March 19, 2021

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

RE: **Notice of Exempt Modification for T-Mobile**
Crown Site ID# 876371; T-Mobile Site ID# CTNL815A
557 Route 82, Oakdale, CT 06370
Latitude: 41° 30′ 20.30″ / Longitude: -72° 11′ 51.10″

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antennas at the 180-foot mount on the existing 180-foot Monopole Tower located at 557 Route 82 in Oakdale. The property is owned by Carolyn Besade and the Tower is owned by Crown Castle. T-Mobile now intends to replace six (6) existing antennas and add three (3) new 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) RFS – APXVTMI4-ALU-I20 Antennas **(REMOVE)** - (3) RFS – APX16DWV-16DWV-S-E-A20 Antennas **(REPLACE)**

(3) Commscope – NNVV-65B-R4 Antennas **(REMOVE)** – (3) RFS – APXVAALL24_43-U-NA20 Antennas **(REPLACE)**

(6) Alcatel Lucent RRH2X50-800 Radios **(REMOVE)** – (3) Ericsson 4415 B66A Radios + (3) Ericsson – 4449 B71+B85 Radios **(REPLACE)**

(3) Nokia – FZHN Radios **(REMOVE)** – (3) Ericsson – 4424 B25 Radios **(REPLACE)**

Install New:
(3) AIR6449 B41 Antennas
(4) 1 5/8'' hybrid cable

Remove:
(3) Alcatel Lucent – PCS 1900MHz 4X45W-65MHz Radio

Ground:

Install New:
(1) SSC 6160 cabinet
(1) RBS 6601
(1) B160 battery cabinet
(1) BB6648
(3) BB6630
(1) DUG20
(1) PSU 4813 voltage booster
(1) CSR IXRe V2

The facility was approved by the Montville Planning & Zoning Commission on October 26, 1999 by way of Zoning Permit 99-276.

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 Ronald McDaniel, Mayor for the Town of Montville, Marcia Vlaun, Montville Director of Planning, and Carolyn Besade, 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, T-Mobile respectfully submits that the proposed modifications to the above-reference telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Richard Zajac
Site Acquisition Specialist
4545 East River Road, Suite 320
West Henrietta, NY
(585) 445-5896
Richard.zajac@crowncastle.com

cc:

Ronald McDaniel, Mayor *(via email only to rmcdaniel@montville-ct.org)*
Town Hall, 2nd Floor
310 Norwich-New London Turnpike
Uncasville, CT 06382
860.848.6778

Marcia Vlaun, Director of Planning *(via email only to planningdept@montville-ct.org)*
Montville Town Hall
310 Norwich-New London Turnpike
Uncasville, CT 06382
860.848.6779

Carolyn Besade *(via email only to redmoebesade@yahoo.com)*
70 Platt Road
PO Box 788
Shelton, CT 06484

Zajac, Richard

From: Zajac, Richard
Sent: Friday, March 19, 2021 10:48 AM
To: rmcdaniel@montville-ct.org
Subject: Connecticut Siting Council exempt modification application notification
Attachments: CSC Exempt Modification Application - 557 Rte 82.pdf

Good morning Mr. McDaniel,
Please see the attached application to the Connecticut Siting Council regarding antenna work on the existing cell tower located at 557 Route 82 in Oakdale.

Should you have any questions/comments/concerns regarding this application, please do not hesitate to contact me.

Thank you,
RICH ZAJAC
Site Acquisition Specialist
T: (585) 445-5896 M: (607) 346-7212
F: (724) 416-4461
CROWN CASTLE
4545 East River Road, Suite 320
West Henrietta, NY 14586

Zajac, Richard

From: Zajac, Richard
Sent: Friday, March 19, 2021 10:51 AM
To: planningdept@montville-ct.org
Subject: Connecticut Siting Council exempt modification application notification
Attachments: CSC Exempt Modification Application - 557 Rte 82.pdf

Good morning Ms. Vlaun,
Please see the attached application to the Connecticut Siting Council regarding antenna work on the existing cell tower located at 557 Route 82 in Oakdale.

Should you have any questions/comments/concerns regarding this application, please do not hesitate to contact me.

Thank you,
RICH ZAJAC
Site Acquisition Specialist
T: (585) 445-5896 M: (607) 346-7212
F: (724) 416-4461
CROWN CASTLE
4545 East River Road, Suite 320
West Henrietta, NY 14586

Zajac, Richard

From: Zajac, Richard
Sent: Friday, March 19, 2021 10:51 AM
To: 'redmoebesade@yahoo.com'
Subject: Connecticut Siting Council exempt modification application notification
Attachments: CSC Exempt Modification Application - 557 Rte 82.pdf

Good morning Ms. Besade,
Please see the attached application to the Connecticut Siting Council regarding antenna work on the existing cell tower located at 557 Route 82 in Oakdale.

Should you have any questions/comments/concerns regarding this application, please do not hesitate to contact me.

Thank you,
RICH ZAJAC
Site Acquisition Specialist
T: (585) 445-5896 M: (607) 346-7212
F: (724) 416-4461
CROWN CASTLE
4545 East River Road, Suite 320
West Henrietta, NY 14586

Exhibit A

Original Facility Approval

Town of Montville
Building Department
310 Norwich New London Tpke

Phone: 848-7166

Fax: 848-7231

Building / Trades Permit

Permit Number BP2000-2 **Permit Date** 1/5/2000 **Permit Type** Building **Permit Code** C2

Job Street # 557 **Job Location** Route 82 **Map/Block-Lot** 058/015-000

Job Description telecommunications tower & equip. building

Owner Carolyn Besade/Sprint PCS **Mailing Address** 1 International Blvd.,Suite 800

City Mahwah **State** N.J. **Zip** 07495 **Telephone** 201/512/6700

Contractor Sprint PCS ***Mailing Address** 1 International Blvd.,Suite 800

***City** Mahwah ***State** N.J. ***Zip** 07495 ***Telephone** 201/512/4700

Lic/Reg Number **Lic/Reg Type** **Expiration Date**

Use Group B **Size** 180' high **Type Construction** 2C

Building Value	$130,000.00	**Building Fee**	$778.00
Plumbing Value	$0.00	**Plumbing Fee**	$0.00
Heating Value	$0.00	**Heating Fee**	$0.00
Electrical Value	$0.00	**Electrical Fee**	$0.00
A/C Value	$0.00	**A/C Fee**	$0.00
Other Value	$0.00	**Other Fee**	$0.00
Total Values	$130,000.00	**State Ed Fee**	$20.80
		C/O Fee	$25.00
		Plan Review Fee	$111.60
		Total Fees	**$935.40**

Building Official's Signature _____ **Date** 1/5/00

Required Inspection

- ☑ Footings - Prior to pouring concrete
- ☐ Footing Drains / Waterproofing - Prior to backfill
- ☑ Framing
- ☑ Rough Electrical
- ☑ Electrical Service
- ☐ Rough Plumbing - Leak test required
- ☐ Pool Bonding and Electric
- ☐ Rough Heating and Air Conditioning
- ☐ Chimney - One flue above thimble
- ☐ Fireplace - Throat
- ☐ Fireplace - Final
- ☐ Firestopping / Draftstopping
- ☐ Insulation

☑ Final Inspection for Certificate of Occupancy - PRIOR to Use or Occupancy

TEL: 848-8549
FAX: 848-2354

TOWN OF MONTVILLE
PLANNING & ZONING COMMISSION

310 NORWICH-NEW LONDON TPKE.
UNCASVILLE, CONNECTICUT 06382-2599

L E G A L N O T I C E

The Montville Planning and Zoning Commission at its meeting held on October 26, 1999, took the following action:

Carolyn Besade/Sprint Spectrum L.P.: Application for a special permit to construct a wireless telecommunications facility, including a 180 foot monopole tower with antenna, base station equipment, fencing, and an access drive on property located at 557 Route 82, Montville, Ct. Shown on Assessor's Map 58, Lot 15. **GRANTED WITH CONDITION.**

The Mohegan Tribe of Indians of Connecticut: Application for a special permit to develop 36 elderly housing units for senior members of the Mohegan Tribe of Indians of Connecticut on property located at 1710 Norwich-New London Tpke., Montville, Ct. Shown on Assessor's Map 41, Lot 1. **GRANTED.**

Maps and documentation concerning the above applications are on file in the office of the Town Planner, Town Hall Annex, Montville, Ct.

Dated at Montville, Ct. this 27th day of October 1999.

MONTVILLE PLANNING AND ZONING COMMISSION

Gregory Majewski, Chairman

PUBLISH IN THE NEW LONDON DAY October 29, 1999

PLEASE REFERENCE PURCHASE ORDER 6100 I 1 ON INVOICE.

ZONING PERMIT

ZONING PERMIT NUMBER 99-276 OR ☐ N/A EXPIRATION DATE 12-9-2004

APPLICANT Sprint Spectrum, L.P.

APPLICANT'S ADDRESS 1 International Blvd., Suite 800 Mahwah, NJ 07495 TELEPHONE (201) 512-4700

PROPERTY OWNER Carolyn Besade

LOCATION 557 Route 82, Montville, CT LOT AREA 10.08 acres ZONE R-120

ASSESSOR'S MAP NUMBER 58 LOT NUMBER 15

BUILDING HEIGHT 180-ft Monopole Tower PROPOSED FLOOR AREA N/A

NATURE OF REQUEST/PROPOSED USE Telecommunications tower, antennas, and associated equipment

SKETCH ON REVERSE OR PROVIDE TWO COPIES OF PLANS DRAWN TO A SCALE OF AT LEAST 1" = 40' SHOWING: DIMENSIONS OF THE LOT, THE SIZE, AREA, AND LOCATION OF EXISTING, PROPOSED, PRINCIPAL AND ACCESSORY STRUCTURES, DRIVEWAYS, SANITARY FACILITIES AND WATER SUPPLY, PARKING FACILITIES, AND ADJACENT STREETS; DISTANCES OF PROPOSED STRUCTURES FROM PROPERTY LINES. IN THE CASE OF FILL OR EXCAVATION REQUESTS (UNDER 500 CUBIC YARDS), DIMENSIONS OF FILL OR EXCAVATION AREA MUST BE INCLUDED. A PLAN PREPARED BY A CONNECTICUT REGISTERED LAND SURVEYOR MAY BE REQUIRED. THE PROPOSED USE SPECIFIED ABOVE SHALL NOT BE AUTHORIZED UNTIL AN ACTUAL CERTIFICATE OF COMPLIANCE IS ISSUED BY THE COMMISSION OR ITS APPOINTED AGENTS.

SKETCH PLAN OR GRADING PLAN	☒ YES	☐ N/A	Submitted 9/21/99
SEPTIC PERMIT	☐ YES	☒ N/A	
DRIVEWAY PERMIT (STATE, LOCAL)	☐ YES	☒ N/A	Existing driveway
WETLANDS PERMIT	☒ YES	☐ N/A	
HAS A VARIANCE EVER BEEN GRANTED FOR THIS PROPERTY	☐ YES	☒ NO	
HAS BOND BEEN FILED	☐ YES	☒ N/A	
FEE PAID	☐ CASH	☒ CHECK # Submitted 9/21/99	☐ N/A

THE APPLICANT AGREES TO:

1. ADHERE TO ALL THE APPLICABLE REQUIREMENTS OF THE ZONING REGULATIONS.
2. NOTIFY THE COMMISSION OR ITS APPOINTED AGENT OF ANY ALTERATION IN THE PLANS.
3. CALL FOR FINAL INSPECTION AND REQUEST CERTIFICATE OF COMPLIANCE BEFORE ISSUANCE OF C. O.

APPLICANT'S SIGNATURE [signature] DATE 12/8/99

Thomas E Landers 12/9/99
COMMISSION AGENT DATE

Thomas E Landers 7/17/01
CERTIFICATE OF COMPLIANCE DATE

THIS SIGNED PERMIT AUTHORIZES THE APPLICANT TO PROCEED TO THE BUILDING DEPARTMENT FOR ANY REQUIRED PERMITS

CONTACT THE ZONING OFFICER (848-8549) AT LEAST 24 HOURS BEFORE CONSTRUCTION BEGINS TO ALLOW ZONING OFFICER TO INSPECT LOCATION.

REV. 9/14/98

Exhibit B

Property Card

The Assessor's office is responsible for the maintenance of records on the ownership of properties. Assessments are computed at 70% of the estimated market value of real property at the time of the last revaluation which was 2016.

Information on the Property Records for the Municipality of Montville was last updated on 3/17/2021.

Parcel Information

Location:	557 ROUTE 82	Property Use:	Residential	Primary Use:	Residential
Unique ID:	B0269700	Map Block Lot:	058/015/000	Acres:	11.22
490 Acres:	0.00	Zone:	R120	Volume / Page:	0429/0737
Developers Map / Lot:		Census:	695202		

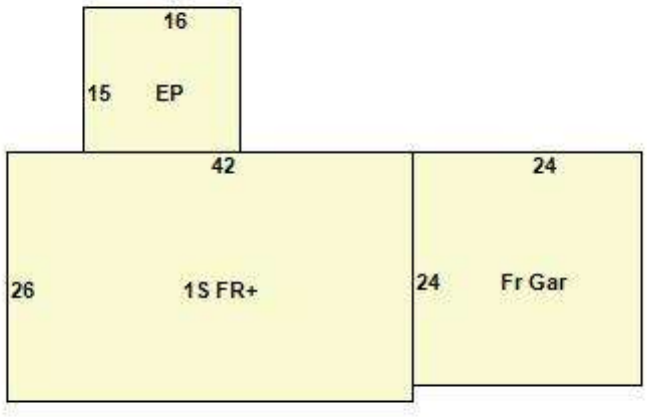
Value Information

	Appraised Value	Assessed Value
Land	197,680	138,370
Buildings	147,894	103,530
Detached Outbuildings	676,910	473,840
Total	1,022,484	715,740

Owner's Information

Owner's Data
BESADE CAROLYN J L/U & BESADE THOMAS E & EDWARD J & JOHN R & BRIAN H 557 ROUTE 82 OAKDALE, CT 06370

Building 1



Building Use:	Single Family	Style:	Ranch	Living Area:	1,092
Stories:	1.00	Construction:	Wood Frame	Year Built:	1979
Total Rooms:	5	Bedrooms:	3	Full Baths:	2

Half Baths:	0	Fireplaces:	1	Heating:	Hot Water
Fuel:	Oil	Cooling Percent:	0	Basement Area:	1,092
Basement Finished Area:	0	Basement Garages:	0	Roof Material:	Asphalt
Siding:	Vinyl Siding	Units:			

Special Features

Attached Components

Type:	Year Built:	Area:
Frame Garage	1979	576
Enclosed Porch	1979	240

Detached Outbuildings

Type:	Year Built:	Length:	Width:	Area:
6 Ft Top Rail Fence	0000	288.00	0.00	288
Cell Shed	0000	120.00	0.00	120
Cell Shed	0000	160.00	0.00	160
Cell Tower	0000	4.00	0.00	4

Owner History - Sales

Owner Name	Volume	Page	Sale Date	Deed Type	Valid Sale	Sale Price
BESADE CAROLYN J L/U & BESADE THOMAS E &	0429	0737	02/04/2004	Warranty Deed	No	$0
BESADE CAROLYN J L/U ET AL	0404	0638	05/29/2003	Warranty Deed	No	$0

Owner Name	Volume	Page	Sale Date	Deed Type	Valid Sale	Sale Price
BESADE CAROLYN J	0170	0742	07/24/1986		No	$0
BESADE THOMAS H EST & CAROLYN J	0163	0325	02/01/1985		No	$0
BESADE THOMAS H & CAROLYN J	0138	1104	05/01/1979		No	$0
COHEN RUBIN & GILBERT J MILONE	0119	0244	05/01/1973		No	$0

Building Permits

Permit Number	Permit Type	Date Opened	Date Closed	Permit Status	Reason
B2020-0158	Commercial New	05/11/2020		Needs Visit	UPGRADE ANTENAS
B2018-0553	Commercial New	12/31/2018		Closed	SPRINT TO REPLACE SIX ANTENNAS & ADD NINE REMOTE RADIO HEADS
B2017-0002	Commercial New	01/03/2017		Closed	REPLACE ANTENNA PANELS & REMOTE RADIO HEADS TO EXISTING TOWER
E2013-0128	Electrical	06/14/2013		Closed	LTE EQUIPMENT
B2009-0044	Commercial New	02/25/2009		Closed	REPLACEMENT OF ANTENNAS
B2006-0398	Residential Addition	08/10/2006		Closed	CO ISSUED-ADDITION 14' X 16'
E2006-0169	Electrical	08/10/2006		Closed	ELECTRICAL FOR ADDITION 14' X 16'
E2003-0052	Electrical	03/19/2003		Closed	ELECTRIC SERVICE & WIRING FOR AT & T EQUIPMENT

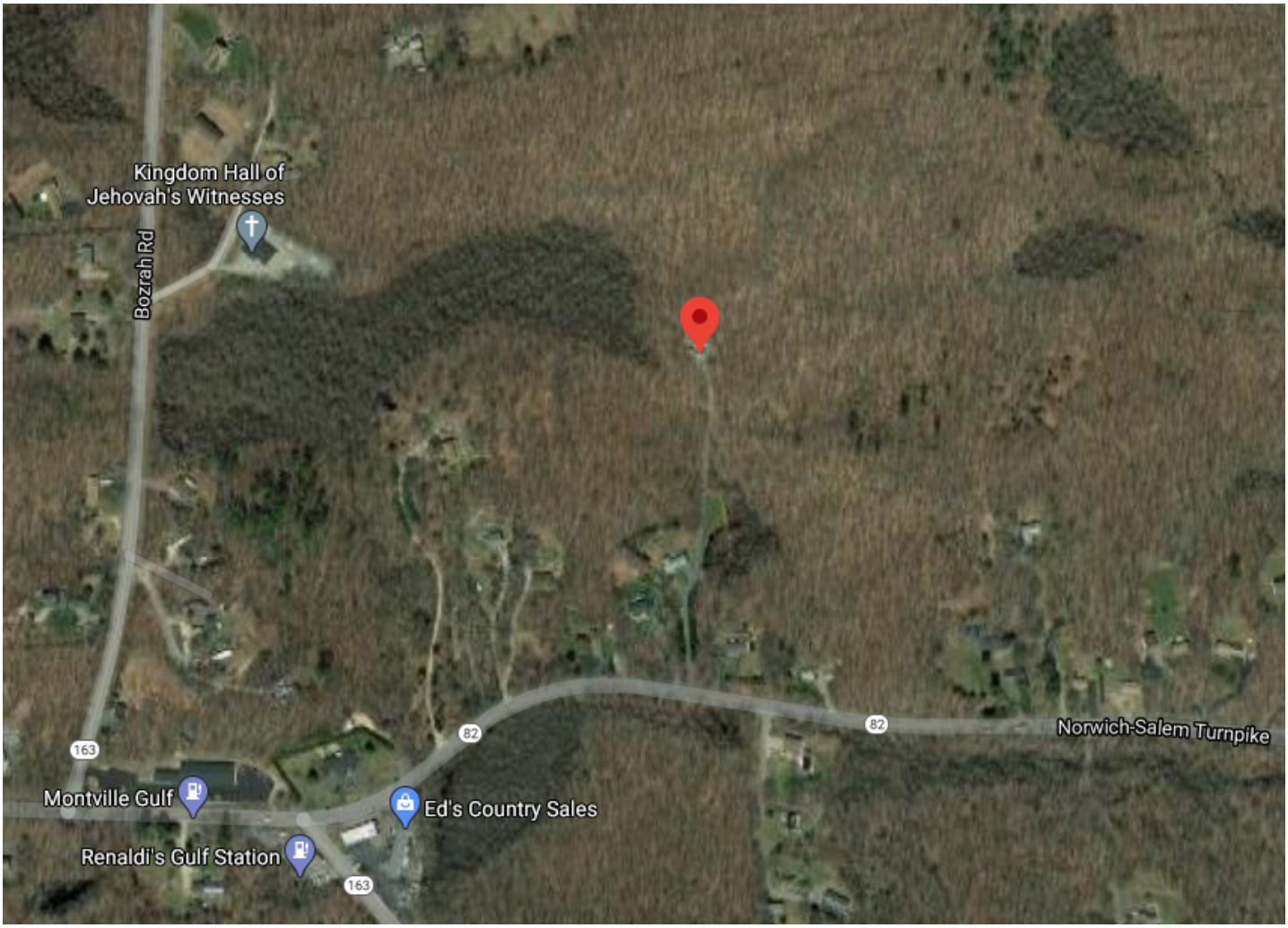

Kingdom Hall of
Jehovah's Witnesses
Bozrah Rd
82
82
Norwich-Salem Turnpike
163
Montville Gulf
Ed's Country Sales
Renaldi's Gulf Station
163

Exhibit C

Construction Drawings

T-Mobile

T-MOBILE SITE NUMBER: CTNL815A
T-MOBILE SITE NAME: CTNL815A
SITE TYPE: MONOPOLE
TOWER HEIGHT: 180'-0"

BUSINESS UNIT #: 876371
SITE ADDRESS: 557 RTE. 82 OAKDALE, CT 06370
COUNTY: NEW LONDON
JURISDICTION: CONNECTICUT SITING COUNCIL

T-MOBILE SPRINT RETAIN SITE CONFIGURATION: 67D5A998C 6160 (GSM ONLY)

SITE INFORMATION

CROWN CASTLE USA INC. SITE NAME:	WALDEN / CAROLYN BESADE
SITE ADDRESS:	557 RTE. 82 OAKDALE, CT 06370
COUNTY:	NEW LONDON
MAP/PARCEL #:	058-015-000
AREA OF CONSTRUCTION:	EXISTING
LATITUDE:	41.505639°
LONGITUDE:	-72.197528°
LAT/LONG TYPE:	NAD83
GROUND ELEVATION:	482'
CURRENT ZONING:	R120
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:	BESADE CAROLYN J L/U & BESADE THOMAS E & EDWARD J & JOHN R & BRIAN H 557 ROUTE 82 OAKDALE, CT 06370
TOWER OWNER:	CROWN CASTLE USA INC 2000 CORPORATE DRIVE CANONSBURG, PA 15317
CARRIER/APPLICANT:	T-MOBILE 4 SYLVAN WAY PARSIPPANY, NJ 07054
ELECTRIC PROVIDER:	NOT PROVIDED
TELCO PROVIDER:	NOT PROVIDED

PROJECT TEAM

A&E FIRM:	B+T GROUP 1717 S BOULDER AVE, SUITE 300 TULSA, OK 74119 JENNY PAUL (918) 587-4630
CROWN CASTLE USA INC. DISTRICT CONTACTS:	3530 TORINGDON WAY, SUITE 300 CHARLOTTE, NC 28277

DRAWING INDEX

SHEET #	SHEET DESCRIPTION
T-1	TITLE SHEET
T-2	GENERAL NOTES
C-1.1	OVERALL SITE PLAN
C-1.2	SITE PLAN & ENLARGED SITE PLAN
C-2	FINAL ELEVATION & ANTENNA PLANS
C-3	ANTENNA & CABLE SCHEDULE
C-4	PLUMBING DIAGRAM
C-5	EQUIPMENT SPECS
E-1	AC PANEL SCHEDULES & ONE LINE DIAGRAM
G-1	ANTENNA GROUNDING DIAGRAM
G-2	GROUNDING DETAILS
G-3	GROUNDING DETAILS

ALL DRAWINGS CONTAINED HEREIN ARE FORMATTED FOR 24X36. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

PROJECT DESCRIPTION

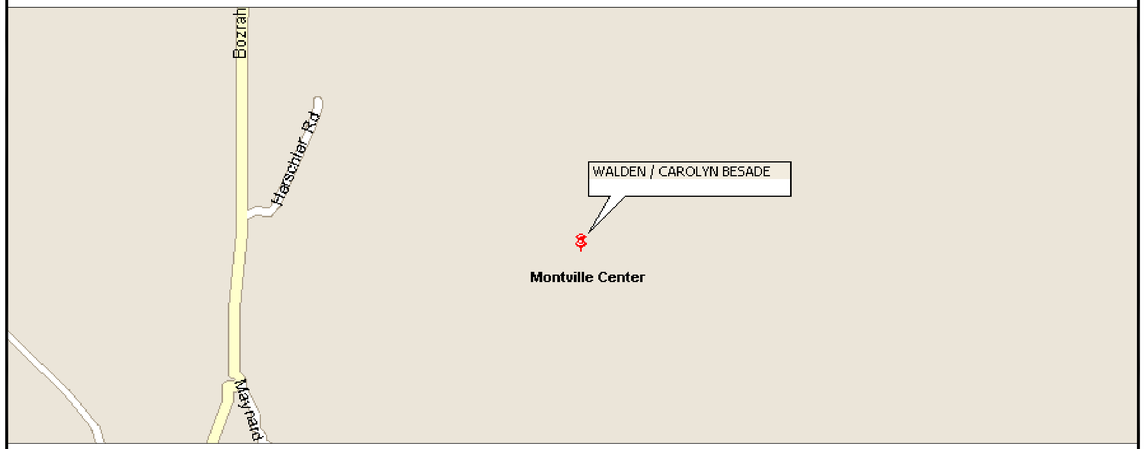
THE PURPOSE OF THIS PROJECT IS TO ENHANCE BROADBAND CONNECTIVITY AND CAPACITY TO THE EXISTING ELIGIBLE WIRELESS FACILITY.

TOWER SCOPE OF WORK:
- REMOVE (6) ANTENNAS
- REMOVE (12) RRHs
- INSTALL (9) ANTENNAS
- INSTALL (9) RRHs
- INSTALL (4) 1 5/8" HYBRID CABLE

GROUND SCOPE OF WORK:
- INSTALL (1) 6160 CABINET
- INSTALL (1) RBS 6601 IN 6160 SSC CABINET
- INSTALL (1) B160 BATTERY CABINET
- INSTALL (1) BB 6648 IN ENCLOSURE 6160 SSC CABINET
- INSTALL (3) BB 6630 IN ENCLOSURE 6160 SSC CABINET
- INSTALL (1) PSU 4813 VOLTAGE BOOSTER IN ENCLOSURE 6160 SSC CABINET
- INSTALL (1) CSR IXRE V2 IN ENCLOSURE 6160 SSC CABINET
- INSTALL (1) DUG 20 IN RBS 6601 IN 6130 SSC CABINET

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

LOCATION MAP



NO SCALE

APPLICABLE CODES/REFERENCE DOCUMENTS

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

CODE TYPE	CODE
BUILDING	2015 IBC/2018 CONNECTICUT SBC
MECHANICAL	2015 IMC
ELECTRICAL	2017 NEC

REFERENCE DOCUMENTS:

STRUCTURAL ANALYSIS:	TOWER ENGINEERING PROFESSIONALS
DATED:	2/11/21
MOUNT ANALYSIS:	GPD
DATED:	2/3/21
RFDS REVISION:	1
DATED:	1/15/21
ORDER ID:	538781
REVISION:	1

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

APPROVALS

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

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

T-Mobile
4 SYLVAN WAY
PARSIPPANY, NJ 07054

CROWN CASTLE
3530 TORINGDON WAY, SUITE 300
CHARLOTTE, NC 28277

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

T-MOBILE SITE NUMBER:
CTNL815A

BU #: **876371**
WALDEN / CAROLYN BESADE

557 RTE. 82
OAKDALE, CT 06370

EXISTING
180'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	2/23/21	LHT	PRELIMINARY REVIEW	MTJ
0	3/8/21	JJD	CONSTRUCTION	MTJ

STATE OF CONNECTICUT
No. 23924
LICENSED
PROFESSIONAL ENGINEER
3/8/21

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/21

SHEET NUMBER: T-1
REVISION: 0

CROWN CASTLE USA INC. SITE ACTIVITY REQUIREMENTS:

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

GENERAL NOTES:

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

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

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

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

GREENFIELD GROUNDING NOTES:

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

ELECTRICAL INSTALLATION NOTES:

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

CONDUCTOR COLOR CODE

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

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

APWA UNIFORM COLOR CODE:

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

ABBREVIATIONS:

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

T-Mobile
4 SYLVAN WAY
PARSIPPANY, NJ 07054

CROWN CASTLE
3530 TORINGDON WAY, SUITE 300
CHARLOTTE, NC 28277

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

T-MOBILE SITE NUMBER:
CTNL815A

BU #: **876371**
WALDEN / CAROLYN BESADE

557 RTE. 82
OAKDALE, CT 06370

EXISTING
180'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	2/23/21	LHT	PRELIMINARY REVIEW	MTJ
0	3/8/21	JJD	CONSTRUCTION	MTJ

STATE OF CONNECTICUT
CHAD TUTTLE
No. 23924
LICENSED
PROFESSIONAL ENGINEER
3/8/21

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/21

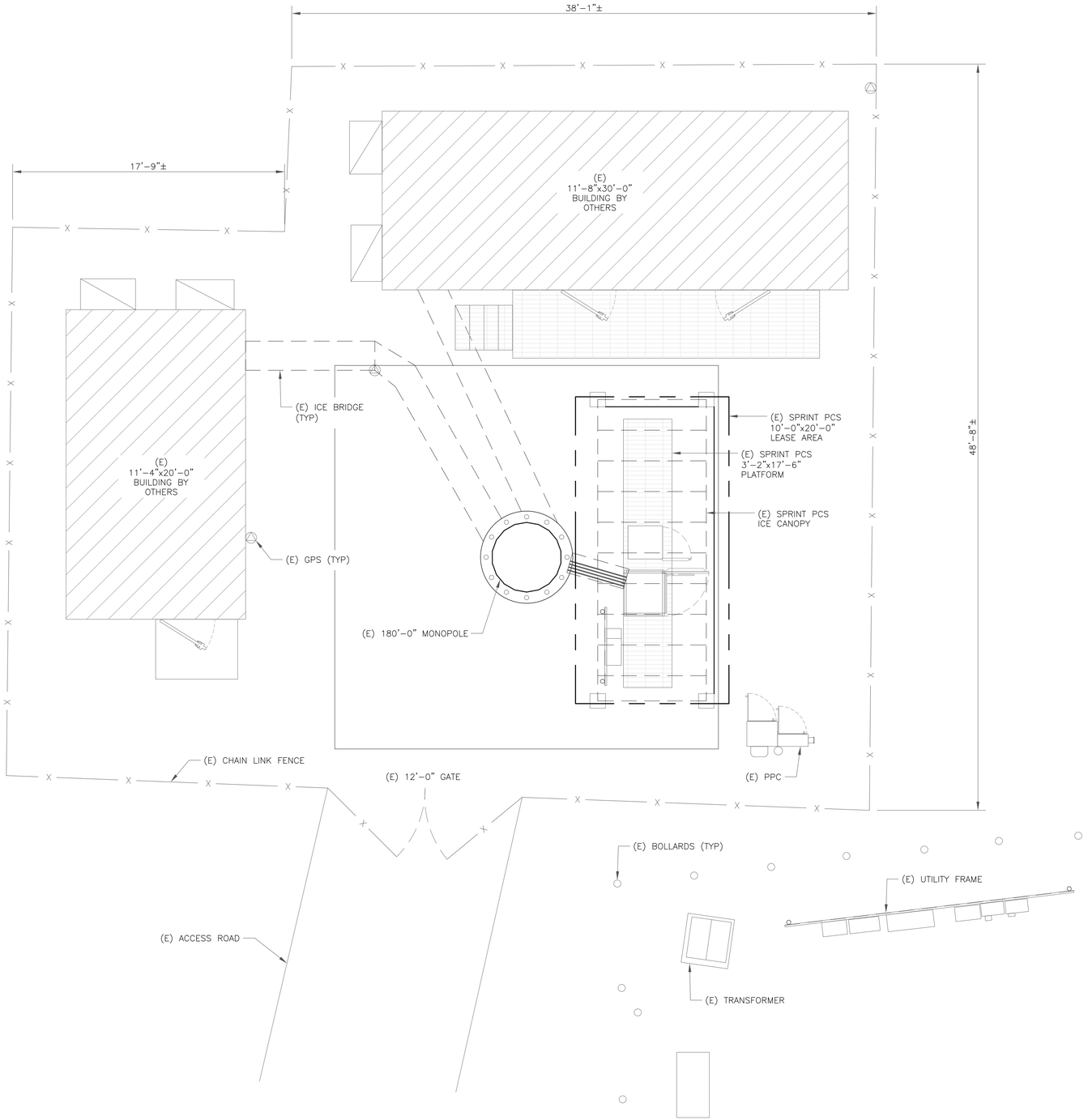
IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SHEET NUMBER: T-2
REVISION: 0

140134.007.01_WALDEN–CAROLYN BESADE.dwg – Sheet:T-2 – User: mjones – Mar 08, 2021 – 8:49am

SITE PLAN DISCLAIMER:

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



APN: 058-015-000
ZONING: R120

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

N

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STATE OF CONNECTICUT
MICHAEL T. JANSEN
No. 23924
LICENSED PROFESSIONAL ENGINEER
3/8/21

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/21

SHEET NUMBER: C-1.1
REVISION: 0

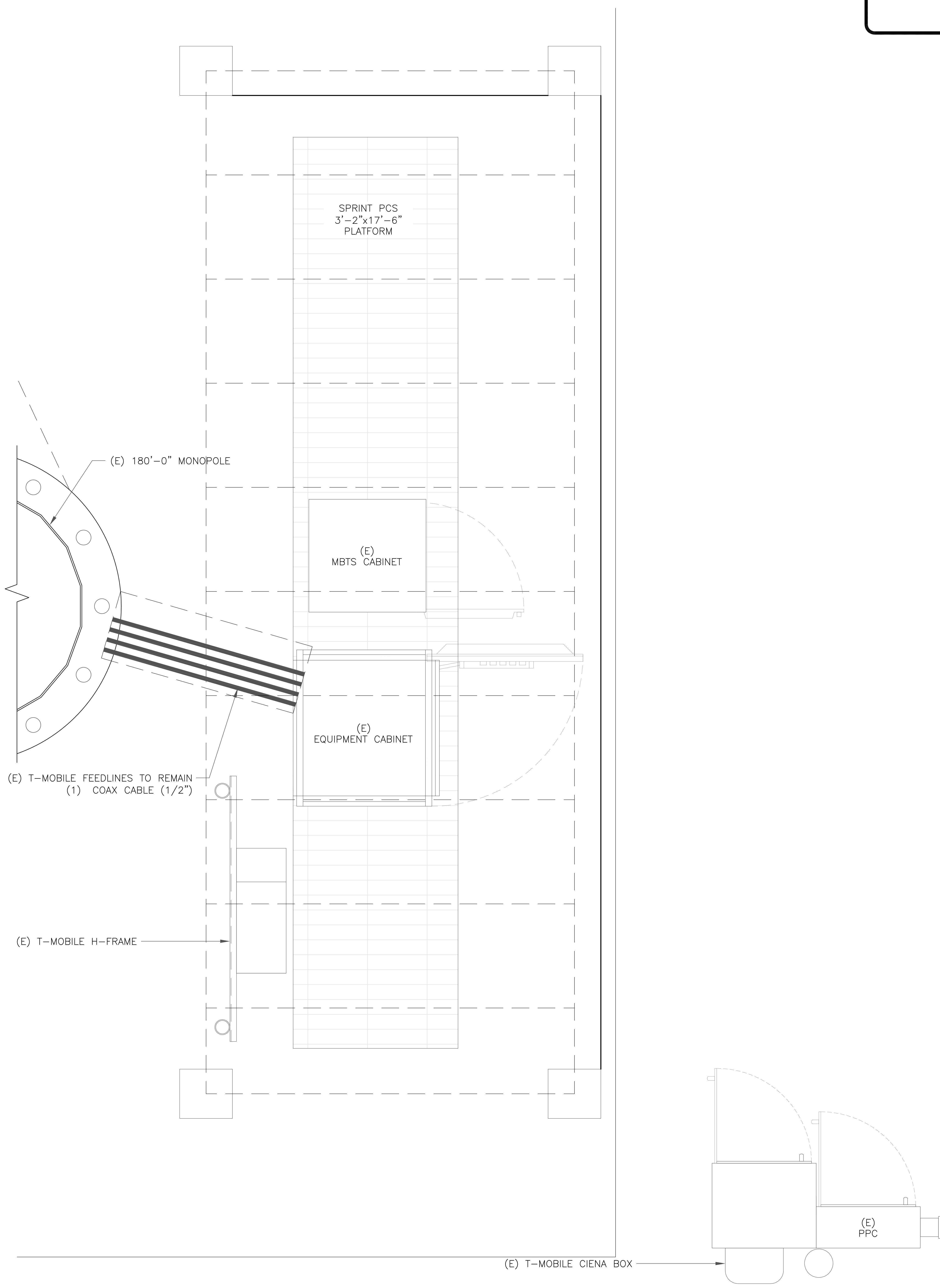
140134.007.01_WALDEN-CAROLYN BESADE.dwg — Sheet:C-1.1 — User: mjones — Mar 08, 2021 — 8:51am

EQUIPMENT LEGEND:

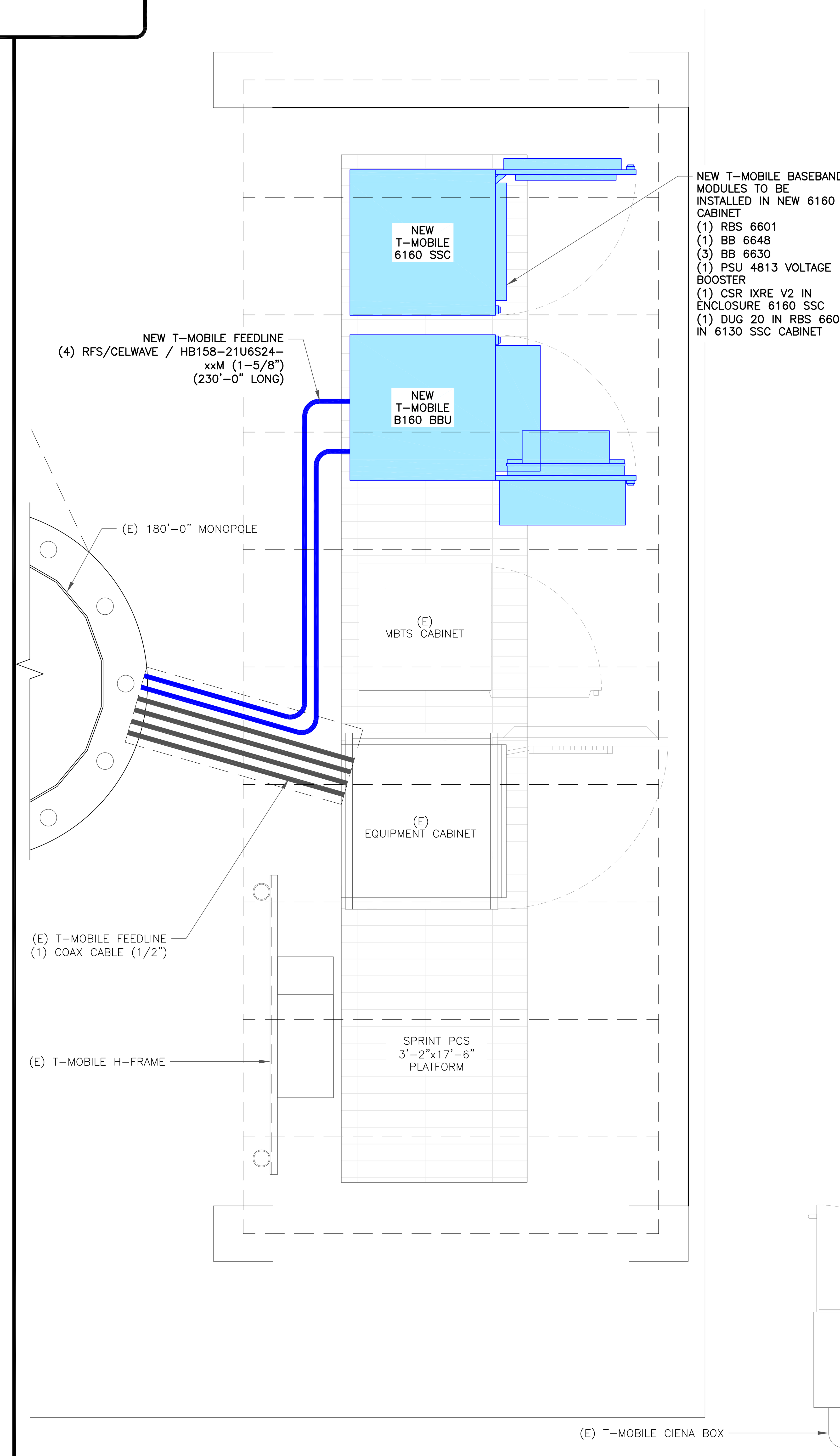
EXISTING

TO BE RELOCATED/REMOVED

NEW



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



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

T-Mobile
4 SYLVAN WAY
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T-MOBILE SITE NUMBER:
CTNL815A

BU #: **876371**
WALDEN / CAROLYN BESADE

557 RTE. 82
OAKDALE, CT 06370

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STATE OF CONNECTICUT No. 23924 LICENSED PROFESSIONAL ENGINEER
3/8/21

B&T ENGINEERING, INC.
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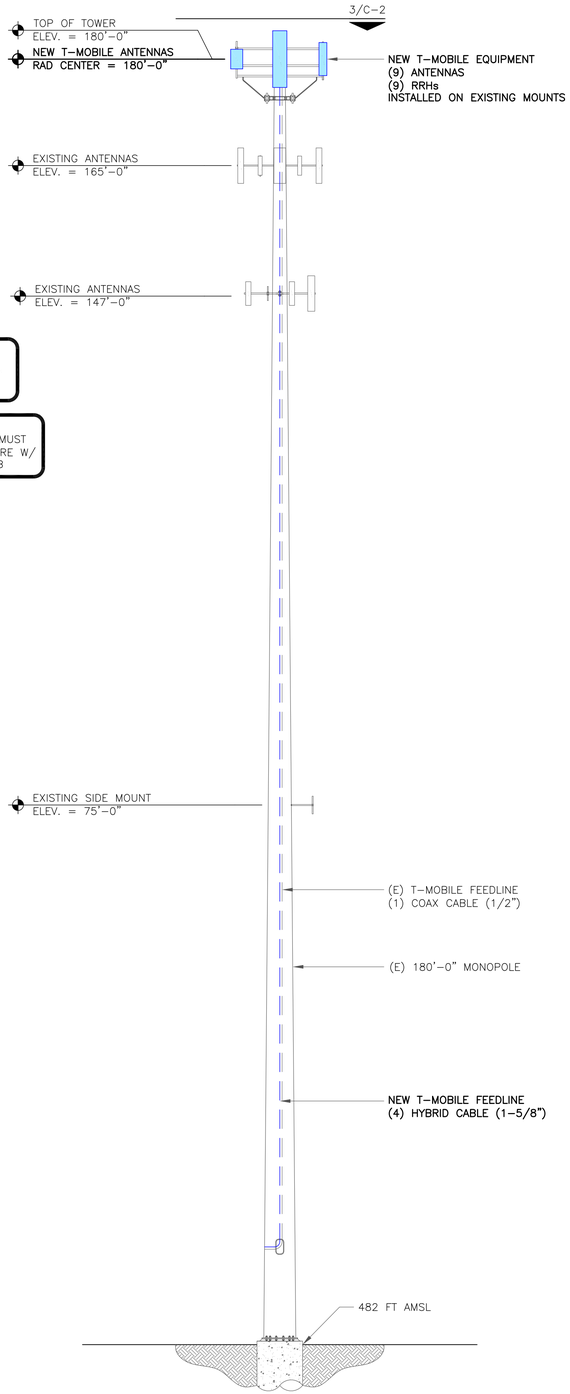
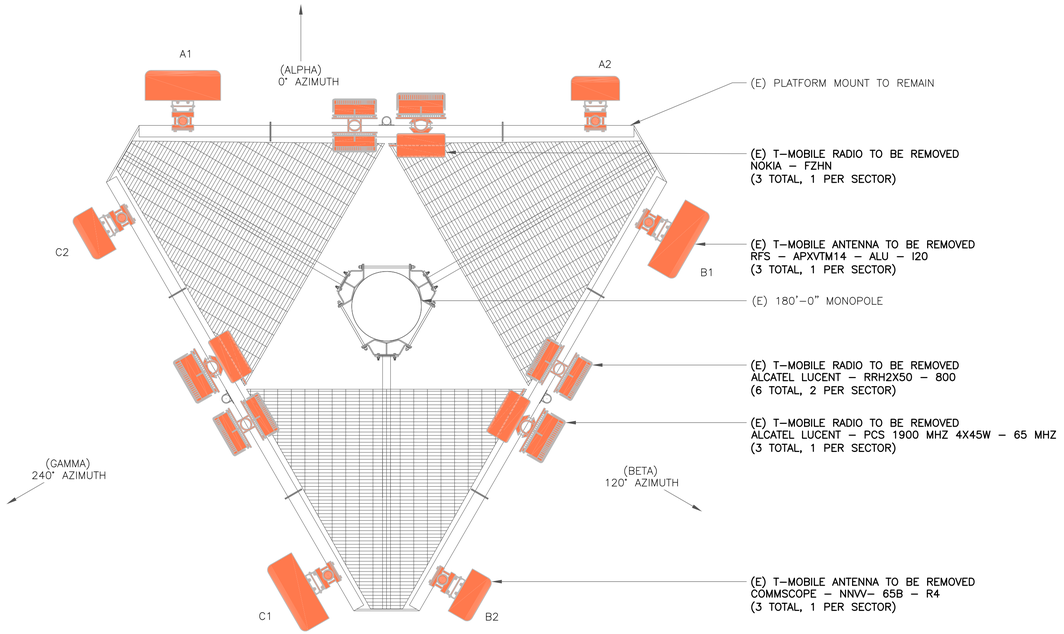
SHEET NUMBER: C-1.2
REVISION: 0

