
11	MP4A	N4	N340		Antenna Pipe Mod	Column	HSS Pipe	A53 Gr.B	Typical
12	MP1B	N7	N335		Antenna Pipe Mod	Column	HSS Pipe	A53 Gr.B	Typical
13	MP4B	N9	N341		Antenna Pipe Mod	Column	HSS Pipe	A53 Gr.B	Typical
14	MP4C	N5	N342		Antenna Pipe Mod	Column	HSS Pipe	A53 Gr.B	Typical
15	MP1C	N10	N334		Antenna Pipe Mod	Column	HSS Pipe	A53 Gr.B	Typical
16	MP1A	N12	N343		Antenna Pipe Mod	Column	HSS Pipe	A53 Gr.B	Typical
17	MP3B	N8	N333		Antenna Pipe Mod	Column	HSS Pipe	A53 Gr.B	Typical
18	MP2B	N6	N339		Antenna Pipe Mod	Column	HSS Pipe	A53 Gr.B	Typical
19	MP3C	N3	N332		Antenna Pipe Mod	Column	HSS Pipe	A53 Gr.B	Typical
20	MP2C	N2	N336		Antenna Pipe Mod	Column	HSS Pipe	A53 Gr.B	Typical
21	MP2A	N1	N338		Antenna Pipe Mod	Column	HSS Pipe	A53 Gr.B	Typical
22	MQ22	N288	N298	90	Corner Plate 1	Beam	RECT	A36 Gr.36	Typical
23	MQ23	N290	N294	90	Corner Plate 1	Beam	RECT	A36 Gr.36	Typical
24	MQ24	N301	N287	90	Corner Plate 1	Beam	RECT	A36 Gr.36	Typical
25	MQ25	N299	N289	90	Corner Plate 1	Beam	RECT	A36 Gr.36	Typical
26	MQ26	N291	N293	90	Corner Plate 1	Beam	RECT	A36 Gr.36	Typical
27	MQ27	N292	N300	90	Corner Plate 1	Beam	RECT	A36 Gr.36	Typical
28	MQ28	N205	N194		Corner Plate 2	Beam	RECT	A36 Gr.36	Typical
29	MQ29	N57	N43		Corner Plate 2	Beam	RECT	A36 Gr.36	Typical
30	MQ30	N251	N250		Corner Plate 2	Beam	RECT	A36 Gr.36	Typical
31	MQ31	N49	N44		Corner Plate 2	Beam	RECT	A36 Gr.36	Typical
32	MQ32	N183	N178		Corner Plate 2	Beam	RECT	A36 Gr.36	Typical
33	MQ33	N276	N253		Corner Plate 2	Beam	RECT	A36 Gr.36	Typical
34	MQ34	N68	N51		Corner Plate 2	Beam	RECT	A36 Gr.36	Typical
35	MQ35	N177	N174		Corner Plate 2	Beam	RECT	A36 Gr.36	Typical
36	MQ36	N281	N243		Corner Plate 2	Beam	RECT	A36 Gr.36	Typical
37	MQ37	N251	N242		Corner Plate 2	Beam	RECT	A36 Gr.36	Typical
38	MQ38	N49	N55		Corner Plate 2	Beam	RECT	A36 Gr.36	Typical
39	MQ39	N205	N219		Corner Plate 2	Beam	RECT	A36 Gr.36	Typical
40	MQ40	N177	N221		Corner Plate 2	Beam	RECT	A36 Gr.36	Typical
41	MQ41	N183	N217		Corner Plate 2	Beam	RECT	A36 Gr.36	Typical
42	MQ42	N57	N69		Corner Plate 2	Beam	RECT	A36 Gr.36	Typical
43	MQ43	N281	N256		Corner Plate 2	Beam	RECT	A36 Gr.36	Typical
44	MQ44	N68	N58		Corner Plate 2	Beam	RECT	A36 Gr.36	Typical
45	MQ45	N276	N252		Corner Plate 2	Beam	RECT	A36 Gr.36	Typical
46	MQ46	N275	N274	180	Grate Bracing	Beam	Single Angle	A36 Gr.36	Typical
47	MQ47	N286	N241	180	Grate Bracing	Beam	Single Angle	A36 Gr.36	Typical
48	MQ48	N257	N285	180	Grate Bracing	Beam	Single Angle	A36 Gr.36	Typical
49	MQ49	N252	N242	180	Horizontal	Beam	Channel	A36 Gr.36	Typical
50	MQ50	N256	N253	180	Horizontal	Beam	Channel	A36 Gr.36	Typical
51	MQ51	N250	N243	180	Horizontal	Beam	Channel	A36 Gr.36	Typical
52	MQ52	N305	N344	90	Kicker Mod	VBrace	Single Angle	A36 Gr.36	Typical
53	MQ53	N310	N350	180	Kicker Mod	VBrace	Single Angle	A36 Gr.36	Typical
54	MQ54	N311	N352	180	Kicker Mod	VBrace	Single Angle	A36 Gr.36	Typical
55	MQ55	N313	N351	90	Kicker Mod	VBrace	Single Angle	A36 Gr.36	Typical
56	MQ56	N314	N345	180	Kicker Mod	VBrace	Single Angle	A36 Gr.36	Typical
57	MQ57	N322	N349	90	Kicker Mod	VBrace	Single Angle	A36 Gr.36	Typical
58	MQ58	N28	N31		RIGID	None	None	RIGID	Typical

Member Primary Data (Continued)

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
59	MQ59	N244	N293		RIGID	None	None	RIGID	Typical
60	MQ60	N108	N111		RIGID	None	None	RIGID	Typical
61	MQ61	N232	N235		RIGID	None	None	RIGID	Typical
62	MQ62	N141	N151		RIGID	None	None	RIGID	Typical
63	MQ63	N227	N225		RIGID	None	None	RIGID	Typical
64	MQ64	N254	N299		RIGID	None	None	RIGID	Typical
65	MQ65	N249	N298		RIGID	None	None	RIGID	Typical
66	MQ66	N229	N230		RIGID	None	None	RIGID	Typical
67	MQ67	N297	N308		RIGID	None	None	RIGID	Typical
68	MQ68	N245	N292		RIGID	None	None	RIGID	Typical
69	MQ69	N139	N137		RIGID	None	None	RIGID	Typical
70	MQ70	N122	N129		RIGID	None	None	RIGID	Typical
71	MQ71	N138	N137		RIGID	None	None	RIGID	Typical
72	MQ72	N296	N320		RIGID	None	None	RIGID	Typical
73	MQ73	N112	N105		RIGID	None	None	RIGID	Typical
74	MQ74	N121	N120		RIGID	None	None	RIGID	Typical
75	MQ75	N143	N150		RIGID	None	None	RIGID	Typical
76	MQ76	N146	N150		RIGID	None	None	RIGID	Typical
77	MQ77	N231	N225		RIGID	None	None	RIGID	Typical
78	MQ78	N161	N158		RIGID	None	None	RIGID	Typical
79	MQ79	N135	N127		RIGID	None	None	RIGID	Typical
80	MQ80	N223	N224		RIGID	None	None	RIGID	Typical
81	MQ81	N236	N224		RIGID	None	None	RIGID	Typical
82	MQ82	N144	N151		RIGID	None	None	RIGID	Typical
83	MQ83	N118	N127		RIGID	None	None	RIGID	Typical
84	MQ84	N29	N38		RIGID	None	None	RIGID	Typical
85	MQ85	N33	N36		RIGID	None	None	RIGID	Typical
86	MQ86	N32	N38		RIGID	None	None	RIGID	Typical
87	MQ87	N287	N290	90	RIGID	None	None	RIGID	Typical
88	MQ88	N240	N228		RIGID	None	None	RIGID	Typical
89	MQ89	N289	N288	90	RIGID	None	None	RIGID	Typical
90	MQ90	N234	N230		RIGID	None	None	RIGID	Typical
91	MQ91	N125	N123		RIGID	None	None	RIGID	Typical
92	MQ92	N128	N133		RIGID	None	None	RIGID	Typical
93	MQ93	N119	N120		RIGID	None	None	RIGID	Typical
94	MQ94	N40	N35		RIGID	None	None	RIGID	Typical
95	MQ95	N149	N136		RIGID	None	None	RIGID	Typical
96	MQ96	N152	N136		RIGID	None	None	RIGID	Typical
97	MQ97	N131	N133		RIGID	None	None	RIGID	Typical
98	MQ98	N41	N27		RIGID	None	None	RIGID	Typical
99	MQ99	N142	N140		RIGID	None	None	RIGID	Typical
100	MQ100	N145	N140		RIGID	None	None	RIGID	Typical
101	MQ101	N37	N30		RIGID	None	None	RIGID	Typical
102	MQ102	N233	N228		RIGID	None	None	RIGID	Typical
103	MQ103	N42	N30		RIGID	None	None	RIGID	Typical
104	MQ104	N130	N126		RIGID	None	None	RIGID	Typical
105	MQ105	N25	N36		RIGID	None	None	RIGID	Typical
106	MQ106	N39	N35		RIGID	None	None	RIGID	Typical
107	MQ107	N226	N238		RIGID	None	None	RIGID	Typical
108	MQ108	N34	N27		RIGID	None	None	RIGID	Typical
109	MQ109	N26	N31		RIGID	None	None	RIGID	Typical
110	MQ110	N239	N238		RIGID	None	None	RIGID	Typical
111	MQ111	N157	N160		RIGID	None	None	RIGID	Typical
112	MQ112	N103	N104		RIGID	None	None	RIGID	Typical
113	MQ113	N166	N169		RIGID	None	None	RIGID	Typical

