CROWN CASTLE

1 Cityplace Dr, Suite 490
Creve Coeur, MO 63141

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

December 3, 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#825983; T-Mobile ID#CT11057C
90 Industrial Park Road., MIDDLETOWN, CT 06457
Latitude: 41° 35′ 08.12″/ Longitude: -72° 42′ 49.86″

Dear Ms. Bachman:

T-Mobile currently maintains (9) antennas at the 183-foot mounts on the existing 185-foot Monopole Tower located at **90 Industrial Park Road., MIDDLETOWN**. The property is owned by Airline Avenue Realty LLC and the Tower by Crown Castle. T-Mobile now intends to replace Six (6) 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) Ericsson AIR32 KRD901146-1B66A-B2A (**REMOVE**)
(3) RFS APX16DWV-16DWV-S-E-A20 Antennas (**REMOVE**), (3) Ericsson AIR6449 Antennas (**REPLACE**)
(6) Coax Cable **(REMOVE)**, (1) 6X24 4AWG Hybrid Cable (**REPLACE**)
(3) TMA's **(REMOVE)**
Install
(3) Ericsson RRUS 4460 B25+B66 Remote Radio Head's

Ground:

REMOVE:
(1) T-Mobile Nortel Cabinet with batteries and plinth
(1) T-Mobile RBS 6102 Cabinet

INSTALL:
(1) 6160 Cabinet
(1) B160 Cabinet
(*) Upgrade BTS cabinet breaker

CROWN CASTLE

1 Cityplace Dr, Suite 490

Creve Coeur, MO 63141

Phone: (314) 513-0147

www.crowncastle.com

The Tower was approved by the City of Middletown, CT on January 28, 1998 with no conditions.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. §16-50j-72(b)(2). In accordance with R.C.S.A. §16-50j-73, a copy of this letter is being sent to Ben Florsheim, The City of Middletown Mayor, Ronald Baia, The City of Middletown Zoning Enforcement Officer and Airline Avenue Realty, LLC, 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,

Ersilia Davis
Crown Castle, Agent for Applicant
1777 Sentry Parkway W | VEVA 17, Suite 400
Blue Bell, PA 19422
edavis@nbcllc.com
(551)804-0667

CROWN CASTLE

1 Cityplace Dr, Suite 490
Creve Coeur, MO 63141

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

cc:

Ben Florsheim, Mayor
245 deKoven Drive Room 209
Middletown, CT 06457
860-638-4801
(Via Fedex)

Ronald Baia, Zoning Enforcement Officer
245 deKoven Drive
Middletown, CT 06457
860-638-4801
(Via Fedex)

Airline Avenue Realty, LLC
15 Mullen Road
Enfield, CT 06082
(Via Fedex)

TRACK ANOTHER SHIPMENT

775390637902

ADD NICKNAME

Delivered
Monday, 12/6/2021 at 10:17 am

DELIVERED

Signed for by: T.RANNO

GET STATUS UPDATES

OBTAIN PROOF OF DELIVERY

FROM

Ersilia Davis

1777 Sentry Parkway
VEVA 17, Suite 210
Blue Bell, PA US 19422
551-804-0667

TO

Benjamin Florsheim, Mayor
City of Middletown

245 de Koven Drive
MIDDLETOWN, CT US 06457
860-638-4870

MANAGE DELIVERY

Travel History

TIME ZONE
Local Scan Time

Monday, December 6, 2021		
10:17 AM	MIDDLETOWN, CT	Delivered
7:18 AM	WINDSOR LOCKS, CT	On FedEx vehicle for delivery
6:07 AM	WINDSOR LOCKS, CT	At local FedEx facility
Saturday, December 4, 2021		
7:04 AM	WINDSOR LOCKS, CT	At local FedEx facility

TRACK ANOTHER SHIPMENT

775390609854

ADD NICKNAME

Delivered
Monday, 12/6/2021 at 10:17 am

DELIVERED

Signed for by: T.RANNO

GET STATUS UPDATES

OBTAIN PROOF OF DELIVERY

FROM

Ersilia Davis

1777 Sentry Parkway
VEVA 17, Suite 210
Blue Bell, PA US 19422
551-804-0667

TO

Ronald Baia, Zoning Officer
City of Middletown

245 de Koven Drive
MIDDLETOWN, CT US 06457
860-638-4870

MANAGE DELIVERY

Travel History

TIME ZONE
Local Scan Time

Monday, December 6, 2021		
10:17 AM	MIDDLETOWN, CT	Delivered
7:17 AM	WINDSOR LOCKS, CT	On FedEx vehicle for delivery
6:07 AM	WINDSOR LOCKS, CT	At local FedEx facility
Saturday, December 4, 2021		
7:04 AM	WINDSOR LOCKS, CT	At local FedEx facility

TRACK ANOTHER SHIPMENT

775390680730

ADD NICKNAME

Delivered
Monday, 12/6/2021 at 10:30 am

DELIVERED

Signed for by: F.RO

GET STATUS UPDATES

OBTAIN PROOF OF DELIVERY

FROM

Ersilia Davis

1777 Sentry Parkway
VEVA 17, Suite 210
Blue Bell, PA US 19422
551-804-0667

TO

Airline Avenue Realty, LLC

15 Mullen Road
ENFIELD, CT US 06082
551-804-0667

MANAGE DELIVERY

Travel History

TIME ZONE
Local Scan Time

Monday, December 6, 2021		
10:30 AM	ENFIELD, CT	Delivered
8:46 AM	WINDSOR LOCKS, CT	On FedEx vehicle for delivery
5:32 AM	WINDSOR LOCKS, CT	At local FedEx facility
Saturday, December 4, 2021		
6:58 AM	WINDSOR LOCKS, CT	At local FedEx facility

Exhibit A

Original Facility Approval

LEGAL NOTICE

NOTICE OF DECISION BY THE MIDDLETOWN PLANNING AND ZONING COMMISSION at its meeting of January 28, 1998

1. Denied without prejudice a request for release of the cash bond for Wesleyan Hills PRD, Red Area Section III. Applicant/agent Larsen, St. John & Johnson, P.C./Atty. Frank St. John PRD

2. Denied without prejudice a request for release of the cash bond for Longhill Meadows Subdivision located off South Main Street. Applicant/agent Krasow, Garlick & Hadley, LLC/Atty. Herbert A. Krasow S87-32

3. Denied without prejudice a request for release of the cash bond for Richards Brook Subdivision, Lots #2 and #3, located on Kenneth Dooley Drive. Applicant/agent Tyler Cooper & Alcorn, LLP/Atty. Barry M. Winnick S89-6

4. Granted Final Approval of a portion of Pond Place in Section 3 of The Meadows at Riverbend Subdivision located off East Street with the condition that all departmental comments be addressed and that a cash bond in the amount of $45,000 be posted. Applicant/agent Tuttle Road Associates/Robert C. Fusari, President S93-3

5. Granted a one (1) year extension of the Special Exception approval for the Connecticut Beverage Mart Plaza located at 955 Washington Street. Applicant/agent 3127 Berlin Turnpike Associates/Brigham S. Metcalfe SE95-6

6. Denied without prejudice a proposed Zoning Code text amendment to modify Section 42 Protection of Water Sources. Applicant/agent City of Middletown Water and Sewer Department/Guy P. Russo, Director Z97-7

7. Granted a Special Exception for construction of a 185 foot monopole and installation of associated antennae and equipment for up to three (3) wireless communication providers at the Dainty Rubbish facility at 90 Industrial Park Road with the condition that all staff comments and conditions be addressed and adhered to. Applicant/agent Omnipoint Communications, Inc./Thomas M. Gilligan SE97-18

8. Granted a Special Exception to convert a former insurance business to a new use as a home for the aged and a rest home at 26 Silver Street with the following conditions: 1) there be no nurse on the premises; 2) no residents are to be older than fifty-five (55) years of age; 3) all residents are to administer their own medication; and 4) any modification to the structure are to be approved by the Design Preservation Board. Applicant/agent Deonarine and Neeta Dhanraj/Atty. Owen P. Eagan SE97-19

9. Adopted a Zoning Map amendment to rezone a portion of a piece of property located behind Middlesex Schools Federal Credit Union on South Main Street from RPZ Residential Pre Zoning to the B-2 General Business Zone with an effective date of February 15, 1998. A copy of the adopted map change is on file in the Office of the Town Clerk. Applicant/agent Middlesex Schools Federal Credit Union/Attorney Philip F. Karpel Z97-12

W. Lee Osborne, Chairman
Planning and Zoning Commission

P. O. No. 061920, Account No. 067419

The above legal notice to appear in the Hartford Courant ONCE

Thursday, February 5, 1998

THE MUNICIPAL BUILDING IS WHEELCHAIR ACCESSIBLE

P 348 778 241

US Postal Service

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write *"Return Receipt Requested"* on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
OmniPoint Communications, Inc.
25 Van Zant St.
4th floor
Norwalk, CT 06855

4a. Article Number
P348 778 241

4b. Service Type
☐ Registered ☑ Certified
☐ Express Mail ☐ Insured
☐ Return Receipt for Merchandise ☐ COD

7. Date of Delivery
2/9/98

5. Received By: *(Print Name)*

8. Addressee's Address *(Only if requested and fee is paid)*

6. Signature: *(Addressee or Agent)*
X

Is your RETURN ADDRESS completed on the reverse side?

Thank you for using Return Receipt Service.

PS Form 3811, December 1994 102595-97-B-0179 Domestic Return Receipt

SE 97-18

INITIAL APPLICATION FOR LAND-USE IN MIDDLETOWN, CT

Please fill out this application so we will know who you are, what you are applying to do, and how to contact you. With this basic information we will evaluate your project as it relates to City regulations as quickly as possible. Thank you for your cooperation.

GENERAL INFORMATION ABOUT THE PEOPLE INVOLVED

Date 11-6-97

Applicant: OMNIPOINT COMMUNICATIONS, INC. Phone#(203) 359-1280

Address: 1515 SUMMER ST. City STAMFORD State CT Zip 06905

Agent: THOMAS M. GILLIGAN Phone#(203) 359-1280

Address: 1515 SUMMER ST. City STAMFORD State CT Zip 06905

WHAT ARE YOU APPLYING TO DO? (CHECK ONE OR MORE)

( ) Add an addition to a single/two family dwelling to be used for _____

( ) Construct a single family dwelling (A-2 survey required)

( ) Add an addition to a multi-family or non-residential building to be used for (A-2 survey required) _____

( ) Convert an existing building from present use as _____ to a new use as _____

( ) Construct one or more new buildings to be used for (A-2 survey required) _____

( ) Subdivide land into building lots (A-2 survey required)

( ) Change the text of the Zoning Code or amend the Zoning Map

( ) Install a sign

( ) Start a Residential Unit Business Pursuit

( ) Application for Zoning Board of Appeals

( ) Extract Natural Resources like sand or gravel or fill an area

(✓) Other WIRELESS COMMUNICATIONS MONOPOLE, ASSOCIATED ANTENNAE AND EQUIPMENT DESIGNED FOR UP TO THREE CARRIERS

DEPT. PLANNING & ZONING
97 NOV -6 PM 4:28

FACTS ABOUT LAND PROPOSED FOR USE

Landowner: PHILIP ARMETTA Location: 90 INDUSTRIAL PARK ROAD

Zone IT Lot Area 2.54A. Tax Assessor's Map 6 Block 22 Lot 6B1

Is this project within 500' of a Municipal Boundary? Yes _____ No ✓

Is this project located in a FEMA 100 or 500 year flood plain? Yes _____ No ✓

Utilities Available: City Water (✓); Private Well ( ); City Sewer (✓); Private Septic ( )

SIGNATURE OF I.W.A. STAFF

DATE APPLIED _____

( ) PERMIT REQUIRED

(✓) PERMIT NOT REQUIRED

( ) IWA REVIEW REQUIRED

[X] Meets Zoning Requirements

Wayne J. Bell
ZONING ENFORCEMENT OFFICER

MARCH 6, 1998
DATE

9/17/97
DATE OF APPROVED PLANS

SIGNATURE OF APPLICANT/AGENT**

Philip C. Armetta
SIGNATURE OF OWNER**

**Both signatures required. I certify that the above information and plans submitted are true and correct, and that, if required, an application for an Inland/Wetlands permit has been filed before or on the same day as the filing of this application with the P&Z Commission.

Pd. $110.00
CK # 1846
11/7/97

ALL DOCUMENTS WHICH MAKE UP THE RECORD OF THIS APPLICATION MUST BE LISTED BELOW. THIS INCLUDES ALL MAPS AND TEXT MATERIAL.

PROJECT: CONSTRUCTION OF A 185' MONOPOLE AND INSTALLATION OF ASSOCIATED ANTENNAE AND EQUIPMENT DESIGNED FOR UP TO 3 CARRIERS

1.) COVER LETTER 2.) SPECIAL EXCEPTION FORM 3) LIST OF ABUTTING OWNERS 4.) DEED 5.) EXECUTED LEASE SIGNATURE PAGE 6.) GENERAL INFORMATION 7.) 8.5 x 11 ARCHITECTURAL PLANS 8.) SITE PLAN 9.) ARCHITECTURAL PLANS

IN THE EVENT A PUBLIC HEARING IS REQUIRED FOR THIS APPLICATION, ALL PERSONS MAKING VERBAL PRESENTATIONS AT THE PUBLIC HEARING FOR THIS PROJECT AND THE APPROXIMATE TIME EACH WILL REQUIRE MUST BE LISTED BELOW.

ELENI SOTIRIOU, DIR. OF ZONING & LEASE MNGMNT. - 10-15 MINUTES
JONATHON LINDENTHALER, PROJECT COORDINATOR - 10-15 MINUTES
THOMAS GILLIGAN, ZONING SPECIALIST/PLANNER 10-15 MINUTES
MOHAN KUPPASWAMY, RF ENGINEER -10-15 MINUTES
LOU CORNACCHIA, RF HEALTH PROFESSIONAL -10-15 MINUTES

SPECIAL EXCEPTION FORM

MIDDLETOWN, CONNECTICUT

PLANNING & ZONING COMMISSION

A. GENERAL INFORMATION ABOUT APPLICANT (Please type or print clearly)
Name OMNIPOINT COMMUNICATIONS, INC Date 11-6-97
Address 1515 SUMMER STREET Phone 203-359-1280
Agent THOMAS M. GILLIGAN Phone 203-359-1280

B. DESCRIPTION OF PREMISES
Owner of Record PHILIP ARMETTA
Location 90 INDUSTRIAL PARK ROAD
Deed Filed in Town Clerk's Office on
Map File# Vol. & Page# 505 : 134
Zone IT Current Use OFFICE & BULKY WASTE TRANSFER STA.
Relevant Zoning Code Provision SECTION 61
NOTE: A legal description of the premises to be affected by the Special Exception must be attached to this form.

C. NATURE OF SPECIAL EXCEPTION
CONSTRUCTION OF A 185 FOOT MONOPOLE AND INSTALLATION OF ASSOCIATED ANTENNAE AND EQUIPMENT FOR UP TO 3 WIRELESS COMMUNICATIONS PROVIDERS

Signature of Applicant or Agent

Philip L Armetta
Signature of Owner
*Both Signatures Required

NOTE: An approved Special Exception will not be effective until a copy of this certification is recorded in the Middletown Town Clerk's Office.

The owner, applicant and\or other authorized agent hereby grant the Middletown Planning and Zoning Commission and\or its agents permission to enter upon the property for which the Special Exception application has been filed for the purpose of inspection and enforcement of the Regulations of the City of Middletown.

Staff Comments

D. CERTIFICATION OF COMMISSION RESPONSE
Dates Legal Notices Published 1/16/98 ; 1/23/98
Date of Public Hearing 1/28/98
Final Action: Disapproved Approved X
Zoning Regulation to which Special Exception is granted Sec. 61
Date Notice of Decision Published 2/5/98
Effective Date upon filing this form

E. MATERIAL FILED IN TOWN CLERK'S OFFICE
☒ This Form ☐ Site Plan
Other legal description ;Date

Rec'd 2/6/98

F. This is to certify that a Special Exception, as depicted on this form, was granted by the Middletown Planning and Zoning Commission.

Chairman

1\95

Exhibit B

Property Card

90 INDUSTRIAL PARK RD

Location	90 INDUSTRIAL PARK RD	**Map-Lot**	06/ / 0018/ /
Acct#	R00347	**Owner**	AIRLINE AVENUE REALTY LLC
Municipality		**Assessment**	$1,324,110
Appraisal	$1,891,590	**PID**	396
Building Count	1	**Assessing District**	

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2018	$1,255,960	$635,630	$1,891,590
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2018	$879,170	$444,940	$1,324,110

Parcel Addreses

Additional Addresses
No Additional Addresses available for this parcel

Owner of Record

Owner	AIRLINE AVENUE REALTY LLC	**Sale Price**	$1,000,000
Co-Owner		**Certificate**	
Address	15 MULLEN RD	**Book & Page**	1956/943
	ENFIELD, CT 06082	**Sale Date**	11/15/2019
		Instrument	25

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
AIRLINE AVENUE REALTY LLC	$1,000,000		1956/943	25	11/15/2019
90 INDUSTRIAL PARK ROAD LLC	$0		1843/0205	29	06/11/2015
ARMETTA PHILIP C	$0		0505/0134	29	02/22/1978

Building Information

Building 1 : Section 1

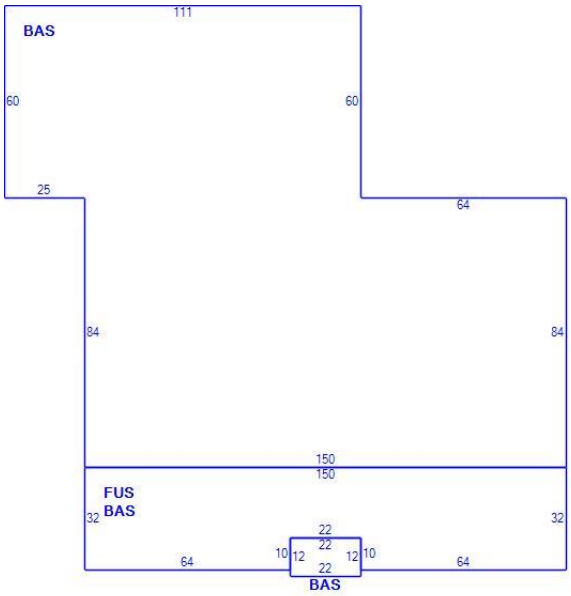
Year Built: 1986
Living Area: 28,684
Replacement Cost: $1,523,694
Building Percent Good: 77
Replacement Cost Less Depreciation: $1,173,240

Building Attributes	
Field	**Description**
Style	Office/Warehs
Model	Industrial
Grade	C
Stories	1
Occupancy	2.00
Exterior Wall 1	Pre-finish Metl
Exterior Wall 2	Concrete
Roof Structure	Flat
Roof Cover	Tar and Gravel
Interior Wall 1	Drywall
Interior Wall 2	
Interior Floor 1	Concrete
Interior Floor 2	Carpet
Heating Fuel	Gas
Heating Type	Forced Air
AC Type	Partial
Struct Class	
Bldg Use	Industrial
Cov Parking	0
Uncov Parking	0
Percent Fin	100
1st Floor Use	
Heat/AC	Heat/AC Pkg
Frame Type	Steel
Baths/Plumbing	Average
Ceiling/Walls	Typical
Rooms/Prtns	Average
Wall Height	25.00

Building Photo

(http://images.vgsi.com/photos/MiddletownCTPhotos//\00\02\11\86.jpg)

Building Layout



(ParcelSketch.ashx?pid=396&bid=396)

Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	24,104	24,104
FUS	Finished Upper Story	4,580	4,580
		28,684	28,684

Extra Features

Extra Features				Legend
Code	**Description**	**Size**	**Value**	**Bldg #**
A/C	Air Condition	8896.00 UNITS	$23,290	1

Land

Land Use

Use Code	301
Description	Industrial
Zone	IT
Neighborhood	3100
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	2.61
Assessed Value	$444,940
Appraised Value	$635,630

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
LT1	Lights-In W/PI			4.00 UNITS	$210	1
PAV1	Paving	AS	Asphalt	51134.00 UNITS	$57,530	1
PAV2	Paving	CN	Concrete LD	2100.00 UNITS	$3,830	1
CSHD	Cell Shed			288.00 UNITS	$34,200	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$1,255,960	$635,630	$1,891,590
2019	$1,255,960	$635,630	$1,891,590
2018	$1,255,960	$635,630	$1,891,590

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$879,170	$444,940	$1,324,110
2019	$879,170	$444,940	$1,324,110
2018	$879,170	$444,940	$1,324,110

Exhibit C

Construction Drawings

T-Mobile

T-MOBILE SITE NUMBER: CT11057C
T-MOBILE SITE NAME: MIDDLETOWN_1
SITE TYPE: MONOPOLE
TOWER HEIGHT: 185'

BUSINESS UNIT #: 825983
SITE ADDRESS: 90 INDUSTRIAL PARK ROAD
MIDDLETOWN, CT 06457
COUNTY: MIDDLESEX
JURISDICTION: CT - CONNECTICUT SITING COUNCIL

T-MOBILE ANCHOR **SITE CONFIGURATION:** 67D5A998E HYBRID

SITE INFORMATION

CROWN CASTLE USA INC.		
SITE NAME:	MIDDLETOWN_1	
SITE ADDRESS:	90 INDUSTRIAL PARK ROAD MIDDLETOWN, CT 06457	
COUNTY:	MIDDLESEX	
MAP/PARCEL #:	06-0018	
AREA OF CONSTRUCTION:	EXISTING	
LATITUDE:	41.58559	(41° 35' 08.12")
LONGITUDE:	-72.713852	(-72° 42' 49.86")
LAT/LONG TYPE:	NAD83	
GROUND ELEVATION:	782' AMSL	
CURRENT ZONING:	IT	
JURISDICTION:	CT - CONNECTICUT SITING COUNCIL	
OCCUPANCY CLASSIFICATION:	U	
TYPE OF CONSTRUCTION:	IIB	
A.D.A. COMPLIANCE:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION	
PROPERTY OWNER:	90 INDUSTRIAL PARK RD LLC 90 INDUSTRIAL PARK RD MIDDLETOWN, CT 06457	
TOWER OWNER:	CROWN CASTLE INC. 2000 CORPORATE DRIVE CANONSBURG, PA 15317	
CARRIER/APPLICANT:	T-MOBILE LLC 2105 WATER RIDGE PARKWAY SUITE 400 CHARLOTTE, NC 28217	
ELECTRIC PROVIDER:	NA	
TELCO PROVIDER:	NA	

FLOODPLAIN INFORMATION

THIS SITE IS NOT IN ANY SPECIAL FLOOD HAZARD AREAS OR FUTURE CONDITIONS FLOOD HAZARD AREAS, AS SHOWN ON:
FIRM PANEL(S): 09007C0104G
EFFECTIVE DATE(S): 8/28/2008

PROJECT TEAM

A&E FIRM:	P. MARSHALL & ASSOCIATES, LLC 3545 WHITEHALL PARK DRIVE SUITE 450 CHARLOTTE NC 28273 478-542-3291
CROWN CASTLE USA INC. DISTRICT CONTACTS:	CROWN CASTLE 6325 ARDREY KELL RD SUITE 600 CHARLOTTE, NC 28277 KEVIN HARRIS KEVIN.HARRIS@CROWNCASTLE.COM 205-909-2047

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

DRAWING INDEX

SHEET #	SHEET DESCRIPTION
T-1	TITLE SHEET
T-2	GENERAL NOTES
C-1.1	SITE PLAN
C-1.2	EXISTING & PROPOSED EQUIPMENT PLAN
C-2	EXISTING & FINAL ELEVATION
C-3	ANTENNA PLANS & SCHEDULE
C-4	MOUNTING DETAILS
C-5	TOWER EQUIPMENT SPECIFICATIONS
C-6	RF SPECIFICATIONS
C-7	CABINET SPECIFICATIONS
E-1	UTILITY ROUTING AND GROUNDING PLAN
E-2	AC PANEL SCHEDULES & ONE LINE DIAGRAM
G-1	ANTENNA GROUNDING DETAILS
G-2	GROUNDING DETAILS

ALL DRAWINGS CONTAINED HEREIN ARE FORMATTED FOR FULL SIZE. 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 (6) 1-5/8" COAX
- REMOVE (3) TMAs
- INSTALL (3) ANTENNAS
- INSTALL (3) RRUs
- INSTALL (1) 6x24 4AWG HYBRID CABLE

GROUND SCOPE OF WORK:
- UPGRADE BTS CABINET BREAKER
- INSTALL 6160 & B160 CABINETS

NOTE:
THE POWER DESIGN FOR ANY AC ELECTRICAL POWER CHANGES IS TO BE PERFORMED BY OTHERS AND IS SHOWN HERE FOR REFERENCE PURPOSES ONLY. T-MOBILE IS SOLELY RESPONSIBLE FOR THE ELECTRICAL POWER DESIGN.

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	2018 CT STATE BUILDING CODE (IBC 2015)
MECHANICAL	2018 CT STATE MECHANICAL CODE (IMC 2015)
ELECTRICAL	2017 ELECTRICAL CODE - NFPA 70
ANSI/TIA	TIA-222-G, TIA-598-C, TIA-6087-B, TIA-569-B, TIA-568-C, TIA-1019-A

REFERENCE DOCUMENTS:

STRUCTURAL ANALYSIS:	MORRISON HERSHFIELD # CN9-327R1 / 2101398
DATED:	10/14/21
MOUNT ANALYSIS:	TRYLON # 193322
DATED:	10/11/21
RFDS REVISION:	7
DATED:	9/13/21
ORDER ID:	586786
REVISION:	NA

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.

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

T-Mobile
2105 WATER RIDGE PARKWAY SUITE 400
CHARLOTTE, NC 28217

CROWN CASTLE
6325 AUDREY KELL ROAD, SUITE 600
CHARLOTTE, NC 28277

PM&A
P. MARSHALL & ASSOCIATES
3545 WHITEHALL PARK DRIVE
SUITE 450 CHARLOTTE,
NORTH CAROLINA 28273

T-MOBILE SITE NUMBER:
CT11057C
CROWN CASTLE BU #:
825983
SITE ADDRESS:

90 INDUSTRIAL PARK ROAD
MIDDLETOWN, CT 06457

185' - MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	11/03/21	RLB	FCDs	JTM
1	11/30/21	JMS	6131 & UPDATED SA/MA	JTM

STATE OF CONNECTICUT
PRESTON L. HUMPHRIES
No. 34370
LICENSED PROFESSIONAL ENGINEER
12/01/2021

PM&A PROJECT NUMBER:
21CCTCTM-0007

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
2. CARRIER: T-MOBILE
3. TOWER OWNER: CROWN CASTLE USA INC.
4. 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.
5. 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.
6. 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.
7. 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.
8. 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.
9. 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.
10. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
11. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
12. 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.
13. 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.
14. 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.
15. 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.
16. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

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

ELECTRICAL INSTALLATION NOTES:

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.
2. CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED AND TRIP HAZARDS ARE ELIMINATED.
3. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC.
4. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.
   - 4.1. ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO REQUIREMENT OF THE NATIONAL ELECTRICAL CODE.
   - 4.2. ALL OVERCURRENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED, 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

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).

T · · Mobile ·
2105 WATER RIDGE PARKWAY SUITE 400
CHARLOTTE, NC 28217

CROWN CASTLE
6325 AUDREY KELL ROAD, SUITE 600
CHARLOTTE, NC 28277

PM&A
P. MARSHALL & ASSOCIATES
3545 WHITEHALL PARK DRIVE
SUITE 450 CHARLOTTE,
NORTH CAROLINA 28273

T-MOBILE SITE NUMBER:
CT11057C
CROWN CASTLE BU #:
825983
SITE ADDRESS:

90 INDUSTRIAL PARK ROAD
MIDDLETOWN, CT 06457

185' - MONOPOLE

ISSUED FOR:

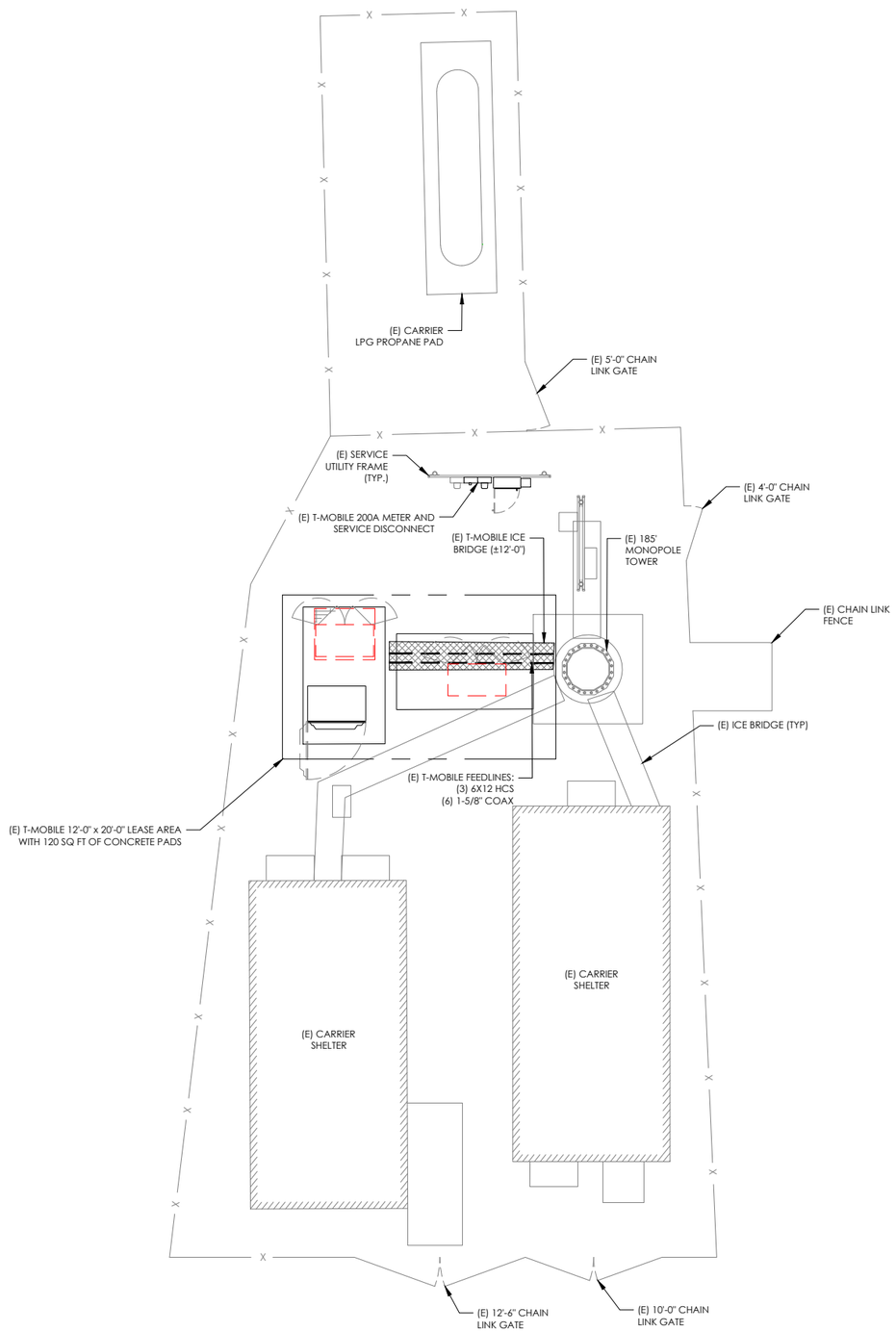
REV	DATE	DRWN	DESCRIPTION	DES./QA
0	11/03/21	RLB	FCDs	JTM

STATE OF CONNECTICUT
PRESTON E. HUMPHRIES
No. 34370
LICENSED PROFESSIONAL ENGINEER
11/05/2021

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.

PM&A PROJECT NUMBER:
21CCTCTM-0007

SHEET NUMBER: T-2
REVISION: 0



1 SITE PLAN

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

N

GENERAL NOTES

1. ALL MATERIAL AND EQUIPMENT FURNISHED SHALL BE NEW AND OF GOOD QUALITY. FREE FROM FAULTS AND DEFECTS AND IN CONFORMANCE WITH THE CONTRACT DOCUMENTS. ANY SUBSTITUTIONS MUST BE PROPERLY APPROVED AND AUTHORIZED IN WRITING BY THE OWNER AND ENGINEER PRIOR TO INSTALLATION. CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND OF QUALITY OF MATERIAL AND EQUIPMENT BEING SUBSTITUTED.
2. ACCESS TO PROPOSED WORK SITE MAY BE RESTRICTED. THE CONTRACTOR SHALL COORDINATE INTENDED CONSTRUCTION ACTIVITY, INCLUDING WORK SCHEDULE AND MATERIALS ACCESS WITH THE LEASING AGENT FOR APPROVAL.
3. CONTRACTOR SHALL HAVE PRESENT ON SITE CURRENT CARRIER SUPPLIED INFORMATION PRIOR TO COMMENCE OF WORK; IE. RFDS, DESIGN DOCUMENTS SPECIFIC TO SITE AND CONFIGURATION. NOTIFY CONSTRUCTION MANAGER OF ANY DISCREPANCY PRIOR TO ARRIVAL AT SITE.
4. ALL HARDWARE ASSEMBLY MANUFACTURER'S INSTRUCTION SHALL BE FOLLOWED EXACTLY AND SHALL SUPERSEDE ANY CONFLICTING NOTES ENCLOSED HEREIN.
5. ALL DAMAGE TO EXISTING UNDERGROUND, OVERHEAD OBSTACLES AND/OR EXISTING EQUIPMENT, PAD OR SHELTERS SHALL BE REPLACED BACK TO FULL ORIGINAL OR BETTER CONDITION & SHALL MATCH EXISTING CONDITIONS BY REPAIRS AT GENERAL CONTRACTOR EXPENSE.
6. THE EXISTING TREES AND VEGETATION ARE SUFFICIENT TO PROVIDE THE REQUIRED SCREENING PER LOCAL ORDINANCE. IF THE VEGETATION IS REMOVED OR DAMAGED, NEW LANDSCAPING/ SCREENING WILL BE INSTALLED TO MEET LOCAL ORDINANCE REQUIREMENTS. REPLACE DEAD OR DYING SHRUBS AS NEEDED. REPLACEMENT SHOULD BE DONE IN THE FALL WHEN WEATHER IS COOLER.

T-Mobile
2105 WATER RIDGE PARKWAY SUITE 400
CHARLOTTE, NC 28217

CROWN CASTLE
6325 AUDREY KELL ROAD, SUITE 600
CHARLOTTE, NC 28277

PM&A
P. MARSHALL & ASSOCIATES
3545 WHITEHALL PARK DRIVE
SUITE 450 CHARLOTTE,
NORTH CAROLINA 28273

T-MOBILE SITE NUMBER:
CT11057C
CROWN CASTLE BU #:
825983
SITE ADDRESS:

90 INDUSTRIAL PARK ROAD
MIDDLETOWN, CT 06457

185' - MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	11/03/21	RLB	FCDs	JTM
1	11/30/21	JMS	6131 & UPDATED SA/MA	JTM

STATE OF CONNECTICUT
PRESTON E. HUMPHRIES
No. 34370
LICENSED
PROFESSIONAL ENGINEER
12/01/2021

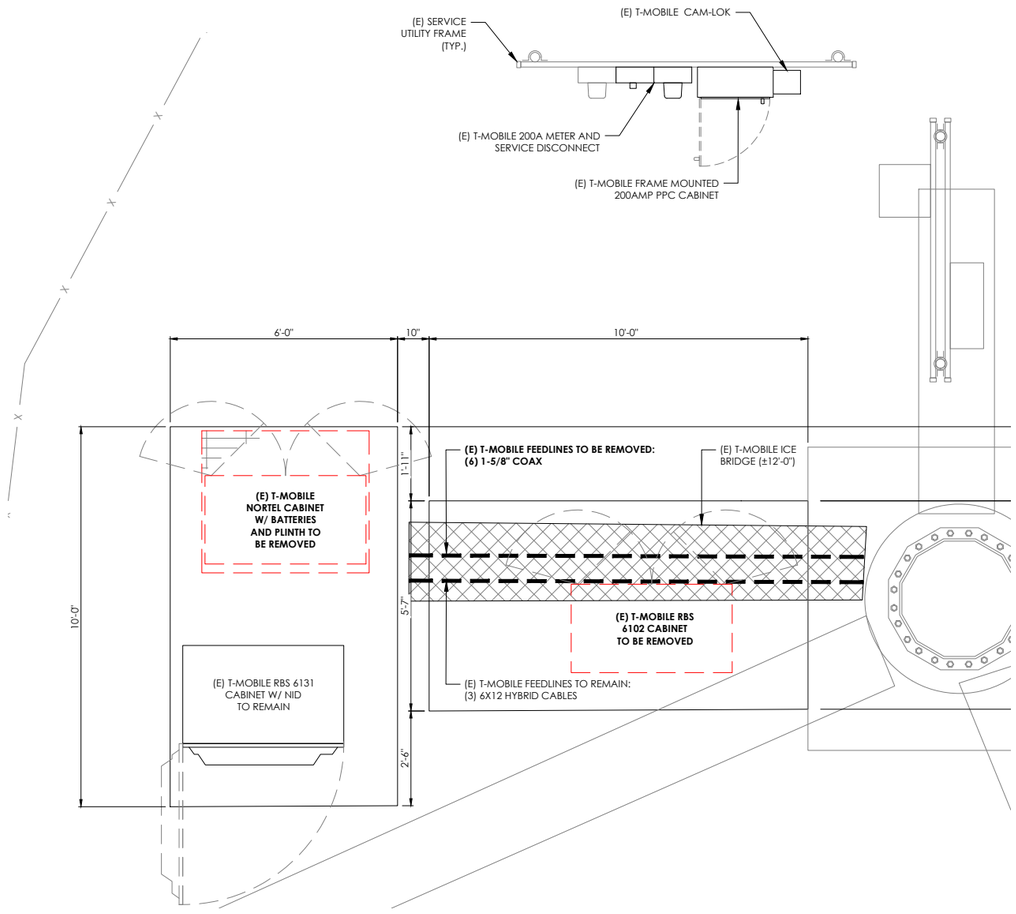
PM&A PROJECT NUMBER:
21CCTCTM-0007

SHEET NUMBER: C-1.1

REVISION: 0

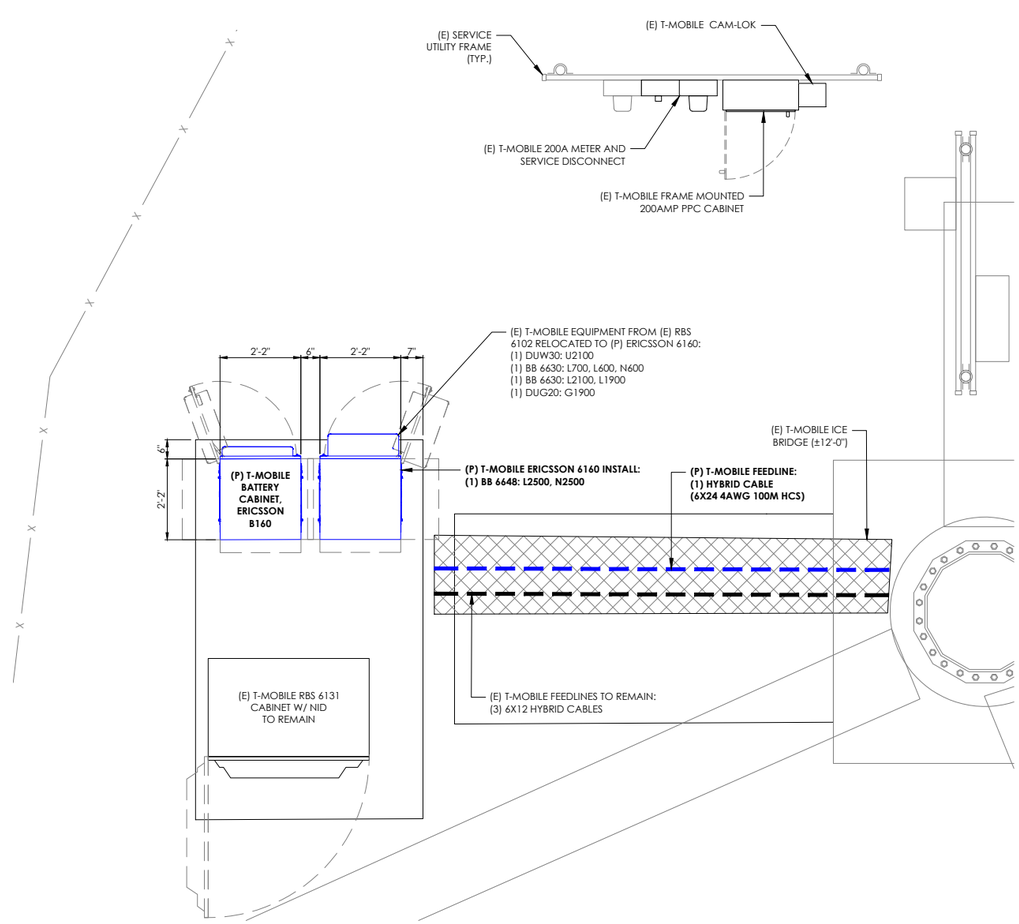
NOTE:

THIS SHEET HAS BEEN PRODUCED USING INFORMATION PROVIDED BY CROWN CASTLE.



1 EXISTING EQUIPMENT PLAN

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



2 FINAL EQUIPMENT PLAN

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

T-Mobile

2105 WATER RIDGE PARKWAY SUITE 400
CHARLOTTE, NC 28217

CROWN CASTLE

6325 AUDREY KELL ROAD, SUITE 600
CHARLOTTE, NC 28277

PM&A

P. MARSHALL & ASSOCIATES
3545 WHITEHALL PARK DRIVE
SUITE 450 CHARLOTTE,
NORTH CAROLINA 28273

T-MOBILE SITE NUMBER:
CT11057C
CROWN CASTLE BU #:
825983
SITE ADDRESS:

90 INDUSTRIAL PARK ROAD
MIDDLETOWN, CT 06457

185' - MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	11/03/21	RLB	FCDs	JTM
1	11/30/21	JMS	6131 & UPDATED SA/MA	JTM

STATE OF CONNECTICUT
PRESTON E. HUMPHRIES
No. 34370
LICENSED PROFESSIONAL ENGINEER

12/01/2021

PM&A PROJECT NUMBER:
21CCTCTM-0007

SHEET NUMBER: C-1.2

REVISION: 0

T-MOBILE EQUIPMENT

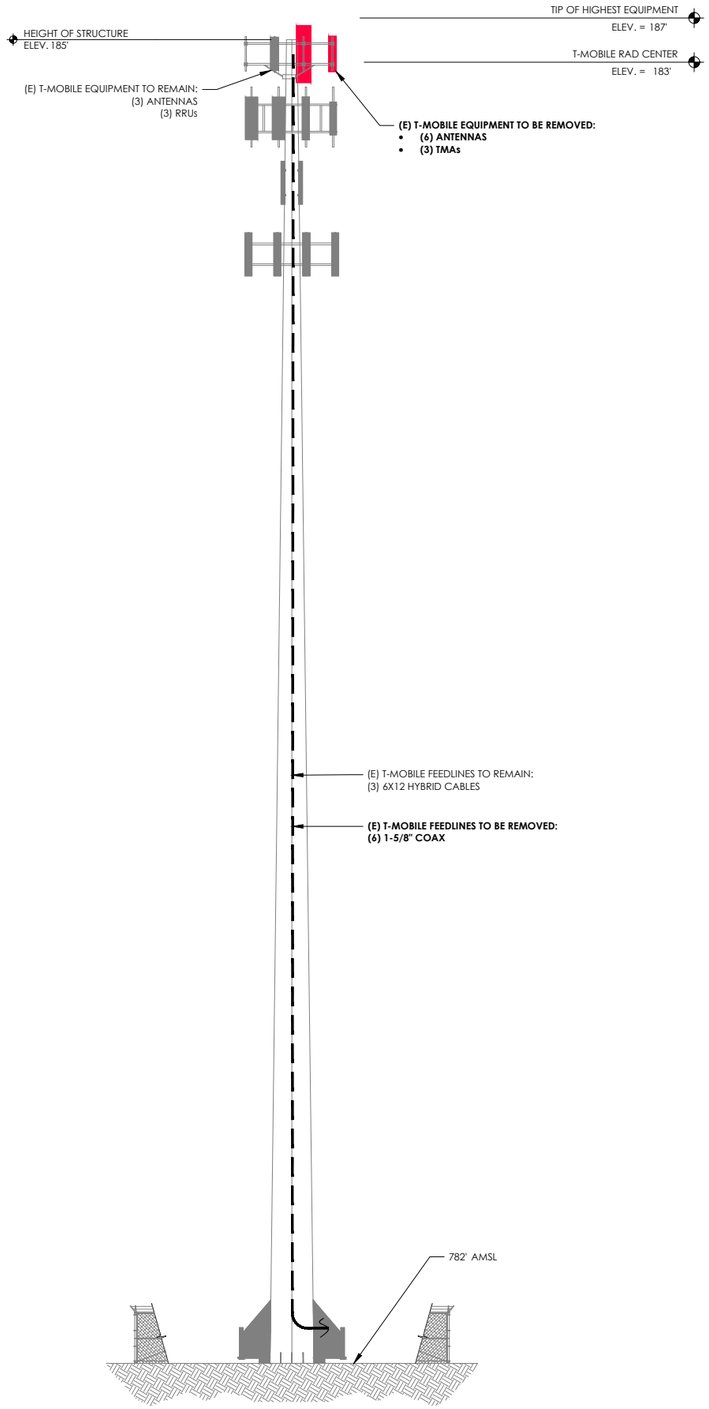
ANTENNA CL: 183'
MOUNT CL: 183'

ANY AND ALL TOWER MOUNTED EQUIPMENT MUST NOT TRAP OR INTERFERE W/ EXISTING SAFETY CLIMB

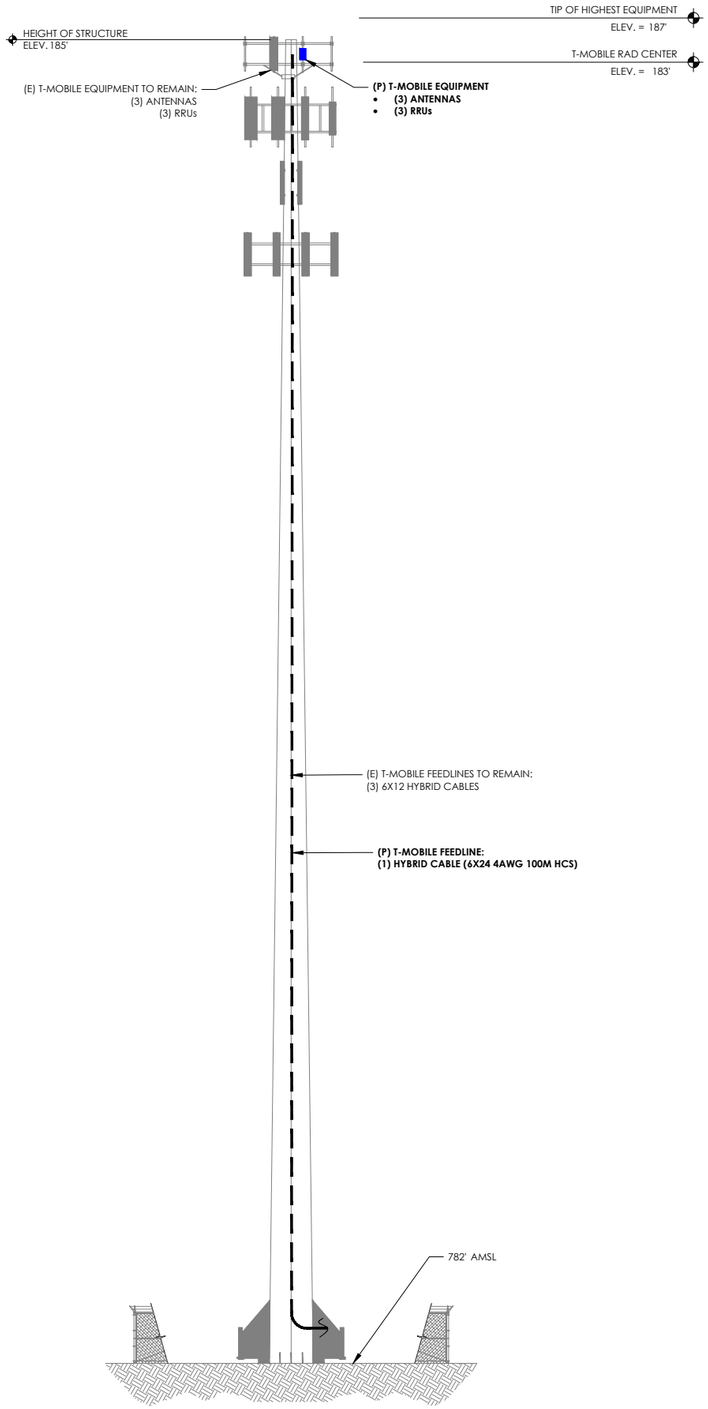
COAX NOTE:
REMOVE (6) 1-5/8" COAX

MOUNT NOTE:
NONE

REFER TO TOWER STRUCTURAL ANALYSIS FOR PROPOSED ANTENNA & CABLE LOADING DETAILS. ON-SITE CONDITIONS SHALL NOT EXCEED ANALYSIS. G.C. TO NOTIFY ENGINEER OF RECORD OF ALL ON-SITE DISCREPANCIES PRIOR TO COMMENCEMENT OF WORK



1 EXISTING ELEVATION
SCALE: NOT TO SCALE



2 FINAL ELEVATION
SCALE: NOT TO SCALE

GENERAL NOTES

1. ALL MATERIAL AND EQUIPMENT FURNISHED SHALL BE NEW AND OF GOOD QUALITY. FREE FROM FAULTS AND DEFECTS AND IN CONFORMANCE WITH THE CONTRACT DOCUMENTS. ANY SUBSTITUTIONS MUST BE PROPERLY APPROVED AND AUTHORIZED IN WRITING BY THE OWNER AND ENGINEER PRIOR TO INSTALLATION. CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND OF QUALITY OF MATERIAL AND EQUIPMENT BEING SUBSTITUTED.
2. ACCESS TO PROPOSED WORK SITE MAY BE RESTRICTED. THE CONTRACTOR SHALL COORDINATE INTENDED CONSTRUCTION ACTIVITY, INCLUDING WORK SCHEDULE AND MATERIALS ACCESS WITH THE LEASING AGENT FOR APPROVAL.
3. CONTRACTOR SHALL HAVE PRESENT ON SITE CURRENT CARRIER SUPPLIED INFORMATION PRIOR TO COMMENCE OF WORK; IE. RFDS, DESIGN DOCUMENTS SPECIFIC TO SITE AND CONFIGURATION. NOTIFY CONSTRUCTION MANAGER OF ANY DISCREPANCY PRIOR TO ARRIVAL AT SITE.
4. ALL HARDWARE ASSEMBLY MANUFACTURER'S INSTRUCTION SHALL BE FOLLOWED EXACTLY AND SHALL SUPERSEDE ANY CONFLICTING NOTES ENCLOSED HEREIN.
5. ALL DAMAGE TO EXISTING UNDERGROUND, OVERHEAD OBSTACLES AND/OR EXISTING EQUIPMENT, PAD OR SHELTERS SHALL BE REPLACED BACK TO FULL ORIGINAL OR BETTER CONDITION & SHALL MATCH EXISTING CONDITIONS BY REPAIRS AT GENERAL CONTRACTOR EXPENSE.
6. THE EXISTING TREES AND VEGETATION ARE SUFFICIENT TO PROVIDE THE REQUIRED SCREENING PER LOCAL ORDINANCE. IF THE VEGETATION IS REMOVED OR DAMAGED, NEW LANDSCAPING/ SCREENING WILL BE INSTALLED TO MEET LOCAL ORDINANCE REQUIREMENTS. REPLACE DEAD OR DYING SHRUBS AS NEEDED. REPLACEMENT SHOULD BE DONE IN THE FALL WHEN WEATHER IS COOLER.