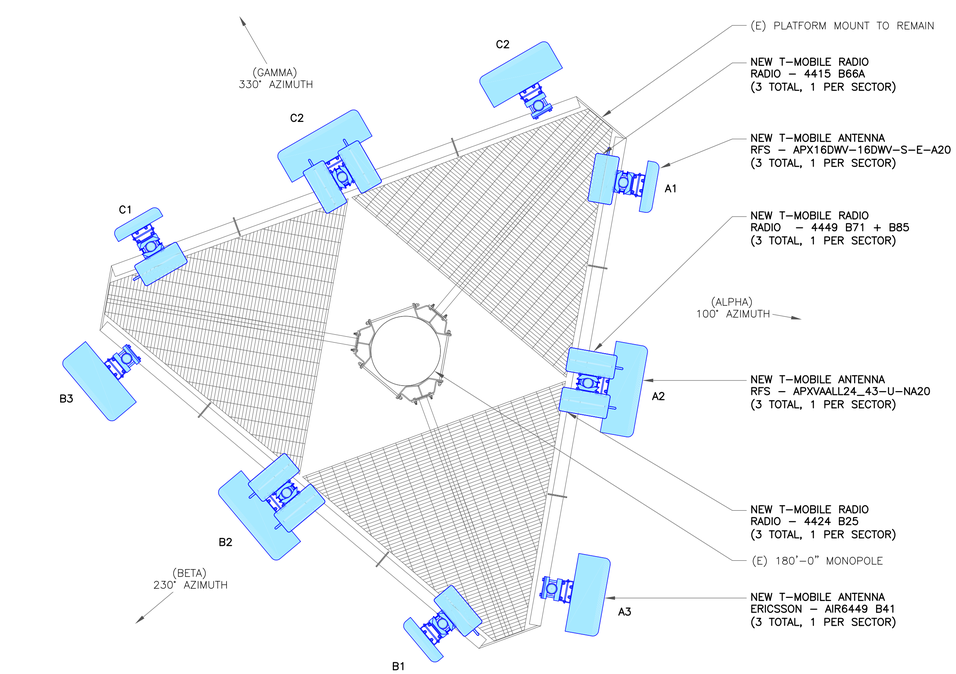
140134.007.01_WALDEN-CAROLYN BESADE.dwg - Sheet:C-1.2 - User: mjones - Mar 08, 2021 - 8:51am



1 FINAL ELEVATION
SCALE: NOT TO SCALE



2 EXISTING ANTENNA PLAN
SCALE: NOT TO SCALE



3 FINAL ANTENNA PLAN
SCALE: NOT TO SCALE

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REVISION: 0

RF SYSTEM SCHEDULE

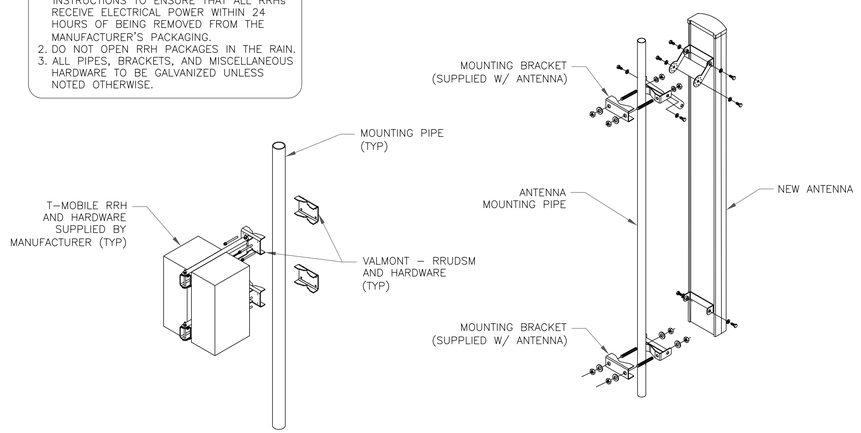
SECTOR	ANTENNA	TECH	MANUFACTURER	ANTENNA MODEL	AZIMUTH	M-TILT	E-TILT	RAD CENTER	TMA/RRU	CABLE TYPE	CABLE DIAMETER	CABLE LENGTH
ALPHA	A-1	L2100	RFS	APX16DWV-16DWV-S-E-A20	100°	0°	2°	180'-0"	(1) 4415B66A	(1) COAX	1/2"	230'
	A-2	L700/L600/N600/ L1900/G1900	RFS	APXVAARR24_43-U-NA20	100°	0°	2°/2°	180'-0"	(1) 4449 B71+B85 (1) 4424 B25	(4) HYBRID	6/24 AWG HYBRID	230'
	A-3	L2500/N2500	ERICSSON	AIR6449 B41	100°	0°	2°	180'-0"	-	-	-	-
BETA	B-1	L2100	RFS	APX16DWV-16DWV-S-E-A20	230°	0°	2°	180'-0"	(1) 4415B66A	-	-	-
	B-2	L700/L600/N600/ L1900/G1900	RFS	APXVAARR24_43-U-NA20	230°	0°	2°/2°	180'-0"	(1) 4449 B71+B85 (1) 4424 B25	-	-	-
	B-3	L2500/N2500	ERICSSON	AIR6449 B41	230°	0°	2°	180'-0"	-	-	-	-
GAMMA	C-1	L2100	RFS	APX16DWV-16DWV-S-E-A20	330°	0°	2°	180'-0"	(1) 4415B66A	-	-	-
	C-2	L700/L600/N600/ L1900/G1900	RFS	APXVAARR24_43-U-NA20	330°	0°	2°/2°	180'-0"	(1) 4449 B71+B85 (1) 4424 B25	-	-	-
	C-3	L2500/N2500	ERICSSON	AIR6449 B41	330°	0°	2°	180'-0"	-	-	-	-

(E) T-MOBILE FEEDLINES TO REMAIN
(1) COAX CABLE (1/2")

1 ANTENNA & FEEDLINE SCHEDULE
SCALE: NOT TO SCALE

INSTALLER NOTES:

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



2 ANTENNA WITH RRHs MOUNTING DETAIL
SCALE: NOT TO SCALE

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WALDEN / CAROLYN BESADE

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STATE OF CONNECTICUT
MICHAEL T. JONES
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SHEET NUMBER: C-3
REVISION: 0

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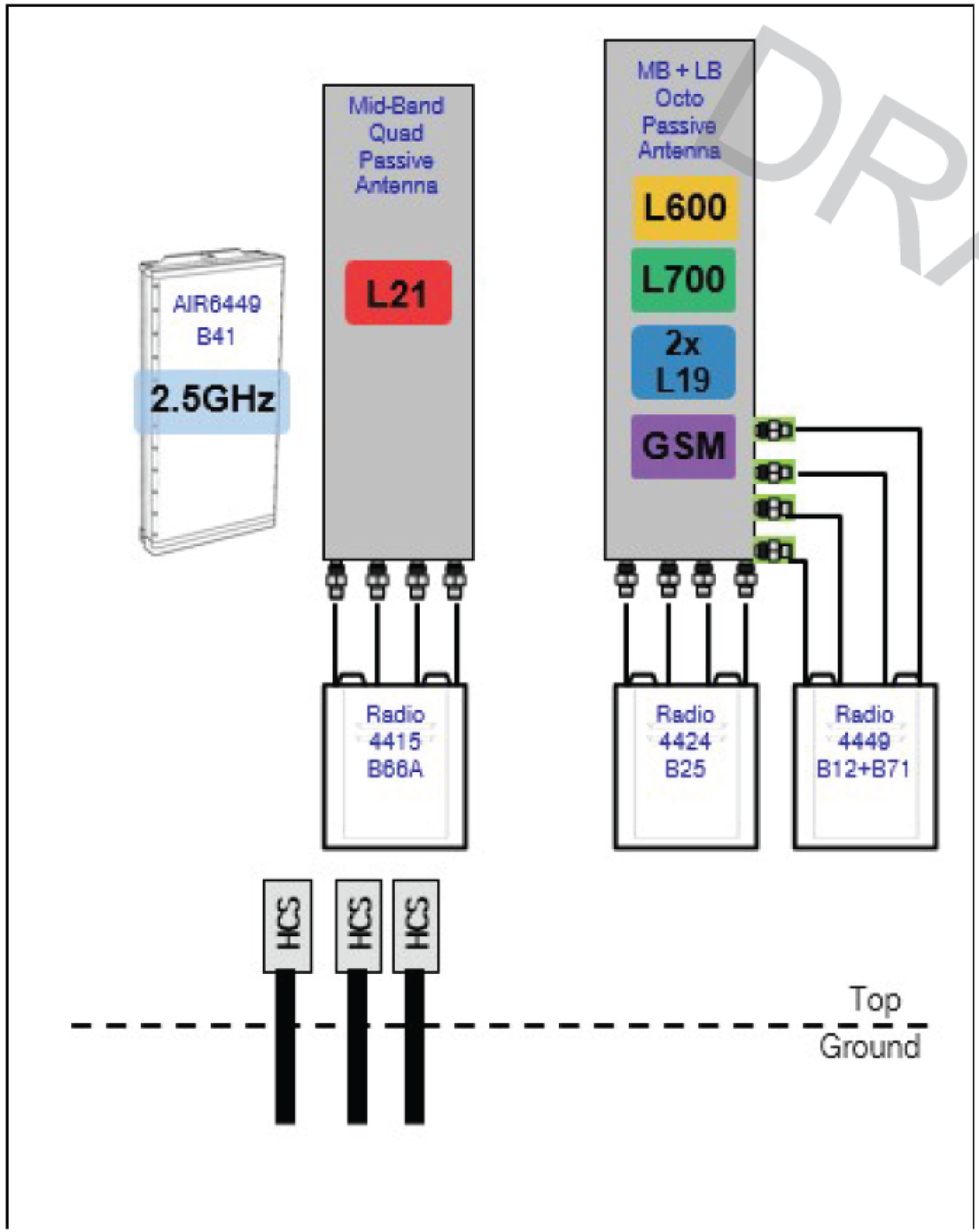

1 PLUMBING DIAGRAM
SCALE: NOT TO SCALE

T-Mobile
4 SYLVAN WAY
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B&T ENGINEERING, INC.
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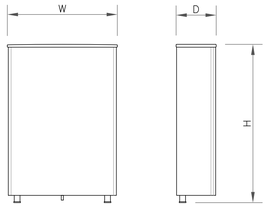
Expires 2/10/21

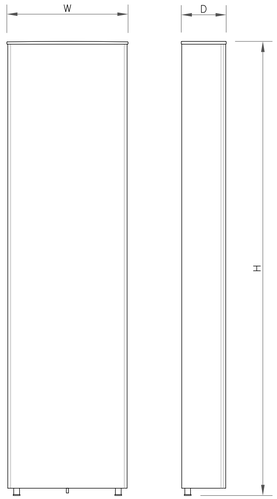
SHEET NUMBER: C-4

REVISION: 0



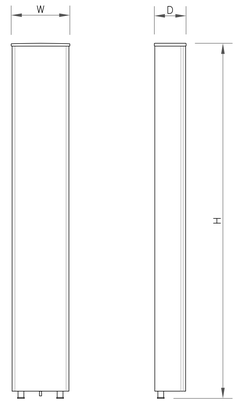
ANTENNA SPECS	
MANUFACTURER	ERICSSON
MODEL #	AIR6449 B41
WIDTH	20.51"
DEPTH	8.54"
HEIGHT	33.11"
WEIGHT	114.63 LBS

1 ANTENNA SPECS
SCALE: NOT TO SCALE



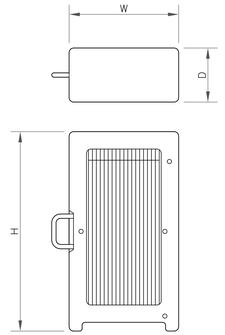
ANTENNA SPECS	
MANUFACTURER	RFS/CELWAVE
MODEL #	APXVAALL24_43-UNA20
WIDTH	24.00"
DEPTH	8.50"
HEIGHT	95.90"
WEIGHT	149.90 LBS

2 ANTENNA SPECS
SCALE: NOT TO SCALE



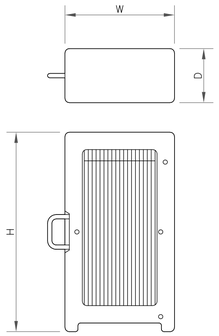
ANTENNA SPECS	
MANUFACTURER	RFS/CELWAVE
MODEL #	APX16DWV-16DWVS-E-A20
WIDTH	13.30"
DEPTH	3.15"
HEIGHT	55.90"
WEIGHT	40.70 LBS

3 ANTENNA SPECS
SCALE: NOT TO SCALE



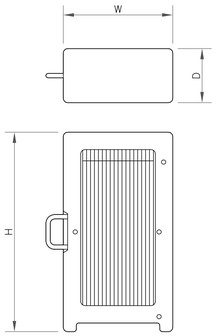
RRU SPECIFICATIONS	
MANUFACTURER	ERICSSON
MODEL #	RADIO 4415 B66A
WIDTH	13.50"
DEPTH	6.30"
HEIGHT	16.50"
WEIGHT	49.60 LBS

4 RRU SPECS
SCALE: NOT TO SCALE



RRU SPECIFICATIONS	
MANUFACTURER	ERICSSON
MODEL #	RADIO 4424 B25
WIDTH	14.40"
DEPTH	11.30"
HEIGHT	17.10"
WEIGHT	86.0 LBS

5 RRU SPECS
SCALE: NOT TO SCALE



RRU SPECIFICATIONS	
MANUFACTURER	ERICSSON
MODEL #	RADIO 4449 B71 B85A
WIDTH	13.20"
DEPTH	10.63"
HEIGHT	17.91"
WEIGHT	73.21 LBS

6 RRU SPECS
SCALE: NOT TO SCALE

ERICSSON 6160 SSC
WEIGHT: 60.0 LBS
SIZE (HxWxD): 63"x25.6"x33.5" IN.

7 ERICSSON 6160 SSC
SCALE: NOT TO SCALE

BATTERY CABINET SPECIFICATIONS	
MODEL #	B160
MANUF.	ERICSSON
HEIGHT	63"
WIDTH	26"
DEPTH	26"
WEIGHT	

8 ERICSSON B160 BATTERY CABINET
SCALE: NOT TO SCALE

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B&T ENGINEERING, INC.
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SHEET NUMBER: C-5

REVISION: 0

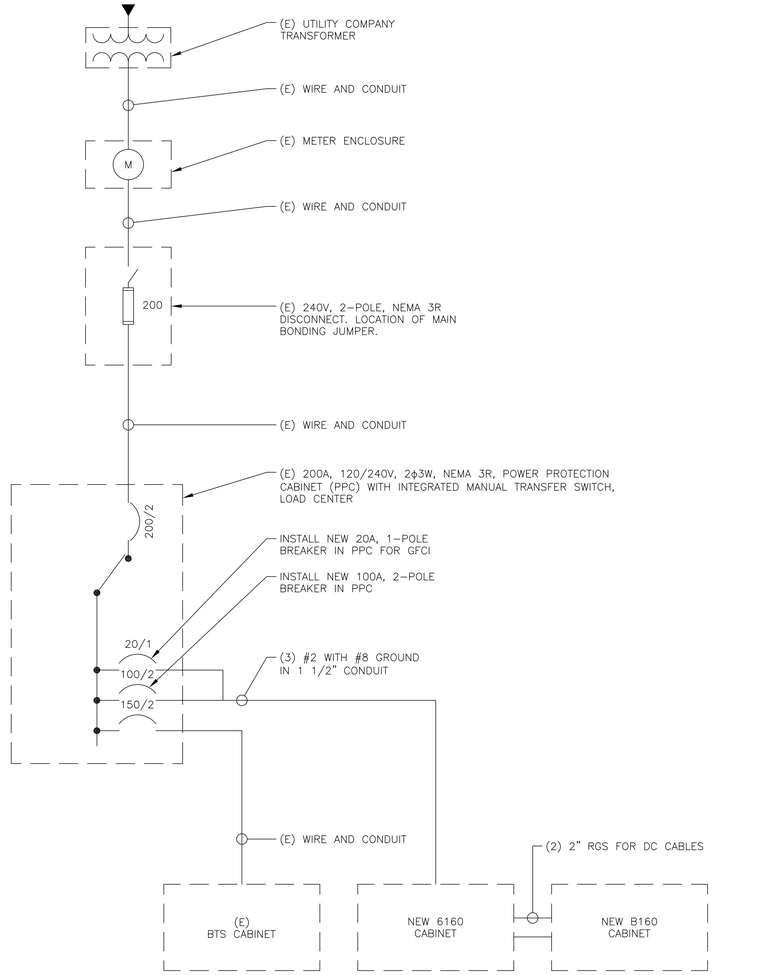
FINAL PANEL SCHEDULE							
LOAD	POLES	AMPS	BUS L1	BUS L2	AMPS	POLES	LOAD
MBTS 1	2	100A	1	7	60A	2	AC SURGE PROTECTION
			2	8			
6160 CABINET	2	100A	3	9			
			4	10			
B160 CABINET	1	20A	5	11	15A	1	TELCO GFI
FAN	1	10A	6	12	20A	1	PANEL OUTLET

RATED VOLTAGE: ■120/240 □_____, 1 PHASE, 3 WIRE	BRANCH POLES: ■12 □24 □30 □42	APPROVED MF'RS
RATED AMPS: □100 ■200 □400 □_____,	CABINET: ■SURFACE □FLUSH	NEMA □1 ■3R □4X
□MAIN LUGS ONLY ■MAIN 200 AMPS ■BREAKER □FUSED SWITCH	■HINGED DOOR	■KEYED DOOR LATCH
□FUSED ■CIRCUIT BREAKER BRANCH DEVICES	□_____ TO BE GFCI BREAKERS	FULL NEUTRAL BUS / GROUND BAR
ALL BREAKERS MUST BE RATED TO INTERRUPT A SHORT CIRCUIT ISC OF 10,000 AMPS SYMMETRICAL		

REPLACE EXISTING BREAKER IN POSITION 3 AND 4 WITH A NEW 2P 100A BREAKER
REPLACE EXISTING BREAKER IN POSITION 5 WITH A NEW 1P 20A BREAKER
IF 100A BREAKER WILL NOT PROPERLY FIT IN EXISTING PANEL, REPLACE (E) PANEL WITH SQUARE D PANEL QO12040M200RB (OR APPROVED EQUAL).
UPGRADE FEEDER WIRES TO MEET AMPACITY IF NEW PANEL IS REQUIRED.
FINAL PANEL DESIGN AND CALCULATIONS FOR WIRE SIZE WERE BASED OFF OF EXISTING PHOTOS

1 FINAL T–MOBILE PANEL DETAIL
SCALE: NOT TO SCALE

1 AC PANEL SCHEDULE
SCALE: NOT TO SCALE



NOTES:

1. ALL NEW CONDUCTORS TO BE INSTALLED SHALL BE COPPER. ALL CONDUCTORS SHALL BE THHW, THWN, THWN–2, XHHW, XHHW–2, THW, THW–2, RHW, OR RHW–2 UNLESS NOTED OTHERWISE.
2. CONTRACTOR IS TO FIELD VERIFY ALL EXISTING ITEMS SHOWN ON THE ELECTRICAL ONE–LINE DIAGRAM AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
3. ALL GROUNDING AND BONDING PER THE NEC.

2 ONE LINE DIAGRAM
SCALE: NOT TO SCALE

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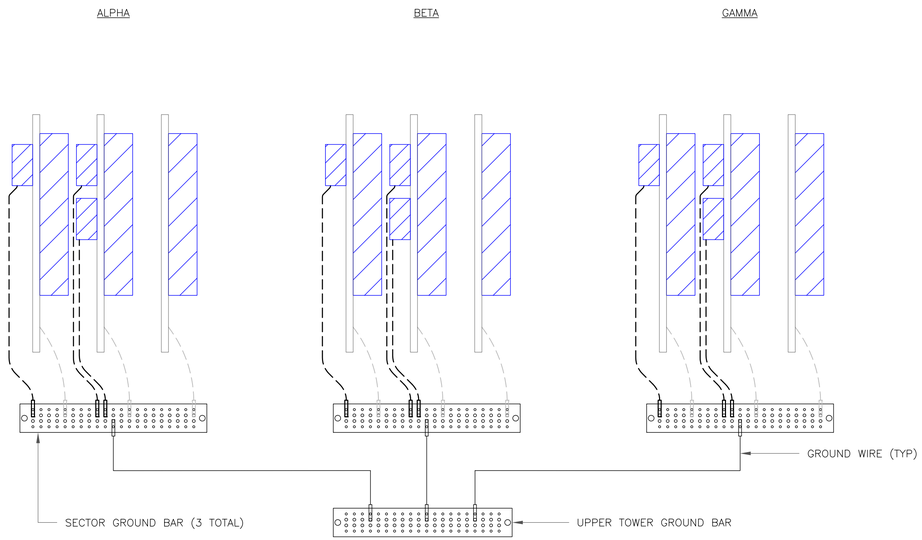
SHEET NUMBER: E-1
REVISION: 0



NOTE:

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

1 ANTENNA GROUNDING DIAGRAM
SCALE: NOT TO SCALE

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4 SYLVAN WAY
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3/8/21

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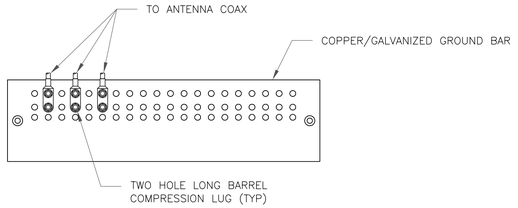
PEC.0001564
Expires 2/10/21

SHEET NUMBER: G-1

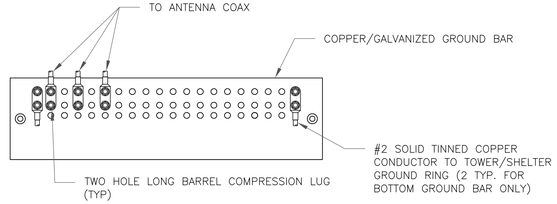
REVISION: 0



NOTES:

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

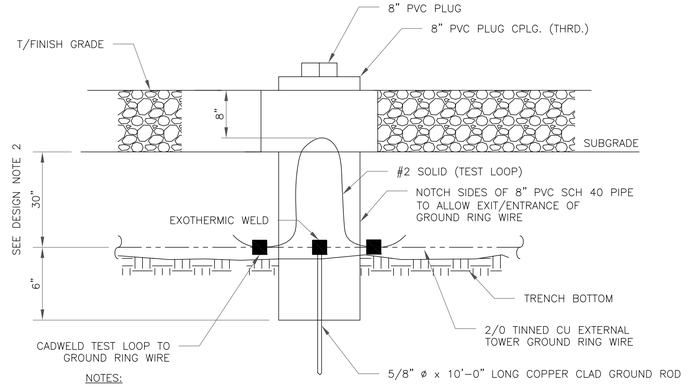
1 ANTENNA SECTOR GROUND BAR DETAIL
SCALE: NOT TO SCALE



NOTES:

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

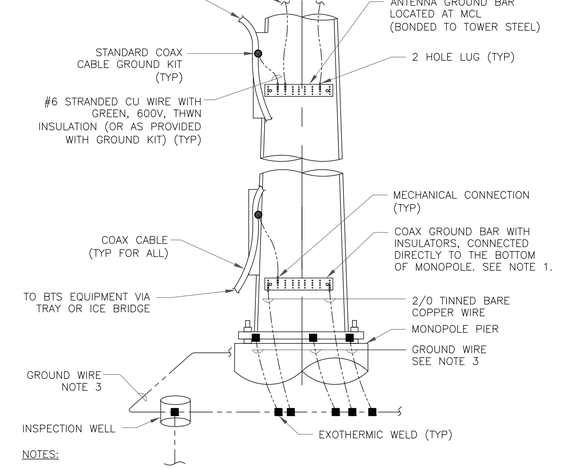
2 TOWER/SHELTER GROUND BAR DETAIL
SCALE: NOT TO SCALE



NOTES:

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

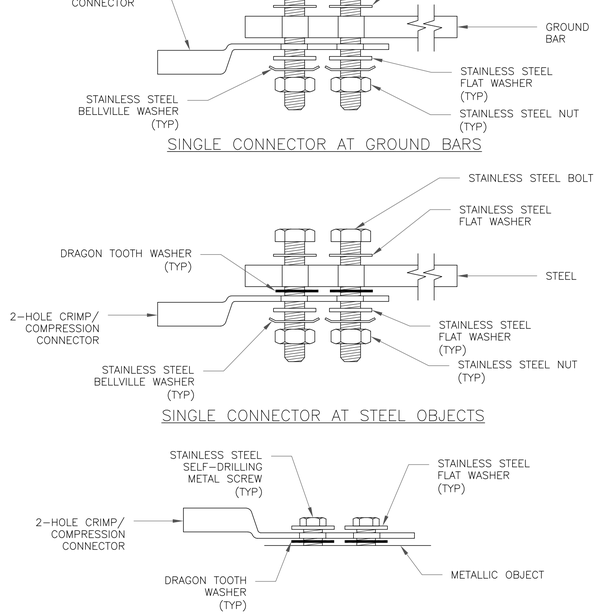
3 INSPECTION WELL DETAIL
SCALE: NOT TO SCALE



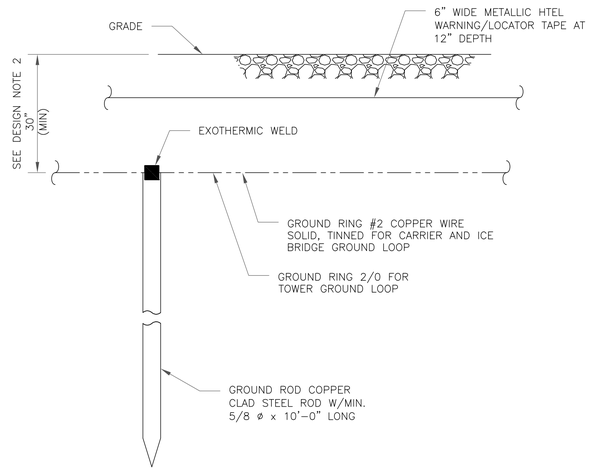
NOTES:

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

4 TYPICAL ANTENNA CABLE GROUNDING
SCALE: NOT TO SCALE



5 HARDWARE DETAIL FOR EXTERIOR CONNECTIONS
SCALE: NOT TO SCALE



NOTES:

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

6 GROUND ROD DETAIL
SCALE: NOT TO SCALE

T-Mobile
4 SYLVAN WAY
PARSIPPANY, NJ 07054

CROWN CASTLE
3530 TORINGDON WAY, SUITE 300
CHARLOTTE, NC 28277

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

T-MOBILE SITE NUMBER:
CTNL815A

BU #: **876371**
WALDEN / CAROLYN BESADE

557 RTE. 82
OAKDALE, CT 06370

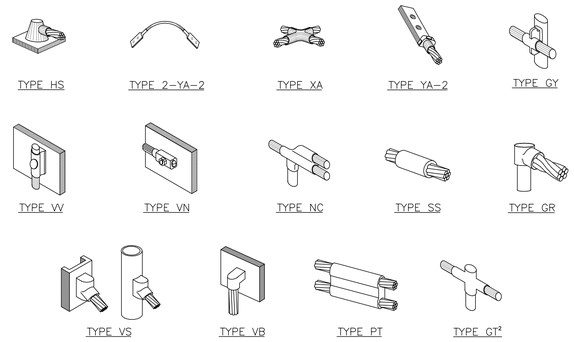
EXISTING
180'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	2/23/21	LHT	PRELIMINARY REVIEW	MTJ
0	3/8/21	JJD	CONSTRUCTION	MTJ

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/21

SHEET NUMBER: G-2
REVISION: 0

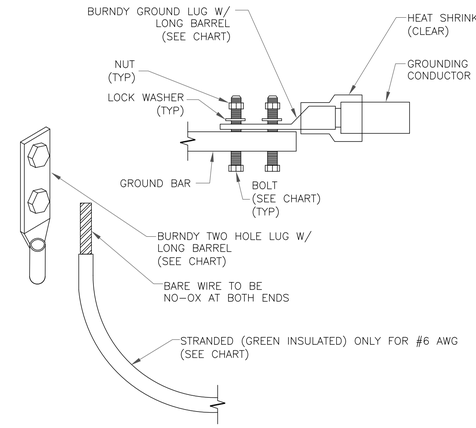


NOTE:

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

1 CADWELD GROUNDING CONNECTIONS
SCALE: NOT TO SCALE

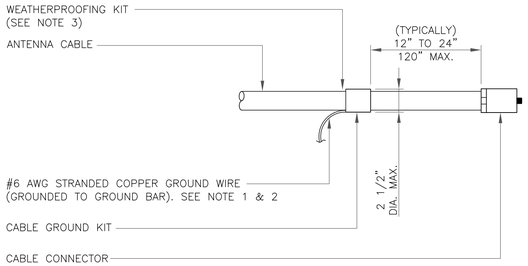
WIRE SIZE	BURNDY LUG	BOLT SIZE
#6 AWG GREEN INSULATED	YA6C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG SOLID TINNED	YA3C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG STRANDED	YA2C-2TC38	3/8" - 16 NC S 2 BOLT
#2/0 AWG STRANDED	YA26-2TC38	3/8" - 16 NC S 2 BOLT
#4/0 AWG STRANDED	YA28-2N	1/2" - 16 NC S 2 BOLT



NOTES:

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

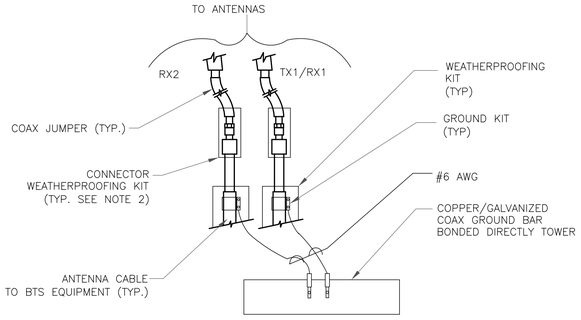
2 MECHANICAL LUG CONNECTION
SCALE: NOT TO SCALE



NOTES:

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

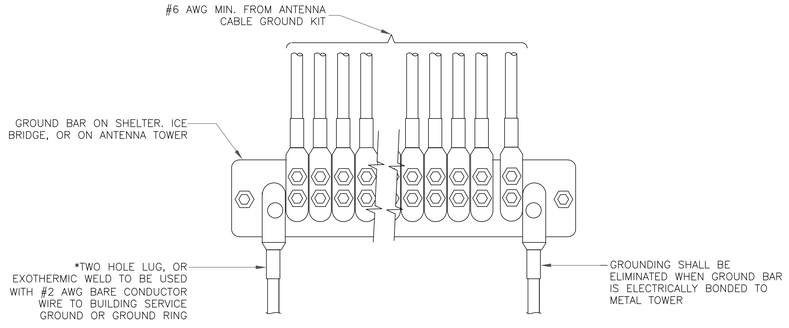
3 CABLE GROUND KIT CONNECTION
SCALE: NOT TO SCALE



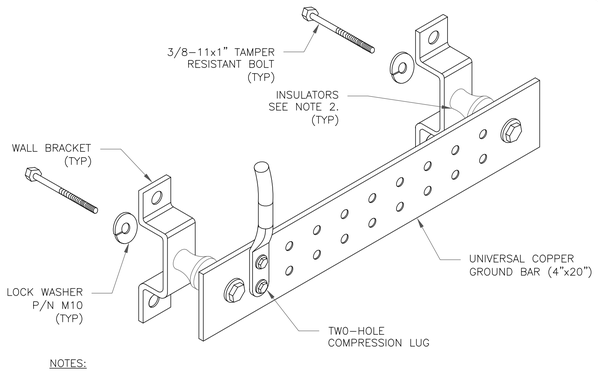
NOTES:

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

4 GROUND CABLE CONNECTION
SCALE: NOT TO SCALE



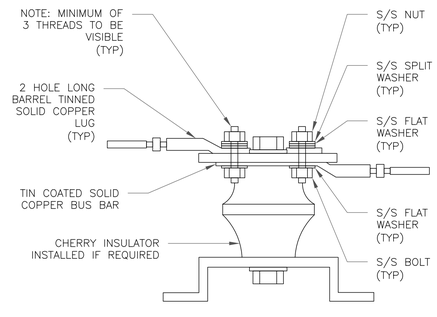
5 GROUNDWIRE INSTALLATION
SCALE: NOT TO SCALE



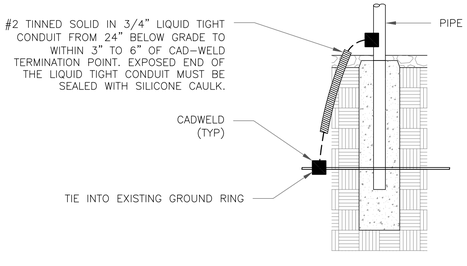
NOTES:

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

6 GROUND BAR DETAIL
SCALE: NOT TO SCALE



7 LUG DETAIL
SCALE: NOT TO SCALE



8 TRANSITIONING GROUND DETAIL
SCALE: NOT TO SCALE

T-Mobile
4 SYLVAN WAY
PARSIPPANY, NJ 07054

CROWN CASTLE
3530 TORINGDON WAY, SUITE 300
CHARLOTTE, NC 28277

B+T GRP
1717 S. BOULDER
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
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T-MOBILE SITE NUMBER:
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WALDEN / CAROLYN BESADE

557 RTE. 82
OAKDALE, CT 06370

EXISTING
180'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	2/23/21	LHT	PRELIMINARY REVIEW	MTJ
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STATE OF CONNECTICUT
MICHAEL T. JONES
No. 23924
LICENSED PROFESSIONAL ENGINEER
3/8/21

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/21

SHEET NUMBER: G-3
REVISION: 0

Exhibit D

Structural Analysis Report

Date: **February 11, 2021**

Tower Engineering Professionals
326 Tryon Road
Raleigh, NC 27603
(919) 661-6351

Subject: Structural Analysis Report

Carrier Designation:	***Sprint PCS* Co-Locate**	
	Site Number:	CTNL815A
	Site Name:	CTNL815A
Crown Castle Designation:	**BU Number:**	876371
	Site Name:	Walden / Carolyn Besade
	JDE Job Number:	628850
	Work Order Number:	1919566
	Order Number:	538781 Rev. 1
Engineering Firm Designation:	**TEP Project Number:**	25624.496701
Site Data:	**557 Rte. 82, Oakdale, New London County, CT 06370** **Latitude *41° 30' 20.3"*, Longitude *-72° 11' 51.1"*** **180 Foot - Monopole Tower**	

Tower Engineering Professionals 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:

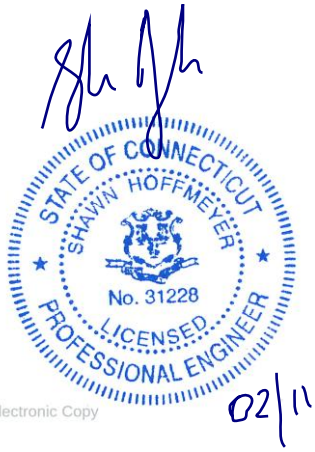
LC5: Proposed Equipment Configuration **Sufficient Capacity - 89.7%**

This analysis utilizes an ultimate 3-second gust wind speed of 135 mph as required by the 2018 Connecticut State Building Code and Appendix N. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by: Gautam Sopal, E.I. / JCR

Respectfully submitted by:

Shawn Hoffmeyer, P.E.



Electronic Copy

02/11/21

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 180-ft monopole tower designed by Engineered Endeavors, Inc. The tower has been modified multiple times in the past to accommodate additional loading.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	135 mph
Exposure Category:	B
Topographic Factor:	1.0
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
180.0	180.0	3	Ericsson	AIR6449 B41_T-MOBILE w/ Mount Pipe	4	1-5/8
		3	RFS Celwave	APX16DWV-16DWV-S-E-A20 w/ Mount Pipe		
		3	RFS Celwave	APXVAALL24_43-U-NA20_TMO w/ Mount Pipe		
		3	Ericsson	RADIO 4415 B66A		
		3	Ericsson	RADIO 4424 B25_TMO		
		3	Ericsson	RADIO 4449 B71 B85A_T-MOBILE		
		2	Tower Mounts	Miscellaneous [NA 507-1]		
		1	Tower Mounts	Platform Mount [LP 712-1_KCKR]		
75.0	76.0	1	GPS	GPS_A	1	1/2
	75.0	1	Tower Mounts	Side Arm Mount [SO 701-1]		

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)
165.0	169.0	2	Antel	LPA-80080-6CF-EDIN w/ Mount Pipe	14 1	1-5/8 1/2
		4	Antel	LPA-80063/6CF w/ Mount Pipe		
		3	Amphenol	QUAD656C0000X w/ Mount Pipe		
		6	Commscope	HBXX-6516DS-A2M w/ Mount Pipe		
		6	RFS Celwave	FD9R6004/2C-3L		
		3	Alcatel Lucent	RRH2X60-700		
		2	RFS Celwave	DB-T1-6Z-8AB-0Z		
		3	Alcatel Lucent	RRH2X60-PCS		
		3	Alcatel Lucent	B66A RRH4X45		
	167.0	1	GPS	GPS_A		
	165.0	1	Tower Mounts	Platform Mount [LP 712-1]		
148.0	148.0	3	Ericsson	RRUS 12 B2/RRUS A2	-	-
		1	Tower Mounts	Pipe Mount [PM 601-3]		
147.0	147.0	3	Powerwave Technologies	7770.00 w/ Mount Pipe	12 2 2 2	1-5/8 7/8 7/16 3/8
		3	CCI Antennas	HPA-65R-BUU-H8 w/ Mount Pipe		
		3	CCI Antennas	DMP65R-BU8D w/ Mount Pipe		
		1	Raycap	DC6-48-60-18-8C-EV		
		3	Ericsson	RRUS 4449 B5/B12		
		1	Raycap	DC6-48-60-18-8F		
		3	Powerwave Technologies	LGP21401		
		1	Tower Mounts	Platform Mount [LP 1201-1_KCKR-HR-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
Geotechnical Report	2053524	CCISites
Tower Foundation Drawings	1615419	CCISites
Tower Manufacturer Drawings	1615393	CCISites
Tower Reinforcement Drawings	2254969	CCISites
Post-Modification Inspection	2447495	CCISites
Tower Reinforcement Drawings	3345718	CCISites
Post-Modification Inspection	3868204	CCISites

3.1) Analysis Method

tnxTower (version 8.0.7.5), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A. When applicable, Crown Castle has calculated and provided the effective area for panel antennas using approved methods following the intent of the TIA-222 Standard.

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

3.2) Assumptions

1) The 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. Tower Engineering Professionals should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)[1,2]

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
180 - 175	Pole	TP19.063x18x0.25	Pole	8.3%	Pass
175 - 170	Pole	TP20.126x19.063x0.25	Pole	15.1%	Pass
170 - 165	Pole	TP21.188x20.126x0.25	Pole	20.9%	Pass
165 - 160	Pole	TP22.251x21.188x0.25	Pole	36.6%	Pass
160 - 155	Pole	TP23.314x22.251x0.25	Pole	45.8%	Pass
155 - 150	Pole	TP24.377x23.314x0.25	Pole	53.7%	Pass
150 - 145	Pole	TP25.439x24.377x0.25	Pole	63.0%	Pass
145 - 140	Pole	TP26.502x25.439x0.25	Pole	73.2%	Pass
140 - 137	Pole	TP27.99x26.502x0.25	Pole	78.7%	Pass
137 - 132	Pole	TP27.69x26.64x0.3125	Pole	69.7%	Pass
132 - 131.08	Pole	TP27.882x27.69x0.3125	Pole	70.7%	Pass
131.08 - 130.83	Pole + Reinf.	TP27.935x27.882x0.475	Reinf. 4 Tension Rupture	64.0%	Pass
130.83 - 125.83	Pole + Reinf.	TP28.984x27.935x0.4625	Reinf. 4 Tension Rupture	69.2%	Pass
125.83 - 120.83	Pole + Reinf.	TP30.034x28.984x0.4563	Reinf. 4 Tension Rupture	73.9%	Pass
120.83 - 115.83	Pole + Reinf.	TP31.084x30.034x0.45	Reinf. 4 Tension Rupture	78.1%	Pass
115.83 - 110.83	Pole + Reinf.	TP32.134x31.084x0.45	Reinf. 4 Tension Rupture	81.8%	Pass
110.83 - 105.83	Pole + Reinf.	TP33.184x32.134x0.4375	Reinf. 4 Tension Rupture	85.1%	Pass
105.83 - 104.57	Pole + Reinf.	TP33.45x33.184x0.4375	Reinf. 4 Tension Rupture	85.9%	Pass
104.57 - 104.23	Pole + Reinf.	TP33.52x33.45x0.475	Reinf. 3 Tension Rupture	73.7%	Pass
104.23 - 104.08	Pole + Reinf.	TP33.551x33.52x0.475	Reinf. 3 Tension Rupture	73.8%	Pass
104.08 - 99.08	Pole + Reinf.	TP34.601x33.551x0.4625	Reinf. 3 Tension Rupture	76.3%	Pass
99.08 - 94.08	Pole + Reinf.	TP35.651x34.601x0.4625	Reinf. 3 Tension Rupture	78.7%	Pass
94.08 - 92.59	Pole + Reinf.	TP37.05x35.651x0.4625	Reinf. 3 Tension Rupture	79.3%	Pass
92.59 - 86.42	Pole + Reinf.	TP36.633x35.34x0.525	Reinf. 3 Tension Rupture	74.2%	Pass
86.42 - 81.42	Pole + Reinf.	TP37.681x36.633x0.5125	Reinf. 3 Tension Rupture	75.8%	Pass
81.42 - 76.42	Pole + Reinf.	TP38.729x37.681x0.5125	Reinf. 3 Tension Rupture	77.1%	Pass

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
76.42 - 71.42	Pole + Reinf.	TP39.777x38.729x0.5125	Reinf. 3 Tension Rupture	78.3%	Pass
71.42 - 69.32	Pole + Reinf.	TP40.218x39.777x0.5063	Reinf. 3 Tension Rupture	78.8%	Pass
69.32 - 69.07	Pole	TP40.27x40.218x0.375	Pole	89.7%	Pass
69.07 - 68.83	Pole	TP40.319x40.27x0.375	Pole	89.7%	Pass
68.83 - 68.58	Pole + Reinf.	TP40.372x40.319x0.5375	Reinf. 2 Compression	71.5%	Pass
68.58 - 63.58	Pole + Reinf.	TP41.42x40.372x0.525	Reinf. 2 Compression	72.5%	Pass
63.58 - 58.58	Pole + Reinf.	TP42.468x41.42x0.525	Reinf. 2 Compression	73.5%	Pass
58.58 - 53.58	Pole + Reinf.	TP43.516x42.468x0.5188	Reinf. 2 Compression	74.3%	Pass
53.58 - 49.13	Pole + Reinf.	TP45.76x43.516x0.5125	Reinf. 2 Compression	74.9%	Pass
49.13 - 41.88	Pole + Reinf.	TP45.22x43.7x0.575	Reinf. 2 Compression	69.8%	Pass
41.88 - 36.88	Pole + Reinf.	TP46.268x45.22x0.575	Reinf. 2 Compression	70.2%	Pass
36.88 - 34.92	Pole + Reinf.	TP46.679x46.268x0.575	Reinf. 2 Compression	70.4%	Pass
34.92 - 34.67	Pole	TP46.732x46.679x0.4375	Pole	81.8%	Pass
34.67 - 34.33	Pole	TP46.802x46.732x0.4375	Pole	81.8%	Pass
34.33 - 34.08	Pole + Reinf.	TP46.855x46.802x0.55	Reinf. 1 Tension Rupture	77.0%	Pass
34.08 - 29.08	Pole + Reinf.	TP47.903x46.855x0.55	Reinf. 1 Tension Rupture	77.3%	Pass
29.08 - 24.08	Pole + Reinf.	TP48.951x47.903x0.5438	Reinf. 1 Tension Rupture	77.6%	Pass
24.08 - 19.08	Pole + Reinf.	TP50x48.951x0.5375	Reinf. 1 Tension Rupture	77.8%	Pass
19.08 - 14.08	Pole + Reinf.	TP51.048x50x0.5375	Reinf. 1 Tension Rupture	78.0%	Pass
14.08 - 9.08	Pole + Reinf.	TP52.096x51.048x0.5375	Reinf. 1 Tension Rupture	78.2%	Pass
9.08 - 4.08	Pole + Reinf.	TP53.145x52.096x0.5375	Reinf. 1 Tension Rupture	78.3%	Pass
4.08 - 0	Pole + Reinf.	TP54x53.145x0.5375	Reinf. 1 Tension Rupture	78.3%	Pass
				Summary	
			Pole	89.7%	Pass
			Reinforcement	85.9%	Pass
			Overall	**89.7%**	**Pass**

Table 5 - Tower Component Stresses vs. Capacity - LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Anchor Rods	-	63.6	Pass
1,2	Base Plate	-	52.3	Pass
1,2,3	Base Foundation - Design Reaction Comparison	-	68.4	Pass

Structure Rating (max from all components) =	**89.7%**

Notes:
1) See additional documentation in "Appendix C - Additional Calculations" for calculations supporting the % capacity listed.
2) Rating per TIA-222-H Section 15.5
3) Foundation capacity determined by comparing analysis reactions to rock anchor design reactions per the structural modification report by Paul J. Ford and Company dated October 04, 2012 (CCI Doc ID# 3345718).