Member Primary Data (Continued)

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
114	MQ114	N155	N169		RIGID	None	None	RIGID	Typical
115	MQ115	N170	N171		RIGID	None	None	RIGID	Typical
116	MQ116	N156	N171		RIGID	None	None	RIGID	Typical
117	MQ117	N124	N126		RIGID	None	None	RIGID	Typical
118	MQ118	N116	N115		RIGID	None	None	RIGID	Typical
119	MQ119	N237	N235		RIGID	None	None	RIGID	Typical
120	MQ120	N110	N115		RIGID	None	None	RIGID	Typical
121	MQ121	N262	N260		RIGID	None	None	RIGID	Typical
122	MQ122	N99	N95		RIGID	None	None	RIGID	Typical
123	MQ123	N185	N182		RIGID	None	None	RIGID	Typical
124	MQ124	N259	N265		RIGID	None	None	RIGID	Typical
125	MQ125	N210	N211		RIGID	None	None	RIGID	Typical
126	MQ126	N193	N204		RIGID	None	None	RIGID	Typical
127	MQ127	N165	N160		RIGID	None	None	RIGID	Typical
128	MQ128	N164	N168		RIGID	None	None	RIGID	Typical
129	MQ129	N305	N310		RIGID	None	None	RIGID	Typical
130	MQ130	N344	N350		RIGID	None	None	RIGID	Typical
131	MQ131	N300	N291	90	RIGID	None	None	RIGID	Typical
132	MQ132	N83	N73		RIGID	None	None	RIGID	Typical
133	MQ133	N313	N311		RIGID	None	None	RIGID	Typical
134	MQ134	N351	N352		RIGID	None	None	RIGID	Typical
135	MQ135	N280	N294		RIGID	None	None	RIGID	Typical
136	MQ136	N277	N301		RIGID	None	None	RIGID	Typical
137	MQ137	N148	N147		RIGID	None	None	RIGID	Typical
138	MQ138	N322	N314		RIGID	None	None	RIGID	Typical
139	MQ139	N163	N168		RIGID	None	None	RIGID	Typical
140	MQ140	N349	N345		RIGID	None	None	RIGID	Typical
141	MQ141	N82	N78		RIGID	None	None	RIGID	Typical
142	MQ142	N203	N213		RIGID	None	None	RIGID	Typical
143	MQ143	N153	N147		RIGID	None	None	RIGID	Typical
144	MQ144	N247	N246		RIGID	None	None	RIGID	Typical
145	MQ145	N100	N107		RIGID	None	None	RIGID	Typical
146	MQ146	N101	N107		RIGID	None	None	RIGID	Typical
147	MQ147	N215	N199		RIGID	None	None	RIGID	Typical
148	MQ148	N132	N123		RIGID	None	None	RIGID	Typical
149	MQ149	N154	N158		RIGID	None	None	RIGID	Typical
150	MQ150	N90	N92		RIGID	None	None	RIGID	Typical
151	MQ151	N267	N266		RIGID	None	None	RIGID	Typical
152	MQ152	N180	N172		RIGID	None	None	RIGID	Typical
153	MQ153	N88	N89		RIGID	None	None	RIGID	Typical
154	MQ154	N134	N129		RIGID	None	None	RIGID	Typical
155	MQ155	N162	N159		RIGID	None	None	RIGID	Typical
156	MQ156	N167	N159		RIGID	None	None	RIGID	Typical
157	MQ157	N117	N106		RIGID	None	None	RIGID	Typical
158	MQ158	N102	N106		RIGID	None	None	RIGID	Typical
159	MQ159	N295	N319		RIGID	None	None	RIGID	Typical
160	MQ160	N109	N111		RIGID	None	None	RIGID	Typical
161	MQ161	N113	N105		RIGID	None	None	RIGID	Typical
162	MQ162	N258	N271		RIGID	None	None	RIGID	Typical
163	MQ163	N222	N209		RIGID	None	None	RIGID	Typical
164	MQ164	N75	N74		RIGID	None	None	RIGID	Typical
165	MQ165	N198	N197		RIGID	None	None	RIGID	Typical
166	MQ166	N72	N76		RIGID	None	None	RIGID	Typical
167	MQ167	N283	N270		RIGID	None	None	RIGID	Typical
168	MQ168	N273	N272		RIGID	None	None	RIGID	Typical

Member Primary Data (Continued)

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
169	MQ169	N114	N104		RIGID	None	None	RIGID	Typical
170	MQ170	N282	N268		RIGID	None	None	RIGID	Typical
171	MQ171	N195	N181		RIGID	None	None	RIGID	Typical
172	MQ172	N84	N70		RIGID	None	None	RIGID	Typical
173	MQ173	N207	N200		RIGID	None	None	RIGID	Typical
174	MQ174	N212	N196		RIGID	None	None	RIGID	Typical
175	MQ175	N93	N94		RIGID	None	None	RIGID	Typical
176	MQ176	N261	N263		RIGID	None	None	RIGID	Typical
177	MQ177	N202	N201		RIGID	None	None	RIGID	Typical
178	MQ178	N264	N284		RIGID	None	None	RIGID	Typical
179	MQ179	N98	N85		RIGID	None	None	RIGID	Typical
180	MQ180	N278	N269		RIGID	None	None	RIGID	Typical
181	MQ181	N91	N87		RIGID	None	None	RIGID	Typical
182	MQ182	N97	N96		RIGID	None	None	RIGID	Typical
183	MQ183	N62	N63	90	SR Corner Bracing Mod	Beam	RECT	A36 Gr.36	Typical
184	MQ184	N196	N263		SR Corner Bracing Mod	Beam	RECT	A36 Gr.36	Typical
185	MQ185	N181	N268		SR Corner Bracing Mod	Beam	RECT	A36 Gr.36	Typical
186	MQ186	N206	N208	90	SR Corner Bracing Mod	Beam	RECT	A36 Gr.36	Typical
187	MQ187	N189	N190	90	SR Corner Bracing Mod	Beam	RECT	A36 Gr.36	Typical
188	MQ188	N187	N188	90	SR Corner Bracing Mod	Beam	RECT	A36 Gr.36	Typical
189	MQ189	N69	N43		SR Corner Bracing Mod	Beam	RECT	A36 Gr.36	Typical
190	MQ190	N66	N67	90	SR Corner Bracing Mod	Beam	RECT	A36 Gr.36	Typical
191	MQ191	N79	N80	90	SR Corner Bracing Mod	Beam	RECT	A36 Gr.36	Typical
192	MQ192	N64	N65	90	SR Corner Bracing Mod	Beam	RECT	A36 Gr.36	Typical
193	MQ193	N81	N86	90	SR Corner Bracing Mod	Beam	RECT	A36 Gr.36	Typical
194	MQ194	N71	N77	90	SR Corner Bracing Mod	Beam	RECT	A36 Gr.36	Typical
195	MQ195	N307	N318	90	Standoff	Beam	SquareTube	A500 Gr.B Rect	Typical
196	MQ196	N317	N306	90	Standoff	Beam	SquareTube	A500 Gr.B Rect	Typical
197	MQ197	N309	N321	90	Standoff	Beam	SquareTube	A500 Gr.B Rect	Typical
198	MQ198	N43	N55		Support Rail	Beam	Single Angle	A36 Gr.36	Typical
199	MQ199	N178	N174	90	Support Rail	Beam	Single Angle	A36 Gr.36	Typical
200	MQ200	N194	N217	90	Support Rail	Beam	Single Angle	A36 Gr.36	Typical
201	MQ201	N58	N69		Support Rail	Beam	Single Angle	A36 Gr.36	Typical
202	MQ202	N44	N51		Support Rail	Beam	Single Angle	A36 Gr.36	Typical
203	MQ203	N221	N219	90	Support Rail	Beam	Single Angle	A36 Gr.36	Typical
204	MQ204	N164	N165		Threaded Rod	Beam	BAR	A36 Gr.36	Typical
205	MQ205	N143	N153		Threaded Rod	Beam	BAR	A36 Gr.36	Typical
206	MQ206	N100	N114		Threaded Rod	Beam	BAR	A36 Gr.36	Typical
207	MQ207	N226	N223		Threaded Rod	Beam	BAR	A36 Gr.36	Typical
208	MQ208	N161	N167		Threaded Rod	Beam	BAR	A36 Gr.36	Typical
209	MQ209	N124	N128		Threaded Rod	Beam	BAR	A36 Gr.36	Typical
210	MQ210	N139	N144		Threaded Rod	Beam	BAR	A36 Gr.36	Typical
211	MQ211	N145	N152		Threaded Rod	Beam	BAR	A36 Gr.36	Typical
212	MQ212	N113	N108		Threaded Rod	Beam	BAR	A36 Gr.36	Typical
213	MQ213	N239	N236		Threaded Rod	Beam	BAR	A36 Gr.36	Typical
214	MQ214	N146	N148		Threaded Rod	Beam	BAR	A36 Gr.36	Typical
215	MQ215	N130	N131		Threaded Rod	Beam	BAR	A36 Gr.36	Typical
216	MQ216	N163	N157		Threaded Rod	Beam	BAR	A36 Gr.36	Typical
217	MQ217	N170	N166		Threaded Rod	Beam	BAR	A36 Gr.36	Typical
218	MQ218	N42	N33		Threaded Rod	Beam	BAR	A36 Gr.36	Typical
219	MQ219	N40	N41		Threaded Rod	Beam	BAR	A36 Gr.36	Typical
220	MQ220	N156	N155		Threaded Rod	Beam	BAR	A36 Gr.36	Typical
221	MQ221	N37	N25		Threaded Rod	Beam	BAR	A36 Gr.36	Typical
222	MQ222	N240	N232		Threaded Rod	Beam	BAR	A36 Gr.36	Typical
223	MQ223	N233	N237		Threaded Rod	Beam	BAR	A36 Gr.36	Typical