MOUNT ANALYSIS NOTES:

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

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

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

T-Mobile
2105 WATER RIDGE PARKWAY SUITE 400
CHARLOTTE, NC 28217

CROWN CASTLE
6325 AUDREY KELL ROAD, SUITE 600
CHARLOTTE, NC 28277

PM&A
P. MARSHALL & ASSOCIATES
3545 WHITEHALL PARK DRIVE
SUITE 450 CHARLOTTE,
NORTH CAROLINA 28273

T-MOBILE SITE NUMBER:
CT11057C
CROWN CASTLE BU #:
825983
SITE ADDRESS:

90 INDUSTRIAL PARK ROAD
MIDDLETOWN, CT 06457

185' - MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	11/03/21	RLB	FCDs	JTM

STATE OF CONNECTICUT
PRESTON E. MURPHRIES
No. 34370
LICENSED
PROFESSIONAL ENGINEER
11/05/2021

PM&A PROJECT NUMBER:
21CCTCTM-0007

SHEET NUMBER: C-2

REVISION: 0

T-MOBILE EQUIPMENT

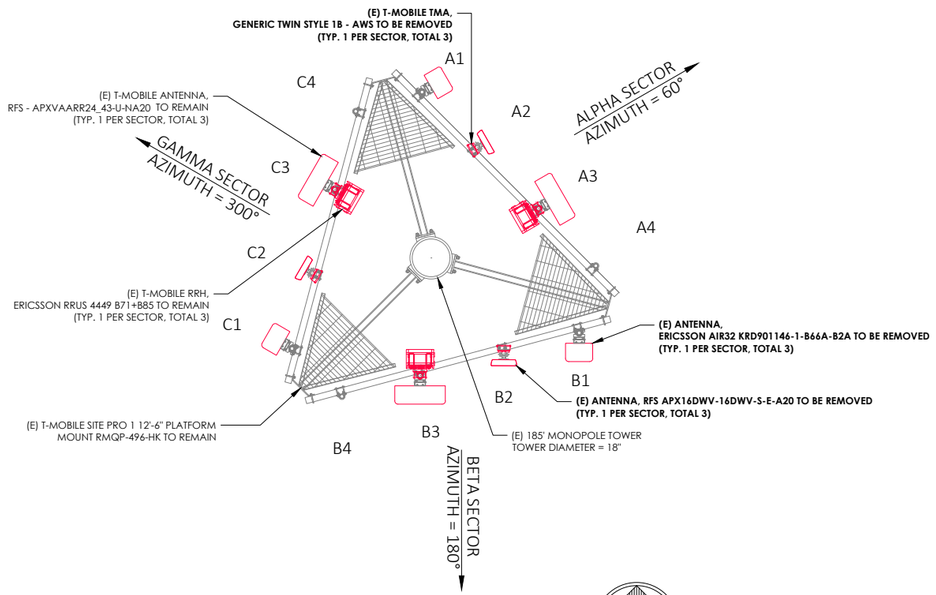
ANTENNA CL:183'
MOUNT CL:183'

ANY AND ALL TOWER MOUNTED EQUIPMENT MUST NOT TRAP OR INTERFERE W/ EXISTING SAFETY CLIMB

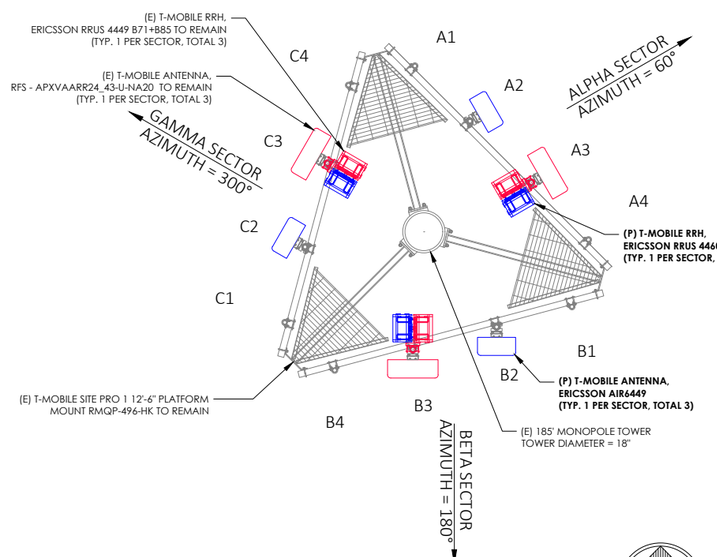
ANTENNA SCHEDULE

SECTOR	POS.	RAD CENTER	AZIMUTH	ANTENNA MANUFACTURER	ANTENNA MODEL	MECH. TILT	ELECT. TILT	TOWER MOUNTED EQUIPMENT	FEEDLINE TYPE
ALPHA	A1	183'	60°	-	-	0°	0°	-	-
ALPHA	A2	183'	60°	ERICSSON	AIR6449 B41 (ACTIVE ANTENNA - MASSIVE MIMO) (P)	0°	2°, 2°	-	(1) 6X24 4AWG 100M HCS
ALPHA	A3	183'	60°	RFS	APXVAARR24_43-U-NA20 (OCTO) (E)	0°	2°, 2°, 4°, 4°	(1) 4449 B71 +B85 (E) (1) 4460 B25+B66 (P)	(1) 6x12 HCS (60M) (E)
ALPHA	A4	183'	60°	-	-	0°	0°	-	-
BETA	B1	183'	180°	-	-	0°	0°	-	-
BETA	B2	183'	180°	ERICSSON	AIR6449 B41 (ACTIVE ANTENNA - MASSIVE MIMO) (P)	0°	2°, 2°	-	-
BETA	B3	183'	180°	RFS	APXVAARR24_43-U-NA20 (OCTO) (E)	0°	2°, 2°, 4°, 4°	(1) 4449 B71 +B85 (E) (1) 4460 B25+B66 (P)	(1) 6x12 HCS (60M) (E)
BETA	B4	183'	180°	-	-	0°	0°	-	-
GAMMA	C1	183'	300°	-	-	0°	0°	-	-
GAMMA	C2	183'	300°	ERICSSON	AIR6449 B41 (ACTIVE ANTENNA - MASSIVE MIMO) (P)	0°	2°, 2°	-	-
GAMMA	C3	183'	300°	RFS	APXVAARR24_43-U-NA20 (OCTO) (E)	0°	2°, 2°, 4°, 4°	(1) 4449 B71 +B85 (E) (1) 4460 B25+B66 (P)	(1) 6x12 HCS (60M) (E)
GAMMA	C4	183'	300°	-	-	0°	0°	-	-

1 ANTENNA AND CABLE SCHEDULE
SCALE: NOT TO SCALE



2 EXISTING ANTENNA LAYOUT
SCALE: NOT TO SCALE



3 FINAL ANTENNA LAYOUT
SCALE: NOT TO SCALE

GENERAL NOTES

1. THE HYBRID CABLE LENGTH SHOWN IS ONLY AN ESTIMATE AND SHOULD NOT BE USED FOR ORDERING MATERIALS. CONFIRM THE REQUIRED HYBRID CABLE LENGTH WITH T-MOBILE PRIOR TO ORDERING OR INSTALLATION.
2. THE CONTRACTOR SHALL TEST THE OPTICAL FIBER AFTER INSTALLATION IN ACCORDANCE WITH T-MOBILE STANDARDS AND SUPPLY THE RESULTS TO T-MOBILE.
3. THE CONTRACTOR SHALL CONFIRM THE TOWER TOP EQUIPMENT LIST ABOVE WITH THE FINAL T-MOBILE RFDS PRIOR TO INSTALLATION.
4. ALL PROPOSED ANTENNA CABLES SHALL BE COLOR CODED PER T-MOBILE MARKET STANDARDS.
5. REFER TO ERICSSON EQUIPMENT INSTALLATION STANDARDS FOR ADDITIONAL INFORMATION.
6. REFER TO EQUIPMENT MANUFACTURER'S SPECIFICATION SHEETS FOR ADDITIONAL INFORMATION NOT LISTED ABOVE.
7. CONTRACTOR TO FIELD COORDINATE EXACT LOCATION OF PROPOSED EQUIPMENT WITH EXISTING CONDITIONS ON SITE.
8. PROPOSED EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS. ALL HARDWARE FASTENERS SHALL BE HIGH STRENGTH (A325, A36)
9. DRILLING OF EXISTING STEEL MEMBERS IS NOT PERMITTED.
10. BOND PROPOSED EQUIPMENT TO EXISTING SECTOR GROUND BAR PER MANUFACTURER'S SPECIFICATIONS. PROVIDE ADDITIONAL SECTOR GROUND BARS AS REQUIRED.
11. ALL ANTENNAS, CABLES, AND MOUNTS SHALL BE INSTALLED IN ACCORDANCE WITH THE ENGINEER'S RECOMMENDATIONS IN A MANNER CONSISTENT WITH THE STRUCTURAL ANALYSIS REPORT.
12. CONTRACTOR TO CONTACT T-MOBILE FOR UP-TO-DATE RF DESIGN DATA. NOTIFY ENGINEER IF CONFLICT EXISTS.
13. THE DESIGN DEPICTED IN THESE DRAWINGS IS VALID WHEN ACCOMPANIED BY A CORRESPONDING PASSING MOUNT ANALYSIS. CONSTRUCTION MANAGER / GENERAL CONTRACTOR SHALL REVIEW THE MOUNT ANALYSIS FOR ANY CONDITIONS PRIOR TO INSTALLATION.
14. GENERAL CONTRACTOR TO NOTIFY T-MOBILE C.M. OF ALL ON-SITE DISCREPANCIES AS SHOWN HERE AS EXISTING CONDITIONS PRIOR TO COMMENCEMENT OF WORK.
15. GENERAL CONTRACTOR TO ADJUST EXISTING MOUNT TO ACCOMMODATE PROPOSED AZIMUTHS AS NECESSARY.
16. ANY REQUIRED MOUNT MODIFICATION DESIGN OR MOUNT REPLACEMENT SHALL BE APPROVED BY EOR.

T-Mobile
2105 WATER RIDGE PARKWAY SUITE 400
CHARLOTTE, NC 28217

CROWN CASTLE
6325 AUDREY KELL ROAD, SUITE 600
CHARLOTTE, NC 28277

PM&A
P. MARSHALL & ASSOCIATES
3545 WHITEHALL PARK DRIVE
SUITE 450 CHARLOTTE,
NORTH CAROLINA 28273

T-MOBILE SITE NUMBER:
CT11057C
CROWN CASTLE BU #:
825983
SITE ADDRESS:

90 INDUSTRIAL PARK ROAD
MIDDLETOWN, CT 06457

185' - MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	11/03/21	RLB	FCDs	JTM

STATE OF CONNECTICUT
PRESTON E. HUMPHRIES
No. 34370
LICENSED
PROFESSIONAL ENGINEER
11/05/2021

PM&A PROJECT NUMBER:
21CCTCTM-0007

SHEET NUMBER: C-3

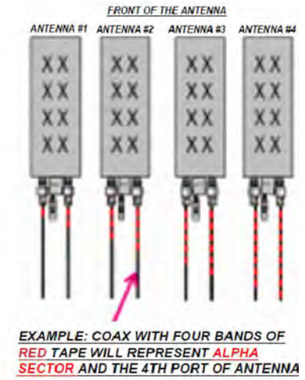
REVISION: 0

1 NOT USED
SCALE: NOT TO SCALE

Coax Color Coding

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

SECTOR A	RED
SECTOR B	GREEN
SECTOR C	BLUE
SECTOR D	YELLOW
SECTOR E	WHITE
SECTOR F	PURPLE
LMU	BROWN + SECTOR COLOR BANDS (1 & 2)
FIBER ID	GRAY
UNUSED COAX	PINK
MICROWAVE	ORANGE
DWE T-1*S + GPS DOWNLINK CABLE	ID W/LABEL MAKER



COLOR CODING NOTES:

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

METALLIC TAG NOTES:

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

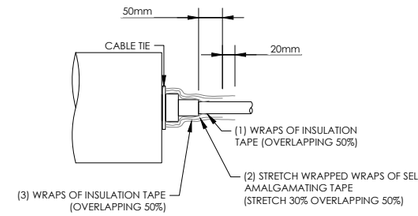
ANTENNA AND COAXIAL CABLE SCHEDULE

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

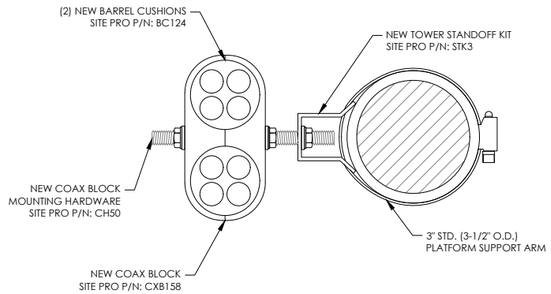
2 COAX COLOR CODING
SCALE: NOT TO SCALE

INSTALLER NOTE:

JUMPERS TO BE TORQUED TO 221.27 IN/LBS.



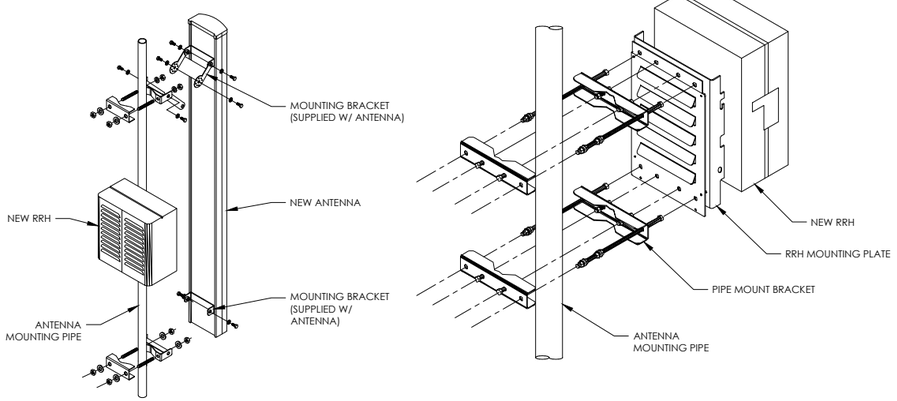
6 RF JUMPER CONNECTION
SCALE: NOT TO SCALE



3 RF JUMPER DETAIL
SCALE: NOT TO SCALE

INSTALLER NOTES:

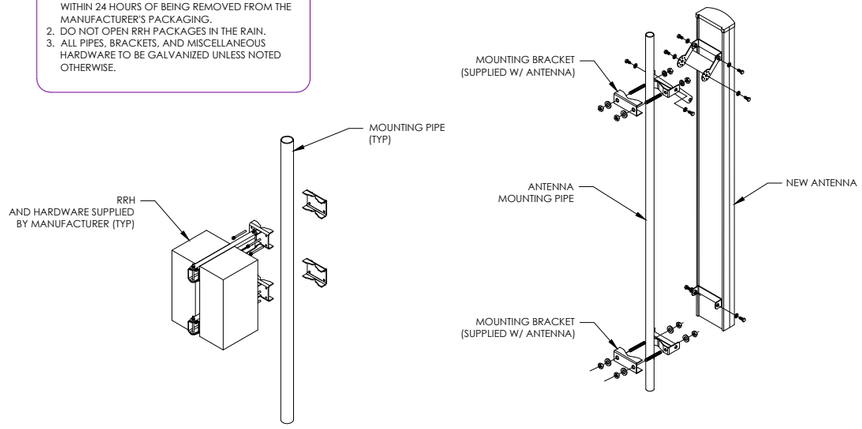
1. COMPLY WITH MANUFACTURERS INSTRUCTIONS TO ENSURE THAT ALL RRHs RECEIVE ELECTRICAL POWER WITHIN 24 HOURS OF BEING REMOVED FROM THE MANUFACTURER'S PACKAGING.
2. DO NOT OPEN RRH PACKAGES IN THE RAIN.
3. ALL PIPES, BRACKETS, AND MISCELLANEOUS HARDWARE TO BE GALVANIZED UNLESS NOTED OTHERWISE.



4 ANTENNA WITH RRH MOUNTING DETAIL
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.



5 ANTENNA WITH RRHs MOUNTING DETAIL
SCALE: NOT TO SCALE

T-Mobile
2105 WATER RIDGE PARKWAY SUITE 400
CHARLOTTE, NC 28217

CROWN CASTLE
6325 AUDREY KELL ROAD, SUITE 600
CHARLOTTE, NC 28277

PM&A
P. MARSHALL & ASSOCIATES
3545 WHITEHALL PARK DRIVE
SUITE 450 CHARLOTTE,
NORTH CAROLINA 28273

T-MOBILE SITE NUMBER:
CT11057C
CROWN CASTLE BU #:
825983
SITE ADDRESS:

90 INDUSTRIAL PARK ROAD
MIDDLETOWN, CT 06457

185' - MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	11/03/21	RLB	FCDs	JTM

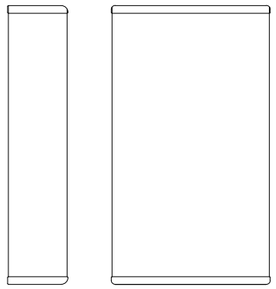
STATE OF CONNECTICUT
PRESTON E. HUMPHRIES
No. 34370
LICENSED
PROFESSIONAL ENGINEER
11/05/2021

PM&A PROJECT NUMBER:
21CCTCTM-0007

SHEET NUMBER: C-4

REVISION: 0

ERICSSON - AIR6449 B41	
WEIGHT (W/O MOUNTING HARDWARE)	104.0 LBS
SIZE (H x W x D)	33.1 x 20.6 x 8.60 IN.
MOUNTING HARDWARE P/N	TBD
RATED WIND VELOCITY	TBD



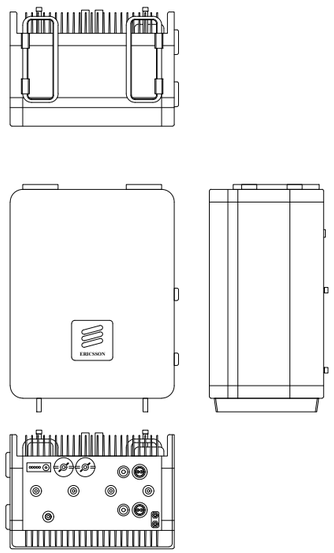
1 ERICSSON - AIR6449 B41
SCALE: NOT TO SCALE

2 NOT USED
SCALE: NOT TO SCALE

3 NOT USED
SCALE: NOT TO SCALE

4 NOT USED
SCALE: NOT TO SCALE

ERICSSON - RADIO 4460	
WEIGHT (W/O MOUNTING HARDWARE)	109.0 LBS
SIZE (H x W x D)	17.0 x 15.1 x 11.9 IN.



5 ERICSSON RADIO 4460
SCALE: NOT TO SCALE

6 NOT USED
SCALE: NOT TO SCALE

T-Mobile

2105 WATER RIDGE PARKWAY SUITE 400
CHARLOTTE, NC 28217

CROWN CASTLE

6325 AUDREY KELL ROAD, SUITE 600
CHARLOTTE, NC 28277

PM&A
P. MARSHALL & ASSOCIATES
3545 WHITEHALL PARK DRIVE
SUITE 450 CHARLOTTE,
NORTH CAROLINA 28273

T-MOBILE SITE NUMBER:
CT11057C
CROWN CASTLE BU #:
825983
SITE ADDRESS:

90 INDUSTRIAL PARK ROAD
MIDDLETOWN, CT 06457

185' - MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	11/03/21	RLB	FCDs	JTM

STATE OF CONNECTICUT
PRESTON E. HUMPHRIES
No. 34370
LICENSED
PROFESSIONAL ENGINEER
11/05/2021

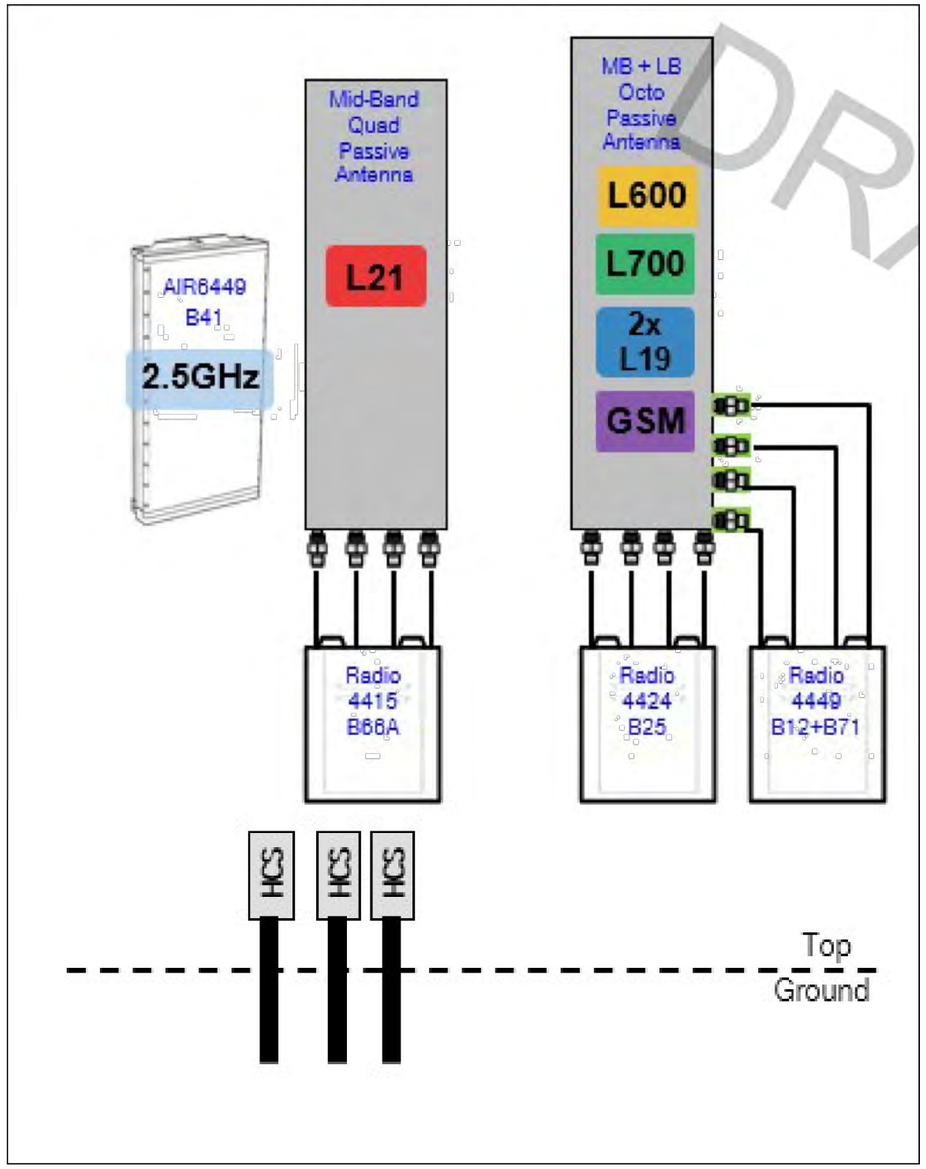
PM&A PROJECT NUMBER:
21CCTCTM-0007

SHEET NUMBER: C-5

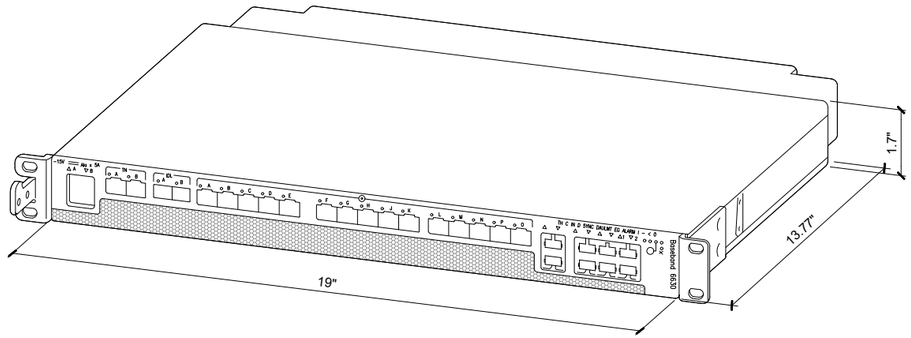
REVISION: 0

PROPOSED RF CONFIGURATION:
(INFORMATION PROVIDED BY CLIENT

67D5A998E HYBRID



ERICSSON BASEBAND 6630	
WEIGHT (W/O MOUNTING HARDWARE)	14.3 LBS
SIZE (H x W x D)	1.7 x 19 x 13.77 IN.

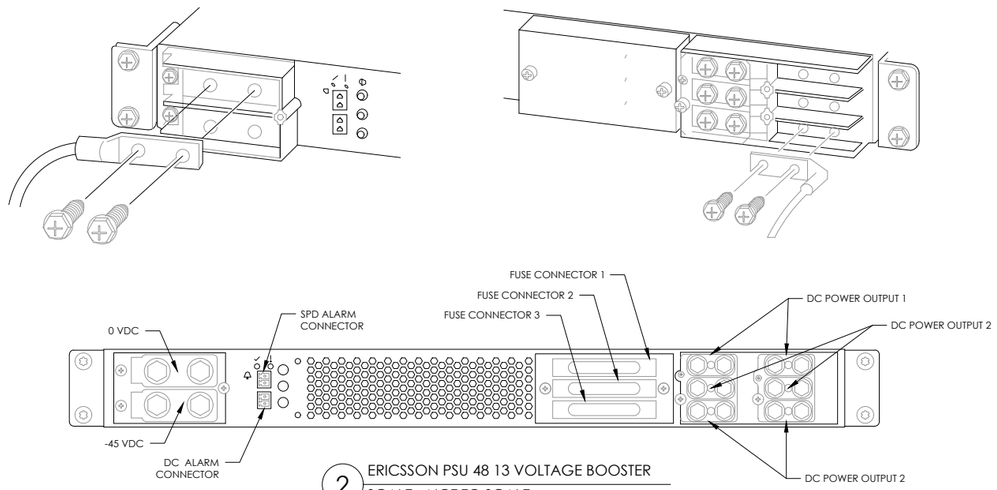


1 ERICSSON BB 6630 / BB 6648
SCALE: NOT TO SCALE

ERICSSON PSU 4813	
WEIGHT (W/O MOUNTING HARDWARE)	17.1 LBS
SIZE (H x W x D)	1.7 x 19 x 13.3 IN.
NEEDED INSTALLATION KIT	
PSU4813 INSTALL KIT FOR RBS	34133
PSU4813 INSTALL KIT FOR PBC6200	34134
PSU4813 INSTALL KIT FOR 6160/RBS6230	34135

INSTALLER NOTE:

1. THE PSU 48 13 SHALL BE FED VIA 200A BREAKER INSTALLED, FOR EXAMPLE, IN THE LLVD1 SECTION OF AN ENCLOSURE 6160 DC DISTRIBUTION SUBRACK.
2. CONNECT -58 VDC DISTRIBUTION CABLE TO TERMINAL AT THE RIGHT, WHICH WILL BE FED TO RRU/AIR AT THE OTHER END.



2 ERICSSON PSU 48 13 VOLTAGE BOOSTER
SCALE: NOT TO SCALE

T-Mobile
2105 WATER RIDGE PARKWAY SUITE 400
CHARLOTTE, NC 28217

CROWN CASTLE
6325 AUDREY KELL ROAD, SUITE 600
CHARLOTTE, NC 28277

PM&A
P. MARSHALL & ASSOCIATES
3545 WHITEHALL PARK DRIVE
SUITE 450 CHARLOTTE,
NORTH CAROLINA 28273

T-MOBILE SITE NUMBER:
CT11057C
CROWN CASTLE BU #:
825983
SITE ADDRESS:

90 INDUSTRIAL PARK ROAD
MIDDLETOWN, CT 06457

185' - MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	11/03/21	RLB	FCDs	JTM

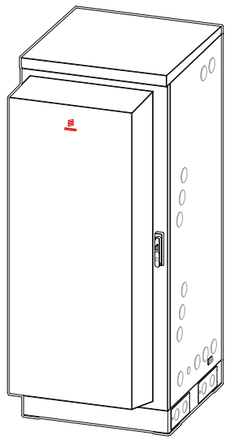
STATE OF CONNECTICUT
PRESTON E. HUMPHRIES
No. 34370
LICENSED PROFESSIONAL ENGINEER
11/05/2021

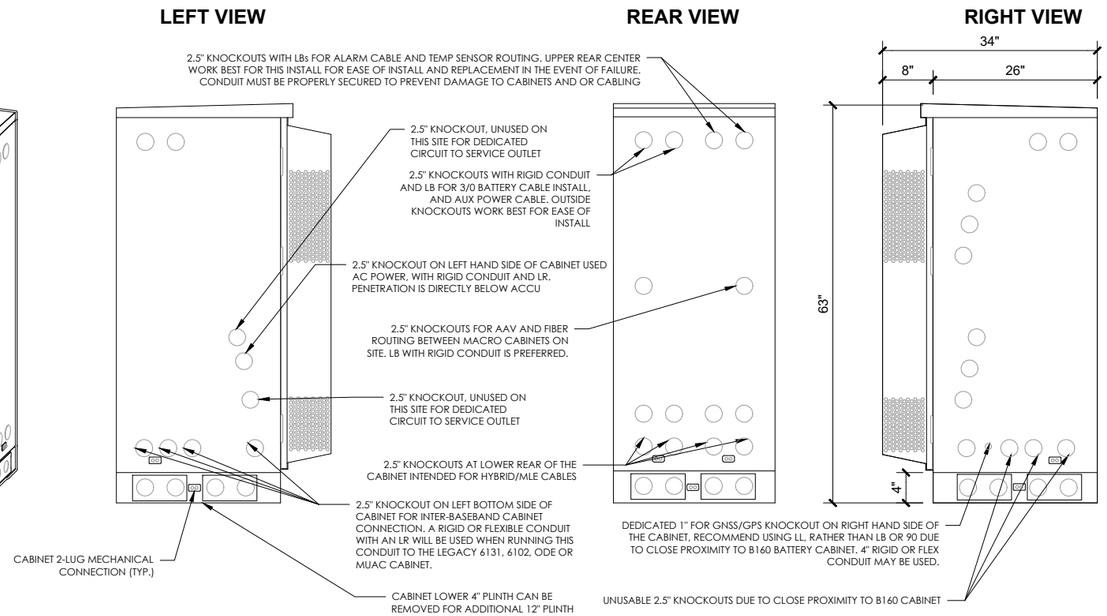
PM&A PROJECT NUMBER:
21CCTCTM-0007

SHEET NUMBER: C-6

REVISION: 0

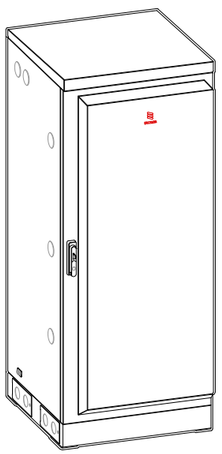
ERICSSON - 6160	
WEIGHT (W/O WITHOUT EQUIPMENT)	295.0 LBS
SIZE (H x W x D)	63" x 25.6x 34"

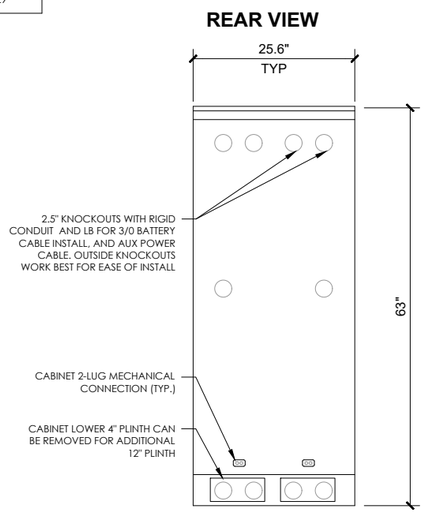




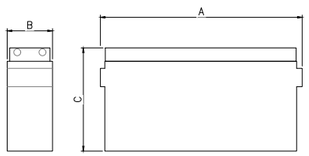
1 ERICSSON 6160
SCALE: NOT TO SCALE

ERICSSON - B160	
WEIGHT (W/O WITHOUT EQUIPMENT)	295.0 LBS
SIZE (H x W x D)	63" x 25.6x 29"





2 ERICSSON B160
SCALE: NOT TO SCALE



INSTALLER NOTE:

THE BATTERIES INSTALLED IN THE CABINET ARE VALVE REGULATED LEAD-ACID (VRLA) CELLS BATTERY STRINGS; NORTHSTAR NSB 190FT RED. ALL NORTHSTAR BATTERIES ARE COMPLIANT WITH: TELCORDIA SR4228, IEC 60896; BELLCORE GR-63-CORE, ISSUE 1; UL APPROVED AND UN2800 CERTIFIED. NORTHSTAR IS REGISTERED TO ISO 9001 AND ISO 14001. ERICSSON CABINET PROVIDES REQUIRED VENTILATION, SMOKE, SEISMIC & ADDITIONAL SIGNAGE TO MEET ALL IFC SECTION 608 REQUIREMENTS.

SPECIFICATIONS												
MODEL NUMBER	VOLTAGE	CAPACITY (AH)		NOMINAL DIMENSIONS						NOMINAL WEIGHT	
		8 HR TO 1.75 VPC @ 25°	10 HR TO 1.8 VPC @ 25°	INCHES			MILLIMETERS				
				A	B	C	A	B	C	LBS	Kg
NSB 190FT RED BATTERY	12	183 / 186 AH	187 / 190 AH	22.0	4.9	12.6	560	125	320	124.3	56.3

ELECTRICAL DATA		
MODEL NUMBER	SHORT CIRCUIT CURRENT	INTERNAL RESISTANCE (mOhms)
NSB 190FT RED BATTERY	5000 A	2.8

CHAPTER 12, SECTION 1206					
ELECTRICAL ENERGY STORAGE SYSTEM					
1206.2 SCOPE:					
STATIONARY STORAGE BATTERY SYSTEMS HAVING CAPACITIES EXCEEDING THE VALUES SHOWN IN TABLE 1206.2 SHALL COMPLY W/ SECTION 1206.2.1 THROUGH 1206.2.12.6, AS APPLICABLE.					
BATTERY STORAGE SYSTEM THRESHOLD QTY'S					
CATTERY TECHNOLOGY		CAPACITY ALLOWED			
LEAD ACID, ALL TYPES		70 kWh (252 MEGAJOULES)			
AH = VOLTAGE (AH)/1000					
VOLTS	AH		kWh	NO. OF BATTERIES	TOTAL kWh
12	190	1000	2.28	12	27.36
CONCLUSIONS:					
27.36	<	70 kWh	SECTION 1206.2 DOES NOT APPLY		
TOTAL BATTERY WEIGHT (12 BATTERIES):					1,491.6 LBS
TOTAL GALLONS - ELECTROLYTE & ACID (12 BATTERIES):					33.36

FLOAT VOLTAGE

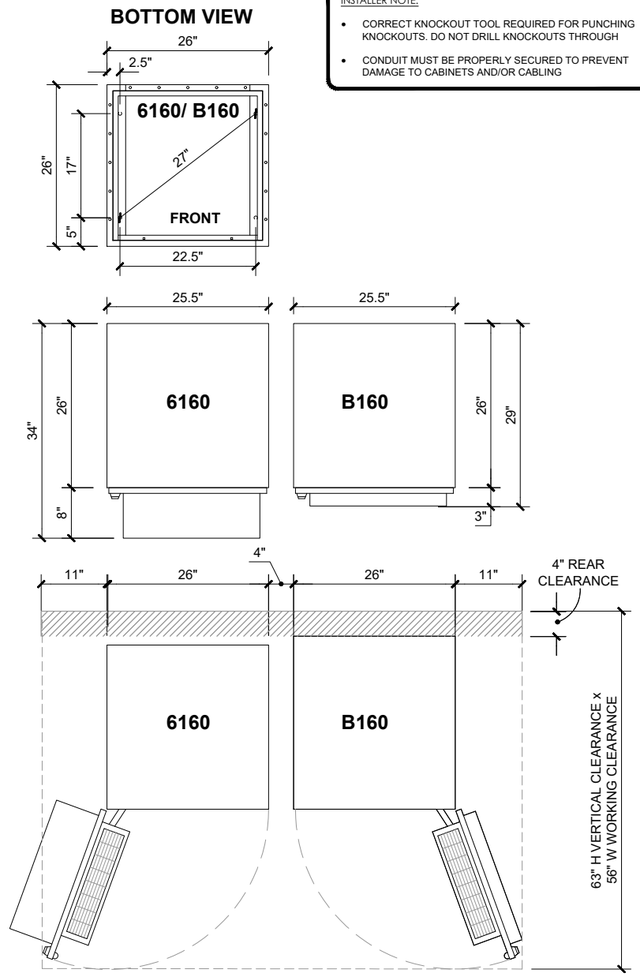
CONSTANT VOLTAGE CHARGING IS RECOMMENDED

RECOMMENDED FLOAT VOLTAGE: 2.27 +/- 0.02 VPC

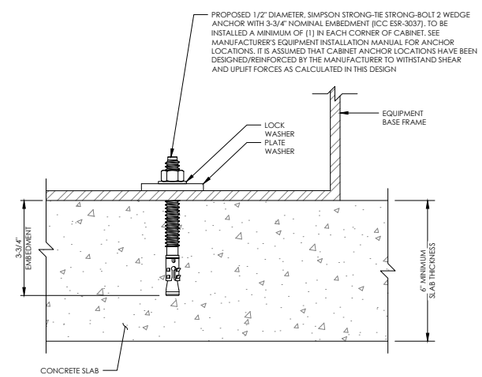
NSB 190FT RED BATTERY LEAD & ACID WEIGHTS (12-VOLT MODULE):			
ELECTROLYTE	WEIGHT	/KG	10.5
		/LBS	23.2
	VOLUME	/LITERS	7.8
		/GALLONS	2.08
ACID	WEIGHT	/KG	4.8
		/LBS	10.5
	VOLUME	/LITERS	2.6
		/GALLONS	0.7
LEAD	WEIGHT	/KG	17.9
		/LBS	39.4
LEAD OXIDE	VOLUME	/KG	23.3
		/LBS	51.2
TOTAL WEIGHT	WEIGHT	/KG	56.3
		/LBS	124.3

INSTALLER NOTE:

- CORRECT KNOCKOUT TOOL REQUIRED FOR PUNCHING KNOCKOUTS. DO NOT DRILL KNOCKOUTS THROUGH
- CONDUIT MUST BE PROPERLY SECURED TO PREVENT DAMAGE TO CABINETS AND/OR CABLING



3 PLAN CABINET DETAILS
SCALE: NOT TO SCALE



4 CABINET ATTACHMENT
SCALE: NOT TO SCALE

T-Mobile
2105 WATER RIDGE PARKWAY SUITE 400
CHARLOTTE, NC 28217

CROWN CASTLE
6325 AUDREY KELL ROAD, SUITE 600
CHARLOTTE, NC 28277

PM&A
P. MARSHALL & ASSOCIATES
3545 WHITEHALL PARK DRIVE
SUITE 450 CHARLOTTE,
NORTH CAROLINA 28273

T-MOBILE SITE NUMBER:
CT11057C
CROWN CASTLE BU #:
825983
SITE ADDRESS:

90 INDUSTRIAL PARK ROAD
MIDDLETOWN, CT 06457

185' - MONOPOLE

ISSUED FOR:

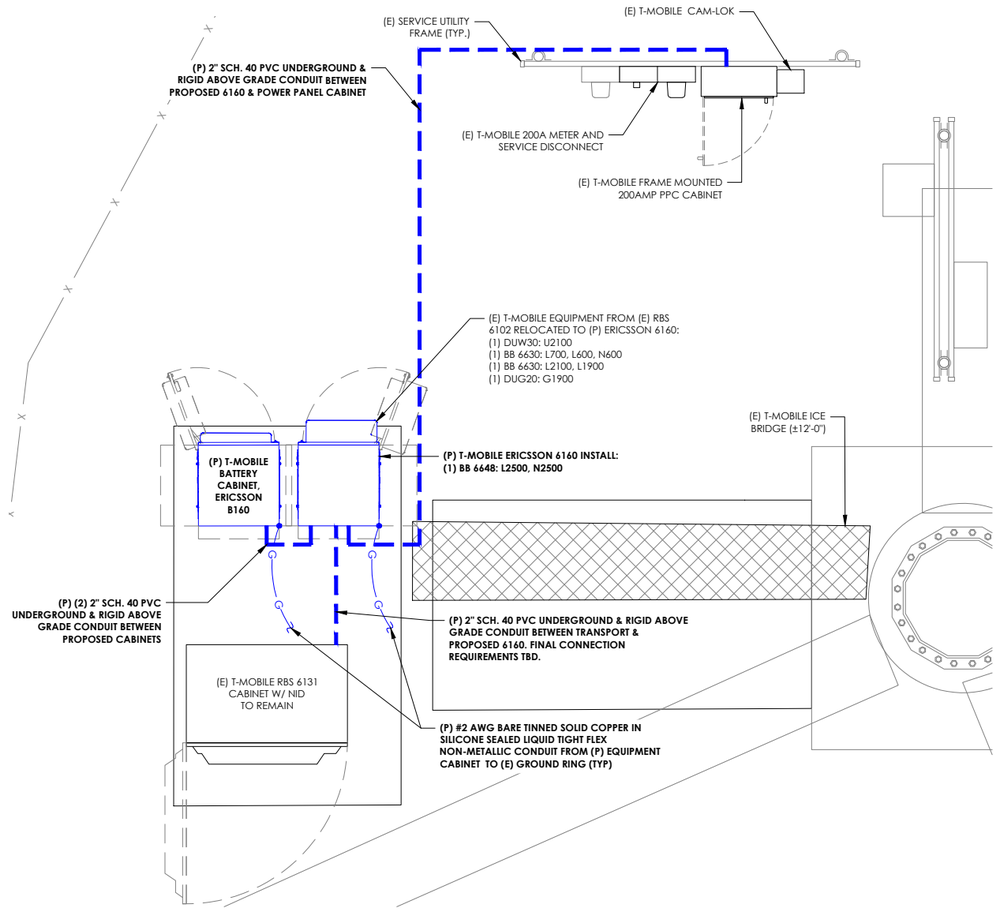
REV	DATE	DRWN	DESCRIPTION	DES./QA
0	11/03/21	RLB	FCDs	JTM

STATE OF CONNECTICUT
PRESTON E. HUMPHRIES
No. 34370
LICENSED PROFESSIONAL ENGINEER
11/05/2021

PM&A PROJECT NUMBER:
21CCTCTM-0007

SHEET NUMBER: C-7

REVISION: 0



1 UTILITY ROUTING & GROUNDING PLAN

SCALE: 1" 6" 0 1' 1"=1'-0" (FULL SIZE) 1/2"=1'-0" (11x17)

GROUNDING PLAN LEGEND:

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

NOTE:

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

NOTE:

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

T-Mobile
2105 WATER RIDGE PARKWAY SUITE 400
CHARLOTTE, NC 28217

CROWN CASTLE
6325 AUDREY KELL ROAD, SUITE 600
CHARLOTTE, NC 28277

PM&A
P. MARSHALL & ASSOCIATES
3545 WHITEHALL PARK DRIVE
SUITE 450 CHARLOTTE,
NORTH CAROLINA 28273

T-MOBILE SITE NUMBER:
CT11057C
CROWN CASTLE BU #:
825983
SITE ADDRESS:

90 INDUSTRIAL PARK ROAD
MIDDLETOWN, CT 06457

185' - MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	11/03/21	RLB	FCDs	JTM
1	11/30/21	JMS	6131 & UPDATED SA/MA	JTM

STATE OF CONNECTICUT
PRESTON E. HUMPHRIES
No. 34370
LICENSED PROFESSIONAL ENGINEER
12/01/2021

PM&A PROJECT NUMBER:
21CCTCTM-0007

SHEET NUMBER: E-1

REVISION: 0

T-MOBILE SITE #:			LOCATION:	VOLTAGE: 240/120 1Ø							MOUNTING / ENCLOSURE: EXISTING / NEMA 3R			
CT11057C (EXISTING)			H-FRAME	MAIN C/B: 200 AMPS							AVAIL. FAULT CURRENT: EXISTING			
11/30/2021				BUS RATING: 200 AMPS							SHORT CIRCUIT RATING: EXISTING			
AMPS/ POLES	WIRE & CONDUIT	TYPE	DESCRIPTION	KVA	CKT	A		B	CKT	KVA	DESCRIPTION	TYPE	WIRE & CONDUIT	AMPS/ POLES
30/2	EXISTING	EQ	SURGE	1.25	1	4.25			2	3.00	6102	EQ	EXISTING	125/2
-	-	EQ	-	1.25	3			4.25	4	3.00	-	EQ	-	-
50/2	EXISTING	EQ	3106	6.25	5	6.75			6	0.50	LIGHT	L	EXISTING	20/1
-	-	EQ	-	6.25	7			6.25	8		BLANK			
					9				10		BLANK			
					11				12		BLANK			
			BLANK		13				14		BLANK			
			BLANK		15				16		BLANK			
			BLANK		17				18		BLANK			
			BLANK		19				20		BLANK			
			BLANK		21				22		BLANK			
			BLANK		23				24		BLANK			
			PHASE TOTAL			11.0		10.5	KVA					

TOTAL CONNECTED LOAD	21.5	kVA	90 A
TOTAL DEMAND LOAD	21.6	kVA	90 A

LOAD TYPE	DESCRIPTION	CONN. LOAD		DEMAND FACTOR	DESIGN LOAD	
		KVA	AMPS		KVA	AMPS
L	LIGHTING	0.5	2.1	1.25	0.6	2.6
R	RECEPTACLE	0.0	0.0	NEC	0.0	0.0
M	MOTOR	0.0	0.0	NEC	0.0	0.0
H	HEATING	0.0	0.0	1.00	0.0	0.0
AC	HVAC	0.0	0.0	1.00	0.0	0.0
EQ	EQUIPMENT	21.0	87.5	1.00	21.0	87.5
E	EXISTING	0.0	0.0	1.25	0.0	0.0

* ALL EQUIPMENT LOADS CONSIDERED CONTINUOUS LOADS

NOTES:

DEPICTED LOAD BASED ON ASSUMPTIONS OF EQUIPMENT INSTALLED AND WAS NOT V.I.F. NOTIFY E.O.R. OF ANY DISCREPANCIES PRIOR TO INSTALLATION OF PROPOSED EQUIPMENT.

1 EXISITNG PANEL SCHEDULE
SCALE: NOT TO SCALE

T-MOBILE SITE #:			LOCATION:	VOLTAGE: 240/120 1Ø							MOUNTING / ENCLOSURE: EXISTING / NEMA 3R			
CT11057C (PROPOSED)			H-FRAME	MAIN C/B: 200 AMPS							AVAIL. FAULT CURRENT: EXISTING			
11/30/2021				BUS RATING: 200 AMPS							SHORT CIRCUIT RATING: EXISTING			
AMPS/ POLES	WIRE & CONDUIT	TYPE	DESCRIPTION	KVA	CKT	A		B	CKT	KVA	DESCRIPTION	TYPE	WIRE & CONDUIT	AMPS/ POLES
30/2	EXISTING	EQ	SURGE	1.25	1	1.25			2		BLANK			
-	-	EQ	-	1.25	3			1.25	4		BLANK			
50/2	EXISTING	EQ	3106	6.25	5	6.75			6	0.50	LIGHT	L	EXISTING	20/1
-	-	EQ	-	6.25	7			6.25	8	0.00	(P) INTERLOCK GEN PLUG	EQ	3#10, 1#10G, 1/2"C	30/2
			BLANK		9				10	0.00	-	EQ	-	-
			BLANK		11			5.55	12	5.55	(P) 6160	EQ	1#1/0. 1#6G, 2"C	150/2
			BLANK		13	5.55			14	5.55	-	EQ	-	-
			BLANK		15				16	0.00	-	EQ	-	-
			BLANK		17				18	0.00	-	EQ	-	-
			BLANK		19			0.18	20	0.18	(P) 6160 GFCI	R	2#12, 1#12G, 1/2"C	20/1
			BLANK		21				22		BLANK			
			BLANK		23				24		BLANK			
			PHASE TOTAL			13.6		13.2	KVA					

TOTAL CONNECTED LOAD	26.8	kVA	112 A
TOTAL DEMAND LOAD	26.9	kVA	112 A

LOAD TYPE	DESCRIPTION	CONN. LOAD		DEMAND FACTOR	DESIGN LOAD	
		KVA	AMPS		KVA	AMPS
L	LIGHTING	0.5	2.1	1.25	0.6	2.6
R	RECEPTACLE	0.2	0.8	NEC	0.2	0.8
M	MOTOR	0.0	0.0	NEC	0.0	0.0
H	HEATING	0.0	0.0	1.00	0.0	0.0
AC	HVAC	0.0	0.0	1.00	0.0	0.0
EQ	EQUIPMENT	26.1	108.8	1.00	26.1	108.8
E	EXISTING	0.0	0.0	1.25	0.0	0.0

* ALL EQUIPMENT LOADS CONSIDERED CONTINUOUS LOADS

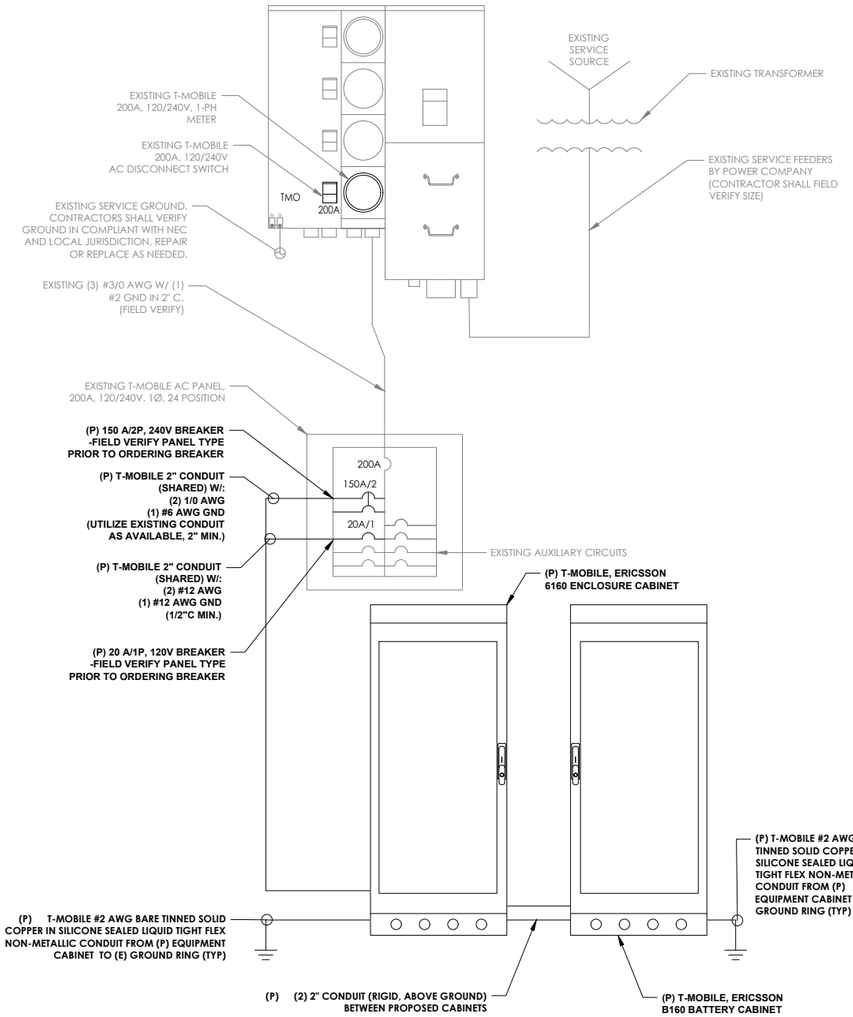
NOTES:

DEPICTED LOAD BASED ON ASSUMPTIONS OF EQUIPMENT INSTALLED AND WAS NOT V.I.F. NOTIFY E.O.R. OF ANY DISCREPANCIES PRIOR TO INSTALLATION OF PROPOSED EQUIPMENT.

2 PROPOSED PANEL SCHEDULE
SCALE: NOT TO SCALE

NOTES:

1. THE MAXIMUM 12-MONTH DEMAND LOAD WAS NOT AVAILABLE AT TIME OF PRINTING. CONTRACTOR SHALL COORDINATE WITH POWER CO., OBTAIN MAXIMUM DEMAND LOAD, MULTIPLY VALUE BY 1.25, ADD ALL NEW LOADS & VERIFY NEW MAXIMUM DEMAND LOAD DOES NOT OVERLOAD ANY PORTION OF THE EXISTING ELECTRICAL SYSTEM. CONTACT EOR IF OVERLOAD IS POSSIBLE BEFORE START OF WORK.
2. CONTRACTOR IS RESPONSIBLE FOR LOADING ON ALL PANELS AND FEEDERS PER THE N.E.C. CONTRACTOR SHALL ENSURE CONTINUITY OF EXISTING CIRCUITS TO REMAIN. ELECTRICAL CONTRACTOR SHALL VERIFY THAT ALL EXISTING AND PROPOSED LOADS PLACED ON EXISTING PANELS DO NOT EXCEED THE MAXIMUM LOADING REQUIRED PER THE LATEST EDITION OF THE N.E.C. NOTIFY EOR IF OVERLOAD IS POSSIBLE.
3. CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANY AND CALCULATE SHORT CIRCUIT FAULT CURRENT AND ARC FLASH AND PROVIDE LABELS ON ELECTRICAL EQUIPMENT PER THE N.E.C. AND LOCAL JURISDICTION. CONTRACTOR SHALL PROVIDE EQUIPMENT RATED FOR FAULT CURRENT.
4. 6160 ENCLOSURE STANDARD CONFIGURATION INCLUDES (4) 3500W RECTIFIERS, MAX OF 7. LOAD PROVIDED IN PANEL SCHEDULE IS BASED ON THIS CONFIGURATION. IF ADDITIONAL RECTIFIERS ARE REQUIRED, ENGINEER OF RECORD SHALL BE CONTACTED TO DETERMINE ADEQUACY OF EXISTING PANEL FOR ADDITIONAL LOAD
5. CONTRACTOR TO FIELD VERIFY ALL EQUIPMENT RATINGS AND WIRE SIZES. IF ANY DISCREPANCIES EXIST, CONTACT ENGINEER PRIOR TO ROUGH IN.
6. CONTRACTOR SHALL FIELD VERIFY EXISTING AC PANEL MODEL AND ENSURE 150A, 2P, 4-POSITION BREAKER IS COMPATIBLE, CONTACT EOR IF DISCREPANCIES ARE FOUND.