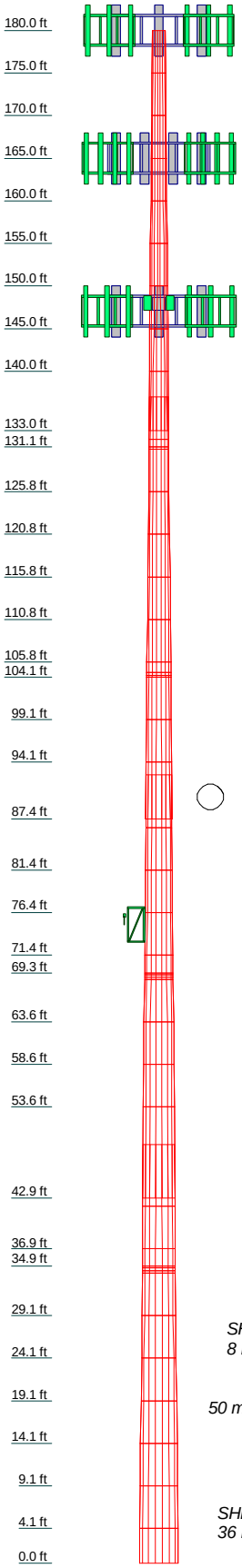
4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	5.00	18	0.2500		18.0000	19.0628		0.2
2	5.00	18	0.2500		19.0628	20.1256		0.3
3	5.00	18	0.2500		20.1256	21.1883		0.3
4	5.00	18	0.2500		21.1883	22.2511		0.3
5	5.00	18	0.2500		22.2511	23.3138		0.3
6	5.00	18	0.2500		23.3138	24.3766		0.3
7	5.00	18	0.2500		24.3766	25.4394		0.3
8	5.00	18	0.2500		25.4394	26.5021		0.3
9	5.00	18	0.2500	4.00	26.5021	27.5649		0.5
10	5.00	18	0.2500		27.5649	28.6277		0.5
11	5.00	18	0.2500		28.6277	29.6904		0.5
12	5.00	18	0.2500		29.6904	30.7532		0.5
13	5.00	18	0.4562		30.7532	31.8159		0.7
14	5.00	18	0.4562		31.8159	32.8787		0.7
15	5.00	18	0.4500		32.8787	33.9415		0.7
16	5.00	18	0.4500		33.9415	35.0042		0.7
17	5.00	18	0.4375		35.0042	36.0670		0.7
18	5.00	18	0.4375		36.0670	37.1297		0.7
19	5.00	18	0.4375		37.1297	38.1925		0.7
20	5.00	18	0.4375		38.1925	39.2553		0.7
21	5.00	18	0.4625		39.2553	40.3180		0.8
22	5.00	18	0.4625		40.3180	41.3808		0.8
23	6.66	18	0.4625	5.17	41.3808	42.4435	A572-65	1.2
24	5.00	18	0.4625		42.4435	43.5063		1.2
25	5.00	18	0.5125		43.5063	44.5691		1.0
26	5.00	18	0.5125		44.5691	45.6318		1.0
27	5.00	18	0.5125		45.6318	46.6946		1.0
28	5.00	18	0.5125		46.6946	47.7573		1.0
29	5.00	18	0.5125		47.7573	48.8201		1.0
30	5.00	18	0.5125		48.8201	49.8829		1.0
31	5.00	18	0.5125		49.8829	50.9456		1.0
32	5.00	18	0.5250		50.9456	52.0084		1.1
33	5.00	18	0.5250		52.0084	53.0711		1.1
34	5.00	18	0.5188		53.0711	54.1339		1.2
35	7.29	18	0.5125	6.25	54.1339	55.2000		2.6
36	5.00	18	0.5750		55.2000	56.2628		1.9
37	5.00	18	0.5750		56.2628	57.3255		1.4
38	5.00	18	0.5750		57.3255	58.3883		1.5
39	5.00	18	0.5750		58.3883	59.4511		1.5
40	5.00	18	0.5750		59.4511	60.5138		1.5
41	5.00	18	0.5750		60.5138	61.5766		1.5
42	5.00	18	0.5625		61.5766	62.6393		1.4
43	5.00	18	0.5437		62.6393	63.7021		1.4
44	5.00	18	0.5375		63.7021	64.7649		1.4
45	5.00	18	0.5375		64.7649	65.8276		1.4
46	5.00	18	0.5375		65.8276	66.8904		1.5
47	5.00	18	0.5375		66.8904	67.9531		1.5
48	4.08	18	0.5375		67.9531	68.8000		1.2



ALL REACTIONS ARE FACTORED

AXIAL 98 K

SHEAR 8 K *MOMENT 1107 kip-ft*

TORQUE 1 kip-ft
50 mph WIND - 1.5000 in ICE

AXIAL 62 K

SHEAR 36 K *MOMENT 4971 kip-ft*

TORQUE 4 kip-ft
REACTIONS - 135 mph WIND

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 135 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING = 89.6%

Tower Engineering Professionals

Tower Engineering Professionals
326 Tryon Road
Raleigh, NC 27603
Phone: (919) 661-6351
FAX: (919) 661-6350

Job: **Walden / Carolyn Besade (BU 876371)**			
Project: ***TEP No. 25624.496701***			
Client: Crown Castle	Drawn by: Julie C. Ryland	App'd:	
Code: TIA-222-H	Date: 02/11/21	Scale: NTS	
Path:		Dwg No. E-1	

Tower Input Data

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

Tower is located in New London County, Connecticut.
Tower base elevation above sea level: 481.00 ft.
Basic wind speed of 135 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 1.5000 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 1.05.
Tower analysis based on target reliabilities in accordance with Annex S.
Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
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	180.00-175.00	5.00	0.00	18	18.0000	19.0628	0.2500	1.0000	A572-65 (65 ksi)
L2	175.00-170.00	5.00	0.00	18	19.0628	20.1255	0.2500	1.0000	A572-65 (65 ksi)
L3	170.00-165.00	5.00	0.00	18	20.1255	21.1883	0.2500	1.0000	A572-65 (65 ksi)
L4	165.00-160.00	5.00	0.00	18	21.1883	22.2511	0.2500	1.0000	A572-65 (65 ksi)
L5	160.00-155.00	5.00	0.00	18	22.2511	23.3138	0.2500	1.0000	A572-65 (65 ksi)
L6	155.00-150.00	5.00	0.00	18	23.3138	24.3766	0.2500	1.0000	A572-65 (65 ksi)
L7	150.00-145.00	5.00	0.00	18	24.3766	25.4394	0.2500	1.0000	A572-65 (65 ksi)
L8	145.00-140.00	5.00	0.00	18	25.4394	26.5021	0.2500	1.0000	A572-65 (65 ksi)
L9	140.00-133.00	7.00	4.00	18	26.5021	27.9900	0.2500	1.0000	A572-65 (65 ksi)
L10	133.00-132.00	5.00	0.00	18	26.6398	27.6896	0.3125	1.2500	A572-65 (65 ksi)
L11	132.00-131.08	0.92	0.00	18	27.6896	27.8821	0.3125	1.2500	A572-65 (65 ksi)
L12	131.08-130.83	0.25	0.00	18	27.8821	27.9346	0.4750	1.9000	A572-65 (65 ksi)
L13	130.83-125.83	5.00	0.00	18	27.9346	28.9844	0.4625	1.8500	A572-65 (65 ksi)
L14	125.83-120.83	5.00	0.00	18	28.9844	30.0343	0.4562	1.8250	A572-65 (65 ksi)
L15	120.83-115.83	5.00	0.00	18	30.0343	31.0841	0.4500	1.8000	A572-65 (65 ksi)
L16	115.83-110.83	5.00	0.00	18	31.0841	32.1340	0.4500	1.8000	A572-65 (65 ksi)
L17	110.83-105.83	5.00	0.00	18	32.1340	33.1838	0.4375	1.7500	A572-65 (65 ksi)
L18	105.83-104.57	1.27	0.00	18	33.1838	33.4497	0.4375	1.7500	A572-65 (65 ksi)
L19	104.57-104.23	0.33	0.00	18	33.4497	33.5198	0.4750	1.9000	A572-65 (65 ksi)
L20	104.23-104.08	0.15	0.00	18	33.5198	33.5513	0.4750	1.9000	A572-65 (65 ksi)
L21	104.08-99.08	5.00	0.00	18	33.5513	34.6011	0.4625	1.8500	A572-65 (65 ksi)
L22	99.08-94.08	5.00	0.00	18	34.6011	35.6510	0.4625	1.8500	A572-65 (65 ksi)
L23	94.08-87.42	6.66	5.17	18	35.6510	37.0500	0.4625	1.8500	A572-65 (65 ksi)
L24	87.42-86.42	6.17	0.00	18	35.3402	36.6328	0.5250	2.1000	A572-65 (65 ksi)
L25	86.42-81.42	5.00	0.00	18	36.6328	37.6808	0.5125	2.0500	A572-65 (65 ksi)
L26	81.42-76.42	5.00	0.00	18	37.6808	38.7289	0.5125	2.0500	A572-65 (65 ksi)
L27	76.42-71.42	5.00	0.00	18	38.7289	39.7770	0.5125	2.0500	A572-65 (65 ksi)
L28	71.42-69.32	2.10	0.00	18	39.7770	40.2178	0.5062	2.0250	A572-65 (65 ksi)
L29	69.32-69.07	0.25	0.00	18	40.2178	40.2702	0.3750	1.5000	A572-65 (65 ksi)
L30	69.07-68.83	0.23	0.00	18	40.2702	40.3192	0.3750	1.5000	A572-65 (65 ksi)

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L31	68.83-68.58	0.25	0.00	18	40.3192	40.3716	0.5375	2.1500	A572-65 (65 ksi)
L32	68.58-63.58	5.00	0.00	18	40.3716	41.4196	0.5250	2.1000	A572-65 (65 ksi)
L33	63.58-58.58	5.00	0.00	18	41.4196	42.4677	0.5250	2.1000	A572-65 (65 ksi)
L34	58.58-53.58	5.00	0.00	18	42.4677	43.5158	0.5188	2.0750	A572-65 (65 ksi)
L35	53.58-42.88	10.71	6.25	18	43.5158	45.7600	0.5125	2.0500	A572-65 (65 ksi)
L36	42.88-41.88	7.25	0.00	18	43.6999	45.2200	0.5750	2.3000	A572-65 (65 ksi)
L37	41.88-36.88	5.00	0.00	18	45.2200	46.2683	0.5750	2.3000	A572-65 (65 ksi)
L38	36.88-34.92	1.96	0.00	18	46.2683	46.6792	0.5750	2.3000	A572-65 (65 ksi)
L39	34.92-34.67	0.25	0.00	18	46.6792	46.7317	0.4375	1.7500	A572-65 (65 ksi)
L40	34.67-34.33	0.34	0.00	18	46.7317	46.8023	0.4375	1.7500	A572-65 (65 ksi)
L41	34.33-34.08	0.25	0.00	18	46.8023	46.8547	0.5500	2.2000	A572-65 (65 ksi)
L42	34.08-29.08	5.00	0.00	18	46.8547	47.9030	0.5500	2.2000	A572-65 (65 ksi)
L43	29.08-24.08	5.00	0.00	18	47.9030	48.9513	0.5437	2.1750	A572-65 (65 ksi)
L44	24.08-19.08	5.00	0.00	18	48.9513	49.9996	0.5375	2.1500	A572-65 (65 ksi)
L45	19.08-14.08	5.00	0.00	18	49.9996	51.0479	0.5375	2.1500	A572-65 (65 ksi)
L46	14.08-9.08	5.00	0.00	18	51.0479	52.0963	0.5375	2.1500	A572-65 (65 ksi)
L47	9.08-4.08	5.00	0.00	18	52.0963	53.1446	0.5375	2.1500	A572-65 (65 ksi)
L48	4.08-0.00	4.08		18	53.1446	54.0000	0.5375	2.1500	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	18.2391	14.0846	560.6340	6.3012	9.1440	61.3117	1122.0058	7.0437	2.7280	10.912
	19.3183	14.9279	667.4863	6.6785	9.6839	68.9275	1335.8509	7.4654	2.9150	11.66
L2	19.3183	14.9279	667.4863	6.6785	9.6839	68.9275	1335.8509	7.4654	2.9150	11.66
	20.3974	15.7712	787.1195	7.0558	10.2238	76.9892	1575.2747	7.8871	3.1021	12.408
L3	20.3974	15.7712	787.1195	7.0558	10.2238	76.9892	1575.2747	7.8871	3.1021	12.408
	21.4766	16.6145	920.2557	7.4331	10.7637	85.4966	1841.7223	8.3088	3.2891	13.157
L4	21.4766	16.6145	920.2557	7.4331	10.7637	85.4966	1841.7223	8.3088	3.2891	13.157
	22.5558	17.4578	1067.6169	7.8104	11.3035	94.4498	2136.6386	8.7306	3.4762	13.905
L5	22.5558	17.4578	1067.6169	7.8104	11.3035	94.4498	2136.6386	8.7306	3.4762	13.905
	23.6349	18.3011	1229.9251	8.1877	11.8434	103.8488	2461.4686	9.1523	3.6632	14.653
L6	23.6349	18.3011	1229.9251	8.1877	11.8434	103.8488	2461.4686	9.1523	3.6632	14.653
	24.7141	19.1445	1407.9024	8.5649	12.3833	113.6935	2817.6573	9.5740	3.8503	15.401
L7	24.7141	19.1445	1407.9024	8.5649	12.3833	113.6935	2817.6573	9.5740	3.8503	15.401
	25.7932	19.9878	1602.2707	8.9422	12.9232	123.9841	3206.6497	9.9958	4.0373	16.149
L8	25.7932	19.9878	1602.2707	8.9422	12.9232	123.9841	3206.6497	9.9958	4.0373	16.149

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
	26.8724	20.8311	1813.7521	9.3195	13.4631	134.7204	3629.8907	10.4175	4.2244	16.897
L9	26.8724	20.8311	1813.7521	9.3195	13.4631	134.7204	3629.8907	10.4175	4.2244	16.897
	28.3832	22.0117	2139.9506	9.8477	14.2189	150.5002	4282.7170	11.0079	4.4862	17.945
L10	27.8554	26.1134	2286.7186	9.3462	13.5330	168.9734	4576.4461	13.0592	4.1386	13.244
	28.0686	27.1547	2571.3311	9.7189	14.0663	182.8004	5146.0457	13.5799	4.3234	13.835
L11	28.0686	27.1547	2571.3311	9.7189	14.0663	182.8004	5146.0457	13.5799	4.3234	13.835
	28.2640	27.3456	2625.9474	9.7872	14.1641	185.3945	5255.3501	13.6754	4.3573	13.943
L12	28.2390	41.3203	3921.2766	9.7295	14.1641	276.8460	7847.7128	20.6641	4.0713	8.571
	28.2923	41.3995	3943.8506	9.7482	14.1908	277.9165	7892.8907	20.7037	4.0805	8.591
L13	28.2942	40.3284	3845.3116	9.7526	14.1908	270.9726	7695.6831	20.1680	4.1025	8.87
	29.3602	41.8695	4303.2161	10.1253	14.7241	292.2568	8612.0945	20.9387	4.2873	9.27
L14	29.3612	41.3127	4247.8558	10.1275	14.7241	288.4969	8501.3011	20.6603	4.2983	9.421
	30.4272	42.8331	4734.2900	10.5002	15.2574	310.2944	9474.8094	21.4206	4.4830	9.826
L15	30.4282	42.2552	4672.3973	10.5024	15.2574	306.2379	9350.9427	21.1316	4.4940	9.987
	31.4942	43.7547	5187.6777	10.8751	15.7907	328.5268	10382.1815	21.8815	4.6788	10.397
L16	31.4942	43.7547	5187.6777	10.8751	15.7907	328.5268	10382.1815	21.8815	4.6788	10.397
	32.5603	45.2542	5739.5142	11.2478	16.3241	351.5987	11486.5805	22.6314	4.8636	10.808
L17	32.5622	44.0145	5586.6902	11.2522	16.3241	342.2368	11180.7315	22.0114	4.8856	11.167
	33.6282	45.4723	6160.4010	11.6249	16.8574	365.4426	12328.9079	22.7405	5.0703	11.589
L18	33.6282	45.4723	6160.4010	11.6249	16.8574	365.4426	12328.9079	22.7405	5.0703	11.589
	33.8983	45.8416	6311.7166	11.7193	16.9925	371.4420	12631.7383	22.9252	5.1172	11.696
L19	33.8925	49.7144	6829.3945	11.7060	16.9925	401.9071	13667.7753	24.8619	5.0512	10.634
	33.9636	49.8200	6873.0212	11.7309	17.0281	403.6291	13755.0860	24.9147	5.0635	10.66
L20	33.9636	49.8200	6873.0212	11.7309	17.0281	403.6291	13755.0860	24.9147	5.0635	10.66
	33.9956	49.8675	6892.6919	11.7421	17.0441	404.4043	13794.4534	24.9385	5.0690	10.672
L21	33.9975	48.5735	6718.9171	11.7465	17.0441	394.2087	13446.6750	24.2914	5.0910	11.008
	35.0636	50.1147	7378.9552	12.1192	17.5774	419.7983	14767.6198	25.0621	5.2758	11.407
L22	35.0636	50.1147	7378.9552	12.1192	17.5774	419.7983	14767.6198	25.0621	5.2758	11.407
	36.1296	51.6558	8080.8630	12.4919	18.1107	446.1928	16172.3590	25.8328	5.4606	11.807
L23	36.1296	51.6558	8080.8630	12.4919	18.1107	446.1928	16172.3590	25.8328	5.4606	11.807
	37.5502	53.7095	9083.5229	12.9886	18.8214	482.6168	18178.9982	26.8599	5.7068	12.339
L24	36.9041	58.0142	8884.0049	12.3594	17.9528	494.8534	17779.6995	29.0126	5.2959	10.087
	37.1169	60.1682	9910.7357	12.8183	18.6095	532.5647	19834.5122	30.0898	5.5234	10.521
L25	37.1188	58.7559	9684.8171	12.8227	18.6095	520.4247	19382.3777	29.3836	5.5454	10.82
	38.1831	60.4608	10552.5569	13.1948	19.1419	551.2815	21118.9991	30.2361	5.7298	11.18
L26	38.1831	60.4608	10552.5569	13.1948	19.1419	551.2815	21118.9991	30.2361	5.7298	11.18
	39.2473	62.1657	11470.6395	13.5668	19.6743	583.0271	22956.3724	31.0887	5.9143	11.54
L27	39.2473	62.1657	11470.6395	13.5668	19.6743	583.0271	22956.3724	31.0887	5.9143	11.54
	40.3115	63.8705	12440.4845	13.9389	20.2067	615.6614	24897.3386	31.9413	6.0987	11.9
L28	40.3125	63.1017	12294.6405	13.9411	20.2067	608.4438	24605.4586	31.5568	6.1097	12.069
	40.7602	63.8101	12713.3890	14.0976	20.4307	622.2700	25443.5066	31.9111	6.1873	12.222
L29	40.7804	47.4229	9511.0092	14.1442	20.4307	465.5262	19034.5332	23.7160	6.4183	17.116
	40.8336	47.4853	9548.5864	14.1628	20.4573	466.7573	19109.7371	23.7472	6.4276	17.14
L30	40.8336	47.4853	9548.5864	14.1628	20.4573	466.7573	19109.7371	23.7472	6.4276	17.14
	40.8833	47.5435	9583.7581	14.1802	20.4821	467.9081	19180.1268	23.7763	6.4362	17.163
L31	40.8582	67.8685	13569.7508	14.1225	20.4821	662.5163	27157.3571	33.9407	6.1502	11.442
	40.9115	67.9579	13623.4464	14.1411	20.5088	664.2745	27264.8188	33.9854	6.1594	11.459
L32	40.9134	66.3983	13319.1529	14.1455	20.5088	649.4373	26655.8314	33.2055	6.1814	11.774
	41.9776	68.1448	14398.0182	14.5176	21.0412	684.2782	28814.9816	34.0789	6.3659	12.125
L33	41.9776	68.1448	14398.0182	14.5176	21.0412	684.2782	28814.9816	34.0789	6.3659	12.125
	43.0418	69.8912	15533.6243	14.8897	21.5736	720.0296	31087.6882	34.9522	6.5503	12.477
L34	43.0428	69.0695	15355.5627	14.8919	21.5736	711.7759	30731.3306	34.5413	6.5613	12.648
	44.1070	70.7951	16535.4992	15.2639	22.1060	748.0093	33092.7562	35.4043	6.7458	13.004
L35	44.1080	69.9523	16343.4012	15.2662	22.1060	739.3195	32708.3075	34.9828	6.7568	13.184
	46.3869	73.6030	19038.0301	16.0629	23.2461	818.9781	38101.1109	36.8085	7.1518	13.955
L36	45.6160	78.7051	18492.5650	15.3093	22.1996	833.0149	37009.4631	39.3600	6.6792	11.616
	45.8289	81.4793	20517.7708	15.8490	22.9718	893.1740	41062.5394	40.7474	6.9467	12.081
L37	45.8289	81.4793	20517.7708	15.8490	22.9718	893.1740	41062.5394	40.7474	6.9467	12.081
	46.8934	83.3926	21997.3209	16.2211	23.5043	935.8851	44023.5864	41.7042	7.1312	12.402
L38	46.8934	83.3926	21997.3209	16.2211	23.5043	935.8851	44023.5864	41.7042	7.1312	12.402
	47.3106	84.1425	22596.1693	16.3670	23.7131	952.9000	45222.0712	42.0793	7.2035	12.528
L39	47.3319	64.2124	17347.0221	16.4158	23.7131	731.5389	34716.8699	32.1123	7.4455	17.018

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
	47.3851	64.2852	17406.0787	16.4344	23.7397	733.2061	34835.0607	32.1487	7.4548	17.039
L40	47.3851	64.2852	17406.0787	16.4344	23.7397	733.2061	34835.0607	32.1487	7.4548	17.039
	47.4568	64.3833	17485.8278	16.4595	23.7755	735.4544	34994.6639	32.1977	7.4672	17.068
L41	47.4394	80.7426	21822.5579	16.4195	23.7755	917.8574	43673.8306	40.3789	7.2692	13.217
	47.4926	80.8341	21896.8342	16.4382	23.8022	919.9512	43822.4808	40.4247	7.2784	13.233
L42	47.4926	80.8341	21896.8342	16.4382	23.8022	919.9512	43822.4808	40.4247	7.2784	13.233
	48.5571	82.6641	23417.9631	16.8103	24.3347	962.3274	46866.7402	41.3399	7.4629	13.569
L43	48.5581	81.7355	23161.0184	16.8125	24.3347	951.7686	46352.5126	40.8755	7.4739	13.745
	49.6226	83.5448	24733.3535	17.1847	24.8673	994.6151	49499.2518	41.7803	7.6584	14.084
L44	49.6235	82.5952	24458.5333	17.1869	24.8673	983.5636	48949.2498	41.3054	7.6694	14.269
	50.6880	84.3836	26082.0063	17.5591	25.3998	1026.8585	52198.3319	42.1998	7.8539	14.612
L45	50.6880	84.3836	26082.0063	17.5591	25.3998	1026.8585	52198.3319	42.1998	7.8539	14.612
	51.7525	86.1721	27775.7771	17.9312	25.9324	1071.0859	55588.1024	43.0942	8.0384	14.955
L46	51.7525	86.1721	27775.7771	17.9312	25.9324	1071.0859	55588.1024	43.0942	8.0384	14.955
	52.8170	87.9605	29541.3343	18.3034	26.4649	1116.2459	59121.5398	43.9886	8.2229	15.298
L47	52.8170	87.9605	29541.3343	18.3034	26.4649	1116.2459	59121.5398	43.9886	8.2229	15.298
	53.8815	89.7490	31380.1675	18.6755	26.9974	1162.3385	62801.6259	44.8830	8.4074	15.642
L48	53.8815	89.7490	31380.1675	18.6755	26.9974	1162.3385	62801.6259	44.8830	8.4074	15.642
	54.7501	91.2084	32935.9831	18.9792	27.4320	1200.6410	65915.3042	45.6128	8.5580	15.922

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 180.00-175.00				1	1	1			
L2 175.00-170.00				1	1	1			
L3 170.00-165.00				1	1	1			
L4 165.00-160.00				1	1	1			
L5 160.00-155.00				1	1	1			
L6 155.00-150.00				1	1	1			
L7 150.00-145.00				1	1	1			
L8 145.00-140.00				1	1	1			
L9 140.00-133.00				1	1	1			
L10 133.00-132.00				1	1	1			
L11 132.00-131.08				1	1	1			
L12 131.08-130.83				1	1	0.951657			
L13 130.83-125.83				1	1	0.965844			
L14 125.83-120.83				1	1	0.968428			
L15 120.83-115.83				1	1	0.971828			
L16 115.83-110.83				1	1	0.962636			
L17 110.83-105.83				1	1	0.980919			
L18 105.83-104.57				1	1	0.978771			

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
L19 104.57-104.23				1	1	0.962225			
L20 104.23-104.08				1	1	0.961935			
L21 104.08-99.08				1	1	0.977969			
L22 99.08-94.08				1	1	0.96895			
L23 94.08-87.42				1	1	0.966355			
L24 87.42-86.42				1	1	0.966563			
L25 86.42-81.42				1	1	0.982518			
L26 81.42-76.42				1	1	0.975639			
L27 76.42-71.42				1	1	0.969128			
L28 71.42-69.32				1	1	0.97827			
L29 69.32-69.07				1	1	1			
L30 69.07-68.83				1	1	1			
L31 68.83-68.58				1	1	0.9654			
L32 68.58-63.58				1	1	0.981059			
L33 63.58-58.58				1	1	0.974393			
L34 58.58-53.58				1	1	0.979572			
L35 53.58-42.88				1	1	0.985853			
L36 42.88-41.88				1	1	0.984136			
L37 41.88-36.88				1	1	0.979014			
L38 36.88-34.92				1	1	0.977069			
L39 34.92-34.67				1	1	1			
L40 34.67-34.33				1	1	1			
L41 34.33-34.08				1	1	0.982959			
L42 34.08-29.08				1	1	0.978808			
L43 29.08-24.08				1	1	0.985915			
L44 24.08-19.08				1	1	0.993365			
L45 19.08-14.08				1	1	0.989642			
L46 14.08-9.08				1	1	0.986069			
L47 9.08-4.08				1	1	0.98264			
L48 4.08-0.00				1	1	0.97994			

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
Miscl										
Safety Line 3/8	A	No	Surface Ar (CaAa)	180.00 - 0.00	1	1	-0.330 -0.330	0.3750		0.22
**										
**										
**										
**										
***Mods**										
PL 1 x 5	A	No	Surface Af (CaAa)	36.75 - 0.00	1	1	-0.330 -0.330	5.0000	12.0000	0.00
PL 1 x 5	B	No	Surface Af (CaAa)	36.75 - 0.00	1	1	-0.330 -0.330	5.0000	12.0000	0.00
PL 1 x 5	C	No	Surface Af (CaAa)	36.75 - 0.00	1	1	-0.330 -0.330	5.0000	12.0000	0.00
**										
PL 1 x 5	A	No	Surface Af (CaAa)	106.75 - 66.90	1	1	-0.330 -0.330	5.0000	12.0000	0.00
PL 1 x 5	A	No	Surface Af (CaAa)	106.75 - 66.90	1	1	-0.330 -0.330	5.0000	12.0000	0.00
PL 1 x 5	A	No	Surface Af (CaAa)	106.75 - 66.90	1	1	-0.330 -0.330	5.0000	12.0000	0.00
**										
(Area) CCI-65FP-060100 (H)	A	No	Surface Af (CaAa)	71.75 - 32.00	1	1	-0.166 -0.166	6.0000	14.0000	0.00
(Area) CCI-65FP-060100 (H)	B	No	Surface Af (CaAa)	71.75 - 32.00	1	1	-0.166 -0.166	6.0000	14.0000	0.00
(Area) CCI-65FP-060100 (H)	C	No	Surface Af (CaAa)	71.75 - 32.00	1	1	-0.166 -0.166	6.0000	14.0000	0.00
**										
PL 1x4	A	No	Surface Af (CaAa)	132.75 - 102.90	1	1	-0.166 -0.166	4.0000	10.0000	0.00
PL 1x4	B	No	Surface Af (CaAa)	132.75 - 102.90	1	1	-0.166 -0.166	4.0000	10.0000	0.00
PL 1x4	C	No	Surface Af (CaAa)	132.75 - 102.90	1	1	-0.166 -0.166	4.0000	10.0000	0.00
**										

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
**									
180									
HB158-21U6S24-xx M_TMO(1-5/8)	B	No	No	Inside Pole	180.00 - 0.00	4	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	2.50 2.50 2.50 2.50
**									
165									
LDF4-50A(1/2)	B	No	No	Inside Pole	165.00 - 0.00	1	No Ice 1/2" Ice	0.00 0.00	0.15 0.15

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
							1" Ice	0.00	0.15
							2" Ice	0.00	0.15
LDF7-50A(1-5/8)	B	No	No	Inside Pole	165.00 - 0.00	12	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
							2" Ice	0.00	0.82
HB158-1-08U8-S8J	B	No	No	Inside Pole	165.00 - 0.00	2	No Ice	0.00	1.30
18(1-5/8)							1/2" Ice	0.00	1.30
							1" Ice	0.00	1.30
							2" Ice	0.00	1.30
**									
147									
LCF158-50A(1-5/8)	A	No	No	Inside Pole	147.00 - 0.00	12	No Ice	0.00	0.80
							1/2" Ice	0.00	0.80
							1" Ice	0.00	0.80
							2" Ice	0.00	0.80
FB-L98B-002-75000	A	No	No	Inside Pole	147.00 - 0.00	1	No Ice	0.00	0.06
(3/8)							1/2" Ice	0.00	0.06
							1" Ice	0.00	0.06
							2" Ice	0.00	0.06
FB-L98B-034-XXX(	A	No	No	Inside Pole	147.00 - 0.00	1	No Ice	0.00	0.06
3/8)							1/2" Ice	0.00	0.06
							1" Ice	0.00	0.06
							2" Ice	0.00	0.06
WR-VG122ST-BRD	A	No	No	Inside Pole	147.00 - 0.00	2	No Ice	0.00	0.14
A(7/16)							1/2" Ice	0.00	0.14
							1" Ice	0.00	0.14
							2" Ice	0.00	0.14
WR-VG66ST-BRD(	A	No	No	Inside Pole	147.00 - 0.00	2	No Ice	0.00	0.91
7/8)							1/2" Ice	0.00	0.91
							1" Ice	0.00	0.91
							2" Ice	0.00	0.91
2" Flexible Conduit	A	No	No	Inside Pole	147.00 - 0.00	1	No Ice	0.00	0.34
							1/2" Ice	0.00	0.34
							1" Ice	0.00	0.34
							2" Ice	0.00	0.34
**									
75									
LCF12-50J(1/2)	B	No	No	Inside Pole	75.00 - 0.00	1	No Ice	0.00	0.15
							1/2" Ice	0.00	0.15
							1" Ice	0.00	0.15
							2" Ice	0.00	0.15
**									

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	180.00-175.00	A	0.000	0.000	0.188	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.05
		C	0.000	0.000	0.000	0.000	0.00
L2	175.00-170.00	A	0.000	0.000	0.188	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.05

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C	0.000	0.000	0.000	0.000	0.00
L3	170.00-165.00	A	0.000	0.000	0.188	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.05
		C	0.000	0.000	0.000	0.000	0.00
L4	165.00-160.00	A	0.000	0.000	0.188	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.11
		C	0.000	0.000	0.000	0.000	0.00
L5	160.00-155.00	A	0.000	0.000	0.188	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.11
		C	0.000	0.000	0.000	0.000	0.00
L6	155.00-150.00	A	0.000	0.000	0.188	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.11
		C	0.000	0.000	0.000	0.000	0.00
L7	150.00-145.00	A	0.000	0.000	0.188	0.000	0.03
		B	0.000	0.000	0.000	0.000	0.11
		C	0.000	0.000	0.000	0.000	0.00
L8	145.00-140.00	A	0.000	0.000	0.188	0.000	0.06
		B	0.000	0.000	0.000	0.000	0.11
		C	0.000	0.000	0.000	0.000	0.00
L9	140.00-133.00	A	0.000	0.000	0.263	0.000	0.09
		B	0.000	0.000	0.000	0.000	0.16
		C	0.000	0.000	0.000	0.000	0.00
L10	133.00-132.00	A	0.000	0.000	0.537	0.000	0.01
		B	0.000	0.000	0.500	0.000	0.02
		C	0.000	0.000	0.500	0.000	0.00
L11	132.00-131.08	A	0.000	0.000	0.646	0.000	0.01
		B	0.000	0.000	0.611	0.000	0.02
		C	0.000	0.000	0.611	0.000	0.00
L12	131.08-130.83	A	0.000	0.000	0.176	0.000	0.00
		B	0.000	0.000	0.167	0.000	0.01
		C	0.000	0.000	0.167	0.000	0.00
L13	130.83-125.83	A	0.000	0.000	3.521	0.000	0.06
		B	0.000	0.000	3.333	0.000	0.11
		C	0.000	0.000	3.333	0.000	0.00
L14	125.83-120.83	A	0.000	0.000	3.521	0.000	0.06
		B	0.000	0.000	3.333	0.000	0.11
		C	0.000	0.000	3.333	0.000	0.00
L15	120.83-115.83	A	0.000	0.000	3.521	0.000	0.06
		B	0.000	0.000	3.333	0.000	0.11
		C	0.000	0.000	3.333	0.000	0.00
L16	115.83-110.83	A	0.000	0.000	3.521	0.000	0.06
		B	0.000	0.000	3.333	0.000	0.11
		C	0.000	0.000	3.333	0.000	0.00
L17	110.83-105.83	A	0.000	0.000	5.813	0.000	0.06
		B	0.000	0.000	3.333	0.000	0.11
		C	0.000	0.000	3.333	0.000	0.00
L18	105.83-104.57	A	0.000	0.000	4.058	0.000	0.02
		B	0.000	0.000	0.844	0.000	0.03
		C	0.000	0.000	0.844	0.000	0.00
L19	104.57-104.23	A	0.000	0.000	1.069	0.000	0.00
		B	0.000	0.000	0.222	0.000	0.01
		C	0.000	0.000	0.222	0.000	0.00
L20	104.23-104.08	A	0.000	0.000	0.481	0.000	0.00
		B	0.000	0.000	0.100	0.000	0.00
		C	0.000	0.000	0.100	0.000	0.00
L21	104.08-99.08	A	0.000	0.000	13.476	0.000	0.06
		B	0.000	0.000	0.789	0.000	0.11
		C	0.000	0.000	0.789	0.000	0.00
L22	99.08-94.08	A	0.000	0.000	12.688	0.000	0.06
		B	0.000	0.000	0.000	0.000	0.11
		C	0.000	0.000	0.000	0.000	0.00

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
L23	94.08-87.42	A	0.000	0.000	16.907	0.000	0.08
		B	0.000	0.000	0.000	0.000	0.15
		C	0.000	0.000	0.000	0.000	0.00
L24	87.42-86.42	A	0.000	0.000	2.538	0.000	0.01
		B	0.000	0.000	0.000	0.000	0.02
		C	0.000	0.000	0.000	0.000	0.00
L25	86.42-81.42	A	0.000	0.000	12.688	0.000	0.06
		B	0.000	0.000	0.000	0.000	0.11
		C	0.000	0.000	0.000	0.000	0.00
L26	81.42-76.42	A	0.000	0.000	12.688	0.000	0.06
		B	0.000	0.000	0.000	0.000	0.11
		C	0.000	0.000	0.000	0.000	0.00
L27	76.42-71.42	A	0.000	0.000	13.018	0.000	0.06
		B	0.000	0.000	0.330	0.000	0.11
		C	0.000	0.000	0.330	0.000	0.00
L28	71.42-69.32	A	0.000	0.000	7.440	0.000	0.03
		B	0.000	0.000	2.103	0.000	0.05
		C	0.000	0.000	2.103	0.000	0.00
L29	69.32-69.07	A	0.000	0.000	0.884	0.000	0.00
		B	0.000	0.000	0.250	0.000	0.01
		C	0.000	0.000	0.250	0.000	0.00
L30	69.07-68.83	A	0.000	0.000	0.826	0.000	0.00
		B	0.000	0.000	0.233	0.000	0.01
		C	0.000	0.000	0.233	0.000	0.00
L31	68.83-68.58	A	0.000	0.000	0.884	0.000	0.00
		B	0.000	0.000	0.250	0.000	0.01
		C	0.000	0.000	0.250	0.000	0.00
L32	68.58-63.58	A	0.000	0.000	9.396	0.000	0.06
		B	0.000	0.000	5.000	0.000	0.11
		C	0.000	0.000	5.000	0.000	0.00
L33	63.58-58.58	A	0.000	0.000	5.188	0.000	0.06
		B	0.000	0.000	5.000	0.000	0.11
		C	0.000	0.000	5.000	0.000	0.00
L34	58.58-53.58	A	0.000	0.000	5.188	0.000	0.06
		B	0.000	0.000	5.000	0.000	0.11
		C	0.000	0.000	5.000	0.000	0.00
L35	53.58-42.88	A	0.000	0.000	11.108	0.000	0.13
		B	0.000	0.000	10.707	0.000	0.24
		C	0.000	0.000	10.707	0.000	0.00
L36	42.88-41.88	A	0.000	0.000	1.038	0.000	0.01
		B	0.000	0.000	1.000	0.000	0.02
		C	0.000	0.000	1.000	0.000	0.00
L37	41.88-36.88	A	0.000	0.000	5.188	0.000	0.06
		B	0.000	0.000	5.000	0.000	0.11
		C	0.000	0.000	5.000	0.000	0.00
L38	36.88-34.92	A	0.000	0.000	3.561	0.000	0.02
		B	0.000	0.000	3.488	0.000	0.04
		C	0.000	0.000	3.488	0.000	0.00
L39	34.92-34.67	A	0.000	0.000	0.468	0.000	0.00
		B	0.000	0.000	0.458	0.000	0.01
		C	0.000	0.000	0.458	0.000	0.00
L40	34.67-34.33	A	0.000	0.000	0.630	0.000	0.00
		B	0.000	0.000	0.617	0.000	0.01
		C	0.000	0.000	0.617	0.000	0.00
L41	34.33-34.08	A	0.000	0.000	0.468	0.000	0.00
		B	0.000	0.000	0.458	0.000	0.01
		C	0.000	0.000	0.458	0.000	0.00
L42	34.08-29.08	A	0.000	0.000	6.434	0.000	0.06
		B	0.000	0.000	6.247	0.000	0.11
		C	0.000	0.000	6.247	0.000	0.00
L43	29.08-24.08	A	0.000	0.000	4.354	0.000	0.06

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
		B	0.000	0.000	4.167	0.000	0.11
		C	0.000	0.000	4.167	0.000	0.00
L44	24.08-19.08	A	0.000	0.000	4.354	0.000	0.06
		B	0.000	0.000	4.167	0.000	0.11
		C	0.000	0.000	4.167	0.000	0.00
L45	19.08-14.08	A	0.000	0.000	4.354	0.000	0.06
		B	0.000	0.000	4.167	0.000	0.11
		C	0.000	0.000	4.167	0.000	0.00
L46	14.08-9.08	A	0.000	0.000	4.354	0.000	0.06
		B	0.000	0.000	4.167	0.000	0.11
		C	0.000	0.000	4.167	0.000	0.00
L47	9.08-4.08	A	0.000	0.000	4.354	0.000	0.06
		B	0.000	0.000	4.167	0.000	0.11
		C	0.000	0.000	4.167	0.000	0.00
L48	4.08-0.00	A	0.000	0.000	3.553	0.000	0.05
		B	0.000	0.000	3.400	0.000	0.09
		C	0.000	0.000	3.400	0.000	0.00

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	180.00-175.00	A	1.509	0.000	0.000	1.696	0.000	0.02
		B		0.000	0.000	0.000	0.000	0.05
		C		0.000	0.000	0.000	0.000	0.00
L2	175.00-170.00	A	1.504	0.000	0.000	1.692	0.000	0.02
		B		0.000	0.000	0.000	0.000	0.05
		C		0.000	0.000	0.000	0.000	0.00
L3	170.00-165.00	A	1.500	0.000	0.000	1.687	0.000	0.02
		B		0.000	0.000	0.000	0.000	0.05
		C		0.000	0.000	0.000	0.000	0.00
L4	165.00-160.00	A	1.495	0.000	0.000	1.683	0.000	0.02
		B		0.000	0.000	0.000	0.000	0.11
		C		0.000	0.000	0.000	0.000	0.00
L5	160.00-155.00	A	1.491	0.000	0.000	1.678	0.000	0.02
		B		0.000	0.000	0.000	0.000	0.11
		C		0.000	0.000	0.000	0.000	0.00
L6	155.00-150.00	A	1.486	0.000	0.000	1.673	0.000	0.02
		B		0.000	0.000	0.000	0.000	0.11
		C		0.000	0.000	0.000	0.000	0.00
L7	150.00-145.00	A	1.481	0.000	0.000	1.668	0.000	0.04
		B		0.000	0.000	0.000	0.000	0.11
		C		0.000	0.000	0.000	0.000	0.00
L8	145.00-140.00	A	1.476	0.000	0.000	1.663	0.000	0.08
		B		0.000	0.000	0.000	0.000	0.11
		C		0.000	0.000	0.000	0.000	0.00
L9	140.00-133.00	A	1.469	0.000	0.000	2.320	0.000	0.11
		B		0.000	0.000	0.000	0.000	0.16
		C		0.000	0.000	0.000	0.000	0.00
L10	133.00-132.00	A	1.465	0.000	0.000	1.052	0.000	0.02
		B		0.000	0.000	0.720	0.000	0.03
		C		0.000	0.000	0.720	0.000	0.01
L11	132.00-131.08	A	1.464	0.000	0.000	1.182	0.000	0.02
		B		0.000	0.000	0.880	0.000	0.03
		C		0.000	0.000	0.880	0.000	0.01
L12	131.08-130.83	A	1.463	0.000	0.000	0.322	0.000	0.01
		B		0.000	0.000	0.240	0.000	0.01