Member Primary Data (Continued)

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
224	MQ224	N135	N134		Threaded Rod	Beam	BAR	A36 Gr.36	Typical
225	MQ225	N117	N116		Threaded Rod	Beam	BAR	A36 Gr.36	Typical
226	MQ226	N142	N149		Threaded Rod	Beam	BAR	A36 Gr.36	Typical
227	MQ227	N138	N141		Threaded Rod	Beam	BAR	A36 Gr.36	Typical
228	MQ228	N234	N227		Threaded Rod	Beam	BAR	A36 Gr.36	Typical
229	MQ229	N154	N162		Threaded Rod	Beam	BAR	A36 Gr.36	Typical
230	MQ230	N32	N26		Threaded Rod	Beam	BAR	A36 Gr.36	Typical
231	MQ231	N125	N121		Threaded Rod	Beam	BAR	A36 Gr.36	Typical
232	MQ232	N132	N119		Threaded Rod	Beam	BAR	A36 Gr.36	Typical
233	MQ233	N229	N231		Threaded Rod	Beam	BAR	A36 Gr.36	Typical
234	MQ234	N101	N103		Threaded Rod	Beam	BAR	A36 Gr.36	Typical
235	MQ235	N102	N110		Threaded Rod	Beam	BAR	A36 Gr.36	Typical
236	MQ236	N29	N28		Threaded Rod	Beam	BAR	A36 Gr.36	Typical
237	MQ237	N118	N122		Threaded Rod	Beam	BAR	A36 Gr.36	Typical
238	MQ238	N112	N109		Threaded Rod	Beam	BAR	A36 Gr.36	Typical
239	MQ239	N39	N34		Threaded Rod	Beam	BAR	A36 Gr.36	Typical
240	MQ240	N61	N175		Vertical	Column	Pipe	A53 Gr.B	Typical
241	MQ241	N23	N302		Vertical	Column	Pipe	A53 Gr.B	Typical
242	MQ242	N48	N216		Vertical	Column	Pipe	A53 Gr.B	Typical
243	MQ243	N46	N186		Vertical	Column	Pipe	A53 Gr.B	Typical
244	MQ244	N24	N304		Vertical	Column	Pipe	A53 Gr.B	Typical
245	MQ245	N53	N184		Vertical	Column	Pipe	A53 Gr.B	Typical
246	MQ246	N56	N218		Vertical	Column	Pipe	A53 Gr.B	Typical
247	MQ247	N47	N179		Vertical	Column	Pipe	A53 Gr.B	Typical
248	MQ248	N50	N214		Vertical	Column	Pipe	A53 Gr.B	Typical
249	MQ249	N22	N303		Vertical	Column	Pipe	A53 Gr.B	Typical
250	MQ250	N59	N220		Vertical	Column	Pipe	A53 Gr.B	Typical
251	MQ251	N54	N176		Vertical	Column	Pipe	A53 Gr.B	Typical
252	MQ252	N60	N191		Vertical	Column	Pipe	A53 Gr.B	Typical
253	MQ253	N45	N173		Vertical	Column	Pipe	A53 Gr.B	Typical
254	MQ254	N52	N192		Vertical	Column	Pipe	A53 Gr.B	Typical

Member Advanced Data

	Label	I Release	J Release	Physical	Deflection Ratio Options	Activation	Seismic DR
1	MQ13			Yes	** NA **	Inactive	None
2	MQ14			Yes	** NA **	Inactive	None
3	MQ15			Yes	** NA **	Inactive	None
4	MQ16			Yes	** NA **	Inactive	None
5	MQ17			Yes	** NA **	Inactive	None
6	MQ18			Yes	** NA **	Inactive	None
7	MQ19			Yes	** NA **	Inactive	None
8	MQ20			Yes	** NA **	Inactive	None
9	MQ21			Yes	** NA **	Inactive	None
10	MP3A			Yes	** NA **		None
11	MP4A			Yes	** NA **		None
12	MP1B			Yes	** NA **		None
13	MP4B			Yes	** NA **		None
14	MP4C			Yes	** NA **		None
15	MP1C			Yes	** NA **		None
16	MP1A			Yes	** NA **		None
17	MP3B			Yes	** NA **		None
18	MP2B			Yes	** NA **		None
19	MP3C			Yes	** NA **		None
20	MP2C			Yes	** NA **		None
21	MP2A			Yes	** NA **		None

Member Advanced Data (Continued)

	Label	I Release	J Release	Physical	Deflection Ratio Options	Activation	Seismic DR
22	MQ22			Yes	Default		None
23	MQ23			Yes	Default		None
24	MQ24			Yes	Default		None
25	MQ25			Yes	Default		None
26	MQ26			Yes	Default		None
27	MQ27			Yes	Default		None
28	MQ28			Yes	N/A		None
29	MQ29			Yes	N/A		None
30	MQ30			Yes	N/A		None
31	MQ31			Yes	N/A		None
32	MQ32			Yes	N/A		None
33	MQ33			Yes	N/A		None
34	MQ34			Yes	N/A		None
35	MQ35			Yes	N/A		None
36	MQ36			Yes	N/A		None
37	MQ37			Yes	N/A		None
38	MQ38			Yes	N/A		None
39	MQ39			Yes	N/A		None
40	MQ40			Yes	N/A		None
41	MQ41			Yes	N/A		None
42	MQ42			Yes	N/A		None
43	MQ43			Yes	N/A		None
44	MQ44			Yes	N/A		None
45	MQ45			Yes	N/A		None
46	MQ46	BenPIN	BenPIN	Yes	Default		None
47	MQ47	BenPIN	BenPIN	Yes	Default		None
48	MQ48	BenPIN	BenPIN	Yes	Default		None
49	MQ49			Yes	Default		None
50	MQ50			Yes	Default		None
51	MQ51			Yes	Default		None
52	MQ52	BenPIN	BenPIN	Yes	** NA **		None
53	MQ53	BenPIN	BenPIN	Yes	** NA **		None
54	MQ54	BenPIN	BenPIN	Yes	** NA **		None
55	MQ55	BenPIN	BenPIN	Yes	** NA **		None
56	MQ56	BenPIN	BenPIN	Yes	** NA **		None
57	MQ57	BenPIN	BenPIN	Yes	** NA **		None
58	MQ58			Yes	** NA **	Inactive	None
59	MQ59			Yes	** NA **		None
60	MQ60			Yes	** NA **	Inactive	None
61	MQ61			Yes	** NA **	Inactive	None
62	MQ62			Yes	** NA **	Inactive	None
63	MQ63			Yes	** NA **	Inactive	None
64	MQ64			Yes	** NA **		None
65	MQ65			Yes	** NA **		None
66	MQ66			Yes	** NA **	Inactive	None
67	MQ67			Yes	** NA **		None
68	MQ68			Yes	** NA **		None
69	MQ69			Yes	** NA **	Inactive	None
70	MQ70			Yes	** NA **	Inactive	None
71	MQ71			Yes	** NA **	Inactive	None
72	MQ72			Yes	** NA **		None
73	MQ73			Yes	** NA **	Inactive	None
74	MQ74			Yes	** NA **	Inactive	None
75	MQ75			Yes	** NA **	Inactive	None
76	MQ76			Yes	** NA **	Inactive	None