3 ONE-LINE DIAGRAM
SCALE: NOT TO SCALE

T-Mobile
2105 WATER RIDGE PARKWAY SUITE 400
CHARLOTTE, NC 28217

CROWN CASTLE
6325 AUDREY KELL ROAD, SUITE 600
CHARLOTTE, NC 28277

PM&A
P. MARSHALL & ASSOCIATES
3545 WHITEHALL PARK DRIVE
SUITE 450 CHARLOTTE,
NORTH CAROLINA 28273

T-MOBILE SITE NUMBER:
CT11057C
CROWN CASTLE BU #:
825983
SITE ADDRESS:

90 INDUSTRIAL PARK ROAD
MIDDLETOWN, CT 06457

185' - MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	11/03/21	RLB	FCDs	JTM
1	11/30/21	JMS	6131 & UPDATED SA/MA	JTM

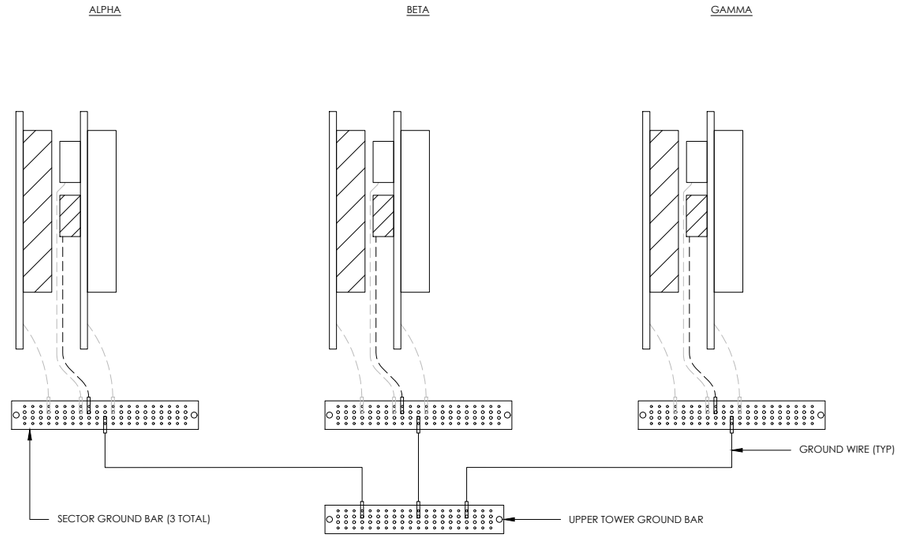
STATE OF CONNECTICUT
PRESTON E. HUMPHRIES
No. 34370
LICENSED
PROFESSIONAL ENGINEER
12/01/2021

PM&A PROJECT NUMBER:
21CCTCTM-0007

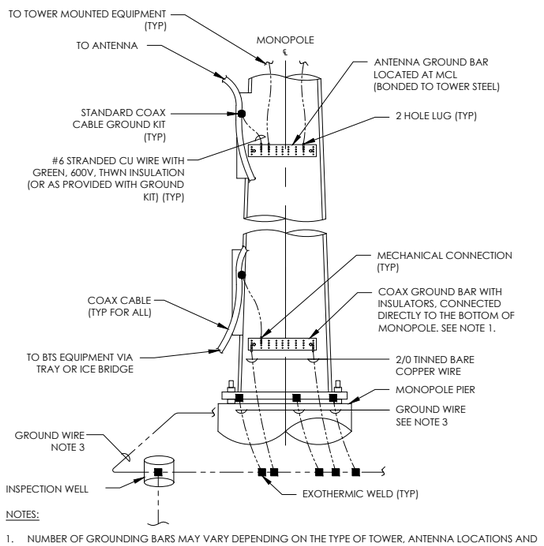
SHEET NUMBER:	REVISION:
E-2	0

NOTE:

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



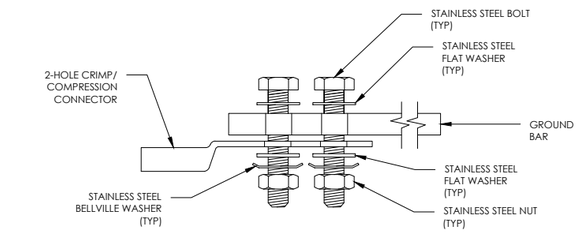
1 ANTENNA GROUNDING DIAGRAM
SCALE: NOT TO SCALE



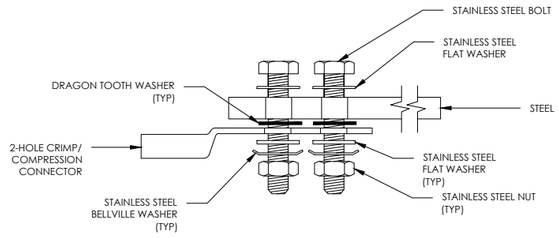
NOTES:

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

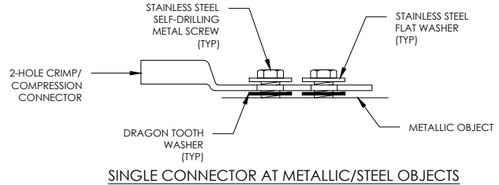
4 TYPICAL ANTENNA CABLE GROUNDING
SCALE: NOT TO SCALE



SINGLE CONNECTOR AT GROUND BARS

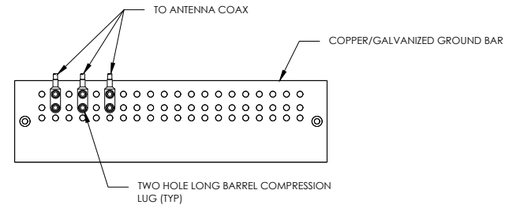


SINGLE CONNECTOR AT STEEL OBJECTS



SINGLE CONNECTOR AT METALLIC/STEEL OBJECTS

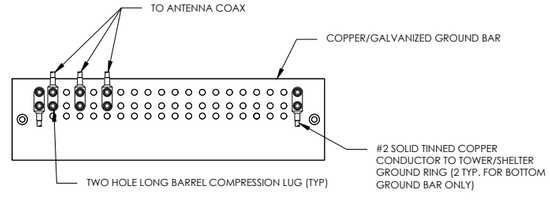
5 HARDWARE DETAIL FOR EXTERIOR CONNECTIONS
SCALE: NOT TO SCALE



NOTES:

1. 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

T-Mobile

2105 WATER RIDGE PARKWAY SUITE 400
CHARLOTTE, NC 28217

CROWN CASTLE

6325 AUDREY KELL ROAD, SUITE 600
CHARLOTTE, NC 28277

PM&A

P. MARSHALL & ASSOCIATES
3545 WHITEHALL PARK DRIVE
SUITE 450 CHARLOTTE,
NORTH CAROLINA 28273

T-MOBILE SITE NUMBER:
CT11057C
CROWN CASTLE BU #:
825983
SITE ADDRESS:

90 INDUSTRIAL PARK ROAD
MIDDLETOWN, CT 06457

185' - MONOPOLE

ISSUED FOR:

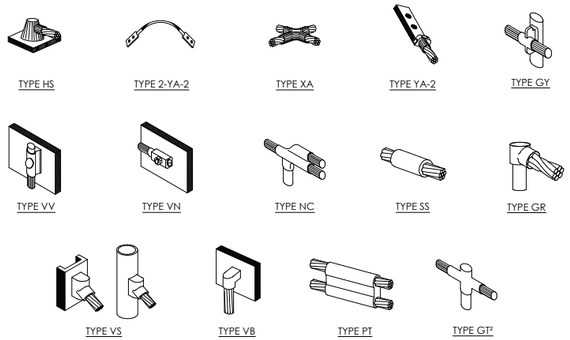
REV	DATE	DRWN	DESCRIPTION	DES./QA
0	11/03/21	RLB	FCDs	JTM

STATE OF CONNECTICUT
PRESTON E. MARSHALL HUMPHRIES
No. 34370
LICENSED
PROFESSIONAL ENGINEER
11/05/2021

PM&A PROJECT NUMBER:
21CCTCTM-0007

SHEET NUMBER: G-1

REVISION: 0

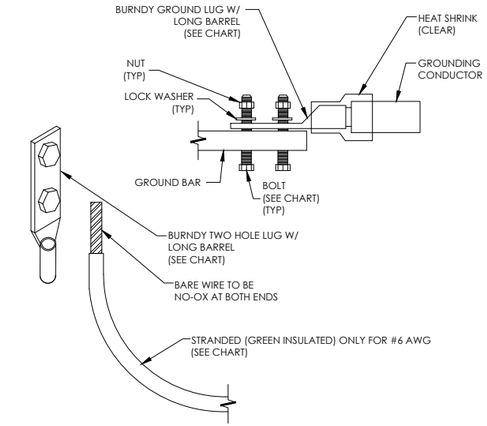


NOTE:

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

1 CADWELD GROUNDING CONNECTIONS
SCALE: NOT TO SCALE

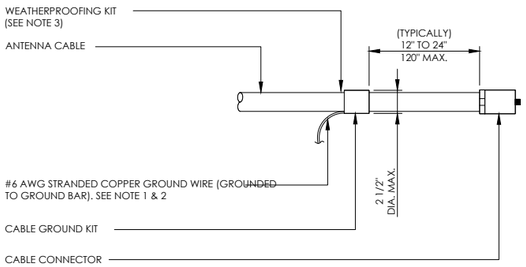
WIRE SIZE	BURNDY LUG	BOLT SIZE
#6 AWG GREEN INSULATED	YA6C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG SOLID TINNED	YA3C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG STRANDED	YA2C-2TC38	3/8" - 16 NC S 2 BOLT
#2/0 AWG STRANDED	YA26-2TC38	3/8" - 16 NC S 2 BOLT
#4/0 AWG STRANDED	YA28-2N	1/2" - 16 NC S 2 BOLT



NOTES:

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

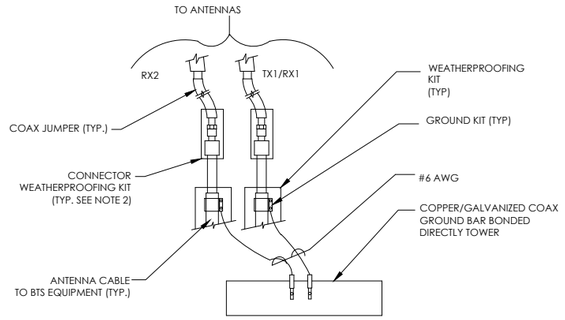
2 MECHANICAL LUG CONNECTION
SCALE: NOT TO SCALE



NOTES:

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

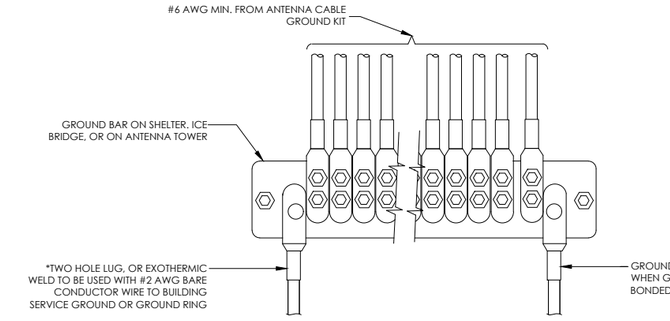
3 CABLE GROUND KIT CONNECTION
SCALE: NOT TO SCALE



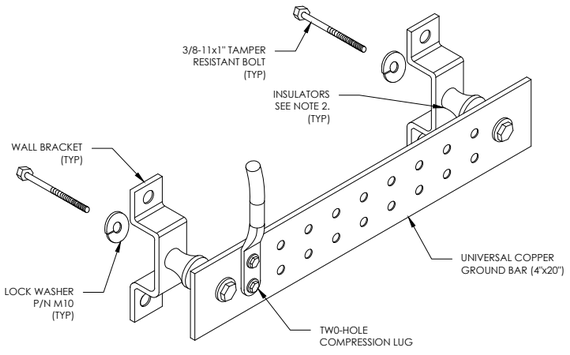
NOTES:

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

4 GROUND CABLE CONNECTION
SCALE: NOT TO SCALE



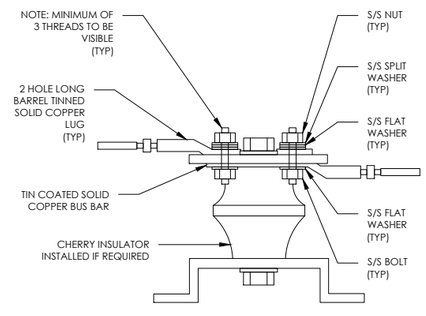
5 GROUNDWIRE INSTALLATION
SCALE: NOT TO SCALE



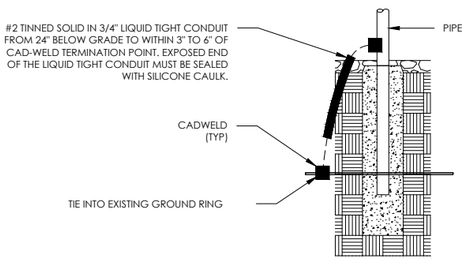
NOTES:

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

6 GROUND BAR DETAIL
SCALE: NOT TO SCALE



7 LUG DETAIL
SCALE: NOT TO SCALE



8 TRANSITIONING GROUND DETAIL
SCALE: NOT TO SCALE

T-Mobile
2105 WATER RIDGE PARKWAY SUITE 400
CHARLOTTE, NC 28217

CROWN CASTLE
6325 AUDREY KELL ROAD, SUITE 600
CHARLOTTE, NC 28277

PM&A
P. MARSHALL & ASSOCIATES
3545 WHITEHALL PARK DRIVE
SUITE 450 CHARLOTTE,
NORTH CAROLINA 28273

T-MOBILE SITE NUMBER:
CT11057C
CROWN CASTLE BU #:
825983
SITE ADDRESS:

90 INDUSTRIAL PARK ROAD
MIDDLETOWN, CT 06457

185' - MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	11/03/21	RLB	FCDs	JTM

STATE OF CONNECTICUT
PRESTON E. HUMPHRIES
No. 34370
LICENSED
PROFESSIONAL ENGINEER
11/05/2021

PM&A PROJECT NUMBER:
21CCTCTM-0007

SHEET NUMBER: G-2
REVISION: 0

Exhibit D

Structural Analysis Report

Date: **October 14, 2021**

MORRISON HERSHFIELD

Morrison Hershfield
1455 Lincoln Parkway, Suite 500
Atlanta, GA 30346
(770) 397-8500

Subject:	**Structural Analysis Report**	
Carrier Designation:	***T-Mobile* Co-Locate**	
	Site Number:	CT11057C
Crown Castle Designation:	**BU Number:**	825983
	Site Name:	Middletown_1
	JDE Job Number:	686923
	Work Order Number:	2029644
	Order Number:	586786 Rev. 0
Engineering Firm Designation:	**Morrison Hershfield Project Number:** CN9-327R1 / 2101398	
Site Data:	**90 Industrial Park Road, Middletown, Middlesex County, CT 06457** **Latitude *41° 35' 8.3"*, Longitude *-72° 42' 50.49"*** **185 Foot - Fred A. Nudd Monopole Tower**	

Morrison Hershfield is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above-mentioned tower.

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

LC7: Proposed Equipment Configuration **Sufficient Capacity – 82%**

This analysis utilizes an ultimate 3-second gust wind speed of 119 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Respectfully submitted by:

STATE OF CONNECTICUT
G. LANCE COOKE
No. 28133
LICENSED PROFESSIONAL ENGINEER

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

Digitally signed by G. Lance Cooke
Date: 2021.10.14 15:21:17-07'00'

TABLE OF CONTENTS

1) INTRODUCTION

2) ANALYSIS CRITERIA
Table 1 - Proposed Equipment Configuration
Table 2 - Other Considered Equipment

3) ANALYSIS PROCEDURE
Table 3 - Documents Provided
3.1) Analysis Method
3.2) Assumptions

4) ANALYSIS RESULTS
Table 4 - Section Capacity (Summary)
Table 5 – Tower Component Stresses vs. Capacity – LC7
4.1) Recommendations

5) APPENDIX A
tnxTower Output

6) APPENDIX B
Base Level Drawing

7) APPENDIX C
Additional Calculations

1) INTRODUCTION

This tower is a 185 ft Monopole tower designed by Fred A. Nudd Corporation.

The tower has been modified multiple times in the past to accommodate additional loading. All the modifications have been considered in this analysis per their respective post modification inspection reports.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	119 mph
Exposure Category:	C
Topographic Factor:	1
Ice Thickness:	1 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)
183.0	183.0	3	rfs/celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe	4	1-5/8
		3	ericsson	AIR6449 B41_T-MOBILE w/ Mount Pipe		
		3	ericsson	RADIO 4449 B12/B71		
		3	ericsson	RADIO 4460 B2/B25 B66_TMO		
		1	Site Pro 1	12.5' Platform Mount [#RMQP-496-HK]		

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)
174.0	174.0	3	cci antennas	DMP65R-BU6D w/ Mount Pipe	12 3 4 3	1-1/4 7/8 3/4 3/8
		3	cci antennas	OPA65R-BU6D w/ Mount Pipe		
		3	quintel technology	QS66512-2 w/ Mount Pipe		
		3	powerwave technologies	7770.00 w/ Mount Pipe		
		3	ericsson	RRUS 32 B2_CCIV2		
		3	ericsson	RRUS 4449 B5/B12		
		3	ericsson	RRUS 4478 B14_CCIV2		
		3	ericsson	RRUS-32 B30		
		6	ericsson	RRUS 32 B2		
		6	kaelus	DBC0061F1V51-2		
		3	kathrein	782 10254		
		6	powerwave technologies	LGP21401		
		2	raycap	DC6-48-60-18-8F		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
174.0	174.0	1	raycap	DC9-48-60-24-8C-EV	-	-
		1	sabre	12' EHD V-Boom Assembly [#C10857803]		
165.0	165.0	3	jma wireless	MX08FRO665-20 w/ Mount Pipe	1	1-3/4
		3	fujitsu	TA08025-B604		
		3	fujitsu	TA08025-B605		
		1	raycap	RDIDC-9181-PF-48		
		1	tower mounts	Commscope MC-PK8-DSH		
155.0	155.0	9	andrew	SBNHH-1D65B w/ Mount Pipe	2	1-5/8
		3	samsung telecommunications	MT6407-77A w/ Mount Pipe		
		3	samsung telecommunications	RFV01U-D1A		
		3	samsung telecommunications	RFV01U-D2A		
		2	rfs/celwave	DB-T1-6Z-8AB-0Z		
		3	commscope	Side-By-Side Mounting Kit [#BSAMNT-SBS-1-2]		
		1	-	Platform Mount [LP 403-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
4-GEOTECHNICAL REPORTS	3473514	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	3880469	CCISITES
4-TOWER MANUFACTURER DRAWINGS	3473517	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	3879955	CCISITES
4-POST-MODIFICATION INSPECTION	3945944	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	3990532	CCISITES
4-POST-MODIFICATION INSPECTION	5512978	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	3954032	CCISITES
4-POST-MODIFICATION INSPECTION	5650784	CCISITES

3.1) Analysis Method

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

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

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
L1	185 - 180	Pole	TP18x18x0.1875	Pole	7.8	Pass
L2	180 - 175	Pole	TP19.631x18x0.25	Pole	12.5	Pass
L3	175 - 170	Pole	TP21.263x19.631x0.25	Pole	26.7	Pass
L4	170 - 165	Pole	TP22.894x21.263x0.25	Pole	38.2	Pass
L5	165 - 160	Pole	TP24.525x22.894x0.25	Pole	51.2	Pass
L6	160 - 155	Pole	TP26.156x24.525x0.25	Pole	61.2	Pass
L7	155 - 154	Pole	TP26.483x26.156x0.25	Pole	64.7	Pass
L8	154 - 153.75	Pole + Reinf.	TP26.564x26.483x0.3688	Reinf. 8 Tension Rupture	50.4	Pass
L9	153.75 - 152.5	Pole + Reinf.	TP26.972x26.564x0.3625	Reinf. 8 Tension Rupture	52.9	Pass
L10	152.5 - 152.25	Pole + Reinf.	TP27.053x26.972x0.55	Reinf. 8 Tension Rupture	36.3	Pass
L11	152.25 - 151.5	Pole + Reinf.	TP27.298x27.053x0.55	Reinf. 8 Tension Rupture	37.4	Pass
L12	151.5 - 151.25	Pole + Reinf.	TP27.38x27.298x0.425	Reinf. 3 Tension Rupture	45.8	Pass
L13	151.25 - 146.25	Pole + Reinf.	TP29.011x27.38x0.4125	Reinf. 3 Tension Rupture	53.3	Pass
L14	146.25 - 141.25	Pole + Reinf.	TP30.642x29.011x0.4	Reinf. 3 Tension Rupture	59.6	Pass
L15	141.25 - 136.25	Pole + Reinf.	TP32.273x30.642x0.3938	Reinf. 3 Tension Rupture	64.9	Pass
L16	136.25 - 135	Pole + Reinf.	TP34.313x32.273x0.3938	Reinf. 3 Tension Rupture	66.1	Pass
L17	135 - 129	Pole + Reinf.	TP34.133x32.181x0.475	Reinf. 7 Tension Rupture	62.2	Pass
L18	129 - 124	Pole + Reinf.	TP35.76x34.133x0.4625	Reinf. 7 Tension Rupture	65.8	Pass
L19	124 - 121.42	Pole + Reinf.	TP36.599x35.76x0.4625	Pole	67.8	Pass
L20	121.42 - 121.17	Pole + Reinf.	TP36.68x36.599x0.5	Pole	62.4	Pass
L21	121.17 - 116.17	Pole + Reinf.	TP38.307x36.68x0.4875	Pole	66.7	Pass
L22	116.17 - 115	Pole + Reinf.	TP38.688x38.307x0.4875	Pole	67.7	Pass
L23	115 - 113.75	Pole + Reinf.	TP39.094x38.688x0.55	Reinf. 7 Tension Rupture	58.6	Pass
L24	113.75 - 113.5	Pole + Reinf.	TP39.175x39.094x0.4688	Pole	64.2	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
L25	113.5 - 108.5	Pole + Reinf.	TP40.8x39.175x0.4625	Pole	67.3	Pass
L26	108.5 - 103.5	Pole + Reinf.	TP42.425x40.8x0.4563	Pole	70.2	Pass
L27	103.5 - 101	Pole + Reinf.	TP45.188x42.425x0.45	Pole	71.6	Pass
L28	101 - 94	Pole + Reinf.	TP44.853x42.613x0.5875	Pole	59.3	Pass
L29	94 - 91.4	Pole + Reinf.	TP45.685x44.853x0.575	Pole	60.6	Pass
L30	91.4 - 91.15	Pole + Reinf.	TP45.765x45.685x0.4438	Pole	78.4	Pass
L31	91.15 - 91	Pole + Reinf.	TP45.813x45.765x0.4438	Pole	78.5	Pass
L32	91 - 86	Pole + Reinf.	TP47.445x45.813x0.5	Pole	65.7	Pass
L33	86 - 81	Pole + Reinf.	TP49.078x47.445x0.5	Pole	67.4	Pass
L34	81 - 76	Pole + Reinf.	TP50.711x49.078x0.4938	Pole	69.1	Pass
L35	76 - 71	Pole + Reinf.	TP52.344x50.711x0.4875	Pole	70.7	Pass
L36	71 - 66	Pole + Reinf.	TP53.977x52.344x0.4875	Pole	72.3	Pass
L37	66 - 63.75	Pole + Reinf.	TP54.711x53.977x0.4875	Pole	73.1	Pass
L38	63.75 - 63.5	Pole + Reinf.	TP54.793x54.711x0.4875	Pole	73.1	Pass
L39	63.5 - 58.5	Pole + Reinf.	TP56.426x54.793x0.4813	Pole	74.7	Pass
L40	58.5 - 58	Pole + Reinf.	TP58.875x56.426x0.4813	Pole	74.9	Pass
L41	58 - 50	Pole + Reinf.	TP58.438x55.839x0.55	Pole	68.1	Pass
L42	50 - 45	Pole + Reinf.	TP60.063x58.438x0.55	Pole	69.7	Pass
L43	45 - 40.42	Pole + Reinf.	TP61.551x60.063x0.5438	Pole	71.2	Pass
L44	40.42 - 40.17	Pole + Reinf.	TP61.632x61.551x0.475	Pole	82.0	Pass
L45	40.17 - 40	Pole + Reinf.	TP61.688x61.632x0.475	Pole	82.0	Pass
L46	40 - 35	Pole + Reinf.	TP63.31x61.688x0.5313	Pole	68.2	Pass
L47	35 - 33	Pole + Reinf.	TP63.958x63.31x0.525	Pole	68.7	Pass
L48	33 - 32.75	Pole + Reinf.	TP64.039x63.958x0.6	Pole	61.9	Pass
L49	32.75 - 28	Pole + Reinf.	TP68.5x64.039x0.6	Pole	63.0	Pass
L50	28 - 18	Pole + Reinf.	TP67.958x64.705x0.6	Pole	66.3	Pass
L51	18 - 13	Pole + Reinf.	TP69.584x67.958x0.5875	Pole	67.4	Pass
L52	13 - 8	Pole + Reinf.	TP71.21x69.584x0.5875	Pole	68.5	Pass
L53	8 - 6.42	Pole + Reinf.	TP71.724x71.21x0.5875	Pole	68.8	Pass
L54	6.42 - 6.17	Pole + Reinf.	TP71.806x71.724x0.9375	Reinf. 9 Tension Rupture	74.2	Pass
L55	6.17 - 1.17	Pole + Reinf.	TP73.432x71.806x0.9125	Reinf. 9 Tension Rupture	74.8	Pass
L56	1.17 - 0	Pole + Reinf.	TP73.813x73.432x0.9	Reinf. 9 Tension Rupture	75.0	Pass
					Summary	
				Pole	82.0	Pass
				Reinforcement	75.0	Pass
				Overall	82.0	Pass

Table 5 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	63.4	Pass
1	Base Plate		35.0	Pass
1	Base Foundation (Structure)	0	67.5	Pass
1	Base Foundation (Soil Interaction)		75.1	Pass

Structure Rating (max from all components) =	82.0%*

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

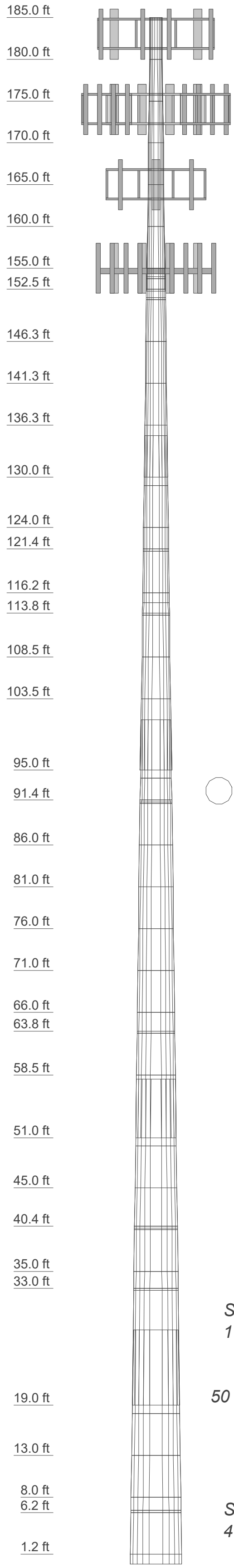
4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	5.00	12	0.1875		18.0000	18.0000		0.2
2	5.00	12	0.2500		18.0000	19.6313		0.3
3	5.00	12	0.2500		19.6313	21.2625		0.3
4	5.00	12	0.2500		21.2625	22.8938		0.3
5	5.00	12	0.2500		22.8938	24.5250		0.3
6	5.00	12	0.2500		[illegible]	[illegible]		0.3
7–12	[illegible]	12	[illegible]		[illegible]	[illegible]		[illegible]
13	5.00	12	[illegible]		[illegible]	[illegible]		0.6
14	5.00	12	0.4000		29.0109	30.6422		0.6
15	5.00	12	0.3937		30.6422	32.2734		0.7
16	[illegible]	12	0.3937	5.00	32.2734	34.3125		0.9
17	[illegible]	12	[illegible]		[illegible]	[illegible]		1.0
18	5.00	12	[illegible]		[illegible]	[illegible]		0.8
19–20	[illegible]	12	[illegible]		[illegible]	[illegible]		[illegible]
21	5.00	12	[illegible]		[illegible]	[illegible]		1.0
22–24	[illegible]	12	[illegible]		[illegible]	[illegible]		[illegible]
25	5.00	12	[illegible]		[illegible]	[illegible]		1.0
26	5.00	12	0.4562		40.8000	42.4250		1.0
27	[illegible]	12	0.4500	6.00	42.4250	45.1875		1.8
28–31	[illegible]	12	[illegible]		[illegible]	[illegible]	A36M-42	[illegible]
32	5.00	12	[illegible]		[illegible]	[illegible]		1.3
33	5.00	12	0.5000		47.4453	49.0781		1.3
34	5.00	12	0.4938		49.0781	50.7109		1.3
35	5.00	12	0.4875		50.7109	52.3438		1.4
36	5.00	12	0.4875		52.3438	53.9766		1.4
37–38	[illegible]	12	[illegible]		[illegible]	[illegible]		[illegible]
39	5.00	12	[illegible]		[illegible]	[illegible]		1.4
40	[illegible]	12	0.4813	7.00	56.4258	58.8750		2.2
41	[illegible]	12	[illegible]		[illegible]	[illegible]		2.7
42	5.00	12	[illegible]		[illegible]	[illegible]		1.7
43	[illegible]	12	[illegible]		[illegible]	[illegible]		1.6
44–45	[illegible]	12	[illegible]		[illegible]	[illegible]		[illegible]
46	5.00	12	[illegible]		[illegible]	[illegible]		1.8
47–48	[illegible]	12	[illegible]		[illegible]	[illegible]		[illegible]
49	[illegible]	12	0.6000	9.00	64.0394	68.5000		6.4
50	[illegible]	12	[illegible]		[illegible]	[illegible]		4.6
51	5.00	12	[illegible]		[illegible]	[illegible]		2.4
52	5.00	12	[illegible]		[illegible]	[illegible]		2.4
53–54	[illegible]	12	[illegible]		[illegible]	[illegible]		[illegible]
55	5.00	12	[illegible]		[illegible]	[illegible]		2.1
56	[illegible]	12	[illegible]		[illegible]	[illegible]		[illegible]
								54.1



MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A36M-42	42 ksi	60 ksi			

TOWER DESIGN NOTES

1. Tower is located in Middlesex County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 119 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. CCIPOLE RATING: 82.0%

ALL REACTIONS ARE FACTORED

AXIAL 117 K
SHEAR 11 K
MOMENT 1395 kip-ft
TORQUE 0 kip-ft
50 mph WIND - 1.0000 in ICE

AXIAL 88 K
SHEAR 47 K
MOMENT 5563 kip-ft
TORQUE 1 kip-ft
REACTIONS - 119 mph WIND

Morrison Hershfield
Consulting Engineers
1455 Lincoln Parkway, Suite 500
Atlanta, GA 30346
Phone: (770) 397-8500
FAX: (770) 397-8501

Job:	**CN9-327R1 / 2101398**
Project:	**825983 / Middletown_1**
Client:	Crown Castle USA
Drawn by:	BV
App'd:	
Code:	TIA-222-H
Date:	10/14/21
Scale:	NTS
Path:	C:\Sai Kiran\Structural Analysis\Crown\CN9-327 - 825983 - MIDDLETOWN_1\CN9-327R1 SA\Analysis\CN9-327R1 BU_825983 WO_2029646.eri
Dwg No.	E-1

Tower Input Data

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

- Tower is located in Middlesex County, Connecticut.
- Tower base elevation above sea level: 89.00 ft.
- Basic wind speed of 119 mph.
- Risk Category II.
- Exposure Category C.
- Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- Topographic Category: 1.
- Crest Height: 0.00 ft.
- Nominal ice thickness of 1.0000 in.
- Ice thickness is considered to increase with height.
- Ice density of 56 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50 °F.
- Deflections calculated using a wind speed of 60 mph.
- CCIPOLE RATING: 82.0%.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in pole design is 1.
- Tower analysis based on target reliabilities in accordance with Annex S.
- Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
- Maximum demand-capacity ratio is: 1.05.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	185.00-180.00	5.00	0.00	12	18.0000	18.0000	0.1875	0.7500	A36M-42 (42 ksi)
L2	180.00-175.00	5.00	0.00	12	18.0000	19.6313	0.2500	1.0000	A36M-42 (42 ksi)
L3	175.00-170.00	5.00	0.00	12	19.6313	21.2625	0.2500	1.0000	A36M-42 (42 ksi)
L4	170.00-165.00	5.00	0.00	12	21.2625	22.8938	0.2500	1.0000	A36M-42 (42 ksi)
L5	165.00-160.00	5.00	0.00	12	22.8938	24.5250	0.2500	1.0000	A36M-42 (42 ksi)
L6	160.00-155.00	5.00	0.00	12	24.5250	26.1563	0.2500	1.0000	A36M-42 (42 ksi)
L7	155.00-154.00	1.00	0.00	12	26.1563	26.4825	0.2500	1.0000	A36M-42 (42 ksi)
L8	154.00-153.75	0.25	0.00	12	26.4825	26.5641	0.3688	1.4750	A36M-42 (42 ksi)
L9	153.75-152.50	1.25	0.00	12	26.5641	26.9719	0.3625	1.4500	A36M-42 (42 ksi)
L10	152.50-152.25	0.25	0.00	12	26.9719	27.0534	0.5500	2.2000	A36M-42 (42 ksi)
L11	152.25-151.50	0.75	0.00	12	27.0534	27.2981	0.5500	2.2000	A36M-42 (42 ksi)
L12	151.50-151.25	0.25	0.00	12	27.2981	27.3797	0.4250	1.7000	A36M-42 (42 ksi)
L13	151.25-146.25	5.00	0.00	12	27.3797	29.0109	0.4125	1.6500	A36M-42 (42 ksi)
L14	146.25-141.25	5.00	0.00	12	29.0109	30.6422	0.4000	1.6000	A36M-42 (42 ksi)
L15	141.25-136.25	5.00	0.00	12	30.6422	32.2734	0.3937	1.5750	A36M-42 (42 ksi)
L16	136.25-130.00	6.25	5.00	12	32.2734	34.3125	0.3937	1.5750	A36M-42 (42 ksi)
L17	130.00-129.00	6.00	0.00	12	32.1812	34.1331	0.4750	1.9000	A36M-42 (42 ksi)
L18	129.00-124.00	5.00	0.00	12	34.1331	35.7597	0.4625	1.8500	A36M-42 (42 ksi)
L19	124.00-121.42	2.58	0.00	12	35.7597	36.5990	0.4625	1.8500	A36M-42 (42 ksi)
L20	121.42-121.17	0.25	0.00	12	36.5990	36.6803	0.5000	2.0000	A36M-42 (42 ksi)
L21	121.17-116.17	5.00	0.00	12	36.6803	38.3069	0.4875	1.9500	A36M-42 (42 ksi)
L22	116.17-115.00	1.17	0.00	12	38.3069	38.6875	0.4875	1.9500	A36M-42 (42 ksi)
L23	115.00-113.75	1.25	0.00	12	38.6875	39.0938	0.5500	2.2000	A36M-42 (42 ksi)
L24	113.75-113.50	0.25	0.00	12	39.0938	39.1750	0.4688	1.8750	A36M-42 (42 ksi)
L25	113.50-108.50	5.00	0.00	12	39.1750	40.8000	0.4625	1.8500	A36M-42 (42 ksi)
L26	108.50-103.50	5.00	0.00	12	40.8000	42.4250	0.4562	1.8250	A36M-42 (42 ksi)
L27	103.50-95.00	8.50	6.00	12	42.4250	45.1875	0.4500	1.8000	A36M-42 (42 ksi)
L28	95.00-94.00	7.00	0.00	12	42.6125	44.8525	0.5875	2.3500	A36M-42 (42 ksi)
L29	94.00-91.40	2.60	0.00	12	44.8525	45.6845	0.5750	2.3000	A36M-42 (42 ksi)
L30	91.40-91.15	0.25	0.00	12	45.6845	45.7645	0.4437	1.7750	A36M-42 (42 ksi)
L31	91.15-91.00	0.15	0.00	12	45.7645	45.8125	0.4437	1.7750	A36M-42 (42 ksi)
L32	91.00-86.00	5.00	0.00	12	45.8125	47.4453	0.5000	2.0000	A36M-42 (42 ksi)
L33	86.00-81.00	5.00	0.00	12	47.4453	49.0781	0.5000	2.0000	A36M-42 (42 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
L34	81.00-76.00	5.00	0.00	12	49.0781	50.7109	0.4938	1.9750	A36M-42 (42 ksi)
L35	76.00-71.00	5.00	0.00	12	50.7109	52.3438	0.4875	1.9500	A36M-42 (42 ksi)
L36	71.00-66.00	5.00	0.00	12	52.3438	53.9766	0.4875	1.9500	A36M-42 (42 ksi)
L37	66.00-63.75	2.25	0.00	12	53.9766	54.7113	0.4875	1.9500	A36M-42 (42 ksi)
L38	63.75-63.50	0.25	0.00	12	54.7113	54.7930	0.4875	1.9500	A36M-42 (42 ksi)
L39	63.50-58.50	5.00	0.00	12	54.7930	56.4258	0.4813	1.9250	A36M-42 (42 ksi)
L40	58.50-51.00	7.50	7.00	12	56.4258	58.8750	0.4813	1.9250	A36M-42 (42 ksi)
L41	51.00-50.00	8.00	0.00	12	55.8391	58.4384	0.5500	2.2000	A36M-42 (42 ksi)
L42	50.00-45.00	5.00	0.00	12	58.4384	60.0629	0.5500	2.2000	A36M-42 (42 ksi)
L43	45.00-40.42	4.58	0.00	12	60.0629	61.5510	0.5437	2.1750	A36M-42 (42 ksi)
L44	40.42-40.17	0.25	0.00	12	61.5510	61.6323	0.4750	1.9000	A36M-42 (42 ksi)
L45	40.17-40.00	0.17	0.00	12	61.6323	61.6875	0.4750	1.9000	A36M-42 (42 ksi)
L46	40.00-35.00	5.00	0.00	12	61.6875	63.3095	0.5313	2.1250	A36M-42 (42 ksi)
L47	35.00-33.00	2.00	0.00	12	63.3095	63.9583	0.5250	2.1000	A36M-42 (42 ksi)
L48	33.00-32.75	0.25	0.00	12	63.9583	64.0394	0.6000	2.4000	A36M-42 (42 ksi)
L49	32.75-19.00	13.75	9.00	12	64.0394	68.5000	0.6000	2.4000	A36M-42 (42 ksi)
L50	19.00-18.00	10.00	0.00	12	64.7054	67.9579	0.6000	2.4000	A36M-42 (42 ksi)
L51	18.00-13.00	5.00	0.00	12	67.9579	69.5842	0.5875	2.3500	A36M-42 (42 ksi)
L52	13.00-8.00	5.00	0.00	12	69.5842	71.2105	0.5875	2.3500	A36M-42 (42 ksi)
L53	8.00-6.42	1.58	0.00	12	71.2105	71.7244	0.5875	2.3500	A36M-42 (42 ksi)
L54	6.42-6.17	0.25	0.00	12	71.7244	71.8057	0.9375	3.7500	A36M-42 (42 ksi)
L55	6.17-1.17	5.00	0.00	12	71.8057	73.4320	0.9125	3.6500	A36M-42 (42 ksi)
L56	1.17-0.00	1.17		12	73.4320	73.8125	0.9000	3.6000	A36M-42 (42 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	18.5688	10.7543	435.5296	6.3769	9.3240	46.7106	882.5011	5.2929	4.3215	23.048
	18.5688	10.7543	435.5296	6.3769	9.3240	46.7106	882.5011	5.2929	4.3215	23.048
L2	18.5468	14.2888	574.6149	6.3545	9.3240	61.6275	1164.3256	7.0325	4.1540	16.616
	20.2356	15.6019	748.0441	6.9385	10.1690	73.5613	1515.7401	7.6788	4.5912	18.365
L3	20.2356	15.6019	748.0441	6.9385	10.1690	73.5613	1515.7401	7.6788	4.5912	18.365
	21.9244	16.9151	953.2680	7.5225	11.0140	86.5508	1931.5794	8.3251	5.0283	20.113
L4	21.9244	16.9151	953.2680	7.5225	11.0140	86.5508	1931.5794	8.3251	5.0283	20.113
	23.6132	18.2282	1192.9628	8.1065	11.8590	100.5959	2417.2660	8.9714	5.4655	21.862
L5	23.6132	18.2282	1192.9628	8.1065	11.8590	100.5959	2417.2660	8.9714	5.4655	21.862
	25.3020	19.5414	1469.8044	8.6905	12.7039	115.6966	2978.2222	9.6177	5.9027	23.611
L6	25.3020	19.5414	1469.8044	8.6905	12.7039	115.6966	2978.2222	9.6177	5.9027	23.611
	26.9908	20.8545	1786.4690	9.2744	13.5489	131.8531	3619.8706	10.2640	6.3399	25.36
L7	26.9908	20.8545	1786.4690	9.2744	13.5489	131.8531	3619.8706	10.2640	6.3399	25.36
	27.3285	21.1172	1854.8162	9.3912	13.7179	135.2110	3758.3604	10.3932	6.4273	25.709
L8	27.2866	31.0068	2698.8676	9.3487	13.7179	196.7401	5468.6374	15.2606	6.1091	16.567

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
	27.3711	31.1037	2724.2352	9.3779	13.7602	197.9796	5520.0391	15.3083	6.1309	16.626
L9	27.3733	30.5838	2679.9791	9.3802	13.7602	194.7633	5430.3642	15.0524	6.1477	16.959
	27.7955	31.0598	2807.0740	9.5262	13.9714	200.9153	5687.8929	15.2867	6.2570	17.261
L10	27.7293	46.7931	4169.6098	9.4590	13.9714	298.4383	8448.7598	23.0302	5.7545	10.463
	27.8138	46.9376	4208.3430	9.4882	14.0137	300.3025	8527.2438	23.1013	5.7763	10.502
L11	27.8138	46.9376	4208.3430	9.4882	14.0137	300.3025	8527.2438	23.1013	5.7763	10.502
	28.0671	47.3709	4325.9804	9.5758	14.1404	305.9299	8765.6090	23.3145	5.8419	10.622
L12	28.1112	36.7759	3389.8874	9.6206	14.1404	239.7302	6868.8309	18.1000	6.1769	14.534
	28.1956	36.8875	3420.8470	9.6498	14.1827	241.1989	6931.5635	18.1549	6.1988	14.585
L13	28.2000	35.8192	3324.8552	9.6543	14.1827	234.4307	6737.0581	17.6291	6.2323	15.109
	29.8888	37.9859	3965.4520	10.2382	15.0277	263.8768	8035.0807	18.6955	6.6694	16.168
L14	29.8932	36.8509	3850.3311	10.2427	15.0277	256.2162	7801.8147	18.1369	6.7029	16.757
	31.5820	38.9519	4547.1724	10.8267	15.8727	286.4784	9213.8040	19.1710	7.1401	17.85
L15	31.5842	38.3512	4478.8986	10.8289	15.8727	282.1771	9075.4628	18.8753	7.1569	18.176
	33.2730	40.4195	5243.2982	11.4129	16.7176	313.6386	10624.3436	19.8932	7.5940	19.286
L16	33.2730	40.4195	5243.2982	11.4129	16.7176	313.6386	10624.3436	19.8932	7.5940	19.286
	35.3840	43.0047	6315.1243	12.1429	17.7739	355.3037	12796.1540	21.1656	8.1405	20.674
L17	34.8329	48.4947	6222.5740	11.3508	16.6699	373.2823	12608.6220	23.8676	7.3516	15.477
	35.1696	51.4801	7443.9798	12.0496	17.6810	421.0168	15083.5213	25.3369	7.8747	16.578
L18	35.1741	50.1440	7256.1640	12.0541	17.6810	410.3943	14702.9556	24.6793	7.9082	17.099
	36.8580	52.5663	8359.3761	12.6364	18.5235	451.2845	16938.3623	25.8716	8.3441	18.041
L19	36.8580	52.5663	8359.3761	12.6364	18.5235	451.2845	16938.3623	25.8716	8.3441	18.041
	37.7269	53.8163	8969.9825	12.9369	18.9583	473.1433	18175.6163	26.4867	8.5690	18.528
L20	37.7137	58.1194	9667.1201	12.9234	18.9583	509.9155	19588.2062	28.6046	8.4685	16.937
	37.7979	58.2503	9732.6052	12.9526	19.0004	512.2314	19720.8967	28.6690	8.4903	16.981
L21	37.8023	56.8137	9499.1288	12.9570	19.0004	499.9434	19247.8104	27.9620	8.5238	17.485
	39.4862	59.3670	10838.2660	13.5393	19.8430	546.2019	21961.2654	29.2186	8.9597	18.379
L22	39.4862	59.3670	10838.2660	13.5393	19.8430	546.2019	21961.2654	29.2186	8.9597	18.379
	39.8803	59.9644	11168.8004	13.6756	20.0401	557.3219	22631.0177	29.5127	9.0618	18.588
L23	39.8582	67.5415	12538.9501	13.6532	20.0401	625.6922	25407.3123	33.2419	8.8942	16.171
	40.2788	68.2610	12943.9375	13.7987	20.2506	639.1890	26227.9267	33.5960	9.0031	16.369
L24	40.3075	58.2996	11101.6768	13.8278	20.2506	548.2157	22495.0070	28.6933	9.2209	19.671
	40.3916	58.4222	11171.8834	13.8568	20.2926	550.5384	22637.2646	28.7537	9.2426	19.718
L25	40.3938	57.6526	11028.2655	13.8591	20.2926	543.4611	22346.2559	28.3749	9.2594	20.02
	42.0761	60.0726	12476.1473	14.4408	21.1344	590.3242	25280.0569	29.5659	9.6949	20.962
L26	42.0783	59.2700	12313.2725	14.4431	21.1344	582.6176	24950.0284	29.1709	9.7117	21.286
	43.7606	61.6573	13861.9013	15.0248	21.9762	630.7702	28087.9702	30.3459	10.1472	22.24
L27	43.7628	60.8218	13678.1213	15.0270	21.9762	622.4075	27715.5820	29.9346	10.1639	22.586
	46.6228	64.8246	16560.3484	16.0160	23.4071	707.4918	33555.7556	31.9047	10.9042	24.232
L28	45.8962	79.5008	17921.4382	15.0450	22.0733	811.9066	36313.6926	39.1279	9.8456	16.759
	46.2275	83.7383	20942.6241	15.8469	23.2336	901.3940	42435.4343	41.2135	10.4460	17.78
L29	46.2319	81.9798	20514.4058	15.8513	23.2336	882.9630	41567.7478	40.3480	10.4795	18.225

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
	47.0932	83.5202	21692.7048	16.1492	23.6646	916.6743	43955.3011	41.1061	10.7024	18.613
L30	47.1395	64.6434	16887.6639	16.1962	23.6646	713.6265	34218.9855	31.8155	11.0542	24.911
	47.2224	64.7577	16977.4106	16.2248	23.7060	716.1648	34400.8367	31.8718	11.0756	24.959
L31	47.2224	64.7577	16977.4106	16.2248	23.7060	716.1648	34400.8367	31.8718	11.0756	24.959
	47.2721	64.8263	17031.4110	16.2420	23.7309	717.6900	34510.2561	31.9055	11.0885	24.988
L32	47.2522	72.9531	19119.0319	16.2219	23.7309	805.6606	38740.3421	35.9053	10.9377	21.876
	48.9426	75.5820	21261.2370	16.8064	24.5767	865.0983	43081.0304	37.1991	11.3753	22.751
L33	48.9426	75.5820	21261.2370	16.8064	24.5767	865.0983	43081.0304	37.1991	11.3753	22.751
	50.6330	78.2108	23557.7642	17.3910	25.4225	926.6513	47734.4171	38.4930	11.8129	23.626
L34	50.6352	77.2431	23272.2724	17.3932	25.4225	915.4214	47155.9333	38.0167	11.8297	23.959
	52.3256	79.8391	25698.4002	17.9778	26.2683	978.3059	52071.9259	39.2944	12.2673	24.845
L35	52.3279	78.8382	25382.5789	17.9800	26.2683	966.2830	51431.9864	38.8018	12.2840	25.198
	54.0183	81.4013	27939.5730	18.5645	27.1141	1030.4458	56613.1497	40.0633	12.7216	26.096
L36	54.0183	81.4013	27939.5730	18.5645	27.1141	1030.4458	56613.1497	40.0633	12.7216	26.096
	55.7087	83.9645	30662.7710	19.1491	27.9599	1096.6711	62131.0872	41.3248	13.1592	26.993
L37	55.7087	83.9645	30662.7710	19.1491	27.9599	1096.6711	62131.0872	41.3248	13.1592	26.993
	56.4694	85.1179	31943.8286	19.4121	28.3405	1127.1454	64726.8571	41.8924	13.3561	27.397
L38	56.4694	85.1179	31943.8286	19.4121	28.3405	1127.1454	64726.8571	41.8924	13.3561	27.397
	56.5539	85.2460	32088.3320	19.4414	28.3828	1130.5572	65019.6602	41.9555	13.3780	27.442
L39	56.5561	84.1628	31687.8814	19.4436	28.3828	1116.4483	64208.2388	41.4224	13.3948	27.833
	58.2465	86.6930	34632.6307	20.0281	29.2286	1184.8903	70175.0992	42.6677	13.8324	28.743
L40	58.2465	86.6930	34632.6307	20.0281	29.2286	1184.8903	70175.0992	42.6677	13.8324	28.743
	60.7821	90.4884	39383.2600	20.9050	30.4973	1291.3709	79801.1622	44.5356	14.4888	30.106
L41	59.9695	97.9169	38205.1746	19.7935	28.9246	1320.8525	77414.0418	48.1917	13.4909	24.529
	60.3058	102.5203	43850.8919	20.7240	30.2711	1448.6070	88853.7955	50.4574	14.1875	25.795
L42	60.3058	102.5203	43850.8919	20.7240	30.2711	1448.6070	88853.7955	50.4574	14.1875	25.795
	61.9877	105.3974	47647.3330	21.3056	31.1126	1531.4481	96546.4145	51.8734	14.6229	26.587
L43	61.9899	104.2107	47120.7287	21.3079	31.1126	1514.5224	95479.3714	51.2893	14.6396	26.923
	63.5305	106.8161	50744.1775	21.8406	31.8834	1591.5529	102821.4610	52.5717	15.0384	27.657
L44	63.5548	93.4158	44478.2784	21.8652	31.8834	1395.0277	90125.0506	45.9764	15.2227	32.048
	63.6389	93.5400	44655.9766	21.8943	31.9255	1398.7552	90485.1155	46.0376	15.2444	32.094
L45	63.6389	93.5400	44655.9766	21.8943	31.9255	1398.7552	90485.1155	46.0376	15.2444	32.094
	63.6960	93.6245	44777.0814	21.9141	31.9541	1401.2927	90730.5066	46.0791	15.2593	32.125
L46	63.6762	104.6154	49941.6983	21.8939	31.9541	1562.9187	101195.4207	51.4885	15.1085	28.44
	65.3554	107.3901	54021.7781	22.4746	32.7943	1647.2900	109462.7685	52.8541	15.5432	29.258

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
L47	65.3576	106.1372	53402.1742	22.4769	32.7943	1628.3964	108207.2830	52.2375	15.5600	29.638
	66.0293	107.2341	55074.9011	22.7091	33.1304	1662.3667	111596.6812	52.7773	15.7338	29.969
L48	66.0029	122.4083	62719.7481	22.6823	33.1304	1893.1168	127087.2139	60.2456	15.5328	25.888
	66.0868	122.5650	62960.9079	22.7113	33.1724	1897.9892	127575.8689	60.3228	15.5546	25.924
L49	66.0868	122.5650	62960.9079	22.7113	33.1724	1897.9892	127575.8689	60.3228	15.5546	25.924
	70.7048	131.1828	77197.3505	24.3082	35.4830	2175.6151	156422.7614	64.5642	16.7500	27.917
L50	69.8068	123.8516	64964.4917	22.9497	33.5174	1938.2333	131635.6728	60.9560	15.7330	26.222
	70.1435	130.1355	75363.1160	24.1141	35.2022	2140.8640	152706.1049	64.0487	16.6047	27.675
L51	70.1480	127.4480	73834.1413	24.1186	35.2022	2097.4300	149607.9877	62.7260	16.6382	28.32
	71.8316	130.5245	79311.1676	24.7008	36.0446	2200.3615	160705.9279	64.2402	17.0741	29.062
L52	71.8316	130.5245	79311.1676	24.7008	36.0446	2200.3615	160705.9279	64.2402	17.0741	29.062
	73.5152	133.6010	85052.5670	25.2830	36.8870	2305.7588	172339.5597	65.7543	17.5099	29.804
L53	73.5152	133.6010	85052.5670	25.2830	36.8870	2305.7588	172339.5597	65.7543	17.5099	29.804
	74.0473	134.5732	86922.8201	25.4670	37.1532	2339.5771	176129.1995	66.2328	17.6476	30.039
L54	73.9238	213.6878	136669.3358	25.3417	37.1532	3678.5328	276929.1273	105.1707	16.7096	17.824
	74.0080	213.9333	137140.8585	25.3708	37.1953	3687.0441	277884.5601	105.2915	16.7314	17.847
L55	74.0168	208.3019	133625.0851	25.3798	37.1953	3592.5222	270760.6499	102.5198	16.7984	18.409
	75.7005	213.0803	143033.6520	25.9620	38.0378	3760.3078	289824.9574	104.8716	17.2343	18.887
L56	75.7049	210.1976	141147.2494	25.9664	38.0378	3710.7149	286002.5942	103.4529	17.2678	19.186
	76.0988	211.3004	143380.5690	26.1027	38.2349	3749.9944	290527.9053	103.9956	17.3698	19.3

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 185.00-180.00				1	1	1			
L2 180.00-175.00				1	1	1			
L3 175.00-170.00				1	1	1			
L4 170.00-165.00				1	1	1			
L5 165.00-160.00				1	1	1			
L6 160.00-155.00				1	1	1			
L7 155.00-154.00				1	1	1			
L8 154.00-153.75				1	1	0.970809			
L9 153.75-152.50				1	1	0.98275			
L10 152.50-152.25				1	1	0.939738			
L11 152.25-151.50				1	1	0.935299			
L12 151.50-				1	1	0.958557			

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft^2	in					in	in	in
151.25									
L13 151.25-146.25				1	1	0.965409			
L14 146.25-141.25				1	1	0.975178			
L15 141.25-136.25				1	1	0.97226			
L16 136.25-130.00				1	1	0.967999			
L17 130.00-129.00				1	1	0.967523			
L18 129.00-124.00				1	1	0.972439			
L19 124.00-121.42				1	1	0.962408			
L20 121.42-121.17				1	1	0.967636			
L21 121.17-116.17				1	1	0.971491			
L22 116.17-115.00				1	1	0.966921			
L23 115.00-113.75				1	1	0.967791			
L24 113.75-113.50				1	1	0.977901			
L25 113.50-108.50				1	1	0.978255			
L26 108.50-103.50				1	1	0.979632			
L27 103.50-95.00				1	1	0.987419			
L28 95.00-94.00				1	1	0.965747			
L29 94.00-91.40				1	1	0.978292			
L30 91.40-91.15				1	1	0.984623			
L31 91.15-91.00				1	1	0.984326			
L32 91.00-86.00				1	1	0.990491			
L33 86.00-81.00				1	1	0.982407			
L34 81.00-76.00				1	1	0.987066			
L35 76.00-71.00				1	1	0.992343			
L36 71.00-66.00				1	1	0.985532			
L37 66.00-63.75				1	1	0.982601			
L38 63.75-63.50				1	1	0.982281			
L39 63.50-58.50				1	1	0.988627			
L40 58.50-51.00				1	1	0.988018			
L41 51.00-50.00				1	1	0.991576			
L42 50.00-45.00				1	1	0.98312			
L43 45.00-40.42				1	1	0.986885			
L44 40.42-40.17				1	1	0.983471			
L45 40.17-40.00				1	1	0.983296			

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
L46 40.00-35.00				1	1	0.992613			
L47 35.00-33.00				1	1	1.00258			
L48 33.00-32.75				1	1	1.07829			
L49 32.75-19.00				1	1	1.07001			
L50 19.00-18.00				1	1	1.05798			
L51 18.00-13.00				1	1	1.07238			
L52 13.00-8.00				1	1	1.06483			
L53 8.00-6.42				1	1	1.06252			
L54 6.42-6.17				1	1	0.582868			
L55 6.17-1.17				1	1	0.595953			
L56 1.17-0.00				1	1	0.60351			

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
***										
Safety Line 3/8	C	No	Surface Ar (CaAa)	185.00 - 0.00	1	1	-0.450 -0.450	0.3750		0.22
Step Pegs	C	No	Surface Ar (CaAa)	185.00 - 0.00	1	1	-0.500 -0.400	0.7050		1.80
***										
*										
HB158-21U6S24-xxM_TMO(1-5/8)	B	No	Surface Ar (CaAa)	183.00 - 0.00	1	1	0.330 0.330	1.9960		2.50
***										
CU12PSM6P4XXX(1-3/4)	B	No	Surface Ar (CaAa)	165.00 - 0.00	1	1	-0.450 -0.450	1.7500		2.72
***										
CCI-045100 (L)	C	No	Surface Af (CaAa)	53.92 - 38.92	1	1	-0.318 -0.318	4.5000	11.0000	0.00
CCI-045100 (L)	B	No	Surface Af (CaAa)	53.92 - 38.92	1	1	-0.318 -0.318	4.5000	11.0000	0.00
CCI-045100 (L)	A	No	Surface Af (CaAa)	53.92 - 38.92	1	1	-0.318 -0.318	4.5000	11.0000	0.00
CCI-060100 (L)	C	No	Surface Af (CaAa)	123.92 - 88.89	1	1	-0.318 -0.318	6.0000	14.0000	0.00
CCI-060100 (L)	B	No	Surface Af (CaAa)	123.92 - 88.89	1	1	-0.318 -0.318	6.0000	14.0000	0.00
CCI-060100 (L)	A	No	Surface Af (CaAa)	123.92 - 88.89	1	1	-0.318 -0.318	6.0000	14.0000	0.00
CCI-045100 (L)	B	No	Surface Af (CaAa)	154.50 - 119.50	1	1	0.432 0.432	4.5000	11.0000	0.00
CCI-045100 (L)	A	No	Surface Af (CaAa)	154.50 - 119.50	1	1	0.432 0.432	4.5000	11.0000	0.00
CCI-045100 (L)	C	No	Surface Af (CaAa)	154.50 - 119.50	1	1	0.432 0.432	4.5000	11.0000	0.00
***										
CCI-085125 (L)	B	No	Surface Af (CaAa)	37.42 - 0.00	1	1	0.182 0.182	8.5000	19.5000	0.00
CCI-085125 (L)	A	No	Surface Af (CaAa)	37.42 - 0.00	1	1	0.432 0.432	8.5000	19.5000	0.00
CCI-085125 (L)	A	No	Surface Af (CaAa)	37.42 - 0.00	1	1	-0.318 -0.318	8.5000	19.5000	0.00
CCI-085125 (L)	C	No	Surface Af (CaAa)	37.42 - 0.00	1	1	0.182 0.182	8.5000	19.5000	0.00

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
CCI-060100 (L)	B	No	Surface Af (CaAa)	65.50 - 30.50	1	1	-0.068 -0.068	6.0000	14.0000	0.00
CCI-060100 (L)	A	No	Surface Af (CaAa)	65.50 - 30.50	1	1	-0.068 -0.068	6.0000	14.0000	0.00
CCI-060100 (L)	C	No	Surface Af (CaAa)	65.50 - 30.50	1	1	-0.068 -0.068	6.0000	14.0000	0.00
CCI-060100 (L)	B	No	Surface Af (CaAa)	101.67 - 61.67	1	1	0.182 0.182	6.0000	14.0000	0.00
CCI-060100 (L)	A	No	Surface Af (CaAa)	101.67 - 61.67	1	1	0.182 0.182	6.0000	14.0000	0.00
CCI-060100 (L)	C	No	Surface Af (CaAa)	101.67 - 61.67	1	1	0.182 0.182	6.0000	14.0000	0.00
CCI-040075 (W)	B	No	Surface Af (CaAa)	132.50 - 112.50	1	1	0.182 0.182	4.0000	9.5000	0.00
CCI-040075 (W)	A	No	Surface Af (CaAa)	132.50 - 112.50	1	1	0.182 0.182	4.0000	9.5000	0.00
CCI-040075 (W)	C	No	Surface Af (CaAa)	132.50 - 112.50	1	1	0.182 0.182	4.0000	9.5000	0.00
CCI-040075 (W)	B	No	Surface Af (CaAa)	155.25 - 150.25	1	1	0.182 0.182	4.0000	9.5000	0.00
CCI-040075 (W)	A	No	Surface Af (CaAa)	155.25 - 150.25	1	1	0.182 0.182	4.0000	9.5000	0.00
CCI-040075 (W)	C	No	Surface Af (CaAa)	155.25 - 150.25	1	1	0.182 0.182	4.0000	9.5000	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
HCS 6X12 4AWG(1-5/8)	B	No	No	Inside Pole	183.00 - 0.00	3	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	2.40 2.40 2.40
***									
LDF6-50A(1-1/4)	A	No	No	Inside Pole	175.00 - 0.00	12	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.60 0.60 0.60
FB-L98B-034-XXXXXX(3/8)	A	No	No	Inside Pole	175.00 - 0.00	2	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.05 0.05 0.05
WR-VG86ST-BRD(3/4)	A	No	No	Inside Pole	175.00 - 0.00	4	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.58 0.58 0.58
*									
FB-L98B-034-XXX(3/8)	A	No	No	Inside Pole	175.00 - 0.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.06 0.06 0.06
WR-VG66ST-BRD_CCIV2(7/8)	A	No	No	Inside Pole	175.00 - 0.00	3	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.88 0.88 0.88
* ***									
HB158-1-08U8-S8J18(1-5/8)	B	No	No	Inside Pole	155.00 - 0.00	2	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	1.30 1.30 1.30
***									