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
		C		0.000	0.000	0.240	0.000	0.00
L13	130.83-125.83	A	1.460	0.000	0.000	6.442	0.000	0.12
		B		0.000	0.000	4.794	0.000	0.16
		C		0.000	0.000	4.794	0.000	0.04
L14	125.83-120.83	A	1.455	0.000	0.000	6.430	0.000	0.12
		B		0.000	0.000	4.788	0.000	0.16
		C		0.000	0.000	4.788	0.000	0.04
L15	120.83-115.83	A	1.449	0.000	0.000	6.418	0.000	0.12
		B		0.000	0.000	4.782	0.000	0.16
		C		0.000	0.000	4.782	0.000	0.04
L16	115.83-110.83	A	1.442	0.000	0.000	6.406	0.000	0.12
		B		0.000	0.000	4.776	0.000	0.16
		C		0.000	0.000	4.776	0.000	0.04
L17	110.83-105.83	A	1.436	0.000	0.000	9.474	0.000	0.15
		B		0.000	0.000	4.769	0.000	0.16
		C		0.000	0.000	4.769	0.000	0.04
L18	105.83-104.57	A	1.432	0.000	0.000	5.872	0.000	0.07
		B		0.000	0.000	1.207	0.000	0.04
		C		0.000	0.000	1.207	0.000	0.01
L19	104.57-104.23	A	1.431	0.000	0.000	1.547	0.000	0.02
		B		0.000	0.000	0.318	0.000	0.01
		C		0.000	0.000	0.318	0.000	0.00
L20	104.23-104.08	A	1.430	0.000	0.000	0.695	0.000	0.01
		B		0.000	0.000	0.143	0.000	0.00
		C		0.000	0.000	0.143	0.000	0.00
L21	104.08-99.08	A	1.427	0.000	0.000	19.521	0.000	0.23
		B		0.000	0.000	1.126	0.000	0.12
		C		0.000	0.000	1.126	0.000	0.01
L22	99.08-94.08	A	1.420	0.000	0.000	18.366	0.000	0.22
		B		0.000	0.000	0.000	0.000	0.11
		C		0.000	0.000	0.000	0.000	0.00
L23	94.08-87.42	A	1.411	0.000	0.000	24.427	0.000	0.29
		B		0.000	0.000	0.000	0.000	0.15
		C		0.000	0.000	0.000	0.000	0.00
L24	87.42-86.42	A	1.405	0.000	0.000	3.666	0.000	0.04
		B		0.000	0.000	0.000	0.000	0.02
		C		0.000	0.000	0.000	0.000	0.00
L25	86.42-81.42	A	1.400	0.000	0.000	18.286	0.000	0.22
		B		0.000	0.000	0.000	0.000	0.11
		C		0.000	0.000	0.000	0.000	0.00
L26	81.42-76.42	A	1.391	0.000	0.000	18.252	0.000	0.22
		B		0.000	0.000	0.000	0.000	0.11
		C		0.000	0.000	0.000	0.000	0.00
L27	76.42-71.42	A	1.382	0.000	0.000	18.637	0.000	0.22
		B		0.000	0.000	0.421	0.000	0.12
		C		0.000	0.000	0.421	0.000	0.00
L28	71.42-69.32	A	1.375	0.000	0.000	10.333	0.000	0.11
		B		0.000	0.000	2.682	0.000	0.07
		C		0.000	0.000	2.682	0.000	0.02
L29	69.32-69.07	A	1.373	0.000	0.000	1.228	0.000	0.01
		B		0.000	0.000	0.319	0.000	0.01
		C		0.000	0.000	0.319	0.000	0.00
L30	69.07-68.83	A	1.372	0.000	0.000	1.146	0.000	0.01
		B		0.000	0.000	0.297	0.000	0.01
		C		0.000	0.000	0.297	0.000	0.00
L31	68.83-68.58	A	1.372	0.000	0.000	1.227	0.000	0.01
		B		0.000	0.000	0.319	0.000	0.01
		C		0.000	0.000	0.319	0.000	0.00
L32	68.58-63.58	A	1.367	0.000	0.000	13.509	0.000	0.17
		B		0.000	0.000	6.367	0.000	0.16
		C		0.000	0.000	6.367	0.000	0.05

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
L33	63.58-58.58	A	1.356	0.000	0.000	7.899	0.000	0.13
		B		0.000	0.000	6.356	0.000	0.16
		C		0.000	0.000	6.356	0.000	0.05
L34	58.58-53.58	A	1.344	0.000	0.000	7.876	0.000	0.13
		B		0.000	0.000	6.344	0.000	0.16
		C		0.000	0.000	6.344	0.000	0.05
L35	53.58-42.88	A	1.324	0.000	0.000	16.779	0.000	0.27
		B		0.000	0.000	13.542	0.000	0.35
		C		0.000	0.000	13.542	0.000	0.10
L36	42.88-41.88	A	1.307	0.000	0.000	1.567	0.000	0.02
		B		0.000	0.000	1.265	0.000	0.03
		C		0.000	0.000	1.265	0.000	0.01
L37	41.88-36.88	A	1.298	0.000	0.000	7.783	0.000	0.12
		B		0.000	0.000	6.298	0.000	0.16
		C		0.000	0.000	6.298	0.000	0.05
L38	36.88-34.92	A	1.286	0.000	0.000	5.041	0.000	0.06
		B		0.000	0.000	4.463	0.000	0.08
		C		0.000	0.000	4.463	0.000	0.03
L39	34.92-34.67	A	1.282	0.000	0.000	0.660	0.000	0.01
		B		0.000	0.000	0.587	0.000	0.01
		C		0.000	0.000	0.587	0.000	0.00
L40	34.67-34.33	A	1.281	0.000	0.000	0.889	0.000	0.01
		B		0.000	0.000	0.790	0.000	0.01
		C		0.000	0.000	0.790	0.000	0.01
L41	34.33-34.08	A	1.280	0.000	0.000	0.660	0.000	0.01
		B		0.000	0.000	0.586	0.000	0.01
		C		0.000	0.000	0.586	0.000	0.00
L42	34.08-29.08	A	1.269	0.000	0.000	9.501	0.000	0.14
		B		0.000	0.000	8.044	0.000	0.17
		C		0.000	0.000	8.044	0.000	0.06
L43	29.08-24.08	A	1.248	0.000	0.000	6.850	0.000	0.11
		B		0.000	0.000	5.414	0.000	0.15
		C		0.000	0.000	5.414	0.000	0.04
L44	24.08-19.08	A	1.222	0.000	0.000	6.798	0.000	0.11
		B		0.000	0.000	5.389	0.000	0.15
		C		0.000	0.000	5.389	0.000	0.04
L45	19.08-14.08	A	1.190	0.000	0.000	6.734	0.000	0.11
		B		0.000	0.000	5.357	0.000	0.15
		C		0.000	0.000	5.357	0.000	0.04
L46	14.08-9.08	A	1.148	0.000	0.000	6.650	0.000	0.11
		B		0.000	0.000	5.315	0.000	0.15
		C		0.000	0.000	5.315	0.000	0.04
L47	9.08-4.08	A	1.085	0.000	0.000	6.524	0.000	0.11
		B		0.000	0.000	5.252	0.000	0.15
		C		0.000	0.000	5.252	0.000	0.03
L48	4.08-0.00	A	0.965	0.000	0.000	5.128	0.000	0.08
		B		0.000	0.000	4.187	0.000	0.12
		C		0.000	0.000	4.187	0.000	0.02

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	180.00-175.00	-0.2962	0.0501	-1.2553	0.2123
L2	175.00-170.00	-0.2964	0.0501	-1.2690	0.2146
L3	170.00-165.00	-0.2965	0.0502	-1.2812	0.2167

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L4	165.00-160.00	-0.2967	0.0502	-1.2921	0.2185
L5	160.00-155.00	-0.2968	0.0502	-1.3019	0.2202
L6	155.00-150.00	-0.2969	0.0502	-1.3105	0.2217
L7	150.00-145.00	-0.2970	0.0502	-1.3182	0.2230
L8	145.00-140.00	-0.2971	0.0503	-1.3249	0.2241
L9	140.00-133.00	-0.2972	0.0503	-1.3319	0.2253
L10	133.00-132.00	-0.1596	0.0270	-0.8184	0.1384
L11	132.00-131.08	-0.1388	0.0235	-0.7258	0.1228
L12	131.08-130.83	-0.1392	0.0235	-0.7276	0.1231
L13	130.83-125.83	-0.1406	0.0238	-0.7343	0.1242
L14	125.83-120.83	-0.1433	0.0242	-0.7465	0.1263
L15	120.83-115.83	-0.1459	0.0247	-0.7582	0.1282
L16	115.83-110.83	-0.1484	0.0251	-0.7692	0.1301
L17	110.83-105.83	-1.6586	1.4062	-1.9627	1.2544
L18	105.83-104.57	-5.8158	5.2129	-5.4925	4.5994
L19	104.57-104.23	-5.8353	5.2311	-5.5101	4.6149
L20	104.23-104.08	-5.8411	5.2365	-5.5153	4.6195
L21	104.08-99.08	-7.6653	6.8747	-7.0708	5.9253
L22	99.08-94.08	-8.5794	7.7005	-7.8280	6.5661
L23	94.08-87.42	-8.7289	7.8412	-7.9548	6.6798
L24	87.42-86.42	-8.7513	7.8622	-7.9760	6.6983
L25	86.42-81.42	-8.8257	7.9323	-8.0327	6.7510
L26	81.42-76.42	-8.9474	8.0469	-8.1340	6.8423
L27	76.42-71.42	-8.7177	7.8452	-7.9762	6.7155
L28	71.42-69.32	-5.7191	5.1488	-5.6064	4.7232
L29	69.32-69.07	-5.7416	5.1698	-5.6261	4.7407
L30	69.07-68.83	-5.7464	5.1742	-5.6303	4.7445
L31	68.83-68.58	-5.7523	5.1797	-5.6357	4.7492
L32	68.58-63.58	-2.5193	2.2107	-2.7646	2.0368
L33	63.58-58.58	-0.1391	0.0235	-0.7450	0.1260
L34	58.58-53.58	-0.1409	0.0238	-0.7495	0.1268
L35	53.58-42.88	-0.1437	0.0243	-0.7550	0.1277
L36	42.88-41.88	-0.1445	0.0244	-0.7592	0.1284
L37	41.88-36.88	-0.1456	0.0246	-0.7528	0.1273
L38	36.88-34.92	-0.1051	0.0178	-0.5627	0.0952
L39	34.92-34.67	-0.1034	0.0175	-0.5534	0.0936
L40	34.67-34.33	-0.1035	0.0175	-0.5535	0.0936
L41	34.33-34.08	-0.1036	0.0175	-0.5537	0.0937
L42	34.08-29.08	-0.1316	0.0223	-0.6742	0.1140
L43	29.08-24.08	-0.1633	0.0276	-0.7943	0.1343
L44	24.08-19.08	-0.1649	0.0279	-0.7895	0.1335
L45	19.08-14.08	-0.1664	0.0282	-0.7812	0.1321
L46	14.08-9.08	-0.1680	0.0284	-0.7674	0.1298
L47	9.08-4.08	-0.1694	0.0287	-0.7423	0.1256
L48	4.08-0.00	-0.1707	0.0289	-0.6862	0.1161

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	Safety Line 3/8	175.00 - 180.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L2	2	Safety Line 3/8	170.00 - 175.00	1.0000	1.0000
L3	2	Safety Line 3/8	165.00 - 170.00	1.0000	1.0000
L4	2	Safety Line 3/8	160.00 - 165.00	1.0000	1.0000
L5	2	Safety Line 3/8	155.00 - 160.00	1.0000	1.0000
L6	2	Safety Line 3/8	150.00 - 155.00	1.0000	1.0000
L7	2	Safety Line 3/8	145.00 - 150.00	1.0000	1.0000
L8	2	Safety Line 3/8	140.00 - 145.00	1.0000	1.0000
L9	2	Safety Line 3/8	133.00 - 140.00	1.0000	1.0000
L10	2	Safety Line 3/8	132.00 - 133.00	1.0000	1.0000
L10	35	PL 1x4	132.00 - 132.75	1.0000	1.0000
L10	36	PL 1x4	132.00 - 132.75	1.0000	1.0000
L10	37	PL 1x4	132.00 - 132.75	1.0000	1.0000
L11	2	Safety Line 3/8	131.08 - 132.00	1.0000	1.0000
L11	35	PL 1x4	131.08 - 132.00	1.0000	1.0000
L11	36	PL 1x4	131.08 - 132.00	1.0000	1.0000
L11	37	PL 1x4	131.08 - 132.00	1.0000	1.0000
L12	2	Safety Line 3/8	130.83 - 131.08	1.0000	1.0000
L12	35	PL 1x4	130.83 - 131.08	1.0000	1.0000
L12	36	PL 1x4	130.83 - 131.08	1.0000	1.0000
L12	37	PL 1x4	130.83 - 131.08	1.0000	1.0000
L13	2	Safety Line 3/8	125.83 - 130.83	1.0000	1.0000
L13	35	PL 1x4	125.83 - 130.83	1.0000	1.0000
L13	36	PL 1x4	125.83 - 130.83	1.0000	1.0000
L13	37	PL 1x4	125.83 - 130.83	1.0000	1.0000
L14	2	Safety Line 3/8	120.83 - 125.83	1.0000	1.0000
L14	35	PL 1x4	120.83 - 125.83	1.0000	1.0000
L14	36	PL 1x4	120.83 - 125.83	1.0000	1.0000
L14	37	PL 1x4	120.83 - 125.83	1.0000	1.0000
L15	2	Safety Line 3/8	115.83 - 120.83	1.0000	1.0000
L15	35	PL 1x4	115.83 - 120.83	1.0000	1.0000
L15	36	PL 1x4	115.83 - 120.83	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L15	37	PL 1x4	115.83 - 120.83	1.0000	1.0000
L16	2	Safety Line 3/8	110.83 - 115.83	1.0000	1.0000
L16	35	PL 1x4	110.83 - 115.83	1.0000	1.0000
L16	36	PL 1x4	110.83 - 115.83	1.0000	1.0000
L16	37	PL 1x4	110.83 - 115.83	1.0000	1.0000
L17	2	Safety Line 3/8	105.83 - 110.83	1.0000	1.0000
L17	27	PL 1 x 5	105.83 - 106.75	1.0000	1.0000
L17	28	PL 1 x 5	105.83 - 106.75	1.0000	1.0000
L17	29	PL 1 x 5	105.83 - 106.75	1.0000	1.0000
L17	35	PL 1x4	105.83 - 110.83	1.0000	1.0000
L17	36	PL 1x4	105.83 - 110.83	1.0000	1.0000
L17	37	PL 1x4	105.83 - 110.83	1.0000	1.0000
L18	2	Safety Line 3/8	104.57 - 105.83	1.0000	1.0000
L18	27	PL 1 x 5	104.57 - 105.83	1.0000	1.0000
L18	28	PL 1 x 5	104.57 - 105.83	1.0000	1.0000
L18	29	PL 1 x 5	104.57 - 105.83	1.0000	1.0000
L18	35	PL 1x4	104.57 - 105.83	1.0000	1.0000
L18	36	PL 1x4	104.57 - 105.83	1.0000	1.0000
L18	37	PL 1x4	104.57 - 105.83	1.0000	1.0000
L19	2	Safety Line 3/8	104.23 - 104.57	1.0000	1.0000
L19	27	PL 1 x 5	104.23 - 104.57	1.0000	1.0000
L19	28	PL 1 x 5	104.23 - 104.57	1.0000	1.0000
L19	29	PL 1 x 5	104.23 - 104.57	1.0000	1.0000
L19	35	PL 1x4	104.23 - 104.57	1.0000	1.0000
L19	36	PL 1x4	104.23 - 104.57	1.0000	1.0000
L19	37	PL 1x4	104.23 - 104.57	1.0000	1.0000
L20	2	Safety Line 3/8	104.08 - 104.23	1.0000	1.0000
L20	27	PL 1 x 5	104.08 - 104.23	1.0000	1.0000
L20	28	PL 1 x 5	104.08 - 104.23	1.0000	1.0000
L20	29	PL 1 x 5	104.08 - 104.23	1.0000	1.0000
L20	35	PL 1x4	104.08 - 104.23	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L20	36	PL 1x4	104.08 - 104.23	1.0000	1.0000
L20	37	PL 1x4	104.08 - 104.23	1.0000	1.0000
L21	2	Safety Line 3/8	99.08 - 104.08	1.0000	1.0000
L21	27	PL 1 x 5	99.08 - 104.08	1.0000	1.0000
L21	28	PL 1 x 5	99.08 - 104.08	1.0000	1.0000
L21	29	PL 1 x 5	99.08 - 104.08	1.0000	1.0000
L21	35	PL 1x4	102.90 - 104.08	1.0000	1.0000
L21	36	PL 1x4	102.90 - 104.08	1.0000	1.0000
L21	37	PL 1x4	102.90 - 104.08	1.0000	1.0000
L22	2	Safety Line 3/8	94.08 - 99.08	1.0000	1.0000
L22	27	PL 1 x 5	94.08 - 99.08	1.0000	1.0000
L22	28	PL 1 x 5	94.08 - 99.08	1.0000	1.0000
L22	29	PL 1 x 5	94.08 - 99.08	1.0000	1.0000
L23	2	Safety Line 3/8	87.42 - 94.08	1.0000	1.0000
L23	27	PL 1 x 5	87.42 - 94.08	1.0000	1.0000
L23	28	PL 1 x 5	87.42 - 94.08	1.0000	1.0000
L23	29	PL 1 x 5	87.42 - 94.08	1.0000	1.0000
L24	2	Safety Line 3/8	86.42 - 87.42	1.0000	1.0000
L24	27	PL 1 x 5	86.42 - 87.42	1.0000	1.0000
L24	28	PL 1 x 5	86.42 - 87.42	1.0000	1.0000
L24	29	PL 1 x 5	86.42 - 87.42	1.0000	1.0000
L25	2	Safety Line 3/8	81.42 - 86.42	1.0000	1.0000
L25	27	PL 1 x 5	81.42 - 86.42	1.0000	1.0000
L25	28	PL 1 x 5	81.42 - 86.42	1.0000	1.0000
L25	29	PL 1 x 5	81.42 - 86.42	1.0000	1.0000
L26	2	Safety Line 3/8	76.42 - 81.42	1.0000	1.0000
L26	27	PL 1 x 5	76.42 - 81.42	1.0000	1.0000
L26	28	PL 1 x 5	76.42 - 81.42	1.0000	1.0000
L26	29	PL 1 x 5	76.42 - 81.42	1.0000	1.0000
L27	2	Safety Line 3/8	71.42 - 76.42	1.0000	1.0000
L27	27	PL 1 x 5	71.42 - 76.42	1.0000	1.0000
L27	28	PL 1 x 5	71.42 - 76.42	1.0000	1.0000
L27	29	PL 1 x 5	71.42 - 76.42	1.0000	1.0000
L27	31	(Area) CCI-65FP-060100 (H)	71.42 - 71.75	1.0000	1.0000
L27	32	(Area) CCI-65FP-060100 (H)	71.42 - 71.75	1.0000	1.0000
L27	33	(Area) CCI-65FP-060100 (H)	71.42 - 71.75	1.0000	1.0000
L28	2	Safety Line 3/8	69.32 - 71.42	1.0000	1.0000
L28	27	PL 1 x 5	69.32 - 71.42	1.0000	1.0000
L28	28	PL 1 x 5	69.32 - 71.42	1.0000	1.0000
L28	29	PL 1 x 5	69.32 - 71.42	1.0000	1.0000
L28	31	(Area) CCI-65FP-060100 (H)	69.32 - 71.42	1.0000	1.0000
L28	32	(Area) CCI-65FP-060100 (H)	69.32 - 71.42	1.0000	1.0000
L28	33	(Area) CCI-65FP-060100 (H)	69.32 - 71.42	1.0000	1.0000
L29	2	Safety Line 3/8	69.07 - 69.32	1.0000	1.0000
L29	27	PL 1 x 5	69.07 - 69.32	1.0000	1.0000
L29	28	PL 1 x 5	69.07 - 69.32	1.0000	1.0000
L29	29	PL 1 x 5	69.07 - 69.32	1.0000	1.0000
L29	31	(Area) CCI-65FP-060100 (H)	69.07 - 69.32	1.0000	1.0000
L29	32	(Area) CCI-65FP-060100 (H)	69.07 - 69.32	1.0000	1.0000
L29	33	(Area) CCI-65FP-060100 (H)	69.07 - 69.32	1.0000	1.0000
L30	2	Safety Line 3/8	68.83 - 69.07	1.0000	1.0000
L30	27	PL 1 x 5	68.83 - 69.07	1.0000	1.0000
L30	28	PL 1 x 5	68.83 - 69.07	1.0000	1.0000
L30	29	PL 1 x 5	68.83 - 69.07	1.0000	1.0000
L30	31	(Area) CCI-65FP-060100 (H)	68.83 - 69.07	1.0000	1.0000
L30	32	(Area) CCI-65FP-060100 (H)	68.83 - 69.07	1.0000	1.0000
L30	33	(Area) CCI-65FP-060100 (H)	68.83 - 69.07	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L31	2	Safety Line 3/8	68.58 - 68.83	1.0000	1.0000
L31	27	PL 1 x 5	68.58 - 68.83	1.0000	1.0000
L31	28	PL 1 x 5	68.58 - 68.83	1.0000	1.0000
L31	29	PL 1 x 5	68.58 - 68.83	1.0000	1.0000
L31	31	(Area) CCI-65FP-060100 (H)	68.58 - 68.83	1.0000	1.0000
L31	32	(Area) CCI-65FP-060100 (H)	68.58 - 68.83	1.0000	1.0000
L31	33	(Area) CCI-65FP-060100 (H)	68.58 - 68.83	1.0000	1.0000
L32	2	Safety Line 3/8	63.58 - 68.58	1.0000	1.0000
L32	27	PL 1 x 5	66.90 - 68.58	1.0000	1.0000
L32	28	PL 1 x 5	66.90 - 68.58	1.0000	1.0000
L32	29	PL 1 x 5	66.90 - 68.58	1.0000	1.0000
L32	31	(Area) CCI-65FP-060100 (H)	63.58 - 68.58	1.0000	1.0000
L32	32	(Area) CCI-65FP-060100 (H)	63.58 - 68.58	1.0000	1.0000
L32	33	(Area) CCI-65FP-060100 (H)	63.58 - 68.58	1.0000	1.0000
L33	2	Safety Line 3/8	58.58 - 63.58	1.0000	1.0000
L33	31	(Area) CCI-65FP-060100 (H)	58.58 - 63.58	1.0000	1.0000
L33	32	(Area) CCI-65FP-060100 (H)	58.58 - 63.58	1.0000	1.0000
L33	33	(Area) CCI-65FP-060100 (H)	58.58 - 63.58	1.0000	1.0000
L34	2	Safety Line 3/8	53.58 - 58.58	1.0000	1.0000
L34	31	(Area) CCI-65FP-060100 (H)	53.58 - 58.58	1.0000	1.0000
L34	32	(Area) CCI-65FP-060100 (H)	53.58 - 58.58	1.0000	1.0000
L34	33	(Area) CCI-65FP-060100 (H)	53.58 - 58.58	1.0000	1.0000
L35	2	Safety Line 3/8	42.88 - 53.58	1.0000	1.0000
L35	31	(Area) CCI-65FP-060100 (H)	42.88 - 53.58	1.0000	1.0000
L35	32	(Area) CCI-65FP-060100 (H)	42.88 - 53.58	1.0000	1.0000
L35	33	(Area) CCI-65FP-060100 (H)	42.88 - 53.58	1.0000	1.0000
L36	2	Safety Line 3/8	41.88 - 42.88	1.0000	1.0000
L36	31	(Area) CCI-65FP-060100 (H)	41.88 - 42.88	1.0000	1.0000
L36	32	(Area) CCI-65FP-060100 (H)	41.88 - 42.88	1.0000	1.0000
L36	33	(Area) CCI-65FP-060100 (H)	41.88 - 42.88	1.0000	1.0000
L37	2	Safety Line 3/8	36.88 - 41.88	1.0000	1.0000
L37	31	(Area) CCI-65FP-060100 (H)	36.88 - 41.88	1.0000	1.0000
L37	32	(Area) CCI-65FP-060100 (H)	36.88 - 41.88	1.0000	1.0000
L37	33	(Area) CCI-65FP-060100 (H)	36.88 - 41.88	1.0000	1.0000
L38	2	Safety Line 3/8	34.92 - 36.88	1.0000	1.0000
L38	23	PL 1 x 5	34.92 - 36.75	1.0000	1.0000
L38	24	PL 1 x 5	34.92 - 36.75	1.0000	1.0000
L38	25	PL 1 x 5	34.92 - 36.75	1.0000	1.0000
L38	31	(Area) CCI-65FP-060100 (H)	34.92 - 36.88	1.0000	1.0000
L38	32	(Area) CCI-65FP-060100 (H)	34.92 - 36.88	1.0000	1.0000
L38	33	(Area) CCI-65FP-060100 (H)	34.92 - 36.88	1.0000	1.0000
L39	2	Safety Line 3/8	34.67 - 34.92	1.0000	1.0000
L39	23	PL 1 x 5	34.67 - 34.92	1.0000	1.0000
L39	24	PL 1 x 5	34.67 - 34.92	1.0000	1.0000
L39	25	PL 1 x 5	34.67 - 34.92	1.0000	1.0000
L39	31	(Area) CCI-65FP-060100 (H)	34.67 - 34.92	1.0000	1.0000
L39	32	(Area) CCI-65FP-060100 (H)	34.67 - 34.92	1.0000	1.0000
L39	33	(Area) CCI-65FP-060100 (H)	34.67 - 34.92	1.0000	1.0000
L40	2	Safety Line 3/8	34.33 - 34.67	1.0000	1.0000
L40	23	PL 1 x 5	34.33 - 34.67	1.0000	1.0000
L40	24	PL 1 x 5	34.33 - 34.67	1.0000	1.0000
L40	25	PL 1 x 5	34.33 - 34.67	1.0000	1.0000
L40	31	(Area) CCI-65FP-060100 (H)	34.33 - 34.67	1.0000	1.0000
L40	32	(Area) CCI-65FP-060100 (H)	34.33 - 34.67	1.0000	1.0000
L40	33	(Area) CCI-65FP-060100 (H)	34.33 - 34.67	1.0000	1.0000
L41	2	Safety Line 3/8	34.08 - 34.33	1.0000	1.0000
L41	23	PL 1 x 5	34.08 - 34.33	1.0000	1.0000
L41	24	PL 1 x 5	34.08 - 34.33	1.0000	1.0000
L41	25	PL 1 x 5	34.08 - 34.33	1.0000	1.0000
L41	31	(Area) CCI-65FP-060100 (H)	34.08 - 34.33	1.0000	1.0000
L41	32	(Area) CCI-65FP-060100 (H)	34.08 - 34.33	1.0000	1.0000
L41	33	(Area) CCI-65FP-060100 (H)	34.08 - 34.33	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L42	2	Safety Line 3/8	29.08 - 34.08	1.0000	1.0000
L42	23	PL 1 x 5	29.08 - 34.08	1.0000	1.0000
L42	24	PL 1 x 5	29.08 - 34.08	1.0000	1.0000
L42	25	PL 1 x 5	29.08 - 34.08	1.0000	1.0000
L42	31	(Area) CCI-65FP-060100 (H)	32.00 - 34.08	1.0000	1.0000
L42	32	(Area) CCI-65FP-060100 (H)	32.00 - 34.08	1.0000	1.0000
L42	33	(Area) CCI-65FP-060100 (H)	32.00 - 34.08	1.0000	1.0000
L43	2	Safety Line 3/8	24.08 - 29.08	1.0000	1.0000
L43	23	PL 1 x 5	24.08 - 29.08	1.0000	1.0000
L43	24	PL 1 x 5	24.08 - 29.08	1.0000	1.0000
L43	25	PL 1 x 5	24.08 - 29.08	1.0000	1.0000
L44	2	Safety Line 3/8	19.08 - 24.08	1.0000	1.0000
L44	23	PL 1 x 5	19.08 - 24.08	1.0000	1.0000
L44	24	PL 1 x 5	19.08 - 24.08	1.0000	1.0000
L44	25	PL 1 x 5	19.08 - 24.08	1.0000	1.0000
L45	2	Safety Line 3/8	14.08 - 19.08	1.0000	1.0000
L45	23	PL 1 x 5	14.08 - 19.08	1.0000	1.0000
L45	24	PL 1 x 5	14.08 - 19.08	1.0000	1.0000
L45	25	PL 1 x 5	14.08 - 19.08	1.0000	1.0000
L46	2	Safety Line 3/8	9.08 - 14.08	1.0000	1.0000
L46	23	PL 1 x 5	9.08 - 14.08	1.0000	1.0000
L46	24	PL 1 x 5	9.08 - 14.08	1.0000	1.0000
L46	25	PL 1 x 5	9.08 - 14.08	1.0000	1.0000
L47	2	Safety Line 3/8	4.08 - 9.08	1.0000	1.0000
L47	23	PL 1 x 5	4.08 - 9.08	1.0000	1.0000
L47	24	PL 1 x 5	4.08 - 9.08	1.0000	1.0000
L47	25	PL 1 x 5	4.08 - 9.08	1.0000	1.0000
L48	2	Safety Line 3/8	0.00 - 4.08	1.0000	1.0000
L48	23	PL 1 x 5	0.00 - 4.08	1.0000	1.0000
L48	24	PL 1 x 5	0.00 - 4.08	1.0000	1.0000
L48	25	PL 1 x 5	0.00 - 4.08	1.0000	1.0000

Effective Width of Flat Linear Attachments / Feed Lines

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L10	35	PL 1x4	132.00 - 132.75	Auto	0.0000
L10	36	PL 1x4	132.00 - 132.75	Auto	0.0000
L10	37	PL 1x4	132.00 - 132.75	Auto	0.0000
L11	35	PL 1x4	131.08 - 132.00	Auto	0.0000
L11	36	PL 1x4	131.08 - 132.00	Auto	0.0000
L11	37	PL 1x4	131.08 - 132.00	Auto	0.0000
L12	35	PL 1x4	130.83 - 131.08	Auto	0.0000
L12	36	PL 1x4	130.83 - 131.08	Auto	0.0000
L12	37	PL 1x4	130.83 -	Auto	0.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
			131.08		
L13	35	PL 1x4	125.83 - 130.83	Auto	0.0000
L13	36	PL 1x4	125.83 - 130.83	Auto	0.0000
L13	37	PL 1x4	125.83 - 130.83	Auto	0.0000
L14	35	PL 1x4	120.83 - 125.83	Auto	0.0000
L14	36	PL 1x4	120.83 - 125.83	Auto	0.0000
L14	37	PL 1x4	120.83 - 125.83	Auto	0.0000
L15	35	PL 1x4	115.83 - 120.83	Auto	0.0000
L15	36	PL 1x4	115.83 - 120.83	Auto	0.0000
L15	37	PL 1x4	115.83 - 120.83	Auto	0.0000
L16	35	PL 1x4	110.83 - 115.83	Auto	0.0000
L16	36	PL 1x4	110.83 - 115.83	Auto	0.0000
L16	37	PL 1x4	110.83 - 115.83	Auto	0.0000
L17	27	PL 1 x 5	105.83 - 106.75	Auto	0.0000
L17	28	PL 1 x 5	105.83 - 106.75	Auto	0.0000
L17	29	PL 1 x 5	105.83 - 106.75	Auto	0.0000
L17	35	PL 1x4	105.83 - 110.83	Auto	0.0000
L17	36	PL 1x4	105.83 - 110.83	Auto	0.0000
L17	37	PL 1x4	105.83 - 110.83	Auto	0.0000
L18	27	PL 1 x 5	104.57 - 105.83	Auto	0.0000
L18	28	PL 1 x 5	104.57 - 105.83	Auto	0.0000
L18	29	PL 1 x 5	104.57 - 105.83	Auto	0.0000
L18	35	PL 1x4	104.57 - 105.83	Auto	0.0000
L18	36	PL 1x4	104.57 - 105.83	Auto	0.0000
L18	37	PL 1x4	104.57 - 105.83	Auto	0.0000
L19	27	PL 1 x 5	104.23 - 104.57	Auto	0.0000
L19	28	PL 1 x 5	104.23 - 104.57	Auto	0.0000
L19	29	PL 1 x 5	104.23 - 104.57	Auto	0.0000
L19	35	PL 1x4	104.23 - 104.57	Auto	0.0000
L19	36	PL 1x4	104.23 - 104.57	Auto	0.0000
L19	37	PL 1x4	104.23 - 104.57	Auto	0.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L20	27	PL 1 x 5	104.08 - 104.23	Auto	0.0000
L20	28	PL 1 x 5	104.08 - 104.23	Auto	0.0000
L20	29	PL 1 x 5	104.08 - 104.23	Auto	0.0000
L20	35	PL 1x4	104.08 - 104.23	Auto	0.0000
L20	36	PL 1x4	104.08 - 104.23	Auto	0.0000
L20	37	PL 1x4	104.08 - 104.23	Auto	0.0000
L21	27	PL 1 x 5	99.08 - 104.08	Auto	0.0000
L21	28	PL 1 x 5	99.08 - 104.08	Auto	0.0000
L21	29	PL 1 x 5	99.08 - 104.08	Auto	0.0000
L21	35	PL 1x4	102.90 - 104.08	Auto	0.0000
L21	36	PL 1x4	102.90 - 104.08	Auto	0.0000
L21	37	PL 1x4	102.90 - 104.08	Auto	0.0000
L22	27	PL 1 x 5	94.08 - 99.08	Auto	0.0000
L22	28	PL 1 x 5	94.08 - 99.08	Auto	0.0000
L22	29	PL 1 x 5	94.08 - 99.08	Auto	0.0000
L23	27	PL 1 x 5	87.42 - 94.08	Auto	0.0000
L23	28	PL 1 x 5	87.42 - 94.08	Auto	0.0000
L23	29	PL 1 x 5	87.42 - 94.08	Auto	0.0000
L24	27	PL 1 x 5	86.42 - 87.42	Auto	0.0000
L24	28	PL 1 x 5	86.42 - 87.42	Auto	0.0000
L24	29	PL 1 x 5	86.42 - 87.42	Auto	0.0000
L25	27	PL 1 x 5	81.42 - 86.42	Auto	0.0000
L25	28	PL 1 x 5	81.42 - 86.42	Auto	0.0000
L25	29	PL 1 x 5	81.42 - 86.42	Auto	0.0000
L26	27	PL 1 x 5	76.42 - 81.42	Auto	0.0000
L26	28	PL 1 x 5	76.42 - 81.42	Auto	0.0000
L26	29	PL 1 x 5	76.42 - 81.42	Auto	0.0000
L27	27	PL 1 x 5	71.42 - 76.42	Auto	0.0000
L27	28	PL 1 x 5	71.42 - 76.42	Auto	0.0000
L27	29	PL 1 x 5	71.42 - 76.42	Auto	0.0000
L27	31	(Area) CCI-65FP-060100 (H)	71.42 - 71.75	Auto	0.0000
L27	32	(Area) CCI-65FP-060100 (H)	71.42 - 71.75	Auto	0.0000
L27	33	(Area) CCI-65FP-060100 (H)	71.42 - 71.75	Auto	0.0000
L28	27	PL 1 x 5	69.32 - 71.42	Auto	0.0000
L28	28	PL 1 x 5	69.32 - 71.42	Auto	0.0000
L28	29	PL 1 x 5	69.32 - 71.42	Auto	0.0000
L28	31	(Area) CCI-65FP-060100 (H)	69.32 - 71.42	Auto	0.0000
L28	32	(Area) CCI-65FP-060100 (H)	69.32 - 71.42	Auto	0.0000
L28	33	(Area) CCI-65FP-060100 (H)	69.32 - 71.42	Auto	0.0000
L29	27	PL 1 x 5	69.07 - 69.32	Auto	0.0000
L29	28	PL 1 x 5	69.07 - 69.32	Auto	0.0000
L29	29	PL 1 x 5	69.07 - 69.32	Auto	0.0000
L29	31	(Area) CCI-65FP-060100 (H)	69.07 - 69.32	Auto	0.0000
L29	32	(Area) CCI-65FP-060100 (H)	69.07 - 69.32	Auto	0.0000
L29	33	(Area) CCI-65FP-060100 (H)	69.07 - 69.32	Auto	0.0000
L30	27	PL 1 x 5	68.83 - 69.07	Auto	0.0000
L30	28	PL 1 x 5	68.83 - 69.07	Auto	0.0000
L30	29	PL 1 x 5	68.83 - 69.07	Auto	0.0000
L30	31	(Area) CCI-65FP-060100 (H)	68.83 - 69.07	Auto	0.0000
L30	32	(Area) CCI-65FP-060100 (H)	68.83 - 69.07	Auto	0.0000
L30	33	(Area) CCI-65FP-060100 (H)	68.83 - 69.07	Auto	0.0000
L31	27	PL 1 x 5	68.58 - 68.83	Auto	0.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L31	28	PL 1 x 5	68.58 - 68.83	Auto	0.0000
L31	29	PL 1 x 5	68.58 - 68.83	Auto	0.0000
L31	31	(Area) CCI-65FP-060100 (H)	68.58 - 68.83	Auto	0.0000
L31	32	(Area) CCI-65FP-060100 (H)	68.58 - 68.83	Auto	0.0000
L31	33	(Area) CCI-65FP-060100 (H)	68.58 - 68.83	Auto	0.0000
L32	27	PL 1 x 5	66.90 - 68.58	Auto	0.0000
L32	28	PL 1 x 5	66.90 - 68.58	Auto	0.0000
L32	29	PL 1 x 5	66.90 - 68.58	Auto	0.0000
L32	31	(Area) CCI-65FP-060100 (H)	63.58 - 68.58	Auto	0.0000
L32	32	(Area) CCI-65FP-060100 (H)	63.58 - 68.58	Auto	0.0000
L32	33	(Area) CCI-65FP-060100 (H)	63.58 - 68.58	Auto	0.0000
L33	31	(Area) CCI-65FP-060100 (H)	58.58 - 63.58	Auto	0.0000
L33	32	(Area) CCI-65FP-060100 (H)	58.58 - 63.58	Auto	0.0000
L33	33	(Area) CCI-65FP-060100 (H)	58.58 - 63.58	Auto	0.0000
L34	31	(Area) CCI-65FP-060100 (H)	53.58 - 58.58	Auto	0.0000
L34	32	(Area) CCI-65FP-060100 (H)	53.58 - 58.58	Auto	0.0000
L34	33	(Area) CCI-65FP-060100 (H)	53.58 - 58.58	Auto	0.0000
L35	31	(Area) CCI-65FP-060100 (H)	42.88 - 53.58	Auto	0.0000
L35	32	(Area) CCI-65FP-060100 (H)	42.88 - 53.58	Auto	0.0000
L35	33	(Area) CCI-65FP-060100 (H)	42.88 - 53.58	Auto	0.0000
L36	31	(Area) CCI-65FP-060100 (H)	41.88 - 42.88	Auto	0.0000
L36	32	(Area) CCI-65FP-060100 (H)	41.88 - 42.88	Auto	0.0000
L36	33	(Area) CCI-65FP-060100 (H)	41.88 - 42.88	Auto	0.0000
L37	31	(Area) CCI-65FP-060100 (H)	36.88 - 41.88	Auto	0.0000
L37	32	(Area) CCI-65FP-060100 (H)	36.88 - 41.88	Auto	0.0000
L37	33	(Area) CCI-65FP-060100 (H)	36.88 - 41.88	Auto	0.0000
L38	23	PL 1 x 5	34.92 - 36.75	Auto	0.0000
L38	24	PL 1 x 5	34.92 - 36.75	Auto	0.0000
L38	25	PL 1 x 5	34.92 - 36.75	Auto	0.0000
L38	31	(Area) CCI-65FP-060100 (H)	34.92 - 36.88	Auto	0.0000
L38	32	(Area) CCI-65FP-060100 (H)	34.92 - 36.88	Auto	0.0000
L38	33	(Area) CCI-65FP-060100 (H)	34.92 - 36.88	Auto	0.0000
L39	23	PL 1 x 5	34.67 - 34.92	Auto	0.0000
L39	24	PL 1 x 5	34.67 - 34.92	Auto	0.0000
L39	25	PL 1 x 5	34.67 - 34.92	Auto	0.0000
L39	31	(Area) CCI-65FP-060100 (H)	34.67 - 34.92	Auto	0.0000
L39	32	(Area) CCI-65FP-060100 (H)	34.67 - 34.92	Auto	0.0000
L39	33	(Area) CCI-65FP-060100 (H)	34.67 - 34.92	Auto	0.0000
L40	23	PL 1 x 5	34.33 - 34.67	Auto	0.0000
L40	24	PL 1 x 5	34.33 - 34.67	Auto	0.0000
L40	25	PL 1 x 5	34.33 - 34.67	Auto	0.0000
L40	31	(Area) CCI-65FP-060100 (H)	34.33 - 34.67	Auto	0.0000
L40	32	(Area) CCI-65FP-060100 (H)	34.33 - 34.67	Auto	0.0000
L40	33	(Area) CCI-65FP-060100 (H)	34.33 - 34.67	Auto	0.0000
L41	23	PL 1 x 5	34.08 - 34.33	Auto	0.0000
L41	24	PL 1 x 5	34.08 - 34.33	Auto	0.0000
L41	25	PL 1 x 5	34.08 - 34.33	Auto	0.0000
L41	31	(Area) CCI-65FP-060100 (H)	34.08 - 34.33	Auto	0.0000
L41	32	(Area) CCI-65FP-060100 (H)	34.08 - 34.33	Auto	0.0000
L41	33	(Area) CCI-65FP-060100 (H)	34.08 - 34.33	Auto	0.0000
L42	23	PL 1 x 5	29.08 - 34.08	Auto	0.0000
L42	24	PL 1 x 5	29.08 - 34.08	Auto	0.0000
L42	25	PL 1 x 5	29.08 - 34.08	Auto	0.0000
L42	31	(Area) CCI-65FP-060100 (H)	32.00 - 34.08	Auto	0.0000
L42	32	(Area) CCI-65FP-060100 (H)	32.00 - 34.08	Auto	0.0000
L42	33	(Area) CCI-65FP-060100 (H)	32.00 - 34.08	Auto	0.0000
L43	23	PL 1 x 5	24.08 - 29.08	Auto	0.0000
L43	24	PL 1 x 5	24.08 - 29.08	Auto	0.0000
L43	25	PL 1 x 5	24.08 - 29.08	Auto	0.0000
L44	23	PL 1 x 5	19.08 - 24.08	Auto	0.0000
L44	24	PL 1 x 5	19.08 - 24.08	Auto	0.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L44	25	PL 1 x 5	19.08 - 24.08	Auto	0.0000
L45	23	PL 1 x 5	14.08 - 19.08	Auto	0.0000
L45	24	PL 1 x 5	14.08 - 19.08	Auto	0.0000
L45	25	PL 1 x 5	14.08 - 19.08	Auto	0.0000
L46	23	PL 1 x 5	9.08 - 14.08	Auto	0.0000
L46	24	PL 1 x 5	9.08 - 14.08	Auto	0.0000
L46	25	PL 1 x 5	9.08 - 14.08	Auto	0.0000
L47	23	PL 1 x 5	4.08 - 9.08	Auto	0.0000
L47	24	PL 1 x 5	4.08 - 9.08	Auto	0.0000
L47	25	PL 1 x 5	4.08 - 9.08	Auto	0.0000
L48	23	PL 1 x 5	0.00 - 4.08	Auto	0.0000
L48	24	PL 1 x 5	0.00 - 4.08	Auto	0.0000
L48	25	PL 1 x 5	0.00 - 4.08	Auto	0.0000

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
*** 180 ***									
AIR6449 B41_T-MOBILE w/ Mount Pipe	A	From Centroid-Leg	4.00 -5.00 0.00	-30.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.87 6.23 6.61 7.38	3.27 3.73 4.20 5.20	0.13 0.18 0.23 0.36
AIR6449 B41_T-MOBILE w/ Mount Pipe	B	From Centroid-Leg	4.00 -5.00 0.00	-20.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.87 6.23 6.61 7.38	3.27 3.73 4.20 5.20	0.13 0.18 0.23 0.36
AIR6449 B41_T-MOBILE w/ Mount Pipe	C	From Centroid-Leg	4.00 -5.00 0.00	-10.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.87 6.23 6.61 7.38	3.27 3.73 4.20 5.20	0.13 0.18 0.23 0.36
APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 0.00	-30.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.29 6.86 7.45 8.68	2.76 3.27 3.79 4.90	0.06 0.11 0.16 0.29
APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 0.00	-20.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.29 6.86 7.45 8.68	2.76 3.27 3.79 4.90	0.06 0.11 0.16 0.29
APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 0.00	-10.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.29 6.86 7.45 8.68	2.76 3.27 3.79 4.90	0.06 0.11 0.16 0.29
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	A	From Centroid-Leg	4.00 5.00 0.00	-30.0000	180.00	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	0.18 0.31 0.45 0.78
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	B	From Centroid-Leg	4.00 5.00	-20.0000	180.00	No Ice 1/2" Ice	14.69 15.46	6.87 7.55	0.18 0.31