Member Advanced Data (Continued)

	Label	I Release	J Release	Physical	Deflection Ratio Options	Activation	Seismic DR
77	MQ77			Yes	** NA **	Inactive	None
78	MQ78			Yes	** NA **	Inactive	None
79	MQ79			Yes	** NA **	Inactive	None
80	MQ80			Yes	** NA **	Inactive	None
81	MQ81			Yes	** NA **	Inactive	None
82	MQ82			Yes	** NA **	Inactive	None
83	MQ83			Yes	** NA **	Inactive	None
84	MQ84			Yes	** NA **	Inactive	None
85	MQ85			Yes	** NA **	Inactive	None
86	MQ86			Yes	** NA **	Inactive	None
87	MQ87			Yes	** NA **		None
88	MQ88			Yes	** NA **	Inactive	None
89	MQ89			Yes	** NA **		None
90	MQ90			Yes	** NA **	Inactive	None
91	MQ91			Yes	** NA **	Inactive	None
92	MQ92			Yes	** NA **	Inactive	None
93	MQ93			Yes	** NA **	Inactive	None
94	MQ94			Yes	** NA **	Inactive	None
95	MQ95			Yes	** NA **	Inactive	None
96	MQ96			Yes	** NA **	Inactive	None
97	MQ97			Yes	** NA **	Inactive	None
98	MQ98			Yes	** NA **	Inactive	None
99	MQ99			Yes	** NA **	Inactive	None
100	MQ100			Yes	** NA **	Inactive	None
101	MQ101			Yes	** NA **	Inactive	None
102	MQ102			Yes	** NA **	Inactive	None
103	MQ103			Yes	** NA **	Inactive	None
104	MQ104			Yes	** NA **	Inactive	None
105	MQ105			Yes	** NA **	Inactive	None
106	MQ106			Yes	** NA **	Inactive	None
107	MQ107			Yes	** NA **	Inactive	None
108	MQ108			Yes	** NA **	Inactive	None
109	MQ109			Yes	** NA **	Inactive	None
110	MQ110			Yes	** NA **	Inactive	None
111	MQ111			Yes	** NA **	Inactive	None
112	MQ112			Yes	** NA **	Inactive	None
113	MQ113			Yes	** NA **	Inactive	None
114	MQ114			Yes	** NA **	Inactive	None
115	MQ115			Yes	** NA **	Inactive	None
116	MQ116			Yes	** NA **	Inactive	None
117	MQ117			Yes	** NA **	Inactive	None
118	MQ118			Yes	** NA **	Inactive	None
119	MQ119			Yes	** NA **	Inactive	None
120	MQ120			Yes	** NA **	Inactive	None
121	MQ121			Yes	** NA **	Inactive	None
122	MQ122			Yes	** NA **		None
123	MQ123			Yes	** NA **		None
124	MQ124			Yes	** NA **	Inactive	None
125	MQ125			Yes	** NA **		None
126	MQ126			Yes	** NA **		None
127	MQ127			Yes	** NA **	Inactive	None
128	MQ128			Yes	** NA **	Inactive	None
129	MQ129			Yes	** NA **		None
130	MQ130			Yes	** NA **		None
131	MQ131			Yes	** NA **		None

Member Advanced Data (Continued)

	Label	I Release	J Release	Physical	Deflection Ratio Options	Activation	Seismic DR
132	MQ132			Yes	** NA **		None
133	MQ133			Yes	** NA **		None
134	MQ134			Yes	** NA **		None
135	MQ135			Yes	** NA **		None
136	MQ136			Yes	** NA **		None
137	MQ137			Yes	** NA **	Inactive	None
138	MQ138			Yes	** NA **		None
139	MQ139			Yes	** NA **	Inactive	None
140	MQ140			Yes	** NA **		None
141	MQ141			Yes	** NA **		None
142	MQ142			Yes	** NA **		None
143	MQ143			Yes	** NA **	Inactive	None
144	MQ144			Yes	** NA **	Inactive	None
145	MQ145			Yes	** NA **	Inactive	None
146	MQ146			Yes	** NA **	Inactive	None
147	MQ147			Yes	** NA **		None
148	MQ148			Yes	** NA **	Inactive	None
149	MQ149			Yes	** NA **	Inactive	None
150	MQ150			Yes	** NA **		None
151	MQ151			Yes	** NA **	Inactive	None
152	MQ152			Yes	** NA **		None
153	MQ153			Yes	** NA **		None
154	MQ154			Yes	** NA **	Inactive	None
155	MQ155			Yes	** NA **	Inactive	None
156	MQ156			Yes	** NA **	Inactive	None
157	MQ157			Yes	** NA **	Inactive	None
158	MQ158			Yes	** NA **	Inactive	None
159	MQ159			Yes	** NA **		None
160	MQ160			Yes	** NA **	Inactive	None
161	MQ161			Yes	** NA **	Inactive	None
162	MQ162			Yes	** NA **	Inactive	None
163	MQ163			Yes	** NA **		None
164	MQ164			Yes	** NA **		None
165	MQ165			Yes	** NA **		None
166	MQ166			Yes	** NA **		None
167	MQ167			Yes	** NA **	Inactive	None
168	MQ168			Yes	** NA **	Inactive	None
169	MQ169			Yes	** NA **	Inactive	None
170	MQ170			Yes	** NA **	Inactive	None
171	MQ171			Yes	** NA **		None
172	MQ172			Yes	** NA **		None
173	MQ173			Yes	** NA **		None
174	MQ174			Yes	** NA **		None
175	MQ175			Yes	** NA **		None
176	MQ176			Yes	** NA **	Inactive	None
177	MQ177			Yes	** NA **		None
178	MQ178			Yes	** NA **	Inactive	None
179	MQ179			Yes	** NA **		None
180	MQ180			Yes	** NA **	Inactive	None
181	MQ181			Yes	** NA **		None
182	MQ182			Yes	** NA **		None
183	MQ183			Yes	N/A		None
184	MQ184			Yes	N/A	Inactive	None
185	MQ185			Yes	N/A	Inactive	None
186	MQ186			Yes	N/A		None

Member Advanced Data (Continued)

	Label	I Release	J Release	Physical	Deflection Ratio Options	Activation	Seismic DR
187	MQ187			Yes	N/A		None
188	MQ188			Yes	N/A		None
189	MQ189	BenPIN	BenPIN	Yes	N/A	Inactive	None
190	MQ190			Yes	N/A		None
191	MQ191	BenPIN	BenPIN	Yes	N/A	Inactive	None
192	MQ192			Yes	N/A		None
193	MQ193	BenPIN	BenPIN	Yes	N/A	Inactive	None
194	MQ194	BenPIN	BenPIN	Yes	N/A	Inactive	None
195	MQ195			Yes	N/A		None
196	MQ196			Yes	N/A		None
197	MQ197			Yes	N/A		None
198	MQ198			Yes	Default		None
199	MQ199			Yes	Default		None
200	MQ200			Yes	Default		None
201	MQ201			Yes	Default		None
202	MQ202			Yes	Default		None
203	MQ203			Yes	Default		None
204	MQ204			Yes	Default	Inactive	None
205	MQ205			Yes	Default	Inactive	None
206	MQ206			Yes	Default	Inactive	None
207	MQ207			Yes	Default	Inactive	None
208	MQ208			Yes	Default	Inactive	None
209	MQ209			Yes	Default	Inactive	None
210	MQ210			Yes	Default	Inactive	None
211	MQ211			Yes	Default	Inactive	None
212	MQ212			Yes	Default	Inactive	None
213	MQ213			Yes	Default	Inactive	None
214	MQ214			Yes	Default	Inactive	None
215	MQ215			Yes	Default	Inactive	None
216	MQ216			Yes	Default	Inactive	None
217	MQ217			Yes	Default	Inactive	None
218	MQ218			Yes	Default	Inactive	None
219	MQ219			Yes	Default	Inactive	None
220	MQ220			Yes	Default	Inactive	None
221	MQ221			Yes	Default	Inactive	None
222	MQ222			Yes	Default	Inactive	None
223	MQ223			Yes	Default	Inactive	None
224	MQ224			Yes	Default	Inactive	None
225	MQ225			Yes	Default	Inactive	None
226	MQ226			Yes	Default	Inactive	None
227	MQ227			Yes	Default	Inactive	None
228	MQ228			Yes	Default	Inactive	None
229	MQ229			Yes	Default	Inactive	None
230	MQ230			Yes	Default	Inactive	None
231	MQ231			Yes	Default	Inactive	None
232	MQ232			Yes	Default	Inactive	None
233	MQ233			Yes	Default	Inactive	None
234	MQ234			Yes	Default	Inactive	None
235	MQ235			Yes	Default	Inactive	None
236	MQ236			Yes	Default	Inactive	None
237	MQ237			Yes	Default	Inactive	None
238	MQ238			Yes	Default	Inactive	None
239	MQ239			Yes	Default	Inactive	None
240	MQ240			Yes	** NA **		None
241	MQ241			Yes	** NA **		None