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	185.00-180.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.599	0.000	0.03
		C	0.000	0.000	0.540	0.000	0.01
L2	180.00-175.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.998	0.000	0.05
		C	0.000	0.000	0.540	0.000	0.01
L3	175.00-170.00	A	0.000	0.000	0.000	0.000	0.06
		B	0.000	0.000	0.998	0.000	0.05
		C	0.000	0.000	0.540	0.000	0.01
L4	170.00-165.00	A	0.000	0.000	0.000	0.000	0.06
		B	0.000	0.000	0.998	0.000	0.05
		C	0.000	0.000	0.540	0.000	0.01
L5	165.00-160.00	A	0.000	0.000	0.000	0.000	0.06
		B	0.000	0.000	1.873	0.000	0.06
		C	0.000	0.000	0.540	0.000	0.01
L6	160.00-155.00	A	0.000	0.000	0.138	0.000	0.06
		B	0.000	0.000	2.011	0.000	0.06
		C	0.000	0.000	0.678	0.000	0.01
L7	155.00-154.00	A	0.000	0.000	0.928	0.000	0.01
		B	0.000	0.000	1.302	0.000	0.02
		C	0.000	0.000	1.036	0.000	0.00
L8	154.00-153.75	A	0.000	0.000	0.326	0.000	0.00
		B	0.000	0.000	0.419	0.000	0.00
		C	0.000	0.000	0.353	0.000	0.00
L9	153.75-152.50	A	0.000	0.000	1.628	0.000	0.02
		B	0.000	0.000	2.097	0.000	0.02
		C	0.000	0.000	1.763	0.000	0.00
L10	152.50-152.25	A	0.000	0.000	0.326	0.000	0.00
		B	0.000	0.000	0.419	0.000	0.00
		C	0.000	0.000	0.353	0.000	0.00
L11	152.25-151.50	A	0.000	0.000	0.977	0.000	0.01
		B	0.000	0.000	1.258	0.000	0.01
		C	0.000	0.000	1.058	0.000	0.00
L12	151.50-151.25	A	0.000	0.000	0.326	0.000	0.00
		B	0.000	0.000	0.419	0.000	0.00
		C	0.000	0.000	0.353	0.000	0.00
L13	151.25-146.25	A	0.000	0.000	4.303	0.000	0.06
		B	0.000	0.000	6.176	0.000	0.08
		C	0.000	0.000	4.843	0.000	0.01
L14	146.25-141.25	A	0.000	0.000	3.750	0.000	0.06
		B	0.000	0.000	5.623	0.000	0.08
		C	0.000	0.000	4.290	0.000	0.01
L15	141.25-136.25	A	0.000	0.000	3.750	0.000	0.06
		B	0.000	0.000	5.623	0.000	0.08
		C	0.000	0.000	4.290	0.000	0.01
L16	136.25-130.00	A	0.000	0.000	6.354	0.000	0.08
		B	0.000	0.000	8.695	0.000	0.09
		C	0.000	0.000	7.029	0.000	0.01
L17	130.00-129.00	A	0.000	0.000	1.417	0.000	0.01
		B	0.000	0.000	1.791	0.000	0.02
		C	0.000	0.000	1.525	0.000	0.00
L18	129.00-124.00	A	0.000	0.000	7.083	0.000	0.06
		B	0.000	0.000	8.956	0.000	0.08
		C	0.000	0.000	7.623	0.000	0.01
L19	124.00-121.42	A	0.000	0.000	6.155	0.000	0.03
		B	0.000	0.000	7.121	0.000	0.04
		C	0.000	0.000	6.434	0.000	0.01
L20	121.42-121.17	A	0.000	0.000	0.604	0.000	0.00
		B	0.000	0.000	0.698	0.000	0.00
		C	0.000	0.000	0.631	0.000	0.00
L21	121.17-116.17	A	0.000	0.000	9.586	0.000	0.06
		B	0.000	0.000	11.459	0.000	0.08
		C	0.000	0.000	10.126	0.000	0.01
L22	116.17-115.00	A	0.000	0.000	1.950	0.000	0.01
		B	0.000	0.000	2.388	0.000	0.02
		C	0.000	0.000	2.076	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	115.00-113.75	A	0.000	0.000	2.083	0.000	0.02
		B	0.000	0.000	2.552	0.000	0.02
		C	0.000	0.000	2.218	0.000	0.00
L24	113.75-113.50	A	0.000	0.000	0.417	0.000	0.00
		B	0.000	0.000	0.510	0.000	0.00
		C	0.000	0.000	0.444	0.000	0.00
L25	113.50-108.50	A	0.000	0.000	5.667	0.000	0.06
		B	0.000	0.000	7.540	0.000	0.08
		C	0.000	0.000	6.207	0.000	0.01
L26	108.50-103.50	A	0.000	0.000	5.000	0.000	0.06
		B	0.000	0.000	6.873	0.000	0.08
		C	0.000	0.000	5.540	0.000	0.01
L27	103.50-95.00	A	0.000	0.000	15.170	0.000	0.10
		B	0.000	0.000	18.354	0.000	0.13
		C	0.000	0.000	16.088	0.000	0.02
L28	95.00-94.00	A	0.000	0.000	2.000	0.000	0.01
		B	0.000	0.000	2.375	0.000	0.02
		C	0.000	0.000	2.108	0.000	0.00
L29	94.00-91.40	A	0.000	0.000	5.200	0.000	0.03
		B	0.000	0.000	6.174	0.000	0.04
		C	0.000	0.000	5.481	0.000	0.01
L30	91.40-91.15	A	0.000	0.000	0.500	0.000	0.00
		B	0.000	0.000	0.594	0.000	0.00
		C	0.000	0.000	0.527	0.000	0.00
L31	91.15-91.00	A	0.000	0.000	0.300	0.000	0.00
		B	0.000	0.000	0.356	0.000	0.00
		C	0.000	0.000	0.316	0.000	0.00
L32	91.00-86.00	A	0.000	0.000	7.110	0.000	0.06
		B	0.000	0.000	8.983	0.000	0.08
		C	0.000	0.000	7.650	0.000	0.01
L33	86.00-81.00	A	0.000	0.000	5.000	0.000	0.06
		B	0.000	0.000	6.873	0.000	0.08
		C	0.000	0.000	5.540	0.000	0.01
L34	81.00-76.00	A	0.000	0.000	5.000	0.000	0.06
		B	0.000	0.000	6.873	0.000	0.08
		C	0.000	0.000	5.540	0.000	0.01
L35	76.00-71.00	A	0.000	0.000	5.000	0.000	0.06
		B	0.000	0.000	6.873	0.000	0.08
		C	0.000	0.000	5.540	0.000	0.01
L36	71.00-66.00	A	0.000	0.000	5.000	0.000	0.06
		B	0.000	0.000	6.873	0.000	0.08
		C	0.000	0.000	5.540	0.000	0.01
L37	66.00-63.75	A	0.000	0.000	4.000	0.000	0.03
		B	0.000	0.000	4.843	0.000	0.03
		C	0.000	0.000	4.243	0.000	0.00
L38	63.75-63.50	A	0.000	0.000	0.500	0.000	0.00
		B	0.000	0.000	0.594	0.000	0.00
		C	0.000	0.000	0.527	0.000	0.00
L39	63.50-58.50	A	0.000	0.000	6.830	0.000	0.06
		B	0.000	0.000	8.703	0.000	0.08
		C	0.000	0.000	7.370	0.000	0.01
L40	58.50-51.00	A	0.000	0.000	9.690	0.000	0.09
		B	0.000	0.000	12.499	0.000	0.11
		C	0.000	0.000	10.500	0.000	0.02
L41	51.00-50.00	A	0.000	0.000	1.750	0.000	0.01
		B	0.000	0.000	2.125	0.000	0.02
		C	0.000	0.000	1.858	0.000	0.00
L42	50.00-45.00	A	0.000	0.000	8.750	0.000	0.06
		B	0.000	0.000	10.623	0.000	0.08
		C	0.000	0.000	9.290	0.000	0.01
L43	45.00-40.42	A	0.000	0.000	8.015	0.000	0.06
		B	0.000	0.000	9.731	0.000	0.07
		C	0.000	0.000	8.510	0.000	0.01
L44	40.42-40.17	A	0.000	0.000	0.438	0.000	0.00
		B	0.000	0.000	0.531	0.000	0.00
		C	0.000	0.000	0.465	0.000	0.00
L45	40.17-40.00	A	0.000	0.000	0.297	0.000	0.00
		B	0.000	0.000	0.361	0.000	0.00
		C	0.000	0.000	0.316	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
L46	40.00-35.00	A	0.000	0.000	12.667	0.000	0.06
		B	0.000	0.000	11.111	0.000	0.08
		C	0.000	0.000	9.778	0.000	0.01
L47	35.00-33.00	A	0.000	0.000	7.667	0.000	0.02
		B	0.000	0.000	5.583	0.000	0.03
		C	0.000	0.000	5.049	0.000	0.00
L48	33.00-32.75	A	0.000	0.000	0.958	0.000	0.00
		B	0.000	0.000	0.698	0.000	0.00
		C	0.000	0.000	0.631	0.000	0.00
L49	32.75-19.00	A	0.000	0.000	41.208	0.000	0.17
		B	0.000	0.000	26.880	0.000	0.21
		C	0.000	0.000	23.214	0.000	0.03
L50	19.00-18.00	A	0.000	0.000	2.833	0.000	0.01
		B	0.000	0.000	1.791	0.000	0.02
		C	0.000	0.000	1.525	0.000	0.00
L51	18.00-13.00	A	0.000	0.000	14.167	0.000	0.06
		B	0.000	0.000	8.956	0.000	0.08
		C	0.000	0.000	7.623	0.000	0.01
L52	13.00-8.00	A	0.000	0.000	14.167	0.000	0.06
		B	0.000	0.000	8.956	0.000	0.08
		C	0.000	0.000	7.623	0.000	0.01
L53	8.00-6.42	A	0.000	0.000	4.477	0.000	0.02
		B	0.000	0.000	2.830	0.000	0.02
		C	0.000	0.000	2.409	0.000	0.00
L54	6.42-6.17	A	0.000	0.000	0.708	0.000	0.00
		B	0.000	0.000	0.448	0.000	0.00
		C	0.000	0.000	0.381	0.000	0.00
L55	6.17-1.17	A	0.000	0.000	14.167	0.000	0.06
		B	0.000	0.000	8.956	0.000	0.08
		C	0.000	0.000	7.623	0.000	0.01
L56	1.17-0.00	A	0.000	0.000	3.315	0.000	0.01
		B	0.000	0.000	2.096	0.000	0.02
		C	0.000	0.000	1.784	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	185.00-180.00	A	1.009	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	1.204	0.000	0.04
		C		0.000	0.000	2.557	0.000	0.03
L2	180.00-175.00	A	1.006	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	2.004	0.000	0.07
		C		0.000	0.000	2.551	0.000	0.03
L3	175.00-170.00	A	1.003	0.000	0.000	0.000	0.000	0.06
		B		0.000	0.000	2.001	0.000	0.07
		C		0.000	0.000	2.546	0.000	0.03
L4	170.00-165.00	A	1.000	0.000	0.000	0.000	0.000	0.06
		B		0.000	0.000	1.998	0.000	0.07
		C		0.000	0.000	2.540	0.000	0.03
L5	165.00-160.00	A	0.997	0.000	0.000	0.000	0.000	0.06
		B		0.000	0.000	3.867	0.000	0.10
		C		0.000	0.000	2.534	0.000	0.03
L6	160.00-155.00	A	0.994	0.000	0.000	0.165	0.000	0.06
		B		0.000	0.000	4.025	0.000	0.10
		C		0.000	0.000	2.692	0.000	0.03
L7	155.00-154.00	A	0.992	0.000	0.000	1.134	0.000	0.02
		B		0.000	0.000	1.905	0.000	0.03
		C		0.000	0.000	1.638	0.000	0.01
L8	154.00-153.75	A	0.991	0.000	0.000	0.402	0.000	0.01
		B		0.000	0.000	0.595	0.000	0.01
		C		0.000	0.000	0.528	0.000	0.00
L9	153.75-152.50	A	0.991	0.000	0.000	2.009	0.000	0.03
		B		0.000	0.000	2.973	0.000	0.04
		C		0.000	0.000	2.640	0.000	0.02

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
L10	152.50-152.25	A	0.991	0.000	0.000	0.402	0.000	0.01
		B		0.000	0.000	0.595	0.000	0.01
		C		0.000	0.000	0.528	0.000	0.00
L11	152.25-151.50	A	0.990	0.000	0.000	1.205	0.000	0.02
		B		0.000	0.000	1.783	0.000	0.02
		C		0.000	0.000	1.583	0.000	0.01
L12	151.50-151.25	A	0.990	0.000	0.000	0.402	0.000	0.01
		B		0.000	0.000	0.594	0.000	0.01
		C		0.000	0.000	0.528	0.000	0.00
L13	151.25-146.25	A	0.988	0.000	0.000	5.397	0.000	0.10
		B		0.000	0.000	9.246	0.000	0.14
		C		0.000	0.000	7.913	0.000	0.06
L14	146.25-141.25	A	0.985	0.000	0.000	4.735	0.000	0.09
		B		0.000	0.000	8.577	0.000	0.14
		C		0.000	0.000	7.244	0.000	0.06
L15	141.25-136.25	A	0.981	0.000	0.000	4.731	0.000	0.09
		B		0.000	0.000	8.567	0.000	0.14
		C		0.000	0.000	7.234	0.000	0.06
L16	136.25-130.00	A	0.977	0.000	0.000	8.064	0.000	0.12
		B		0.000	0.000	12.849	0.000	0.18
		C		0.000	0.000	11.182	0.000	0.08
L17	130.00-129.00	A	0.975	0.000	0.000	1.808	0.000	0.02
		B		0.000	0.000	2.573	0.000	0.03
		C		0.000	0.000	2.306	0.000	0.02
L18	129.00-124.00	A	0.972	0.000	0.000	9.028	0.000	0.11
		B		0.000	0.000	12.845	0.000	0.16
		C		0.000	0.000	11.512	0.000	0.08
L19	124.00-121.42	A	0.969	0.000	0.000	7.640	0.000	0.08
		B		0.000	0.000	9.607	0.000	0.10
		C		0.000	0.000	8.919	0.000	0.06
L20	121.42-121.17	A	0.968	0.000	0.000	0.749	0.000	0.01
		B		0.000	0.000	0.940	0.000	0.01
		C		0.000	0.000	0.873	0.000	0.01
L21	121.17-116.17	A	0.966	0.000	0.000	11.841	0.000	0.13
		B		0.000	0.000	15.646	0.000	0.18
		C		0.000	0.000	14.313	0.000	0.09
L22	116.17-115.00	A	0.964	0.000	0.000	2.401	0.000	0.03
		B		0.000	0.000	3.290	0.000	0.04
		C		0.000	0.000	2.978	0.000	0.02
L23	115.00-113.75	A	0.962	0.000	0.000	2.565	0.000	0.03
		B		0.000	0.000	3.514	0.000	0.04
		C		0.000	0.000	3.181	0.000	0.02
L24	113.75-113.50	A	0.962	0.000	0.000	0.513	0.000	0.01
		B		0.000	0.000	0.703	0.000	0.01
		C		0.000	0.000	0.636	0.000	0.00
L25	113.50-108.50	A	0.960	0.000	0.000	6.818	0.000	0.10
		B		0.000	0.000	10.610	0.000	0.15
		C		0.000	0.000	9.277	0.000	0.07
L26	108.50-103.50	A	0.955	0.000	0.000	5.955	0.000	0.09
		B		0.000	0.000	9.739	0.000	0.14
		C		0.000	0.000	8.406	0.000	0.06
L27	103.50-95.00	A	0.949	0.000	0.000	18.049	0.000	0.20
		B		0.000	0.000	24.459	0.000	0.28
		C		0.000	0.000	22.193	0.000	0.15
L28	95.00-94.00	A	0.944	0.000	0.000	2.380	0.000	0.03
		B		0.000	0.000	3.134	0.000	0.03
		C		0.000	0.000	2.867	0.000	0.02
L29	94.00-91.40	A	0.942	0.000	0.000	6.180	0.000	0.07
		B		0.000	0.000	8.134	0.000	0.09
		C		0.000	0.000	7.441	0.000	0.05
L30	91.40-91.15	A	0.941	0.000	0.000	0.594	0.000	0.01
		B		0.000	0.000	0.782	0.000	0.01
		C		0.000	0.000	0.715	0.000	0.00
L31	91.15-91.00	A	0.941	0.000	0.000	0.356	0.000	0.00
		B		0.000	0.000	0.469	0.000	0.01
		C		0.000	0.000	0.429	0.000	0.00
L32	91.00-86.00	A	0.938	0.000	0.000	8.444	0.000	0.11
		B		0.000	0.000	12.193	0.000	0.15
		C		0.000	0.000	10.860	0.000	0.07

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	86.00-81.00	A	0.933	0.000	0.000	5.933	0.000	0.09
		B		0.000	0.000	9.671	0.000	0.14
		C		0.000	0.000	8.338	0.000	0.06
L34	81.00-76.00	A	0.927	0.000	0.000	5.927	0.000	0.09
		B		0.000	0.000	9.654	0.000	0.14
		C		0.000	0.000	8.321	0.000	0.06
L35	76.00-71.00	A	0.921	0.000	0.000	5.921	0.000	0.09
		B		0.000	0.000	9.636	0.000	0.14
		C		0.000	0.000	8.303	0.000	0.06
L36	71.00-66.00	A	0.914	0.000	0.000	5.914	0.000	0.09
		B		0.000	0.000	9.616	0.000	0.14
		C		0.000	0.000	8.283	0.000	0.06
L37	66.00-63.75	A	0.909	0.000	0.000	4.728	0.000	0.05
		B		0.000	0.000	6.389	0.000	0.07
		C		0.000	0.000	5.789	0.000	0.04
L38	63.75-63.50	A	0.908	0.000	0.000	0.591	0.000	0.01
		B		0.000	0.000	0.775	0.000	0.01
		C		0.000	0.000	0.709	0.000	0.00
L39	63.50-58.50	A	0.904	0.000	0.000	8.065	0.000	0.10
		B		0.000	0.000	11.745	0.000	0.15
		C		0.000	0.000	10.412	0.000	0.07
L40	58.50-51.00	A	0.894	0.000	0.000	11.553	0.000	0.15
		B		0.000	0.000	17.045	0.000	0.22
		C		0.000	0.000	15.046	0.000	0.10
L41	51.00-50.00	A	0.887	0.000	0.000	2.108	0.000	0.02
		B		0.000	0.000	2.840	0.000	0.03
		C		0.000	0.000	2.573	0.000	0.02
L42	50.00-45.00	A	0.882	0.000	0.000	10.513	0.000	0.12
		B		0.000	0.000	14.149	0.000	0.16
		C		0.000	0.000	12.816	0.000	0.08
L43	45.00-40.42	A	0.872	0.000	0.000	9.613	0.000	0.11
		B		0.000	0.000	12.926	0.000	0.14
		C		0.000	0.000	11.705	0.000	0.07
L44	40.42-40.17	A	0.867	0.000	0.000	0.524	0.000	0.01
		B		0.000	0.000	0.705	0.000	0.01
		C		0.000	0.000	0.638	0.000	0.00
L45	40.17-40.00	A	0.867	0.000	0.000	0.356	0.000	0.00
		B		0.000	0.000	0.479	0.000	0.01
		C		0.000	0.000	0.434	0.000	0.00
L46	40.00-35.00	A	0.861	0.000	0.000	14.547	0.000	0.13
		B		0.000	0.000	14.297	0.000	0.16
		C		0.000	0.000	12.964	0.000	0.08
L47	35.00-33.00	A	0.853	0.000	0.000	8.690	0.000	0.07
		B		0.000	0.000	6.947	0.000	0.07
		C		0.000	0.000	6.413	0.000	0.04
L48	33.00-32.75	A	0.850	0.000	0.000	1.086	0.000	0.01
		B		0.000	0.000	0.868	0.000	0.01
		C		0.000	0.000	0.801	0.000	0.00
L49	32.75-19.00	A	0.829	0.000	0.000	46.143	0.000	0.38
		B		0.000	0.000	34.095	0.000	0.39
		C		0.000	0.000	30.429	0.000	0.18
L50	19.00-18.00	A	0.802	0.000	0.000	3.165	0.000	0.03
		B		0.000	0.000	2.289	0.000	0.03
		C		0.000	0.000	2.022	0.000	0.01
L51	18.00-13.00	A	0.788	0.000	0.000	15.743	0.000	0.13
		B		0.000	0.000	11.321	0.000	0.14
		C		0.000	0.000	9.988	0.000	0.06
L52	13.00-8.00	A	0.758	0.000	0.000	15.683	0.000	0.13
		B		0.000	0.000	11.230	0.000	0.13
		C		0.000	0.000	9.897	0.000	0.06
L53	8.00-6.42	A	0.730	0.000	0.000	4.938	0.000	0.04
		B		0.000	0.000	3.522	0.000	0.04
		C		0.000	0.000	3.101	0.000	0.02
L54	6.42-6.17	A	0.720	0.000	0.000	0.780	0.000	0.01
		B		0.000	0.000	0.556	0.000	0.01
		C		0.000	0.000	0.489	0.000	0.00
L55	6.17-1.17	A	0.682	0.000	0.000	15.531	0.000	0.12
		B		0.000	0.000	11.003	0.000	0.13
		C		0.000	0.000	9.670	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
L56	1.17-0.00	A	0.568	0.000	0.000	3.581	0.000	0.03
		B		0.000	0.000	2.494	0.000	0.03
		C		0.000	0.000	2.183	0.000	0.01

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	185.00-180.00	1.1737	0.4652	2.2098	1.1348
L2	180.00-175.00	1.5714	0.5222	2.6576	1.1798
L3	175.00-170.00	1.5824	0.5268	2.7198	1.2091
L4	170.00-165.00	1.5920	0.5309	2.7751	1.2352
L5	165.00-160.00	1.5809	-0.4202	2.6819	-0.0691
L6	160.00-155.00	1.5446	-0.4096	2.6712	-0.0669
L7	155.00-154.00	0.7789	-0.2063	1.5267	-0.0377
L8	154.00-153.75	0.6484	-0.1717	1.2926	-0.0318
L9	153.75-152.50	0.6520	-0.1726	1.3000	-0.0319
L10	152.50-152.25	0.6561	-0.1736	1.3084	-0.0320
L11	152.25-151.50	0.6585	-0.1742	1.3133	-0.0320
L12	151.50-151.25	0.6606	-0.1747	1.3176	-0.0320
L13	151.25-146.25	0.8394	-0.2218	1.6218	-0.0390
L14	146.25-141.25	0.9193	-0.2425	1.7614	-0.0416
L15	141.25-136.25	0.9426	-0.2483	1.8095	-0.0421
L16	136.25-130.00	0.8437	-0.2219	1.6410	-0.0377
L17	130.00-129.00	0.7164	-0.1883	1.4123	-0.0321
L18	129.00-124.00	0.7283	-0.1913	1.4342	-0.0328
L19	124.00-121.42	0.5391	-0.1414	1.1021	-0.0251
L20	121.42-121.17	0.5390	-0.1414	1.1028	-0.0251
L21	121.17-116.17	0.6358	-0.1667	1.2894	-0.0293
L22	116.17-115.00	0.7027	-0.1841	1.4173	-0.0322
L23	115.00-113.75	0.7071	-0.1852	1.4258	-0.0323
L24	113.75-113.50	0.7095	-0.1858	1.4306	-0.0324
L25	113.50-108.50	0.8795	-0.2302	1.7573	-0.0398
L26	108.50-103.50	0.9493	-0.2483	1.8904	-0.0429
L27	103.50-95.00	0.7290	-0.1904	1.4941	-0.0341
L28	95.00-94.00	0.6908	-0.1804	1.4247	-0.0323
L29	94.00-91.40	0.6961	-0.1817	1.4313	-0.0331
L30	91.40-91.15	0.7001	-0.1827	1.4387	-0.0334
L31	91.15-91.00	0.7007	-0.1829	1.4398	-0.0334
L32	91.00-86.00	0.8520	-0.2223	1.7192	-0.0401
L33	86.00-81.00	1.0152	-0.2647	2.0104	-0.0474
L34	81.00-76.00	1.0299	-0.2683	2.0360	-0.0486
L35	76.00-71.00	1.0441	-0.2719	2.0598	-0.0498
L36	71.00-66.00	1.0578	-0.2753	2.0821	-0.0512
L37	66.00-63.75	0.8246	-0.2145	1.6625	-0.0414
L38	63.75-63.50	0.7775	-0.2022	1.5749	-0.0394
L39	63.50-58.50	0.9478	-0.2465	1.8834	-0.0477
L40	58.50-51.00	0.9875	-0.2566	1.9406	-0.0505
L41	51.00-50.00	0.8626	-0.2241	1.7091	-0.0444
L42	50.00-45.00	0.8700	-0.2260	1.7127	-0.0465
L43	45.00-40.42	0.8816	-0.2289	1.7277	-0.0483
L44	40.42-40.17	0.8872	-0.2303	1.7344	-0.0492
L45	40.17-40.00	0.8877	-0.2305	1.7350	-0.0493
L46	40.00-35.00	1.0670	1.0084	1.8552	1.0328
L47	35.00-33.00	1.1129	1.9234	1.7820	1.8605
L48	33.00-32.75	1.1172	1.9308	1.7864	1.8673
L49	32.75-19.00	1.3804	2.3850	2.1605	2.2769
L50	19.00-18.00	1.4568	2.5166	2.2737	2.3964
L51	18.00-13.00	1.4680	2.5355	2.2455	2.4063
L52	13.00-8.00	1.4863	2.5667	2.2394	2.4301
L53	8.00-6.42	1.4981	2.5869	2.2254	2.4437
L54	6.42-6.17	1.5026	2.5946	2.2209	2.4490
L55	6.17-1.17	1.5118	2.6102	2.1906	2.4561
L56	1.17-0.00	1.5225	2.6285	2.0715	2.4500

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	180.00 - 185.00	1.0000	1.0000
L1	3	Step Pegs	180.00 - 185.00	1.0000	1.0000
L1	8	HB158-21U6S24-xxM_TMO(1-5/8)	180.00 - 183.00	1.0000	1.0000
L2	2	Safety Line 3/8	175.00 - 180.00	1.0000	1.0000
L2	3	Step Pegs	175.00 - 180.00	1.0000	1.0000
L2	8	HB158-21U6S24-xxM_TMO(1-5/8)	175.00 - 180.00	1.0000	1.0000
L3	2	Safety Line 3/8	170.00 - 175.00	1.0000	1.0000
L3	3	Step Pegs	170.00 - 175.00	1.0000	1.0000
L3	8	HB158-21U6S24-xxM_TMO(1-5/8)	170.00 - 175.00	1.0000	1.0000
L4	2	Safety Line 3/8	165.00 - 170.00	1.0000	1.0000
L4	3	Step Pegs	165.00 - 170.00	1.0000	1.0000
L4	8	HB158-21U6S24-xxM_TMO(1-5/8)	165.00 - 170.00	1.0000	1.0000
L5	2	Safety Line 3/8	160.00 - 165.00	1.0000	1.0000
L5	3	Step Pegs	160.00 - 165.00	1.0000	1.0000
L5	8	HB158-21U6S24-xxM_TMO(1-5/8)	160.00 - 165.00	1.0000	1.0000
L5	19	CU12PSM6P4XXX(1-3/4)	160.00 - 165.00	1.0000	1.0000
L6	2	Safety Line 3/8	155.00 - 160.00	1.0000	1.0000
L6	3	Step Pegs	155.00 - 160.00	1.0000	1.0000
L6	8	HB158-21U6S24-xxM_TMO(1-5/8)	155.00 - 160.00	1.0000	1.0000
L6	19	CU12PSM6P4XXX(1-3/4)	155.00 - 160.00	1.0000	1.0000
L6	46	CCI-040075 (W)	155.00 - 155.25	1.0000	1.0000
L6	47	CCI-040075 (W)	155.00 - 155.25	1.0000	1.0000
L6	48	CCI-040075 (W)	155.00 - 155.25	1.0000	1.0000
L7	2	Safety Line 3/8	154.00 - 155.00	1.0000	1.0000
L7	3	Step Pegs	154.00 - 155.00	1.0000	1.0000
L7	8	HB158-21U6S24-xxM_TMO(1-5/8)	154.00 - 155.00	1.0000	1.0000
L7	19	CU12PSM6P4XXX(1-3/4)	154.00 - 155.00	1.0000	1.0000
L7	29	CCI-045100 (L)	154.00 - 154.50	1.0000	1.0000
L7	30	CCI-045100 (L)	154.00 - 154.50	1.0000	1.0000
L7	31	CCI-045100 (L)	154.00 - 154.50	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L7	46	CCI-040075 (W)	154.00 - 155.00	1.0000	1.0000
L7	47	CCI-040075 (W)	154.00 - 155.00	1.0000	1.0000
L7	48	CCI-040075 (W)	154.00 - 155.00	1.0000	1.0000
L8	2	Safety Line 3/8	153.75 - 154.00	1.0000	1.0000
L8	3	Step Pegs	153.75 - 154.00	1.0000	1.0000
L8	8	HB158-21U6S24-xxM_TMO(1-5/8)	153.75 - 154.00	1.0000	1.0000
L8	19	CU12PSM6P4XXX(1-3/4)	153.75 - 154.00	1.0000	1.0000
L8	29	CCI-045100 (L)	153.75 - 154.00	1.0000	1.0000
L8	30	CCI-045100 (L)	153.75 - 154.00	1.0000	1.0000
L8	31	CCI-045100 (L)	153.75 - 154.00	1.0000	1.0000
L8	46	CCI-040075 (W)	153.75 - 154.00	1.0000	1.0000
L8	47	CCI-040075 (W)	153.75 - 154.00	1.0000	1.0000
L8	48	CCI-040075 (W)	153.75 - 154.00	1.0000	1.0000
L9	2	Safety Line 3/8	152.50 - 153.75	1.0000	1.0000
L9	3	Step Pegs	152.50 - 153.75	1.0000	1.0000
L9	8	HB158-21U6S24-xxM_TMO(1-5/8)	152.50 - 153.75	1.0000	1.0000
L9	19	CU12PSM6P4XXX(1-3/4)	152.50 - 153.75	1.0000	1.0000
L9	29	CCI-045100 (L)	152.50 - 153.75	1.0000	1.0000
L9	30	CCI-045100 (L)	152.50 - 153.75	1.0000	1.0000
L9	31	CCI-045100 (L)	152.50 - 153.75	1.0000	1.0000
L9	46	CCI-040075 (W)	152.50 - 153.75	1.0000	1.0000
L9	47	CCI-040075 (W)	152.50 - 153.75	1.0000	1.0000
L9	48	CCI-040075 (W)	152.50 - 153.75	1.0000	1.0000
L10	2	Safety Line 3/8	152.25 - 152.50	1.0000	1.0000
L10	3	Step Pegs	152.25 - 152.50	1.0000	1.0000
L10	8	HB158-21U6S24-xxM_TMO(1-5/8)	152.25 - 152.50	1.0000	1.0000
L10	19	CU12PSM6P4XXX(1-3/4)	152.25 - 152.50	1.0000	1.0000
L10	29	CCI-045100 (L)	152.25 - 152.50	1.0000	1.0000
L10	30	CCI-045100 (L)	152.25 - 152.50	1.0000	1.0000
L10	31	CCI-045100 (L)	152.25 - 152.50	1.0000	1.0000
L10	46	CCI-040075 (W)	152.25 - 152.50	1.0000	1.0000
L10	47	CCI-040075 (W)	152.25 - 152.50	1.0000	1.0000
L10	48	CCI-040075 (W)	152.25 - 152.50	1.0000	1.0000
L11	2	Safety Line 3/8	151.50 - 152.25	1.0000	1.0000
L11	3	Step Pegs	151.50 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L11	8	HB158-21U6S24-xxM_TMO(1-5/8)	152.25 - 151.50	1.0000	1.0000
L11	19	CU12PSM6P4XXX(1-3/4)	151.50 - 152.25	1.0000	1.0000
L11	29	CCI-045100 (L)	151.50 - 152.25	1.0000	1.0000
L11	30	CCI-045100 (L)	151.50 - 152.25	1.0000	1.0000
L11	31	CCI-045100 (L)	151.50 - 152.25	1.0000	1.0000
L11	46	CCI-040075 (W)	151.50 - 152.25	1.0000	1.0000
L11	47	CCI-040075 (W)	151.50 - 152.25	1.0000	1.0000
L11	48	CCI-040075 (W)	151.50 - 152.25	1.0000	1.0000
L12	2	Safety Line 3/8	151.25 - 151.50	1.0000	1.0000
L12	3	Step Pegs	151.25 - 151.50	1.0000	1.0000
L12	8	HB158-21U6S24-xxM_TMO(1-5/8)	151.25 - 151.50	1.0000	1.0000
L12	19	CU12PSM6P4XXX(1-3/4)	151.25 - 151.50	1.0000	1.0000
L12	29	CCI-045100 (L)	151.25 - 151.50	1.0000	1.0000
L12	30	CCI-045100 (L)	151.25 - 151.50	1.0000	1.0000
L12	31	CCI-045100 (L)	151.25 - 151.50	1.0000	1.0000
L12	46	CCI-040075 (W)	151.25 - 151.50	1.0000	1.0000
L12	47	CCI-040075 (W)	151.25 - 151.50	1.0000	1.0000
L12	48	CCI-040075 (W)	151.25 - 151.50	1.0000	1.0000
L13	2	Safety Line 3/8	146.25 - 151.25	1.0000	1.0000
L13	3	Step Pegs	146.25 - 151.25	1.0000	1.0000
L13	8	HB158-21U6S24-xxM_TMO(1-5/8)	146.25 - 151.25	1.0000	1.0000
L13	19	CU12PSM6P4XXX(1-3/4)	146.25 - 151.25	1.0000	1.0000
L13	29	CCI-045100 (L)	146.25 - 151.25	1.0000	1.0000
L13	30	CCI-045100 (L)	146.25 - 151.25	1.0000	1.0000
L13	31	CCI-045100 (L)	146.25 - 151.25	1.0000	1.0000
L13	46	CCI-040075 (W)	150.25 - 151.25	1.0000	1.0000
L13	47	CCI-040075 (W)	150.25 - 151.25	1.0000	1.0000
L13	48	CCI-040075 (W)	150.25 - 151.25	1.0000	1.0000
L14	2	Safety Line 3/8	141.25 - 146.25	1.0000	1.0000
L14	3	Step Pegs	141.25 - 146.25	1.0000	1.0000
L14	8	HB158-21U6S24-xxM_TMO(1-5/8)	141.25 - 146.25	1.0000	1.0000
L14	19	CU12PSM6P4XXX(1-3/4)	141.25 - 146.25	1.0000	1.0000
L14	29	CCI-045100 (L)	141.25 - 146.25	1.0000	1.0000
L14	30	CCI-045100 (L)	141.25 - 146.25	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L14	31	CCI-045100 (L)	141.25 - 146.25	1.0000	1.0000
L15	2	Safety Line 3/8	136.25 - 141.25	1.0000	1.0000
L15	3	Step Pegs	136.25 - 141.25	1.0000	1.0000
L15	8	HB158-21U6S24-xxM_TMO(1-5/8)	136.25 - 141.25	1.0000	1.0000
L15	19	CU12PSM6P4XXX(1-3/4)	136.25 - 141.25	1.0000	1.0000
L15	29	CCI-045100 (L)	136.25 - 141.25	1.0000	1.0000
L15	30	CCI-045100 (L)	136.25 - 141.25	1.0000	1.0000
L15	31	CCI-045100 (L)	136.25 - 141.25	1.0000	1.0000
L16	2	Safety Line 3/8	130.00 - 136.25	1.0000	1.0000
L16	3	Step Pegs	130.00 - 136.25	1.0000	1.0000
L16	8	HB158-21U6S24-xxM_TMO(1-5/8)	130.00 - 136.25	1.0000	1.0000
L16	19	CU12PSM6P4XXX(1-3/4)	130.00 - 136.25	1.0000	1.0000
L16	29	CCI-045100 (L)	130.00 - 136.25	1.0000	1.0000
L16	30	CCI-045100 (L)	130.00 - 136.25	1.0000	1.0000
L16	31	CCI-045100 (L)	130.00 - 136.25	1.0000	1.0000
L16	43	CCI-040075 (W)	130.00 - 132.50	1.0000	1.0000
L16	44	CCI-040075 (W)	130.00 - 132.50	1.0000	1.0000
L16	45	CCI-040075 (W)	130.00 - 132.50	1.0000	1.0000
L17	2	Safety Line 3/8	129.00 - 130.00	1.0000	1.0000
L17	3	Step Pegs	129.00 - 130.00	1.0000	1.0000
L17	8	HB158-21U6S24-xxM_TMO(1-5/8)	129.00 - 130.00	1.0000	1.0000
L17	19	CU12PSM6P4XXX(1-3/4)	129.00 - 130.00	1.0000	1.0000
L17	29	CCI-045100 (L)	129.00 - 130.00	1.0000	1.0000
L17	30	CCI-045100 (L)	129.00 - 130.00	1.0000	1.0000
L17	31	CCI-045100 (L)	129.00 - 130.00	1.0000	1.0000
L17	43	CCI-040075 (W)	129.00 - 130.00	1.0000	1.0000
L17	44	CCI-040075 (W)	129.00 - 130.00	1.0000	1.0000
L17	45	CCI-040075 (W)	129.00 - 130.00	1.0000	1.0000
L18	2	Safety Line 3/8	124.00 - 129.00	1.0000	1.0000
L18	3	Step Pegs	124.00 - 129.00	1.0000	1.0000
L18	8	HB158-21U6S24-xxM_TMO(1-5/8)	124.00 - 129.00	1.0000	1.0000
L18	19	CU12PSM6P4XXX(1-3/4)	124.00 - 129.00	1.0000	1.0000
L18	29	CCI-045100 (L)	124.00 - 129.00	1.0000	1.0000
L18	30	CCI-045100 (L)	124.00 - 129.00	1.0000	1.0000
L18	31	CCI-045100 (L)	124.00 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L18	43	CCI-040075 (W)	129.00 - 124.00	1.0000	1.0000
L18	44	CCI-040075 (W)	129.00 - 124.00	1.0000	1.0000
L18	45	CCI-040075 (W)	129.00 - 124.00	1.0000	1.0000
L19	2	Safety Line 3/8	129.00 - 121.42	1.0000	1.0000
L19	3	Step Pegs	124.00 - 121.42	1.0000	1.0000
L19	8	HB158-21U6S24-xxM_TMO(1-5/8)	124.00 - 121.42	1.0000	1.0000
L19	19	CU12PSM6P4XXX(1-3/4)	124.00 - 121.42	1.0000	1.0000
L19	26	CCI-060100 (L)	124.00 - 121.42	1.0000	1.0000
L19	27	CCI-060100 (L)	123.92 - 121.42	1.0000	1.0000
L19	28	CCI-060100 (L)	123.92 - 121.42	1.0000	1.0000
L19	29	CCI-045100 (L)	123.92 - 121.42	1.0000	1.0000
L19	30	CCI-045100 (L)	124.00 - 121.42	1.0000	1.0000
L19	31	CCI-045100 (L)	124.00 - 121.42	1.0000	1.0000
L19	43	CCI-040075 (W)	124.00 - 121.42	1.0000	1.0000
L19	44	CCI-040075 (W)	124.00 - 121.42	1.0000	1.0000
L19	45	CCI-040075 (W)	124.00 - 121.42	1.0000	1.0000
L20	2	Safety Line 3/8	124.00 - 121.17	1.0000	1.0000
L20	3	Step Pegs	121.42 - 121.17	1.0000	1.0000
L20	8	HB158-21U6S24-xxM_TMO(1-5/8)	121.42 - 121.17	1.0000	1.0000
L20	19	CU12PSM6P4XXX(1-3/4)	121.42 - 121.17	1.0000	1.0000
L20	26	CCI-060100 (L)	121.42 - 121.17	1.0000	1.0000
L20	27	CCI-060100 (L)	121.42 - 121.17	1.0000	1.0000
L20	28	CCI-060100 (L)	121.42 - 121.17	1.0000	1.0000
L20	29	CCI-045100 (L)	121.42 - 121.17	1.0000	1.0000
L20	30	CCI-045100 (L)	121.42 - 121.17	1.0000	1.0000
L20	31	CCI-045100 (L)	121.42 - 121.17	1.0000	1.0000
L20	43	CCI-040075 (W)	121.42 - 121.17	1.0000	1.0000
L20	44	CCI-040075 (W)	121.42 - 121.17	1.0000	1.0000
L20	45	CCI-040075 (W)	121.42 - 121.17	1.0000	1.0000
L21	2	Safety Line 3/8	121.17 - 116.17	1.0000	1.0000
L21	3	Step Pegs	121.17 - 116.17	1.0000	1.0000
L21	8	HB158-21U6S24-xxM_TMO(1-5/8)	121.17 - 116.17	1.0000	1.0000
L21	19	CU12PSM6P4XXX(1-3/4)	121.17 - 116.17	1.0000	1.0000
L21	26	CCI-060100 (L)	121.17 - 116.17	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L21	27	CCI-060100 (L)	116.17 - 121.17	1.0000	1.0000
L21	28	CCI-060100 (L)	116.17 - 121.17	1.0000	1.0000
L21	29	CCI-045100 (L)	119.50 - 121.17	1.0000	1.0000
L21	30	CCI-045100 (L)	119.50 - 121.17	1.0000	1.0000
L21	31	CCI-045100 (L)	119.50 - 121.17	1.0000	1.0000
L21	43	CCI-040075 (W)	116.17 - 121.17	1.0000	1.0000
L21	44	CCI-040075 (W)	116.17 - 121.17	1.0000	1.0000
L21	45	CCI-040075 (W)	116.17 - 121.17	1.0000	1.0000
L22	2	Safety Line 3/8	115.00 - 116.17	1.0000	1.0000
L22	3	Step Pegs	115.00 - 116.17	1.0000	1.0000
L22	8	HB158-21U6S24-xxM_TMO(1-5/8)	115.00 - 116.17	1.0000	1.0000
L22	19	CU12PSM6P4XXX(1-3/4)	115.00 - 116.17	1.0000	1.0000
L22	26	CCI-060100 (L)	115.00 - 116.17	1.0000	1.0000
L22	27	CCI-060100 (L)	115.00 - 116.17	1.0000	1.0000
L22	28	CCI-060100 (L)	115.00 - 116.17	1.0000	1.0000
L22	43	CCI-040075 (W)	115.00 - 116.17	1.0000	1.0000
L22	44	CCI-040075 (W)	115.00 - 116.17	1.0000	1.0000
L22	45	CCI-040075 (W)	115.00 - 116.17	1.0000	1.0000
L23	2	Safety Line 3/8	113.75 - 115.00	1.0000	1.0000
L23	3	Step Pegs	113.75 - 115.00	1.0000	1.0000
L23	8	HB158-21U6S24-xxM_TMO(1-5/8)	113.75 - 115.00	1.0000	1.0000
L23	19	CU12PSM6P4XXX(1-3/4)	113.75 - 115.00	1.0000	1.0000
L23	26	CCI-060100 (L)	113.75 - 115.00	1.0000	1.0000
L23	27	CCI-060100 (L)	113.75 - 115.00	1.0000	1.0000
L23	28	CCI-060100 (L)	113.75 - 115.00	1.0000	1.0000
L23	43	CCI-040075 (W)	113.75 - 115.00	1.0000	1.0000
L23	44	CCI-040075 (W)	113.75 - 115.00	1.0000	1.0000
L23	45	CCI-040075 (W)	113.75 - 115.00	1.0000	1.0000
L24	2	Safety Line 3/8	113.50 - 113.75	1.0000	1.0000
L24	3	Step Pegs	113.50 - 113.75	1.0000	1.0000
L24	8	HB158-21U6S24-xxM_TMO(1-5/8)	113.50 - 113.75	1.0000	1.0000
L24	19	CU12PSM6P4XXX(1-3/4)	113.50 - 113.75	1.0000	1.0000
L24	26	CCI-060100 (L)	113.50 - 113.75	1.0000	1.0000
L24	27	CCI-060100 (L)	113.50 - 113.75	1.0000	1.0000
L24	28	CCI-060100 (L)	113.50 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L24	43	CCI-040075 (W)	113.75 113.50 - 113.75	1.0000	1.0000
L24	44	CCI-040075 (W)	113.50 - 113.75	1.0000	1.0000
L24	45	CCI-040075 (W)	113.50 - 113.75	1.0000	1.0000
L25	2	Safety Line 3/8	108.50 - 113.50	1.0000	1.0000
L25	3	Step Pegs	108.50 - 113.50	1.0000	1.0000
L25	8	HB158-21U6S24-xxM_TMO(1-5/8)	108.50 - 113.50	1.0000	1.0000
L25	19	CU12PSM6P4XXX(1-3/4)	108.50 - 113.50	1.0000	1.0000
L25	26	CCI-060100 (L)	108.50 - 113.50	1.0000	1.0000
L25	27	CCI-060100 (L)	108.50 - 113.50	1.0000	1.0000
L25	28	CCI-060100 (L)	108.50 - 113.50	1.0000	1.0000
L25	43	CCI-040075 (W)	112.50 - 113.50	1.0000	1.0000
L25	44	CCI-040075 (W)	112.50 - 113.50	1.0000	1.0000
L25	45	CCI-040075 (W)	112.50 - 113.50	1.0000	1.0000
L26	2	Safety Line 3/8	103.50 - 108.50	1.0000	1.0000
L26	3	Step Pegs	103.50 - 108.50	1.0000	1.0000
L26	8	HB158-21U6S24-xxM_TMO(1-5/8)	103.50 - 108.50	1.0000	1.0000
L26	19	CU12PSM6P4XXX(1-3/4)	103.50 - 108.50	1.0000	1.0000
L26	26	CCI-060100 (L)	103.50 - 108.50	1.0000	1.0000
L26	27	CCI-060100 (L)	103.50 - 108.50	1.0000	1.0000
L26	28	CCI-060100 (L)	103.50 - 108.50	1.0000	1.0000
L27	2	Safety Line 3/8	95.00 - 103.50	1.0000	1.0000
L27	3	Step Pegs	95.00 - 103.50	1.0000	1.0000
L27	8	HB158-21U6S24-xxM_TMO(1-5/8)	95.00 - 103.50	1.0000	1.0000
L27	19	CU12PSM6P4XXX(1-3/4)	95.00 - 103.50	1.0000	1.0000
L27	26	CCI-060100 (L)	95.00 - 103.50	1.0000	1.0000
L27	27	CCI-060100 (L)	95.00 - 103.50	1.0000	1.0000
L27	28	CCI-060100 (L)	95.00 - 103.50	1.0000	1.0000
L27	40	CCI-060100 (L)	95.00 - 101.67	1.0000	1.0000
L27	41	CCI-060100 (L)	95.00 - 101.67	1.0000	1.0000
L27	42	CCI-060100 (L)	95.00 - 101.67	1.0000	1.0000
L28	2	Safety Line 3/8	94.00 - 95.00	1.0000	1.0000
L28	3	Step Pegs	94.00 - 95.00	1.0000	1.0000
L28	8	HB158-21U6S24-xxM_TMO(1-5/8)	94.00 - 95.00	1.0000	1.0000
L28	19	CU12PSM6P4XXX(1-3/4)	94.00 - 95.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L28	26	CCI-060100 (L)	94.00 - 95.00	1.0000	1.0000
L28	27	CCI-060100 (L)	94.00 - 95.00	1.0000	1.0000
L28	28	CCI-060100 (L)	94.00 - 95.00	1.0000	1.0000
L28	40	CCI-060100 (L)	94.00 - 95.00	1.0000	1.0000
L28	41	CCI-060100 (L)	94.00 - 95.00	1.0000	1.0000
L28	42	CCI-060100 (L)	94.00 - 95.00	1.0000	1.0000
L29	2	Safety Line 3/8	91.40 - 94.00	1.0000	1.0000
L29	3	Step Pegs	91.40 - 94.00	1.0000	1.0000
L29	8	HB158-21U6S24-xxM_TMO(1-5/8)	91.40 - 94.00	1.0000	1.0000
L29	19	CU12PSM6P4XXX(1-3/4)	91.40 - 94.00	1.0000	1.0000
L29	26	CCI-060100 (L)	91.40 - 94.00	1.0000	1.0000
L29	27	CCI-060100 (L)	91.40 - 94.00	1.0000	1.0000
L29	28	CCI-060100 (L)	91.40 - 94.00	1.0000	1.0000
L29	40	CCI-060100 (L)	91.40 - 94.00	1.0000	1.0000
L29	41	CCI-060100 (L)	91.40 - 94.00	1.0000	1.0000
L29	42	CCI-060100 (L)	91.40 - 94.00	1.0000	1.0000
L30	2	Safety Line 3/8	91.15 - 91.40	1.0000	1.0000
L30	3	Step Pegs	91.15 - 91.40	1.0000	1.0000
L30	8	HB158-21U6S24-xxM_TMO(1-5/8)	91.15 - 91.40	1.0000	1.0000
L30	19	CU12PSM6P4XXX(1-3/4)	91.15 - 91.40	1.0000	1.0000
L30	26	CCI-060100 (L)	91.15 - 91.40	1.0000	1.0000
L30	27	CCI-060100 (L)	91.15 - 91.40	1.0000	1.0000
L30	28	CCI-060100 (L)	91.15 - 91.40	1.0000	1.0000
L30	40	CCI-060100 (L)	91.15 - 91.40	1.0000	1.0000
L30	41	CCI-060100 (L)	91.15 - 91.40	1.0000	1.0000
L30	42	CCI-060100 (L)	91.15 - 91.40	1.0000	1.0000
L31	2	Safety Line 3/8	91.00 - 91.15	1.0000	1.0000
L31	3	Step Pegs	91.00 - 91.15	1.0000	1.0000
L31	8	HB158-21U6S24-xxM_TMO(1-5/8)	91.00 - 91.15	1.0000	1.0000
L31	19	CU12PSM6P4XXX(1-3/4)	91.00 - 91.15	1.0000	1.0000
L31	26	CCI-060100 (L)	91.00 - 91.15	1.0000	1.0000
L31	27	CCI-060100 (L)	91.00 - 91.15	1.0000	1.0000
L31	28	CCI-060100 (L)	91.00 - 91.15	1.0000	1.0000
L31	40	CCI-060100 (L)	91.00 - 91.15	1.0000	1.0000
L31	41	CCI-060100 (L)	91.00 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			91.15		
L31	42	CCI-060100 (L)	91.00 - 91.15	1.0000	1.0000
L32	2	Safety Line 3/8	86.00 - 91.00	1.0000	1.0000
L32	3	Step Pegs	86.00 - 91.00	1.0000	1.0000
L32	8	HB158-21U6S24-xxM_TMO(1-5/8)	86.00 - 91.00	1.0000	1.0000
L32	19	CU12PSM6P4XXX(1-3/4)	86.00 - 91.00	1.0000	1.0000
L32	26	CCI-060100 (L)	88.89 - 91.00	1.0000	1.0000
L32	27	CCI-060100 (L)	88.89 - 91.00	1.0000	1.0000
L32	28	CCI-060100 (L)	88.89 - 91.00	1.0000	1.0000
L32	40	CCI-060100 (L)	86.00 - 91.00	1.0000	1.0000
L32	41	CCI-060100 (L)	86.00 - 91.00	1.0000	1.0000
L32	42	CCI-060100 (L)	86.00 - 91.00	1.0000	1.0000
L33	2	Safety Line 3/8	81.00 - 86.00	1.0000	1.0000
L33	3	Step Pegs	81.00 - 86.00	1.0000	1.0000
L33	8	HB158-21U6S24-xxM_TMO(1-5/8)	81.00 - 86.00	1.0000	1.0000
L33	19	CU12PSM6P4XXX(1-3/4)	81.00 - 86.00	1.0000	1.0000
L33	40	CCI-060100 (L)	81.00 - 86.00	1.0000	1.0000
L33	41	CCI-060100 (L)	81.00 - 86.00	1.0000	1.0000
L33	42	CCI-060100 (L)	81.00 - 86.00	1.0000	1.0000
L34	2	Safety Line 3/8	76.00 - 81.00	1.0000	1.0000
L34	3	Step Pegs	76.00 - 81.00	1.0000	1.0000
L34	8	HB158-21U6S24-xxM_TMO(1-5/8)	76.00 - 81.00	1.0000	1.0000
L34	19	CU12PSM6P4XXX(1-3/4)	76.00 - 81.00	1.0000	1.0000
L34	40	CCI-060100 (L)	76.00 - 81.00	1.0000	1.0000
L34	41	CCI-060100 (L)	76.00 - 81.00	1.0000	1.0000
L34	42	CCI-060100 (L)	76.00 - 81.00	1.0000	1.0000
L35	2	Safety Line 3/8	71.00 - 76.00	1.0000	1.0000
L35	3	Step Pegs	71.00 - 76.00	1.0000	1.0000
L35	8	HB158-21U6S24-xxM_TMO(1-5/8)	71.00 - 76.00	1.0000	1.0000
L35	19	CU12PSM6P4XXX(1-3/4)	71.00 - 76.00	1.0000	1.0000
L35	40	CCI-060100 (L)	71.00 - 76.00	1.0000	1.0000
L35	41	CCI-060100 (L)	71.00 - 76.00	1.0000	1.0000
L35	42	CCI-060100 (L)	71.00 - 76.00	1.0000	1.0000
L36	2	Safety Line 3/8	66.00 - 71.00	1.0000	1.0000
L36	3	Step Pegs	66.00 - 71.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L36	8	HB158-21U6S24-xxM_TMO(1-5/8)	66.00 - 71.00	1.0000	1.0000
L36	19	CU12PSM6P4XXX(1-3/4)	66.00 - 71.00	1.0000	1.0000
L36	40	CCI-060100 (L)	66.00 - 71.00	1.0000	1.0000
L36	41	CCI-060100 (L)	66.00 - 71.00	1.0000	1.0000
L36	42	CCI-060100 (L)	66.00 - 71.00	1.0000	1.0000
L37	2	Safety Line 3/8	63.75 - 66.00	1.0000	1.0000
L37	3	Step Pegs	63.75 - 66.00	1.0000	1.0000
L37	8	HB158-21U6S24-xxM_TMO(1-5/8)	63.75 - 66.00	1.0000	1.0000
L37	19	CU12PSM6P4XXX(1-3/4)	63.75 - 66.00	1.0000	1.0000
L37	37	CCI-060100 (L)	63.75 - 65.50	1.0000	1.0000
L37	38	CCI-060100 (L)	63.75 - 65.50	1.0000	1.0000
L37	39	CCI-060100 (L)	63.75 - 65.50	1.0000	1.0000
L37	40	CCI-060100 (L)	63.75 - 66.00	1.0000	1.0000
L37	41	CCI-060100 (L)	63.75 - 66.00	1.0000	1.0000
L37	42	CCI-060100 (L)	63.75 - 66.00	1.0000	1.0000
L38	2	Safety Line 3/8	63.50 - 63.75	1.0000	1.0000
L38	3	Step Pegs	63.50 - 63.75	1.0000	1.0000
L38	8	HB158-21U6S24-xxM_TMO(1-5/8)	63.50 - 63.75	1.0000	1.0000
L38	19	CU12PSM6P4XXX(1-3/4)	63.50 - 63.75	1.0000	1.0000
L38	37	CCI-060100 (L)	63.50 - 63.75	1.0000	1.0000
L38	38	CCI-060100 (L)	63.50 - 63.75	1.0000	1.0000
L38	39	CCI-060100 (L)	63.50 - 63.75	1.0000	1.0000
L38	40	CCI-060100 (L)	63.50 - 63.75	1.0000	1.0000
L38	41	CCI-060100 (L)	63.50 - 63.75	1.0000	1.0000
L38	42	CCI-060100 (L)	63.50 - 63.75	1.0000	1.0000
L39	2	Safety Line 3/8	58.50 - 63.50	1.0000	1.0000
L39	3	Step Pegs	58.50 - 63.50	1.0000	1.0000
L39	8	HB158-21U6S24-xxM_TMO(1-5/8)	58.50 - 63.50	1.0000	1.0000
L39	19	CU12PSM6P4XXX(1-3/4)	58.50 - 63.50	1.0000	1.0000
L39	37	CCI-060100 (L)	58.50 - 63.50	1.0000	1.0000
L39	38	CCI-060100 (L)	58.50 - 63.50	1.0000	1.0000
L39	39	CCI-060100 (L)	58.50 - 63.50	1.0000	1.0000
L39	40	CCI-060100 (L)	61.67 - 63.50	1.0000	1.0000
L39	41	CCI-060100 (L)	61.67 - 63.50	1.0000	1.0000
L39	42	CCI-060100 (L)	61.67 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			63.50		
L40	2	Safety Line 3/8	51.00 - 58.50	1.0000	1.0000
L40	3	Step Pegs	51.00 - 58.50	1.0000	1.0000
L40	8	HB158-21U6S24-xxM_TMO(1-5/8)	51.00 - 58.50	1.0000	1.0000
L40	19	CU12PSM6P4XXX(1-3/4)	51.00 - 58.50	1.0000	1.0000
L40	23	CCI-045100 (L)	51.00 - 53.92	1.0000	1.0000
L40	24	CCI-045100 (L)	51.00 - 53.92	1.0000	1.0000
L40	25	CCI-045100 (L)	51.00 - 53.92	1.0000	1.0000
L40	37	CCI-060100 (L)	51.00 - 58.50	1.0000	1.0000
L40	38	CCI-060100 (L)	51.00 - 58.50	1.0000	1.0000
L40	39	CCI-060100 (L)	51.00 - 58.50	1.0000	1.0000
L41	2	Safety Line 3/8	50.00 - 51.00	1.0000	1.0000
L41	3	Step Pegs	50.00 - 51.00	1.0000	1.0000
L41	8	HB158-21U6S24-xxM_TMO(1-5/8)	50.00 - 51.00	1.0000	1.0000
L41	19	CU12PSM6P4XXX(1-3/4)	50.00 - 51.00	1.0000	1.0000
L41	23	CCI-045100 (L)	50.00 - 51.00	1.0000	1.0000
L41	24	CCI-045100 (L)	50.00 - 51.00	1.0000	1.0000
L41	25	CCI-045100 (L)	50.00 - 51.00	1.0000	1.0000
L41	37	CCI-060100 (L)	50.00 - 51.00	1.0000	1.0000
L41	38	CCI-060100 (L)	50.00 - 51.00	1.0000	1.0000
L41	39	CCI-060100 (L)	50.00 - 51.00	1.0000	1.0000
L42	2	Safety Line 3/8	45.00 - 50.00	1.0000	1.0000
L42	3	Step Pegs	45.00 - 50.00	1.0000	1.0000
L42	8	HB158-21U6S24-xxM_TMO(1-5/8)	45.00 - 50.00	1.0000	1.0000
L42	19	CU12PSM6P4XXX(1-3/4)	45.00 - 50.00	1.0000	1.0000
L42	23	CCI-045100 (L)	45.00 - 50.00	1.0000	1.0000
L42	24	CCI-045100 (L)	45.00 - 50.00	1.0000	1.0000
L42	25	CCI-045100 (L)	45.00 - 50.00	1.0000	1.0000
L42	37	CCI-060100 (L)	45.00 - 50.00	1.0000	1.0000
L42	38	CCI-060100 (L)	45.00 - 50.00	1.0000	1.0000
L42	39	CCI-060100 (L)	45.00 - 50.00	1.0000	1.0000
L43	2	Safety Line 3/8	40.42 - 45.00	1.0000	1.0000
L43	3	Step Pegs	40.42 - 45.00	1.0000	1.0000
L43	8	HB158-21U6S24-xxM_TMO(1-5/8)	40.42 - 45.00	1.0000	1.0000
L43	19	CU12PSM6P4XXX(1-3/4)	40.42 - 45.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L43	23	CCI-045100 (L)	40.42 - 45.00	1.0000	1.0000
L43	24	CCI-045100 (L)	40.42 - 45.00	1.0000	1.0000
L43	25	CCI-045100 (L)	40.42 - 45.00	1.0000	1.0000
L43	37	CCI-060100 (L)	40.42 - 45.00	1.0000	1.0000
L43	38	CCI-060100 (L)	40.42 - 45.00	1.0000	1.0000
L43	39	CCI-060100 (L)	40.42 - 45.00	1.0000	1.0000
L44	2	Safety Line 3/8	40.17 - 40.42	1.0000	1.0000
L44	3	Step Pegs	40.17 - 40.42	1.0000	1.0000
L44	8	HB158-21U6S24-xxM_TMO(1-5/8)	40.17 - 40.42	1.0000	1.0000
L44	19	CU12PSM6P4XXX(1-3/4)	40.17 - 40.42	1.0000	1.0000
L44	23	CCI-045100 (L)	40.17 - 40.42	1.0000	1.0000
L44	24	CCI-045100 (L)	40.17 - 40.42	1.0000	1.0000
L44	25	CCI-045100 (L)	40.17 - 40.42	1.0000	1.0000
L44	37	CCI-060100 (L)	40.17 - 40.42	1.0000	1.0000
L44	38	CCI-060100 (L)	40.17 - 40.42	1.0000	1.0000
L44	39	CCI-060100 (L)	40.17 - 40.42	1.0000	1.0000
L45	2	Safety Line 3/8	40.00 - 40.17	1.0000	1.0000
L45	3	Step Pegs	40.00 - 40.17	1.0000	1.0000
L45	8	HB158-21U6S24-xxM_TMO(1-5/8)	40.00 - 40.17	1.0000	1.0000
L45	19	CU12PSM6P4XXX(1-3/4)	40.00 - 40.17	1.0000	1.0000
L45	23	CCI-045100 (L)	40.00 - 40.17	1.0000	1.0000
L45	24	CCI-045100 (L)	40.00 - 40.17	1.0000	1.0000
L45	25	CCI-045100 (L)	40.00 - 40.17	1.0000	1.0000
L45	37	CCI-060100 (L)	40.00 - 40.17	1.0000	1.0000
L45	38	CCI-060100 (L)	40.00 - 40.17	1.0000	1.0000
L45	39	CCI-060100 (L)	40.00 - 40.17	1.0000	1.0000
L46	2	Safety Line 3/8	35.00 - 40.00	1.0000	1.0000
L46	3	Step Pegs	35.00 - 40.00	1.0000	1.0000
L46	8	HB158-21U6S24-xxM_TMO(1-5/8)	35.00 - 40.00	1.0000	1.0000
L46	19	CU12PSM6P4XXX(1-3/4)	35.00 - 40.00	1.0000	1.0000
L46	23	CCI-045100 (L)	38.92 - 40.00	1.0000	1.0000
L46	24	CCI-045100 (L)	38.92 - 40.00	1.0000	1.0000
L46	25	CCI-045100 (L)	38.92 - 40.00	1.0000	1.0000
L46	33	CCI-085125 (L)	35.00 - 37.42	1.0000	1.0000
L46	34	CCI-085125 (L)	35.00 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L46	35	CCI-085125 (L)	37.42 35.00 -	1.0000	1.0000
L46	36	CCI-085125 (L)	37.42 35.00 -	1.0000	1.0000
L46	37	CCI-060100 (L)	37.42 35.00 -	1.0000	1.0000
L46	38	CCI-060100 (L)	40.00 35.00 -	1.0000	1.0000
L46	39	CCI-060100 (L)	40.00 35.00 -	1.0000	1.0000
L47	2	Safety Line 3/8	40.00 33.00 -	1.0000	1.0000
L47	3	Step Pegs	35.00 33.00 -	1.0000	1.0000
L47	8	HB158-21U6S24-xxM_TMO(1-5/8)	35.00 33.00 -	1.0000	1.0000
L47	19	CU12PSM6P4XXX(1-3/4)	35.00 33.00 -	1.0000	1.0000
L47	33	CCI-085125 (L)	35.00 33.00 -	1.0000	1.0000
L47	34	CCI-085125 (L)	35.00 33.00 -	1.0000	1.0000
L47	35	CCI-085125 (L)	35.00 33.00 -	1.0000	1.0000
L47	36	CCI-085125 (L)	35.00 33.00 -	1.0000	1.0000
L47	37	CCI-060100 (L)	35.00 33.00 -	1.0000	1.0000
L47	38	CCI-060100 (L)	35.00 33.00 -	1.0000	1.0000
L47	39	CCI-060100 (L)	35.00 33.00 -	1.0000	1.0000
L48	2	Safety Line 3/8	35.00 32.75 -	1.0000	1.0000
L48	3	Step Pegs	33.00 32.75 -	1.0000	1.0000
L48	8	HB158-21U6S24-xxM_TMO(1-5/8)	33.00 32.75 -	1.0000	1.0000
L48	19	CU12PSM6P4XXX(1-3/4)	33.00 32.75 -	1.0000	1.0000
L48	33	CCI-085125 (L)	33.00 32.75 -	1.0000	1.0000
L48	34	CCI-085125 (L)	33.00 32.75 -	1.0000	1.0000
L48	35	CCI-085125 (L)	33.00 32.75 -	1.0000	1.0000
L48	36	CCI-085125 (L)	33.00 32.75 -	1.0000	1.0000
L48	37	CCI-060100 (L)	33.00 32.75 -	1.0000	1.0000
L48	38	CCI-060100 (L)	33.00 32.75 -	1.0000	1.0000
L48	39	CCI-060100 (L)	33.00 32.75 -	1.0000	1.0000
L49	2	Safety Line 3/8	33.00 19.00 -	1.0000	1.0000
L49	3	Step Pegs	32.75 19.00 -	1.0000	1.0000
L49	8	HB158-21U6S24-xxM_TMO(1-5/8)	32.75 19.00 -	1.0000	1.0000
L49	19	CU12PSM6P4XXX(1-3/4)	32.75 19.00 -	1.0000	1.0000
L49	33	CCI-085125 (L)	32.75 19.00 -	1.0000	1.0000
L49	34	CCI-085125 (L)	32.75 19.00 -	1.0000	1.0000
L49	35	CCI-085125 (L)	32.75 19.00 -	1.0000	1.0000
			32.75		