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
		g	0.00			1" Ice	16.23	8.25	0.45
						2" Ice	17.82	9.67	0.78
APXVAALL24_43-U-NA20 _TMO w/ Mount Pipe	C	From Centroid-Le g	4.00 5.00 0.00	-10.0000	180.00	No Ice 1/2" Ice 1" Ice	14.69 15.46 16.23	6.87 7.55 8.25	0.18 0.31 0.45
						2" Ice	17.82	9.67	0.78
RADIO 4415 B66A	A	From Centroid-Le g	4.00 -5.00 0.00	-30.0000	180.00	No Ice 1/2" Ice 1" Ice	1.86 2.03 2.20	0.87 1.00 1.13	0.05 0.06 0.08
						2" Ice	2.58	1.43	0.12
RADIO 4415 B66A	B	From Centroid-Le g	4.00 -5.00 0.00	-20.0000	180.00	No Ice 1/2" Ice 1" Ice	1.86 2.03 2.20	0.87 1.00 1.13	0.05 0.06 0.08
						2" Ice	2.58	1.43	0.12
RADIO 4415 B66A	C	From Centroid-Le g	4.00 -5.00 0.00	-10.0000	180.00	No Ice 1/2" Ice 1" Ice	1.86 2.03 2.20	0.87 1.00 1.13	0.05 0.06 0.08
						2" Ice	2.58	1.43	0.12
RADIO 4424 B25_TMO	A	From Centroid-Le g	4.00 0.00 0.00	-30.0000	180.00	No Ice 1/2" Ice 1" Ice	2.05 2.23 2.42	1.61 1.77 1.94	0.09 0.11 0.13
						2" Ice	2.81	2.30	0.19
RADIO 4424 B25_TMO	B	From Centroid-Le g	4.00 0.00 0.00	-20.0000	180.00	No Ice 1/2" Ice 1" Ice	2.05 2.23 2.42	1.61 1.77 1.94	0.09 0.11 0.13
						2" Ice	2.81	2.30	0.19
RADIO 4424 B25_TMO	C	From Centroid-Le g	4.00 0.00 0.00	-10.0000	180.00	No Ice 1/2" Ice 1" Ice	2.05 2.23 2.42	1.61 1.77 1.94	0.09 0.11 0.13
						2" Ice	2.81	2.30	0.19
RADIO 4449 B71 B85A_T-MOBILE	A	From Centroid-Le g	4.00 5.00 0.00	-30.0000	180.00	No Ice 1/2" Ice 1" Ice	1.97 2.15 2.33	1.59 1.75 1.92	0.07 0.09 0.12
						2" Ice	2.72	2.28	0.17
RADIO 4449 B71 B85A_T-MOBILE	B	From Centroid-Le g	4.00 5.00 0.00	-20.0000	180.00	No Ice 1/2" Ice 1" Ice	1.97 2.15 2.33	1.59 1.75 1.92	0.07 0.09 0.12
						2" Ice	2.72	2.28	0.17
RADIO 4449 B71 B85A_T-MOBILE	C	From Centroid-Le g	4.00 5.00 0.00	-10.0000	180.00	No Ice 1/2" Ice 1" Ice	1.97 2.15 2.33	1.59 1.75 1.92	0.07 0.09 0.12
						2" Ice	2.72	2.28	0.17
Platform Mount [LP 712-1_KCKR]	C	None		0.0000	180.00	No Ice 1/2" Ice 1" Ice	35.78 42.14 48.66	35.78 42.14 48.66	1.61 2.33 3.15
						2" Ice	62.23	62.23	5.06
(2) Miscellaneous [NA 507-1]	C	None		0.0000	180.00	No Ice 1/2" Ice 1" Ice	4.56 6.39 8.18	4.56 6.39 8.18	0.25 0.31 0.40
						2" Ice	11.66	11.66	0.66
8' Ladder	A	From Leg	2.00 0.00 -4.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice	1.53 4.36 7.19	5.33 8.08 10.83	0.10 0.11 0.13
						2" Ice	12.86	16.33	0.16
165 GPS_A	A	From Centroid-Le	4.00 -6.00	0.0000	165.00	No Ice 1/2" Ice	0.11 0.21	0.11 0.21	0.00 0.00

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
		g	2.00			1" Ice	0.28	0.28	0.01
						2" Ice	0.44	0.44	0.02
(2) LPA-80080-6CF-EDIN w/ Mount Pipe	A	From Centroid-Le g	4.00 -1.50 4.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.56 5.10 5.61 6.65	10.27 11.44 12.32 14.14	0.05 0.11 0.19 0.36
(2) LPA-80063/6CF w/ Mount Pipe	B	From Centroid-Le g	4.00 -1.50 4.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice 2" Ice	10.06 10.75 11.40 12.62	10.45 11.74 12.87 14.82	0.06 0.15 0.25 0.49
(2) LPA-80063/6CF w/ Mount Pipe	C	From Centroid-Le g	4.00 -1.50 4.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice 2" Ice	10.06 10.75 11.40 12.62	10.45 11.74 12.87 14.82	0.06 0.15 0.25 0.49
QUAD656C0000X w/ Mount Pipe	A	From Centroid-Le g	4.00 -3.00 4.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice 2" Ice	13.67 14.37 15.04 16.32	7.52 8.82 9.96 11.93	0.08 0.18 0.28 0.52
QUAD656C0000X w/ Mount Pipe	B	From Centroid-Le g	4.00 0.00 4.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice 2" Ice	13.67 14.37 15.04 16.32	7.52 8.82 9.96 11.93	0.08 0.18 0.28 0.52
QUAD656C0000X w/ Mount Pipe	C	From Centroid-Le g	4.00 0.00 4.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice 2" Ice	13.67 14.37 15.04 16.32	7.52 8.82 9.96 11.93	0.08 0.18 0.28 0.52
(2) HBXX-6516DS-A2M w/ Mount Pipe	A	From Centroid-Le g	4.00 3.00 4.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.18 5.70 6.24 7.36	3.97 4.47 4.98 6.06	0.05 0.09 0.15 0.28
(2) HBXX-6516DS-A2M w/ Mount Pipe	B	From Centroid-Le g	4.00 1.50 4.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.18 5.70 6.24 7.36	3.97 4.47 4.98 6.06	0.05 0.09 0.15 0.28
(2) HBXX-6516DS-A2M w/ Mount Pipe	C	From Centroid-Le g	4.00 1.50 4.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.18 5.70 6.24 7.36	3.97 4.47 4.98 6.06	0.05 0.09 0.15 0.28
(2) FD9R6004/2C-3L	A	From Centroid-Le g	4.00 -1.50 4.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.31 0.39 0.47 0.65	0.08 0.12 0.17 0.29	0.00 0.01 0.01 0.02
(2) FD9R6004/2C-3L	B	From Centroid-Le g	4.00 -1.50 4.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.31 0.39 0.47 0.65	0.08 0.12 0.17 0.29	0.00 0.01 0.01 0.02
(2) FD9R6004/2C-3L	C	From Centroid-Le g	4.00 -1.50 4.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.31 0.39 0.47 0.65	0.08 0.12 0.17 0.29	0.00 0.01 0.01 0.02
RRH2X60-700	A	From Centroid-Le g	4.00 -3.00 4.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.50 3.76 4.03 4.58	1.82 2.05 2.29 2.79	0.06 0.08 0.11 0.17
RRH2X60-700	B	From Centroid-Le g	4.00 0.00 4.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice	3.50 3.76 4.03	1.82 2.05 2.29	0.06 0.08 0.11

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	4.58	2.79	0.17
RRH2X60-700	C	From Centroid-Leg	4.00 0.00 4.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.50 3.76 4.03 4.58	1.82 2.05 2.29 2.79	0.06 0.08 0.11 0.17
DB-T1-6Z-8AB-0Z	A	From Centroid-Leg	4.00 -3.00 4.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.80 5.07 5.35 5.93	2.00 2.19 2.39 2.81	0.04 0.08 0.12 0.21
DB-T1-6Z-8AB-0Z	C	From Centroid-Leg	4.00 6.00 4.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.80 5.07 5.35 5.93	2.00 2.19 2.39 2.81	0.04 0.08 0.12 0.21
RRH2X60-PCS	A	From Centroid-Leg	4.00 0.00 4.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.20 2.39 2.59 3.01	1.72 1.90 2.09 2.48	0.06 0.08 0.10 0.16
RRH2X60-PCS	B	From Centroid-Leg	4.00 -3.00 4.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.20 2.39 2.59 3.01	1.72 1.90 2.09 2.48	0.06 0.08 0.10 0.16
RRH2X60-PCS	C	From Centroid-Leg	4.00 -3.00 4.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.20 2.39 2.59 3.01	1.72 1.90 2.09 2.48	0.06 0.08 0.10 0.16
B66A RRH4X45	A	From Centroid-Leg	4.00 6.00 4.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.54 2.75 2.97 3.43	1.61 1.79 1.98 2.37	0.06 0.08 0.10 0.16
B66A RRH4X45	B	From Centroid-Leg	4.00 6.00 4.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.54 2.75 2.97 3.43	1.61 1.79 1.98 2.37	0.06 0.08 0.10 0.16
B66A RRH4X45	C	From Centroid-Leg	4.00 6.00 4.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.54 2.75 2.97 3.43	1.61 1.79 1.98 2.37	0.06 0.08 0.10 0.16
Platform Mount [LP 712-1]	C	None		0.0000	165.00	No Ice 1/2" Ice 1" Ice 2" Ice	24.56 27.92 31.27 37.98	24.56 27.92 31.27 37.98	1.34 1.91 2.55 3.97
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RRUS 12 B2/RRUS A2	A	From Leg	0.50 0.00 0.00	10.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.15 3.36 3.59 4.07	1.84 2.01 2.20 2.59	0.07 0.10 0.13 0.20
RRUS 12 B2/RRUS A2	B	From Leg	0.50 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.15 3.36 3.59 4.07	1.84 2.01 2.20 2.59	0.07 0.10 0.13 0.20
RRUS 12 B2/RRUS A2	C	From Leg	0.50 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.15 3.36 3.59 4.07	1.84 2.01 2.20 2.59	0.07 0.10 0.13 0.20
Pipe Mount [PM 601-3]	C	None		0.0000	148.00	No Ice 1/2" Ice	3.17 3.79	3.17 3.79	0.20 0.23

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice	4.42	4.42	0.28
						2" Ice	5.76	5.76	0.40
**									
*** 147P ***									
7770.00 w/ Mount Pipe	A	From Centroid-Leg	4.00 6.00 0.00	23.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.75 6.18 6.61 7.49	4.25 5.01 5.71 7.16	0.06 0.10 0.16 0.29
7770.00 w/ Mount Pipe	B	From Centroid-Leg	4.00 6.00 0.00	23.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.75 6.18 6.61 7.49	4.25 5.01 5.71 7.16	0.06 0.10 0.16 0.29
7770.00 w/ Mount Pipe	C	From Centroid-Leg	4.00 6.00 0.00	23.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.75 6.18 6.61 7.49	4.25 5.01 5.71 7.16	0.06 0.10 0.16 0.29
HPA-65R-BUU-H8 w/ Mount Pipe	A	From Centroid-Leg	4.00 -2.00 0.00	10.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice	12.25 13.19 14.16 16.14	8.33 9.23 10.15 12.05	0.10 0.19 0.30 0.54
HPA-65R-BUU-H8 w/ Mount Pipe	B	From Centroid-Leg	4.00 -2.00 0.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice	12.25 13.19 14.16 16.14	8.33 9.23 10.15 12.05	0.10 0.19 0.30 0.54
HPA-65R-BUU-H8 w/ Mount Pipe	C	From Centroid-Leg	4.00 -2.00 0.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice	12.25 13.19 14.16 16.14	8.33 9.23 10.15 12.05	0.10 0.19 0.30 0.54
DMP65R-BU8D w/ Mount Pipe	A	From Centroid-Leg	4.00 -6.00 0.00	10.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice	15.89 16.81 17.76 19.70	7.89 8.74 9.60 11.37	0.14 0.25 0.38 0.68
DMP65R-BU8D w/ Mount Pipe	B	From Centroid-Leg	4.00 -6.00 0.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice	15.89 16.81 17.76 19.70	7.89 8.74 9.60 11.37	0.14 0.25 0.38 0.68
DMP65R-BU8D w/ Mount Pipe	C	From Centroid-Leg	4.00 -6.00 0.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice	15.89 16.81 17.76 19.70	7.89 8.74 9.60 11.37	0.14 0.25 0.38 0.68
DC6-48-60-18-8C-EV	B	From Centroid-Leg	4.00 -6.00 0.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.14 1.79 2.00 2.45	1.14 1.79 2.00 2.45	0.03 0.05 0.07 0.13
RRUS 4449 B5/B12	A	From Centroid-Leg	4.00 -6.00 0.00	10.0000	147.00	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 Centroid-Leg	4.00 -6.00 0.00	0.0000	147.00	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 Centroid-Leg	4.00 -6.00 0.00	0.0000	147.00	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
DC6-48-60-18-8F	B	From	4.00	0.0000	147.00	No Ice	1.21	1.21	0.03

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
		Centroid-Leg	-2.00 0.00			1/2" Ice 1" Ice 2" Ice	1.89 2.11 2.57	1.89 2.11 2.57	0.05 0.08 0.14
LGP21401	A	From Centroid-Leg	4.00 6.00 0.00	23.0000	147.00	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
LGP21401	B	From Centroid-Leg	4.00 6.00 0.00	23.0000	147.00	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
LGP21401	C	From Centroid-Leg	4.00 6.00 0.00	23.0000	147.00	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
2.4" Dia x 6-ft Pipe	A	From Centroid-Leg	4.00 2.00 0.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.93 2.30 3.06	1.43 1.93 2.30 3.06	0.02 0.03 0.05 0.09
2.4" Dia x 6-ft Pipe	B	From Centroid-Leg	4.00 2.00 0.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.93 2.30 3.06	1.43 1.93 2.30 3.06	0.02 0.03 0.05 0.09
2.4" Dia x 6-ft Pipe	C	From Centroid-Leg	4.00 2.00 0.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.93 2.30 3.06	1.43 1.93 2.30 3.06	0.02 0.03 0.05 0.09
Platform Mount [LP 1201-1_KCKR-HR-1]	C	None		0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice	37.61 45.62 53.59 69.65	37.61 45.62 53.59 69.65	2.63 3.48 4.46 6.85
*** 75 ***									
GPS_A	C	From Leg	3.00 0.00 1.00	0.0000	75.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.12 0.21 0.28 0.44	0.12 0.21 0.28 0.44	0.00 0.00 0.01 0.02
1.9" x 12" Pipe	C	From Leg	3.00 0.00 0.50	0.0000	75.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.12 0.19 0.27 0.46	0.12 0.19 0.27 0.46	0.00 0.00 0.01 0.02
Side Arm Mount [SO 701-1]	C	From Leg	1.50 0.00 0.00	30.0000	75.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.85 1.14 1.43 2.01	1.67 2.34 3.01 4.35	0.07 0.08 0.09 0.12
****									

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

Comb. No.	Description
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 Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	180 - 175	33.119	42	1.8242	0.0088
L2	175 - 170	31.212	42	1.8170	0.0083
L3	170 - 165	29.319	42	1.7973	0.0078
L4	165 - 160	27.452	42	1.7684	0.0074
L5	160 - 155	25.624	42	1.7214	0.0066
L6	155 - 150	23.852	42	1.6618	0.0059
L7	150 - 145	22.147	42	1.5930	0.0053
L8	145 - 140	20.518	42	1.5167	0.0047
L9	140 - 133	18.974	42	1.4311	0.0039

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L10	137 - 132	18.092	42	1.3761	0.0035
L11	132 - 131.083	16.675	42	1.3241	0.0032
L12	131.083 - 130.833	16.422	42	1.3089	0.0031
L13	130.833 - 125.833	16.354	42	1.3060	0.0031
L14	125.833 - 120.833	15.017	42	1.2469	0.0028
L15	120.833 - 115.833	13.743	42	1.1857	0.0025
L16	115.833 - 110.833	12.535	42	1.1227	0.0022
L17	110.833 - 105.833	11.392	42	1.0595	0.0020
L18	105.833 - 104.567	10.317	42	0.9944	0.0018
L19	104.567 - 104.233	10.055	42	0.9782	0.0017
L20	104.233 - 104.083	9.987	42	0.9742	0.0017
L21	104.083 - 99.083	9.956	42	0.9724	0.0017
L22	99.083 - 94.083	8.970	42	0.9112	0.0015
L23	94.083 - 87.42	8.048	42	0.8505	0.0014
L24	92.5867 - 86.42	7.784	42	0.8325	0.0013
L25	86.42 - 81.42	6.732	42	0.7916	0.0012
L26	81.42 - 76.42	5.933	42	0.7356	0.0011
L27	76.42 - 71.42	5.191	42	0.6805	0.0010
L28	71.42 - 69.3167	4.507	42	0.6264	0.0009
L29	69.3167 - 69.0667	4.236	42	0.6037	0.0008
L30	69.0667 - 68.8333	4.205	42	0.6001	0.0008
L31	68.8333 - 68.5833	4.176	42	0.5967	0.0008
L32	68.5833 - 63.5833	4.144	42	0.5942	0.0008
L33	63.5833 - 58.5833	3.549	42	0.5429	0.0007
L34	58.5833 - 53.5833	3.007	42	0.4926	0.0006
L35	53.5833 - 42.8767	2.517	42	0.4427	0.0005
L36	49.1267 - 41.8767	2.125	42	0.3986	0.0005
L37	41.8767 - 36.8767	1.546	42	0.3603	0.0004
L38	36.8767 - 34.9167	1.192	42	0.3160	0.0004
L39	34.9167 - 34.6667	1.065	42	0.2992	0.0003
L40	34.6667 - 34.33	1.050	42	0.2963	0.0003
L41	34.33 - 34.08	1.029	42	0.2925	0.0003
L42	34.08 - 29.08	1.014	42	0.2903	0.0003
L43	29.08 - 24.08	0.733	42	0.2457	0.0003
L44	24.08 - 19.08	0.499	42	0.2015	0.0002
L45	19.08 - 14.08	0.311	42	0.1579	0.0002
L46	14.08 - 9.08	0.168	42	0.1152	0.0001
L47	9.08 - 4.08	0.069	42	0.0735	0.0001
L48	4.08 - 0	0.014	42	0.0326	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.00	AIR6449 B41_T-MOBILE w/ Mount Pipe	42	33.119	1.8242	0.0090	20659
165.00	GPS_A	42	27.452	1.7684	0.0078	7565
148.00	RRUS 12 B2/RRUS A2	42	21.486	1.5632	0.0052	3793
147.00	7770.00 w/ Mount Pipe	42	21.160	1.5479	0.0050	3727
75.00	GPS_A	42	4.991	0.6647	0.0009	5291

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	180 - 175	178.937	8	9.8784	0.0448
L2	175 - 170	168.657	8	9.8395	0.0417
L3	170 - 165	158.454	8	9.7332	0.0392
L4	165 - 160	148.387	8	9.5769	0.0372
L5	160 - 155	138.531	8	9.3208	0.0334
L6	155 - 150	128.976	8	8.9967	0.0301
L7	150 - 145	119.783	8	8.6229	0.0273
L8	145 - 140	110.997	8	8.2101	0.0241
L9	140 - 133	102.664	8	7.7484	0.0203
L10	137 - 132	97.902	8	7.4516	0.0183
L11	132 - 131.083	90.247	8	7.1712	0.0166
L12	131.083 - 130.833	88.882	8	7.0886	0.0161
L13	130.833 - 125.833	88.512	8	7.0734	0.0161
L14	125.833 - 120.833	81.288	8	6.7541	0.0144
L15	120.833 - 115.833	74.404	8	6.4229	0.0130
L16	115.833 - 110.833	67.868	8	6.0827	0.0116
L17	110.833 - 105.833	61.689	8	5.7403	0.0104
L18	105.833 - 104.567	55.871	8	5.3885	0.0093
L19	104.567 - 104.233	54.455	8	5.3006	0.0090
L20	104.233 - 104.083	54.086	8	5.2790	0.0090
L21	104.083 - 99.083	53.920	8	5.2693	0.0089
L22	99.083 - 94.083	48.583	8	4.9378	0.0080
L23	94.083 - 87.42	43.590	8	4.6092	0.0071
L24	92.5867 - 86.42	42.163	8	4.5116	0.0069
L25	86.42 - 81.42	36.468	8	4.2903	0.0063
L26	81.42 - 76.42	32.138	8	3.9868	0.0057
L27	76.42 - 71.42	28.123	8	3.6883	0.0051
L28	71.42 - 69.3167	24.417	8	3.3950	0.0045
L29	69.3167 - 69.0667	22.949	8	3.2718	0.0043
L30	69.0667 - 68.8333	22.779	8	3.2524	0.0043
L31	68.8333 - 68.5833	22.620	8	3.2342	0.0042
L32	68.5833 - 63.5833	22.451	8	3.2205	0.0042
L33	63.5833 - 58.5833	19.226	8	2.9423	0.0037
L34	58.5833 - 53.5833	16.290	8	2.6695	0.0033
L35	53.5833 - 42.8767	13.637	8	2.3991	0.0028
L36	49.1267 - 41.8767	11.510	8	2.1599	0.0025
L37	41.8767 - 36.8767	8.373	8	1.9523	0.0022
L38	36.8767 - 34.9167	6.455	8	1.7123	0.0019
L39	34.9167 - 34.6667	5.771	8	1.6209	0.0018
L40	34.6667 - 34.33	5.686	8	1.6056	0.0018
L41	34.33 - 34.08	5.574	8	1.5850	0.0017
L42	34.08 - 29.08	5.491	8	1.5728	0.0017
L43	29.08 - 24.08	3.971	8	1.3309	0.0014
L44	24.08 - 19.08	2.703	8	1.0917	0.0011
L45	19.08 - 14.08	1.684	8	0.8552	0.0009
L46	14.08 - 9.08	0.910	8	0.6240	0.0006
L47	9.08 - 4.08	0.376	8	0.3979	0.0004
L48	4.08 - 0	0.075	8	0.1768	0.0002

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.00	AIR6449 B41_T-MOBILE w/ Mount Pipe	8	178.937	9.8784	0.0508	4086
165.00	GPS_A	8	148.387	9.5769	0.0454	1485
148.00	RRUS 12 B2/RRUS A2	8	116.217	8.4613	0.0291	733
147.00	7770.00 w/ Mount Pipe	8	114.460	8.3785	0.0282	719

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
75.00	GPS_A	8	27.039	3.6028	0.0050	984

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	180 - 175 (1)	TP19.0628x18x0.25	5.00	0.00	0.0	14.9279	-3.87	873.28	0.004
L2	175 - 170 (2)	TP20.1255x19.0628x0.25	5.00	0.00	0.0	15.7712	-4.20	922.62	0.005
L3	170 - 165 (3)	TP21.1883x20.1255x0.25	5.00	0.00	0.0	16.6145	-4.55	971.95	0.005
L4	165 - 160 (4)	TP22.2511x21.1883x0.25	5.00	0.00	0.0	17.4578	-7.18	1021.28	0.007
L5	160 - 155 (5)	TP23.3138x22.2511x0.25	5.00	0.00	0.0	18.3011	-7.71	1070.62	0.007
L6	155 - 150 (6)	TP24.3766x23.3138x0.25	5.00	0.00	0.0	19.1445	-8.28	1119.95	0.007
L7	150 - 145 (7)	TP25.4394x24.3766x0.25	5.00	0.00	0.0	19.9878	-13.13	1169.28	0.011
L8	145 - 140 (8)	TP26.5021x25.4394x0.25	5.00	0.00	0.0	20.8311	-13.89	1218.62	0.011
L9	140 - 133 (9)	TP27.99x26.5021x0.25	7.00	0.00	0.0	21.3370	-14.37	1248.22	0.012
L10	133 - 132 (10)	TP27.6896x26.6398x0.3125	5.00	0.00	0.0	27.1547	-15.54	1588.55	0.010
L11	132 - 131.083 (11)	TP27.8821x27.6896x0.3125	0.92	0.00	0.0	27.3456	-15.71	1599.72	0.010
L12	131.083 - 130.833 (12)	TP27.9346x27.8821x0.475	0.25	0.00	0.0	41.3995	-15.78	2421.87	0.007
L13	130.833 - 125.833 (13)	TP28.9844x27.9346x0.4625	5.00	0.00	0.0	41.8695	-16.87	2449.37	0.007
L14	125.833 - 120.833 (14)	TP30.0343x28.9844x0.4563	5.00	0.00	0.0	42.8330	-18.01	2505.73	0.007
L15	120.833 - 115.833 (15)	TP31.0841x30.0343x0.45	5.00	0.00	0.0	43.7547	-19.18	2559.65	0.007
L16	115.833 - 110.833 (16)	TP32.134x31.0841x0.45	5.00	0.00	0.0	45.2542	-20.37	2647.37	0.008
L17	110.833 - 105.833 (17)	TP33.1838x32.134x0.4375	5.00	0.00	0.0	45.4723	-21.60	2660.13	0.008
L18	105.833 - 104.567 (18)	TP33.4497x33.1838x0.4375	1.27	0.00	0.0	45.8416	-21.91	2681.74	0.008
L19	104.567 - 104.233 (19)	TP33.5198x33.4497x0.475	0.33	0.00	0.0	49.8200	-22.01	2914.47	0.008
L20	104.233 - 104.083 (20)	TP33.5513x33.5198x0.475	0.15	0.00	0.0	49.8675	-22.05	2917.25	0.008
L21	104.083 - 99.083 (21)	TP34.6011x33.5513x0.4625	5.00	0.00	0.0	50.1147	-23.35	2931.71	0.008
L22	99.083 - 94.083 (22)	TP35.651x34.6011x0.4625	5.00	0.00	0.0	51.6558	-24.69	3021.87	0.008
L23	94.083 - 87.42 (23)	TP37.05x35.651x0.4625	6.66	0.00	0.0	52.1170	-25.09	3048.85	0.008
L24	87.42 - 86.42 (24)	TP36.6328x35.3402x0.525	6.17	0.00	0.0	60.1682	-27.93	3519.84	0.008
L25	86.42 - 81.42 (25)	TP37.6808x36.6328x0.5125	5.00	0.00	0.0	60.4608	-29.46	3536.96	0.008
L26	81.42 - 76.42 (26)	TP38.7289x37.6808x0.5125	5.00	0.00	0.0	62.1657	-31.01	3636.69	0.009
L27	76.42 - 71.42 (27)	TP39.777x38.7289x0.5125	5.00	0.00	0.0	63.8705	-32.67	3736.43	0.009
L28	71.42 - 69.3167 (28)	TP40.2178x39.777x0.5063	2.10	0.00	0.0	63.8101	-33.35	3732.89	0.009
L29	69.3167 - 69.0667 (29)	TP40.2702x40.2178x0.375	0.25	0.00	0.0	47.4853	-33.43	2777.89	0.012
L30	69.0667 - 68.8333 (30)	TP40.3192x40.2702x0.375	0.23	0.00	0.0	47.5435	-33.49	2781.30	0.012
L31	68.8333 - 68.5833 (31)	TP40.3716x40.3192x0.5375	0.25	0.00	0.0	67.9579	-33.58	3975.54	0.008
L32	68.5833 - 63.5833 (32)	TP41.4196x40.3716x0.525	5.00	0.00	0.0	68.1448	-35.25	3986.47	0.009
L33	63.5833 - 58.5833 (33)	TP42.4677x41.4196x0.525	5.00	0.00	0.0	69.8912	-36.96	4088.64	0.009
L34	58.5833 - 53.5833 (34)	TP43.5158x42.4677x0.5188	5.00	0.00	0.0	70.7951	-38.70	4141.51	0.009
L35	53.5833 - 42.8767 (35)	TP45.76x43.5158x0.5125	10.71	0.00	0.0	71.4719	-40.27	4181.11	0.010
L36	42.8767 - 41.8767 (36)	TP45.22x43.6999x0.575	7.25	0.00	0.0	81.4793	-44.83	4766.54	0.009
L37	41.8767 - 36.8767 (37)	TP46.2683x45.22x0.575	5.00	0.00	0.0	83.3926	-46.81	4878.46	0.010
L38	36.8767 - 34.9167 (38)	TP46.6792x46.2683x0.575	1.96	0.00	0.0	84.1425	-47.59	4922.34	0.010
L39	34.9167 - 34.6667 (39)	TP46.7317x46.6792x0.4375	0.25	0.00	0.0	64.2852	-47.69	3760.69	0.013
L40	34.6667 - 34.33 (40)	TP46.8023x46.7317x0.4375	0.34	0.00	0.0	64.3832	-47.81	3766.42	0.013
L41	34.33 - 34.08 (41)	TP46.8547x46.8023x0.55	0.25	0.00	0.0	80.8341	-47.91	4728.79	0.010
L42	34.08 - 29.08 (42)	TP47.903x46.8547x0.55	5.00	0.00	0.0	81.5661	-48.71	4771.62	0.010
L43	29.08 - 24.08 (43)	TP48.9513x47.903x0.5438	5.00	0.00	0.0	81.7355	-49.90	4781.53	0.010
L44	24.08 - 19.08 (44)	TP49.9996x48.9513x0.5375	5.00	0.00	0.0	82.5952	-51.91	4831.82	0.011
L45	19.08 - 14.08 (45)	TP51.0479x49.9996x0.5375	5.00	0.00	0.0	84.3836	-53.95	4936.44	0.011
L46	14.08 - 9.08 (46)	TP52.0963x51.0479x0.5375	5.00	0.00	0.0	87.9605	-58.09	5145.69	0.011
L47	9.08 - 4.08 (47)	TP53.1446x52.0963x0.5375	5.00	0.00	0.0	89.7490	-60.22	5250.32	0.011
L48	4.08 - 0 (48)	TP54x53.1446x0.5375	4.08	0.00	0.0	91.2084	-61.98	5335.69	0.012

Pole Bending Design Data

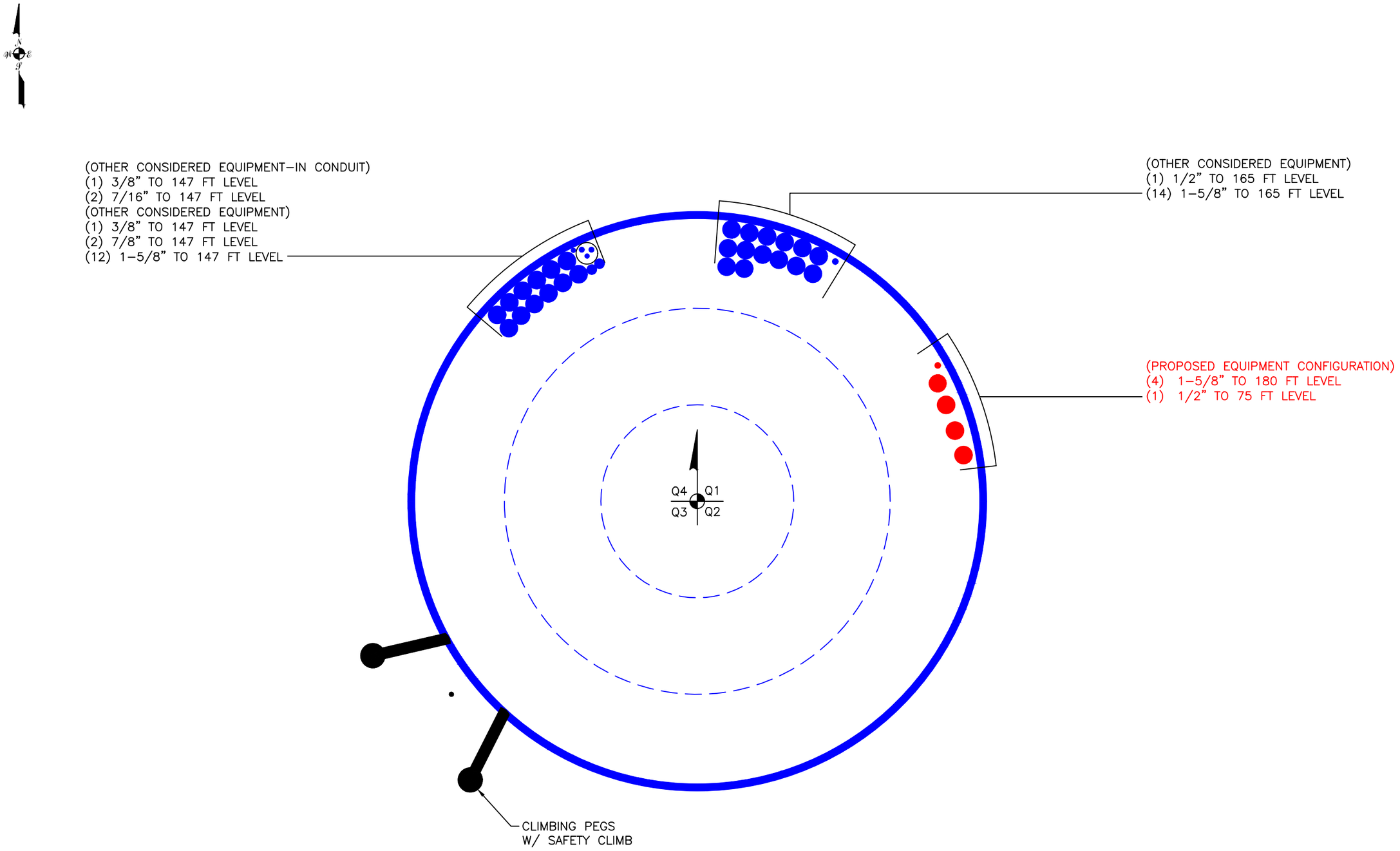
Section No.	Elevation	Size	M_{ux}	ϕM_{nx}	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy}	ϕM_{ny}	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	ft		kip-ft	kip-ft		kip-ft	kip-ft	
L1	180 - 175 (1)	TP19.0628x18x0.25	35.66	426.75	0.084	0.00	426.75	0.000
L2	175 - 170 (2)	TP20.1255x19.0628x0.25	74.03	476.66	0.155	0.00	476.66	0.000
L3	170 - 165 (3)	TP21.1883x20.1255x0.25	114.28	529.33	0.216	0.00	529.33	0.000
L4	165 - 160 (4)	TP22.2511x21.1883x0.25	221.32	584.76	0.378	0.00	584.76	0.000
L5	160 - 155 (5)	TP23.3138x22.2511x0.25	305.07	642.95	0.474	0.00	642.95	0.000
L6	155 - 150 (6)	TP24.3766x23.3138x0.25	390.79	701.36	0.557	0.00	701.36	0.000
L7	150 - 145 (7)	TP25.4394x24.3766x0.25	492.67	756.65	0.651	0.00	756.65	0.000
L8	145 - 140 (8)	TP26.5021x25.4394x0.25	616.65	813.28	0.758	0.00	813.28	0.000
L9	140 - 133 (9)	TP27.99x26.5021x0.25	691.93	847.87	0.816	0.00	847.87	0.000
L10	133 - 132 (10)	TP27.6896x26.6398x0.3125	819.19	1131.77	0.724	0.00	1131.77	0.000
L11	132 - 131.083 (11)	TP27.8821x27.6896x0.3125	842.77	1147.83	0.734	0.00	1147.83	0.000
L12	131.083 - 130.833 (12)	TP27.9346x27.8821x0.475	849.21	1720.65	0.494	0.00	1720.65	0.000
L13	130.833 - 125.833 (13)	TP28.9844x27.9346x0.4625	979.23	1809.43	0.541	0.00	1809.43	0.000
L14	125.833 - 120.833 (14)	TP30.0343x28.9844x0.4563	1111.49	1921.11	0.579	0.00	1921.11	0.000
L15	120.833 - 115.833 (15)	TP31.0841x30.0343x0.45	1246.01	2033.99	0.613	0.00	2033.99	0.000
L16	115.833 - 110.833 (16)	TP32.134x31.0841x0.45	1382.75	2176.83	0.635	0.00	2176.83	0.000
L17	110.833 - 105.833 (17)	TP33.1838x32.134x0.4375	1521.70	2262.55	0.673	0.00	2262.55	0.000
L18	105.833 - 104.567 (18)	TP33.4497x33.1838x0.4375	1557.25	2299.69	0.677	0.00	2299.69	0.000
L19	104.567 - 104.233 (19)	TP33.5198x33.4497x0.475	1566.64	2498.97	0.627	0.00	2498.97	0.000
L20	104.233 - 104.083 (20)	TP33.5513x33.5198x0.475	1570.87	2503.77	0.627	0.00	2503.77	0.000
L21	104.083 - 99.083 (21)	TP34.6011x33.5513x0.4625	1712.82	2599.07	0.659	0.00	2599.07	0.000
L22	99.083 - 94.083 (22)	TP35.651x34.6011x0.4625	1856.99	2762.49	0.672	0.00	2762.49	0.000
L23	94.083 - 87.42 (23)	TP37.05x35.651x0.4625	1900.57	2812.37	0.676	0.00	2812.37	0.000
L24	87.42 - 86.42 (24)	TP36.6328x35.3402x0.525	2082.85	3297.24	0.632	0.00	3297.24	0.000
L25	86.42 - 81.42 (25)	TP37.6808x36.6328x0.5125	2233.47	3413.13	0.654	0.00	3413.13	0.000
L26	81.42 - 76.42 (26)	TP38.7289x37.6808x0.5125	2386.25	3609.67	0.661	0.00	3609.67	0.000
L27	76.42 - 71.42 (27)	TP39.777x38.7289x0.5125	2541.14	3811.72	0.667	0.00	3811.72	0.000
L28	71.42 - 69.3167 (28)	TP40.2178x39.777x0.5063	2607.05	3852.63	0.677	0.00	3852.63	0.000
L29	69.3167 - 69.0667 (29)	TP40.2702x40.2178x0.375	2614.91	2807.74	0.931	0.00	2807.74	0.000
L30	69.0667 - 68.8333 (30)	TP40.3192x40.2702x0.375	2622.25	2813.72	0.932	0.00	2813.72	0.000
L31	68.8333 - 68.5833 (31)	TP40.3716x40.3192x0.5375	2630.12	4112.69	0.640	0.00	4112.69	0.000
L32	68.5833 - 63.5833 (32)	TP41.4196x40.3716x0.525	2788.56	4236.54	0.658	0.00	4236.54	0.000
L33	63.5833 - 58.5833 (33)	TP42.4677x41.4196x0.525	2949.07	4457.88	0.662	0.00	4457.88	0.000
L34	58.5833 - 53.5833 (34)	TP43.5158x42.4677x0.5188	3111.62	4631.12	0.672	0.00	4631.12	0.000
L35	53.5833 - 42.8767 (35)	TP45.76x43.5158x0.5125	3258.12	4779.53	0.682	0.00	4779.53	0.000
L36	42.8767 - 41.8767 (36)	TP45.22x43.6999x0.575	3500.45	5529.87	0.633	0.00	5529.87	0.000
L37	41.8767 - 36.8767 (37)	TP46.2683x45.22x0.575	3670.22	5794.30	0.633	0.00	5794.30	0.000
L38	36.8767 - 34.9167 (38)	TP46.6792x46.2683x0.575	3737.26	5899.64	0.633	0.00	5899.64	0.000
L39	34.9167 - 34.6667 (39)	TP46.7317x46.6792x0.4375	3745.82	4417.06	0.848	0.00	4417.06	0.000
L40	34.6667 - 34.33 (40)	TP46.8023x46.7317x0.4375	3757.38	4428.76	0.848	0.00	4428.76	0.000
L41	34.33 - 34.08 (41)	TP46.8547x46.8023x0.55	3765.95	5695.65	0.661	0.00	5695.65	0.000
L42	34.08 - 29.08 (42)	TP47.903x46.8547x0.55	3834.70	5799.88	0.661	0.00	5799.88	0.000
L43	29.08 - 24.08 (43)	TP48.9513x47.903x0.5438	3938.30	5892.63	0.668	0.00	5892.63	0.000
L44	24.08 - 19.08 (44)	TP49.9996x48.9513x0.5375	4112.18	6089.49	0.675	0.00	6089.49	0.000
L45	19.08 - 14.08 (45)	TP51.0479x49.9996x0.5375	4287.58	6357.53	0.674	0.00	6357.53	0.000
L46	14.08 - 9.08 (46)	TP52.0963x51.0479x0.5375	4642.87	6896.03	0.673	0.00	6896.03	0.000
L47	9.08 - 4.08 (47)	TP53.1446x52.0963x0.5375	4822.76	7145.59	0.675	0.00	7145.59	0.000
L48	4.08 - 0 (48)	TP54x53.1446x0.5375	4970.65	7351.39	0.676	0.00	7351.39	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	180 - 175 (1)	TP19.0628x18x0.25	7.49	261.99	0.029	1.09	431.63	0.003
L2	175 - 170 (2)	TP20.1255x19.0628x0.25	7.86	276.79	0.028	1.09	481.77	0.002
L3	170 - 165 (3)	TP21.1883x20.1255x0.25	8.24	291.58	0.028	1.09	534.67	0.002
L4	165 - 160 (4)	TP22.2511x21.1883x0.25	16.56	306.38	0.054	2.24	590.33	0.004
L5	160 - 155 (5)	TP23.3138x22.2511x0.25	16.95	321.19	0.053	2.24	648.73	0.003
L6	155 - 150 (6)	TP24.3766x23.3138x0.25	17.35	335.99	0.052	2.24	709.90	0.003
L7	150 - 145 (7)	TP25.4394x24.3766x0.25	24.62	350.79	0.070	3.86	773.82	0.005
L8	145 - 140 (8)	TP26.5021x25.4394x0.25	24.99	365.58	0.068	3.85	840.49	0.005
L9	140 - 133 (9)	TP27.99x26.5021x0.25	25.21	374.46	0.067	3.85	881.82	0.004
L10	133 - 132 (10)	TP27.6896x26.6398x0.3125	25.70	476.57	0.054	3.84	1142.59	0.003
L11	132 - 131.083 (11)	TP27.8821x27.6896x0.3125	25.77	479.92	0.054	3.84	1158.71	0.003
L12	131.083 - 130.833 (12)	TP27.9346x27.8821x0.475	25.78	726.56	0.035	3.84	1747.22	0.002
L13	130.833 - 125.833 (13)	TP28.9844x27.9346x0.4625	26.24	734.81	0.036	3.84	1835.42	0.002
L14	125.833 - 120.833 (14)	TP30.0343x28.9844x0.4563	26.69	751.72	0.036	3.83	1947.18	0.002
L15	120.833 - 115.833 (15)	TP31.0841x30.0343x0.45	27.14	767.89	0.035	3.83	2060.09	0.002
L16	115.833 - 110.833 (16)	TP32.134x31.0841x0.45	27.58	794.21	0.035	3.83	2203.72	0.002
L17	110.833 - 105.833 (17)	TP33.1838x32.134x0.4375	28.02	798.04	0.035	3.82	2288.58	0.002
L18	105.833 - 104.567 (18)	TP33.4497x33.1838x0.4375	28.14	804.52	0.035	3.82	2325.91	0.002
L19	104.567 - 104.233 (19)	TP33.5198x33.4497x0.475	28.16	874.34	0.032	3.82	2530.25	0.002
L20	104.233 - 104.083 (20)	TP33.5513x33.5198x0.475	28.17	875.17	0.032	3.82	2535.08	0.002
L21	104.083 - 99.083 (21)	TP34.6011x33.5513x0.4625	28.63	879.51	0.033	3.82	2629.47	0.001
L22	99.083 - 94.083 (22)	TP35.651x34.6011x0.4625	29.07	906.56	0.032	3.81	2793.68	0.001
L23	94.083 - 87.42 (23)	TP37.05x35.651x0.4625	29.21	914.65	0.032	3.81	2843.79	0.001
L24	87.42 - 86.42 (24)	TP36.6328x35.3402x0.525	29.92	1055.95	0.028	3.81	3339.07	0.001
L25	86.42 - 81.42 (25)	TP37.6808x36.6328x0.5125	30.36	1061.09	0.029	3.81	3453.86	0.001
L26	81.42 - 76.42 (26)	TP38.7289x37.6808x0.5125	30.79	1091.01	0.028	3.81	3651.38	0.001
L27	76.42 - 71.42 (27)	TP39.777x38.7289x0.5125	31.27	1120.93	0.028	3.73	3854.41	0.001
L28	71.42 - 69.3167 (28)	TP40.2178x39.777x0.5063	31.44	1119.87	0.028	3.73	3894.61	0.001
L29	69.3167 - 69.0667 (29)	TP40.2702x40.2178x0.375	31.45	833.37	0.038	3.73	2911.64	0.001
L30	69.0667 - 68.8333 (30)	TP40.3192x40.2702x0.375	31.46	834.39	0.038	3.73	2918.78	0.001
L31	68.8333 - 68.5833 (31)	TP40.3716x40.3192x0.5375	31.48	1192.66	0.026	3.73	4160.56	0.001
L32	68.5833 - 63.5833 (32)	TP41.4196x40.3716x0.525	31.92	1195.94	0.027	3.73	4283.07	0.001
L33	63.5833 - 58.5833 (33)	TP42.4677x41.4196x0.525	32.33	1226.59	0.026	3.72	4505.43	0.001
L34	58.5833 - 53.5833 (34)	TP43.5158x42.4677x0.5188	32.72	1242.45	0.026	3.72	4678.42	0.001
L35	53.5833 - 42.8767 (35)	TP45.76x43.5158x0.5125	33.06	1254.33	0.026	3.72	4826.44	0.001
L36	42.8767 - 41.8767 (36)	TP45.22x43.6999x0.575	33.80	1429.96	0.024	3.72	5590.84	0.001
L37	41.8767 - 36.8767 (37)	TP46.2683x45.22x0.575	34.15	1463.54	0.023	3.72	5856.48	0.001
L38	36.8767 - 34.9167 (38)	TP46.6792x46.2683x0.575	34.30	1476.70	0.023	3.72	5962.30	0.001
L39	34.9167 - 34.6667 (39)	TP46.7317x46.6792x0.4375	34.29	1128.21	0.030	3.72	4573.98	0.001
L40	34.6667 - 34.33 (40)	TP46.8023x46.7317x0.4375	34.31	1129.93	0.030	3.72	4587.94	0.001
L41	34.33 - 34.08 (41)	TP46.8547x46.8023x0.55	34.32	1418.64	0.024	3.72	5752.76	0.001
L42	34.08 - 29.08 (42)	TP47.903x46.8547x0.55	34.52	1437.91	0.024	3.72	5857.42	0.001
L43	29.08 - 24.08 (43)	TP48.9513x47.903x0.5438	34.71	1440.81	0.024	3.72	5949.39	0.001
L44	24.08 - 19.08 (44)	TP49.9996x48.9513x0.5375	35.01	1455.82	0.024	3.72	6145.83	0.001
L45	19.08 - 14.08 (45)	TP51.0479x49.9996x0.5375	35.31	1487.21	0.024	3.71	6414.87	0.001
L46	14.08 - 9.08 (46)	TP52.0963x51.0479x0.5375	35.85	1543.71	0.023	3.71	6970.23	0.001
L47	9.08 - 4.08 (47)	TP53.1446x52.0963x0.5375	36.15	1575.09	0.023	3.71	7256.56	0.001
L48	4.08 - 0 (48)	TP54x53.1446x0.5375	36.39	1600.71	0.023	3.71	7494.47	0.000