Member Advanced Data (Continued)

	Label	I Release	J Release	Physical	Deflection Ratio Options	Activation	Seismic DR
242	MQ242			Yes	** NA **		None
243	MQ243			Yes	** NA **		None
244	MQ244			Yes	** NA **		None
245	MQ245			Yes	** NA **		None
246	MQ246			Yes	** NA **		None
247	MQ247			Yes	** NA **		None
248	MQ248			Yes	** NA **		None
249	MQ249			Yes	** NA **		None
250	MQ250			Yes	** NA **		None
251	MQ251			Yes	** NA **		None
252	MQ252			Yes	** NA **		None
253	MQ253			Yes	** NA **		None
254	MQ254			Yes	** NA **		None

Member Area Loads (BLC 39 : Structure D)

	Node A	Node B	Node C	Direction	Load Direction	Magnitude [ksf]
1	N251	N281	N276	Y	Two Way	-0.005

Member Area Loads (BLC 40 : Structure Di)

	Node A	Node B	Node C	Direction	Load Direction	Magnitude [ksf]
1	N251	N281	N276	Y	Two Way	-0.015

Envelope Node Reactions

	Node Label		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N309	max	4692.167	9	452.778	3	2826.626	3	0.341	9	1.716	12	0.592	9
2		min	-4840.964	3	-627.281	9	-2743.627	9	-0.257	3	-1.715	6	-0.446	3
3	N317	max	4851.77	11	459.28	11	2823.124	11	0.321	5	1.467	8	0.448	11
4		min	-4668.034	5	-624.88	5	-2750.347	5	-0.267	11	-1.411	2	-0.601	5
5	N307	max	513.975	10	455.3	7	5444.607	1	0.517	7	1.538	4	0.023	5
6		min	-479.629	4	-628.86	1	-5587.489	7	-0.685	1	-1.601	10	-0.04	11
7	N346	max	5473.815	17	4733.712	17	3160.437	17	0.062	2	0.102	8	0.036	2
8		min	-264.813	11	-221.621	11	-152.943	11	-0.064	8	-0.099	2	-0.037	8
9	N347	max	71.793	10	4827.115	13	279.25	7	0	51	0.113	4	0.082	4
10		min	-71.835	4	-202.104	7	-6447.975	13	0	1	-0.115	10	-0.084	10
11	N348	max	217.387	3	4881.805	21	3261.436	21	0.078	12	0.124	12	0.045	6
12		min	-5648.522	21	-181.33	3	-125.44	3	-0.078	6	-0.124	6	-0.045	12
13	Totals:	max	5554.351	10	12124.322	24	5601.321	1						
14		min	-5554.353	4	4014.445	6	-5601.323	7						

Envelope AISC 15TH (360-16): LRFD Member Steel Code Checks

	Member	Shape	Code Check	Loc[ft]	LC	Shear Check	Loc[ft]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [k-ft]	phi*Mn z-z [k-ft]	Cb	Eqn
1	MP3A	PIPE_2.0	0.24	5.75	10	0.049	5.75		10	14916.096	32130	1.872	1.872	2.653	H1-1b
2	MP4A	PIPE_2.0	0.399	5.75	22	0.067	5.75		12	14916.096	32130	1.872	1.872	2.264	H1-1b
3	MP1B	PIPE_2.0	0.451	5.75	20	0.056	3.917		18	14916.096	32130	1.872	1.872	2.264	H1-1b
4	MP4B	PIPE_2.0	0.401	5.75	14	0.066	5.75		4	14916.096	32130	1.872	1.872	2.288	H1-1b
5	MP4C	PIPE_2.0	0.359	5.75	18	0.066	5.75		7	14916.096	32130	1.872	1.872	2.17	H1-1b
6	MP1C	PIPE_2.0	0.433	5.75	24	0.057	3.917		22	14916.096	32130	1.872	1.872	2.194	H1-1b
7	MP1A	PIPE_2.0	0.45	5.75	16	0.05	3.917		2	14916.096	32130	1.872	1.872	2.264	H1-1b
8	MP3B	PIPE_2.0	0.243	5.75	2	0.049	5.75		2	14916.096	32130	1.872	1.872	2.592	H1-1b
9	MP2B	PIPE_2.0	0.26	5.75	19	0.103	5.75		8	14916.096	32130	1.872	1.872	2.486	H1-1b

Envelope AISC 15TH (360-16): LRFD Member Steel Code Checks (Continued)