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L49	36	CCI-085125 (L)	19.00 - 32.75	1.0000	1.0000
L49	37	CCI-060100 (L)	30.50 - 32.75	1.0000	1.0000
L49	38	CCI-060100 (L)	30.50 - 32.75	1.0000	1.0000
L49	39	CCI-060100 (L)	30.50 - 32.75	1.0000	1.0000
L50	2	Safety Line 3/8	18.00 - 19.00	1.0000	1.0000
L50	3	Step Pegs	18.00 - 19.00	1.0000	1.0000
L50	8	HB158-21U6S24-xxM_TMO(1-5/8)	18.00 - 19.00	1.0000	1.0000
L50	19	CU12PSM6P4XXX(1-3/4)	18.00 - 19.00	1.0000	1.0000
L50	33	CCI-085125 (L)	18.00 - 19.00	1.0000	1.0000
L50	34	CCI-085125 (L)	18.00 - 19.00	1.0000	1.0000
L50	35	CCI-085125 (L)	18.00 - 19.00	1.0000	1.0000
L50	36	CCI-085125 (L)	18.00 - 19.00	1.0000	1.0000
L51	2	Safety Line 3/8	13.00 - 18.00	1.0000	1.0000
L51	3	Step Pegs	13.00 - 18.00	1.0000	1.0000
L51	8	HB158-21U6S24-xxM_TMO(1-5/8)	13.00 - 18.00	1.0000	1.0000
L51	19	CU12PSM6P4XXX(1-3/4)	13.00 - 18.00	1.0000	1.0000
L51	33	CCI-085125 (L)	13.00 - 18.00	1.0000	1.0000
L51	34	CCI-085125 (L)	13.00 - 18.00	1.0000	1.0000
L51	35	CCI-085125 (L)	13.00 - 18.00	1.0000	1.0000
L51	36	CCI-085125 (L)	13.00 - 18.00	1.0000	1.0000
L52	2	Safety Line 3/8	8.00 - 13.00	1.0000	1.0000
L52	3	Step Pegs	8.00 - 13.00	1.0000	1.0000
L52	8	HB158-21U6S24-xxM_TMO(1-5/8)	8.00 - 13.00	1.0000	1.0000
L52	19	CU12PSM6P4XXX(1-3/4)	8.00 - 13.00	1.0000	1.0000
L52	33	CCI-085125 (L)	8.00 - 13.00	1.0000	1.0000
L52	34	CCI-085125 (L)	8.00 - 13.00	1.0000	1.0000
L52	35	CCI-085125 (L)	8.00 - 13.00	1.0000	1.0000
L52	36	CCI-085125 (L)	8.00 - 13.00	1.0000	1.0000
L53	2	Safety Line 3/8	6.42 - 8.00	1.0000	1.0000
L53	3	Step Pegs	6.42 - 8.00	1.0000	1.0000
L53	8	HB158-21U6S24-xxM_TMO(1-5/8)	6.42 - 8.00	1.0000	1.0000
L53	19	CU12PSM6P4XXX(1-3/4)	6.42 - 8.00	1.0000	1.0000
L53	33	CCI-085125 (L)	6.42 - 8.00	1.0000	1.0000
L53	34	CCI-085125 (L)	6.42 - 8.00	1.0000	1.0000
L53	35	CCI-085125 (L)	6.42 - 8.00	1.0000	1.0000
L53	36	CCI-085125 (L)	6.42 - 8.00	1.0000	1.0000
L54	2	Safety Line 3/8	6.17 - 6.42	1.0000	1.0000
L54	3	Step Pegs	6.17 - 6.42	1.0000	1.0000
L54	8	HB158-21U6S24-xxM_TMO(1-5/8)	6.17 - 6.42	1.0000	1.0000
L54	19	CU12PSM6P4XXX(1-3/4)	6.17 - 6.42	1.0000	1.0000
L54	33	CCI-085125 (L)	6.17 - 6.42	1.0000	1.0000
L54	34	CCI-085125 (L)	6.17 - 6.42	1.0000	1.0000
L54	35	CCI-085125 (L)	6.17 - 6.42	1.0000	1.0000
L54	36	CCI-085125 (L)	6.17 - 6.42	1.0000	1.0000
L55	2	Safety Line 3/8	1.17 - 6.17	1.0000	1.0000
L55	3	Step Pegs	1.17 - 6.17	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L55	8	HB158-21U6S24-xxM_TMO(1-5/8)	1.17 - 6.17	1.0000	1.0000
L55	19	CU12PSM6P4XXX(1-3/4)	1.17 - 6.17	1.0000	1.0000
L55	33	CCI-085125 (L)	1.17 - 6.17	1.0000	1.0000
L55	34	CCI-085125 (L)	1.17 - 6.17	1.0000	1.0000
L55	35	CCI-085125 (L)	1.17 - 6.17	1.0000	1.0000
L55	36	CCI-085125 (L)	1.17 - 6.17	1.0000	1.0000
L56	2	Safety Line 3/8	0.00 - 1.17	1.0000	1.0000
L56	3	Step Pegs	0.00 - 1.17	1.0000	1.0000
L56	8	HB158-21U6S24-xxM_TMO(1-5/8)	0.00 - 1.17	1.0000	1.0000
L56	19	CU12PSM6P4XXX(1-3/4)	0.00 - 1.17	1.0000	1.0000
L56	33	CCI-085125 (L)	0.00 - 1.17	1.0000	1.0000
L56	34	CCI-085125 (L)	0.00 - 1.17	1.0000	1.0000
L56	35	CCI-085125 (L)	0.00 - 1.17	1.0000	1.0000
L56	36	CCI-085125 (L)	0.00 - 1.17	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
L6	46	CCI-040075 (W)	155.00 - 155.25	Auto	0.0000
L6	47	CCI-040075 (W)	155.00 - 155.25	Auto	0.0000
L6	48	CCI-040075 (W)	155.00 - 155.25	Auto	0.0000
L7	29	CCI-045100 (L)	154.00 - 154.50	Auto	0.0000
L7	30	CCI-045100 (L)	154.00 - 154.50	Auto	0.0000
L7	31	CCI-045100 (L)	154.00 - 154.50	Auto	0.0000
L7	46	CCI-040075 (W)	154.00 - 155.00	Auto	0.0000
L7	47	CCI-040075 (W)	154.00 - 155.00	Auto	0.0000
L7	48	CCI-040075 (W)	154.00 - 155.00	Auto	0.0000
L8	29	CCI-045100 (L)	153.75 - 154.00	Auto	0.0000
L8	30	CCI-045100 (L)	153.75 - 154.00	Auto	0.0000
L8	31	CCI-045100 (L)	153.75 - 154.00	Auto	0.0000
L8	46	CCI-040075 (W)	153.75 - 154.00	Auto	0.0000
L8	47	CCI-040075 (W)	153.75 - 154.00	Auto	0.0000
L8	48	CCI-040075 (W)	153.75 - 154.00	Auto	0.0000
L9	29	CCI-045100 (L)	152.50 - 153.75	Auto	0.0000
L9	30	CCI-045100 (L)	152.50 - 153.75	Auto	0.0000
L9	31	CCI-045100 (L)	152.50 - 153.75	Auto	0.0000
L9	46	CCI-040075 (W)	152.50 - 153.75	Auto	0.0000
L9	47	CCI-040075 (W)	152.50 - 153.75	Auto	0.0000
L9	48	CCI-040075 (W)	152.50 - 153.75	Auto	0.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L10	29	CCI-045100 (L)	152.25 - 152.50	Auto	0.0000
L10	30	CCI-045100 (L)	152.25 - 152.50	Auto	0.0000
L10	31	CCI-045100 (L)	152.25 - 152.50	Auto	0.0000
L10	46	CCI-040075 (W)	152.25 - 152.50	Auto	0.0000
L10	47	CCI-040075 (W)	152.25 - 152.50	Auto	0.0000
L10	48	CCI-040075 (W)	152.25 - 152.50	Auto	0.0000
L11	29	CCI-045100 (L)	151.50 - 152.25	Auto	0.0000
L11	30	CCI-045100 (L)	151.50 - 152.25	Auto	0.0000
L11	31	CCI-045100 (L)	151.50 - 152.25	Auto	0.0000
L11	46	CCI-040075 (W)	151.50 - 152.25	Auto	0.0000
L11	47	CCI-040075 (W)	151.50 - 152.25	Auto	0.0000
L11	48	CCI-040075 (W)	151.50 - 152.25	Auto	0.0000
L12	29	CCI-045100 (L)	151.25 - 151.50	Auto	0.0000
L12	30	CCI-045100 (L)	151.25 - 151.50	Auto	0.0000
L12	31	CCI-045100 (L)	151.25 - 151.50	Auto	0.0000
L12	46	CCI-040075 (W)	151.25 - 151.50	Auto	0.0000
L12	47	CCI-040075 (W)	151.25 - 151.50	Auto	0.0000
L12	48	CCI-040075 (W)	151.25 - 151.50	Auto	0.0000
L13	29	CCI-045100 (L)	146.25 - 151.25	Auto	0.0000
L13	30	CCI-045100 (L)	146.25 - 151.25	Auto	0.0000
L13	31	CCI-045100 (L)	146.25 - 151.25	Auto	0.0000
L13	46	CCI-040075 (W)	150.25 - 151.25	Auto	0.0000
L13	47	CCI-040075 (W)	150.25 - 151.25	Auto	0.0000
L13	48	CCI-040075 (W)	150.25 - 151.25	Auto	0.0000
L14	29	CCI-045100 (L)	141.25 - 146.25	Auto	0.0000
L14	30	CCI-045100 (L)	141.25 - 146.25	Auto	0.0000
L14	31	CCI-045100 (L)	141.25 - 146.25	Auto	0.0000
L15	29	CCI-045100 (L)	136.25 - 141.25	Auto	0.0000
L15	30	CCI-045100 (L)	136.25 - 141.25	Auto	0.0000
L15	31	CCI-045100 (L)	136.25 - 141.25	Auto	0.0000
L16	29	CCI-045100 (L)	130.00 - 136.25	Auto	0.0000
L16	30	CCI-045100 (L)	130.00 - 136.25	Auto	0.0000
L16	31	CCI-045100 (L)	130.00 - 136.25	Auto	0.0000
L16	43	CCI-040075 (W)	130.00 - 132.50	Auto	0.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L16	44	CCI-040075 (W)	130.00 - 132.50	Auto	0.0000
L16	45	CCI-040075 (W)	130.00 - 132.50	Auto	0.0000
L17	29	CCI-045100 (L)	129.00 - 130.00	Auto	0.0000
L17	30	CCI-045100 (L)	129.00 - 130.00	Auto	0.0000
L17	31	CCI-045100 (L)	129.00 - 130.00	Auto	0.0000
L17	43	CCI-040075 (W)	129.00 - 130.00	Auto	0.0000
L17	44	CCI-040075 (W)	129.00 - 130.00	Auto	0.0000
L17	45	CCI-040075 (W)	129.00 - 130.00	Auto	0.0000
L18	29	CCI-045100 (L)	124.00 - 129.00	Auto	0.0000
L18	30	CCI-045100 (L)	124.00 - 129.00	Auto	0.0000
L18	31	CCI-045100 (L)	124.00 - 129.00	Auto	0.0000
L18	43	CCI-040075 (W)	124.00 - 129.00	Auto	0.0000
L18	44	CCI-040075 (W)	124.00 - 129.00	Auto	0.0000
L18	45	CCI-040075 (W)	124.00 - 129.00	Auto	0.0000
L19	26	CCI-060100 (L)	121.42 - 123.92	Auto	0.0000
L19	27	CCI-060100 (L)	121.42 - 123.92	Auto	0.0000
L19	28	CCI-060100 (L)	121.42 - 123.92	Auto	0.0000
L19	29	CCI-045100 (L)	121.42 - 124.00	Auto	0.0000
L19	30	CCI-045100 (L)	121.42 - 124.00	Auto	0.0000
L19	31	CCI-045100 (L)	121.42 - 124.00	Auto	0.0000
L19	43	CCI-040075 (W)	121.42 - 124.00	Auto	0.0000
L19	44	CCI-040075 (W)	121.42 - 124.00	Auto	0.0000
L19	45	CCI-040075 (W)	121.42 - 124.00	Auto	0.0000
L20	26	CCI-060100 (L)	121.17 - 121.42	Auto	0.0000
L20	27	CCI-060100 (L)	121.17 - 121.42	Auto	0.0000
L20	28	CCI-060100 (L)	121.17 - 121.42	Auto	0.0000
L20	29	CCI-045100 (L)	121.17 - 121.42	Auto	0.0000
L20	30	CCI-045100 (L)	121.17 - 121.42	Auto	0.0000
L20	31	CCI-045100 (L)	121.17 - 121.42	Auto	0.0000
L20	43	CCI-040075 (W)	121.17 - 121.42	Auto	0.0000
L20	44	CCI-040075 (W)	121.17 - 121.42	Auto	0.0000
L20	45	CCI-040075 (W)	121.17 - 121.42	Auto	0.0000
L21	26	CCI-060100 (L)	116.17 - 121.17	Auto	0.0000
L21	27	CCI-060100 (L)	116.17 - 121.17	Auto	0.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L21	28	CCI-060100 (L)	116.17 - 121.17	Auto	0.0000
L21	29	CCI-045100 (L)	119.50 - 121.17	Auto	0.0000
L21	30	CCI-045100 (L)	119.50 - 121.17	Auto	0.0000
L21	31	CCI-045100 (L)	119.50 - 121.17	Auto	0.0000
L21	43	CCI-040075 (W)	116.17 - 121.17	Auto	0.0000
L21	44	CCI-040075 (W)	116.17 - 121.17	Auto	0.0000
L21	45	CCI-040075 (W)	116.17 - 121.17	Auto	0.0000
L22	26	CCI-060100 (L)	115.00 - 116.17	Auto	0.0000
L22	27	CCI-060100 (L)	115.00 - 116.17	Auto	0.0000
L22	28	CCI-060100 (L)	115.00 - 116.17	Auto	0.0000
L22	43	CCI-040075 (W)	115.00 - 116.17	Auto	0.0000
L22	44	CCI-040075 (W)	115.00 - 116.17	Auto	0.0000
L22	45	CCI-040075 (W)	115.00 - 116.17	Auto	0.0000
L23	26	CCI-060100 (L)	113.75 - 115.00	Auto	0.0000
L23	27	CCI-060100 (L)	113.75 - 115.00	Auto	0.0000
L23	28	CCI-060100 (L)	113.75 - 115.00	Auto	0.0000
L23	43	CCI-040075 (W)	113.75 - 115.00	Auto	0.0000
L23	44	CCI-040075 (W)	113.75 - 115.00	Auto	0.0000
L23	45	CCI-040075 (W)	113.75 - 115.00	Auto	0.0000
L24	26	CCI-060100 (L)	113.50 - 113.75	Auto	0.0000
L24	27	CCI-060100 (L)	113.50 - 113.75	Auto	0.0000
L24	28	CCI-060100 (L)	113.50 - 113.75	Auto	0.0000
L24	43	CCI-040075 (W)	113.50 - 113.75	Auto	0.0000
L24	44	CCI-040075 (W)	113.50 - 113.75	Auto	0.0000
L24	45	CCI-040075 (W)	113.50 - 113.75	Auto	0.0000
L25	26	CCI-060100 (L)	108.50 - 113.50	Auto	0.0000
L25	27	CCI-060100 (L)	108.50 - 113.50	Auto	0.0000
L25	28	CCI-060100 (L)	108.50 - 113.50	Auto	0.0000
L25	43	CCI-040075 (W)	112.50 - 113.50	Auto	0.0000
L25	44	CCI-040075 (W)	112.50 - 113.50	Auto	0.0000
L25	45	CCI-040075 (W)	112.50 - 113.50	Auto	0.0000
L26	26	CCI-060100 (L)	103.50 - 108.50	Auto	0.0000
L26	27	CCI-060100 (L)	103.50 - 108.50	Auto	0.0000
L26	28	CCI-060100 (L)	103.50 - 108.50	Auto	0.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L27	26	CCI-060100 (L)	95.00 - 103.50	Auto	0.0000
L27	27	CCI-060100 (L)	95.00 - 103.50	Auto	0.0000
L27	28	CCI-060100 (L)	95.00 - 103.50	Auto	0.0000
L27	40	CCI-060100 (L)	95.00 - 101.67	Auto	0.0000
L27	41	CCI-060100 (L)	95.00 - 101.67	Auto	0.0000
L27	42	CCI-060100 (L)	95.00 - 101.67	Auto	0.0000
L28	26	CCI-060100 (L)	94.00 - 95.00	Auto	0.0000
L28	27	CCI-060100 (L)	94.00 - 95.00	Auto	0.0000
L28	28	CCI-060100 (L)	94.00 - 95.00	Auto	0.0000
L28	40	CCI-060100 (L)	94.00 - 95.00	Auto	0.0000
L28	41	CCI-060100 (L)	94.00 - 95.00	Auto	0.0000
L28	42	CCI-060100 (L)	94.00 - 95.00	Auto	0.0000
L29	26	CCI-060100 (L)	91.40 - 94.00	Auto	0.0000
L29	27	CCI-060100 (L)	91.40 - 94.00	Auto	0.0000
L29	28	CCI-060100 (L)	91.40 - 94.00	Auto	0.0000
L29	40	CCI-060100 (L)	91.40 - 94.00	Auto	0.0000
L29	41	CCI-060100 (L)	91.40 - 94.00	Auto	0.0000
L29	42	CCI-060100 (L)	91.40 - 94.00	Auto	0.0000
L30	26	CCI-060100 (L)	91.15 - 91.40	Auto	0.0000
L30	27	CCI-060100 (L)	91.15 - 91.40	Auto	0.0000
L30	28	CCI-060100 (L)	91.15 - 91.40	Auto	0.0000
L30	40	CCI-060100 (L)	91.15 - 91.40	Auto	0.0000
L30	41	CCI-060100 (L)	91.15 - 91.40	Auto	0.0000
L30	42	CCI-060100 (L)	91.15 - 91.40	Auto	0.0000
L31	26	CCI-060100 (L)	91.00 - 91.15	Auto	0.0000
L31	27	CCI-060100 (L)	91.00 - 91.15	Auto	0.0000
L31	28	CCI-060100 (L)	91.00 - 91.15	Auto	0.0000
L31	40	CCI-060100 (L)	91.00 - 91.15	Auto	0.0000
L31	41	CCI-060100 (L)	91.00 - 91.15	Auto	0.0000
L31	42	CCI-060100 (L)	91.00 - 91.15	Auto	0.0000
L32	26	CCI-060100 (L)	88.89 - 91.00	Auto	0.0000
L32	27	CCI-060100 (L)	88.89 - 91.00	Auto	0.0000
L32	28	CCI-060100 (L)	88.89 - 91.00	Auto	0.0000
L32	40	CCI-060100 (L)	86.00 - 91.00	Auto	0.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L32	41	CCI-060100 (L)	86.00 - 91.00	Auto	0.0000
L32	42	CCI-060100 (L)	86.00 - 91.00	Auto	0.0000
L33	40	CCI-060100 (L)	81.00 - 86.00	Auto	0.0000
L33	41	CCI-060100 (L)	81.00 - 86.00	Auto	0.0000
L33	42	CCI-060100 (L)	81.00 - 86.00	Auto	0.0000
L34	40	CCI-060100 (L)	76.00 - 81.00	Auto	0.0000
L34	41	CCI-060100 (L)	76.00 - 81.00	Auto	0.0000
L34	42	CCI-060100 (L)	76.00 - 81.00	Auto	0.0000
L35	40	CCI-060100 (L)	71.00 - 76.00	Auto	0.0000
L35	41	CCI-060100 (L)	71.00 - 76.00	Auto	0.0000
L35	42	CCI-060100 (L)	71.00 - 76.00	Auto	0.0000
L36	40	CCI-060100 (L)	66.00 - 71.00	Auto	0.0000
L36	41	CCI-060100 (L)	66.00 - 71.00	Auto	0.0000
L36	42	CCI-060100 (L)	66.00 - 71.00	Auto	0.0000
L37	37	CCI-060100 (L)	63.75 - 65.50	Auto	0.0000
L37	38	CCI-060100 (L)	63.75 - 65.50	Auto	0.0000
L37	39	CCI-060100 (L)	63.75 - 65.50	Auto	0.0000
L37	40	CCI-060100 (L)	63.75 - 66.00	Auto	0.0000
L37	41	CCI-060100 (L)	63.75 - 66.00	Auto	0.0000
L37	42	CCI-060100 (L)	63.75 - 66.00	Auto	0.0000
L38	37	CCI-060100 (L)	63.50 - 63.75	Auto	0.0000
L38	38	CCI-060100 (L)	63.50 - 63.75	Auto	0.0000
L38	39	CCI-060100 (L)	63.50 - 63.75	Auto	0.0000
L38	40	CCI-060100 (L)	63.50 - 63.75	Auto	0.0000
L38	41	CCI-060100 (L)	63.50 - 63.75	Auto	0.0000
L38	42	CCI-060100 (L)	63.50 - 63.75	Auto	0.0000
L39	37	CCI-060100 (L)	58.50 - 63.50	Auto	0.0000
L39	38	CCI-060100 (L)	58.50 - 63.50	Auto	0.0000
L39	39	CCI-060100 (L)	58.50 - 63.50	Auto	0.0000
L39	40	CCI-060100 (L)	61.67 - 63.50	Auto	0.0000
L39	41	CCI-060100 (L)	61.67 - 63.50	Auto	0.0000
L39	42	CCI-060100 (L)	61.67 - 63.50	Auto	0.0000
L40	23	CCI-045100 (L)	51.00 - 53.92	Auto	0.0000
L40	24	CCI-045100 (L)	51.00 - 53.92	Auto	0.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L40	25	CCI-045100 (L)	51.00 - 53.92	Auto	0.0000
L40	37	CCI-060100 (L)	51.00 - 58.50	Auto	0.0000
L40	38	CCI-060100 (L)	51.00 - 58.50	Auto	0.0000
L40	39	CCI-060100 (L)	51.00 - 58.50	Auto	0.0000
L41	23	CCI-045100 (L)	50.00 - 51.00	Auto	0.0000
L41	24	CCI-045100 (L)	50.00 - 51.00	Auto	0.0000
L41	25	CCI-045100 (L)	50.00 - 51.00	Auto	0.0000
L41	37	CCI-060100 (L)	50.00 - 51.00	Auto	0.0000
L41	38	CCI-060100 (L)	50.00 - 51.00	Auto	0.0000
L41	39	CCI-060100 (L)	50.00 - 51.00	Auto	0.0000
L42	23	CCI-045100 (L)	45.00 - 50.00	Auto	0.0000
L42	24	CCI-045100 (L)	45.00 - 50.00	Auto	0.0000
L42	25	CCI-045100 (L)	45.00 - 50.00	Auto	0.0000
L42	37	CCI-060100 (L)	45.00 - 50.00	Auto	0.0000
L42	38	CCI-060100 (L)	45.00 - 50.00	Auto	0.0000
L42	39	CCI-060100 (L)	45.00 - 50.00	Auto	0.0000
L43	23	CCI-045100 (L)	40.42 - 45.00	Auto	0.0000
L43	24	CCI-045100 (L)	40.42 - 45.00	Auto	0.0000
L43	25	CCI-045100 (L)	40.42 - 45.00	Auto	0.0000
L43	37	CCI-060100 (L)	40.42 - 45.00	Auto	0.0000
L43	38	CCI-060100 (L)	40.42 - 45.00	Auto	0.0000
L43	39	CCI-060100 (L)	40.42 - 45.00	Auto	0.0000
L44	23	CCI-045100 (L)	40.17 - 40.42	Auto	0.0000
L44	24	CCI-045100 (L)	40.17 - 40.42	Auto	0.0000
L44	25	CCI-045100 (L)	40.17 - 40.42	Auto	0.0000
L44	37	CCI-060100 (L)	40.17 - 40.42	Auto	0.0000
L44	38	CCI-060100 (L)	40.17 - 40.42	Auto	0.0000
L44	39	CCI-060100 (L)	40.17 - 40.42	Auto	0.0000
L45	23	CCI-045100 (L)	40.00 - 40.17	Auto	0.0000
L45	24	CCI-045100 (L)	40.00 - 40.17	Auto	0.0000
L45	25	CCI-045100 (L)	40.00 - 40.17	Auto	0.0000
L45	37	CCI-060100 (L)	40.00 - 40.17	Auto	0.0000
L45	38	CCI-060100 (L)	40.00 - 40.17	Auto	0.0000
L45	39	CCI-060100 (L)	40.00 - 40.17	Auto	0.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L46	23	CCI-045100 (L)	38.92 - 40.00	Auto	0.0000
L46	24	CCI-045100 (L)	38.92 - 40.00	Auto	0.0000
L46	25	CCI-045100 (L)	38.92 - 40.00	Auto	0.0000
L46	33	CCI-085125 (L)	35.00 - 37.42	Auto	0.0000
L46	34	CCI-085125 (L)	35.00 - 37.42	Auto	0.0000
L46	35	CCI-085125 (L)	35.00 - 37.42	Auto	0.0000
L46	36	CCI-085125 (L)	35.00 - 37.42	Auto	0.0000
L46	37	CCI-060100 (L)	35.00 - 40.00	Auto	0.0000
L46	38	CCI-060100 (L)	35.00 - 40.00	Auto	0.0000
L46	39	CCI-060100 (L)	35.00 - 40.00	Auto	0.0000
L47	33	CCI-085125 (L)	33.00 - 35.00	Auto	0.0000
L47	34	CCI-085125 (L)	33.00 - 35.00	Auto	0.0000
L47	35	CCI-085125 (L)	33.00 - 35.00	Auto	0.0000
L47	36	CCI-085125 (L)	33.00 - 35.00	Auto	0.0000
L47	37	CCI-060100 (L)	33.00 - 35.00	Auto	0.0000
L47	38	CCI-060100 (L)	33.00 - 35.00	Auto	0.0000
L47	39	CCI-060100 (L)	33.00 - 35.00	Auto	0.0000
L48	33	CCI-085125 (L)	32.75 - 33.00	Auto	0.0000
L48	34	CCI-085125 (L)	32.75 - 33.00	Auto	0.0000
L48	35	CCI-085125 (L)	32.75 - 33.00	Auto	0.0000
L48	36	CCI-085125 (L)	32.75 - 33.00	Auto	0.0000
L48	37	CCI-060100 (L)	32.75 - 33.00	Auto	0.0000
L48	38	CCI-060100 (L)	32.75 - 33.00	Auto	0.0000
L48	39	CCI-060100 (L)	32.75 - 33.00	Auto	0.0000
L49	33	CCI-085125 (L)	19.00 - 32.75	Auto	0.0000
L49	34	CCI-085125 (L)	19.00 - 32.75	Auto	0.0000
L49	35	CCI-085125 (L)	19.00 - 32.75	Auto	0.0000
L49	36	CCI-085125 (L)	19.00 - 32.75	Auto	0.0000
L49	37	CCI-060100 (L)	30.50 - 32.75	Auto	0.0000
L49	38	CCI-060100 (L)	30.50 - 32.75	Auto	0.0000
L49	39	CCI-060100 (L)	30.50 - 32.75	Auto	0.0000
L50	33	CCI-085125 (L)	18.00 - 19.00	Auto	0.0000
L50	34	CCI-085125 (L)	18.00 - 19.00	Auto	0.0000
L50	35	CCI-085125 (L)	18.00 - 19.00	Auto	0.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L50	36	CCI-085125 (L)	18.00 - 19.00	Auto	0.0000
L51	33	CCI-085125 (L)	13.00 - 18.00	Auto	0.0000
L51	34	CCI-085125 (L)	13.00 - 18.00	Auto	0.0000
L51	35	CCI-085125 (L)	13.00 - 18.00	Auto	0.0000
L51	36	CCI-085125 (L)	13.00 - 18.00	Auto	0.0000
L52	33	CCI-085125 (L)	8.00 - 13.00	Auto	0.0000
L52	34	CCI-085125 (L)	8.00 - 13.00	Auto	0.0000
L52	35	CCI-085125 (L)	8.00 - 13.00	Auto	0.0000
L52	36	CCI-085125 (L)	8.00 - 13.00	Auto	0.0000
L53	33	CCI-085125 (L)	6.42 - 8.00	Auto	0.0000
L53	34	CCI-085125 (L)	6.42 - 8.00	Auto	0.0000
L53	35	CCI-085125 (L)	6.42 - 8.00	Auto	0.0000
L53	36	CCI-085125 (L)	6.42 - 8.00	Auto	0.0000
L54	33	CCI-085125 (L)	6.17 - 6.42	Auto	0.0000
L54	34	CCI-085125 (L)	6.17 - 6.42	Auto	0.0000
L54	35	CCI-085125 (L)	6.17 - 6.42	Auto	0.0000
L54	36	CCI-085125 (L)	6.17 - 6.42	Auto	0.0000
L55	33	CCI-085125 (L)	1.17 - 6.17	Auto	0.0000
L55	34	CCI-085125 (L)	1.17 - 6.17	Auto	0.0000
L55	35	CCI-085125 (L)	1.17 - 6.17	Auto	0.0000
L55	36	CCI-085125 (L)	1.17 - 6.17	Auto	0.0000
L56	33	CCI-085125 (L)	0.00 - 1.17	Auto	0.0000
L56	34	CCI-085125 (L)	0.00 - 1.17	Auto	0.0000
L56	35	CCI-085125 (L)	0.00 - 1.17	Auto	0.0000
L56	36	CCI-085125 (L)	0.00 - 1.17	Auto	0.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
***									
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	183.00	No Ice 1/2" Ice 1" Ice	14.69 15.46 16.23	6.87 7.55 8.25	0.19 0.31 0.46
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	183.00	No Ice 1/2" Ice 1" Ice	14.69 15.46 16.23	6.87 7.55 8.25	0.19 0.31 0.46
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	183.00	No Ice 1/2" Ice 1" Ice	14.69 15.46 16.23	6.87 7.55 8.25	0.19 0.31 0.46
RADIO 4449 B12/B71	A	From Leg	4.00 0.00 0.00	0.0000	183.00	No Ice 1/2" Ice 1" Ice	1.65 1.81 1.98	1.16 1.30 1.45	0.07 0.09 0.11
RADIO 4449 B12/B71	B	From Leg	4.00 0.00 0.00	0.0000	183.00	No Ice 1/2" Ice 1" Ice	1.65 1.81 1.98	1.16 1.30 1.45	0.07 0.09 0.11
RADIO 4449 B12/B71	C	From Leg	4.00 0.00 0.00	0.0000	183.00	No Ice 1/2" Ice 1" Ice	1.65 1.81 1.98	1.16 1.30 1.45	0.07 0.09 0.11

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
8' x 2" Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	183.00	No Ice 1/2" Ice 1" Ice	1.90 2.73 3.40	1.90 2.73 3.40	0.03 0.04 0.06
8' x 2" Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	183.00	No Ice 1/2" Ice 1" Ice	1.90 2.73 3.40	1.90 2.73 3.40	0.03 0.04 0.06
8' x 2" Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	183.00	No Ice 1/2" Ice 1" Ice	1.90 2.73 3.40	1.90 2.73 3.40	0.03 0.04 0.06
12.5' Platform Mount [#RMQP-496-HK]	A	None		0.0000	183.00	No Ice 1/2" Ice 1" Ice	23.14 28.17 33.20	23.14 28.17 33.20	1.95 2.34 2.73
*									
AIR6449 B41_T-MOBILE w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	183.00	No Ice 1/2" Ice 1" Ice	5.19 5.59 6.02	2.71 3.04 3.38	0.13 0.17 0.23
AIR6449 B41_T-MOBILE w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	183.00	No Ice 1/2" Ice 1" Ice	5.19 5.59 6.02	2.71 3.04 3.38	0.13 0.17 0.23
AIR6449 B41_T-MOBILE w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	183.00	No Ice 1/2" Ice 1" Ice	5.19 5.59 6.02	2.71 3.04 3.38	0.13 0.17 0.23
RADIO 4460 B2/B25 B66_TMO	A	From Leg	4.00 0.00 0.00	0.0000	183.00	No Ice 1/2" Ice 1" Ice	2.14 2.32 2.51	1.69 1.85 2.02	0.11 0.13 0.16
RADIO 4460 B2/B25 B66_TMO	B	From Leg	4.00 0.00 0.00	0.0000	183.00	No Ice 1/2" Ice 1" Ice	2.14 2.32 2.51	1.69 1.85 2.02	0.11 0.13 0.16
RADIO 4460 B2/B25 B66_TMO	C	From Leg	4.00 0.00 0.00	0.0000	183.00	No Ice 1/2" Ice 1" Ice	2.14 2.32 2.51	1.69 1.85 2.02	0.11 0.13 0.16
***									
DMP65R-BU6D w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	174.00	No Ice 1/2" Ice 1" Ice	11.96 12.70 13.46	5.97 6.63 7.30	0.11 0.20 0.30
DMP65R-BU6D w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	174.00	No Ice 1/2" Ice 1" Ice	11.96 12.70 13.46	5.97 6.63 7.30	0.11 0.20 0.30
DMP65R-BU6D w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	174.00	No Ice 1/2" Ice 1" Ice	11.96 12.70 13.46	5.97 6.63 7.30	0.11 0.20 0.30
OPA65R-BU6D w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	174.00	No Ice 1/2" Ice 1" Ice	12.25 13.00 13.76	6.05 6.71 7.39	0.09 0.18 0.27
OPA65R-BU6D w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	174.00	No Ice 1/2" Ice 1" Ice	12.25 13.00 13.76	6.05 6.71 7.39	0.09 0.18 0.27
OPA65R-BU6D w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	174.00	No Ice 1/2" Ice	12.25 13.00 13.76	6.05 6.71 7.39	0.09 0.18 0.27

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
7770.00 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	174.00	1" Ice No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
7770.00 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	174.00	1" Ice No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
7770.00 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	174.00	1" Ice No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
QS66512-2 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	174.00	1" Ice No Ice 1/2" Ice 1" Ice	4.04 4.42 4.82	4.18 4.57 4.97	0.14 0.21 0.29
QS66512-2 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	174.00	1" Ice No Ice 1/2" Ice 1" Ice	4.04 4.42 4.82	4.18 4.57 4.97	0.14 0.21 0.29
QS66512-2 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	174.00	1" Ice No Ice 1/2" Ice 1" Ice	4.04 4.42 4.82	4.18 4.57 4.97	0.14 0.21 0.29
RRUS-32 B30	A	From Leg	4.00 0.00 0.00	0.0000	174.00	1" Ice No Ice 1/2" Ice 1" Ice	3.31 3.56 3.81	2.42 2.64 2.86	0.08 0.10 0.14
RRUS-32 B30	B	From Leg	4.00 0.00 0.00	0.0000	174.00	1" Ice No Ice 1/2" Ice 1" Ice	3.31 3.56 3.81	2.42 2.64 2.86	0.08 0.10 0.14
RRUS-32 B30	C	From Leg	4.00 0.00 0.00	0.0000	174.00	1" Ice No Ice 1/2" Ice 1" Ice	3.31 3.56 3.81	2.42 2.64 2.86	0.08 0.10 0.14
(2) RRUS 32 B2	A	From Leg	4.00 0.00 0.00	0.0000	174.00	1" Ice No Ice 1/2" Ice 1" Ice	2.73 2.95 3.18	1.67 1.86 2.05	0.05 0.07 0.10
(2) RRUS 32 B2	B	From Leg	4.00 0.00 0.00	0.0000	174.00	1" Ice No Ice 1/2" Ice 1" Ice	2.73 2.95 3.18	1.67 1.86 2.05	0.05 0.07 0.10
(2) RRUS 32 B2	C	From Leg	4.00 0.00 0.00	0.0000	174.00	1" Ice No Ice 1/2" Ice 1" Ice	2.73 2.95 3.18	1.67 1.86 2.05	0.05 0.07 0.10
RRUS 32 B2_CCIV2	A	From Leg	4.00 0.00 0.00	0.0000	174.00	1" Ice No Ice 1/2" Ice 1" Ice	2.86 3.09 3.32	1.78 1.97 2.17	0.06 0.08 0.10
RRUS 32 B2_CCIV2	B	From Leg	4.00 0.00 0.00	0.0000	174.00	1" Ice No Ice 1/2" Ice 1" Ice	2.86 3.09 3.32	1.78 1.97 2.17	0.06 0.08 0.10
RRUS 32 B2_CCIV2	C	From Leg	4.00 0.00 0.00	0.0000	174.00	1" Ice No Ice 1/2" Ice 1" Ice	2.86 3.09 3.32	1.78 1.97 2.17	0.06 0.08 0.10
RRUS 4449 B5/B12	A	From Leg	4.00 0.00 0.00	0.0000	174.00	1" Ice No Ice 1/2" Ice 1" Ice	1.97 2.14 2.33	1.41 1.56 1.73	0.07 0.09 0.11

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
RRUS 4449 B5/B12	B	From Leg	4.00 0.00 0.00	0.0000	174.00	No Ice 1/2" Ice 1" Ice	1.97 2.14 2.33	1.41 1.56 1.73	0.07 0.09 0.11
RRUS 4449 B5/B12	C	From Leg	4.00 0.00 0.00	0.0000	174.00	No Ice 1/2" Ice 1" Ice	1.97 2.14 2.33	1.41 1.56 1.73	0.07 0.09 0.11
RRUS 4478 B14_CCIV2	A	From Leg	4.00 0.00 0.00	0.0000	174.00	No Ice 1/2" Ice 1" Ice	2.02 2.20 2.39	1.25 1.40 1.55	0.06 0.08 0.10
RRUS 4478 B14_CCIV2	B	From Leg	4.00 0.00 0.00	0.0000	174.00	No Ice 1/2" Ice 1" Ice	2.02 2.20 2.39	1.25 1.40 1.55	0.06 0.08 0.10
RRUS 4478 B14_CCIV2	C	From Leg	4.00 0.00 0.00	0.0000	174.00	No Ice 1/2" Ice 1" Ice	2.02 2.20 2.39	1.25 1.40 1.55	0.06 0.08 0.10
(2) DBC0061F1V51-2	A	From Leg	4.00 0.00 0.00	0.0000	174.00	No Ice 1/2" Ice 1" Ice	0.43 0.51 0.61	0.41 0.50 0.59	0.03 0.03 0.04
(2) DBC0061F1V51-2	B	From Leg	4.00 0.00 0.00	0.0000	174.00	No Ice 1/2" Ice 1" Ice	0.43 0.51 0.61	0.41 0.50 0.59	0.03 0.03 0.04
(2) DBC0061F1V51-2	C	From Leg	4.00 0.00 0.00	0.0000	174.00	No Ice 1/2" Ice 1" Ice	0.43 0.51 0.61	0.41 0.50 0.59	0.03 0.03 0.04
782 10254	A	From Leg	4.00 0.00 0.00	0.0000	174.00	No Ice 1/2" Ice 1" Ice	0.14 0.19 0.25	0.08 0.12 0.17	0.00 0.00 0.01
782 10254	B	From Leg	4.00 0.00 0.00	0.0000	174.00	No Ice 1/2" Ice 1" Ice	0.14 0.19 0.25	0.08 0.12 0.17	0.00 0.00 0.01
782 10254	C	From Leg	4.00 0.00 0.00	0.0000	174.00	No Ice 1/2" Ice 1" Ice	0.14 0.19 0.25	0.08 0.12 0.17	0.00 0.00 0.01
(2) LGP21401	A	From Leg	4.00 0.00 0.00	0.0000	174.00	No Ice 1/2" Ice 1" Ice	1.10 1.24 1.38	0.21 0.27 0.35	0.01 0.02 0.03
(2) LGP21401	B	From Leg	4.00 0.00 0.00	0.0000	174.00	No Ice 1/2" Ice 1" Ice	1.10 1.24 1.38	0.21 0.27 0.35	0.01 0.02 0.03
(2) LGP21401	C	From Leg	4.00 0.00 0.00	0.0000	174.00	No Ice 1/2" Ice 1" Ice	1.10 1.24 1.38	0.21 0.27 0.35	0.01 0.02 0.03
DC6-48-60-18-8F	A	From Leg	1.00 0.00 0.00	0.0000	174.00	No Ice 1/2" Ice 1" Ice	0.92 1.46 1.64	0.92 1.46 1.64	0.02 0.04 0.06
DC6-48-60-18-8F	B	From Leg	1.00 0.00 0.00	0.0000	174.00	No Ice 1/2" Ice 1" Ice	0.92 1.46 1.64	0.92 1.46 1.64	0.02 0.04 0.06
DC9-48-60-24-8C-EV	C	From Leg	1.00	0.0000	174.00	No Ice	2.74	4.78	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00 0.00			1/2" Ice 1" Ice	2.96 3.20	5.06 5.35	0.06 0.10
12' EHD V-Boom Assembly [#C10857803]	A	None		0.0000	174.00	No Ice 1/2" Ice 1" Ice	22.50 30.38 38.26	22.50 30.38 38.26	2.21 2.98 3.76
***									
***									
MX08FRO665-20 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice	8.01 8.52 9.04	4.23 4.69 5.16	0.10 0.18 0.28
MX08FRO665-20 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice	8.01 8.52 9.04	4.23 4.69 5.16	0.10 0.18 0.28
MX08FRO665-20 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice	8.01 8.52 9.04	4.23 4.69 5.16	0.10 0.18 0.28
TA08025-B604	A	From Leg	4.00 0.00 0.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice	1.96 2.14 2.32	0.98 1.11 1.25	0.06 0.08 0.10
TA08025-B604	B	From Leg	4.00 0.00 0.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice	1.96 2.14 2.32	0.98 1.11 1.25	0.06 0.08 0.10
TA08025-B604	C	From Leg	4.00 0.00 0.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice	1.96 2.14 2.32	0.98 1.11 1.25	0.06 0.08 0.10
TA08025-B605	A	From Leg	4.00 0.00 0.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice	1.96 2.14 2.32	1.13 1.27 1.41	0.08 0.09 0.11
TA08025-B605	B	From Leg	4.00 0.00 0.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice	1.96 2.14 2.32	1.13 1.27 1.41	0.08 0.09 0.11
TA08025-B605	C	From Leg	4.00 0.00 0.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice	1.96 2.14 2.32	1.13 1.27 1.41	0.08 0.09 0.11
RDIDC-9181-PF-48	A	From Leg	4.00 0.00 0.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice	2.01 2.19 2.37	1.17 1.31 1.46	0.02 0.04 0.06
(2) 8' x 2" Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice	1.90 2.73 3.40	1.90 2.73 3.40	0.03 0.04 0.06
(2) 8' x 2" Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice	1.90 2.73 3.40	1.90 2.73 3.40	0.03 0.04 0.06
(2) 8' x 2" Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice	1.90 2.73 3.40	1.90 2.73 3.40	0.03 0.04 0.06
Commscope MC-PK8-DSH	A	None		0.0000	165.00	No Ice 1/2" Ice 1" Ice	34.24 62.95 91.66	34.24 62.95 91.66	1.75 2.10 2.45

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
***									
(3) SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	4.09 4.49 4.89	3.30 3.68 4.07	0.07 0.13 0.20
(3) SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	4.09 4.49 4.89	3.30 3.68 4.07	0.07 0.13 0.20
(3) SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	4.09 4.49 4.89	3.30 3.68 4.07	0.07 0.13 0.20
(2) DB-T1-6Z-8AB-0Z	C	From Leg	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	4.80 5.07 5.35	2.00 2.19 2.39	0.04 0.08 0.12
Platform Mount [LP 403-1]	A	None		0.0000	155.00	No Ice 1/2" Ice 1" Ice	18.94 23.31 27.74	18.94 23.31 27.74	1.50 1.90 2.37
***									
MT6407-77A w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	4.91 5.26 5.61	2.68 3.14 3.62	0.10 0.14 0.18
MT6407-77A w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	4.91 5.26 5.61	2.68 3.14 3.62	0.10 0.14 0.18
MT6407-77A w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	4.91 5.26 5.61	2.68 3.14 3.62	0.10 0.14 0.18
RFV01U-D1A	A	From Leg	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	1.88 2.05 2.22	1.25 1.39 1.54	0.08 0.10 0.12
RFV01U-D1A	B	From Leg	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	1.88 2.05 2.22	1.25 1.39 1.54	0.08 0.10 0.12
RFV01U-D1A	C	From Leg	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	1.88 2.05 2.22	1.25 1.39 1.54	0.08 0.10 0.12
RFV01U-D2A	A	From Leg	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	1.88 2.05 2.22	1.01 1.14 1.28	0.07 0.09 0.11
RFV01U-D2A	B	From Leg	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	1.88 2.05 2.22	1.01 1.14 1.28	0.07 0.09 0.11
RFV01U-D2A	C	From Leg	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	1.88 2.05 2.22	1.01 1.14 1.28	0.07 0.09 0.11
Tower Reinforcement Specifications	A	None		0.0000	155.00	No Ice 1/2" Ice 1" Ice	28.63 37.31 45.80	28.63 37.31 45.80	0.28 0.67 0.94
***									

Load Combinations

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	185 - 180	Pole	Max Tension	48	0.00	-0.00	0.00
			Max. Compression	26	-6.91	-0.01	-0.02
			Max. Mx	8	-4.14	-12.99	-0.01
			Max. My	14	-4.14	-0.00	-12.99