APPENDIX B

BASE LEVEL DRAWING


(OTHER CONSIDERED EQUIPMENT–IN CONDUIT)
(1) 3/8" TO 147 FT LEVEL
(2) 7/16" TO 147 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(1) 3/8" TO 147 FT LEVEL
(2) 7/8" TO 147 FT LEVEL
(12) 1–5/8" TO 147 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(1) 1/2" TO 165 FT LEVEL
(14) 1–5/8" TO 165 FT LEVEL
(PROPOSED EQUIPMENT CONFIGURATION)
(4) 1–5/8" TO 180 FT LEVEL
(1) 1/2" TO 75 FT LEVEL
Q4
Q1
Q3
Q2
CLIMBING PEGS
W/ SAFETY CLIMB

APPENDIX C

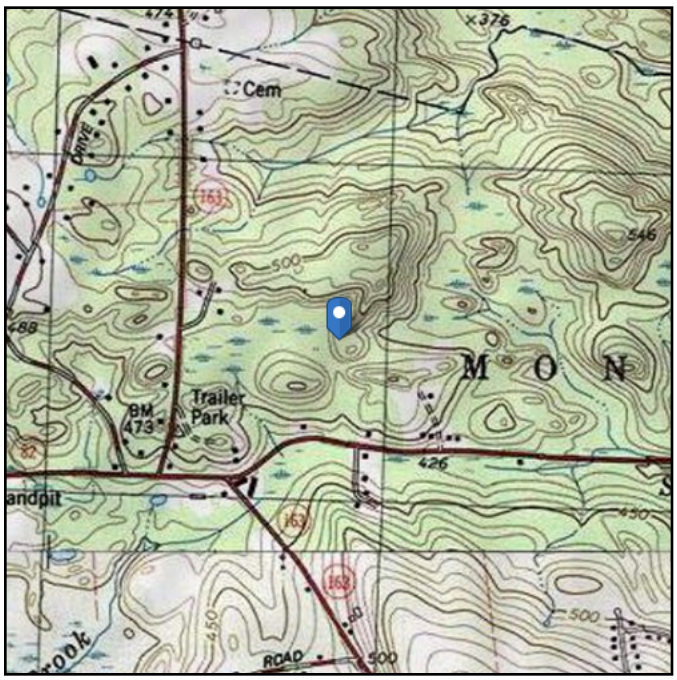
ADDITIONAL CALCULATIONS

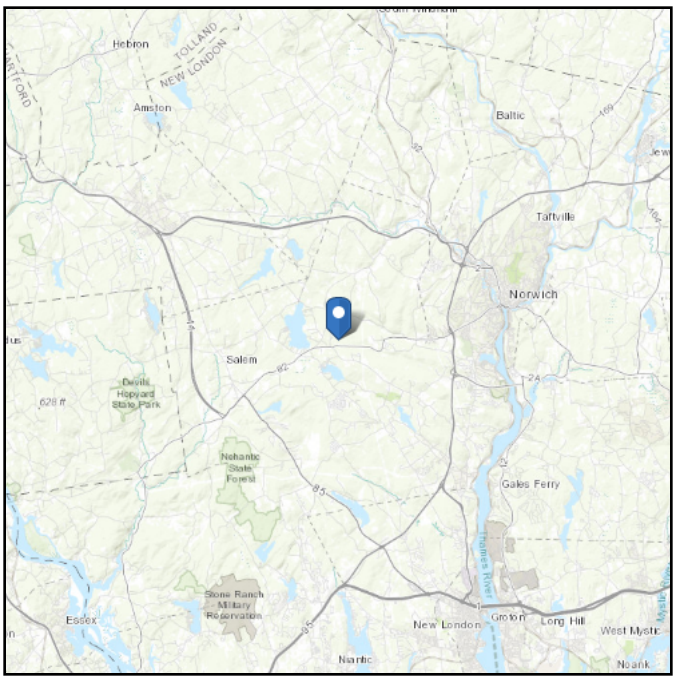
ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 481.28 ft (NAVD 88)
Latitude: 41.505639
Longitude: -72.197528





Wind

Results:

Wind Speed:	131 Vmph 135 Vmph per Jdx requirements
10-year MRI	79 Vmph
25-year MRI	89 Vmph
50-year MRI	97 Vmph
100-year MRI	107 Vmph

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

Date Accessed: Wed Feb 10 2021

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

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

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

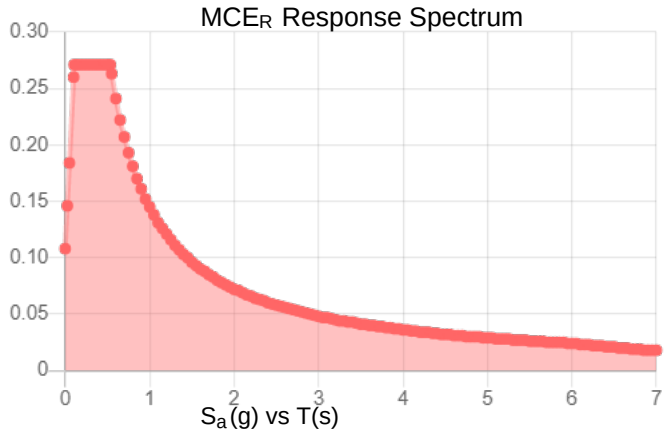
Seismic

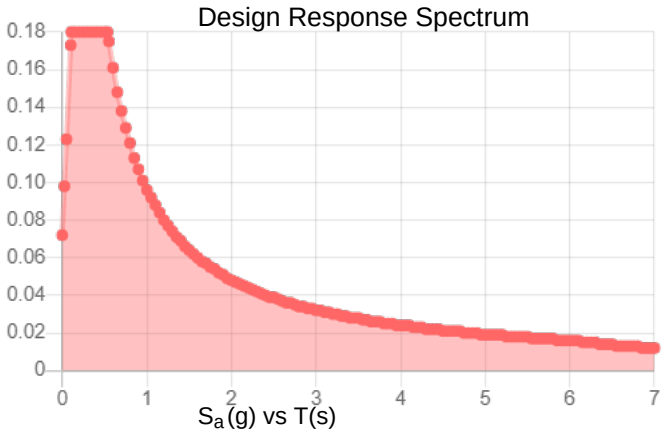
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.169	S_{DS} :	0.18
S_1 :	0.06	S_{D1} :	0.096
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.085
S_{MS} :	0.271	PGA_M :	0.136
S_{M1} :	0.145	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B





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

CCIpole

per TIA-222- H

Site BU: 876371

Work Order: 1919566

Pole Geometry

	Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
1	180	47	4	18	18	27.99	0.25	Auto	A572-65
2	137	49.58	5.1667	18	26.64	37.05	0.3125	Auto	A572-65
3	92.5867	49.71	6.25	18	35.34	45.76	0.375	Auto	A572-65
4	49.1267	49.1267	0	18	43.70	54	0.4375	Auto	A572-65

Reinforcement Configuration

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	0	34.33	plate	100FP-050100	3						x						x						x
2	34.9167	68.8333	plate	100FP-060100	3					x						x						x	
3	69.3167	104.333	plate	100FP-050100	3						x						x						x
4	104.5667	131.0833	plate	100FP-040100	3					x						x						x	
5																							
6																							
7																							
8																							
9																							
10																							

Reinforcement Details

	B (in)	H (in)	Gross Area (in^2)	Pole Face to Centroid (in)	Bottom Termination Type	Bottom Termination Length (in)	Top Termination Type	Top Termination Length (in)	Lu (in)	Net Area (in2)	Bolt Hole Size (in)	Reinforcement Material
1	5	1	5	0.5	PC 8.8 - M20 (100)	29	PC 8.8 - M20 (100)	29.000	18.000	3.750	1.1875	A514-GR100
2	6	1	6	0.5	PC 8.8 - M20 (100)	35	PC 8.8 - M20 (100)	35.000	17.000	4.750	1.1875	A514-GR100
3	5	1	5	0.5	PC 8.8 - M20 (100)	29	PC 8.8 - M20 (100)	29.000	18.000	3.750	1.1875	A514-GR100
4	4	1	4	0.5	PC 8.8 - M20 (100)	20	PC 8.8 - M20 (100)	20.000	20.000	2.750	1.1875	A514-GR100

TNX Geometry Input

Increment (ft): 5 Export to TNX

	Section Height (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Tapered Pole Grade	Weight Multiplier
1	180 - 175	5		18	18.000	19.063	0.25	A572-65	1.000
2	175 - 170	5		18	19.063	20.126	0.25	A572-65	1.000
3	170 - 165	5		18	20.126	21.188	0.25	A572-65	1.000
4	165 - 160	5		18	21.188	22.251	0.25	A572-65	1.000
5	160 - 155	5		18	22.251	23.314	0.25	A572-65	1.000
6	155 - 150	5		18	23.314	24.377	0.25	A572-65	1.000
7	150 - 145	5		18	24.377	25.439	0.25	A572-65	1.000
8	145 - 140	5		18	25.439	26.502	0.25	A572-65	1.000
9	140 - 137	7	4	18	26.502	27.990	0.25	A572-65	1.000
10	137 - 132	5		18	26.640	27.690	0.3125	A572-65	1.000
11	132 - 131.0833	0.9167		18	27.690	27.882	0.3125	A572-65	1.000
12	131.0833 - 130.8333	0.25		18	27.882	27.935	0.475	A572-65	0.952
13	130.8333 - 125.8333	5		18	27.935	28.984	0.4625	A572-65	0.966
14	125.8333 - 120.8333	5		18	28.984	30.034	0.45625	A572-65	0.968
15	120.8333 - 115.8333	5		18	30.034	31.084	0.45	A572-65	0.972
16	115.8333 - 110.8333	5		18	31.084	32.134	0.45	A572-65	0.963
17	110.8333 - 105.8333	5		18	32.134	33.184	0.4375	A572-65	0.981
18	105.8333 - 104.5667	1.2666		18	33.184	33.450	0.4375	A572-65	0.979
19	104.5667 - 104.233	0.3337		18	33.450	33.520	0.475	A572-65	0.962
20	104.233 - 104.083	0.15		18	33.520	33.551	0.475	A572-65	0.962
21	104.083 - 99.083	5		18	33.551	34.601	0.4625	A572-65	0.978
22	99.083 - 94.083	5		18	34.601	35.651	0.4625	A572-65	0.969
23	94.083 - 92.5867	6.663	5.1667	18	35.651	37.050	0.4625	A572-65	0.966
24	92.5867 - 86.42	6.1667		18	35.340	36.633	0.525	A572-65	0.967
25	86.42 - 81.42	5		18	36.633	37.681	0.5125	A572-65	0.983
26	81.42 - 76.42	5		18	37.681	38.729	0.5125	A572-65	0.976
27	76.42 - 71.42	5		18	38.729	39.777	0.5125	A572-65	0.969
28	71.42 - 69.3167	2.1033		18	39.777	40.218	0.50625	A572-65	0.978
29	69.3167 - 69.0667	0.25		18	40.218	40.270	0.375	A572-65	1.000
30	69.0667 - 68.8333	0.2334		18	40.270	40.319	0.375	A572-65	1.000
31	68.8333 - 68.5833	0.25		18	40.319	40.372	0.5375	A572-65	0.965
32	68.5833 - 63.5833	5		18	40.372	41.420	0.525	A572-65	0.981
33	63.5833 - 58.5833	5		18	41.420	42.468	0.525	A572-65	0.974
34	58.5833 - 53.5833	5		18	42.468	43.516	0.51875	A572-65	0.980
35	53.5833 - 49.1267	10.7066	6.25	18	43.516	45.760	0.5125	A572-65	0.986
36	49.1267 - 41.8767	7.25		18	43.700	45.220	0.575	A572-65	0.984
37	41.8767 - 36.8767	5		18	45.220	46.268	0.575	A572-65	0.979
38	36.8767 - 34.9167	1.96		18	46.268	46.679	0.575	A572-65	0.977
39	34.9167 - 34.6667	0.25		18	46.679	46.732	0.4375	A572-65	1.000
40	34.6667 - 34.33	0.3367		18	46.732	46.802	0.4375	A572-65	1.000
41	34.33 - 34.08	0.25		18	46.802	46.855	0.55	A572-65	0.983
42	34.08 - 29.08	5		18	46.855	47.903	0.55	A572-65	0.979
43	29.08 - 24.08	5		18	47.903	48.951	0.54375	A572-65	0.986
44	24.08 - 19.08	5		18	48.951	50.000	0.5375	A572-65	0.993
45	19.08 - 14.08	5		18	50.000	51.048	0.5375	A572-65	0.990
46	14.08 - 9.08	5		18	51.048	52.096	0.5375	A572-65	0.986
47	9.08 - 4.08	5		18	52.096	53.145	0.5375	A572-65	0.983
48	4.08 - 0	4.08		18	53.145	54.000	0.5375	A572-65	0.980

TNX Section Forces

Increment (ft):	5	TNX Output		
	Section Height (ft)	P_u (K)	M_{ux} (kip-ft)	V_u (K)
1	180 - 175	3.87	35.66	7.49
2	175 - 170	4.20	74.03	7.86
3	170 - 165	4.55	114.28	8.24
4	165 - 160	7.18	221.32	16.56
5	160 - 155	7.71	305.07	16.95
6	155 - 150	8.28	390.79	17.35
7	150 - 145	13.13	492.67	24.62
8	145 - 140	13.89	616.65	24.99
9	140 - 137	14.37	691.93	25.21
10	137 - 132	15.54	819.19	25.70
11	132 - 131.0833	15.71	842.77	25.77
12	131.0833 - 130.8333	15.78	849.21	25.78
13	130.8333 - 125.8333	16.87	979.22	26.24
14	125.8333 - 120.8333	18.01	1111.49	26.69
15	120.8333 - 115.8333	19.18	1246.01	27.14
16	115.8333 - 110.8333	20.37	1382.75	27.58
17	110.8333 - 105.8333	21.60	1521.70	28.02
18	105.8333 - 104.5667	21.91	1557.25	28.14
19	104.5667 - 104.233	22.01	1566.64	28.16
20	104.233 - 104.083	22.05	1570.87	28.17
21	104.083 - 99.083	23.35	1712.81	28.63
22	99.083 - 94.083	24.69	1856.99	29.07
23	94.083 - 92.5867	25.09	1900.57	29.21
24	92.5867 - 86.42	27.93	2082.85	29.92
25	86.42 - 81.42	29.46	2233.46	30.36
26	81.42 - 76.42	31.01	2386.25	30.79
27	76.42 - 71.42	32.67	2541.14	31.27
28	71.42 - 69.3167	33.35	2607.05	31.44
29	69.3167 - 69.0667	33.43	2614.91	31.45
30	69.0667 - 68.8333	33.49	2622.25	31.46
31	68.8333 - 68.5833	33.58	2630.12	31.48
32	68.5833 - 63.5833	35.25	2788.56	31.92
33	63.5833 - 58.5833	36.96	2949.08	32.33
34	58.5833 - 53.5833	38.70	3111.62	32.72
35	53.5833 - 49.1267	40.27	3258.12	33.06
36	49.1267 - 41.8767	44.83	3500.45	33.80
37	41.8767 - 36.8767	46.81	3670.23	34.15
38	36.8767 - 34.9167	47.59	3737.26	34.30
39	34.9167 - 34.6667	47.69	3745.83	34.29
40	34.6667 - 34.33	47.81	3757.37	34.31
41	34.33 - 34.08	47.91	3765.95	34.32
42	34.08 - 29.08	49.87	3938.30	34.65
43	29.08 - 24.08	51.88	4112.19	34.95
44	24.08 - 19.08	53.92	4287.58	35.25
45	19.08 - 14.08	55.99	4464.48	35.55
46	14.08 - 9.08	58.09	4642.87	35.85
47	9.08 - 4.08	60.22	4822.76	36.15
48	4.08 - 0	61.98	4970.65	36.39

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
180 - 175	Pole	TP19.063x18x0.25	Pole	8.3%	Pass
175 - 170	Pole	TP20.126x19.063x0.25	Pole	15.1%	Pass
170 - 165	Pole	TP21.188x20.126x0.25	Pole	20.9%	Pass
165 - 160	Pole	TP22.251x21.188x0.25	Pole	36.6%	Pass
160 - 155	Pole	TP23.314x22.251x0.25	Pole	45.8%	Pass
155 - 150	Pole	TP24.377x23.314x0.25	Pole	53.7%	Pass
150 - 145	Pole	TP25.439x24.377x0.25	Pole	63.0%	Pass
145 - 140	Pole	TP26.502x25.439x0.25	Pole	73.2%	Pass
140 - 137	Pole	TP27.99x26.502x0.25	Pole	78.7%	Pass
137 - 132	Pole	TP27.69x26.64x0.3125	Pole	69.7%	Pass
132 - 131.08	Pole	TP27.882x27.69x0.3125	Pole	70.7%	Pass
131.08 - 130.83	Pole + Reinf.	TP27.935x27.882x0.475	Reinf. 4 Tension Rupture	64.0%	Pass
130.83 - 125.83	Pole + Reinf.	TP28.984x27.935x0.4625	Reinf. 4 Tension Rupture	69.2%	Pass
125.83 - 120.83	Pole + Reinf.	TP30.034x28.984x0.4563	Reinf. 4 Tension Rupture	73.9%	Pass
120.83 - 115.83	Pole + Reinf.	TP31.084x30.034x0.45	Reinf. 4 Tension Rupture	78.1%	Pass
115.83 - 110.83	Pole + Reinf.	TP32.134x31.084x0.45	Reinf. 4 Tension Rupture	81.8%	Pass
110.83 - 105.83	Pole + Reinf.	TP33.184x32.134x0.4375	Reinf. 4 Tension Rupture	85.1%	Pass
105.83 - 104.57	Pole + Reinf.	TP33.45x33.184x0.4375	Reinf. 4 Tension Rupture	85.9%	Pass
104.57 - 104.23	Pole + Reinf.	TP33.52x33.45x0.475	Reinf. 3 Tension Rupture	73.7%	Pass
104.23 - 104.08	Pole + Reinf.	TP33.551x33.52x0.475	Reinf. 3 Tension Rupture	73.8%	Pass
104.08 - 99.08	Pole + Reinf.	TP34.601x33.551x0.4625	Reinf. 3 Tension Rupture	76.3%	Pass
99.08 - 94.08	Pole + Reinf.	TP35.651x34.601x0.4625	Reinf. 3 Tension Rupture	78.7%	Pass
94.08 - 92.59	Pole + Reinf.	TP37.05x35.651x0.4625	Reinf. 3 Tension Rupture	79.3%	Pass
92.59 - 86.42	Pole + Reinf.	TP36.633x35.34x0.525	Reinf. 3 Tension Rupture	74.2%	Pass
86.42 - 81.42	Pole + Reinf.	TP37.681x36.633x0.5125	Reinf. 3 Tension Rupture	75.8%	Pass
81.42 - 76.42	Pole + Reinf.	TP38.729x37.681x0.5125	Reinf. 3 Tension Rupture	77.1%	Pass
76.42 - 71.42	Pole + Reinf.	TP39.777x38.729x0.5125	Reinf. 3 Tension Rupture	78.3%	Pass
71.42 - 69.32	Pole + Reinf.	TP40.218x39.777x0.5063	Reinf. 3 Tension Rupture	78.8%	Pass
69.32 - 69.07	Pole	TP40.27x40.218x0.375	Pole	89.7%	Pass
69.07 - 68.83	Pole	TP40.319x40.27x0.375	Pole	89.7%	Pass
68.83 - 68.58	Pole + Reinf.	TP40.372x40.319x0.5375	Reinf. 2 Compression	71.5%	Pass
68.58 - 63.58	Pole + Reinf.	TP41.42x40.372x0.525	Reinf. 2 Compression	72.5%	Pass
63.58 - 58.58	Pole + Reinf.	TP42.468x41.42x0.525	Reinf. 2 Compression	73.5%	Pass
58.58 - 53.58	Pole + Reinf.	TP43.516x42.468x0.5188	Reinf. 2 Compression	74.3%	Pass
53.58 - 49.13	Pole + Reinf.	TP45.76x43.516x0.5125	Reinf. 2 Compression	74.9%	Pass
49.13 - 41.88	Pole + Reinf.	TP45.22x43.7x0.575	Reinf. 2 Compression	69.8%	Pass
41.88 - 36.88	Pole + Reinf.	TP46.268x45.22x0.575	Reinf. 2 Compression	70.2%	Pass
36.88 - 34.92	Pole + Reinf.	TP46.679x46.268x0.575	Reinf. 2 Compression	70.4%	Pass
34.92 - 34.67	Pole	TP46.732x46.679x0.4375	Pole	81.8%	Pass
34.67 - 34.33	Pole	TP46.802x46.732x0.4375	Pole	81.8%	Pass
34.33 - 34.08	Pole + Reinf.	TP46.855x46.802x0.55	Reinf. 1 Tension Rupture	77.0%	Pass
34.08 - 29.08	Pole + Reinf.	TP47.903x46.855x0.55	Reinf. 1 Tension Rupture	77.3%	Pass
29.08 - 24.08	Pole + Reinf.	TP48.951x47.903x0.5438	Reinf. 1 Tension Rupture	77.6%	Pass
24.08 - 19.08	Pole + Reinf.	TP50x48.951x0.5375	Reinf. 1 Tension Rupture	77.8%	Pass
19.08 - 14.08	Pole + Reinf.	TP51.048x50x0.5375	Reinf. 1 Tension Rupture	78.0%	Pass
14.08 - 9.08	Pole + Reinf.	TP52.096x51.048x0.5375	Reinf. 1 Tension Rupture	78.2%	Pass
9.08 - 4.08	Pole + Reinf.	TP53.145x52.096x0.5375	Reinf. 1 Tension Rupture	78.3%	Pass
4.08 - 0	Pole + Reinf.	TP54x53.145x0.5375	Reinf. 1 Tension Rupture	78.3%	Pass
				Summary	
			Pole	89.7%	Pass
			Reinforcement	85.9%	Pass
			Overall	89.7%	Pass

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in^4)			Area (in^2)			% Capacity*				
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3	R4
180 - 175	667	n/a	667	14.93	n/a	14.93	8.3%				
175 - 170	787	n/a	787	15.77	n/a	15.77	15.1%				
170 - 165	920	n/a	920	16.61	n/a	16.61	20.9%				
165 - 160	1067	n/a	1067	17.46	n/a	17.46	36.6%				
160 - 155	1230	n/a	1230	18.30	n/a	18.30	45.8%				
155 - 150	1407	n/a	1407	19.14	n/a	19.14	53.7%				
150 - 145	1602	n/a	1602	19.99	n/a	19.99	63.0%				
145 - 140	1813	n/a	1813	20.83	n/a	20.83	73.2%				
140 - 137	1948	n/a	1948	21.34	n/a	21.34	78.7%				
137 - 132	2570	n/a	2570	27.15	n/a	27.15	69.7%				
132 - 131.08	2625	n/a	2625	27.34	n/a	27.34	70.7%				
131.08 - 130.83	2640	1264	3904	27.40	12.00	39.40	47.3%				64.0%
130.83 - 125.83	2953	1357	4310	28.44	12.00	40.44	51.3%				69.2%
125.83 - 120.83	3289	1453	4742	29.48	12.00	41.48	54.8%				73.9%
120.83 - 115.83	3650	1553	5203	30.52	12.00	42.52	58.4%				78.1%
115.83 - 110.83	4036	1655	5692	31.56	12.00	43.56	61.8%				81.8%
110.83 - 105.83	4449	1761	6211	32.60	12.00	44.60	64.9%				85.1%
105.83 - 104.57	4558	1789	6347	32.87	12.00	44.87	65.6%				85.9%
104.57 - 104.23	4587	2251	6838	32.94	15.00	47.94	61.5%			73.7%	
104.23 - 104.08	4600	2255	6855	32.97	15.00	47.97	61.5%			73.8%	
104.08 - 99.08	5050	2393	7443	34.01	15.00	49.01	64.3%			76.3%	
99.08 - 94.08	5528	2535	8063	35.05	15.00	50.05	66.9%			78.7%	
94.08 - 92.59	5677	2578	8255	35.36	15.00	50.36	67.6%			79.3%	
92.59 - 86.42	7165	2672	9837	43.15	15.00	58.15	60.6%			74.2%	
86.42 - 81.42	7805	2822	10626	44.40	15.00	59.40	62.3%			75.8%	
81.42 - 76.42	8481	2976	11457	45.65	15.00	60.65	63.9%			77.1%	
76.42 - 71.42	9196	3134	12329	46.90	15.00	61.90	65.4%			78.3%	
71.42 - 69.32	9508	3202	12709	47.42	15.00	62.42	66.1%			78.8%	
69.32 - 69.07	9545	n/a	9545	47.48	n/a	47.48	89.7%				
69.07 - 68.83	9580	n/a	9580	47.54	n/a	47.54	89.7%				
68.83 - 68.58	9618	3879	13497	47.60	18.00	65.60	63.1%		71.5%		
68.58 - 63.58	10394	4076	14471	48.85	18.00	66.85	64.5%		72.5%		
63.58 - 58.58	11211	4279	15490	50.10	18.00	68.10	65.8%		73.5%		
58.58 - 53.58	12069	4486	16556	51.35	18.00	69.35	67.0%		74.3%		
53.58 - 49.13	12870	4676	17546	52.46	18.00	70.46	68.1%		74.9%		
49.13 - 41.88	15751	4834	20585	62.18	18.00	80.18	61.0%		69.8%		
41.88 - 36.88	16883	5055	21938	63.64	18.00	81.64	61.8%		70.2%		
36.88 - 34.92	17341	5143	22484	64.21	18.00	82.21	62.1%		70.4%		
34.92 - 34.67	17400	n/a	17400	64.28	n/a	64.28	81.8%				
34.67 - 34.33	17480	n/a	17480	64.38	n/a	64.38	81.8%				
34.33 - 34.08	17539	4310	21849	64.45	15.00	79.45	64.7%	77.0%			
34.08 - 29.08	18754	4500	23255	65.91	15.00	80.91	65.5%	77.3%			
29.08 - 24.08	20025	4695	24719	67.37	15.00	82.37	66.1%	77.6%			
24.08 - 19.08	21351	4893	26244	68.82	15.00	83.82	66.8%	77.8%			
19.08 - 14.08	22735	5096	27830	70.28	15.00	85.28	67.4%	78.0%			
14.08 - 9.08	24177	5302	29479	71.73	15.00	86.73	68.0%	78.2%			
9.08 - 4.08	25679	5513	31192	73.19	15.00	88.19	68.5%	78.3%			
4.08 - 0	26949	5688	32638	74.38	15.00	89.38	68.9%	78.3%			

Note: Section capacity checked using 5 degree increments.
Rating per TIA-222-H Section 15.5.

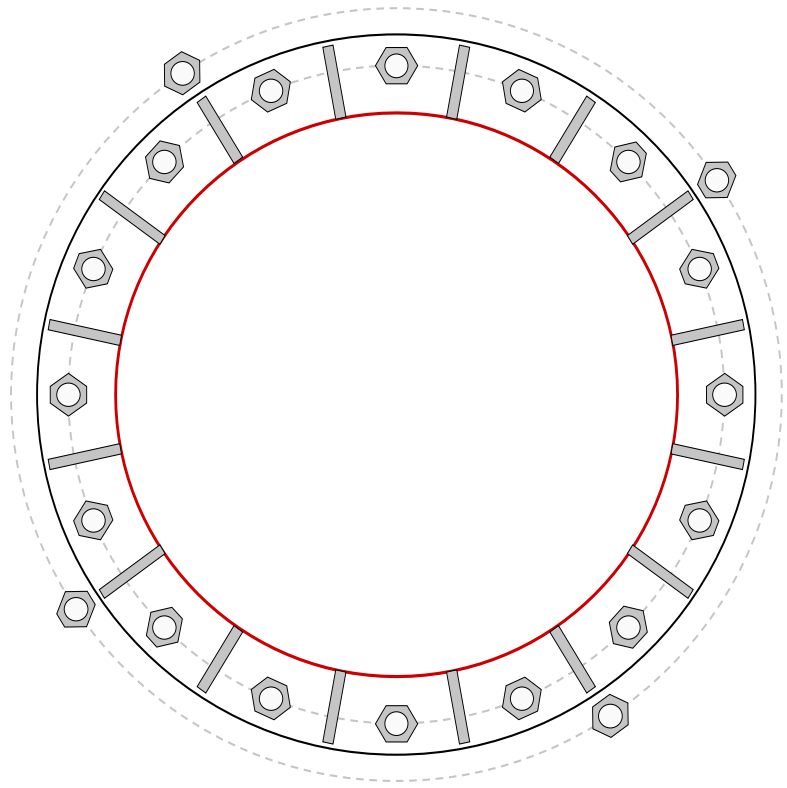
Monopole Base Plate Connection

Site Info	
BU #	876371
Site Name	Walden / Carolyn Besa
Order #	538781 Rev. 1

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	See Custom Sheet
l_{ar} (in)	See Custom Sheet

Applied Loads	
Moment (kip-ft)	4970.65
Axial Force (kips)	61.98
Shear Force (kips)	36.39

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

GROUP 1: (16) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 63" BC
GROUP 2: (4) 2-1/4" ø bolts (A193 Gr. B7 N; Fy=105 ksi, Fu=125 ksi) on 74" BC

Base Plate Data

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

Stiffener Data

(16) 20"H x 7"W x 1"T, Notch: 0"
plate: Fy= 50 ksi ; weld: Fy= 70 ksi
horiz. weld: 0.75" fillet
vert. weld: 0.4375" fillet

Pole Data

54" x 0.4375" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

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

GROUP 1:

Pu_c = 179.01	ϕPn_c = 268.39	**Stress Rating**
Vu = 2.27	ϕVn = 120.77	**63.6%**
Mu = n/a	ϕMn = n/a	**Pass**

GROUP 2:

Pu_c = 209.67	ϕPn_c = 375.74	**Stress Rating**
Vu = 0	ϕVn = 169.08	**53.1%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary

Max Stress (ksi):	29.66	(Roark's Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	**52.3%**	**Pass**

Stiffener Summary

Horizontal Weld:	**51.3%**	**Pass**
Vertical Weld:	**33.6%**	**Pass**
Plate Flexure+Shear:	**10.7%**	**Pass**
Plate Tension+Shear:	**39.0%**	**Pass**
Plate Compression:	**48.1%**	**Pass**

Pole Summary

Punching Shear:	**8.9%**	**Pass**

CCIplate

Elevation (ft)	0	*(Base)*

note: Bending interaction not considered when Grout Considered = "Yes"

Bolt Group	Resist Axial	Resist Shear	Induce Plate Bending	Grout Considered	Apply at BARB Elevation	BARB CL Elevation (ft)
1	Yes	Yes	Yes	Yes	No	
2	Yes	No	No	No	No	

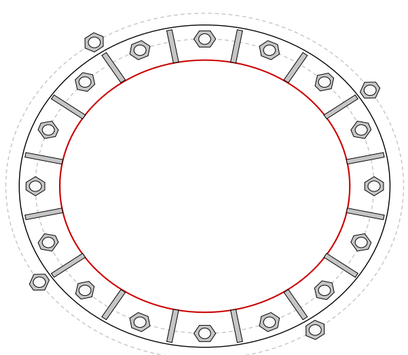
Custom Bolt Connection

Bolt	Bolt Group ID	Location (deg.)	Diameter (in)	Material	Bolt Circle (in)	Eta Factor, η:	l_{ar} (in):	Thread Type	Area Override, in^2	Tension Only
1	1	0	2.25	A615-75	63	0.5	0	N-Included		No
2	1	22.5	2.25	A615-75	63	0.5	0	N-Included		No
3	1	45	2.25	A615-75	63	0.5	0	N-Included		No
4	1	67.5	2.25	A615-75	63	0.5	0	N-Included		No
5	1	90	2.25	A615-75	63	0.5	0	N-Included		No
6	1	112.5	2.25	A615-75	63	0.5	0	N-Included		No
7	1	135	2.25	A615-75	63	0.5	0	N-Included		No
8	1	157.5	2.25	A615-75	63	0.5	0	N-Included		No
9	1	180	2.25	A615-75	63	0.5	0	N-Included		No
10	1	202.5	2.25	A615-75	63	0.5	0	N-Included		No
11	1	225	2.25	A615-75	63	0.5	0	N-Included		No
12	1	247.5	2.25	A615-75	63	0.5	0	N-Included		No
13	1	270	2.25	A615-75	63	0.5	0	N-Included		No
14	1	292.5	2.25	A615-75	63	0.5	0	N-Included		No
15	1	315	2.25	A615-75	63	0.5	0	N-Included		No
16	1	337.5	2.25	A615-75	63	0.5	0	N-Included		No
17	2	33.75	2.25	A193 Gr. B7	74	0.5	0	N-Included		No
18	2	123.75	2.25	A193 Gr. B7	74	0.5	0	N-Included		No
19	2	213.75	2.25	A193 Gr. B7	74	0.5	0	N-Included		No
20	2	303.75	2.25	A193 Gr. B7	74	0.5	0	N-Included		No

Custom Stiffener Connection

Stiffener	Stiffener Group ID	Location (deg.)	Width (in)	Height (in)	Thickness (in)	H. Notch (in)	V. Notch (in)	Grade (ksi)	Weld Type	Groove Depth (in)	Groove Angle (deg.)	H. Fillet Weld Size (in)	V. Fillet Weld Size (in)	Weld Strength (ksi)
1	1	11.25	7	20	1	0	0	50	Fillet			0.75	0.4375	70
2	1	33.75	7	20	1	0	0	50	Fillet			0.75	0.4375	70
3	1	56.25	7	20	1	0	0	50	Fillet			0.75	0.4375	70
4	1	78.75	7	20	1	0	0	50	Fillet			0.75	0.4375	70
5	1	101.25	7	20	1	0	0	50	Fillet			0.75	0.4375	70
6	1	123.75	7	20	1	0	0	50	Fillet			0.75	0.4375	70
7	1	146.25	7	20	1	0	0	50	Fillet			0.75	0.4375	70
8	1	168.75	7	20	1	0	0	50	Fillet			0.75	0.4375	70
9	1	191.25	7	20	1	0	0	50	Fillet			0.75	0.4375	70
10	1	213.75	7	20	1	0	0	50	Fillet			0.75	0.4375	70
11	1	236.25	7	20	1	0	0	50	Fillet			0.75	0.4375	70
12	1	258.75	7	20	1	0	0	50	Fillet			0.75	0.4375	70
13	1	281.25	7	20	1	0	0	50	Fillet			0.75	0.4375	70
14	1	303.75	7	20	1	0	0	50	Fillet			0.75	0.4375	70
15	1	326.25	7	20	1	0	0	50	Fillet			0.75	0.4375	70
16	1	348.75	7	20	1	0	0	50	Fillet			0.75	0.4375	70

Plot Graphic



Walden / Carolyn Besade (BU 876371)
TEP #: 25624.496701
Analysis: GJS 2/11/2021
Check: JCR 2/11/2021

Design Reaction Comparison Tool

Code Revisions: TIA-222-H

Tower Type: Monopole

Monopole					
Reactions	Design	Design*1.35	Analysis	Capacity	Pass / Fail
Moment (kips.ft)	5129	6924.15	4971	68.4%	Pass
Axial (kips)	62	83.7	49	55.8%	Pass
Shear (kips)	42	56.7	36	60.5%	Pass

Note 1: Design loads were multiplied by 1.35 for comparison as allowed by TIA-222-H, Section 15.6.2.
Note 2: Rating per TIA-222-H, Section 15.5

Exhibit E

Mount Analysis

Date: **February 3, 2021**

Darcy Tarr
Crown Castle
6325 Ardrey Kell Road, Suite 600
Charlotte, NC 28277
(704) 405-6589

GPD Engineering and Architecture
Professional Corporation
520 South Main Street, Suite 2531
Akron, Ohio 44311
(216) 927-8663
CrownMA@gpdgroup.com

Subject:	**Mount Analysis Report**	
Carrier Designation:	***Sprint PCS* Loading Modification**	
	Carrier Site Number:	CTNL815A
	Carrier Site Name:	CTNL815A
Crown Castle Designation:	**Crown Castle BU Number:**	876371
	Crown Castle Site Name:	WALDEN / CAROLYN BESADE
	Crown Castle JDE Job Number:	628850
	Crown Castle Order Number:	538781 Rev. 0
Engineering Firm Designation:	**GPD Report Designation:**	2021777.876371.01
Site Data:	**557 Rte. 82, Oakdale, New London County, CT 06370** **Latitude 41° 30' 20.30" Longitude -72° 11' 51.10"**	
Structure Information:	**Tower Height & Type:**	**180.0 ft Monopole Tower**
	Mount Elevation:	**180.0 ft**
	Mount Type:	**10.7 ft Platform Mount**

Dear Darcy Tarr,

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

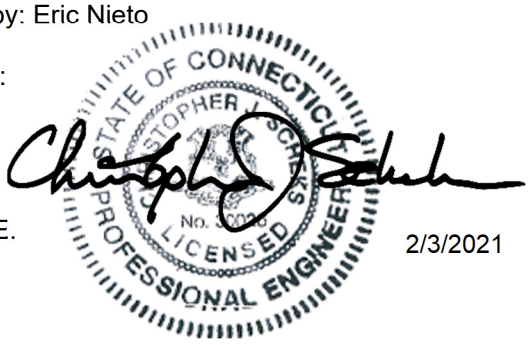
The purpose of the analysis is to determine acceptability of the mount stress level. Based on our analysis we have determined the mount stress level to be:

Platform Mount **Sufficient – 57.2%**

This analysis utilizes an ultimate 3-second gust wind speed of 135 mph as required by the 2018 Connecticut Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Mount analysis prepared by: Eric Nieto

Respectfully Submitted by:



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

2/3/2021

TABLE OF CONTENTS

1) INTRODUCTION

This is a modified 10.7' Platform Mount. Mount geometry was obtained from the previous mount analysis by Hudson Design Group LLC (Project #: 3876278 Rev. 1, dated 6/15/2018), site photos, and experience with similar mounts.

The mount has been modified per the mount analysis by Hudson Design Group LLC (Project #: 3876278 Rev. 1, dated 6/15/2018). Reinforcement consists of adding a support rail kit below the bottom face horizontal and a v-stabilizer kit between the new support rail and tower.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	135 mph
Exposure Category:	B
Topographic Factor at Base:	1
Topographic Factor at Mount:	1
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Live Loading Wind Speed:	30 mph
Man Live Load at Mid/End-Points:	250 lb
Man Live Load at Mount Pipes:	500 lb

Table 1 - Proposed Equipment Configuration

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount Details
180.0	180.0	3	Ericsson	AIR6449 B41_T-MOBILE	10.7 ft. Platform Mount
		3	RFS/Celwave	APX16DWV-16DWV-S-E-A20	
		3	RFS/Celwave	APXVAALL24_43-U-NA20_TMO	
		3	Ericsson	RADIO 4415 B66A	
		3	Ericsson	RADIO 4424 B25_TMO	
		3	Ericsson	RADIO 4449 B71 B85A_T-MOBILE	

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
CCI Application	Crown Order Number 538781 Rev. 0	-	CCI
RF Data Sheet	Site ID: CTNL815A, Draft Rev. 1, dated 1/15/2021	-	CCI
Mount Analysis	Hudson Design Group LLC Project #: 3876278 Rev. 1, dated 6/15/2018	7615440	CCI

3.1) Analysis Method

RISA-3D Edition (Version 17.0.2), a commercially available analysis software package, was used to create a three-dimensional model of the antenna mounting system and calculate member stresses for various loading cases.

A tool internally developed by GPD, using Microsoft Excel, was used to calculate wind loading on all appurtenances, dishes, and mount members for various load cases. Selected output from the analysis is included in Appendix B.