	Member	Shape	Code Check	Loc[ft]	LC	Shear Check	Loc[ft]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [k-ft]	phi*Mn z-z [k-ft]	Cb	Eqn
10	MP3C	PIPE_2.0	0.213	5.75	6	0.039	5.75		19	14916.096	32130	1.872	1.872	2.278	H1-1b
11	MP2C	PIPE_2.0	0.235	5.75	12	0.102	5.75		12	14916.096	32130	1.872	1.872	2.195	H1-1b
12	MP2A	PIPE_2.0	0.246	5.75	15	0.103	5.75		4	14916.096	32130	1.872	1.872	2.288	H1-1b
13	MQ22	PL1/2x9	0.747	0	17	0.369	0.662	y	17	124327.856	145800	1.519	27.338	1.734	H1-1b
14	MQ23	PL1/2x9	0.764	0	21	0.38	0.662	y	22	124327.856	145800	1.519	27.338	1.719	H1-1b
15	MQ24	PL1/2x9	0.764	0.662	21	0.378	0	y	21	124327.856	145800	1.519	27.338	1.726	H1-1b
16	MQ25	PL1/2x9	0.735	0.662	17	0.359	0	y	17	124327.856	145800	1.519	27.338	1.622	H1-1b
17	MQ26	PL1/2x9	0.752	0	13	0.371	0.662	y	13	124327.856	145800	1.519	27.338	1.618	H1-1b
18	MQ27	PL1/2x9	0.754	0.662	13	0.374	0	y	13	124327.856	145800	1.519	27.338	1.74	H1-1b
19	MQ28	PL1/4x3	0.637	0	3	0.113	0	y	13	14808.443	24300	0.127	1.519	1.492	H1-1b
20	MQ29	PL1/4x3	0.197	0.583	12	0.054	0	y	13	14808.443	24300	0.127	1.519	1.831	H1-1b
21	MQ30	PL1/4x3	0.664	0	6	0.404	0.583	y	22	14808.443	24300	0.127	1.519	1.296	H1-1b
22	MQ31	PL1/4x3	0.245	0	15	0.056	0	y	21	14808.443	24300	0.127	1.519	1.427	H1-1b
23	MQ32	PL1/4x3	0.647	0	11	0.115	0	y	22	14808.443	24300	0.127	1.519	1.503	H1-1b
24	MQ33	PL1/4x3	0.667	0	4	0.388	0.583	y	24	14808.443	24300	0.127	1.519	1.284	H1-1b
25	MQ34	PL1/4x3	0.272	0	23	0.065	0	y	14	14808.443	24300	0.127	1.519	1.526	H1-1b
26	MQ35	PL1/4x3	0.612	0	3	0.113	0	y	17	14808.443	24300	0.127	1.519	1.462	H1-1b
27	MQ36	PL1/4x3	0.638	0	8	0.388	0.583	y	16	14808.443	24300	0.127	1.519	1.29	H1-1b
28	MQ37	PL1/4x3	0.672	0	12	0.398	0.583	y	20	14808.443	24300	0.127	1.519	1.29	H1-1b
29	MQ38	PL1/4x3	0.262	0	15	0.062	0	y	18	14808.443	24300	0.127	1.519	1.542	H1-1b
30	MQ39	PL1/4x3	0.626	0	11	0.115	0	y	24	14808.443	24300	0.127	1.519	1.489	H1-1b
31	MQ40	PL1/4x3	0.623	0	7	0.11	0	y	18	14808.443	24300	0.127	1.519	1.521	H1-1b
32	MQ41	PL1/4x3	0.64	0	7	0.118	0	y	20	14808.443	24300	0.127	1.519	1.476	H1-1b
33	MQ42	PL1/4x3	0.289	0	15	0.068	0	y	22	14808.443	24300	0.127	1.519	1.41	H1-1b
34	MQ43	PL1/4x3	0.649	0	1	0.382	0.583	y	18	14808.443	24300	0.127	1.519	1.151	H1-1b
35	MQ44	PL1/4x3	0.235	0	23	0.057	0	y	17	14808.443	24300	0.127	1.519	1.432	H1-1b
36	MQ45	PL1/4x3	0.652	0	10	0.399	0.583	y	14	14808.443	24300	0.127	1.519	1.293	H1-1b
37	MQ46	L4X3X4	0.17	2.977	18	0.016	5.833	y	19	29111.475	54756	1.844	4.47	1.161	H2-1
38	MQ47	L4X3X4	0.17	2.856	24	0.017	0	y	23	29111.475	54756	1.844	4.47	1.161	H2-1
39	MQ48	L4X3X4	0.414	3.799	21	0.024	0	y	24	18754.977	54756	1.844	4.116	1.132	H2-1
40	MQ49	C5X6.7	0.416	1.372	9	0.159	11.795	y	21	4253.276	63828	1.604	9.585	2.623	H1-1a
41	MQ50	C5X6.7	0.412	1.372	1	0.155	11.795	y	13	4253.276	63828	1.604	9.585	2.53	H1-1a
42	MQ51	C5X6.7	0.415	1.372	5	0.16	1.372	y	21	4253.276	63828	1.604	9.585	2.693	H1-1a
43	MQ52	L3X3X3	0.244	2.586	14	0.005	5.067	y	4	20036.715	35316	1.32	2.373	1.136	H2-1
44	MQ53	L3X3X3	0.244	2.586	24	0.005	5.067	z	4	20036.715	35316	1.32	2.373	1.136	H2-1
45	MQ54	L3X3X3	0.246	2.586	20	0.006	5.067	z	12	20036.715	35316	1.32	2.373	1.136	H2-1
46	MQ55	L3X3X3	0.246	2.586	22	0.006	5.067	y	12	20036.715	35316	1.32	2.373	1.136	H2-1
47	MQ56	L3X3X3	0.242	2.586	16	0.005	5.067	z	2	20036.715	35316	1.32	2.373	1.136	H2-1
48	MQ57	L3X3X3	0.239	2.586	18	0.005	5.067	y	2	20036.715	35316	1.32	2.373	1.136	H2-1
49	MQ183	PL1/2X6	0.08	0	7	0.034	0.872	y	10	73705.548	97200	1.012	11.791	1.015	H1-1b
50	MQ186	PL1/2X6	0.1	0	10	0.028	0.872	y	6	73705.548	97200	1.012	12.15	1.129	H1-1b
51	MQ187	PL1/2X6	0.097	0	2	0.027	0.872	y	10	73705.548	97200	1.012	12.15	1.128	H1-1b
52	MQ188	PL1/2X6	0.102	0	6	0.028	0.872	y	2	73705.548	97200	1.012	12.15	1.127	H1-1b
53	MQ190	PL1/2X6	0.083	0	12	0.034	0.872	y	2	73705.548	97200	1.012	12.15	1.114	H1-1b
54	MQ192	PL1/2X6	0.081	0	4	0.034	0.872	y	6	73705.548	97200	1.012	12.15	1.116	H1-1b
55	MQ195	HSS4X4X3	0.198	4.033	12	0.14	4.092	z	13	93747.523	106812	12.662	12.662	1.128	H1-1b
56	MQ196	HSS4X4X3	0.197	4.033	6	0.139	4.092	z	17	93747.523	106812	12.662	12.662	1.117	H1-1b
57	MQ197	HSS4X4X3	0.191	4.033	10	0.138	4.092	z	21	93747.523	106812	12.662	12.662	1.204	H1-1b
58	MQ198	L3X3X4	0.708	9.326	3	0.087	0.411	y	13	4459.641	46656	1.688	2.541	1.283	H2-1
59	MQ199	L3X3X4	0.797	0.411	10	0.139	0.411	z	22	4459.641	46656	1.688	2.712	1.5	H2-1
60	MQ200	L3X3X4	0.789	0.411	2	0.138	12.755	z	20	4459.641	46656	1.688	2.712	1.5	H2-1
61	MQ201	L3X3X4	0.718	9.326	7	0.081	0.411	y	17	4459.641	46656	1.688	2.49	1.227	H2-1
62	MQ202	L3X3X4	0.736	9.326	11	0.082	12.755	y	13	4459.641	46656	1.688	2.499	1.236	H2-1
63	MQ203	L3X3X4	0.806	0.411	6	0.141	0.411	z	18	4459.641	46656	1.688	2.712	1.5	H2-1
64	MQ240	PIPE_2.0	0.289	4	22	0.038	4		45	26521.424	32130	1.872	1.872	2.284	H1-1b

Envelope AISC 15TH (360-16): LRFD Member Steel Code Checks (Continued)

	Member	Shape	Code Check	Loc[ft]	LC	Shear Check	Loc[ft]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [k-ft]	phi*Mn z-z [k-ft]	Cb	Eqn
65	MQ241	PIPE_2.0	0.557	4.74	19	0.205	4.74		8	23808.54	32130	1.872	1.872	3	H1-1b
66	MQ242	PIPE_2.0	0.307	4	16	0.038	4		15	26521.424	32130	1.872	1.872	2.285	H1-1b
67	MQ243	PIPE_2.0	0.286	4	24	0.042	4		23	26521.424	32130	1.872	1.872	2.284	H1-1b
68	MQ244	PIPE_2.0	0.565	4.271	21	0.203	4.74		4	23808.54	32130	1.872	1.872	2.742	H1-1b
69	MQ245	PIPE_2.0	0.228	4	6	0.031	4		19	26521.424	32130	1.872	1.872	2.278	H1-1b
70	MQ246	PIPE_2.0	0.225	4	10	0.031	4		23	26521.424	32130	1.872	1.872	2.286	H1-1b
71	MQ247	PIPE_2.0	0.199	4	4	0.025	4		5	26521.424	32130	1.872	1.872	2.255	H1-1b
72	MQ248	PIPE_2.0	0.307	4	20	0.039	4		19	26521.424	32130	1.872	1.872	2.275	H1-1b
73	MQ249	PIPE_2.0	0.536	4.74	23	0.206	4.74		12	23808.54	32130	1.872	1.872	2.687	H1-1b
74	MQ250	PIPE_2.0	0.202	4	8	0.025	4		9	26521.424	32130	1.872	1.872	2.26	H1-1b
75	MQ251	PIPE_2.0	0.253	4	18	0.043	4		19	26521.424	32130	1.872	1.872	2.284	H1-1b
76	MQ252	PIPE_2.0	0.29	4	14	0.037	4		15	26521.424	32130	1.872	1.872	2.282	H1-1b
77	MQ253	PIPE_2.0	0.228	4	2	0.034	4		15	26521.424	32130	1.872	1.872	2.284	H1-1b
78	MQ254	PIPE_2.0	0.199	4	6	0.025	4		6	26521.424	32130	1.872	1.872	2.255	H1-1b

Connection Check Summary	
Site Name	HARTFORD NW CT
Site ID	469115
NB+C Project No.	100819

Connection Properties			
Plate Properties			
Thickness	t	0.75	in
Plate length	L	8	in
Plate Grade	F_y	36	ksi
Connected Part Dimensions	Width	4	in
	Height	4	in
Horizontal Bolt Separation	d_x	6	in
Vertical Bolt Separation	d_y	6	in
Bolt Properties			
Bolt Grade		A325	
Bolt Diameter	d_b	0.625	in
Number of Bolts	N_b	4	Bolts
Weld Properties			
Weld Shape		Square	
Standoff Arm Height	d	4	in
Standoff Arm Width	b	4	in
Fillet Weld Size	a	1/4	in

Member End Reactions			
Shear	F_Y	545	lbs
	F_Z	89	lbs
Tension	F_X	82	lbs
Bending	M_Z	0.085	k-ft
	M_Y	1.715	k-ft
Torsion	M_X	0.036	k-ft

Connection Capacities (% Usage)			
Plate Capacity	Shear	**0.4%**	**Pass**
	Bending	**12.9%**	**Pass**
Bolt Capacity	Shear	**1.3%**	**Pass**
	Tension	**8.8%**	**Pass**
Weld Capacity	% Usage	**17.4%**	**Pass**

Mount Desktop – Post Modification Inspection (PMI) Report Requirements

Documents & Photos Required from Contractor – Mount Modification

Purpose – to provide NB+C the proper documentation in order to complete the required Mount Desktop review of the Post Modification Inspection Report.

- Contractor is responsible for making certain the photos provided as noted below provide confirmation that the modification was completed in accordance with the modification drawings.
- Contractor shall relay any data that can impact the performance of the mount or the mount modification, this includes safety issues.