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	8	4.39	-12.99	-0.01
			Max. Vx	14	4.39	-0.00	-12.99
			Max. Torque	12			0.00
L2	180 - 175	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-7.44	-0.04	-0.03
			Max. Mx	8	-4.49	-36.00	-0.01
			Max. My	14	-4.49	-0.01	-35.99
			Max. Vy	8	4.81	-36.00	-0.01
			Max. Vx	14	4.81	-0.01	-35.99
			Max. Torque	12			0.00
L3	175 - 170	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-18.47	0.01	-0.08
			Max. Mx	8	-10.21	-89.34	-0.19
			Max. My	14	-10.20	-0.21	-89.57
			Max. Vy	8	12.30	-89.34	-0.19
			Max. Vx	14	12.36	-0.21	-89.57
			Max. Torque	24			0.36
L4	170 - 165	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-19.15	-0.02	-0.10
			Max. Mx	8	-10.71	-152.02	-0.42
			Max. My	14	-10.70	-0.44	-152.50
			Max. Vy	8	12.77	-152.02	-0.42
			Max. Vx	14	12.82	-0.44	-152.50
			Max. Torque	24			0.36
L5	165 - 160	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-24.81	-0.08	0.22
			Max. Mx	8	-14.20	-234.94	-0.54
			Max. My	2	-14.19	0.57	235.89
			Max. Vy	20	-16.82	234.83	0.71
			Max. Vx	14	16.91	-0.69	-235.70
			Max. Torque	24			0.36
L6	160 - 155	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-25.61	-0.14	0.23
			Max. Mx	8	-14.81	-320.29	-0.76
			Max. My	2	-14.80	0.76	321.65
			Max. Vy	20	-17.32	320.12	0.94
			Max. Vx	14	17.41	-0.93	-321.45
			Max. Torque	2			0.31
L7	155 - 154	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-33.03	0.97	-0.42
			Max. Mx	20	-18.45	342.99	0.67
			Max. My	14	-18.45	-0.51	-344.12
			Max. Vy	20	-22.50	342.99	0.67
			Max. Vx	14	22.48	-0.51	-344.12
			Max. Torque	24			1.08
L8	154 - 153.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-33.09	0.97	-0.42
			Max. Mx	20	-18.50	348.61	0.66
			Max. My	14	-18.50	-0.50	-349.74
			Max. Vy	20	-22.52	348.61	0.66
			Max. Vx	14	22.50	-0.50	-349.74
			Max. Torque	24			1.08
L9	153.75 - 152.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-33.38	0.95	-0.42
			Max. Mx	20	-18.70	376.84	0.59
			Max. My	14	-18.70	-0.44	-377.94
			Max. Vy	8	22.66	-376.19	-0.84
			Max. Vx	14	22.64	-0.44	-377.94
			Max. Torque	24			1.08
L10	152.5 - 152.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-33.46	0.94	-0.42
			Max. Mx	20	-18.76	382.51	0.58
			Max. My	14	-18.76	-0.43	-383.60
			Max. Vy	8	22.69	-381.86	-0.83
			Max. Vx	14	22.66	-0.43	-383.60
			Max. Torque	24			1.08
L11	152.25 -	Pole	Max Tension	1	0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
	151.5						
			Max. Compression	26	-33.68	0.93	-0.42
			Max. Mx	20	-18.92	399.55	0.54
			Max. My	14	-18.92	-0.39	-400.63
			Max. Vy	8	22.77	-398.91	-0.79
			Max. Vx	14	22.75	-0.39	-400.63
			Max. Torque	24			1.08
L12	151.5 - 151.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-33.74	0.93	-0.42
			Max. Mx	20	-18.97	405.24	0.53
			Max. My	14	-18.97	-0.38	-406.32
			Max. Vy	8	22.80	-404.61	-0.78
			Max. Vx	14	22.78	-0.38	-406.32
			Max. Torque	24			1.08
L13	151.25 - 146.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-34.98	0.86	-0.41
			Max. Mx	20	-19.90	520.60	0.27
			Max. My	14	-19.90	-0.15	-521.58
			Max. Vy	8	23.37	-520.04	-0.51
			Max. Vx	14	23.34	-0.15	-521.58
			Max. Torque	24			1.08
L14	146.25 - 141.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-36.24	0.78	-0.41
			Max. Mx	20	-20.87	638.82	0.01
			Max. My	14	-20.88	0.08	-639.71
			Max. Vy	8	23.95	-638.33	-0.25
			Max. Vx	14	23.93	0.08	-639.71
			Max. Torque	24			1.08
L15	141.25 - 136.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-37.53	0.71	-0.40
			Max. Mx	20	-21.88	760.00	-0.25
			Max. My	14	-21.88	0.31	-760.80
			Max. Vy	8	24.55	-759.59	0.02
			Max. Vx	14	24.53	0.31	-760.80
			Max. Torque	24			1.08
L16	136.25 - 130	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-37.87	0.68	-0.40
			Max. Mx	20	-22.14	790.77	-0.32
			Max. My	14	-22.14	0.37	-791.54
			Max. Vy	8	24.71	-790.38	0.09
			Max. Vx	14	24.68	0.37	-791.54
			Max. Torque	24			1.08
L17	130 - 129	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-40.77	0.58	-0.40
			Max. Mx	20	-24.38	941.53	-0.63
			Max. My	14	-24.38	0.64	-942.19
			Max. Vy	8	25.56	-941.23	0.41
			Max. Vx	14	25.54	0.64	-942.19
			Max. Torque	24			1.08
L18	129 - 124	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-42.39	0.50	-0.39
			Max. Mx	20	-25.62	1070.91	-0.89
			Max. My	14	-25.62	0.87	-1071.48
			Max. Vy	8	26.23	-1070.70	0.68
			Max. Vx	14	26.20	0.87	-1071.48
			Max. Torque	24			1.08
L19	124 - 121.42	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43.30	0.45	-0.39
			Max. Mx	20	-26.27	1138.97	-1.02
			Max. My	14	-26.27	0.98	-1139.50
			Max. Vy	8	26.58	-1138.81	0.82
			Max. Vx	14	26.55	0.98	-1139.50
			Max. Torque	24			1.08
L20	121.42 - 121.17	Pole	Max Tension	1	0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	26	-43.39	0.45	-0.39
			Max. Mx	20	-26.35	1145.62	-1.04
			Max. My	14	-26.35	0.99	-1146.14
			Max. Vy	8	26.60	-1145.46	0.83
			Max. Vx	14	26.58	0.99	-1146.14
			Max. Torque	12			-1.08
L21	121.17 - 116.17	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-45.20	0.36	-0.38
			Max. Mx	20	-27.72	1280.32	-1.30
			Max. My	14	-27.72	1.22	-1280.75
			Max. Vy	8	27.31	-1280.24	1.10
			Max. Vx	14	27.28	1.22	-1280.75
			Max. Torque	12			-1.08
L22	116.17 - 115	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-45.63	0.33	-0.38
			Max. Mx	20	-28.04	1312.35	-1.36
			Max. My	14	-28.05	1.27	-1312.76
			Max. Vy	8	27.48	-1312.30	1.17
			Max. Vx	14	27.45	1.27	-1312.76
			Max. Torque	12			-1.08
L23	115 - 113.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-46.12	0.31	-0.38
			Max. Mx	20	-28.43	1346.78	-1.42
			Max. My	14	-28.43	1.32	-1347.17
			Max. Vy	8	27.66	-1346.76	1.23
			Max. Vx	14	27.64	1.32	-1347.17
			Max. Torque	12			-1.08
L24	113.75 - 113.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-46.21	0.31	-0.38
			Max. Mx	20	-28.51	1353.70	-1.44
			Max. My	14	-28.51	1.33	-1354.08
			Max. Vy	8	27.69	-1353.68	1.25
			Max. Vx	14	27.67	1.33	-1354.08
			Max. Torque	12			-1.08
L25	113.5 - 108.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-47.98	0.21	-0.37
			Max. Mx	8	-29.91	-1493.97	1.52
			Max. My	14	-29.91	1.55	-1494.19
			Max. Vy	8	28.42	-1493.97	1.52
			Max. Vx	14	28.40	1.55	-1494.19
			Max. Torque	12			-1.08
L26	108.5 - 103.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-49.77	0.11	-0.37
			Max. Mx	8	-31.35	-1637.93	1.79
			Max. My	14	-31.35	1.77	-1637.97
			Max. Vy	8	29.17	-1637.93	1.79
			Max. Vx	14	29.14	1.77	-1637.97
			Max. Torque	12			-1.08
L27	103.5 - 95	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-50.72	0.05	-0.36
			Max. Mx	8	-32.08	-1711.31	1.93
			Max. My	14	-32.08	1.87	-1711.26
			Max. Vy	8	29.54	-1711.31	1.93
			Max. Vx	14	29.52	1.87	-1711.26
			Max. Torque	12			-1.08
L28	95 - 94	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-55.77	-0.09	-0.35
			Max. Mx	8	-36.14	-1922.40	2.31
			Max. My	14	-36.14	2.17	-1922.08
			Max. Vy	8	30.76	-1922.40	2.31
			Max. Vx	14	30.73	2.17	-1922.08
			Max. Torque	12			-1.08
L29	94 - 91.4	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-56.98	-0.15	-0.35
			Max. Mx	8	-37.11	-2002.91	2.45

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	14	-37.11	2.28	-2002.50
			Max. Vy	8	31.18	-2002.91	2.45
			Max. Vx	14	31.15	2.28	-2002.50
			Max. Torque	12			-1.08
L30	91.4 - 91.15	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-57.08	-0.16	-0.35
			Max. Mx	8	-37.19	-2010.71	2.46
			Max. My	14	-37.19	2.29	-2010.28
			Max. Vy	8	31.21	-2010.71	2.46
			Max. Vx	14	31.18	2.29	-2010.28
			Max. Torque	12			-1.08
L31	91.15 - 91	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-57.14	-0.16	-0.35
			Max. Mx	8	-37.24	-2015.39	2.47
			Max. My	14	-37.24	2.30	-2014.96
			Max. Vy	8	31.23	-2015.39	2.47
			Max. Vx	14	31.21	2.30	-2014.96
			Max. Torque	12			-1.08
L32	91 - 86	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-59.29	-0.27	-0.34
			Max. Mx	8	-38.96	-2173.56	2.74
			Max. My	14	-38.96	2.51	-2172.94
			Max. Vy	8	32.03	-2173.56	2.74
			Max. Vx	14	32.01	2.51	-2172.94
			Max. Torque	12			-1.08
L33	86 - 81	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-61.44	-0.38	-0.34
			Max. Mx	8	-40.74	-2335.74	3.01
			Max. My	14	-40.74	2.72	-2334.93
			Max. Vy	8	32.84	-2335.74	3.01
			Max. Vx	2	-32.82	-3.41	2334.82
			Max. Torque	12			-1.08
L34	81 - 76	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-63.63	-0.50	-0.33
			Max. Mx	8	-42.56	-2502.01	3.28
			Max. My	14	-42.56	2.92	-2501.00
			Max. Vy	8	33.67	-2502.01	3.28
			Max. Vx	2	-33.64	-3.73	2500.91
			Max. Torque	12			-1.08
L35	76 - 71	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-65.88	-0.62	-0.32
			Max. Mx	8	-44.42	-2672.42	3.56
			Max. My	14	-44.42	3.13	-2671.21
			Max. Vy	8	34.50	-2672.42	3.56
			Max. Vx	2	-34.47	-4.05	2671.14
			Max. Torque	12			-1.08
L36	71 - 66	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-68.17	-0.75	-0.31
			Max. Mx	8	-46.32	-2847.02	3.83
			Max. My	14	-46.32	3.33	-2845.61
			Max. Vy	8	35.34	-2847.02	3.83
			Max. Vx	2	-35.32	-4.38	2845.56
			Max. Torque	12			-1.08
L37	66 - 63.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-69.25	-0.80	-0.31
			Max. Mx	8	-47.19	-2926.98	3.95
			Max. My	14	-47.19	3.42	-2925.48
			Max. Vy	8	35.73	-2926.98	3.95
			Max. Vx	2	-35.70	-4.53	2925.43
			Max. Torque	12			-1.08
L38	63.75 - 63.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-69.37	-0.81	-0.31
			Max. Mx	8	-47.29	-2935.92	3.96
			Max. My	14	-47.29	3.43	-2934.40
			Max. Vy	8	35.76	-2935.92	3.96
			Max. Vx	2	-35.73	-4.54	2934.36
			Max. Torque	12			-1.08
L39	63.5 - 58.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-71.76	-0.94	-0.30

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	8	-49.25	-3116.89	4.24
			Max. My	14	-49.25	3.62	-3115.17
			Max. Vy	8	36.62	-3116.89	4.24
			Max. Vx	2	-36.60	-4.87	3115.14
			Max. Torque	12			-1.08
L40	58.5 - 51	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-72.00	-0.95	-0.30
			Max. Mx	8	-49.45	-3135.22	4.26
			Max. My	14	-49.46	3.64	-3133.48
			Max. Vy	8	36.70	-3135.22	4.26
			Max. Vx	2	-36.67	-4.91	3133.46
			Max. Torque	12			-1.08
L41	51 - 50	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-79.30	-1.16	-0.28
			Max. Mx	8	-55.53	-3434.95	4.70
			Max. My	2	-55.53	-5.43	3432.89
			Max. Vy	8	38.21	-3434.95	4.70
			Max. Vx	2	-38.18	-5.43	3432.89
			Max. Torque	12			-1.08
L42	50 - 45	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-82.10	-1.30	-0.28
			Max. Mx	8	-57.85	-3628.16	4.97
			Max. My	2	-57.85	-5.77	3625.91
			Max. Vy	8	39.07	-3628.16	4.97
			Max. Vx	2	-39.05	-5.77	3625.91
			Max. Torque	12			-1.08
L43	45 - 40.42	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-84.70	-1.42	-0.27
			Max. Mx	8	-60.02	-3808.92	5.22
			Max. My	2	-60.02	-6.07	3806.50
			Max. Vy	8	39.86	-3808.92	5.22
			Max. Vx	2	-39.83	-6.07	3806.50
			Max. Torque	12			-1.08
L44	40.42 - 40.17	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-84.83	-1.43	-0.27
			Max. Mx	8	-60.13	-3818.89	5.23
			Max. My	2	-60.13	-6.09	3816.46
			Max. Vy	8	39.89	-3818.89	5.23
			Max. Vx	2	-39.87	-6.09	3816.46
			Max. Torque	12			-1.08
L45	40.17 - 40	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-84.92	-1.44	-0.27
			Max. Mx	8	-60.21	-3825.68	5.24
			Max. My	2	-60.21	-6.10	3823.24
			Max. Vy	8	39.92	-3825.68	5.24
			Max. Vx	2	-39.90	-6.10	3823.24
			Max. Torque	12			-1.08
L46	40 - 35	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-87.81	-1.53	-0.24
			Max. Mx	8	-62.59	-4027.46	5.51
			Max. My	2	-62.59	-6.43	4024.83
			Max. Vy	8	40.78	-4027.46	5.51
			Max. Vx	2	-40.75	-6.43	4024.83
			Max. Torque	12			-1.08
L47	35 - 33	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-89.00	-1.55	-0.22
			Max. Mx	8	-63.56	-4109.36	5.62
			Max. My	2	-63.56	-6.57	4106.66
			Max. Vy	8	41.12	-4109.36	5.62
			Max. Vx	2	-41.09	-6.57	4106.66
			Max. Torque	12			-1.08
L48	33 - 32.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-89.18	-1.55	-0.22
			Max. Mx	8	-63.71	-4119.65	5.63
			Max. My	2	-63.71	-6.58	4116.93
			Max. Vy	8	41.15	-4119.65	5.63
			Max. Vx	2	-41.13	-6.58	4116.93
			Max. Torque	12			-1.08

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L49	32.75 - 19	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-92.44	-1.60	-0.17
			Max. Mx	8	-66.51	-4317.03	5.89
			Max. My	2	-66.51	-6.90	4314.13
			Max. Vy	8	41.94	-4317.03	5.89
			Max. Vx	2	-41.92	-6.90	4314.13
			Max. Torque	12			-1.08
L50	19 - 18	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-105.04	-1.69	-0.07
			Max. Mx	8	-77.46	-4745.55	6.43
			Max. My	2	-77.46	-7.58	4742.26
			Max. Vy	8	43.74	-4745.55	6.43
			Max. Vx	2	-43.71	-7.58	4742.26
			Max. Torque	12			-1.08
L51	18 - 13	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-108.56	-1.75	-0.02
			Max. Mx	8	-80.52	-4966.12	6.70
			Max. My	2	-80.52	-7.92	4962.64
			Max. Vy	8	44.49	-4966.12	6.70
			Max. Vx	2	-44.46	-7.92	4962.64
			Max. Torque	12			-1.08
L52	13 - 8	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-112.11	-1.80	0.03
			Max. Mx	8	-83.64	-5190.46	6.97
			Max. My	2	-83.64	-8.26	5186.78
			Max. Vy	8	45.25	-5190.46	6.97
			Max. Vx	2	-45.22	-8.26	5186.78
			Max. Torque	12			-1.08
L53	8 - 6.42	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-113.24	-1.82	0.05
			Max. Mx	8	-84.63	-5262.15	7.05
			Max. My	2	-84.63	-8.37	5258.40
			Max. Vy	8	45.50	-5262.15	7.05
			Max. Vx	2	-45.47	-8.37	5258.40
			Max. Torque	12			-1.08
L54	6.42 - 6.17	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-113.40	-1.82	0.05
			Max. Mx	8	-84.78	-5273.53	7.07
			Max. My	2	-84.78	-8.38	5269.77
			Max. Vy	8	45.52	-5273.53	7.07
			Max. Vx	2	-45.49	-8.38	5269.77
			Max. Torque	12			-1.08
L55	6.17 - 1.17	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-116.61	-1.88	0.10
			Max. Mx	8	-87.56	-5503.24	7.34
			Max. My	2	-87.56	-8.72	5499.29
			Max. Vy	8	46.35	-5503.24	7.34
			Max. Vx	2	-46.32	-8.72	5499.29
			Max. Torque	12			-1.08
L56	1.17 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-117.35	-1.89	0.11
			Max. Mx	8	-88.22	-5557.59	7.40
			Max. My	2	-88.22	-8.80	5553.59
			Max. Vy	8	46.54	-5557.59	7.40
			Max. Vx	2	-46.52	-8.80	5553.59
			Max. Torque	12			-1.08

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	117.35	0.00	0.00
	Max. H_x	20	88.22	46.53	-0.05
	Max. H_z	2	88.22	-0.05	46.51

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Max. M_x	2	5553.59	-0.05	46.51
	Max. M_z	8	5557.59	-46.53	0.05
	Max. Torsion	24	1.08	23.22	40.25
	Min. Vert	23	66.17	40.27	23.21
	Min. H_x	8	88.22	-46.53	0.05
	Min. H_z	14	88.22	0.05	-46.51
	Min. M_x	14	-5553.37	0.05	-46.51
	Min. M_z	20	-5554.58	46.53	-0.05
	Min. Torsion	12	-1.08	-23.22	-40.25

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	73.52	0.00	0.00	-0.09	-1.24	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	88.22	0.05	-46.51	-5553.59	-8.80	-1.04
0.9 Dead+1.0 Wind 0 deg - No Ice	66.17	0.05	-46.51	-5510.25	-8.37	-1.03
1.2 Dead+1.0 Wind 30 deg - No Ice	88.22	23.31	-40.30	-4813.20	-2785.86	-0.72
0.9 Dead+1.0 Wind 30 deg - No Ice	66.17	23.31	-40.30	-4775.64	-2763.78	-0.71
1.2 Dead+1.0 Wind 60 deg - No Ice	88.22	40.32	-23.30	-2783.16	-4816.86	-0.21
0.9 Dead+1.0 Wind 60 deg - No Ice	66.17	40.32	-23.30	-2761.43	-4778.93	-0.21
1.2 Dead+1.0 Wind 90 deg - No Ice	88.22	46.53	-0.05	-7.40	-5557.59	0.36
0.9 Dead+1.0 Wind 90 deg - No Ice	66.17	46.53	-0.05	-7.32	-5513.89	0.36
1.2 Dead+1.0 Wind 120 deg - No Ice	88.22	40.27	23.21	2770.32	-4809.58	0.83
0.9 Dead+1.0 Wind 120 deg - No Ice	66.17	40.27	23.21	2748.73	-4771.71	0.82
1.2 Dead+1.0 Wind 150 deg - No Ice	88.22	23.22	40.25	4805.71	-2773.25	1.08
0.9 Dead+1.0 Wind 150 deg - No Ice	66.17	23.22	40.25	4768.24	-2751.25	1.07
1.2 Dead+1.0 Wind 180 deg - No Ice	88.22	-0.05	46.51	5553.37	5.77	1.04
0.9 Dead+1.0 Wind 180 deg - No Ice	66.17	-0.05	46.51	5510.08	6.11	1.03
1.2 Dead+1.0 Wind 210 deg - No Ice	88.22	-23.31	40.30	4812.99	2782.84	0.72
0.9 Dead+1.0 Wind 210 deg - No Ice	66.17	-23.31	40.30	4775.48	2761.52	0.71
1.2 Dead+1.0 Wind 240 deg - No Ice	88.22	-40.32	23.30	2782.94	4813.84	0.21
0.9 Dead+1.0 Wind 240 deg - No Ice	66.17	-40.32	23.30	2761.27	4776.68	0.21
1.2 Dead+1.0 Wind 270 deg - No Ice	88.22	-46.53	0.05	7.18	5554.58	-0.36
0.9 Dead+1.0 Wind 270 deg - No Ice	66.17	-46.53	0.05	7.16	5511.64	-0.36
1.2 Dead+1.0 Wind 300 deg - No Ice	88.22	-40.27	-23.21	-2770.55	4806.56	-0.83
0.9 Dead+1.0 Wind 300 deg - No Ice	66.17	-40.27	-23.21	-2748.90	4769.45	-0.82
1.2 Dead+1.0 Wind 330 deg - No Ice	88.22	-23.22	-40.25	-4805.93	2770.22	-1.08
0.9 Dead+1.0 Wind 330 deg - No Ice	66.17	-23.22	-40.25	-4768.41	2748.98	-1.07
1.2 Dead+1.0 Ice+1.0 Temp	117.35	0.00	0.00	-0.11	-1.89	0.00

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	117.35	0.01	-11.23	-1392.06	-3.31	-0.22
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	117.35	5.62	-9.73	-1206.26	-699.35	-0.16
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	117.35	9.73	-5.62	-697.26	-1208.51	-0.05
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	117.35	11.23	-0.01	-1.46	-1394.37	0.07
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	117.35	9.72	5.60	694.72	-1207.13	0.17
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	117.35	5.61	9.72	1204.73	-696.95	0.23
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	117.35	-0.01	11.23	1391.91	-0.54	0.22
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	117.35	-5.62	9.73	1206.11	695.50	0.16
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	117.35	-9.73	5.62	697.12	1204.66	0.05
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	117.35	-11.23	0.01	1.31	1390.53	-0.07
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	117.35	-9.72	-5.60	-694.87	1203.28	-0.17
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	117.35	-5.61	-9.72	-1204.88	693.10	-0.23
Dead+Wind 0 deg - Service	73.52	0.01	-11.14	-1323.94	-2.99	-0.25
Dead+Wind 30 deg - Service	73.52	5.58	-9.65	-1147.45	-665.00	-0.17
Dead+Wind 60 deg - Service	73.52	9.66	-5.58	-663.52	-1149.15	-0.05
Dead+Wind 90 deg - Service	73.52	11.14	-0.01	-1.83	-1325.72	0.09
Dead+Wind 120 deg - Service	73.52	9.64	5.56	660.33	-1147.41	0.20
Dead+Wind 150 deg - Service	73.52	5.56	9.64	1145.53	-661.99	0.26
Dead+Wind 180 deg - Service	73.52	-0.01	11.14	1323.76	0.48	0.25
Dead+Wind 210 deg - Service	73.52	-5.58	9.65	1147.27	662.49	0.17
Dead+Wind 240 deg - Service	73.52	-9.66	5.58	663.34	1146.64	0.05
Dead+Wind 270 deg - Service	73.52	-11.14	0.01	1.65	1323.22	-0.09
Dead+Wind 300 deg - Service	73.52	-9.64	-5.56	-660.51	1144.90	-0.20
Dead+Wind 330 deg - Service	73.52	-5.56	-9.64	-1145.71	659.48	-0.26

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-73.52	0.00	0.00	73.52	0.00	0.000%
2	0.05	-88.22	-46.51	-0.05	88.22	46.51	0.000%
3	0.05	-66.17	-46.51	-0.05	66.17	46.51	0.000%
4	23.31	-88.22	-40.30	-23.31	88.22	40.30	0.000%
5	23.31	-66.17	-40.30	-23.31	66.17	40.30	0.000%
6	40.32	-88.22	-23.30	-40.32	88.22	23.30	0.000%
7	40.32	-66.17	-23.30	-40.32	66.17	23.30	0.000%
8	46.53	-88.22	-0.05	-46.53	88.22	0.05	0.000%
9	46.53	-66.17	-0.05	-46.53	66.17	0.05	0.000%
10	40.27	-88.22	23.21	-40.27	88.22	-23.21	0.000%
11	40.27	-66.17	23.21	-40.27	66.17	-23.21	0.000%
12	23.22	-88.22	40.25	-23.22	88.22	-40.25	0.000%
13	23.22	-66.17	40.25	-23.22	66.17	-40.25	0.000%
14	-0.05	-88.22	46.51	0.05	88.22	-46.51	0.000%
15	-0.05	-66.17	46.51	0.05	66.17	-46.51	0.000%
16	-23.31	-88.22	40.30	23.31	88.22	-40.30	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
17	-23.31	-66.17	40.30	23.31	66.17	-40.30	0.000%
18	-40.32	-88.22	23.30	40.32	88.22	-23.30	0.000%
19	-40.32	-66.17	23.30	40.32	66.17	-23.30	0.000%
20	-46.53	-88.22	0.05	46.53	88.22	-0.05	0.000%
21	-46.53	-66.17	0.05	46.53	66.17	-0.05	0.000%
22	-40.27	-88.22	-23.21	40.27	88.22	23.21	0.000%
23	-40.27	-66.17	-23.21	40.27	66.17	23.21	0.000%
24	-23.22	-88.22	-40.25	23.22	88.22	40.25	0.000%
25	-23.22	-66.17	-40.25	23.22	66.17	40.25	0.000%
26	0.00	-117.35	0.00	0.00	117.35	0.00	0.000%
27	0.01	-117.35	-11.23	-0.01	117.35	11.23	0.000%
28	5.62	-117.35	-9.73	-5.62	117.35	9.73	0.000%
29	9.73	-117.35	-5.62	-9.73	117.35	5.62	0.000%
30	11.23	-117.35	-0.01	-11.23	117.35	0.01	0.000%
31	9.72	-117.35	5.60	-9.72	117.35	-5.60	0.000%
32	5.61	-117.35	9.72	-5.61	117.35	-9.72	0.000%
33	-0.01	-117.35	11.23	0.01	117.35	-11.23	0.000%
34	-5.62	-117.35	9.73	5.62	117.35	-9.73	0.000%
35	-9.73	-117.35	5.62	9.73	117.35	-5.62	0.000%
36	-11.23	-117.35	0.01	11.23	117.35	-0.01	0.000%
37	-9.72	-117.35	-5.60	9.72	117.35	5.60	0.000%
38	-5.61	-117.35	-9.72	5.61	117.35	9.72	0.000%
39	0.01	-73.52	-11.14	-0.01	73.52	11.14	0.000%
40	5.58	-73.52	-9.65	-5.58	73.52	9.65	0.000%
41	9.66	-73.52	-5.58	-9.66	73.52	5.58	0.000%
42	11.14	-73.52	-0.01	-11.14	73.52	0.01	0.000%
43	9.64	-73.52	5.56	-9.64	73.52	-5.56	0.000%
44	5.56	-73.52	9.64	-5.56	73.52	-9.64	0.000%
45	-0.01	-73.52	11.14	0.01	73.52	-11.14	0.000%
46	-5.58	-73.52	9.65	5.58	73.52	-9.65	0.000%
47	-9.66	-73.52	5.58	9.66	73.52	-5.58	0.000%
48	-11.14	-73.52	0.01	11.14	73.52	-0.01	0.000%
49	-9.64	-73.52	-5.56	9.64	73.52	5.56	0.000%
50	-5.56	-73.52	-9.64	5.56	73.52	9.64	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00026011
3	Yes	5	0.00000001	0.00011152
4	Yes	6	0.00000001	0.00027034
5	Yes	6	0.00000001	0.00009230
6	Yes	6	0.00000001	0.00027450
7	Yes	6	0.00000001	0.00009385
8	Yes	5	0.00000001	0.00019666
9	Yes	5	0.00000001	0.00007399
10	Yes	6	0.00000001	0.00027602
11	Yes	6	0.00000001	0.00009451
12	Yes	6	0.00000001	0.00026729
13	Yes	6	0.00000001	0.00009125
14	Yes	5	0.00000001	0.00028636
15	Yes	5	0.00000001	0.00012573
16	Yes	6	0.00000001	0.00027699
17	Yes	6	0.00000001	0.00009478
18	Yes	6	0.00000001	0.00027254
19	Yes	6	0.00000001	0.00009312
20	Yes	5	0.00000001	0.00020904
21	Yes	5	0.00000001	0.00008157
22	Yes	6	0.00000001	0.00026818
23	Yes	6	0.00000001	0.00009160
24	Yes	6	0.00000001	0.00027720
25	Yes	6	0.00000001	0.00009496
26	Yes	4	0.00000001	0.00000001

27	Yes	6	0.00000001	0.00023447
28	Yes	6	0.00000001	0.00025350
29	Yes	6	0.00000001	0.00025366
30	Yes	6	0.00000001	0.00023459
31	Yes	6	0.00000001	0.00025360
32	Yes	6	0.00000001	0.00025339
33	Yes	6	0.00000001	0.00023482
34	Yes	6	0.00000001	0.00025403
35	Yes	6	0.00000001	0.00025384
36	Yes	6	0.00000001	0.00023461
37	Yes	6	0.00000001	0.00025310
38	Yes	6	0.00000001	0.00025335
39	Yes	4	0.00000001	0.00092245
40	Yes	5	0.00000001	0.00010217
41	Yes	5	0.00000001	0.00010544
42	Yes	4	0.00000001	0.00089213
43	Yes	5	0.00000001	0.00010751
44	Yes	5	0.00000001	0.00010055
45	Yes	4	0.00000001	0.00092578
46	Yes	5	0.00000001	0.00010750
47	Yes	5	0.00000001	0.00010379
48	Yes	4	0.00000001	0.00089265
49	Yes	5	0.00000001	0.00010109
50	Yes	5	0.00000001	0.00010848

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	185 - 180	19.197	41	1.1164	0.0014
L2	180 - 175	18.030	41	1.1134	0.0014
L3	175 - 170	16.870	41	1.1011	0.0014
L4	170 - 165	15.729	41	1.0777	0.0013
L5	165 - 160	14.619	41	1.0399	0.0012
L6	160 - 155	13.556	41	0.9911	0.0011
L7	155 - 154	12.548	41	0.9337	0.0010
L8	154 - 153.75	12.354	41	0.9215	0.0010
L9	153.75 - 152.5	12.306	41	0.9194	0.0009
L10	152.5 - 152.25	12.067	41	0.9085	0.0009
L11	152.25 - 151.5	12.019	41	0.9069	0.0009
L12	151.5 - 151.25	11.877	41	0.9023	0.0009
L13	151.25 - 146.25	11.830	41	0.9004	0.0009
L14	146.25 - 141.25	10.909	41	0.8574	0.0008
L15	141.25 - 136.25	10.036	41	0.8107	0.0006
L16	136.25 - 130	9.212	41	0.7621	0.0005
L17	135 - 129	9.015	41	0.7499	0.0005
L18	129 - 124	8.090	41	0.7185	0.0005
L19	124 - 121.42	7.360	41	0.6749	0.0004
L20	121.42 - 121.17	7.001	41	0.6527	0.0004
L21	121.17 - 116.17	6.967	41	0.6507	0.0004
L22	116.17 - 115	6.307	41	0.6103	0.0003
L23	115 - 113.75	6.159	41	0.6012	0.0003
L24	113.75 - 113.5	6.002	41	0.5925	0.0003
L25	113.5 - 108.5	5.971	41	0.5904	0.0003
L26	108.5 - 103.5	5.375	41	0.5494	0.0003
L27	103.5 - 95	4.821	41	0.5089	0.0002
L28	101 - 94	4.559	41	0.4888	0.0002
L29	94 - 91.4	3.861	41	0.4615	0.0002
L30	91.4 - 91.15	3.614	41	0.4451	0.0002
L31	91.15 - 91	3.591	41	0.4431	0.0002
L32	91 - 86	3.577	41	0.4419	0.0002
L33	86 - 81	3.133	41	0.4068	0.0002
L34	81 - 76	2.725	41	0.3727	0.0002
L35	76 - 71	2.352	41	0.3392	0.0001
L36	71 - 66	2.014	41	0.3063	0.0001
L37	66 - 63.75	1.710	41	0.2744	0.0001
L38	63.75 - 63.5	1.584	41	0.2603	0.0001

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L39	63.5 - 58.5	1.570	41	0.2588	0.0001
L40	58.5 - 51	1.316	41	0.2278	0.0001
L41	58 - 50	1.292	41	0.2248	0.0001
L42	50 - 45	0.934	41	0.1996	0.0001
L43	45 - 40.42	0.739	41	0.1734	0.0001
L44	40.42 - 40.17	0.584	41	0.1498	0.0000
L45	40.17 - 40	0.577	41	0.1483	0.0000
L46	40 - 35	0.571	41	0.1473	0.0000
L47	35 - 33	0.430	41	0.1217	0.0000
L48	33 - 32.75	0.382	41	0.1115	0.0000
L49	32.75 - 19	0.376	41	0.1104	0.0000
L50	28 - 18	0.276	41	0.0896	0.0000
L51	18 - 13	0.111	41	0.0659	0.0000
L52	13 - 8	0.053	41	0.0444	0.0000
L53	8 - 6.42	0.018	41	0.0234	0.0000
L54	6.42 - 6.17	0.011	41	0.0170	0.0000
L55	6.17 - 1.17	0.010	41	0.0163	0.0000
L56	1.17 - 0	0.000	41	0.0000	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
183.00	APXVAARR24_43-U-NA20 w/ Mount Pipe	41	18.730	1.1158	0.0014	36596
174.00	DMP65R-BU6D w/ Mount Pipe	41	16.640	1.0974	0.0014	14551
165.00	MX08FRO665-20 w/ Mount Pipe	41	14.619	1.0399	0.0012	6578
155.00	(3) SBNHH-1D65B w/ Mount Pipe	41	12.548	0.9337	0.0010	5390

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	185 - 180	80.637	4	4.6981	0.0062
L2	180 - 175	75.730	6	4.6853	0.0062
L3	175 - 170	70.859	6	4.6335	0.0062
L4	170 - 165	66.064	6	4.5348	0.0056
L5	165 - 160	61.404	6	4.3755	0.0051
L6	160 - 155	56.935	6	4.1694	0.0046
L7	155 - 154	52.701	6	3.9269	0.0042
L8	154 - 153.75	51.885	6	3.8760	0.0040
L9	153.75 - 152.5	51.683	6	3.8670	0.0040
L10	152.5 - 152.25	50.678	6	3.8210	0.0038
L11	152.25 - 151.5	50.478	6	3.8145	0.0038
L12	151.5 - 151.25	49.881	6	3.7952	0.0037
L13	151.25 - 146.25	49.683	6	3.7869	0.0037
L14	146.25 - 141.25	45.816	6	3.6060	0.0032
L15	141.25 - 136.25	42.147	6	3.4094	0.0027
L16	136.25 - 130	38.686	6	3.2047	0.0023
L17	135 - 129	37.855	6	3.1531	0.0022
L18	129 - 124	33.969	6	3.0208	0.0020
L19	124 - 121.42	30.904	6	2.8372	0.0017
L20	121.42 - 121.17	29.398	6	2.7435	0.0016
L21	121.17 - 116.17	29.254	6	2.7352	0.0016
L22	116.17 - 115	26.481	6	2.5652	0.0014
L23	115 - 113.75	25.857	6	2.5266	0.0014
L24	113.75 - 113.5	25.201	6	2.4900	0.0014
L25	113.5 - 108.5	25.071	6	2.4814	0.0013
L26	108.5 - 103.5	22.564	6	2.3088	0.0012

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L27	103.5 - 95	20.237	6	2.1383	0.0010
L28	101 - 94	19.140	6	2.0536	0.0010
L29	94 - 91.4	16.207	6	1.9388	0.0009
L30	91.4 - 91.15	15.170	6	1.8699	0.0008
L31	91.15 - 91	15.073	6	1.8615	0.0008
L32	91 - 86	15.014	6	1.8564	0.0008
L33	86 - 81	13.148	6	1.7086	0.0007
L34	81 - 76	11.435	6	1.5652	0.0006
L35	76 - 71	9.870	6	1.4245	0.0006
L36	71 - 66	8.452	6	1.2862	0.0005
L37	66 - 63.75	7.175	6	1.1520	0.0004
L38	63.75 - 63.5	6.647	6	1.0929	0.0004
L39	63.5 - 58.5	6.589	6	1.0864	0.0004
L40	58.5 - 51	5.520	6	0.9564	0.0003
L41	58 - 50	5.421	6	0.9436	0.0003
L42	50 - 45	3.920	6	0.8375	0.0003
L43	45 - 40.42	3.101	6	0.7276	0.0002
L44	40.42 - 40.17	2.451	6	0.6284	0.0002
L45	40.17 - 40	2.418	6	0.6223	0.0002
L46	40 - 35	2.396	6	0.6182	0.0002
L47	35 - 33	1.805	6	0.5106	0.0001
L48	33 - 32.75	1.600	6	0.4679	0.0001
L49	32.75 - 19	1.576	6	0.4632	0.0001
L50	28 - 18	1.159	6	0.3758	0.0001
L51	18 - 13	0.466	6	0.2765	0.0001
L52	13 - 8	0.224	6	0.1861	0.0000
L53	8 - 6.42	0.076	6	0.0981	0.0000
L54	6.42 - 6.17	0.048	6	0.0711	0.0000
L55	6.17 - 1.17	0.044	6	0.0683	0.0000
L56	1.17 - 0	0.002	6	0.0129	0.0000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
183.00	APXVAARR24_43-U-NA20 w/ Mount Pipe	4	78.672	4.6956	0.0062	8786
174.00	DMP65R-BU6D w/ Mount Pipe	6	69.892	4.6180	0.0061	3493
165.00	MX08FRO665-20 w/ Mount Pipe	6	61.404	4.3755	0.0051	1579
155.00	(3) SBNHH-1D65B w/ Mount Pipe	6	52.701	3.9269	0.0042	1292

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	185 - 180 (1)	TP18x18x0.1875	5.00	0.00	0.0	10.7543	-4.14	406.51	0.010
L2	180 - 175 (2)	TP19.6313x18x0.25	5.00	0.00	0.0	15.6019	-4.49	589.75	0.008
L3	175 - 170 (3)	TP21.2625x19.6313x0.25	5.00	0.00	0.0	16.9151	-10.20	639.39	0.016
L4	170 - 165 (4)	TP22.8938x21.2625x0.25	5.00	0.00	0.0	18.2282	-10.70	689.03	0.016
L5	165 - 160 (5)	TP24.525x22.8938x0.25	5.00	0.00	0.0	19.5414	-14.19	738.66	0.019

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L6	160 - 155 (6)	TP26.1563x24.525x0.25	5.00	0.00	0.0	20.8545	-14.80	788.30	0.019
L7	155 - 154 (7)	TP26.4825x26.1563x0.25	1.00	0.00	0.0	21.1172	-18.45	798.23	0.023
L8	154 - 153.75 (8)	TP26.5641x26.4825x0.3688	0.25	0.00	0.0	31.1037	-18.50	1175.72	0.016
L9	153.75 - 152.5 (9)	TP26.9719x26.5641x0.3625	1.25	0.00	0.0	31.0598	-18.70	1174.06	0.016
L10	152.5 - 152.25 (10)	TP27.0534x26.9719x0.55	0.25	0.00	0.0	46.9376	-18.77	1774.24	0.011
L11	152.25 - 151.5 (11)	TP27.2981x27.0534x0.55	0.75	0.00	0.0	47.3709	-18.93	1790.62	0.011
L12	151.5 - 151.25 (12)	TP27.3797x27.2981x0.425	0.25	0.00	0.0	36.8875	-18.98	1394.35	0.014
L13	151.25 - 146.25 (13)	TP29.0109x27.3797x0.4125	5.00	0.00	0.0	37.9859	-19.90	1435.87	0.014
L14	146.25 - 141.25 (14)	TP30.6422x29.0109x0.4	5.00	0.00	0.0	38.9519	-20.88	1472.38	0.014
L15	141.25 - 136.25 (15)	TP32.2734x30.6422x0.3938	5.00	0.00	0.0	40.4195	-21.88	1527.86	0.014
L16	136.25 - 130 (16)	TP34.3125x32.2734x0.3938	6.25	0.00	0.0	40.9365	-22.13	1547.40	0.014
L17	130 - 129 (17)	TP34.1331x32.1813x0.475	6.00	0.00	0.0	51.4801	-24.38	1945.95	0.013
L18	129 - 124 (18)	TP35.7597x34.1331x0.4625	5.00	0.00	0.0	52.5663	-25.62	1987.01	0.013
L19	124 - 121.42 (19)	TP36.599x35.7597x0.4625	2.58	0.00	0.0	53.8163	-26.27	2034.26	0.013
L20	121.42 - 121.17 (20)	TP36.6803x36.599x0.5	0.25	0.00	0.0	58.2503	-26.35	2201.86	0.012
L21	121.17 - 116.17 (21)	TP38.3069x36.6803x0.4875	5.00	0.00	0.0	59.3670	-27.72	2244.07	0.012
L22	116.17 - 115 (22)	TP38.6875x38.3069x0.4875	1.17	0.00	0.0	59.9645	-28.04	2266.66	0.012
L23	115 - 113.75 (23)	TP39.0938x38.6875x0.55	1.25	0.00	0.0	68.2610	-28.43	2580.27	0.011
L24	113.75 - 113.5 (24)	TP39.175x39.0938x0.4688	0.25	0.00	0.0	58.4222	-28.51	2208.36	0.013
L25	113.5 - 108.5 (25)	TP40.8x39.175x0.4625	5.00	0.00	0.0	60.0726	-29.90	2270.75	0.013
L26	108.5 - 103.5 (26)	TP42.425x40.8x0.4563	5.00	0.00	0.0	61.6573	-31.34	2330.65	0.013
L27	103.5 - 95 (27)	TP45.1875x42.425x0.45	8.50	0.00	0.0	61.9991	-32.08	2343.57	0.014
L28	95 - 94 (28)	TP44.8525x42.6125x0.5875	7.00	0.00	0.0	83.7383	-36.13	3165.31	0.011
L29	94 - 91.4 (29)	TP45.6845x44.8525x0.575	2.60	0.00	0.0	83.5202	-37.10	3157.07	0.012
L30	91.4 - 91.15 (30)	TP45.7645x45.6845x0.4438	0.25	0.00	0.0	64.7577	-37.19	2447.84	0.015
L31	91.15 - 91 (31)	TP45.8125x45.7645x0.4438	0.15	0.00	0.0	64.8263	-37.24	2450.43	0.015
L32	91 - 86 (32)	TP47.4453x45.8125x0.5	5.00	0.00	0.0	75.5820	-38.96	2857.00	0.014
L33	86 - 81 (33)	TP49.0781x47.4453x0.5	5.00	0.00	0.0	78.2108	-40.74	2956.37	0.014
L34	81 - 76 (34)	TP50.7109x49.0781x0.4938	5.00	0.00	0.0	79.8391	-42.55	3017.92	0.014
L35	76 - 71 (35)	TP52.3438x50.7109x0.4875	5.00	0.00	0.0	81.4014	-44.41	3076.97	0.014
L36	71 - 66 (36)	TP53.9766x52.3438x0.4875	5.00	0.00	0.0	83.9645	-46.32	3173.86	0.015
L37	66 - 63.75 (37)	TP54.7113x53.9766x0.4875	2.25	0.00	0.0	85.1179	-47.19	3217.46	0.015
L38	63.75 - 63.5 (38)	TP54.793x54.7113x0.4875	0.25	0.00	0.0	85.2460	-47.29	3222.30	0.015
L39	63.5 - 58.5 (39)	TP56.4258x54.793x0.4813	5.00	0.00	0.0	86.6930	-49.25	3277.00	0.015
L40	58.5 - 51 (40)	TP58.875x56.4258x0.481	7.50	0.00	0.0	86.946	-49.45	3286.56	0.015

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
		3				1			
L41	51 - 50 (41)	TP58.4384x55.8391x0.55	8.00	0.00	0.0	102.52 00	-55.53	3875.27	0.014
L42	50 - 45 (42)	TP60.0629x58.4384x0.55	5.00	0.00	0.0	105.39 70	-57.85	3984.02	0.015
L43	45 - 40.42 (43)	TP61.551x60.0629x0.543 8	4.58	0.00	0.0	106.81 60	-60.02	4037.65	0.015
L44	40.42 - 40.17 (44)	TP61.6323x61.551x0.475	0.25	0.00	0.0	93.540 0	-60.13	3535.81	0.017
L45	40.17 - 40 (45)	TP61.6875x61.6323x0.47 5	0.17	0.00	0.0	93.624 5	-60.20	3539.01	0.017
L46	40 - 35 (46)	TP63.3095x61.6875x0.53 13	5.00	0.00	0.0	107.39 00	-62.59	4059.35	0.015
L47	35 - 33 (47)	TP63.9583x63.3095x0.52 5	2.00	0.00	0.0	107.23 40	-63.56	4053.45	0.016
L48	33 - 32.75 (48)	TP64.0394x63.9583x0.6	0.25	0.00	0.0	122.56 50	-63.71	4632.96	0.014
L49	32.75 - 19 (49)	TP68.5x64.0394x0.6	13.75	0.00	0.0	125.54 20	-66.51	4745.49	0.014
L50	19 - 18 (50)	TP67.9579x64.7054x0.6	10.00	0.00	0.0	130.13 50	-77.46	4919.12	0.016
L51	18 - 13 (51)	TP69.5842x67.9579x0.58 75	5.00	0.00	0.0	130.52 40	-80.52	4933.83	0.016
L52	13 - 8 (52)	TP71.2105x69.5842x0.58 75	5.00	0.00	0.0	133.60 10	-83.64	5050.12	0.017
L53	8 - 6.42 (53)	TP71.7244x71.2105x0.58 75	1.58	0.00	0.0	134.57 30	-84.63	5086.87	0.017
L54	6.42 - 6.17 (54)	TP71.8057x71.7244x0.93 75	0.25	0.00	0.0	213.68 80	-84.64	8077.40	0.010
L55	6.17 - 1.17 (55)	TP73.432x71.8057x0.912 5	5.00	0.00	0.0	208.30 20	-84.78	7873.81	0.011
L56	1.17 - 0 (56)	TP73.8125x73.432x0.9	1.17	0.00	0.0	210.19 80	-87.57	7945.47	0.011

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	185 - 180 (1)	TP18x18x0.1875	12.99	185.39	0.070	0.00	185.39	0.000
L2	180 - 175 (2)	TP19.6313x18x0.25	36.00	291.96	0.123	0.00	291.96	0.000
L3	175 - 170 (3)	TP21.2625x19.6313x0.25	89.67	343.52	0.261	0.00	343.52	0.000
L4	170 - 165 (4)	TP22.8938x21.2625x0.25	152.74	399.26	0.383	0.00	399.26	0.000
L5	165 - 160 (5)	TP24.525x22.8938x0.25	236.17	459.20	0.514	0.00	459.20	0.000
L6	160 - 155 (6)	TP26.1563x24.525x0.25	321.99	519.54	0.620	0.00	519.54	0.000
L7	155 - 154 (7)	TP26.4825x26.1563x0.25	344.37	530.76	0.649	0.00	530.76	0.000
L8	154 - 153.75 (8)	TP26.5641x26.4825x0.36 88	349.98	785.78	0.445	0.00	785.78	0.000
L9	153.75 - 152.5 (9)	TP26.9719x26.5641x0.36 25	378.14	797.43	0.474	0.00	797.43	0.000
L10	152.5 - 152.25 (10)	TP27.0534x26.9719x0.55	383.79	1191.90	0.322	0.00	1191.90	0.000
L11	152.25 - 151.5 (11)	TP27.2981x27.0534x0.55	400.79	1214.23	0.330	0.00	1214.23	0.000
L12	151.5 - 151.25 (12)	TP27.3797x27.2981x0.42 5	406.46	957.32	0.425	0.00	957.32	0.000
L13	151.25 - 146.25 (13)	TP29.0109x27.3797x0.41 25	521.59	1047.33	0.498	0.00	1047.33	0.000
L14	146.25 - 141.25 (14)	TP30.6422x29.0109x0.4	639.71	1137.03	0.563	0.00	1137.03	0.000
L15	141.25 - 136.25 (15)	TP32.2734x30.6422x0.39 38	760.80	1244.83	0.611	0.00	1244.83	0.000
L16	136.25 - 130	TP34.3125x32.2734x0.39	791.59	1277.08	0.620	0.00	1277.08	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	(16)	38						
L17	130 - 129 (17)	TP34.1331x32.1813x0.475	942.52	1671.02	0.564	0.00	1671.02	0.000
L18	129 - 124 (18)	TP35.7597x34.1331x0.4625	1072.06	1791.15	0.599	0.00	1791.15	0.000
L19	124 - 121.42 (19)	TP36.599x35.7597x0.4625	1140.20	1877.91	0.607	0.00	1877.91	0.000
L20	121.42 - 121.17 (20)	TP36.6803x36.599x0.5	1146.85	2033.05	0.564	0.00	2033.05	0.000
L21	121.17 - 116.17 (21)	TP38.3069x36.6803x0.4875	1281.70	2167.88	0.591	0.00	2167.88	0.000
L22	116.17 - 115 (22)	TP38.6875x38.3069x0.4875	1313.77	2212.01	0.594	0.00	2212.01	0.000
L23	115 - 113.75 (23)	TP39.0938x38.6875x0.55	1348.24	2536.94	0.531	0.00	2536.94	0.000
L24	113.75 - 113.5 (24)	TP39.175x39.0938x0.4688	1355.16	2185.08	0.620	0.00	2185.08	0.000
L25	113.5 - 108.5 (25)	TP40.8x39.175x0.4625	1495.51	2343.00	0.638	0.00	2343.00	0.000
L26	108.5 - 103.5 (26)	TP42.425x40.8x0.4563	1639.52	2503.53	0.655	0.00	2503.53	0.000
L27	103.5 - 95 (27)	TP45.1875x42.425x0.45	1712.98	2567.42	0.667	0.00	2567.42	0.000
L28	95 - 94 (28)	TP44.8525x42.6125x0.5875	1924.34	3577.63	0.538	0.00	3577.63	0.000
L29	94 - 91.4 (29)	TP45.6845x44.8525x0.575	2004.95	3638.28	0.551	0.00	3638.28	0.000
L30	91.4 - 91.15 (30)	TP45.7645x45.6845x0.4438	2012.76	2834.07	0.710	0.00	2834.07	0.000
L31	91.15 - 91 (31)	TP45.8125x45.7645x0.4438	2017.45	2839.22	0.711	0.00	2839.22	0.000
L32	91 - 86 (32)	TP47.4453x45.8125x0.5	2175.81	3433.57	0.634	0.00	3433.57	0.000
L33	86 - 81 (33)	TP49.0781x47.4453x0.5	2338.18	3677.88	0.636	0.00	3677.88	0.000
L34	81 - 76 (34)	TP50.7109x49.0781x0.4938	2504.65	3876.18	0.646	0.00	3876.18	0.000
L35	76 - 71 (35)	TP52.3438x50.7109x0.4875	2675.25	4028.01	0.664	0.00	4028.01	0.000
L36	71 - 66 (36)	TP53.9766x52.3438x0.4875	2850.04	4245.06	0.671	0.00	4245.06	0.000
L37	66 - 63.75 (37)	TP54.7113x53.9766x0.4875	2930.08	4343.68	0.675	0.00	4343.68	0.000
L38	63.75 - 63.5 (38)	TP54.793x54.7113x0.4875	2939.03	4354.67	0.675	0.00	4354.67	0.000
L39	63.5 - 58.5 (39)	TP56.4258x54.793x0.4813	3120.19	4498.48	0.694	0.00	4498.48	0.000
L40	58.5 - 51 (40)	TP58.875x56.4258x0.4813	3138.55	4520.28	0.694	0.00	4520.28	0.000
L41	51 - 50 (41)	TP58.4384x55.8391x0.55	3438.58	5681.07	0.605	0.00	5681.07	0.000
L42	50 - 45 (42)	TP60.0629x58.4384x0.55	3631.98	5954.45	0.610	0.00	5954.45	0.000
L43	45 - 40.42 (43)	TP61.551x60.0629x0.5438	3812.92	6115.80	0.623	0.00	6115.80	0.000
L44	40.42 - 40.17 (44)	TP61.6323x61.551x0.475	3822.90	5111.28	0.748	0.00	5111.28	0.000
L45	40.17 - 40 (45)	TP61.6875x61.6323x0.475	3829.69	5118.70	0.748	0.00	5118.70	0.000
L46	40 - 35 (46)	TP63.3095x61.6875x0.5313	4031.66	6217.93	0.648	0.00	6217.93	0.000
L47	35 - 33 (47)	TP63.9583x63.3095x0.525	4113.64	6224.60	0.661	0.00	6224.60	0.000
L48	33 - 32.75 (48)	TP64.0394x63.9583x0.6	4123.93	7433.05	0.555	0.00	7433.05	0.000
L49	32.75 - 19 (49)	TP68.5x64.0394x0.6	4321.49	7742.02	0.558	0.00	7742.02	0.000
L50	19 - 18 (50)	TP67.9579x64.7054x0.6	4750.39	8225.02	0.578	0.00	8225.02	0.000
L51	18 - 13 (51)	TP69.5842x67.9579x0.5875	4971.15	8323.87	0.597	0.00	8323.87	0.000
L52	13 - 8 (52)	TP71.2105x69.5842x0.5875	5195.68	8649.92	0.601	0.00	8649.92	0.000
L53	8 - 6.42 (53)	TP71.7244x71.2105x0.58	5267.42	8753.50	0.602	0.00	8753.50	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
		75						
L54	6.42 - 6.17 (54)	TP71.8057x71.7244x0.9375	5267.42	14600.08	0.361	0.00	14600.08	0.000
L55	6.17 - 1.17 (55)	TP73.432x71.8057x0.9125	5278.81	14258.75	0.370	0.00	14258.75	0.000
L56	1.17 - 0 (56)	TP73.8125x73.432x0.9	5508.71	14727.83	0.374	0.00	14727.83	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	185 - 180 (1)	TP18x18x0.1875	4.39	121.95	0.036	0.00	191.08	0.000
L2	180 - 175 (2)	TP19.6313x18x0.25	4.81	176.93	0.027	0.00	301.63	0.000
L3	175 - 170 (3)	TP21.2625x19.6313x0.25	12.38	191.82	0.065	0.36	354.54	0.001
L4	170 - 165 (4)	TP22.8938x21.2625x0.25	12.85	206.71	0.062	0.36	411.72	0.001
L5	165 - 160 (5)	TP24.525x22.8938x0.25	16.93	221.60	0.076	0.24	473.18	0.001
L6	160 - 155 (6)	TP26.1563x24.525x0.25	17.42	236.49	0.074	0.24	538.91	0.000
L7	155 - 154 (7)	TP26.4825x26.1563x0.25	22.44	239.47	0.094	1.08	552.57	0.002
L8	154 - 153.75 (8)	TP26.5641x26.4825x0.3688	22.46	352.72	0.064	1.08	812.73	0.001
L9	153.75 - 152.5 (9)	TP26.9719x26.5641x0.3625	22.60	352.22	0.064	1.08	824.42	0.001
L10	152.5 - 152.25 (10)	TP27.0534x26.9719x0.55	22.63	532.27	0.043	1.08	1240.90	0.001
L11	152.25 - 151.5 (11)	TP27.2981x27.0534x0.55	22.71	537.19	0.042	1.08	1263.92	0.001
L12	151.5 - 151.25 (12)	TP27.3797x27.2981x0.425	22.74	418.30	0.054	1.08	991.81	0.001
L13	151.25 - 146.25 (13)	TP29.0109x27.3797x0.4125	23.34	430.76	0.054	1.04	1083.63	0.001
L14	146.25 - 141.25 (14)	TP30.6422x29.0109x0.4	23.93	441.71	0.054	1.04	1175.05	0.001
L15	141.25 - 136.25 (15)	TP32.2734x30.6422x0.3938	24.53	458.36	0.054	1.04	1285.34	0.001
L16	136.25 - 130 (16)	TP34.3125x32.2734x0.3938	24.74	464.22	0.053	0.72	1318.43	0.001
L17	130 - 129 (17)	TP34.1331x32.1813x0.475	25.59	583.78	0.044	0.72	1728.39	0.000
L18	129 - 124 (18)	TP35.7597x34.1331x0.4625	26.25	596.10	0.044	0.72	1850.81	0.000
L19	124 - 121.42 (19)	TP36.599x35.7597x0.4625	26.60	610.28	0.044	0.72	1939.87	0.000
L20	121.42 - 121.17 (20)	TP36.6803x36.599x0.5	26.63	660.56	0.040	0.72	2102.25	0.000
L21	121.17 - 116.17 (21)	TP38.3069x36.6803x0.4875	27.34	673.22	0.041	0.72	2239.61	0.000
L22	116.17 - 115 (22)	TP38.6875x38.3069x0.4875	27.50	680.00	0.040	0.72	2284.92	0.000
L23	115 - 113.75 (23)	TP39.0938x38.6875x0.55	27.69	774.08	0.036	0.72	2624.46	0.000
L24	113.75 - 113.5 (24)	TP39.175x39.0938x0.4688	27.72	662.51	0.042	0.72	2255.65	0.000
L25	113.5 - 108.5 (25)	TP40.8x39.175x0.4625	28.45	681.22	0.042	0.72	2417.13	0.000
L26	108.5 - 103.5 (26)	TP42.425x40.8x0.4563	29.19	699.19	0.042	0.72	2581.21	0.000
L27	103.5 - 95 (27)	TP45.1875x42.425x0.45	29.58	703.07	0.042	0.21	2646.15	0.000
L28	95 - 94 (28)	TP44.8525x42.6125x0.5875	30.80	949.59	0.032	0.21	3697.41	0.000
L29	94 - 91.4 (29)	TP45.6845x44.8525x0.575	31.22	947.12	0.033	0.21	3758.13	0.000