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

3.2) Assumptions

1) The antenna mounting system was properly fabricated, installed and maintained in good condition in accordance with its original design and manufacturer's specifications.
2) The configuration of antennas, mounts, and other appurtenances are as specified in Table 1 and the referenced drawings.
3) All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
4) This analysis assumes all information reference in Table 2 is current and correct.
5) Portions of the mount were modeled from site photos. Member information and dimensions not provided have been assumed based on previous experience with similar mounts. No guarantee can be made as to the accuracy of these assumptions without a complete mount mapping.
6) Steel grades have been assumed as follows, unless noted otherwise:

Channel, Solid Round, Angle	ASTM A36 (GR 36)
Pipe	ASTM A53 (GR 35)
Connection Bolts	ASTM A325

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

4) ANALYSIS RESULTS

Table 3 - Mount Component Stresses vs. Capacity (Platform Mount)

Notes	Component	Critical Member	Centerline (ft)	% Capacity	Pass / Fail
1,3	Toe Rail	M83	180.0	41.7	Pass
	Platform Inner Bracing	M2		24.7	Pass
	Support Rail	M23		28.1	Pass
	Support Rail Corner	M26		38.9	Pass
	Pipe Mount	B2		57.2	Pass
	Ladder Support Bracing	C1		32.3	Pass
	Mod Support Rail	M31		21.0	Pass
	Mod Support Rail Corner	M32A		15.9	Pass
	Mod V-Kit	M36		13.8	Pass
2,3	Mount to Tower Connection	-		21.9	Pass
	Mod V-Kit to Tower Connection	-		2.9	Pass

Structure Rating (max from all components) =	**57.2%[3]**

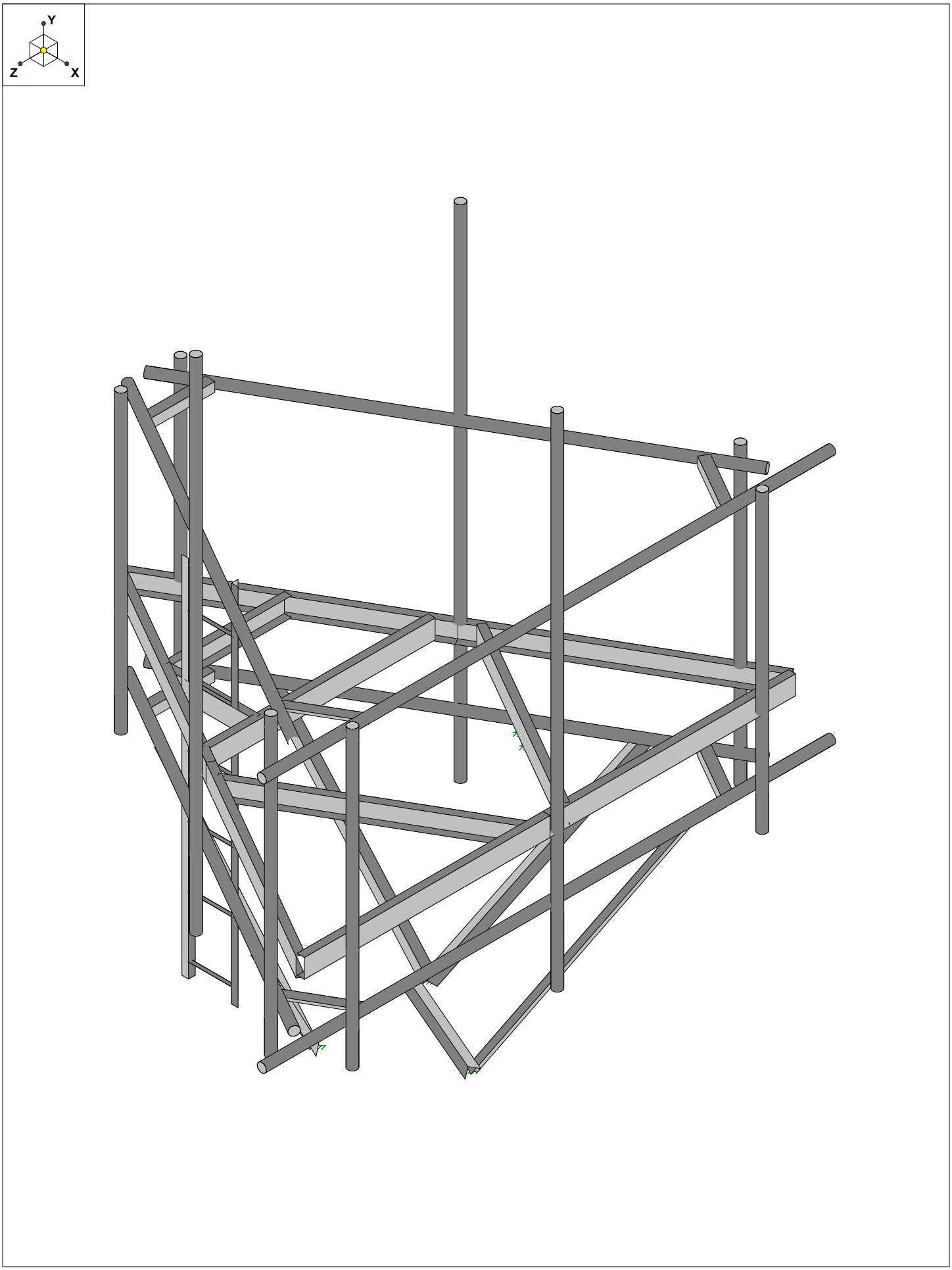
Notes:
1) See additional documentation in "Appendix C - Software Analysis Output" for calculations supporting the % capacity consumed.
2) See additional documentation in "Appendix D - Additional Calculations" for calculations supporting the % capacity consumed.
3) Ratings per TIA-222-H section 15.5.

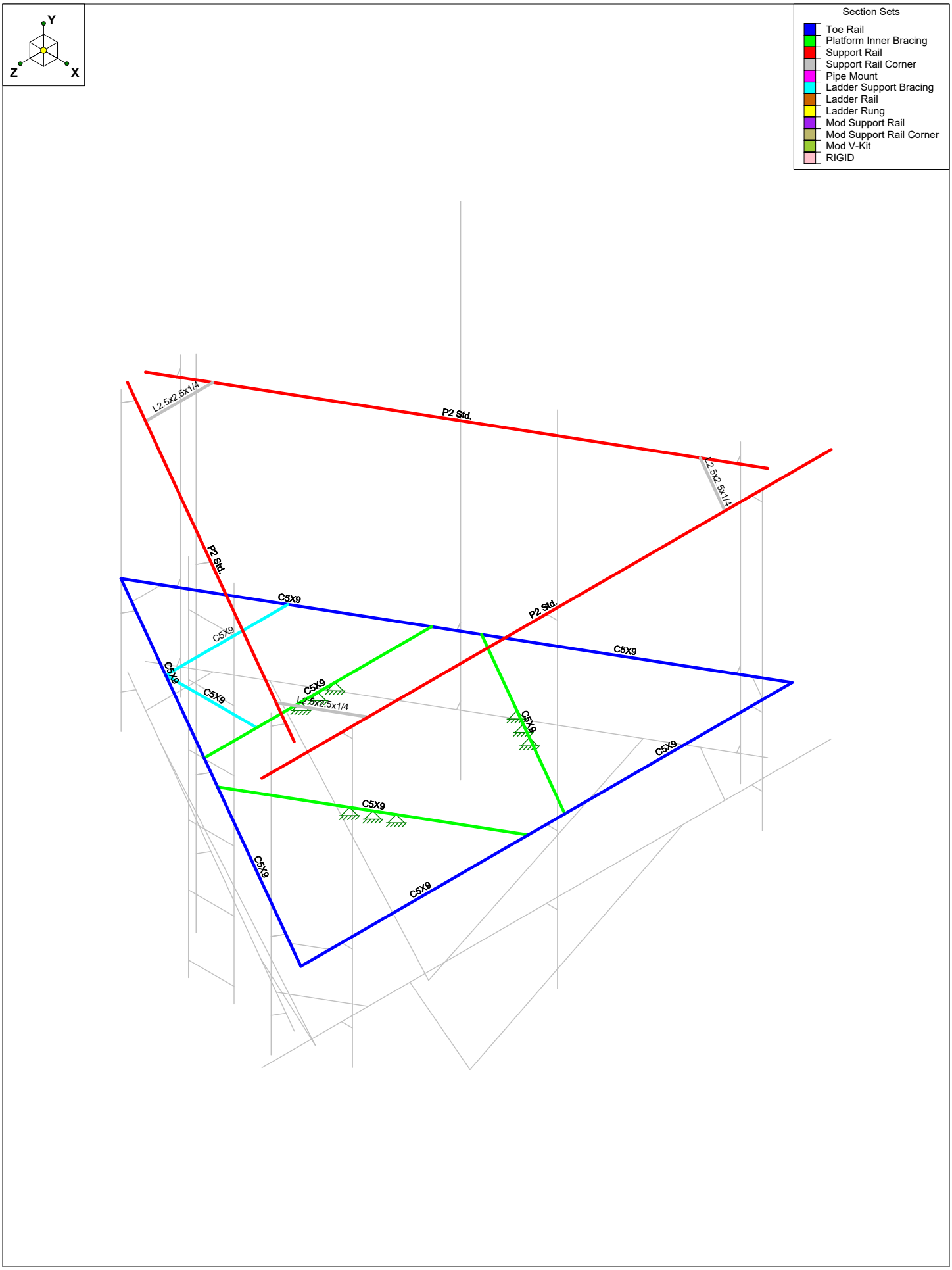
4.1) Recommendations

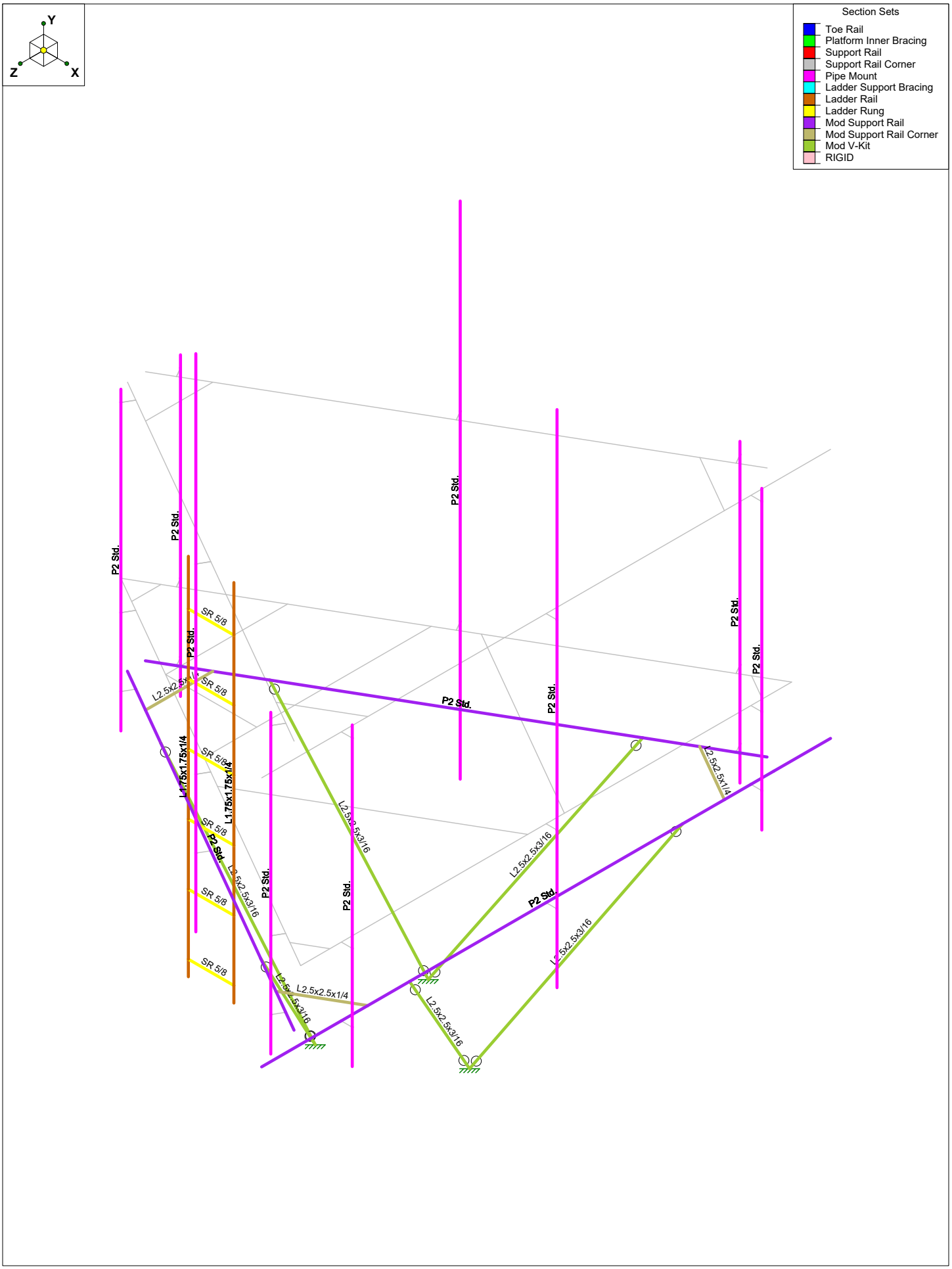
The mount has sufficient capacity to carry the proposed loading configuration. No modifications are required at this time.

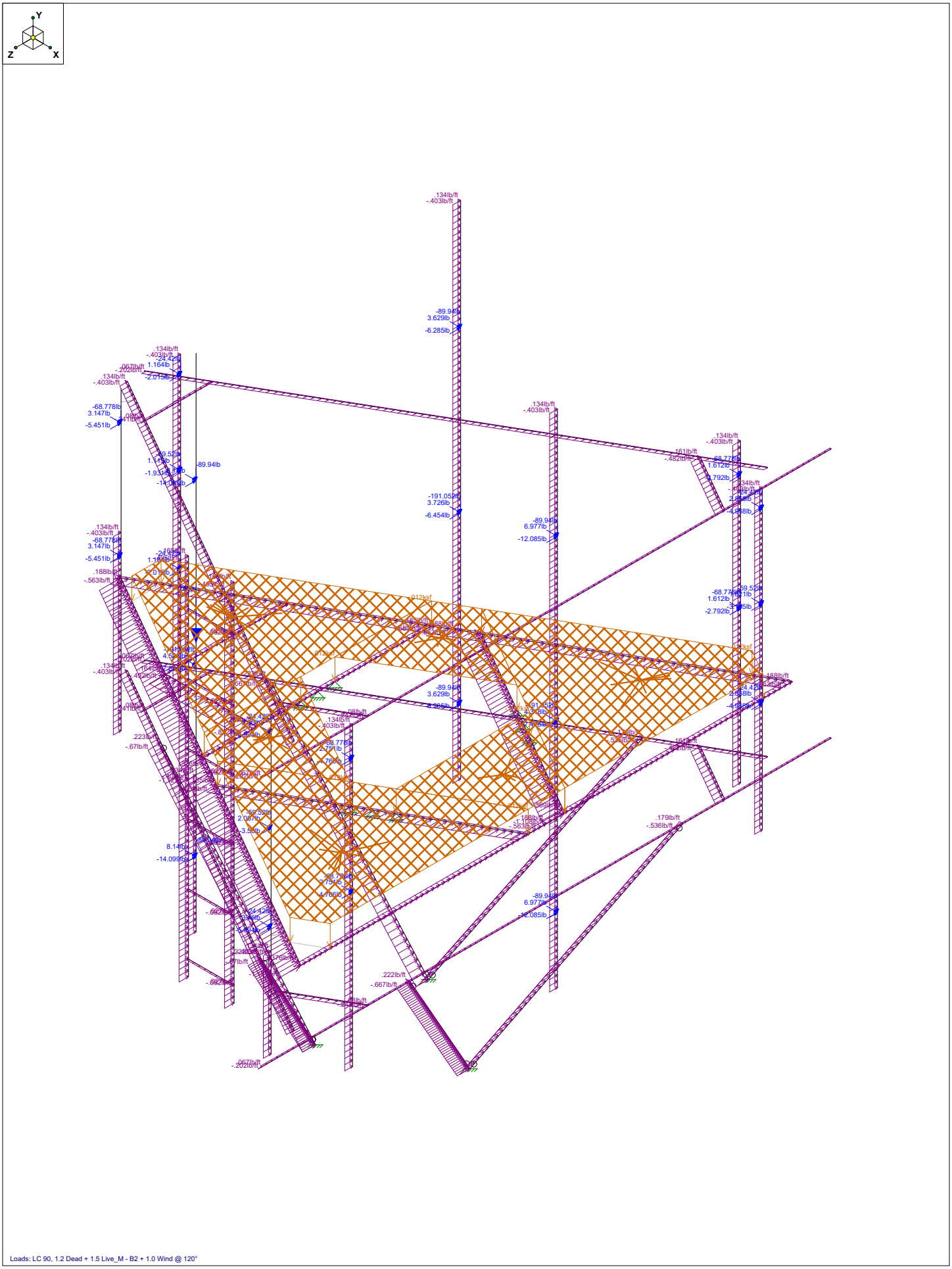
APPENDIX A

WIRE FRAME AND RENDERED MODELS

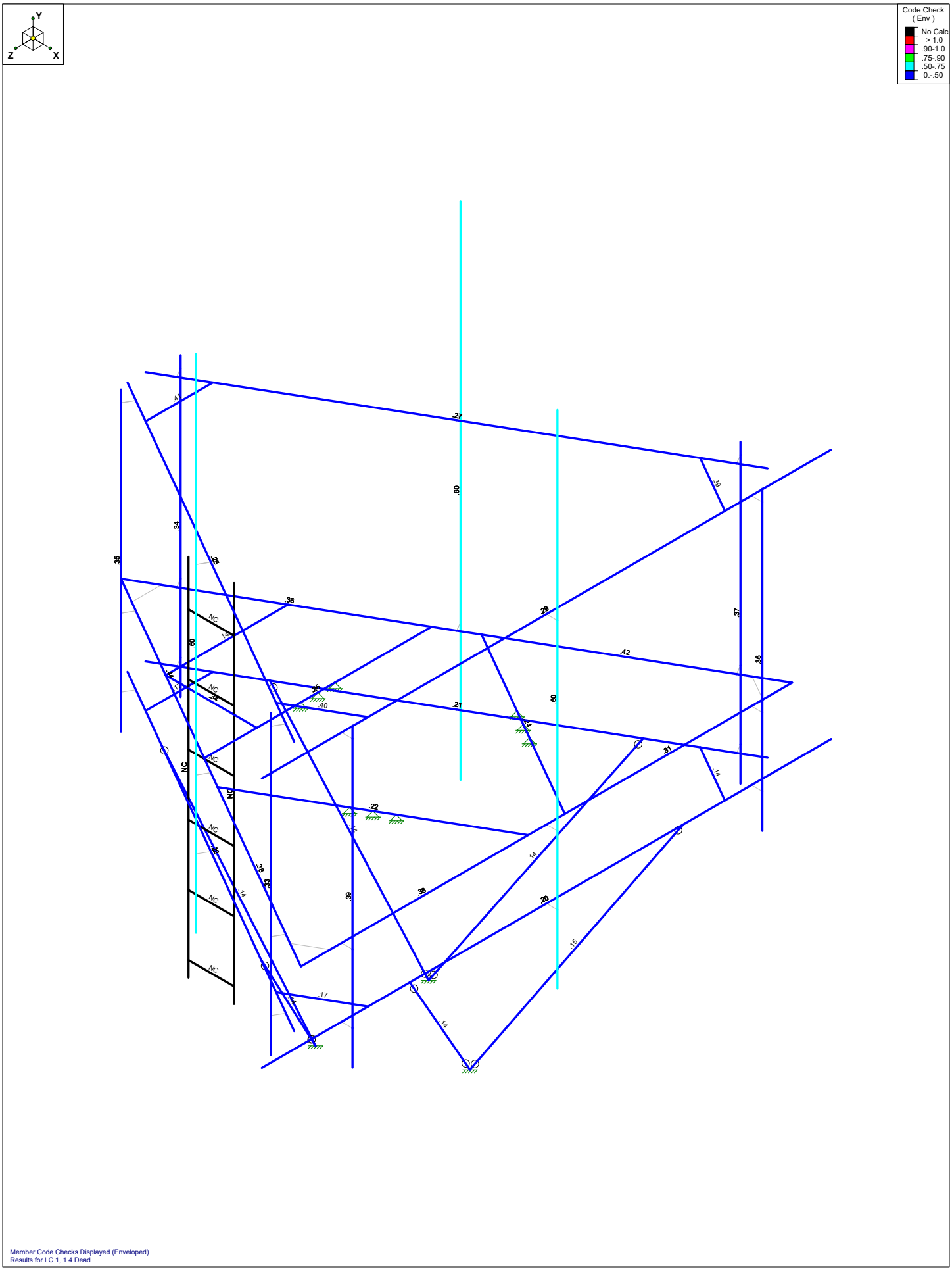

Y
Z
X

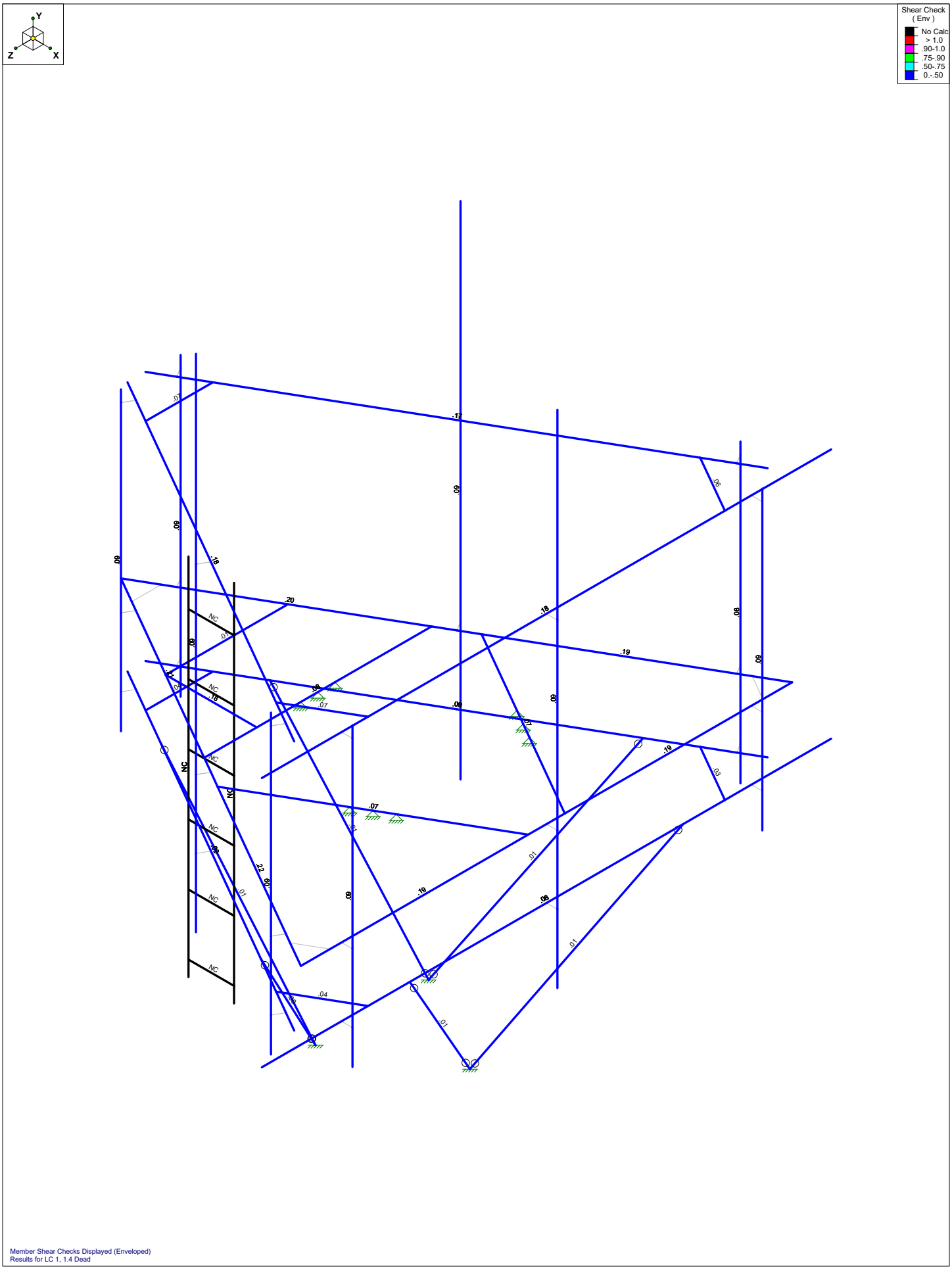

Y
Z
X
Section Sets
Toe Rail
Platform Inner Bracing
Support Rail
Support Rail Corner
Pipe Mount
Ladder Support Bracing
Ladder Rail
Ladder Rung
Mod Support Rail
Mod Support Rail Corner
Mod V-Kit
RIGID
L2.5x2.5x1/4
P2 Std.
L2.5x2.5x1/4
P2 Std.
C5X9
C5X9
P2 Std.
C5X9
C5X9
C5X9
L2.5x2.5x1/4
C5X9
C5X9
C5X9
C5X9
C5X9
C5X9


Y
Z
X
Section Sets
Toe Rail
Platform Inner Bracing
Support Rail
Support Rail Corner
Pipe Mount
Ladder Support Bracing
Ladder Rail
Ladder Rung
Mod Support Rail
Mod Support Rail Corner
Mod V-Kit
RIGID
P2 Std.
SR 5/8
L2.5x2.5x1/4
L2.5x2.5x3/16
L1.75x1.75x1/4



Loads: LC 90, 1.2 Dead + 1.5 Live_M - B2 + 1.0 Wind @ 120°


Y
Z
X
Code Check
(Env)
No Calc
> 1.0
.90-1.0
.75-.90
.50-.75
0.-.50
Member Code Checks Displayed (Enveloped)
Results for LC 1, 1.4 Dead



Member Shear Checks Displayed (Enveloped)
Results for LC 1, 1.4 Dead

APPENDIX B

SOFTWARE INPUT CALCULATIONS

TIA-222-H: Mount Analysis Wind Loading
876371 - WALDEN / CAROLYN BESADE
2021777.876371.01

Structure Information		
Structure Type:	Monopole	
Structure Height:	180	ft
z (Mount Centerline) =	180	ft
Gh (Mount Gust Effect Factor) =	1.00	
Risk Category:	II	

Code Specifications		
TIA/EIA Code:	H	
Ultimate Wind Speed (No Ice) =	135	mph (3-s gust)
Ultimate Wind Speed (With Ice) =	50	mph (3-s gust)
Ice Thickness	1.5	in
Exposure Category	B	
Tower Base Elevation (AMSL)	481	ft

Topographic Inputs	
Topographic Feature:	N/A

Section Sets										No Ice	Ice Output	
Mount Components	Member Type	Length (in)	Side (Longest seeing wind) (in)	Other Side (in)	Calculated Dc, for ice weight (in)	Dc, for ice weight (in)	Area Type (Round or Flat)	K_a	User's Wind Multiplier	Normal Wind Force (lb/ft)*	Normal Ice Wind Force (lb/ft)*	Ice Weight (lb/ft)*
Toe Rail	Square/Rect.	64.000	5	1.89		5.35	Flat	0.90	1.00	33.80	5.80	15.47
Platform Inner Bracing	Square/Rect.	60.000	5	1.89		5.35	Flat	0.90	1.00	33.24	5.73	15.47
Support Rail	Pipe	150.000	2.375	2.375		2.38	Round	0.90	1.00	12.09	4.14	9.02
Support Rail Corner	Angle	15.500	2.5	2.5		3.54	Flat	0.90	1.00	14.47	3.20	11.54
Pipe Mount	Pipe	132.000	2.375	2.375		2.38	Round	0.90	1.00	12.09	3.93	9.02
Ladder Support Bracing	Square/Rect.	34.000	5	1.89		5.35	Flat	0.90	1.00	29.51	5.20	15.47
Ladder Rail	Angle	96.000	1.75	1.75		2.47	Flat	0.90	1.00	14.85	3.97	9.23
Ladder Rung	Pipe	12.000	0.625	0.625		0.63	Round	0.90	1.00	2.84	1.72	5.22
Mod Support Rail	Pipe	150.000	2.375	2.375		2.38	Round	0.90	1.00	12.09	4.14	9.02
Mod Support Rail Corner	Angle	15.500	2.5	2.5		3.54	Flat	0.90	1.00	14.47	3.20	11.54
Mod V-Kit	Angle	72.000	2.5	2.5		3.54	Flat	0.90	1.00	21.22	4.15	11.54

*All forces are unfactored.

Appurtenances							Shielding			No Ice		Ice Output	
Appurtenance Model	Loading Elevation (ft)	Height (in)	Front Width (in)	Side Depth (in)	Wt (lbs)	Type for Area	Front Shielding (%)	Side Shielding (%)	K_a and/or block shielding	Normal Wind Force (lbs)*	Wt (lbs) (no ice)*	Normal Wind Force (lbs) (w/ ice)*	Wt (lbs) (only ice)*
(3) AIR6449 B41_T-MOBILE	180	33.11	20.51	8.54	114.63	Flat	0%	0%	0.90	259.33	114.63	41.78	157.89
(3) APX16DWV-16DWV-S-E-A20	180	55.9	13.3	3.15	40.7	CFD	0%	0%	0.90	286.87	40.70	53.05	143.64
(3) APXVAALL24_43-U-NA20_TMO	180	95.9	24	8.5	149.9	CFD	0%	0%	0.90	672.26	149.90	109.71	439.58
(3) RADIO 4415 B66A	180	16.5	13.5	6.3	49.6	Flat	0%	0%	0.90	85.06	49.60	15.31	63.75
(3) RADIO 4424 B25_TMO	180	17.1	14.4	11.3	86	Flat	0%	0%	0.90	94.03	86.00	16.71	88.35
(3) RADIO 4449 B71 B85A_T-MOBILE	180	17.91	13.2	10.63	73.21	Flat	0%	0%	0.90	90.28	73.21	16.15	83.88

*All forces are unfactored.

APPENDIX C

SOFTWARE ANALYSIS OUTPUT

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E5 F)	Density[k/ft^3]	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A992	29000	11154	.3	.65	.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	.3	.65	.527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	.527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	.3	.65	.49	35	1.6	60	1.2
7	A1085	29000	11154	.3	.65	.49	50	1.4	65	1.3

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Desig...	A [in2]	Iyy [i...	Izz [i...	J [in4]
1	Toe Rail	C5X9	None	None	A36 Gr.36	Typical	2.64	.624	8.89	.109
2	Platform Inner Bracing	C5X9	None	None	A36 Gr.36	Typical	2.64	.624	8.89	.109
3	Support Rail	P2 Std.	None	None	A53 Gr.B	Typical	1.077	.67	.67	1.34
4	Support Rail Corner	L2.5x2.5x1/4	None	None	A36 Gr.36	Typical	1.188	.703	.703	.023
5	Pipe Mount	P2 Std.	None	None	A53 Gr.B	Typical	1.077	.67	.67	1.34
6	Ladder Support Bracing	C5X9	None	None	A36 Gr.36	Typical	2.64	.624	8.89	.109
7	Ladder Rail	L1.75x1.75x1/4	None	None	A36 Gr.36	Typical	.813	.227	.227	.015
8	Ladder Rung	SR 5/8	None	None	A36 Gr.36	Typical	.307	.007	.007	.015
9	Mod Support Rail	P2 Std.	None	None	A53 Gr.B	Typical	1.077	.67	.67	1.34
10	Mod Support Rail Corner	L2.5x2.5x1/4	None	None	A36 Gr.36	Typical	1.188	.703	.703	.023
11	Mod V-Kit	L2.5x2.5x3/16	None	None	A36 Gr.36	Typical	.902	.547	.547	.01

Basic Load Cases

	BLC Description	Category	X Gra...	Y Gra...	Z Grav...	Joint	Point	Distrib...	Area(Member)	Surface(Plate/W...
1	Dead	DL		-1			30		6	
2	No Ice Wind 0 deg	None					30	39		
3	No Ice Wind 30 deg	None					60	78		
4	No Ice Wind 60 deg	None					60	92		
5	No Ice Wind 90 deg	None					30	38		
6	No Ice Wind 120 deg	None					60	92		
7	No Ice Wind 150 deg	None					60	78		
8	No Ice Wind 180 deg	None					30	39		
9	No Ice Wind 210 deg	None					60	78		
10	No Ice Wind 240 deg	None					60	92		
11	No Ice Wind 270 deg	None					30	38		
12	No Ice Wind 300 deg	None					60	92		
13	No Ice Wind 330 deg	None					60	78		
14	Ice Weight	None					30	46	6	
15	Ice Wind 0 deg	None					30	39		
16	Ice Wind 30 deg	None					60	78		
17	Ice Wind 60 deg	None					60	92		
18	Ice Wind 90 deg	None					30	38		
19	Ice Wind 120 deg	None					60	92		
20	Ice Wind 150 deg	None					60	78		
21	Ice Wind 180 deg	None					30	39		
22	Ice Wind 210 deg	None					60	78		
23	Ice Wind 240 deg	None					60	92		
24	Ice Wind 270 deg	None					30	38		
25	Ice Wind 300 deg	None					60	92		
26	Ice Wind 330 deg	None					60	78		
27	Live Load - A1	None					1			
28	Live Load - A2	None					1			
29	Live Load - A3	None					1			

Basic Load Cases (Continued)

	BLC Description	Category	X Gra...	Y Gra...	Z Grav...	Joint	Point	Distrib...	Area(Member)	Surface(Plate/W...
30	Live Load - B1	None					1			
31	Live Load - B2	None					1			
32	Live Load - B3	None					1			
33	Live Load - C1	None					1			
34	Live Load - C2	None					1			
35	Live Load - C3	None					1			
36	Live Load - M1 (Start)	None					1			
37	Live Load - M1 (Middle)	None					1			
38	Live Load - M1 (End)	None					1			
39	Live Load - M2 (Start)	None					1			
40	Live Load - M2 (Middle)	None					1			
41	Live Load - M2 (End)	None					1			
42	Live Load - M21 (Start)	None					1			
43	Live Load - M21 (Middle)	None					1			
44	Live Load - M21 (End)	None					1			
45	Live Load - M32 (Start)	None					1			
46	Live Load - M32 (Middle)	None					1			
47	Live Load - M32 (End)	None					1			
48	Live Load - M33 (Start)	None					1			
49	Live Load - M33 (Middle)	None					1			
50	Live Load - M33 (End)	None					1			
51	Live Load - M52 (Start)	None					1			
52	Live Load - M52 (Middle)	None					1			
53	Live Load - M52 (End)	None					1			
54	Live Load - M63 (Start)	None					1			
55	Live Load - M63 (Middle)	None					1			
56	Live Load - M63 (End)	None					1			
57	Live Load - M64 (Start)	None					1			
58	Live Load - M64 (Middle)	None					1			
59	Live Load - M64 (End)	None					1			
60	Live Load - M83 (Start)	None					1			
61	Live Load - M83 (Middle)	None					1			
62	Live Load - M83 (End)	None					1			
63	Live Load - M94 (Start)	None					1			
64	Live Load - M94 (Middle)	None					1			
65	Live Load - M94 (End)	None					1			
66	Live Load - M95 (Start)	None					1			
67	Live Load - M95 (Middle)	None					1			
68	Live Load - M95 (End)	None					1			
69	BLC 1 Transient Area Loads	None						84		
70	BLC 14 Transient Area Loads	None						84		

Load Combinations

	Description	S...	PDel...	SRSS	B...	Fa...	B...	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.4 Dead	Y...	Y		1	1.4	0		0		0		0		0		0		0					
2	1.2 Dead + 1.0 Wind @ 0° - No Ice	Y...	Y		1	1.2	2	1	0		0		0		0		0		0					
3	0.9 Dead + 1.0 Wind @ 0° - No Ice	Y...	Y		1	.9	2	1	0		0		0		0		0		0					
4	1.2 Dead + 1.0 Wind @ 30° - No Ice	Y...	Y		1	1.2	3	1	0		0		0		0		0		0					
5	0.9 Dead + 1.0 Wind @ 30° - No Ice	Y...	Y		1	.9	3	1	0		0		0		0		0		0					
6	1.2 Dead + 1.0 Wind @ 60° - No Ice	Y...	Y		1	1.2	4	1	0		0		0		0		0		0					
7	0.9 Dead + 1.0 Wind @ 60° - No Ice	Y...	Y		1	.9	4	1	0		0		0		0		0		0					
8	1.2 Dead + 1.0 Wind @ 90° - No Ice	Y...	Y		1	1.2	5	1	0		0		0		0		0		0					
9	0.9 Dead + 1.0 Wind @ 90° - No Ice	Y...	Y		1	.9	5	1	0		0		0		0		0		0					
10	1.2 Dead + 1.0 Wind @ 120° - No I...	Y...	Y		1	1.2	6	1	0		0		0		0		0		0					
11	0.9 Dead + 1.0 Wind @ 120° - No I...	Y...	Y		1	.9	6	1	0		0		0		0		0		0					

Load Combinations (Continued)

	Description	S...	PDel...	SRSS	B...	Fa...	B...	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
12	1.2 Dead + 1.0 Wind @ 150° - No I...	Y...	Y		1	1.2	7	1	0		0		0		0		0		0					
13	0.9 Dead + 1.0 Wind @ 150° - No I...	Y...	Y		1	.9	7	1	0		0		0		0		0		0					
14	1.2 Dead + 1.0 Wind @ 180° - No I...	Y...	Y		1	1.2	8	1	0		0		0		0		0		0					
15	0.9 Dead + 1.0 Wind @ 180° - No I...	Y...	Y		1	.9	8	1	0		0		0		0		0		0					
16	1.2 Dead + 1.0 Wind @ 210° - No I...	Y...	Y		1	1.2	9	1	0		0		0		0		0		0					
17	0.9 Dead + 1.0 Wind @ 210° - No I...	Y...	Y		1	.9	9	1	0		0		0		0		0		0					
18	1.2 Dead + 1.0 Wind @ 240° - No I...	Y...	Y		1	1.2	10	1	0		0		0		0		0		0					
19	0.9 Dead + 1.0 Wind @ 240° - No I...	Y...	Y		1	.9	10	1	0		0		0		0		0		0					
20	1.2 Dead + 1.0 Wind @ 270° - No I...	Y...	Y		1	1.2	11	1	0		0		0		0		0		0					
21	0.9 Dead + 1.0 Wind @ 270° - No I...	Y...	Y		1	.9	11	1	0		0		0		0		0		0					
22	1.2 Dead + 1.0 Wind @ 300° - No I...	Y...	Y		1	1.2	12	1	0		0		0		0		0		0					
23	0.9 Dead + 1.0 Wind @ 300° - No I...	Y...	Y		1	.9	12	1	0		0		0		0		0		0					
24	1.2 Dead + 1.0 Wind @ 330° - No I...	Y...	Y		1	1.2	13	1	0		0		0		0		0		0					
25	0.9 Dead + 1.0 Wind @ 330° - No I...	Y...	Y		1	.9	13	1	0		0		0		0		0		0					
26	1.2 Dead + 1.0 Ice Wind @ 0°+ 1.0...	Y...	Y		1	1.2	15	1	14	1		1	0		0		0		0					
27	1.2 Dead + 1.0 Ice Wind @ 30°+ 1...	Y...	Y		1	1.2	16	1	14	1		1	0		0		0		0					
28	1.2 Dead + 1.0 Ice Wind @ 60°+ 1...	Y...	Y		1	1.2	17	1	14	1		1	0		0		0		0					
29	1.2 Dead + 1.0 Ice Wind @ 90°+ 1...	Y...	Y		1	1.2	18	1	14	1		1	0		0		0		0					
30	1.2 Dead + 1.0 Ice Wind @ 120°+ ...	Y...	Y		1	1.2	19	1	14	1		1	0		0		0		0					
31	1.2 Dead + 1.0 Ice Wind @ 150°+ ...	Y...	Y		1	1.2	20	1	14	1		1	0		0		0		0					
32	1.2 Dead + 1.0 Ice Wind @ 180°+ ...	Y...	Y		1	1.2	21	1	14	1		1	0		0		0		0					
33	1.2 Dead + 1.0 Ice Wind @ 210°+ ...	Y...	Y		1	1.2	22	1	14	1		1	0		0		0		0					
34	1.2 Dead + 1.0 Ice Wind @ 240°+ ...	Y...	Y		1	1.2	23	1	14	1		1	0		0		0		0					
35	1.2 Dead + 1.0 Ice Wind @ 270°+ ...	Y...	Y		1	1.2	24	1	14	1		1	0		0		0		0					
36	1.2 Dead + 1.0 Ice Wind @ 300°+ ...	Y...	Y		1	1.2	25	1	14	1		1	0		0		0		0					
37	1.2 Dead + 1.0 Ice Wind @ 330°+ ...	Y...	Y		1	1.2	26	1	14	1		1	0		0		0		0					
38	1.2 Dead + 1.5 Live_M - A1 + 1.0 ...	Y...	Y		1	1.2	27	1.5	2	.049	0		0		0		0		0					
39	1.2 Dead + 1.5 Live_M - A1 + 1.0 ...	Y...	Y		1	1.2	27	1.5	3	.049	0		0		0		0		0					
40	1.2 Dead + 1.5 Live_M - A1 + 1.0 ...	Y...	Y		1	1.2	27	1.5	4	.049	0		0		0		0		0					
41	1.2 Dead + 1.5 Live_M - A1 + 1.0 ...	Y...	Y		1	1.2	27	1.5	5	.049	0		0		0		0		0					
42	1.2 Dead + 1.5 Live_M - A1 + 1.0 ...	Y...	Y		1	1.2	27	1.5	6	.049	0		0		0		0		0					
43	1.2 Dead + 1.5 Live_M - A1 + 1.0 ...	Y...	Y		1	1.2	27	1.5	7	.049	0		0		0		0		0					
44	1.2 Dead + 1.5 Live_M - A1 + 1.0 ...	Y...	Y		1	1.2	27	1.5	8	.049	0		0		0		0		0					
45	1.2 Dead + 1.5 Live_M - A1 + 1.0 ...	Y...	Y		1	1.2	27	1.5	9	.049	0		0		0		0		0					
46	1.2 Dead + 1.5 Live_M - A1 + 1.0 ...	Y...	Y		1	1.2	27	1.5	10	.049	0		0		0		0		0					
47	1.2 Dead + 1.5 Live_M - A1 + 1.0 ...	Y...	Y		1	1.2	27	1.5	11	.049	0		0		0		0		0					
48	1.2 Dead + 1.5 Live_M - A1 + 1.0 ...	Y...	Y		1	1.2	27	1.5	12	.049	0		0		0		0		0					
49	1.2 Dead + 1.5 Live_M - A1 + 1.0 ...	Y...	Y		1	1.2	27	1.5	13	.049	0		0		0		0		0					
50	1.2 Dead + 1.5 Live_M - A2 + 1.0 ...	Y...	Y		1	1.2	28	1.5	2	.049	0		0		0		0		0					
51	1.2 Dead + 1.5 Live_M - A2 + 1.0 ...	Y...	Y		1	1.2	28	1.5	3	.049	0		0		0		0		0					
52	1.2 Dead + 1.5 Live_M - A2 + 1.0 ...	Y...	Y		1	1.2	28	1.5	4	.049	0		0		0		0		0					
53	1.2 Dead + 1.5 Live_M - A2 + 1.0 ...	Y...	Y		1	1.2	28	1.5	5	.049	0		0		0		0		0					
54	1.2 Dead + 1.5 Live_M - A2 + 1.0 ...	Y...	Y		1	1.2	28	1.5	6	.049	0		0		0		0		0					
55	1.2 Dead + 1.5 Live_M - A2 + 1.0 ...	Y...	Y		1	1.2	28	1.5	7	.049	0		0		0		0		0					
56	1.2 Dead + 1.5 Live_M - A2 + 1.0 ...	Y...	Y		1	1.2	28	1.5	8	.049	0		0		0		0		0					
57	1.2 Dead + 1.5 Live_M - A2 + 1.0 ...	Y...	Y		1	1.2	28	1.5	9	.049	0		0		0		0		0					
58	1.2 Dead + 1.5 Live_M - A2 + 1.0 ...	Y...	Y		1	1.2	28	1.5	10	.049	0		0		0		0		0					
59	1.2 Dead + 1.5 Live_M - A2 + 1.0 ...	Y...	Y		1	1.2	28	1.5	11	.049	0		0		0		0		0					
60	1.2 Dead + 1.5 Live_M - A2 + 1.0 ...	Y...	Y		1	1.2	28	1.5	12	.049	0		0		0		0		0					
61	1.2 Dead + 1.5 Live_M - A2 + 1.0 ...	Y...	Y		1	1.2	28	1.5	13	.049	0		0		0		0		0					
62	1.2 Dead + 1.5 Live_M - A3 + 1.0 ...	Y...	Y		1	1.2	29	1.5	2	.049	0		0		0		0		0					
63	1.2 Dead + 1.5 Live_M - A3 + 1.0 ...	Y...	Y		1	1.2	29	1.5	3	.049	0		0		0		0		0					
64	1.2 Dead + 1.5 Live_M - A3 + 1.0 ...	Y...	Y		1	1.2	29	1.5	4	.049	0		0		0		0		0					
65	1.2 Dead + 1.5 Live_M - A3 + 1.0 ...	Y...	Y		1	1.2	29	1.5	5	.049	0		0		0		0		0					
66	1.2 Dead + 1.5 Live_M - A3 + 1.0 ...	Y...	Y		1	1.2	29	1.5	6	.049	0		0		0		0		0					
67	1.2 Dead + 1.5 Live_M - A3 + 1.0 ...	Y...	Y		1	1.2	29	1.5	7	.049	0		0		0		0		0					
68	1.2 Dead + 1.5 Live_M - A3 + 1.0 ...	Y...	Y		1	1.2	29	1.5	8	.049	0		0		0		0		0					

Load Combinations (Continued)