Base Requirements:

- Any special photos outside of the standard requirements will be indicated on the drawings
- Provide "as built drawings" showing contractor's name, preparer's signature, and date. Any deviations from the drawings (proposed modification) must be shown.
- Notation that all hardware was properly installed, and the existing hardware was inspected for any issues.
- Verification that loading is as communicated in the modification drawings. NOTE If loading is different than what is conveyed in the modification drawing contact NB+C immediately.
- Each photo should be time and date stamped
- Photos should be high resolution and submitted in a Zip File and should be organized in the file structure as depicted in Schedule A attached.
- Contractor shall ensure that the safety climb wire rope is supported and not adversely impacted by the install of the modification components. This may involve the install of wire rope guides, or other items to protect the wire rope.
- The photos in the file structure should be uploaded **to** https://pmi.vzwsmart.com as depicted on the drawings

Photo Requirements:

- *Base and "During Installation Photos"*
  - Base pictures include
    - Photo of Gate Signs showing the tower owner, site name, and number
    - Photo of carrier shelter showing the carrier site name and number if available
    - Photos of the galvanizing compound and/or paint used (if applicable), clearly showing the label and name
  - "During Installation Photos if provided - must be placed only in this folder
- *Photos taken at ground level*
  - Overall tower structure before and after installation of the modifications
  - Photos of the appropriate mount before and after installation of the modifications; if the mounts are at different rad elevations, pictures must be provided for all elevations that the modifications were installed

- *Photos taken at Mount Elevation*
    - Photos showing each individual sector before and also after installation of modifications. Each entire sector must be in one photo to show in the inter-connection of members.
        - These photos should also certify that the placement and geometry of the equipment on the mount is as depicted on the sketch and table in the mount analysis
    - Close-up photos of each installed modification per the modification drawings; pictures should also include connection hardware (U-bolts, bolts, nuts, all-threaded rods, etc.)
    - Photos showing the measurements of the installed modification member sizes (i.e. lengths, widths, depths, diameters, thicknesses)
    - Photos showing the elevation or distances of the installed modifications from the appropriate reference locations shown in the modification drawings
    - Photos showing the installed modifications onto the tower with tape drop measurements (if applicable) (i.e. ring/collar mounts, tie-backs, V-bracing kits, etc.); if the existing mount elevation needs to be changed according to the modification drawings, a tape drop measurement shall be provided before the elevation change
    - Photos showing the safety climb wire rope above and below the mount prior to modification.
    - Photos showing the climbing facility and safety climb if present.

Material Certification:

- Materials utilized must be as per specification on the drawings or the equivalent as validated by NB+C.
    - If the drawings are as specified on the drawings
        - The contractor should provide the packing list or the materials utilized to perform the mount modification
    - If an equivalent is utilized
        - It is required that the NB+C certification of such is included in the contractor submission package. There may be an additional charge for this certification if the equivalent submission doesn't meet specifications as prescribed in the drawings.
- The contractor must certify that the materials meet these specifications by one of these methods.

☐ The Material utilized was as specified on the NB+C Mount Modification Drawings and included
in the Material certification folder is a packing list or invoice for these materials

☐ The material utilized was an "equivalent" and included as part of the contractor submission is the NB+C certification, invoices, or specifications validating accepted status

Certifying Individual: Company _____

Name _____

Signature _____

Antenna & equipment placement and Geometry Confirmation:

- The contractor must certify that the antenna & equipment placement and geometry is in accordance with the antenna placement diagrams as included in this mount analysis.

☐ The contractor certifies that the photos support and the equipment on the mount is as depicted on the antenna placement diagrams as included in this mount analysis.

☐ The contractor notes that the equipment on the mount is not in accordance with the antenna placement diagrams and has accordingly marked up the diagrams or provided a diagram outlining the differences.

Certifying Individual: Company _____

Name _____

Signature _____

Special Instructions / Validation as required from the MA or Mod Drawings:

Issue:

Response:

Schedule A – Photo & Document File Structure

- VzW Site Number / Name
  - Base & “During Installation” Photos
  - Pre-Installation Photos
    - Alpha
    - Beta
    - Gamma
    - Ground Level
    - Tape Drop
  - Post-Installation Photos
    - Alpha
    - Beta
    - Gamma
    - Ground Level
    - Tape Drop
    - Photos of climbing facility and safety climb – If Present
  - Certifications – Submission of this document including certifications
  - Specific Required Additional Photos