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 $\frac{T_u}{\phi T_n}$
L30	91.4 - 91.15 (30)	TP45.7645x45.6845x0.4438	31.25	734.35	0.043	0.21	2927.53	0.000
L31	91.15 - 91 (31)	TP45.8125x45.7645x0.4438	31.27	735.13	0.043	0.21	2933.73	0.000
L32	91 - 86 (32)	TP47.4453x45.8125x0.5	32.07	857.10	0.037	0.21	3539.35	0.000
L33	86 - 81 (33)	TP49.0781x47.4453x0.5	32.88	886.91	0.037	0.21	3789.83	0.000
L34	81 - 76 (34)	TP50.7109x49.0781x0.4938	33.70	905.38	0.037	0.21	3999.27	0.000
L35	76 - 71 (35)	TP52.3438x50.7109x0.4875	34.54	923.09	0.037	0.21	4210.62	0.000
L36	71 - 66 (36)	TP53.9766x52.3438x0.4875	35.38	952.16	0.037	0.21	4479.95	0.000
L37	66 - 63.75 (37)	TP54.7113x53.9766x0.4875	35.77	965.24	0.037	0.21	4603.88	0.000
L38	63.75 - 63.5 (38)	TP54.793x54.7113x0.4875	35.80	966.69	0.037	0.21	4617.75	0.000
L39	63.5 - 58.5 (39)	TP56.4258x54.793x0.4813	36.66	983.10	0.037	0.21	4837.88	0.000
L40	58.5 - 51 (40)	TP58.875x56.4258x0.4813	36.74	985.97	0.037	0.21	4866.16	0.000
L41	51 - 50 (41)	TP58.4384x55.8391x0.55	38.25	1162.58	0.033	0.21	5919.90	0.000
L42	50 - 45 (42)	TP60.0629x58.4384x0.55	39.11	1195.21	0.033	0.21	6256.82	0.000
L43	45 - 40.42 (43)	TP61.551x60.0629x0.5438	39.90	1211.30	0.033	0.21	6500.27	0.000
L44	40.42 - 40.17 (44)	TP61.6323x61.551x0.475	39.93	1060.74	0.038	0.21	5706.35	0.000
L45	40.17 - 40 (45)	TP61.6875x61.6323x0.475	39.96	1061.70	0.038	0.21	5716.67	0.000
L46	40 - 35 (46)	TP63.3095x61.6875x0.5313	40.82	1217.80	0.034	0.21	6724.91	0.000
L47	35 - 33 (47)	TP63.9583x63.3095x0.525	41.16	1216.03	0.034	0.21	6785.21	0.000
L48	33 - 32.75 (48)	TP64.0394x63.9583x0.6	41.19	1389.89	0.030	0.21	7756.02	0.000
L49	32.75 - 19 (49)	TP68.5x64.0394x0.6	41.98	1423.65	0.029	0.21	8137.37	0.000
L50	19 - 18 (50)	TP67.9579x64.7054x0.6	43.78	1475.74	0.030	0.21	8743.75	0.000
L51	18 - 13 (51)	TP69.5842x67.9579x0.5875	44.52	1480.15	0.030	0.21	8983.25	0.000
L52	13 - 8 (52)	TP71.2105x69.5842x0.5875	45.28	1515.04	0.030	0.21	9411.75	0.000
L53	8 - 6.42 (53)	TP71.7244x71.2105x0.5875	45.53	1526.06	0.030	0.21	9549.17	0.000
L54	6.42 - 6.17 (54)	TP71.8057x71.7244x0.9375	45.56	2426.00	0.019	0.21	15088.50	0.000
L55	6.17 - 1.17 (55)	TP73.432x71.8057x0.9125	45.73	2372.98	0.019	0.21	14730.25	0.000
L56	1.17 - 0 (56)	TP73.8125x73.432x0.9	46.58	2396.15	0.019	0.21	15207.92	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	185 - 180 (1)	0.010	0.070	0.000	0.036	0.000	0.082	1.050	4.8.2
L2	180 - 175 (2)	0.008	0.123	0.000	0.027	0.000	0.132	1.050	4.8.2
L3	175 - 170 (3)	0.016	0.261	0.000	0.065	0.001	0.281	1.050	4.8.2
L4	170 - 165 (4)	0.016	0.383	0.000	0.062	0.001	0.402	1.050	4.8.2
L5	165 - 160 (5)	0.019	0.514	0.000	0.076	0.001	0.539	1.050	4.8.2
L6	160 - 155 (6)	0.019	0.620	0.000	0.074	0.000	0.644	1.050	4.8.2
L7	155 - 154 (7)	0.023	0.649	0.000	0.094	0.002	0.681	1.050	4.8.2
L8	154 - 153.75 (8)	0.016	0.445	0.000	0.064	0.001	0.465	1.050	4.8.2

Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L9	153.75 - 152.5 (9)	0.016	0.474	0.000	0.064	0.001	0.494	1.050	4.8.2
L10	152.5 - 152.25 (10)	0.011	0.322	0.000	0.043	0.001	0.334	1.050	4.8.2
L11	152.25 - 151.5 (11)	0.011	0.330	0.000	0.042	0.001	0.343	1.050	4.8.2
L12	151.5 - 151.25 (12)	0.014	0.425	0.000	0.054	0.001	0.441	1.050	4.8.2
L13	151.25 - 146.25 (13)	0.014	0.498	0.000	0.054	0.001	0.515	1.050	4.8.2
L14	146.25 - 141.25 (14)	0.014	0.563	0.000	0.054	0.001	0.580	1.050	4.8.2
L15	141.25 - 136.25 (15)	0.014	0.611	0.000	0.054	0.001	0.628	1.050	4.8.2
L16	136.25 - 130 (16)	0.014	0.620	0.000	0.053	0.001	0.637	1.050	4.8.2
L17	130 - 129 (17)	0.013	0.564	0.000	0.044	0.000	0.579	1.050	4.8.2
L18	129 - 124 (18)	0.013	0.599	0.000	0.044	0.000	0.613	1.050	4.8.2
L19	124 - 121.42 (19)	0.013	0.607	0.000	0.044	0.000	0.622	1.050	4.8.2
L20	121.42 - 121.17 (20)	0.012	0.564	0.000	0.040	0.000	0.578	1.050	4.8.2
L21	121.17 - 116.17 (21)	0.012	0.591	0.000	0.041	0.000	0.605	1.050	4.8.2
L22	116.17 - 115 (22)	0.012	0.594	0.000	0.040	0.000	0.608	1.050	4.8.2
L23	115 - 113.75 (23)	0.011	0.531	0.000	0.036	0.000	0.544	1.050	4.8.2
L24	113.75 - 113.5 (24)	0.013	0.620	0.000	0.042	0.000	0.635	1.050	4.8.2
L25	113.5 - 108.5 (25)	0.013	0.638	0.000	0.042	0.000	0.653	1.050	4.8.2
L26	108.5 - 103.5 (26)	0.013	0.655	0.000	0.042	0.000	0.670	1.050	4.8.2
L27	103.5 - 95 (27)	0.014	0.667	0.000	0.042	0.000	0.683	1.050	4.8.2
L28	95 - 94 (28)	0.011	0.538	0.000	0.032	0.000	0.550	1.050	4.8.2
L29	94 - 91.4 (29)	0.012	0.551	0.000	0.033	0.000	0.564	1.050	4.8.2
L30	91.4 - 91.15 (30)	0.015	0.710	0.000	0.043	0.000	0.727	1.050	4.8.2
L31	91.15 - 91 (31)	0.015	0.711	0.000	0.043	0.000	0.728	1.050	4.8.2
L32	91 - 86 (32)	0.014	0.634	0.000	0.037	0.000	0.649	1.050	4.8.2
L33	86 - 81 (33)	0.014	0.636	0.000	0.037	0.000	0.651	1.050	4.8.2
L34	81 - 76 (34)	0.014	0.646	0.000	0.037	0.000	0.662	1.050	4.8.2
L35	76 - 71 (35)	0.014	0.664	0.000	0.037	0.000	0.680	1.050	4.8.2
L36	71 - 66 (36)	0.015	0.671	0.000	0.037	0.000	0.687	1.050	4.8.2
L37	66 - 63.75 (37)	0.015	0.675	0.000	0.037	0.000	0.691	1.050	4.8.2
L38	63.75 - 63.5 (38)	0.015	0.675	0.000	0.037	0.000	0.691	1.050	4.8.2
L39	63.5 - 58.5 (39)	0.015	0.694	0.000	0.037	0.000	0.710	1.050	4.8.2
L40	58.5 - 51 (40)	0.015	0.694	0.000	0.037	0.000	0.711	1.050	4.8.2
L41	51 - 50 (41)	0.014	0.605	0.000	0.033	0.000	0.621	1.050	4.8.2
L42	50 - 45 (42)	0.015	0.610	0.000	0.033	0.000	0.626	1.050	4.8.2
L43	45 - 40.42 (43)	0.015	0.623	0.000	0.033	0.000	0.639	1.050	4.8.2
L44	40.42 - 40.17 (44)	0.017	0.748	0.000	0.038	0.000	0.766	1.050	4.8.2
L45	40.17 - 40 (45)	0.017	0.748	0.000	0.038	0.000	0.767	1.050	4.8.2
L46	40 - 35 (46)	0.015	0.648	0.000	0.034	0.000	0.665	1.050	4.8.2
L47	35 - 33 (47)	0.016	0.661	0.000	0.034	0.000	0.678	1.050	4.8.2
L48	33 - 32.75 (48)	0.014	0.555	0.000	0.030	0.000	0.569	1.050	4.8.2
L49	32.75 - 19 (49)	0.014	0.558	0.000	0.029	0.000	0.573	1.050	4.8.2
L50	19 - 18 (50)	0.016	0.578	0.000	0.030	0.000	0.594	1.050	4.8.2

Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L51	18 - 13 (51)	0.016	0.597	0.000	0.030	0.000	0.614	1.050	4.8.2
L52	13 - 8 (52)	0.017	0.601	0.000	0.030	0.000	0.618	1.050	4.8.2
L53	8 - 6.42 (53)	0.017	0.602	0.000	0.030	0.000	0.619	1.050	4.8.2
L54	6.42 - 6.17 (54)	0.010	0.361	0.000	0.019	0.000	0.372	1.050	4.8.2
L55	6.17 - 1.17 (55)	0.011	0.370	0.000	0.019	0.000	0.381	1.050	4.8.2
L56	1.17 - 0 (56)	0.011	0.374	0.000	0.019	0.000	0.385	1.050	4.8.2

Section Capacity Table

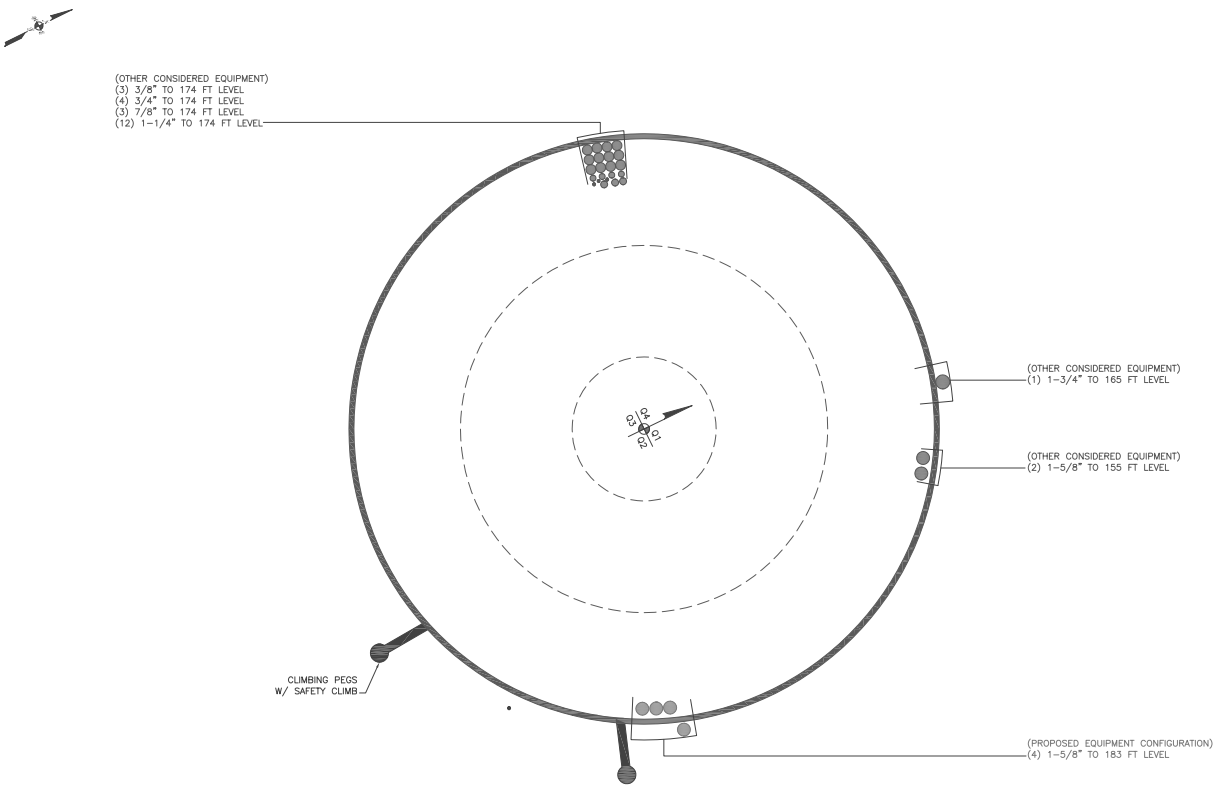
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	185 - 180	Pole	TP18x18x0.1875	1	-4.14	426.84	7.8	Pass
L2	180 - 175	Pole	TP19.6313x18x0.25	2	-4.49	619.24	12.5	Pass
L3	175 - 170	Pole	TP21.2625x19.6313x0.25	3	-10.20	671.36	26.8	Pass
L4	170 - 165	Pole	TP22.8938x21.2625x0.25	4	-10.70	723.48	38.3	Pass
L5	165 - 160	Pole	TP24.525x22.8938x0.25	5	-14.19	775.60	51.4	Pass
L6	160 - 155	Pole	TP26.1563x24.525x0.25	6	-14.80	827.72	61.3	Pass
L7	155 - 154	Pole	TP26.4825x26.1563x0.25	7	-18.45	838.14	64.9	Pass
L8	154 - 153.75	Pole	TP26.5641x26.4825x0.3688	8	-18.50	1234.51	44.3	Pass
L9	153.75 - 152.5	Pole	TP26.9719x26.5641x0.3625	9	-18.70	1232.76	47.1	Pass
L10	152.5 - 152.25	Pole	TP27.0534x26.9719x0.55	10	-18.77	1862.95	31.9	Pass
L11	152.25 - 151.5	Pole	TP27.2981x27.0534x0.55	11	-18.93	1880.15	32.6	Pass
L12	151.5 - 151.25	Pole	TP27.3797x27.2981x0.425	12	-18.98	1464.07	42.0	Pass
L13	151.25 - 146.25	Pole	TP29.0109x27.3797x0.4125	13	-19.90	1507.66	49.0	Pass
L14	146.25 - 141.25	Pole	TP30.6422x29.0109x0.4	14	-20.88	1546.00	55.2	Pass
L15	141.25 - 136.25	Pole	TP32.2734x30.6422x0.3938	15	-21.88	1604.25	59.9	Pass
L16	136.25 - 130	Pole	TP34.3125x32.2734x0.3938	16	-22.13	1624.77	60.7	Pass
L17	130 - 129	Pole	TP34.1331x32.1813x0.475	17	-24.38	2043.25	55.1	Pass
L18	129 - 124	Pole	TP35.7597x34.1331x0.4625	18	-25.62	2086.36	58.4	Pass
L19	124 - 121.42	Pole	TP36.599x35.7597x0.4625	19	-26.27	2135.97	59.2	Pass
L20	121.42 - 121.17	Pole	TP36.6803x36.599x0.5	20	-26.35	2311.95	55.0	Pass
L21	121.17 - 116.17	Pole	TP38.3069x36.6803x0.4875	21	-27.72	2356.27	57.6	Pass
L22	116.17 - 115	Pole	TP38.6875x38.3069x0.4875	22	-28.04	2379.99	57.9	Pass
L23	115 - 113.75	Pole	TP39.0938x38.6875x0.55	23	-28.43	2709.28	51.8	Pass
L24	113.75 - 113.5	Pole	TP39.175x39.0938x0.4688	24	-28.51	2318.78	60.5	Pass
L25	113.5 - 108.5	Pole	TP40.8x39.175x0.4625	25	-29.90	2384.29	62.2	Pass
L26	108.5 - 103.5	Pole	TP42.425x40.8x0.4563	26	-31.34	2447.18	63.8	Pass
L27	103.5 - 95	Pole	TP45.1875x42.425x0.45	27	-32.08	2460.75	65.0	Pass
L28	95 - 94	Pole	TP44.8525x42.6125x0.5875	28	-36.13	3323.58	52.4	Pass
L29	94 - 91.4	Pole	TP45.6845x44.8525x0.575	29	-37.10	3314.92	53.7	Pass
L30	91.4 - 91.15	Pole	TP45.7645x45.6845x0.4438	30	-37.19	2570.23	69.3	Pass
L31	91.15 - 91	Pole	TP45.8125x45.7645x0.4438	31	-37.24	2572.95	69.3	Pass
L32	91 - 86	Pole	TP47.4453x45.8125x0.5	32	-38.96	2999.85	61.8	Pass
L33	86 - 81	Pole	TP49.0781x47.4453x0.5	33	-40.74	3104.19	62.0	Pass
L34	81 - 76	Pole	TP50.7109x49.0781x0.4938	34	-42.55	3168.82	63.0	Pass
L35	76 - 71	Pole	TP52.3438x50.7109x0.4875	35	-44.41	3230.82	64.8	Pass
L36	71 - 66	Pole	TP53.9766x52.3438x0.4875	36	-46.32	3332.55	65.5	Pass
L37	66 - 63.75	Pole	TP54.7113x53.9766x0.4875	37	-47.19	3378.33	65.8	Pass
L38	63.75 - 63.5	Pole	TP54.793x54.7113x0.4875	38	-47.29	3383.41	65.8	Pass
L39	63.5 - 58.5	Pole	TP56.4258x54.793x0.4813	39	-49.25	3440.85	67.6	Pass
L40	58.5 - 51	Pole	TP58.875x56.4258x0.4813	40	-49.45	3450.89	67.7	Pass
L41	51 - 50	Pole	TP58.4384x55.8391x0.55	41	-55.53	4069.03	59.1	Pass
L42	50 - 45	Pole	TP60.0629x58.4384x0.55	42	-57.85	4183.22	59.6	Pass
L43	45 - 40.42	Pole	TP61.551x60.0629x0.5438	43	-60.02	4239.53	60.9	Pass
L44	40.42 - 40.17	Pole	TP61.6323x61.551x0.475	44	-60.13	3712.60	73.0	Pass
L45	40.17 - 40	Pole	TP61.6875x61.6323x0.475	45	-60.20	3715.96	73.0	Pass
L46	40 - 35	Pole	TP63.3095x61.6875x0.5313	46	-62.59	4262.32	63.3	Pass
L47	35 - 33	Pole	TP63.9583x63.3095x0.525	47	-63.56	4256.12	64.5	Pass
L48	33 - 32.75	Pole	TP64.0394x63.9583x0.6	48	-63.71	4864.61	54.2	Pass
L49	32.75 - 19	Pole	TP68.5x64.0394x0.6	49	-66.51	4982.76	54.6	Pass
L50	19 - 18	Pole	TP67.9579x64.7054x0.6	50	-77.46	5165.08	56.6	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L51	18 - 13	Pole	TP69.5842x67.9579x0.5875	51	-80.52	5180.52	58.5	Pass
L52	13 - 8	Pole	TP71.2105x69.5842x0.5875	52	-83.64	5302.63	58.9	Pass
L53	8 - 6.42	Pole	TP71.7244x71.2105x0.5875	53	-84.63	5341.21	59.0	Pass
L54	6.42 - 6.17	Pole	TP71.8057x71.7244x0.9375	54	-84.64	8481.27	35.4	Pass
L55	6.17 - 1.17	Pole	TP73.432x71.8057x0.9125	55	-84.78	8267.50	36.3	Pass
L56	1.17 - 0	Pole	TP73.8125x73.432x0.9	56	-87.57	8342.74	36.7	Pass
							Summary	
						Pole (L45)	73.0	Pass
						RATING =	**73.0**	**Pass**

***NOTE: Above stress ratios for reinforced sections are approximate. More exact calculations are presented in Appendix C.**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 825983 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

CCIpole

per TIA-222- H

Site BU: 825983

Work Order: 2029644

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	185	5	0	12	18	18	0.1875	Auto	A36M-42
2	180	50	5	12	18.00	34.3125	0.25	Auto	A36M-42
3	135	20	0	12	32.18	38.6875	0.25	Auto	A36M-42
4	115	20	6	12	38.69	45.1875	0.3125	Auto	A36M-42
5	101	10	0	12	42.61	45.8125	0.3125	Auto	A36M-42
6	91	40	7	12	45.81	58.875	0.375	Auto	A36M-42
7	58	18	0	12	55.84	61.6875	0.375	Auto	A36M-42
8	40	21	9	12	61.69	68.5	0.4375	Auto	A36M-42
9	28	28	0	12	64.71	73.8125	0.4375	Auto	A36M-42

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
1	40.42	52.42	plate	CCI-045100_1	3	x				x				x			
2	91.4	121.42	plate	CCI-060100_1	3	x				x				x			
3	121.42	152.5	plate	CCI-045100_2	3		x				x				x		
4	6.42	33	plate	CCI-085125_1	4			x			x			x		x	
5	33	63.75	plate	CCI-060100_2	3				x				x				x
6	63.75	99.42	plate	CCI-060100_2	3			x				x				x	
7	113.75	131	plate	CCI-040075_1	3			x				x				x	
8	151.5	154	plate	CCI-040075_2	3			x				x				x	
9	0	6.42	plate	Titan 73/45_1	6	x		x		x			x	x			x
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	4.5	1	4.5	0.5	PC 8.8 - M20 (100)	18	PC 8.8 - M20 (100)	18.000	20.000	3.250	1.1875	A572-65
2	6	1	6	0.5	PC 8.8 - M20 (100)	30	PC 8.8 - M20 (100)	30.000	16.000	4.750	1.1875	A572-65
3	4.5	1	4.5	0.5	PC 8.8 - M20 (100)	24	PC 8.8 - M20 (100)	24.000	20.000	3.250	1.1875	A572-65
4	8.5	1.25	10.625	0.625	PC 8.8 - M20 (100)	48	PC 8.8 - M20 (100)	51.000	17.000	9.063	1.1875	A572-65
5	6	1	6	0.5	PC 8.8 - M20 (100)	27	PC 8.8 - M20 (100)	27.000	16.000	4.750	1.1875	A572-65
6	6	1	6	0.5	PC 8.8 - M20 (100)	27	PC 8.8 - M20 (100)	27.000	16.000	4.750	1.1875	A572-65
7	4	0.75	3	0.375	PC 8.8 - M20 (100)	15	PC 8.8 - M20 (100)	18.000	16.000	2.063	1.1875	A572-65
8	4	0.75	3	0.375	PC 8.8 - M20 (100)	15	PC 8.8 - M20 (100)	15.000	16.000	2.063	1.1875	A572-65
9	11.6978	0.34366	4.02007	48.00075	Capacity Input	n/a	Capacity Input	n/a	0.000	3.500	0.0000	A572-65

Connection Details for Custom Reinforcements

Reinforcement	End	# Bolts	N or X	Bolt Spacing (in)	Edge Dist (in)	Weld Grade (ksi)	Transverse (Horiz.) Weld Type	Horiz. Weld Length (in)	Horiz. Groove Depth (in)	Horiz. Groove Angle (deg)	Horiz. Fillet Size (in)	Vertical Weld Length (in)	Vertical Fillet Size (in)	Rev H Connection Capacity (kip)
CCI-045100_1	Top	6	N	3	3	-	-	-	-	-	-	-	-	-
	Bottom	6	N	3	3	-	-	-	-	-	-	-	-	-
CCI-060100_1	Top	10	N	3	3	-	-	-	-	-	-	-	-	-
	Bottom	10	N	3	3	-	-	-	-	-	-	-	-	-
CCI-045100_2	Top	8	N	3	3	-	-	-	-	-	-	-	-	-
	Bottom	8	N	3	3	-	-	-	-	-	-	-	-	-
CCI-085125_1	Top	17	N	3	3	-	-	-	-	-	-	-	-	-
	Bottom	16	N	3	3	-	-	-	-	-	-	-	-	-
CCI-060100_2	Top	9	N	3	3	-	-	-	-	-	-	-	-	-
	Bottom	9	N	3	3	-	-	-	-	-	-	-	-	-
CCI-040075_1	Top	6	N	3	3	-	-	-	-	-	-	-	-	-
	Bottom	5	N	3	3	-	-	-	-	-	-	-	-	-
CCI-040075_2	Top	5	N	3	3	-	-	-	-	-	-	-	-	-
	Bottom	5	N	3	3	-	-	-	-	-	-	-	-	-
Titan 73/45_1	Top	-	-	-	-	0	None	-	-	-	-	-	-	285.12
	Bottom	-	-	-	-	0	None	-	-	-	-	-	-	285.12

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	185 - 180	5	0	12	18.000	18.000	0.1875	A36M-42	1.000
2	180 - 175	5		12	18.000	19.631	0.25	A36M-42	1.000
3	175 - 170	5		12	19.631	21.263	0.25	A36M-42	1.000
4	170 - 165	5		12	21.263	22.894	0.25	A36M-42	1.000
5	165 - 160	5		12	22.894	24.525	0.25	A36M-42	1.000
6	160 - 155	5		12	24.525	26.156	0.25	A36M-42	1.000
7	155 - 154	1		12	26.156	26.483	0.25	A36M-42	1.000
8	154 - 153.75	0.25		12	26.483	26.564	0.36875	A36M-42	0.971
9	153.75 - 152.5	1.25		12	26.564	26.972	0.3625	A36M-42	0.983
10	152.5 - 152.25	0.25		12	26.972	27.053	0.55	A36M-42	0.940
11	152.25 - 151.5	0.75		12	27.053	27.298	0.55	A36M-42	0.935
12	151.5 - 151.25	0.25		12	27.298	27.380	0.425	A36M-42	0.959
13	151.25 - 146.25	5		12	27.380	29.011	0.4125	A36M-42	0.965
14	146.25 - 141.25	5		12	29.011	30.642	0.4	A36M-42	0.975
15	141.25 - 136.25	5		12	30.642	32.273	0.39375	A36M-42	0.972
16	136.25 - 135	6.25	5	12	32.273	34.313	0.39375	A36M-42	0.968
17	135 - 129	6		12	32.181	34.133	0.475	A36M-42	0.968
18	129 - 124	5		12	34.133	35.760	0.4625	A36M-42	0.972
19	124 - 121.42	2.58		12	35.760	36.599	0.4625	A36M-42	0.962
20	121.42 - 121.17	0.25		12	36.599	36.680	0.5	A36M-42	0.968
21	121.17 - 116.17	5		12	36.680	38.307	0.4875	A36M-42	0.971
22	116.17 - 115	1.17	0	12	38.307	38.688	0.4875	A36M-42	0.967
23	115 - 113.75	1.25		12	38.688	39.094	0.55	A36M-42	0.968
24	113.75 - 113.5	0.25		12	39.094	39.175	0.46875	A36M-42	0.978
25	113.5 - 108.5	5		12	39.175	40.800	0.4625	A36M-42	0.978
26	108.5 - 103.5	5		12	40.800	42.425	0.45625	A36M-42	0.980
27	103.5 - 101	8.5	6	12	42.425	45.188	0.45	A36M-42	0.987
28	101 - 94	7		12	42.613	44.853	0.5875	A36M-42	0.966
29	94 - 91.4	2.6		12	44.853	45.685	0.575	A36M-42	0.978
30	91.4 - 91.15	0.25		12	45.685	45.765	0.44375	A36M-42	0.985
31	91.15 - 91	0.15	0	12	45.765	45.813	0.44375	A36M-42	0.984
32	91 - 86	5		12	45.813	47.445	0.5	A36M-42	0.990
33	86 - 81	5		12	47.445	49.078	0.5	A36M-42	0.982
34	81 - 76	5		12	49.078	50.711	0.49375	A36M-42	0.987
35	76 - 71	5		12	50.711	52.344	0.4875	A36M-42	0.992
36	71 - 66	5		12	52.344	53.977	0.4875	A36M-42	0.986
37	66 - 63.75	2.25		12	53.977	54.711	0.4875	A36M-42	0.983
38	63.75 - 63.5	0.25		12	54.711	54.793	0.4875	A36M-42	0.982
39	63.5 - 58.5	5		12	54.793	56.426	0.48125	A36M-42	0.989
40	58.5 - 58	7.5	7	12	56.426	58.875	0.48125	A36M-42	0.988
41	58 - 50	8		12	55.839	58.438	0.55	A36M-42	0.992
42	50 - 45	5		12	58.438	60.063	0.55	A36M-42	0.983
43	45 - 40.42	4.58		12	60.063	61.551	0.54375	A36M-42	0.987
44	40.42 - 40.17	0.25		12	61.551	61.632	0.475	A36M-42	0.983
45	40.17 - 40	0.17	0	12	61.632	61.688	0.475	A36M-42	0.983
46	40 - 35	5		12	61.688	63.310	0.53125	A36M-42	0.993
47	35 - 33	2		12	63.310	63.958	0.525	A36M-42	1.003
48	33 - 32.75	0.25		12	63.958	64.039	0.6	A36M-42	1.078
49	32.75 - 28	13.75	9	12	64.039	68.500	0.6	A36M-42	1.070
50	28 - 18	10		12	64.705	67.958	0.6	A36M-42	1.058
51	18 - 13	5		12	67.958	69.584	0.5875	A36M-42	1.072
52	13 - 8	5		12	69.584	71.210	0.5875	A36M-42	1.065
53	8 - 6.42	1.58		12	71.210	71.724	0.5875	A36M-42	1.063
54	6.42 - 6.17	0.25		12	71.724	71.806	0.9375	A36M-42	0.583
55	6.17 - 1.17	5		12	71.806	73.432	0.9125	A36M-42	0.596
56	1.17 - 0	1.17		12	73.432	73.813	0.9	A36M-42	0.604

TNX Section Forces

Increment (ft): 5

	Section Height (ft)	TNX Output P_u (K)	M_{ux} (kip-ft)	V_u (K)
1	185 - 180	4.14	12.99	4.39
2	180 - 175	4.49	36.00	4.81
3	175 - 170	10.20	89.67	12.38
4	170 - 165	10.70	152.74	12.85
5	165 - 160	14.19	236.17	16.93
6	160 - 155	14.80	321.99	17.42
7	155 - 154	18.45	344.37	22.44
8	154 - 153.75	18.50	349.98	22.46
9	153.75 - 152.5	18.70	378.14	22.60
10	152.5 - 152.25	18.77	383.79	22.63
11	152.25 - 151.5	18.93	400.79	22.71
12	151.5 - 151.25	18.98	406.47	22.74
13	151.25 - 146.25	19.90	521.58	23.34
14	146.25 - 141.25	20.88	639.71	23.93
15	141.25 - 136.25	21.88	760.80	24.53
16	136.25 - 135	22.13	791.59	24.74
17	135 - 129	24.38	942.52	25.59
18	129 - 124	25.62	1072.05	26.25
19	124 - 121.42	26.27	1140.20	26.60
20	121.42 - 121.17	26.35	1146.85	26.63
21	121.17 - 116.17	27.72	1281.70	27.34
22	116.17 - 115	28.04	1313.76	27.50
23	115 - 113.75	28.43	1348.24	27.69
24	113.75 - 113.5	28.51	1355.16	27.72
25	113.5 - 108.5	29.90	1495.51	28.45
26	108.5 - 103.5	31.34	1639.52	29.19
27	103.5 - 101	32.08	1712.98	29.58
28	101 - 94	36.13	1924.34	30.80
29	94 - 91.4	37.10	2004.95	31.22
30	91.4 - 91.15	37.19	2012.76	31.25
31	91.15 - 91	37.24	2017.45	31.27
32	91 - 86	38.96	2175.81	32.07
33	86 - 81	40.74	2338.19	32.88
34	81 - 76	42.55	2504.65	33.70
35	76 - 71	44.41	2675.25	34.54
36	71 - 66	46.32	2850.04	35.38
37	66 - 63.75	47.19	2930.08	35.77
38	63.75 - 63.5	47.29	2939.03	35.80
39	63.5 - 58.5	49.25	3120.19	36.66
40	58.5 - 58	49.45	3138.55	36.74
41	58 - 50	55.53	3438.58	38.25
42	50 - 45	57.85	3631.98	39.11
43	45 - 40.42	60.02	3812.92	39.90
44	40.42 - 40.17	60.13	3822.90	39.93
45	40.17 - 40	60.20	3829.69	39.96
46	40 - 35	62.59	4031.66	40.82
47	35 - 33	63.56	4113.64	41.16
48	33 - 32.75	63.71	4123.93	41.19
49	32.75 - 28	66.51	4321.49	41.98
50	28 - 18	77.46	4750.39	43.78
51	18 - 13	80.52	4971.15	44.52
52	13 - 8	83.64	5195.67	45.28
53	8 - 6.42	84.63	5267.42	45.53
54	6.42 - 6.17	84.78	5278.81	45.56
55	6.17 - 1.17	87.56	5508.71	46.39
56	1.17 - 0	88.22	5563.10	46.58

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
185 - 180	Pole	TP18x18x0.1875	Pole	7.8%	Pass
180 - 175	Pole	TP19.631x18x0.25	Pole	12.5%	Pass
175 - 170	Pole	TP21.263x19.631x0.25	Pole	26.7%	Pass
170 - 165	Pole	TP22.894x21.263x0.25	Pole	38.2%	Pass
165 - 160	Pole	TP24.525x22.894x0.25	Pole	51.2%	Pass
160 - 155	Pole	TP26.156x24.525x0.25	Pole	61.2%	Pass
155 - 154	Pole	TP26.483x26.156x0.25	Pole	64.7%	Pass
154 - 153.75	Pole + Reinf.	TP26.564x26.483x0.3688	Reinf. 8 Tension Rupture	50.4%	Pass
153.75 - 152.5	Pole + Reinf.	TP26.972x26.564x0.3625	Reinf. 8 Tension Rupture	52.9%	Pass
152.5 - 152.25	Pole + Reinf.	TP27.053x26.972x0.55	Reinf. 8 Tension Rupture	36.3%	Pass
152.25 - 151.5	Pole + Reinf.	TP27.298x27.053x0.55	Reinf. 8 Tension Rupture	37.4%	Pass
151.5 - 151.25	Pole + Reinf.	TP27.38x27.298x0.425	Reinf. 3 Tension Rupture	45.8%	Pass
151.25 - 146.25	Pole + Reinf.	TP29.011x27.38x0.4125	Reinf. 3 Tension Rupture	53.3%	Pass
146.25 - 141.25	Pole + Reinf.	TP30.642x29.011x0.4	Reinf. 3 Tension Rupture	59.6%	Pass
141.25 - 136.25	Pole + Reinf.	TP32.273x30.642x0.3938	Reinf. 3 Tension Rupture	64.9%	Pass
136.25 - 135	Pole + Reinf.	TP34.313x32.273x0.3938	Reinf. 3 Tension Rupture	66.1%	Pass
135 - 129	Pole + Reinf.	TP34.133x32.181x0.475	Reinf. 7 Tension Rupture	62.2%	Pass
129 - 124	Pole + Reinf.	TP35.76x34.133x0.4625	Reinf. 7 Tension Rupture	65.8%	Pass
124 - 121.42	Pole + Reinf.	TP36.599x35.76x0.4625	Pole	67.8%	Pass
121.42 - 121.17	Pole + Reinf.	TP36.68x36.599x0.5	Pole	62.4%	Pass
121.17 - 116.17	Pole + Reinf.	TP38.307x36.68x0.4875	Pole	66.7%	Pass
116.17 - 115	Pole + Reinf.	TP38.688x38.307x0.4875	Pole	67.7%	Pass
115 - 113.75	Pole + Reinf.	TP39.094x38.688x0.55	Reinf. 7 Tension Rupture	58.6%	Pass
113.75 - 113.5	Pole + Reinf.	TP39.175x39.094x0.4688	Pole	64.2%	Pass
113.5 - 108.5	Pole + Reinf.	TP40.8x39.175x0.4625	Pole	67.3%	Pass
108.5 - 103.5	Pole + Reinf.	TP42.425x40.8x0.4563	Pole	70.2%	Pass
103.5 - 101	Pole + Reinf.	TP45.188x42.425x0.45	Pole	71.6%	Pass
101 - 94	Pole + Reinf.	TP44.853x42.613x0.5875	Pole	59.3%	Pass
94 - 91.4	Pole + Reinf.	TP45.685x44.853x0.575	Pole	60.6%	Pass
91.4 - 91.15	Pole + Reinf.	TP45.765x45.685x0.4438	Pole	78.4%	Pass
91.15 - 91	Pole + Reinf.	TP45.813x45.765x0.4438	Pole	78.5%	Pass
91 - 86	Pole + Reinf.	TP47.445x45.813x0.5	Pole	65.7%	Pass
86 - 81	Pole + Reinf.	TP49.078x47.445x0.5	Pole	67.4%	Pass
81 - 76	Pole + Reinf.	TP50.711x49.078x0.4938	Pole	69.1%	Pass
76 - 71	Pole + Reinf.	TP52.344x50.711x0.4875	Pole	70.7%	Pass
71 - 66	Pole + Reinf.	TP53.977x52.344x0.4875	Pole	72.3%	Pass
66 - 63.75	Pole + Reinf.	TP54.711x53.977x0.4875	Pole	73.1%	Pass
63.75 - 63.5	Pole + Reinf.	TP54.793x54.711x0.4875	Pole	73.1%	Pass
63.5 - 58.5	Pole + Reinf.	TP56.426x54.793x0.4813	Pole	74.7%	Pass
58.5 - 58	Pole + Reinf.	TP58.875x56.426x0.4813	Pole	74.9%	Pass
58 - 50	Pole + Reinf.	TP58.438x55.839x0.55	Pole	68.1%	Pass
50 - 45	Pole + Reinf.	TP60.063x58.438x0.55	Pole	69.7%	Pass
45 - 40.42	Pole + Reinf.	TP61.551x60.063x0.5438	Pole	71.2%	Pass
40.42 - 40.17	Pole + Reinf.	TP61.632x61.551x0.475	Pole	82.0%	Pass
40.17 - 40	Pole + Reinf.	TP61.688x61.632x0.475	Pole	82.0%	Pass
40 - 35	Pole + Reinf.	TP63.31x61.688x0.5313	Pole	68.2%	Pass
35 - 33	Pole + Reinf.	TP63.958x63.31x0.525	Pole	68.7%	Pass
33 - 32.75	Pole + Reinf.	TP64.039x63.958x0.6	Pole	61.9%	Pass
32.75 - 28	Pole + Reinf.	TP68.5x64.039x0.6	Pole	63.0%	Pass
28 - 18	Pole + Reinf.	TP67.958x64.705x0.6	Pole	66.3%	Pass
18 - 13	Pole + Reinf.	TP69.584x67.958x0.5875	Pole	67.4%	Pass
13 - 8	Pole + Reinf.	TP71.21x69.584x0.5875	Pole	68.5%	Pass
8 - 6.42	Pole + Reinf.	TP71.724x71.21x0.5875	Pole	68.8%	Pass
6.42 - 6.17	Pole + Reinf.	TP71.806x71.724x0.9375	Reinf. 9 Tension Rupture	74.2%	Pass
6.17 - 1.17	Pole + Reinf.	TP73.432x71.806x0.9125	Reinf. 9 Tension Rupture	74.8%	Pass
1.17 - 0	Pole + Reinf.	TP73.813x73.432x0.9	Reinf. 9 Tension Rupture	75.0%	Pass
				Summary	
			Pole	82.0%	Pass
			Reinforcement	75.0%	Pass
			Overall	82.0%	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	R5	R6	R7	R8	R9
185 - 180	436	n/a	436	10.74	n/a	10.74	7.8%									
180 - 175	749	n/a	749	15.58	n/a	15.58	12.5%									
175 - 170	955	n/a	955	16.89	n/a	16.89	26.7%									
170 - 165	1195	n/a	1195	18.20	n/a	18.20	38.2%									
165 - 160	1472	n/a	1472	19.51	n/a	19.51	51.2%									
160 - 155	1789	n/a	1789	20.82	n/a	20.82	61.2%									
155 - 154	1857	n/a	1857	21.09	n/a	21.09	64.7%									
154 - 153.75	1875	846	2720	21.15	9.00	30.15	43.2%								50.4%	
153.75 - 152.5	1963	871	2834	21.48	9.00	30.48	45.6%								52.9%	
152.5 - 152.25	1981	2216	4197	21.55	22.50	44.05	31.3%			34.9%					36.3%	
152.25 - 151.5	2036	2255	4291	21.74	22.50	44.24	32.3%			35.9%					37.4%	
151.5 - 151.25	2054	1371	3426	21.81	13.50	35.31	41.2%			45.8%						
151.25 - 146.25	2448	1532	3980	23.12	13.50	36.62	48.9%			53.3%						
146.25 - 141.25	2888	1702	4590	24.43	13.50	37.93	55.9%			59.6%						
141.25 - 136.25	3379	1880	5259	25.74	13.50	39.24	62.2%			64.9%						
136.25 - 135	3510	1926	5436	26.07	13.50	39.57	63.7%			66.1%						
135 - 129	4002	3470	7472	27.24	22.50	49.74	58.5%			59.7%				62.2%		
129 - 124	4607	3798	8405	28.54	22.50	51.04	63.3%			63.1%				65.8%		
124 - 121.42	4941	3973	8914	29.22	22.50	51.72	67.8%			64.7%				67.5%		
121.42 - 121.17	4975	4805	9779	29.28	27.00	56.28	62.4%		54.3%					61.9%		
121.17 - 116.17	5671	5226	10897	30.59	27.00	57.59	66.7%		56.8%					64.8%		
116.17 - 115	5843	5328	11171	30.90	27.00	57.90	67.7%		57.3%					65.4%		
115 - 113.75	7501	5437	12938	38.97	27.00	65.97	53.4%		51.3%					58.6%		
113.75 - 113.5	7549	3659	11208	39.05	18.00	57.05	64.2%		59.7%							
113.5 - 108.5	8536	3959	12495	40.68	18.00	58.68	67.3%		61.4%							
108.5 - 103.5	9605	4271	13876	42.32	18.00	60.32	70.2%		63.0%							
103.5 - 101	10172	4431	14603	43.13	18.00	61.13	71.6%		63.7%							
101 - 94	11364	9517	20880	44.75	36.00	80.75	59.3%		51.9%				51.9%			
94 - 91.4	12013	9863	21876	45.59	36.00	81.59	60.6%		52.5%				52.5%			
91.4 - 91.15	12076	4948	17025	45.67	18.00	63.67	78.4%						68.0%			
91.15 - 91	12115	4958	17073	45.72	18.00	63.72	78.5%						68.0%			
91 - 86	16095	5308	21404	56.76	18.00	74.76	65.7%						60.5%			
86 - 81	17829	5670	23499	58.72	18.00	76.72	67.4%						61.3%			
81 - 76	19683	6044	25727	60.69	18.00	78.69	69.1%						61.9%			
76 - 71	21661	6430	28091	62.66	18.00	80.66	70.7%						62.5%			
71 - 66	23768	6828	30596	64.63	18.00	82.63	72.3%						63.0%			
66 - 63.75	24758	7011	31770	65.52	18.00	83.52	73.1%						63.2%			
63.75 - 63.5	24870	7032	31902	65.62	18.00	83.62	73.1%					63.3%				
63.5 - 58.5	27177	7448	34624	67.58	18.00	85.58	74.7%					63.7%				
58.5 - 58	27415	7490	34905	67.78	18.00	85.78	74.9%					63.7%				
58 - 50	30211	13951	44161	70.01	31.50	101.51	68.1%	62.4%				57.0%				
50 - 45	32818	14721	47539	71.97	31.50	103.47	69.7%	62.9%				57.5%				
45 - 40.42	35334	15446	50780	73.76	31.50	105.26	71.2%	63.3%				57.9%				
40.42 - 40.17	35475	8854	44329	73.86	18.00	91.86	82.0%					66.6%				
40.17 - 40	35571	8870	44441	73.93	18.00	91.93	82.0%					66.6%				
40 - 35	44748	9333	54081	88.44	18.00	106.44	68.2%					59.2%				
35 - 33	46148	9522	55669	89.36	18.00	107.36	68.7%					59.2%				
33 - 32.75	46436	17211	63646	89.47	42.50	131.97	61.9%				46.3%					
32.75 - 28	49889	18029	67918	91.64	42.50	134.14	63.0%				46.6%					
28 - 18	55547	19329	74876	94.98	42.50	137.48	66.3%				48.3%					
18 - 13	59654	20245	79898	97.27	42.50	139.77	67.4%				48.5%					
13 - 8	63958	21182	85140	99.56	42.50	142.06	68.5%				48.7%					
8 - 6.42	65360	21482	86842	100.28	42.50	142.78	68.8%				48.8%					
6.42 - 6.17	65549	70691	136240	100.40	24.12	124.52	43.9%									74.2%
6.17 - 1.17	70127	72068	142195	102.68	24.12	126.80	45.4%									74.8%
1.17 - 0	71228	72392	143620	103.22	24.12	127.34	45.7%									75.0%

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

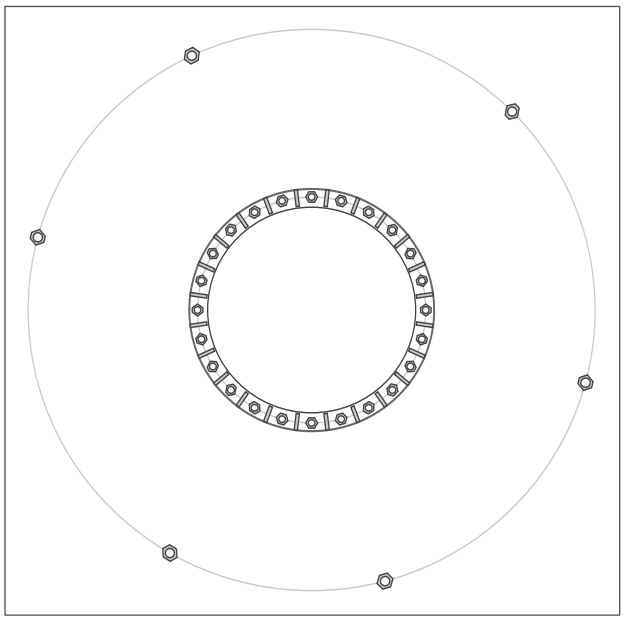
Monopole Base Plate Connection

Site Info	
BU #	825983
Site Name	Middletown_1
Order #	586786 Rev. 0

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	1.75

Applied Loads	
Moment (kip-ft)	5563.10
Axial Force (kips)	88.22
Shear Force (kips)	46.58

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

GROUP 1: (24) 2" ø bolts (A36 N; Fy=36 ksi, Fu=58 ksi) on 68" BC

GROUP 2: (6) 2-3/4" ø bolts (Titan 73/45 N; Fy=90.51429 ksi, Fu=108.6171 ksi) on 169" BC

pos. (deg): 45, 115, 165, 240, 285, 345

Base Plate Data

62" ID x 2" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Stiffener Data

(24) 18"H x 5"W x 1"T, Notch: 1"

plate: Fy= 50 ksi ; weld: Fy= 70 ksi

horiz. weld: 0.75" fillet

vert. weld: 0.375" fillet

Pole Data

73.8125" x 0.4375" 12-sided pole (A36M-42; Fy=42 ksi, Fu=60 ksi)

Analysis Results

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

GROUP 1:			
	Pu_c = 58.87	ϕPn_c = 101.79	**Stress Rating**
	Vu = 1.94	ϕVn = 45.8	**55.2%**
	Mu = n/a	ϕMn = n/a	Pass
GROUP 2:			
	Pu_c = 189.75	ϕPn_c = 285.12	**Stress Rating**
	Vu = 0	ϕVn = 128.3	**63.4%**
	Mu = n/a	ϕMn = n/a	Pass

Base Plate Summary

Max Stress (ksi):	11.9	(Roark's Flexural)
Allowable Stress (ksi):	32.4	
Stress Rating:	**35.0%**	Pass

Stiffener Summary

Horizontal Weld:	**18.6%**	Pass
Vertical Weld:	**9.4%**	Pass
Plate Flexure+Shear:	**1.7%**	Pass
Plate Tension+Shear:	**13.7%**	Pass
Plate Compression:	**12.3%**	Pass

Pole Summary

Punching Shear:	**3.0%**	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	No	No	
2	No	No	No	No	No	

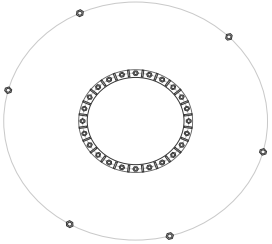
Custom Bolt Connection

Bolt	Bolt Group ID	Location (deg.)	Diameter (in)	Material	Bolt Circle (in)	Eta Factor, n:	l_{sr} (in):	Thread Type	Area Override, in^2	Tension Only
1	1	0	2	A36	68	0.5	1.75	N-Included		No
2	1	15	2	A36	68	0.5	1.75	N-Included		No
3	1	30	2	A36	68	0.5	1.75	N-Included		No
4	1	45	2	A36	68	0.5	1.75	N-Included		No
5	1	60	2	A36	68	0.5	1.75	N-Included		No
6	1	75	2	A36	68	0.5	1.75	N-Included		No
7	1	90	2	A36	68	0.5	1.75	N-Included		No
8	1	105	2	A36	68	0.5	1.75	N-Included		No
9	1	120	2	A36	68	0.5	1.75	N-Included		No
10	1	135	2	A36	68	0.5	1.75	N-Included		No
11	1	150	2	A36	68	0.5	1.75	N-Included		No
12	1	165	2	A36	68	0.5	1.75	N-Included		No
13	1	180	2	A36	68	0.5	1.75	N-Included		No
14	1	195	2	A36	68	0.5	1.75	N-Included		No
15	1	210	2	A36	68	0.5	1.75	N-Included		No
16	1	225	2	A36	68	0.5	1.75	N-Included		No
17	1	240	2	A36	68	0.5	1.75	N-Included		No
18	1	255	2	A36	68	0.5	1.75	N-Included		No
19	1	270	2	A36	68	0.5	1.75	N-Included		No
20	1	285	2	A36	68	0.5	1.75	N-Included		No
21	1	300	2	A36	68	0.5	1.75	N-Included		No
22	1	315	2	A36	68	0.5	1.75	N-Included		No
23	1	330	2	A36	68	0.5	1.75	N-Included		No
24	1	345	2	A36	68	0.5	1.75	N-Included		No
25	2	45	2.75	Titan 73/45	169	0.5	0	N-Included	3.5	No
26	2	115	2.75	Titan 73/45	169	0.5	0	N-Included	3.5	No
27	2	165	2.75	Titan 73/45	169	0.5	0	N-Included	3.5	No
28	2	240	2.75	Titan 73/45	169	0.5	0	N-Included	3.5	No
29	2	285	2.75	Titan 73/45	169	0.5	0	N-Included	3.5	No
30	2	345	2.75	Titan 73/45	169	0.5	0	N-Included	3.5	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	7.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
2	1	22.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
3	1	37.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
4	1	52.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
5	1	67.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
6	1	82.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
7	1	97.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
8	1	112.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
9	1	127.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
10	1	142.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
11	1	157.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
12	1	172.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
13	1	187.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
14	1	202.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
15	1	217.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
16	1	232.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
17	1	247.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
18	1	262.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
19	1	277.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
20	1	292.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
21	1	307.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
22	1	322.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
23	1	337.5	5	18	1	1	1	50	Fillet			0.75	0.375	70
24	1	352.5	5	18	1	1	1	50	Fillet			0.75	0.375	70

Plot Graphic



Pier and Pad Foundation

BU # :	825983
Site Name:	Middletown_1
App. Number:	586786 Rev. 0

TIA-222 Revision:	H
Tower Type:	Monopole

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

Superstructure Analysis Reactions		
Compression, P_{comp}:	88.22	kips
Base Shear, Vu_comp:	46.57	kips
Moment, M_u:	5563.1	ft-kips
Tower Height, **H**:	185	ft
BP Dist. Above Fdn, bp_{dist}:	4	in

Pier Properties		
Pier Shape:	Circular	
Pier Diameter, **dpier**:	7.5	ft
Ext. Above Grade, **E**:	0.25	ft
Pier Rebar Size, **Sc**:	8	
Pier Rebar Quantity, **mc**:	65	
Pier Tie/Spiral Size, **St**:	4	
Pier Tie/Spiral Quantity, **mt**:	8	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier}:	3	in

Pad Properties		
Depth, **D**:	10.5	ft
Pad Width, W_1:	25	ft
Pad Thickness, **T**:	3	ft
Pad Rebar Size (Bottom dir. 2), Sp_2:	8	
Pad Rebar Quantity (Bottom dir. 2), mp_2:	35	
Pad Clear Cover, cc_{pad}:	3	in

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

Soil Properties		
Total Soil Unit Weight, γ:	110	pcf
Ultimate Net Bearing, Qnet:	6.600	ksf
Cohesion, **Cu**:	1.000	ksf
Friction Angle, φ:	0	degrees
SPT Blow Count, N_{blows}:	13	
Base Friction, μ:	0.3	
Neglected Depth, **N**:	3.80	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, **gw**:	16	ft

<--Toggle between Gross and Net

Foundation Analysis Checks				
	Capacity	**Demand**	**Rating***	**Check**
Lateral (Sliding) (kips)	402.02	46.57	**11.0%**	**Pass**
Bearing Pressure (ksf)	5.82	3.34	**57.5%**	**Pass**
*Overturning (kip*ft)*	8098.32	6079.25	**75.1%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	8833.97	5924.02	**63.9%**	**Pass**
Pier Compression (kip)	28118.83	149.85	**0.5%**	**Pass**
*Pad Flexure (kip*ft)*	3818.20	2243.59	**56.0%**	**Pass**
Pad Shear - 1-way (kips)	896.51	352.31	**37.4%**	**Pass**
Pad Shear - 2-way (Comp) (ksi)	0.190	0.056	**28.2%**	**Pass**
*Flexural 2-way (Comp) (kip*ft)*	5013.71	3554.41	**67.5%**	**Pass**

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

Structural Rating*:	**67.5%**
Soil Rating*:	**75.1%**

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-16
Risk Category: II
Soil Class: D - Stiff Soil

Elevation: 89.45 ft (NAVD 88)
Latitude: 41.585639
Longitude: -72.714025

Wind

Results:

Wind Speed:	119 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	90 Vmph
100-year MRI	98 Vmph

Data Source:	ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed:	Wed Oct 13 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 7-16 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 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

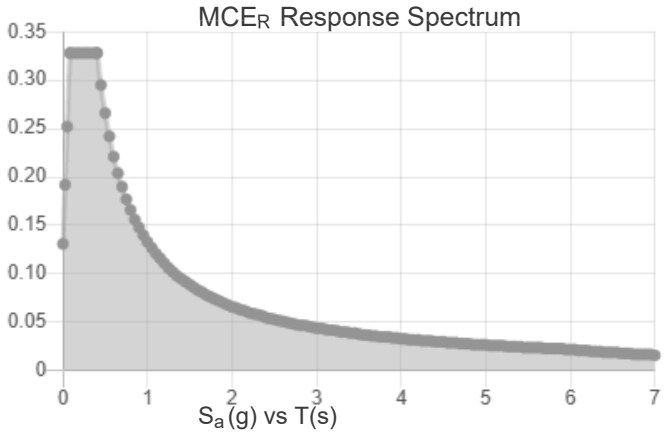
Seismic

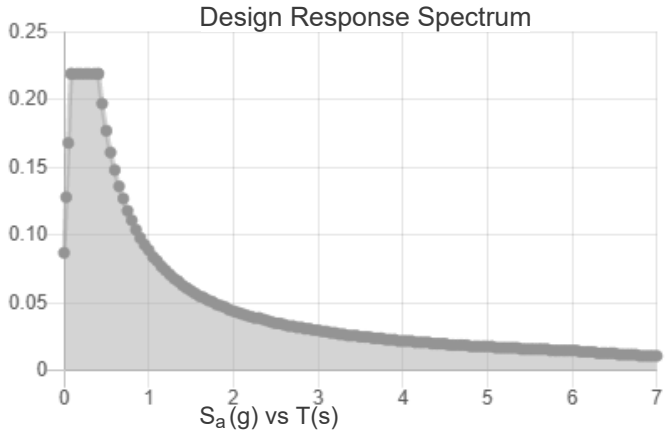
Site Soil Class: D - Stiff Soil

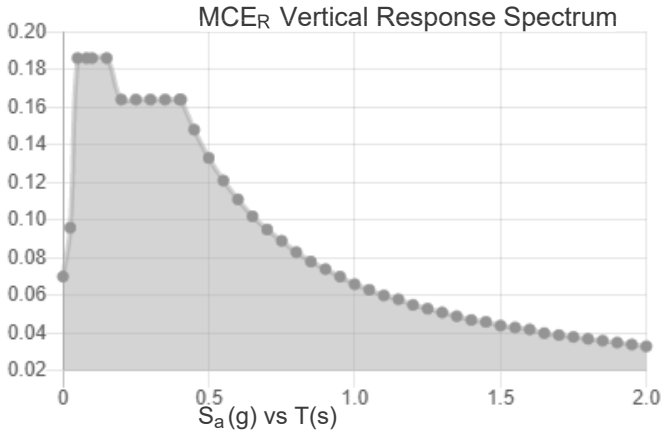
Results:

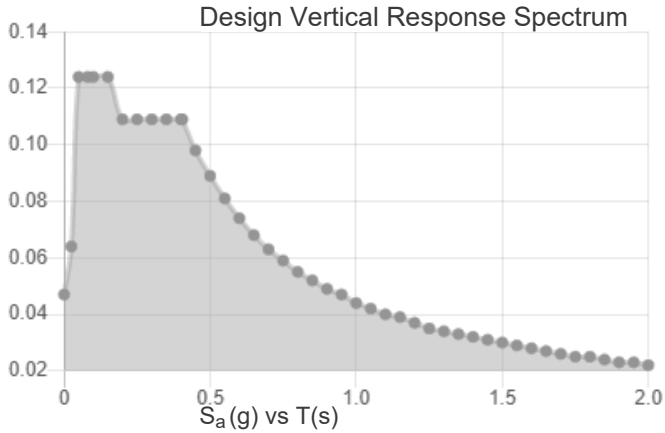
S_S :	0.205	S_{D1} :	0.089
S_1 :	0.055	T_L :	6
F_a :	1.6	PGA :	0.113
F_v :	2.4	PGA_M :	0.178
S_{MS} :	0.328	F_{PGA} :	1.573
S_{M1} :	0.133	I_e :	1
S_{DS} :	0.219	C_v :	0.71

Seismic Design Category B









Data Accessed: Wed Oct 13 2021

Date Source: USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness:	1.00 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Wed Oct 13 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 500-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Exhibit E

Mount Analysis

Date: **October 11, 2021**

Darcy Tarr
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
(704) 405-6589

Trylon
1825 W. Walnut Hill Lane,
Suite 302
Irving, TX 75038
214-930-1730

Subject:	**Mount Analysis Report**	
Carrier Designation:	**T-Mobile Anchor**	
	Carrier Site Number:	CT11057C
	Carrier Site Name:	Middletown_1
Crown Castle Designation:	**Crown Castle BU Number:**	825983
	Crown Castle Site Name:	Middletown_1
	Crown Castle JDE Job Number:	586786
	Crown Castle Order Number:	586786 Rev. 0
Engineering Firm Designation:	**Trylon Report Designation:**	193322
Site Data:	**90 Industrial Park Road, Middletown, Middlesex County, CT, 06457 Latitude 41°35'8.30" Longitude -72°42'50.49"**	
Structure Information:	**Tower Height & Type:**	**185.0 ft Monopole**
	Mount Elevation:	**183.0 ft**
	Mount Type:	**12.5 ft Platform**

Dear Darcy Tarr,

Trylon is pleased to submit this **"Mount Analysis Report"** to determine the structural integrity of T-Mobile's antenna mounting system with the proposed appurtenance and equipment addition on the abovementioned 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	**Sufficient**

This analysis utilizes an ultimate 3-second gust wind speed of 130 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Mount analysis prepared by: Aura Baltoiu

Respectfully Submitted by:
Cliff Abernathy, P.E.

cliff abernathy Digitally signed by cliff abernathy
Date: 2021.10.11 19:03:26 -04'00'

TABLE OF CONTENTS

1) INTRODUCTION

2) ANALYSIS CRITERIA
Table 1 - Proposed Equipment Configuration

3) ANALYSIS PROCEDURE
Table 2 - Documents Provided
3.1) Analysis Method
3.2) Assumptions

4) ANALYSIS RESULTS
Table 3 - Mount Component Stresses vs. Capacity
4.1) Recommendations

5) APPENDIX A
Wire Frame and Rendered Models

6) APPENDIX B
Software Input Calculations

7) APPENDIX C
Software Analysis Output

8) APPENDIX D
Additional Calculations

1) INTRODUCTION

This is an existing 3 sector 12.5 ft Platform, designed by Site Pro 1.