	Description	S...	PDel...	SRSS	B...	Fa...	B...	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
69	1.2 Dead + 1.5 Live_M - A3 + 1.0 ...	Y...	Y		1	1.2	29	1.5	9	.049	0		0		0		0					
70	1.2 Dead + 1.5 Live_M - A3 + 1.0 ...	Y...	Y		1	1.2	29	1.5	10	.049	0		0		0		0					
71	1.2 Dead + 1.5 Live_M - A3 + 1.0 ...	Y...	Y		1	1.2	29	1.5	11	.049	0		0		0		0					
72	1.2 Dead + 1.5 Live_M - A3 + 1.0 ...	Y...	Y		1	1.2	29	1.5	12	.049	0		0		0		0					
73	1.2 Dead + 1.5 Live_M - A3 + 1.0 ...	Y...	Y		1	1.2	29	1.5	13	.049	0		0		0		0					
74	1.2 Dead + 1.5 Live_M - B1 + 1.0 ...	Y...	Y		1	1.2	30	1.5	2	.049	0		0		0		0					
75	1.2 Dead + 1.5 Live_M - B1 + 1.0 ...	Y...	Y		1	1.2	30	1.5	3	.049	0		0		0		0					
76	1.2 Dead + 1.5 Live_M - B1 + 1.0 ...	Y...	Y		1	1.2	30	1.5	4	.049	0		0		0		0					
77	1.2 Dead + 1.5 Live_M - B1 + 1.0 ...	Y...	Y		1	1.2	30	1.5	5	.049	0		0		0		0					
78	1.2 Dead + 1.5 Live_M - B1 + 1.0 ...	Y...	Y		1	1.2	30	1.5	6	.049	0		0		0		0					
79	1.2 Dead + 1.5 Live_M - B1 + 1.0 ...	Y...	Y		1	1.2	30	1.5	7	.049	0		0		0		0					
80	1.2 Dead + 1.5 Live_M - B1 + 1.0 ...	Y...	Y		1	1.2	30	1.5	8	.049	0		0		0		0					
81	1.2 Dead + 1.5 Live_M - B1 + 1.0 ...	Y...	Y		1	1.2	30	1.5	9	.049	0		0		0		0					
82	1.2 Dead + 1.5 Live_M - B1 + 1.0 ...	Y...	Y		1	1.2	30	1.5	10	.049	0		0		0		0					
83	1.2 Dead + 1.5 Live_M - B1 + 1.0 ...	Y...	Y		1	1.2	30	1.5	11	.049	0		0		0		0					
84	1.2 Dead + 1.5 Live_M - B1 + 1.0 ...	Y...	Y		1	1.2	30	1.5	12	.049	0		0		0		0					
85	1.2 Dead + 1.5 Live_M - B1 + 1.0 ...	Y...	Y		1	1.2	30	1.5	13	.049	0		0		0		0					
86	1.2 Dead + 1.5 Live_M - B2 + 1.0 ...	Y...	Y		1	1.2	31	1.5	2	.049	0		0		0		0					
87	1.2 Dead + 1.5 Live_M - B2 + 1.0 ...	Y...	Y		1	1.2	31	1.5	3	.049	0		0		0		0					
88	1.2 Dead + 1.5 Live_M - B2 + 1.0 ...	Y...	Y		1	1.2	31	1.5	4	.049	0		0		0		0					
89	1.2 Dead + 1.5 Live_M - B2 + 1.0 ...	Y...	Y		1	1.2	31	1.5	5	.049	0		0		0		0					
90	1.2 Dead + 1.5 Live_M - B2 + 1.0 ...	Y...	Y		1	1.2	31	1.5	6	.049	0		0		0		0					
91	1.2 Dead + 1.5 Live_M - B2 + 1.0 ...	Y...	Y		1	1.2	31	1.5	7	.049	0		0		0		0					
92	1.2 Dead + 1.5 Live_M - B2 + 1.0 ...	Y...	Y		1	1.2	31	1.5	8	.049	0		0		0		0					
93	1.2 Dead + 1.5 Live_M - B2 + 1.0 ...	Y...	Y		1	1.2	31	1.5	9	.049	0		0		0		0					
94	1.2 Dead + 1.5 Live_M - B2 + 1.0 ...	Y...	Y		1	1.2	31	1.5	10	.049	0		0		0		0					
95	1.2 Dead + 1.5 Live_M - B2 + 1.0 ...	Y...	Y		1	1.2	31	1.5	11	.049	0		0		0		0					
96	1.2 Dead + 1.5 Live_M - B2 + 1.0 ...	Y...	Y		1	1.2	31	1.5	12	.049	0		0		0		0					
97	1.2 Dead + 1.5 Live_M - B2 + 1.0 ...	Y...	Y		1	1.2	31	1.5	13	.049	0		0		0		0					
98	1.2 Dead + 1.5 Live_M - B3 + 1.0 ...	Y...	Y		1	1.2	32	1.5	2	.049	0		0		0		0					
99	1.2 Dead + 1.5 Live_M - B3 + 1.0 ...	Y...	Y		1	1.2	32	1.5	3	.049	0		0		0		0					
100	1.2 Dead + 1.5 Live_M - B3 + 1.0 ...	Y...	Y		1	1.2	32	1.5	4	.049	0		0		0		0					
101	1.2 Dead + 1.5 Live_M - B3 + 1.0 ...	Y...	Y		1	1.2	32	1.5	5	.049	0		0		0		0					
102	1.2 Dead + 1.5 Live_M - B3 + 1.0 ...	Y...	Y		1	1.2	32	1.5	6	.049	0		0		0		0					
103	1.2 Dead + 1.5 Live_M - B3 + 1.0 ...	Y...	Y		1	1.2	32	1.5	7	.049	0		0		0		0					
104	1.2 Dead + 1.5 Live_M - B3 + 1.0 ...	Y...	Y		1	1.2	32	1.5	8	.049	0		0		0		0					
105	1.2 Dead + 1.5 Live_M - B3 + 1.0 ...	Y...	Y		1	1.2	32	1.5	9	.049	0		0		0		0					
106	1.2 Dead + 1.5 Live_M - B3 + 1.0 ...	Y...	Y		1	1.2	32	1.5	10	.049	0		0		0		0					
107	1.2 Dead + 1.5 Live_M - B3 + 1.0 ...	Y...	Y		1	1.2	32	1.5	11	.049	0		0		0		0					
108	1.2 Dead + 1.5 Live_M - B3 + 1.0 ...	Y...	Y		1	1.2	32	1.5	12	.049	0		0		0		0					
109	1.2 Dead + 1.5 Live_M - B3 + 1.0 ...	Y...	Y		1	1.2	32	1.5	13	.049	0		0		0		0					
110	1.2 Dead + 1.5 Live_M - C1 + 1.0 ...	Y...	Y		1	1.2	33	1.5	2	.049	0		0		0		0					
111	1.2 Dead + 1.5 Live_M - C1 + 1.0 ...	Y...	Y		1	1.2	33	1.5	3	.049	0		0		0		0					
112	1.2 Dead + 1.5 Live_M - C1 + 1.0 ...	Y...	Y		1	1.2	33	1.5	4	.049	0		0		0		0					
113	1.2 Dead + 1.5 Live_M - C1 + 1.0 ...	Y...	Y		1	1.2	33	1.5	5	.049	0		0		0		0					
114	1.2 Dead + 1.5 Live_M - C1 + 1.0 ...	Y...	Y		1	1.2	33	1.5	6	.049	0		0		0		0					
115	1.2 Dead + 1.5 Live_M - C1 + 1.0 ...	Y...	Y		1	1.2	33	1.5	7	.049	0		0		0		0					
116	1.2 Dead + 1.5 Live_M - C1 + 1.0 ...	Y...	Y		1	1.2	33	1.5	8	.049	0		0		0		0					
117	1.2 Dead + 1.5 Live_M - C1 + 1.0 ...	Y...	Y		1	1.2	33	1.5	9	.049	0		0		0		0					
118	1.2 Dead + 1.5 Live_M - C1 + 1.0 ...	Y...	Y		1	1.2	33	1.5	10	.049	0		0		0		0					
119	1.2 Dead + 1.5 Live_M - C1 + 1.0 ...	Y...	Y		1	1.2	33	1.5	11	.049	0		0		0		0					
120	1.2 Dead + 1.5 Live_M - C1 + 1.0 ...	Y...	Y		1	1.2	33	1.5	12	.049	0		0		0		0					
121	1.2 Dead + 1.5 Live_M - C1 + 1.0 ...	Y...	Y		1	1.2	33	1.5	13	.049	0		0		0		0					
122	1.2 Dead + 1.5 Live_M - C2 + 1.0 ...	Y...	Y		1	1.2	34	1.5	2	.049	0		0		0		0					
123	1.2 Dead + 1.5 Live_M - C2 + 1.0 ...	Y...	Y		1	1.2	34	1.5	3	.049	0		0		0		0					
124	1.2 Dead + 1.5 Live_M - C2 + 1.0 ...	Y...	Y		1	1.2	34	1.5	4	.049	0		0		0		0					
125	1.2 Dead + 1.5 Live_M - C2 + 1.0 ...	Y...	Y		1	1.2	34	1.5	5	.049	0		0		0		0					

Load Combinations (Continued)

	Description	S...	PDel..	SRSS	B...	Fa...	B...	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
126	1.2 Dead + 1.5 Live_M - C2 + 1.0 ...	Y...	Y		1	1.2	34	1.5	6	.049	0		0		0		0		0					
127	1.2 Dead + 1.5 Live_M - C2 + 1.0 ...	Y...	Y		1	1.2	34	1.5	7	.049	0		0		0		0		0					
128	1.2 Dead + 1.5 Live_M - C2 + 1.0 ...	Y...	Y		1	1.2	34	1.5	8	.049	0		0		0		0		0					
129	1.2 Dead + 1.5 Live_M - C2 + 1.0 ...	Y...	Y		1	1.2	34	1.5	9	.049	0		0		0		0		0					
130	1.2 Dead + 1.5 Live_M - C2 + 1.0 ...	Y...	Y		1	1.2	34	1.5	10	.049	0		0		0		0		0					
131	1.2 Dead + 1.5 Live_M - C2 + 1.0 ...	Y...	Y		1	1.2	34	1.5	11	.049	0		0		0		0		0					
132	1.2 Dead + 1.5 Live_M - C2 + 1.0 ...	Y...	Y		1	1.2	34	1.5	12	.049	0		0		0		0		0					
133	1.2 Dead + 1.5 Live_M - C2 + 1.0 ...	Y...	Y		1	1.2	34	1.5	13	.049	0		0		0		0		0					
134	1.2 Dead + 1.5 Live_M - C3 + 1.0 ...	Y...	Y		1	1.2	35	1.5	2	.049	0		0		0		0		0					
135	1.2 Dead + 1.5 Live_M - C3 + 1.0 ...	Y...	Y		1	1.2	35	1.5	3	.049	0		0		0		0		0					
136	1.2 Dead + 1.5 Live_M - C3 + 1.0 ...	Y...	Y		1	1.2	35	1.5	4	.049	0		0		0		0		0					
137	1.2 Dead + 1.5 Live_M - C3 + 1.0 ...	Y...	Y		1	1.2	35	1.5	5	.049	0		0		0		0		0					
138	1.2 Dead + 1.5 Live_M - C3 + 1.0 ...	Y...	Y		1	1.2	35	1.5	6	.049	0		0		0		0		0					
139	1.2 Dead + 1.5 Live_M - C3 + 1.0 ...	Y...	Y		1	1.2	35	1.5	7	.049	0		0		0		0		0					
140	1.2 Dead + 1.5 Live_M - C3 + 1.0 ...	Y...	Y		1	1.2	35	1.5	8	.049	0		0		0		0		0					
141	1.2 Dead + 1.5 Live_M - C3 + 1.0 ...	Y...	Y		1	1.2	35	1.5	9	.049	0		0		0		0		0					
142	1.2 Dead + 1.5 Live_M - C3 + 1.0 ...	Y...	Y		1	1.2	35	1.5	10	.049	0		0		0		0		0					
143	1.2 Dead + 1.5 Live_M - C3 + 1.0 ...	Y...	Y		1	1.2	35	1.5	11	.049	0		0		0		0		0					
144	1.2 Dead + 1.5 Live_M - C3 + 1.0 ...	Y...	Y		1	1.2	35	1.5	12	.049	0		0		0		0		0					
145	1.2 Dead + 1.5 Live_M - C3 + 1.0 ...	Y...	Y		1	1.2	35	1.5	13	.049	0		0		0		0		0					
146	1.2 Dead + 1.5 Live_V - M1 (Start)	Y...	Y		1	1.2	36	1.5	0		0		0		0		0		0					
147	1.2 Dead + 1.5 Live_V - M1 (Middle)	Y...	Y		1	1.2	37	1.5	0		0		0		0		0		0					
148	1.2 Dead + 1.5 Live_V - M1 (End)	Y...	Y		1	1.2	38	1.5	0		0		0		0		0		0					
149	1.2 Dead + 1.5 Live_V - M2 (Start)	Y...	Y		1	1.2	39	1.5	0		0		0		0		0		0					
150	1.2 Dead + 1.5 Live_V - M2 (Middle)	Y...	Y		1	1.2	40	1.5	0		0		0		0		0		0					
151	1.2 Dead + 1.5 Live_V - M2 (End)	Y...	Y		1	1.2	41	1.5	0		0		0		0		0		0					
152	1.2 Dead + 1.5 Live_V - M21 (Start)	Y...	Y		1	1.2	42	1.5	0		0		0		0		0		0					
153	1.2 Dead + 1.5 Live_V - M21 (Midd..	Y...	Y		1	1.2	43	1.5	0		0		0		0		0		0					
154	1.2 Dead + 1.5 Live_V - M21 (End)	Y...	Y		1	1.2	44	1.5	0		0		0		0		0		0					
155	1.2 Dead + 1.5 Live_V - M32 (Start)	Y...	Y		1	1.2	45	1.5	0		0		0		0		0		0					
156	1.2 Dead + 1.5 Live_V - M32 (Midd..	Y...	Y		1	1.2	46	1.5	0		0		0		0		0		0					
157	1.2 Dead + 1.5 Live_V - M32 (End)	Y...	Y		1	1.2	47	1.5	0		0		0		0		0		0					
158	1.2 Dead + 1.5 Live_V - M33 (Start)	Y...	Y		1	1.2	48	1.5	0		0		0		0		0		0					
159	1.2 Dead + 1.5 Live_V - M33 (Midd..	Y...	Y		1	1.2	49	1.5	0		0		0		0		0		0					
160	1.2 Dead + 1.5 Live_V - M33 (End)	Y...	Y		1	1.2	50	1.5	0		0		0		0		0		0					
161	1.2 Dead + 1.5 Live_V - M52 (Start)	Y...	Y		1	1.2	51	1.5	0		0		0		0		0		0					
162	1.2 Dead + 1.5 Live_V - M52 (Midd..	Y...	Y		1	1.2	52	1.5	0		0		0		0		0		0					
163	1.2 Dead + 1.5 Live_V - M52 (End)	Y...	Y		1	1.2	53	1.5	0		0		0		0		0		0					
164	1.2 Dead + 1.5 Live_V - M63 (Start)	Y...	Y		1	1.2	54	1.5	0		0		0		0		0		0					
165	1.2 Dead + 1.5 Live_V - M63 (Midd..	Y...	Y		1	1.2	55	1.5	0		0		0		0		0		0					
166	1.2 Dead + 1.5 Live_V - M63 (End)	Y...	Y		1	1.2	56	1.5	0		0		0		0		0		0					
167	1.2 Dead + 1.5 Live_V - M64 (Start)	Y...	Y		1	1.2	57	1.5	0		0		0		0		0		0					
168	1.2 Dead + 1.5 Live_V - M64 (Midd..	Y...	Y		1	1.2	58	1.5	0		0		0		0		0		0					
169	1.2 Dead + 1.5 Live_V - M64 (End)	Y...	Y		1	1.2	59	1.5	0		0		0		0		0		0					
170	1.2 Dead + 1.5 Live_V - M83 (Start)	Y...	Y		1	1.2	60	1.5	0		0		0		0		0		0					
171	1.2 Dead + 1.5 Live_V - M83 (Midd..	Y...	Y		1	1.2	61	1.5	0		0		0		0		0		0					
172	1.2 Dead + 1.5 Live_V - M83 (End)	Y...	Y		1	1.2	62	1.5	0		0		0		0		0		0					
173	1.2 Dead + 1.5 Live_V - M94 (Start)	Y...	Y		1	1.2	63	1.5	0		0		0		0		0		0					
174	1.2 Dead + 1.5 Live_V - M94 (Midd..	Y...	Y		1	1.2	64	1.5	0		0		0		0		0		0					
175	1.2 Dead + 1.5 Live_V - M94 (End)	Y...	Y		1	1.2	65	1.5	0		0		0		0		0		0					
176	1.2 Dead + 1.5 Live_V - M95 (Start)	Y...	Y		1	1.2	66	1.5	0		0		0		0		0		0					
177	1.2 Dead + 1.5 Live_V - M95 (Midd..	Y...	Y		1	1.2	67	1.5	0		0		0		0		0		0					
178	1.2 Dead + 1.5 Live_V - M95 (End)	Y...	Y		1	1.2	68	1.5	0		0		0		0		0		0					

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N7	m...	1162.153	2	2956.852	27	1985.199	10	0	178	0	178	0	178
2		min	-1162.3...	15	212.004	17	-1945.509	23	0	1	0	1	0	1
3	N6	m...	1889.419	15	-466.947	15	4.207	11	0	178	0	178	0	178
4		min	-1911.1...	2	-4572.581	26	-4.207	18	0	1	0	1	0	1
5	N5	m...	1660.478	2	3719.887	37	2633.695	7	0	178	0	178	0	178
6		min	-1632.9...	15	352.955	13	-2676.301	18	0	1	0	1	0	1
7	N62	m...	2651.579	2	3048.045	29	534.62	4	0	178	0	178	0	178
8		min	-2585.5...	15	174.373	21	-505.521	17	0	1	0	1	0	1
9	N63	m...	780.286	11	-448.765	23	1354.257	22	0	178	0	178	0	178
10		min	-783.934	22	-4400.698	30	-1347.939	11	0	1	0	1	0	1
11	N64	m...	1349.169	9	3226.693	32	2046.922	9	0	178	0	178	0	178
12		min	-1399.0...	20	83.843	3	-2082.635	20	0	1	0	1	0	1
13	N119	m...	1712.046	23	3199.41	32	2202.255	10	0	178	0	178	0	178
14		min	-1758.7...	10	132.644	3	-2172.877	23	0	1	0	1	0	1
15	N120	m...	761.517	21	-540.449	7	1309.271	21	0	178	0	178	0	178
16		min	-763.679	8	-4429.875	34	-1313.016	8	0	1	0	1	0	1
17	N121	m...	2446.774	2	3113.588	36	546.344	13	0	178	0	178	0	178
18		min	-2382.0...	15	184.097	11	-573.87	24	0	1	0	1	0	1
19	N64B	m...	644.531	32	1657.67	32	259.446	71	0	8	0	8	0	12
20		min	-46.39	3	-323.11	3	-255.779	41	0	21	0	21	0	25
21	N82	m...	88.708	15	1698.92	36	560.542	36	0	11	0	14	0	11
22		min	-427.368	98	-348.533	11	-60.574	11	0	22	0	3	0	22
23	N86	m...	69.484	13	1668.131	28	71.825	23	0	6	0	2	0	17
24		min	-415.934	121	-280.285	19	-557.049	30	0	19	0	15	0	4
25	Totals:	m...	6082.104	2	10055.623	26	6046.773	9						
26		min	-6082.1...	15	2804.59	15	-6046.775	21						

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

	Member	Shape	Code Che...	Loc[in]	LC	Shear Che...	Loc[in]	Dir	LC	phi*...	phi*...	phi*...	phi*...	...	Eqn
1	B2	P2 Std.	.601	94.875	90	.087	96.25		20	1969..	3392..	2.006	2.006	...	H1-...
2	C2	P2 Std.	.601	94.875	130	.088	94.875		14	1969..	3392..	2.006	2.006	...	H1-...
3	A2	P2 Std.	.600	94.875	50	.093	94.875		22	1969..	3392..	2.006	2.006	...	H1-...
4	M83	C5X9	.438	4.72	20	.208	54.618	z	8	3363..	85536	1.909	11.8...	...	H1-...
5	M21	C5X9	.418	4.72	2	.190	54.618	z	16	3363..	85536	1.909	11.8...	...	H1-...
6	M26	L2.5x2.5x1/4	.408	0	8	.073	0	y	20	3592..	38475	1.145	2.565	...	H2-1
7	M28	L2.5x2.5x1/4	.404	17.732	10	.070	17.732	y	24	3592..	38475	1.145	2.565	...	H2-1
8	M27	L2.5x2.5x1/4	.393	17.732	2	.061	17.732	y	14	3592..	38475	1.145	2.565	...	H2-1
9	A3	P2 Std.	.391	50.375	10	.086	51.188		14	5641..	3392..	2.006	2.006	...	H1-...
10	M63	C5X9	.385	60.012	2	.220	10.114	z	10	3363..	85536	1.909	11.8...	...	H1-...
11	M52	C5X9	.377	4.72	10	.194	54.618	z	24	3363..	85536	1.909	11.8...	...	H1-...
12	C3	P2 Std.	.368	50.375	2	.079	51.188		8	5641..	3392..	2.006	2.006	...	H1-...
13	A1	P2 Std.	.362	50.375	10	.091	51.188		14	5641..	3392..	2.006	2.006	...	H1-...
14	M1	C5X9	.358	60.012	8	.202	10.114	z	20	3363..	85536	1.909	11.8...	...	H1-...
15	B3	P2 Std.	.346	50.375	18	.088	50.375		10	5641..	3392..	2.006	2.006	...	H1-...
16	C1	P2 Std.	.339	50.375	2	.090	50.375		8	5641..	3392..	2.006	2.006	...	H1-...
17	M94	C5X9	.339	24	8	.179	18	z	8	7523..	85536	1.909	11.8...	...	H1-...
18	B1	P2 Std.	.331	50.375	2	.088	51.188		22	5641..	3392..	2.006	2.006	...	H1-...
19	M32	C5X9	.314	60.012	20	.189	10.114	z	2	3363..	85536	1.909	11.8...	...	H1-...
20	M23	P2 Std.	.295	75	10	.178	28.125		2	6727..	3392..	2.006	2.006	...	H1-...
21	M24	P2 Std.	.267	107.5	2	.168	106.25		18	1051..	3392..	2.006	2.006	...	H1-...
22	M2	C5X9	.259	34.948	2	.082	34.324	y	37	3845..	85536	1.909	11.8...	...	H1-...
23	M25	P2 Std.	.252	60	20	.176	13.75		10	1051..	3392..	2.006	2.006	...	H1-...
24	M33	C5X9	.235	0	11	.074	25.587	y	32	3845..	85536	1.909	11.8...	...	H1-...
25	M64	C5X9	.224	59.911	22	.074	34.324	y	32	3845..	85536	1.909	11.8...	...	H1-...

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

	Member	Shape	Code Che...	Loc[in]	LC	Shear Che...	Loc[in]	Dir	LC	phi*...	phi*...	phi*...	phi*...	...	Eqn
26	M31	P2 Std.	.221	6.25	26	.090	12.5		26	1051..	3392..	2.006	2.006	...	H1-...
27	M30	P2 Std.	.213	6.25	26	.087	107.5		10	1051..	3392..	2.006	2.006	...	H1-...
28	M29	P2 Std.	.203	110.938	32	.082	26.563		34	6727..	3392..	2.006	2.006	...	H1-...
29	M32A	L2.5x2.5x1/4	.167	0	20	.039	.185	z	20	3592..	38475	1.145	2.565	...	H2-1
30	M34	L2.5x2.5x1/4	.167	17.732	22	.036	4.064	z	12	3592..	38475	1.145	2.565	...	H2-1
31	M36	L2.5x2.5x3/16	.145	31.65	14	.005	0	z	14	1235..	2923..	.911	1.62	...	H2-1
32	M35	L2.5x2.5x3/16	.144	31.65	14	.005	63.3	y	14	1235..	2923..	.911	1.62	...	H2-1
33	M40	L2.5x2.5x3/16	.143	31.65	8	.006	63.3	z	8	1235..	2923..	.911	1.62	...	H2-1
34	M37	L2.5x2.5x3/16	.143	31.65	20	.006	63.3	y	20	1235..	2923..	.911	1.62	...	H2-1
35	M33A	L2.5x2.5x1/4	.140	17.732	14	.031	0	z	4	3592..	38475	1.145	2.565	...	H2-1
36	M38	L2.5x2.5x3/16	.136	32.31	35	.005	0	z	24	1235..	2923..	.911	1.62	...	H2-1
37	M39	L2.5x2.5x3/16	.136	32.31	29	.005	0	y	2	1235..	2923..	.911	1.62	...	H2-1
38	M95	C5X9	.135	0	8	.012	16.099	z	20	6790..	85536	1.909	11.8...	...	H1-...

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

	Member	Shape	Code Check Actual	Code Check Allowable	Ratio (Act./Allow.)	Loc[in]	LC	Shear Check	Shear Check Allowable	Ratio (Act./Allow.)	Loc[in]	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [k-ft]	phi*Mn z-z [k-ft]	Cb	Eqn
1	B2	P2 Std.	0.601	1.05	0.572*	94.88	90	0.087	1.05	0.083*	96.25	1969.828	33925.5	2.006	2.006	2.321	H1-1a
2	C2	P2 Std.	0.601	1.05	0.572*	94.88	130	0.088	1.05	0.084*	94.88	1969.828	33925.5	2.006	2.006	2.202	H1-1a
3	A2	P2 Std.	0.6	1.05	0.571*	94.88	50	0.093	1.05	0.089*	94.88	1969.828	33925.5	2.006	2.006	2.266	H1-1a
4	M83	C5X9	0.438	1.05	0.417*	4.72	20	0.208	1.05	0.198*	54.62	33638.136	85536	1.909	11.853	1.854	H1-1b
5	M21	C5X9	0.418	1.05	0.398*	4.72	2	0.19	1.05	0.181*	54.62	33638.135	85536	1.909	11.853	1.768	H1-1b
6	M26	L2.5x2.5x1/4	0.408	1.05	0.389*	0	8	0.073	1.05	0.07*	0	35926.531	38475	1.145	2.565	2.264	H2-1
7	M28	L2.5x2.5x1/4	0.404	1.05	0.385*	17.73	10	0.07	1.05	0.067*	17.73	35926.531	38475	1.145	2.565	2.243	H2-1
8	M27	L2.5x2.5x1/4	0.393	1.05	0.374*	17.73	2	0.061	1.05	0.058*	17.73	35926.531	38475	1.145	2.565	2.263	H2-1
9	A3	P2 Std.	0.391	1.05	0.372*	50.38	10	0.086	1.05	0.082*	51.19	5641.399	33925.5	2.006	2.006	1.874	H1-1b
10	M63	C5X9	0.385	1.05	0.367*	60.01	2	0.22	1.05	0.21*	10.11	33638.135	85536	1.909	11.853	1.762	H1-1b
11	M52	C5X9	0.377	1.05	0.359*	4.72	10	0.194	1.05	0.185*	54.62	33638.135	85536	1.909	11.853	1.777	H1-1b
12	C3	P2 Std.	0.368	1.05	0.35*	50.38	2	0.079	1.05	0.075*	51.19	5641.399	33925.5	2.006	2.006	2.265	H1-1b
13	A1	P2 Std.	0.362	1.05	0.345*	50.38	10	0.091	1.05	0.087*	51.19	5641.399	33925.5	2.006	2.006	2.279	H1-1b
14	M1	C5X9	0.358	1.05	0.341*	60.01	8	0.202	1.05	0.192*	10.11	33638.135	85536	1.909	11.853	1.932	H1-1b
15	B3	P2 Std.	0.346	1.05	0.33*	50.38	18	0.088	1.05	0.084*	50.38	5641.399	33925.5	2.006	2.006	2.616	H1-1b
16	C1	P2 Std.	0.339	1.05	0.323*	50.38	2	0.09	1.05	0.086*	50.38	5641.399	33925.5	2.006	2.006	2.373	H1-1b
17	M94	C5X9	0.339	1.05	0.323*	24	8	0.179	1.05	0.17*	18	75237.284	85536	1.909	11.853	1.815	H1-1b
18	B1	P2 Std.	0.331	1.05	0.315*	50.38	2	0.088	1.05	0.084*	51.19	5641.399	33925.5	2.006	2.006	2.181	H1-1b
19	M32	C5X9	0.314	1.05	0.299*	60.01	20	0.189	1.05	0.18*	10.11	33638.136	85536	1.909	11.853	1.768	H1-1b
20	M23	P2 Std.	0.295	1.05	0.281*	75	10	0.178	1.05	0.17*	28.13	6727.166	33925.5	2.006	2.006	1.424	H1-1b
21	M24	P2 Std.	0.267	1.05	0.254*	107.5	2	0.168	1.05	0.16*	106.3	10511.197	33925.5	2.006	2.006	1.799	H1-1b
22	M2	C5X9	0.259	1.05	0.247*	34.95	2	0.082	1.05	0.078*	34.32	38455.723	85536	1.909	11.853	1.65	H1-1b
23	M25	P2 Std.	0.252	1.05	0.24*	60	20	0.176	1.05	0.168*	13.75	10511.197	33925.5	2.006	2.006	2.044	H1-1b
24	M33	C5X9	0.235	1.05	0.224*	0	11	0.074	1.05	0.07*	25.59	38455.723	85536	1.909	11.853	1.559	H1-1b
25	M64	C5X9	0.224	1.05	0.213*	59.91	22	0.074	1.05	0.07*	34.32	38455.723	85536	1.909	11.853	1.735	H1-1b
26	M31	P2 Std.	0.221	1.05	0.21*	6.25	26	0.09	1.05	0.086*	12.5	10511.197	33925.5	2.006	2.006	1.42	H1-1b
27	M30	P2 Std.	0.213	1.05	0.203*	6.25	26	0.087	1.05	0.083*	107.5	10511.197	33925.5	2.006	2.006	1.403	H1-1b
28	M29	P2 Std.	0.203	1.05	0.193*	110.9	32	0.082	1.05	0.078*	26.56	6727.166	33925.5	2.006	2.006	1.23	H1-1b
29	M32A	L2.5x2.5x1/4	0.167	1.05	0.159*	0	20	0.039	1.05	0.037*	0.185	35926.531	38475	1.145	2.565	2.176	H2-1
30	M34	L2.5x2.5x1/4	0.167	1.05	0.159*	17.73	22	0.036	1.05	0.034*	4.064	35926.531	38475	1.145	2.565	1.665	H2-1
31	M36	L2.5x2.5x3/16	0.145	1.05	0.138*	31.65	14	0.005	1.05	0.005*	0	12355.418	29235.938	0.911	1.62	1.136	H2-1
32	M35	L2.5x2.5x3/16	0.144	1.05	0.137*	31.65	14	0.005	1.05	0.005*	63.3	12355.418	29235.938	0.911	1.62	1.136	H2-1
33	M40	L2.5x2.5x3/16	0.143	1.05	0.136*	31.65	8	0.006	1.05	0.006*	63.3	12355.418	29235.938	0.911	1.62	1.136	H2-1
34	M37	L2.5x2.5x3/16	0.143	1.05	0.136*	31.65	20	0.006	1.05	0.006*	63.3	12355.418	29235.938	0.911	1.62	1.136	H2-1
35	M33A	L2.5x2.5x1/4	0.14	1.05	0.133*	17.73	14	0.031	1.05	0.03*	0	35926.531	38475	1.145	2.565	1.603	H2-1
36	M38	L2.5x2.5x3/16	0.136	1.05	0.13*	32.31	35	0.005	1.05	0.005*	0	12355.418	29235.938	0.911	1.62	1.136	H2-1
37	M39	L2.5x2.5x3/16	0.136	1.05	0.13*	32.31	29	0.005	1.05	0.005*	0	12355.418	29235.938	0.911	1.62	1.136	H2-1
38	M95	C5X9	0.135	1.05	0.129*	0	8	0.012	1.05	0.011*	16.1	67900.01	85536	1.909	11.853	1.735	H1-1b

*Rating per TIA-222-H, Section 15.5

APPENDIX D

ADDITIONAL CALCULATIONS

TIA-222-H CONNECTION CHECK
Mount to Tower Connection - Typ. All Sectors
2021777.876371.01

Bolt Information		
Bolt Diameter (d)	0.75	in
Net Tensile Area (An)	0.334	in^2
# of Bolts Total (n)	1	
Bolt Grade	A325N	
Bolt Tensile Strength (F_{ub})	120	ksi

RISA 3D Reactions		
Moment (M)	0.00	k-ft
Axial (T)	-0.46	kips
Shear (V)	4.57	kips

Bolt Capacity		
Nominal Tensile Strength (R_{nt})	40.135	kips
Nominal Shear Strength (R_{nv})	26.51	kips
Bolt Tensile Force (T_{ub})	-0.46	kips
Bolt Shear Force (V_{ub})	4.573	kips
$T_{ub}/\phi R_{nt}$	-0.01444	
$V_{ub}/\phi R_{nv}$	0.21905	
$(V_{ub}/\phi R_{nv})^2+(T_{ub}/\phi R_{nt})^2$	0.05060	
Bolt Capacity =	21.9%	OK

*Rating per TIA-222-H, Section 15.5

TIA-222-H CONNECTION CHECK
Mod V-Kit to Tower Connection - Typ. All Sectors
2021777.876371.01

Bolt Information		
Bolt Diameter (d)	0.625	in
Net Tensile Area (An)	0.226	in^2
# of Bolts Total (n)	4	
Bolt Distance Up-Down	6	in
Bolt Distance Left-Right	6	in
Bolt Grade	A325N	
Bolt Tensile Strength (F_{ub})	120	ksi

RISA 3D Reactions		
Moment (M)	0.00	k-ft
Axial (T)	-0.67	kips
Shear (V)	1.70	kips

Bolt Capacity		
Nominal Tensile Strength (R_{nt})	27.120	kips
Nominal Shear Strength (R_{nv})	18.41	kips
Bolt Tensile Force (T_{ub})	-0.17	kips
Bolt Shear Force (V_{ub})	0.425	kips
$T_{ub}/\phi R_{nt}$	-0.00780	
$V_{ub}/\phi R_{nv}$	0.02930	
$(V_{ub}/\phi R_{nv})^2+(T_{ub}/\phi R_{nt})^2$	0.00097	
Bolt Capacity =	2.9%	OK

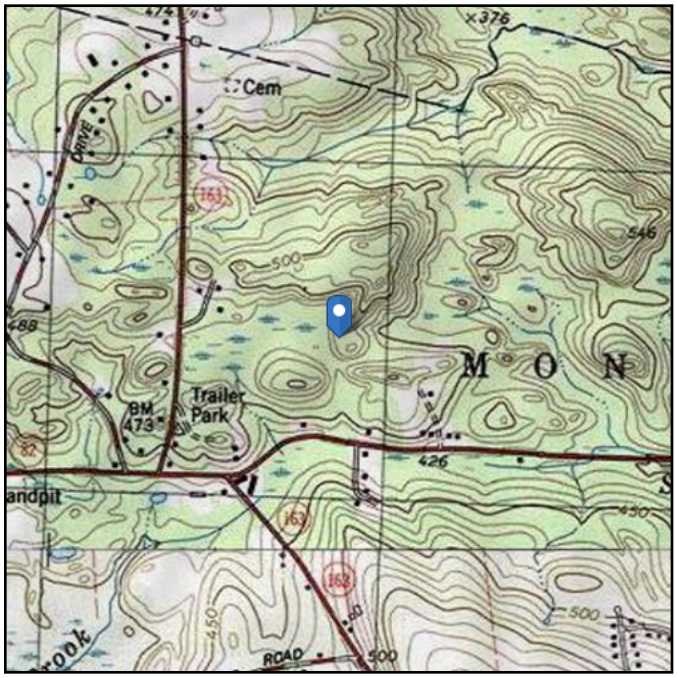
*Rating per TIA-222-H, Section 15.5

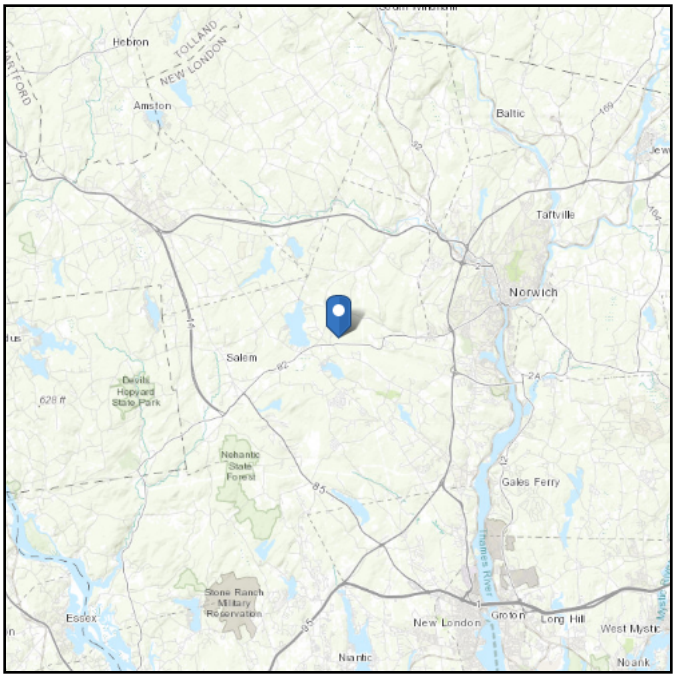
ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 481.28 ft (NAVD 88)
Latitude: 41.505639
Longitude: -72.197528





Wind

Results:

Wind Speed:	~~131 Vmph~~
10-year MRI	79 Vmph
25-year MRI	89 Vmph
50-year MRI	97 Vmph
100-year MRI	107 Vmph

135Vpmh per 2018 Connecticut Building Code Appendix N

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

Date Accessed: Mon Feb 01 2021

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

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

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

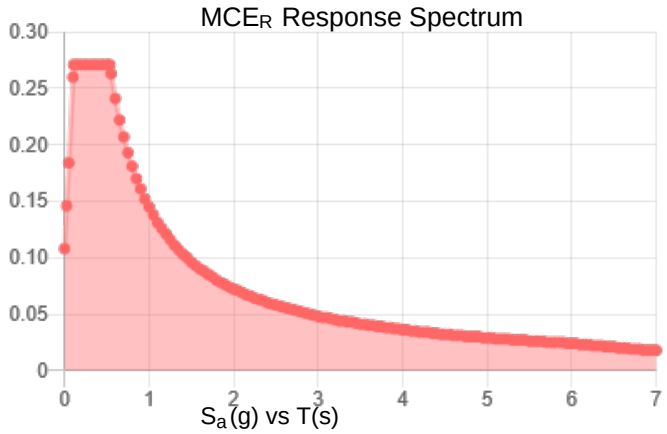
Seismic

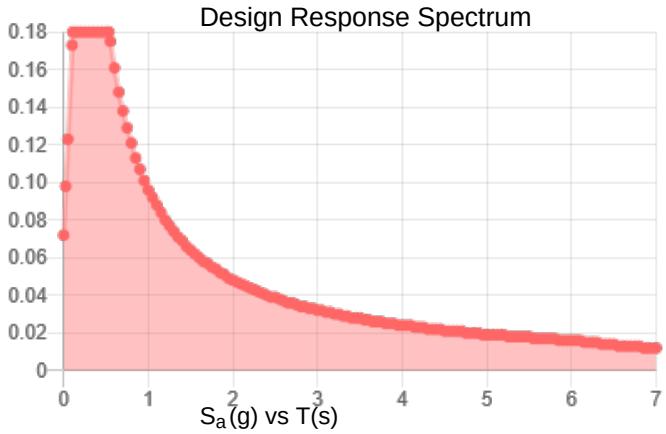
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.169	S_{DS} :	0.18
S_1 :	0.06	S_{D1} :	0.096
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.085
S_{MS} :	0.271	PGA_M :	0.136
S_{M1} :	0.145	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B





Data Accessed: Mon Feb 01 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:	0.75 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Mon Feb 01 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 F

Power Density/RF Emissions Report

EBI Consulting

environmental | engineering | due diligence

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

T-Mobile Existing Facility

Site ID: CTNL815A

557 Rte. 82
Oakdale, Connecticut 06370

March 12, 2021

EBI Project Number: 6221001152

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**12.52%**

March 12, 2021

T-Mobile
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, Connecticut 06002

Emissions Analysis for Site: CTNL815A

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **557 Rte. 82** in **Oakdale, Connecticut** for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$, respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz frequency bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at 557 Rte. 82 in Oakdale, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower. For power density calculations, the broadcast footprint of the AIR6449 antenna has been considered. Due to the beamforming nature of this antenna, the actual beam locations vary depending on demand and are narrow in nature. Using the broadcast footprint accounts for the potential location of beams at any given time.

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

1) 2 LTE channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

2) 1 NR channel (600 MHz Band) was considered for each sector of the proposed installation. This Channel has a transmit power of 80 Watts.

3) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

4) 4 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

5) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

6) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

7) 1 LTE channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 120 Watts.

8) 1 NR channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 120 Watts.

9) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

10) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

11) The antennas used in this modeling are the RFS APX16DWV-16DWV-S-E-A20 for the 2100 MHz channel(s), the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s) in Sector A, the RFS APX16DWV-16DWV-S-E-A20 for the 2100 MHz channel(s), the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s) in Sector B, the RFS APX16DWV-16DWV-S-E-A20 for the 2100 MHz channel(s), the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

12) The antenna mounting height centerline of the proposed antennas is 180 feet above ground level (AGL).

13) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	RFS APX16DWV-16DWV-S-E-A20	Make / Model:	RFS APX16DWV-16DWV-S-E-A20	Make / Model:	RFS APX16DWV-16DWV-S-E-A20
Frequency Bands:	2100 MHz	Frequency Bands:	2100 MHz	Frequency Bands:	2100 MHz
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	180 feet	Height (AGL):	180 feet	Height (AGL):	180 feet
Channel Count:	2	Channel Count:	2	Channel Count:	2
Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A1 MPE %:	**0.55%**	Antenna B1 MPE %:	**0.55%**	Antenna C1 MPE %:	**0.55%**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20
Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz
Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd
Height (AGL):	180 feet	Height (AGL):	180 feet	Height (AGL):	180 feet
Channel Count:	11	Channel Count:	11	Channel Count:	11
Total TX Power (W):	440 Watts	Total TX Power (W):	440 Watts	Total TX Power (W):	440 Watts
ERP (W):	12,569.87	ERP (W):	12,569.87	ERP (W):	12,569.87
Antenna A2 MPE %:	**2.17%**	Antenna B2 MPE %:	**2.17%**	Antenna C2 MPE %:	**2.17%**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449
Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz
Gain:	17.3 dBd / 17.3 dBd	Gain:	17.3 dBd / 17.3 dBd	Gain:	17.3 dBd / 17.3 dBd
Height (AGL):	180 feet	Height (AGL):	180 feet	Height (AGL):	180 feet
Channel Count:	2	Channel Count:	2	Channel Count:	2
Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts
ERP (W):	12,888.76	ERP (W):	12,888.76	ERP (W):	12,888.76
Antenna A3 MPE %:	**1.53%**	Antenna B3 MPE %:	**1.53%**	Antenna C3 MPE %:	**1.53%**

Site Composite MPE %	
Carrier	**MPE %**
T-Mobile (Max at Sector A):	4.26%
Verizon	2.5%
Sprint	1.82%
AT&T	3.94%
Site Total MPE % :	12.52%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	4.26%
T-Mobile Sector B Total:	4.26%
T-Mobile Sector C Total:	4.26%
Site Total MPE % :	12.52%

T-Mobile Maximum MPE Power Values (Sector A)

T-Mobile Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
T-Mobile 2100 MHz LTE	2	2334.27	180.0	5.54	2100 MHz LTE	1000	0.55%
T-Mobile 600 MHz LTE	2	591.73	180.0	1.41	600 MHz LTE	400	0.35%
T-Mobile 600 MHz NR	1	1577.94	180.0	1.87	600 MHz NR	400	0.47%
T-Mobile 700 MHz LTE	2	695.22	180.0	1.65	700 MHz LTE	467	0.35%
T-Mobile 1900 MHz GSM	4	1052.26	180.0	5.00	1900 MHz GSM	1000	0.50%
T-Mobile 1900 MHz LTE	2	2104.51	180.0	5.00	1900 MHz LTE	1000	0.50%
T-Mobile 2500 MHz LTE	1	6444.38	180.0	7.65	2500 MHz LTE	1000	0.77%
T-Mobile 2500 MHz NR	1	6444.38	180.0	7.65	2500 MHz NR	1000	0.77%
						Total:	**4.26%**

• NOTE: Totals may vary by approximately 0.01% due to summation of remainders in calculations.

Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector A:	4.26%
Sector B:	4.26%
Sector C:	4.26%
T-Mobile Maximum MPE % (Sector A):	4.26%
Site Total:	12.52%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **12.52%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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