RTFORD NW CT

Sector: **A**

8/13/2021

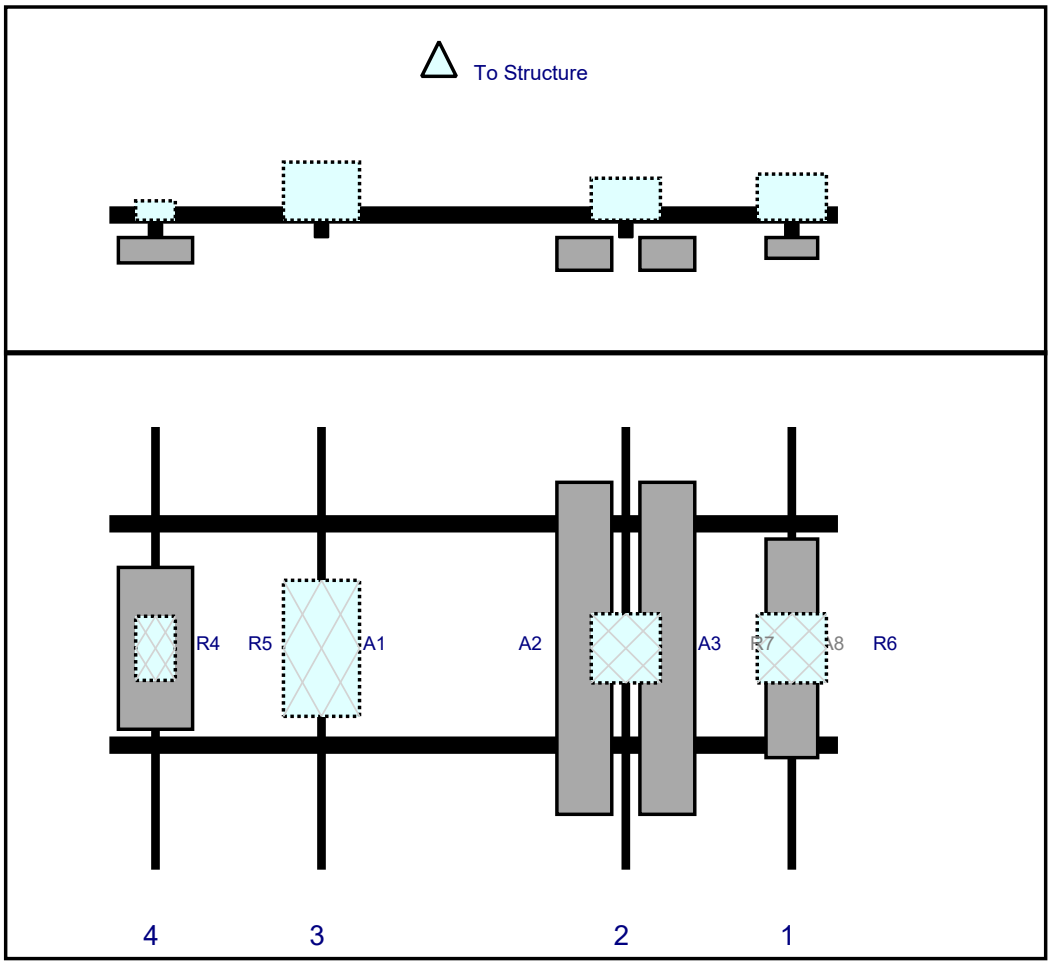
Structure Type: Monopole

10093320

Mount Elev: 137.00

Plan View

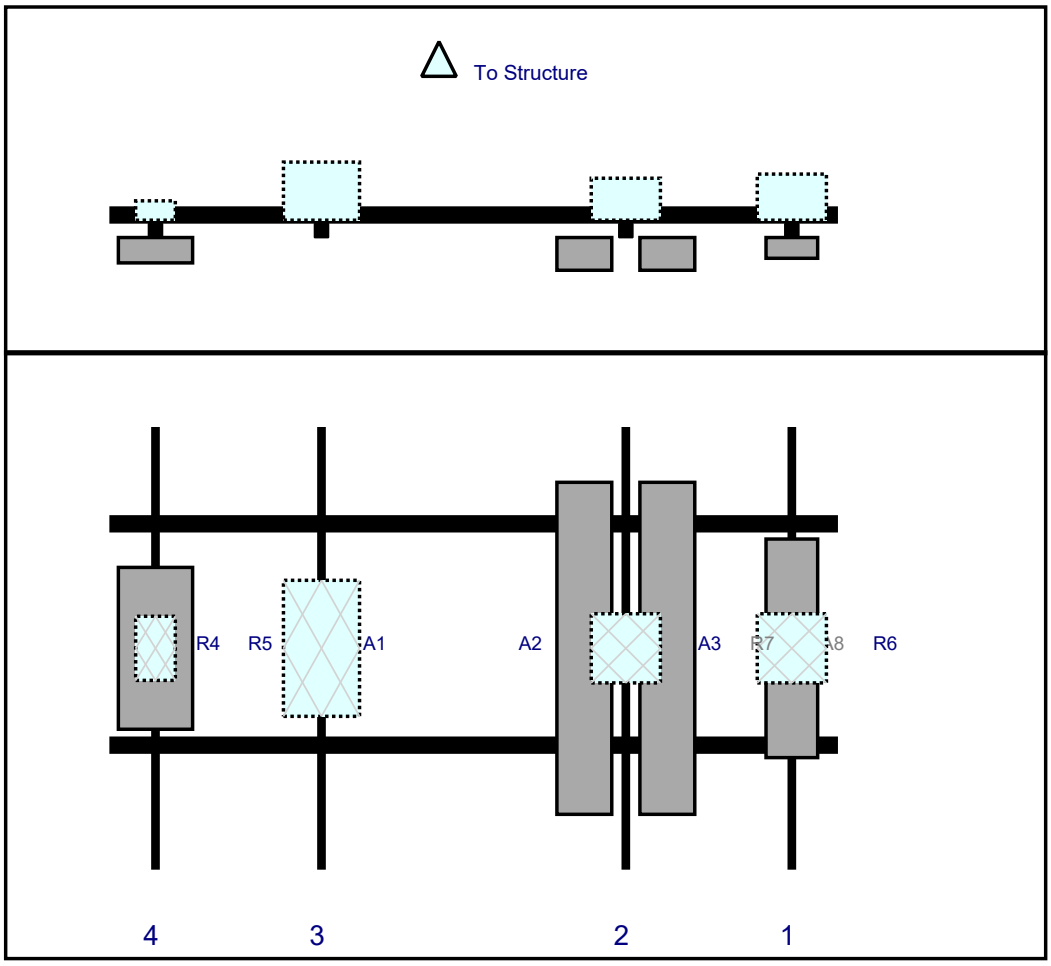
Front View
Looking at Structure



Ref#	Model	Height (in)	Width (in)	H Dist Frm L.	Pipe #	Pipe Pos V	Ant Pos	C. Ant Frm T.	Ant H Off	Status	Validation
A8	BXA-80063/4	47.4	11.2	148	1	a	Front	48	0	Retained	04/06/2021
R6	RF4439d-25A	15	15	148	1	c	Behind	48	0	Added	
A2	NHH-65B-R2B	72	11.9	112	2	a	Front	48	-9	Added	
A3	NHHSS-65B-R2BT0	72	11.9	112	2	b	Front	48	9	Added	
R7	RF4440d-13A	15	15	112	2	a	Behind	48	0	Added	
A1	OVP-6	29.5	16.5	46	3	a	Behind	48	0	Added	
R4	MT6407-77A	35.1	16.1	10	4	a	Front	48	0	Added	
R5	CBRS RRH - RT4401-48A	13.9	8.6	10	4	a	Behind	48	0	Added	

Plan View

Front View
Looking at Structure



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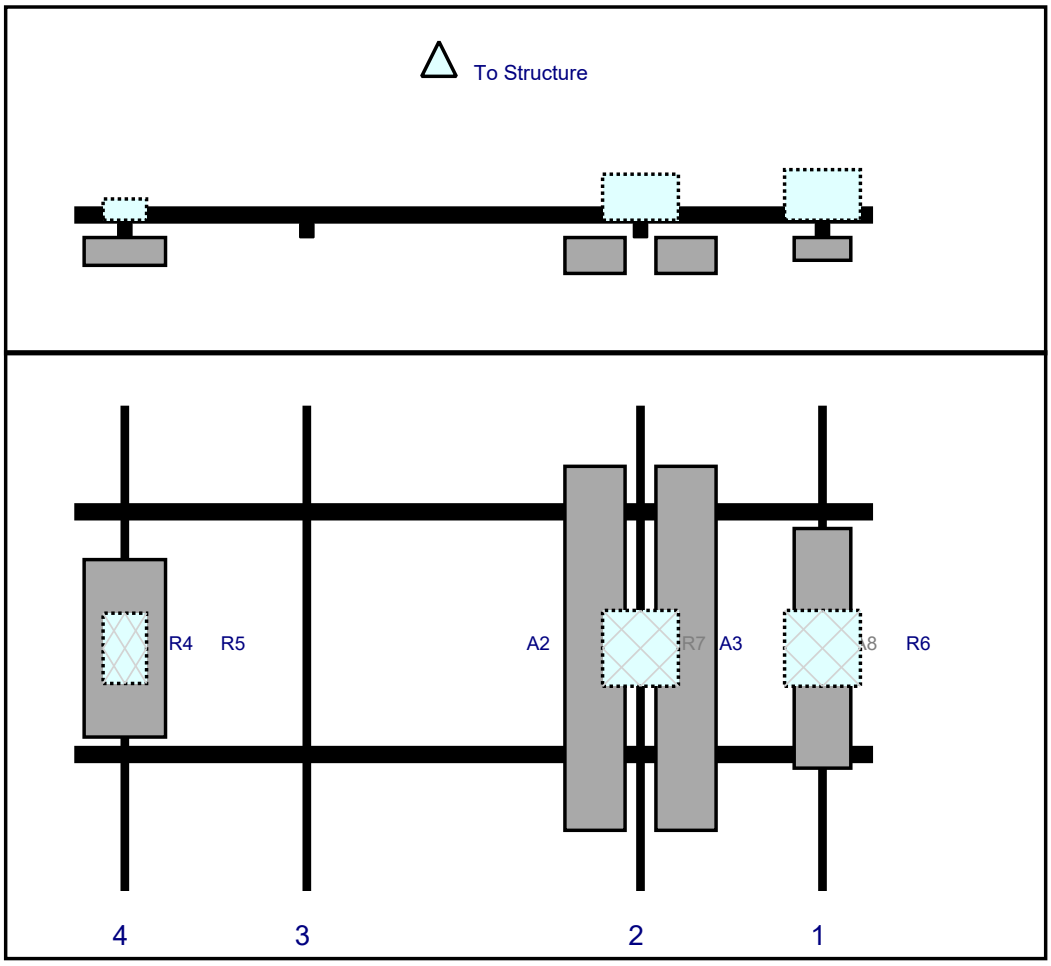
A2	NHH-65B-R2B	72	11.9	112	2	a	Front	48	-9	Added	
A3	NHHSS-65B-R2BT0	72	11.9	112	2	b	Front	48	9	Added	
R7	RF4440d-13A	15	15	112	2	a	Behind	48	0	Added	
A1	OVP-6	29.5	16.5	46	3	a	Behind	48	0	Added	
R4	MT6407-77A	35.1	16.1	10	4	a	Front	48	0	Added	
R5	CBRS RRH - RT4401-48A	13.9	8.6	10	4	a	Behind	48	0	Added	

Plan View

Front View
Looking at Structure



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R7	RF4440d-13A	15	15	112	2	a	Behind	48	0	Added	
R4	MT6407-77A	35.1	16.1	10	4	a	Front	48	0	Added	
R5	CBRS RRH - RT4401-48A	13.9	8.6	10	4	a	Behind	48	0	Added	

Exhibit F

Power Density/RF Emissions Report

Site Name: ***HARTFORD NW***
Cumulative Power Density

Operator	Operating Frequency	Number of Trans.	ERP Per Trans.	Total ERP	Distance to Target	Calculated Power Density	Maximum Permissible Exposure*	Fraction of MPE
	(MHz)		(watts)	(watts)	(feet)	(mW/cm^2)	(mW/cm^2)	(%)
VZW 700	751	4	689	2756	137	0.0053	0.5007	1.05%
VZW CDMA	869	2	401	802	137	0.0015	0.5793	0.27%
VZW Cellular	869	4	697	2788	137	0.0053	0.5793	0.92%
VZW PCS	1980	4	1486	5944	137	0.0114	1.0000	1.14%
VZW AWS	2125	4	1429	5716	137	0.0110	1.0000	1.10%
VZW CBAND	3730	4	6531	26124	137	0.0501	1.0000	5.01%
VZW CBRS	3625	4	12	48	137	0.0001	1.0000	0.01%
Total Percentage of Maximum Permissible Exposure								9.49%

*Guidelines adopted by the FCC on August 1, 1996, 47 CFR Part 1 based on NCRP Report 86, 1986 and generally on ANSI/IEEE C95.1-1992
**Calculation includes a -10 dB Off Beam Antenna Pattern Adjustment pursuant to Attachments B and C of the Siting Council's November 10, 2015 Memorandum for Exempt Modification filings

MHz = Megahertz
mW/cm^2 = milliwatts per square centimeter
ERP = Effective Radiated Power

Absolute worst case maximum values used.