2) ANALYSIS CRITERIA

Building Code:	2015 IBC
TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	130 mph
Exposure Category:	C
Topographic Factor at Base:	1.00
Topographic Factor at Mount:	1.00
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Seismic S_s:	0.180
Seismic S_1:	0.063
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 / Modification Details
183.0	183.0	3	ERICSSON	AIR6449 B41_T-MOBILE	12.5 ft Platform
		3	RFS/CELWAVE	APXVAARR24_43-U-NA20	
		3	ERICSSON	RADIO 4449 B12/B71	
		3	ERICSSON	RADIO 4460 B2/B25 B66_TMO	

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
Crown Application	T-Mobile Application	586786, Rev.0	CCI Sites
Mount Manufacturer Drawings	Site Pro 1	RMQP-496-HK	Trylon

3.1) Analysis Method

RISA-3D (Version 17.0.4), 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, using Microsoft Excel, by Trylon 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 B).

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) The analysis will be required to be revised if the existing conditions in the field differ from those shown in the above-referenced documents or assumed in this analysis. No allowance was made for any damaged, missing, or rusted members.
5) Prior structural modifications to the tower mounting system are assumed to be installed as shown per available data.
6) Steel grades have been assumed as follows, unless noted otherwise:

Channel, Solid Round, Angle, Plate	ASTM A36 (GR 36)
HSS (Rectangular)	ASTM A500 (GR B-46)
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. Trylon 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, All Sectors)

Notes	Component	Critical Member	Centerline (ft)	% Capacity	Pass / Fail
1,2,3	Mount Pipe(s)	MP10	183.0	67.3	Pass
	Horizontal(s)	H3		14.9	Pass
	Standoff(s)	M86		18.0	Pass
	Bracing(s)	M5		22.2	Pass
	Handrail(s)	M10		56.4	Pass
	Kicker(s)	M101		22.6	Pass
	Tieback(s)	M39		33.4	Pass
	Mount Connection(s)	-		18.0	Pass

Structure Rating (max from all components) =	67.3%

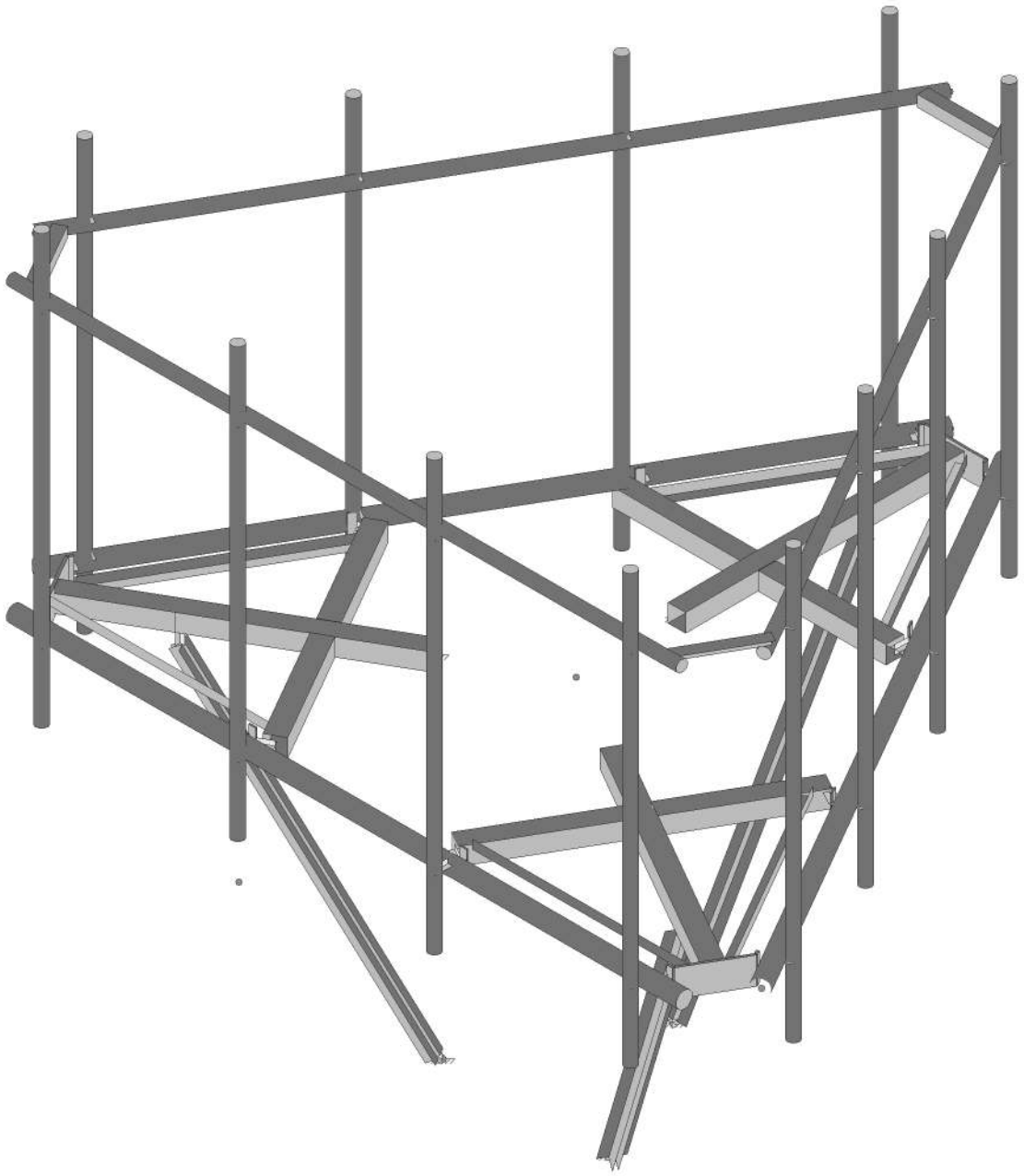
Notes:
1) See additional documentation in "Appendix C - Software Analysis Output" for calculations supporting the % capacity consumed.
2) All sectors are typical
3) Rating per TIA-222-H, Section 15.5

4.1) Recommendations

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

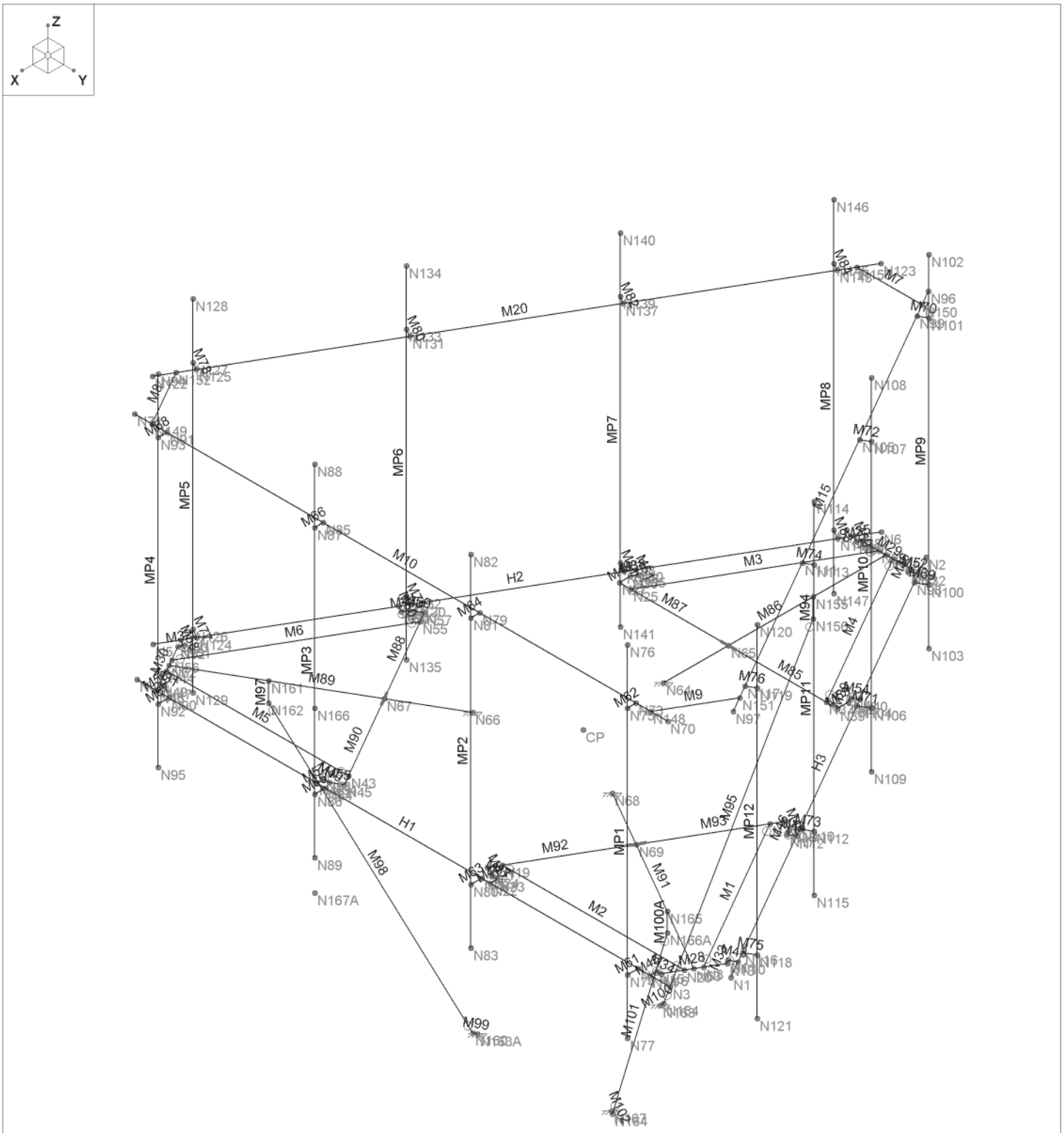
APPENDIX A

WIRE FRAME AND RENDERED MODELS



Envelope Only Solution

Trylon	825983	SK - 1
AB		Oct 11, 2021 at 7:39 AM
193322		825983.r3d



Envelope Only Solution

Trylon	825983	SK - 2
AB		Oct 11, 2021 at 7:39 AM
193322		825983.r3d

APPENDIX B

SOFTWARE INPUT 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: 89.45 ft (NAVD 88)
Latitude: 41.585639
Longitude: -72.714025

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 Oct 11 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.

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

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

In using this Tool, you expressly assume all risks associated with your use. Under no circumstances shall ASCE or its officers, directors, employees, members, affiliates, or agents be liable to you or any other person for any direct, indirect, special, incidental, or consequential damages arising from or related to your use of, or reliance on, the Tool or any information obtained therein. To the fullest extent permitted by law, you agree to release and hold harmless ASCE from any and all liability of any nature arising out of or resulting from any use of data provided by the ASCE 7 Hazard Tool.

Trylon
1825 W. Walnut Hill Lane Suite 120
Irving, TX 75038

TIA LOAD CALCULATOR 2.1

PROJECT DATA	
Job Code:	193322
Carrier Site ID:	CT11057C
Carrier Site Name:	-

CODES AND STANDARDS	
Building Code:	2015 IBC
Local Building Code:	Connecticut State Building
Design Standard:	TIA-222-H

STRUCTURE DETAILS		
Mount Type:	Platform	--
Mount Elevation:	183.0	ft.
Number of Sectors:	3	--
Structure Type:	Monopole	--
Structure Height:	185.0	ft.

ANALYSIS CRITERIA		
Structure Risk Category:	II	--
Exposure Category:	C	--
Site Class:	D - Stiff Soil	--
Ground Elevation:	89.45	ft.

TOPOGRAPHIC DATA		
Topographic Category:	1.00	--
Topographic Feature:	N/A	--
Crest Point Elevation:	0.00	ft.
Base Point Elevation:	0.00	ft.
Crest to Mid-Height (L/2):	0.00	ft.
Distance from Crest (x):	0.00	ft.
Base Topo Factor (K_{zt}):	1.00	--
Mount Topo Factor (K_{zt}):	1.00	--

WIND PARAMETERS		
Design Wind Speed:	130	mph
Wind Escalation Factor (K_s):	1.00	--
Velocity Coefficient (K_z):	1.44	--
Directionality Factor (K_d):	0.95	--
Gust Effect Factor (Gh):	1.00	--
Shielding Factor (K_a):	0.90	--
Velocity Pressure (q_z):	58.88	psf
Ground Elevation Factor (K_e):	1.00	--

ICE PARAMETERS		
Design Ice Wind Speed:	50	mph
Design Ice Thickness (t_i):	1.50	in
Importance Factor (I_i):	1.00	--
Ice Velocity Pressure (q_{zi}):	58.88	psf
Mount Ice Thickness (t_{iz}):	1.78	in

WIND STRUCTURE CALCULATIONS		
Flat Member Pressure:	105.99	psf
Round Member Pressure:	63.60	psf
Ice Wind Pressure:	7.77	psf

SEISMIC PARAMETERS		
Importance Factor (I_e):	1.00	--
Short Period Accel .(S_s):	0.180	g
1 Second Accel (S_1):	0.063	g
Short Period Des. (S_{DS}):	0.19	g
1 Second Des. (S_{D1}):	0.10	g
Short Period Coeff. (F_a):	1.60	--
1 Second Coeff. (F_v):	2.40	--
Response Coefficient (Cs):	0.10	--
Amplification Factor (A_S):	1.20	--

LOAD COMBINATIONS [LRFD]

#	Description
1	1.4DL
2	1.2DL + 1WL 0 AZI
3	1.2DL + 1WL 30 AZI
4	1.2DL + 1WL 45 AZI
5	1.2DL + 1WL 60 AZI
6	1.2DL + 1WL 90 AZI
7	1.2DL + 1WL 120 AZI
8	1.2DL + 1WL 135 AZI
9	1.2DL + 1WL 150 AZI
10	1.2DL + 1WL 180 AZI
11	1.2DL + 1WL 210 AZI
12	1.2DL + 1WL 225 AZI
13	1.2DL + 1WL 240 AZI
14	1.2DL + 1WL 270 AZI
15	1.2DL + 1WL 300 AZI
16	1.2DL + 1WL 315 AZI
17	1.2DL + 1WL 330 AZI
18	0.9DL + 1WL 0 AZI
19	0.9DL + 1WL 30 AZI
20	0.9DL + 1WL 45 AZI
21	0.9DL + 1WL 60 AZI
22	0.9DL + 1WL 90 AZI
23	0.9DL + 1WL 120 AZI
24	0.9DL + 1WL 135 AZI
25	0.9DL + 1WL 150 AZI
26	0.9DL + 1WL 180 AZI
27	0.9DL + 1WL 210 AZI
28	0.9DL + 1WL 225 AZI
29	0.9DL + 1WL 240 AZI
30	0.9DL + 1WL 270 AZI
31	0.9DL + 1WL 300 AZI
32	0.9DL + 1WL 315 AZI
33	0.9DL + 1WL 330 AZI
34	1.2DL + 1DLi + 1WLi 0 AZI
35	1.2DL + 1DLi + 1WLi 30 AZI
36	1.2DL + 1DLi + 1WLi 45 AZI
37	1.2DL + 1DLi + 1WLi 60 AZI
38	1.2DL + 1DLi + 1WLi 90 AZI
39	1.2DL + 1DLi + 1WLi 120 AZI
40	1.2DL + 1DLi + 1WLi 135 AZI
41	1.2DL + 1DLi + 1WLi 150 AZI

#	Description
42	1.2DL + 1DLi + 1WLi 180 AZI
43	1.2DL + 1DLi + 1WLi 210 AZI
44	1.2DL + 1DLi + 1WLi 225 AZI
45	1.2DL + 1DLi + 1WLi 240 AZI
46	1.2DL + 1DLi + 1WLi 270 AZI
47	1.2DL + 1DLi + 1WLi 300 AZI
48	1.2DL + 1DLi + 1WLi 315 AZI
49	1.2DL + 1DLi + 1WLi 330 AZI
50	(1.2+0.2Sds) + 1.0E 0 AZI
51	(1.2+0.2Sds) + 1.0E 30 AZI
52	(1.2+0.2Sds) + 1.0E 45 AZI
53	(1.2+0.2Sds) + 1.0E 60 AZI
54	(1.2+0.2Sds) + 1.0E 90 AZI
55	(1.2+0.2Sds) + 1.0E 120 AZI
56	(1.2+0.2Sds) + 1.0E 135 AZI
57	(1.2+0.2Sds) + 1.0E 150 AZI
58	(1.2+0.2Sds) + 1.0E 180 AZI
59	(1.2+0.2Sds) + 1.0E 210 AZI
60	(1.2+0.2Sds) + 1.0E 225 AZI
61	(1.2+0.2Sds) + 1.0E 240 AZI
62	(1.2+0.2Sds) + 1.0E 270 AZI
63	(1.2+0.2Sds) + 1.0E 300 AZI
64	(1.2+0.2Sds) + 1.0E 315 AZI
65	(1.2+0.2Sds) + 1.0E 330 AZI
66	(0.9-0.2Sds) + 1.0E 0 AZI
67	(0.9-0.2Sds) + 1.0E 30 AZI
68	(0.9-0.2Sds) + 1.0E 45 AZI
69	(0.9-0.2Sds) + 1.0E 60 AZI
70	(0.9-0.2Sds) + 1.0E 90 AZI
71	(0.9-0.2Sds) + 1.0E 120 AZI
72	(0.9-0.2Sds) + 1.0E 135 AZI
73	(0.9-0.2Sds) + 1.0E 150 AZI
74	(0.9-0.2Sds) + 1.0E 180 AZI
75	(0.9-0.2Sds) + 1.0E 210 AZI
76	(0.9-0.2Sds) + 1.0E 225 AZI
77	(0.9-0.2Sds) + 1.0E 240 AZI
78	(0.9-0.2Sds) + 1.0E 270 AZI
79	(0.9-0.2Sds) + 1.0E 300 AZI
80	(0.9-0.2Sds) + 1.0E 315 AZI
81	(0.9-0.2Sds) + 1.0E 330 AZI
82-88	1.2D + 1.5 Lv1

#	Description
89	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP1
90	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP1
91	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP1
92	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP1
93	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP1
94	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP1
95	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP1
96	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP1
97	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP1
98	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP1
99	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP1
100	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP1
101	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP1
102	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP1
103	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP1
104	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP1
105	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP2
106	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP2
107	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP2
108	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP2
109	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP2
110	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP2
111	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP2
112	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP2
113	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP2
114	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP2
115	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP2
116	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP2
117	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP2
118	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP2
119	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP2
120	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP2

#	Description
121	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP3
122	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP3
123	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP3
124	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP3
125	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP3
126	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP3
127	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP3
128	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP3
129	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP3
130	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP3
131	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP3
132	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP3
133	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP3
134	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP3
135	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP3
136	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP3
137	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP4
138	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP4
139	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP4
140	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP4
141	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP4
142	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP4
143	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP4
144	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP4
145	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP4
146	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP4
147	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP4
148	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP4
149	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP4
150	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP4
151	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP4
152	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP4

*This page shows an example of maintenance loads for (4) pipes, the number of mount pipe LCs may vary per site

EQUIPMENT LOADING

Appurtenance Name	Qty.	Elevation [ft]	--	EPA_N (ft2)	EPA_T (ft2)	Weight (lbs)
AIR6449 B41_T-MOBILE	3	183	No Ice	5.27	2.03	114.63
--	--	--	w/ Ice	6.63	3.10	158.20
APXVAARR24_43-U-NA20	3	183	No Ice	14.67	5.32	128.00
--	--	--	w/ Ice	17.04	7.41	440.24
RADIO 4460B2/B25 B66_TMO	3	183	No Ice	2.14	1.69	109.00
--	--	--	w/ Ice	2.60	2.10	93.24
RADIO 4449B12/B71	3	183	No Ice	1.64	1.15	75.00
--	--	--	w/ Ice	2.05	1.51	69.61
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			

EQUIPMENT LOADING [CONT.]

Appurtenance Name	Qty.	Elevation [ft]	--	EPA $_N$ (ft2)	EPA $_T$ (ft2)	Weight (lbs)
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			

EQUIPMENT WIND CALCULATIONS

Appurtenance Name	Qty.	Elevation [ft]	K_{zt}	K_z	K_d	t_d	q_z [psf]	q_{zi} [psf]
AIR6449 B41_T-MOBILE	3	183	1.00	1.44	0.95	1.78	58.88	8.71
APXVAARR24_43-U-NA20	3	183	1.00	1.44	0.95	1.78	58.88	8.71
DIO 4460B2/B25 B66_TM	3	183	1.00	1.44	0.95	1.78	58.88	8.71
RADIO 4449B12/B71	3	183	1.00	1.44	0.95	1.78	58.88	8.71

EQUIPMENT LATERAL WIND FORCE CALCULATIONS

Appurtenance Name	Qty.	--	0° 180°	30° 210°	60° 240°	90° 270°	120° 300°	150° 330°
AIR6449 B41_T-MOBILE	3	No Ice	279.29	150.51	236.36	107.58	236.36	150.51
--	--	w/ Ice	52.01	31.23	45.08	24.30	45.08	31.23
APXVAARR24_43-U-NA20	3	No Ice	777.45	405.82	653.57	281.94	653.57	405.82
--	--	w/ Ice	133.57	76.93	114.69	58.06	114.69	76.93
RADIO 4460B2/B25 B66_TMO	3	No Ice	113.37	95.35	107.36	89.34	107.36	95.35
--	--	w/ Ice	20.35	17.45	19.38	16.48	19.38	17.45
RADIO 4449B12/B71	3	No Ice	87.09	67.58	80.58	61.07	80.58	67.58
--	--	w/ Ice	16.06	12.89	15.01	11.83	15.01	12.89
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						

EQUIPMENT LATERAL WIND FORCE CALCULATIONS [CONT.]

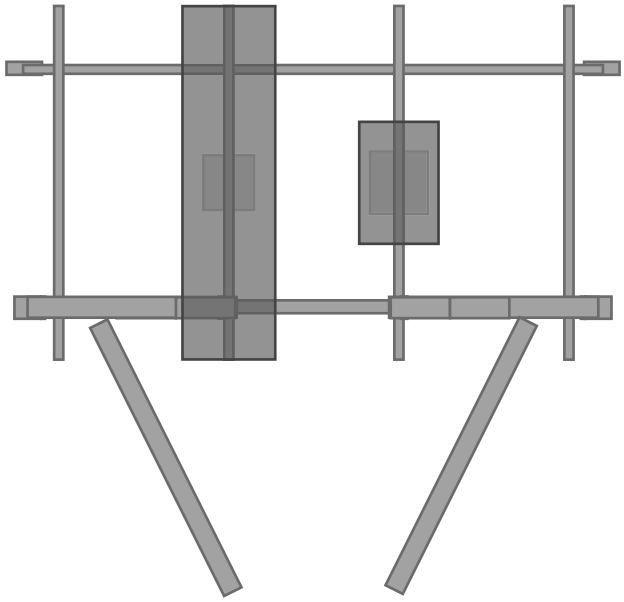
Appurtenance Name	Qty.	--	0° 180°	30° 210°	60° 240°	90° 270°	120° 300°	150° 330°
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						

EQUIPMENT SEISMIC FORCE CALCULATIONS

Appurtenance Name	Qty.	Elevation [ft]	Weight [lbs]	F_p [lbs]
AIR6449 B41_T-MOBILE	3	183	114.63	13.21
APXVAARR24_43-U-NA20	3	183	128	14.75
RADIO 4460B2/B25 B66_TMO	3	183	109	12.56
RADIO 4449B12/B71	3	183	75	8.64

1825 W. Walnut Hill Lane, Suite 120
Irving, Texas 75038

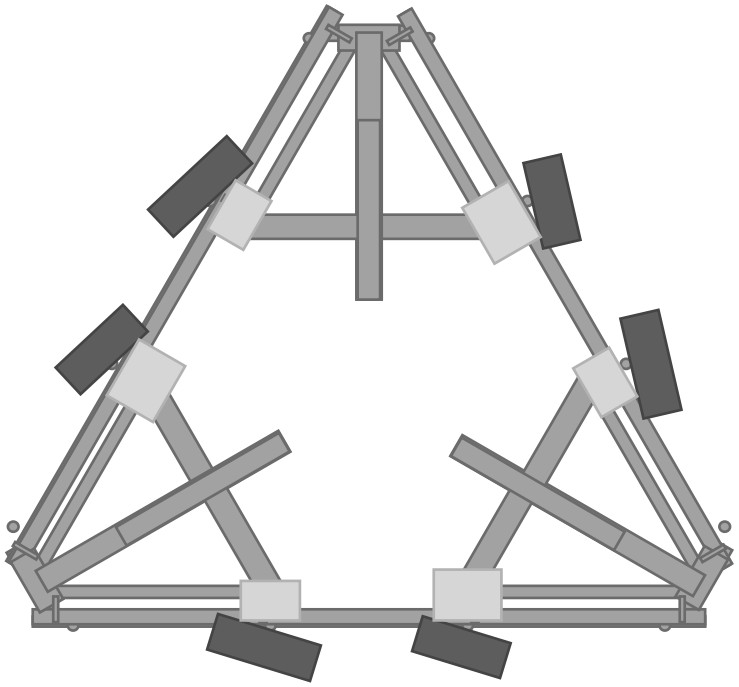
ELEVATION VIEW



MP4 MP3 MP2 MP1

*Elevation View Shows Alpha Sector Only

PLAN VIEW



1825 W. Walnut Hill Lane, Suite 120
Irving, Texas 75038

Equipment Name	Total Quantity	Antenna Centerline	Mount Pipe Positions	Equipment Azimuths
AIR6449 B41_T-MOBILE	3	183	MP2/MP6/MP10	17/137/257
APXVAARR24_43-U-NA20	3	183	MP3/MP7/MP11	17/137/257
RADIO 4460B2/B25 B66_TMO	3	183	MP2/MP6/MP10	0/120/240
RADIO 4449B12/B71	3	183	MP3/MP7/MP11	0/120/240

APPENDIX C

SOFTWARE ANALYSIS OUTPUT

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (in/sec^2)	386.4
Wall Mesh Size (in)	24
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Z
Global Member Orientation Plane	XY
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 15th(360-16): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 15th(360-16): LRFD
Cold Formed Steel Code	AISI S100-16: LRFD
Wood Code	None
Wood Temperature	< 100F
Concrete Code	None
Masonry Code	None
Aluminum Code	None - Building
Stainless Steel Code	None

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	No
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR_SET_ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8

(Global) Model Settings, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (in)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	1
Cd X	1
Rho Z	1
Rho X	1

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1E..	Density[k/ft...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A992	29000	11154	.3	.65	.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	.3	.65	.527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	.527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	.3	.65	.49	35	1.6	60	1.2
7	A1085	29000	11154	.3	.65	.49	50	1.4	65	1.3
8	A913 Gr.65	29000	11154	.3	.65	.49	65	1.1	80	1.1

Cold Formed Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1E5 F)	Density[k/ft^3]	Yield[ksi]	Fu[ksi]
1	A653 SS Gr33	29500	11346	.3	.65	.49	33	45
2	A653 SS Gr50/1	29500	11346	.3	.65	.49	50	65

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rul...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	PIPE 2.0	PIPE 2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
2	HSS4X4X4	HSS4X4X4	Beam	Tube	A53 Gr.B	Typical	3.37	7.8	7.8	12.8
3	L2x2x3	L2x2x3	Beam	Single Angle	A53 Gr.B	Typical	.722	.271	.271	.009
4	L2.5x2.5x4	L2.5x2.5x4	Beam	Single Angle	A53 Gr.B	Typical	1.19	.692	.692	.026
5	Plate 6"x0.5"	Pl 6"x0.5"	Beam	RECT	A53 Gr.B	Typical	3	.063	9	.237
6	Plate 6"x0.375"	PL 6x0.375	Beam	RECT	A53 Gr.B	Typical	2.25	.026	6.75	.101

Hot Rolled Steel Section Sets (Continued)

	Label	Shape	Type	Design List	Material	Design Rul...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
7	PIPE 3.0	PIPE 3.0	Beam	Pipe	A53 Gr.B	Typical	2.07	2.85	2.85	5.69
8	PIPE 2.5	PIPE 2.5	Beam	Pipe	A53 Gr.B	Typical	1.61	1.45	1.45	2.89
9	PRK 1245	LL2.5x2.5x3x0	Beam	Double An...	A53 Gr.B	Typical	1.8	1.91	1.07	.023

Cold Formed Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rules	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	CF1A	8CU1.25X057	Beam	None	A653 SS Gr33	Typical	.581	.057	4.41	.00063

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N64	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N68	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N66	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
4	N154						
5	N155						
6	N156						
7	N163	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
8	N160						
9	N161						
10	N162						
11	N163A	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
12	N164						
13	N165						
14	N166A						
15	N167	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
1	Self Weight	DL			-1		18		3	
2	Structure Wind X	WLX						102		
3	Structure Wind Y	WLY						102		
4	Wind Load 0 AZI	WLX					36			
5	Wind Load 30 AZI	None					36			
6	Wind Load 45 AZI	None					36			
7	Wind Load 60 AZI	None					36			
8	Wind Load 90 AZI	WLY					36			
9	Wind Load 120 AZI	None					36			
10	Wind Load 135 AZI	None					36			
11	Wind Load 150 AZI	None					36			
12	Ice Weight	OL1					18	102	3	
13	Ice Structure Wind X	OL2						102		
14	Ice Structure Wind Y	OL3						102		
15	Ice Wind Load 0 AZI	OL2					36			
16	Ice Wind Load 30 AZI	None					36			
17	Ice Wind Load 45 AZI	None					36			
18	Ice Wind Load 60 AZI	None					36			
19	Ice Wind Load 90 AZI	OL3					36			

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
20	Ice Wind Load 120 AZI	None					36			
21	Ice Wind Load 135 AZI	None					36			
22	Ice Wind Load 150 AZI	None					36			
23	Seismic Load X	ELX	-.115				18			
24	Seismic Load Y	ELY		-.115			18			
25	Live Load 1 (Lv)	None					1			
26	Live Load 2 (Lv)	None					1			
27	Live Load 3 (Lv)	None					1			
28	Live Load 4 (Lv)	None					1			
29	Live Load 5 (Lv)	None					1			
30	Live Load 6 (Lv)	None					1			
31	Live Load 7 (Lv)	None					1			
32	Live Load 8 (Lv)	None					1			
33	Live Load 9 (Lv)	None					1			
34	Maintenance Load 1 (...	None					1			
35	Maintenance Load 2 (...	None					1			
36	Maintenance Load 3 (...	None					1			
37	Maintenance Load 4 (...	None					1			
38	Maintenance Load 5 (...	None					1			
39	Maintenance Load 6 (...	None					1			
40	Maintenance Load 7 (...	None					1			
41	Maintenance Load 8 (...	None					1			
42	Maintenance Load 9 (...	None					1			
43	Maintenance Load 10 ...	None					1			
44	Maintenance Load 11 ...	None					1			
45	Maintenance Load 12 ...	None					1			
46	BLC 1 Transient Area...	None						54		
47	BLC 12 Transient Are...	None						54		

Load Combinations

	Description	Sol...	PD...	SR...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...
1	1.4DL	Yes	Y		DL	1.4																				
2	1.2DL + 1...	Yes	Y		DL	1.2	2	1	3		4	1														
3	1.2DL + 1...	Yes	Y		DL	1.2	2	.866	3	.5	5	1														
4	1.2DL + 1...	Yes	Y		DL	1.2	2	.707	3	.707	6	1														
5	1.2DL + 1...	Yes	Y		DL	1.2	2	.5	3	.866	7	1														
6	1.2DL + 1...	Yes	Y		DL	1.2	2		3	1	8	1														
7	1.2DL + 1...	Yes	Y		DL	1.2	2	-.5	3	.866	9	1														
8	1.2DL + 1...	Yes	Y		DL	1.2	2	-.707	3	.707	10	1														
9	1.2DL + 1...	Yes	Y		DL	1.2	2	-.866	3	.5	11	1														
10	1.2DL + 1...	Yes	Y		DL	1.2	2	-1	3		4	-1														
11	1.2DL + 1...	Yes	Y		DL	1.2	2	-.866	3	-.5	5	-1														
12	1.2DL + 1...	Yes	Y		DL	1.2	2	-.707	3	-.707	6	-1														
13	1.2DL + 1...	Yes	Y		DL	1.2	2	-.5	3	-.866	7	-1														
14	1.2DL + 1...	Yes	Y		DL	1.2	2		3	-1	8	-1														
15	1.2DL + 1...	Yes	Y		DL	1.2	2	.5	3	-.866	9	-1														
16	1.2DL + 1...	Yes	Y		DL	1.2	2	.707	3	-.707	10	-1														
17	1.2DL + 1...	Yes	Y		DL	1.2	2	.866	3	-.5	11	-1														
18	0.9DL + 1...	Yes	Y		DL	.9	2	1	3		4	1														
19	0.9DL + 1...	Yes	Y		DL	.9	2	.866	3	.5	5	1														

Load Combinations (Continued)

	Description	Sol..	PD..	SR..	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...
20	0.9DL + 1...	Yes	Y		DL	.9	2	.707	3	.707	6	1														
21	0.9DL + 1...	Yes	Y		DL	.9	2	.5	3	.866	7	1														
22	0.9DL + 1...	Yes	Y		DL	.9	2		3	1	8	1														
23	0.9DL + 1...	Yes	Y		DL	.9	2	-.5	3	.866	9	1														
24	0.9DL + 1...	Yes	Y		DL	.9	2	-.707	3	.707	10	1														
25	0.9DL + 1...	Yes	Y		DL	.9	2	-.866	3	.5	11	1														
26	0.9DL + 1...	Yes	Y		DL	.9	2	-1	3		4	-1														
27	0.9DL + 1...	Yes	Y		DL	.9	2	-.866	3	-.5	5	-1														
28	0.9DL + 1...	Yes	Y		DL	.9	2	-.707	3	-.707	6	-1														
29	0.9DL + 1...	Yes	Y		DL	.9	2	-.5	3	-.866	7	-1														
30	0.9DL + 1...	Yes	Y		DL	.9	2		3	-1	8	-1														
31	0.9DL + 1...	Yes	Y		DL	.9	2	.5	3	-.866	9	-1														
32	0.9DL + 1...	Yes	Y		DL	.9	2	.707	3	-.707	10	-1														
33	0.9DL + 1...	Yes	Y		DL	.9	2	.866	3	-.5	11	-1														
34	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	1	14		15	1												
35	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	.866	14	.5	16	1												
36	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	.707	14	.707	17	1												
37	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	.5	14	.866	18	1												
38	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13		14	1	19	1												
39	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	-.5	14	.866	20	1												
40	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	-.707	14	.707	21	1												
41	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	-.866	14	.5	22	1												
42	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	-1	14		15	-1												
43	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	-.866	14	-.5	16	-1												
44	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	-.707	14	-.707	17	-1												
45	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	-.5	14	-.866	18	-1												
46	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13		14	-1	19	-1												
47	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	.5	14	-.866	20	-1												
48	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	.707	14	-.707	21	-1												
49	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	.866	14	-.5	22	-1												
50	(1.2+0.2S...	Yes	Y		DL	1.238	23	1	24																	
51	(1.2+0.2S...	Yes	Y		DL	1.238	23	.866	24	.5																
52	(1.2+0.2S...	Yes	Y		DL	1.238	23	.707	24	.707																
53	(1.2+0.2S...	Yes	Y		DL	1.238	23	.5	24	.866																
54	(1.2+0.2S...	Yes	Y		DL	1.238	23		24	1																
55	(1.2+0.2S...	Yes	Y		DL	1.238	23	-.5	24	.866																
56	(1.2+0.2S...	Yes	Y		DL	1.238	23	-.707	24	.707																
57	(1.2+0.2S...	Yes	Y		DL	1.238	23	-.866	24	.5																
58	(1.2+0.2S...	Yes	Y		DL	1.238	23	-1	24																	
59	(1.2+0.2S...	Yes	Y		DL	1.238	23	-.866	24	-.5																
60	(1.2+0.2S...	Yes	Y		DL	1.238	23	-.707	24	-.707																
61	(1.2+0.2S...	Yes	Y		DL	1.238	23	-.5	24	-.866																
62	(1.2+0.2S...	Yes	Y		DL	1.238	23		24	-1																
63	(1.2+0.2S...	Yes	Y		DL	1.238	23	.5	24	-.866																
64	(1.2+0.2S...	Yes	Y		DL	1.238	23	.707	24	-.707																
65	(1.2+0.2S...	Yes	Y		DL	1.238	23	.866	24	-.5																
66	(0.9-0.2Sd...	Yes	Y		DL	.862	23	1	24																	
67	(0.9-0.2Sd...	Yes	Y		DL	.862	23	.866	24	.5																
68	(0.9-0.2Sd...	Yes	Y		DL	.862	23	.707	24	.707																
69	(0.9-0.2Sd...	Yes	Y		DL	.862	23	.5	24	.866																
70	(0.9-0.2Sd...	Yes	Y		DL	.862	23		24	1																
71	(0.9-0.2Sd...	Yes	Y		DL	.862	23	-.5	24	.866																

Load Combinations (Continued)

	Description	Sol..	PD..	SR..	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...
72	(0.9-0.2Sd..	Yes	Y		DL	.862	23	-.707	24	.707																
73	(0.9-0.2Sd..	Yes	Y		DL	.862	23	-.866	24	.5																
74	(0.9-0.2Sd..	Yes	Y		DL	.862	23	-1	24																	
75	(0.9-0.2Sd..	Yes	Y		DL	.862	23	-.866	24	-.5																
76	(0.9-0.2Sd..	Yes	Y		DL	.862	23	-.707	24	-.707																
77	(0.9-0.2Sd..	Yes	Y		DL	.862	23	-.5	24	-.866																
78	(0.9-0.2Sd..	Yes	Y		DL	.862	23		24	-1																
79	(0.9-0.2Sd..	Yes	Y		DL	.862	23	.5	24	-.866																
80	(0.9-0.2Sd..	Yes	Y		DL	.862	23	.707	24	-.707																
81	(0.9-0.2Sd..	Yes	Y		DL	.862	23	.866	24	-.5																
82	1.2DL + 1...	Yes	Y		DL	1.2	25	1.5																		
83	1.2DL + 1...	Yes	Y		DL	1.2	26	1.5																		
84	1.2DL + 1...	Yes	Y		DL	1.2	27	1.5																		
85	1.2DL + 1...	Yes	Y		DL	1.2	28	1.5																		
86	1.2DL + 1...	Yes	Y		DL	1.2	29	1.5																		
87	1.2DL + 1...	Yes	Y		DL	1.2	30	1.5																		
88	1.2DL + 1...	Yes	Y		DL	1.2	31	1.5																		
89	1.2DL + 1...	Yes	Y		DL	1.2	32	1.5																		
90	1.2DL + 1...	Yes	Y		DL	1.2	33	1.5																		
91	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2	.053	3		4	.053												
92	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2	.046	3	.027	5	.053												
93	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2	.038	3	.038	6	.053												
94	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2	.027	3	.046	7	.053												
95	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2		3	.053	8	.053												
96	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2	-.027	3	.046	9	.053												
97	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2	-.038	3	.038	10	.053												
98	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2	-.046	3	.027	11	.053												
99	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2	-.053	3		4	-.053												
100	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2	-.046	3	-.027	5	-.053												
101	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2	-.038	3	-.038	6	-.053												
102	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2	-.027	3	-.046	7	-.053												
103	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2		3	-.053	8	-.053												
104	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2	.027	3	-.046	9	-.053												
105	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2	.038	3	-.038	10	-.053												
106	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2	.046	3	-.027	11	-.053												
107	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2	.053	3		4	.053												
108	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2	.046	3	.027	5	.053												
109	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2	.038	3	.038	6	.053												
110	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2	.027	3	.046	7	.053												
111	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2		3	.053	8	.053												
112	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2	-.027	3	.046	9	.053												
113	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2	-.038	3	.038	10	.053												
114	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2	-.046	3	.027	11	.053												
115	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2	-.053	3		4	-.053												
116	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2	-.046	3	-.027	5	-.053												
117	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2	-.038	3	-.038	6	-.053												
118	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2	-.027	3	-.046	7	-.053												
119	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2		3	-.053	8	-.053												
120	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2	.027	3	-.046	9	-.053												
121	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2	.038	3	-.038	10	-.053												
122	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2	.046	3	-.027	11	-.053												
123	1.2DL + 1...	Yes	Y		DL	1.2	36	1.5	2	.053	3		4	.053												

Load Combinations (Continued)

	Description	Sol..	PD..	SR..	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...
124	1.2DL + 1...	Yes	Y		DL	1.2	36	1.5	2	.046	3	.027	5	.053												
125	1.2DL + 1...	Yes	Y		DL	1.2	36	1.5	2	.038	3	.038	6	.053												
126	1.2DL + 1...	Yes	Y		DL	1.2	36	1.5	2	.027	3	.046	7	.053												
127	1.2DL + 1...	Yes	Y		DL	1.2	36	1.5	2		3	.053	8	.053												
128	1.2DL + 1...	Yes	Y		DL	1.2	36	1.5	2	-.027	3	.046	9	.053												
129	1.2DL + 1...	Yes	Y		DL	1.2	36	1.5	2	-.038	3	.038	10	.053												
130	1.2DL + 1...	Yes	Y		DL	1.2	36	1.5	2	-.046	3	.027	11	.053												
131	1.2DL + 1...	Yes	Y		DL	1.2	36	1.5	2	-.053	3		4	-.053												
132	1.2DL + 1...	Yes	Y		DL	1.2	36	1.5	2	-.046	3	-.027	5	-.053												
133	1.2DL + 1...	Yes	Y		DL	1.2	36	1.5	2	-.038	3	-.038	6	-.053												
134	1.2DL + 1...	Yes	Y		DL	1.2	36	1.5	2	-.027	3	-.046	7	-.053												
135	1.2DL + 1...	Yes	Y		DL	1.2	36	1.5	2		3	-.053	8	-.053												
136	1.2DL + 1...	Yes	Y		DL	1.2	36	1.5	2	.027	3	-.046	9	-.053												
137	1.2DL + 1...	Yes	Y		DL	1.2	36	1.5	2	.038	3	-.038	10	-.053												
138	1.2DL + 1...	Yes	Y		DL	1.2	36	1.5	2	.046	3	-.027	11	-.053												
139	1.2DL + 1...	Yes	Y		DL	1.2	37	1.5	2	.053	3		4	.053												
140	1.2DL + 1...	Yes	Y		DL	1.2	37	1.5	2	.046	3	.027	5	.053												
141	1.2DL + 1...	Yes	Y		DL	1.2	37	1.5	2	.038	3	.038	6	.053												
142	1.2DL + 1...	Yes	Y		DL	1.2	37	1.5	2	.027	3	.046	7	.053												
143	1.2DL + 1...	Yes	Y		DL	1.2	37	1.5	2		3	.053	8	.053												
144	1.2DL + 1...	Yes	Y		DL	1.2	37	1.5	2	-.027	3	.046	9	.053												
145	1.2DL + 1...	Yes	Y		DL	1.2	37	1.5	2	-.038	3	.038	10	.053												
146	1.2DL + 1...	Yes	Y		DL	1.2	37	1.5	2	-.046	3	.027	11	.053												
147	1.2DL + 1...	Yes	Y		DL	1.2	37	1.5	2	-.053	3		4	-.053												
148	1.2DL + 1...	Yes	Y		DL	1.2	37	1.5	2	-.046	3	-.027	5	-.053												
149	1.2DL + 1...	Yes	Y		DL	1.2	37	1.5	2	-.038	3	-.038	6	-.053												
150	1.2DL + 1...	Yes	Y		DL	1.2	37	1.5	2	-.027	3	-.046	7	-.053												
151	1.2DL + 1...	Yes	Y		DL	1.2	37	1.5	2		3	-.053	8	-.053												
152	1.2DL + 1...	Yes	Y		DL	1.2	37	1.5	2	.027	3	-.046	9	-.053												
153	1.2DL + 1...	Yes	Y		DL	1.2	37	1.5	2	.038	3	-.038	10	-.053												
154	1.2DL + 1...	Yes	Y		DL	1.2	37	1.5	2	.046	3	-.027	11	-.053												
155	1.2DL + 1...	Yes	Y		DL	1.2	38	1.5	2	.053	3		4	.053												
156	1.2DL + 1...	Yes	Y		DL	1.2	38	1.5	2	.046	3	.027	5	.053												
157	1.2DL + 1...	Yes	Y		DL	1.2	38	1.5	2	.038	3	.038	6	.053												
158	1.2DL + 1...	Yes	Y		DL	1.2	38	1.5	2	.027	3	.046	7	.053												
159	1.2DL + 1...	Yes	Y		DL	1.2	38	1.5	2		3	.053	8	.053												
160	1.2DL + 1...	Yes	Y		DL	1.2	38	1.5	2	-.027	3	.046	9	.053												
161	1.2DL + 1...	Yes	Y		DL	1.2	38	1.5	2	-.038	3	.038	10	.053												
162	1.2DL + 1...	Yes	Y		DL	1.2	38	1.5	2	-.046	3	.027	11	.053												
163	1.2DL + 1...	Yes	Y		DL	1.2	38	1.5	2	-.053	3		4	-.053												
164	1.2DL + 1...	Yes	Y		DL	1.2	38	1.5	2	-.046	3	-.027	5	-.053												
165	1.2DL + 1...	Yes	Y		DL	1.2	38	1.5	2	-.038	3	-.038	6	-.053												
166	1.2DL + 1...	Yes	Y		DL	1.2	38	1.5	2	-.027	3	-.046	7	-.053												
167	1.2DL + 1...	Yes	Y		DL	1.2	38	1.5	2		3	-.053	8	-.053												
168	1.2DL + 1...	Yes	Y		DL	1.2	38	1.5	2	.027	3	-.046	9	-.053												
169	1.2DL + 1...	Yes	Y		DL	1.2	38	1.5	2	.038	3	-.038	10	-.053												
170	1.2DL + 1...	Yes	Y		DL	1.2	38	1.5	2	.046	3	-.027	11	-.053												
171	1.2DL + 1...	Yes	Y		DL	1.2	39	1.5	2	.053	3		4	.053												
172	1.2DL + 1...	Yes	Y		DL	1.2	39	1.5	2	.046	3	.027	5	.053												
173	1.2DL + 1...	Yes	Y		DL	1.2	39	1.5	2	.038	3	.038	6	.053												
174	1.2DL + 1...	Yes	Y		DL	1.2	39	1.5	2	.027	3	.046	7	.053												
175	1.2DL + 1...	Yes	Y		DL	1.2	39	1.5	2		3	.053	8	.053												

Load Combinations (Continued)

	Description	Sol...	PD...	SR...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...
176	1.2DL + 1...	Yes	Y		DL	1.2	39	1.5	2	-.027	3	.046	9	.053												
177	1.2DL + 1...	Yes	Y		DL	1.2	39	1.5	2	-.038	3	.038	10	.053												
178	1.2DL + 1...	Yes	Y		DL	1.2	39	1.5	2	-.046	3	.027	11	.053												
179	1.2DL + 1...	Yes	Y		DL	1.2	39	1.5	2	-.053	3		4	-.053												
180	1.2DL + 1...	Yes	Y		DL	1.2	39	1.5	2	-.046	3	-.027	5	-.053												
181	1.2DL + 1...	Yes	Y		DL	1.2	39	1.5	2	-.038	3	-.038	6	-.053												
182	1.2DL + 1...	Yes	Y		DL	1.2	39	1.5	2	-.027	3	-.046	7	-.053												
183	1.2DL + 1...	Yes	Y		DL	1.2	39	1.5	2		3	-.053	8	-.053												
184	1.2DL + 1...	Yes	Y		DL	1.2	39	1.5	2	.027	3	-.046	9	-.053												
185	1.2DL + 1...	Yes	Y		DL	1.2	39	1.5	2	.038	3	-.038	10	-.053												
186	1.2DL + 1...	Yes	Y		DL	1.2	39	1.5	2	.046	3	-.027	11	-.053												
187	1.2DL + 1...	Yes	Y		DL	1.2	40	1.5	2	.053	3		4	.053												
188	1.2DL + 1...	Yes	Y		DL	1.2	40	1.5	2	.046	3	.027	5	.053												
189	1.2DL + 1...	Yes	Y		DL	1.2	40	1.5	2	.038	3	.038	6	.053												
190	1.2DL + 1...	Yes	Y		DL	1.2	40	1.5	2	.027	3	.046	7	.053												
191	1.2DL + 1...	Yes	Y		DL	1.2	40	1.5	2		3	.053	8	.053												
192	1.2DL + 1...	Yes	Y		DL	1.2	40	1.5	2	-.027	3	.046	9	.053												
193	1.2DL + 1...	Yes	Y		DL	1.2	40	1.5	2	-.038	3	.038	10	.053												
194	1.2DL + 1...	Yes	Y		DL	1.2	40	1.5	2	-.046	3	.027	11	.053												
195	1.2DL + 1...	Yes	Y		DL	1.2	40	1.5	2	-.053	3		4	-.053												
196	1.2DL + 1...	Yes	Y		DL	1.2	40	1.5	2	-.046	3	-.027	5	-.053												
197	1.2DL + 1...	Yes	Y		DL	1.2	40	1.5	2	-.038	3	-.038	6	-.053												
198	1.2DL + 1...	Yes	Y		DL	1.2	40	1.5	2	-.027	3	-.046	7	-.053												
199	1.2DL + 1...	Yes	Y		DL	1.2	40	1.5	2		3	-.053	8	-.053												
200	1.2DL + 1...	Yes	Y		DL	1.2	40	1.5	2	.027	3	-.046	9	-.053												
201	1.2DL + 1...	Yes	Y		DL	1.2	40	1.5	2	.038	3	-.038	10	-.053												
202	1.2DL + 1...	Yes	Y		DL	1.2	40	1.5	2	.046	3	-.027	11	-.053												
203	1.2DL + 1...	Yes	Y		DL	1.2	41	1.5	2	.053	3		4	.053												
204	1.2DL + 1...	Yes	Y		DL	1.2	41	1.5	2	.046	3	.027	5	.053												
205	1.2DL + 1...	Yes	Y		DL	1.2	41	1.5	2	.038	3	.038	6	.053												
206	1.2DL + 1...	Yes	Y		DL	1.2	41	1.5	2	.027	3	.046	7	.053												
207	1.2DL + 1...	Yes	Y		DL	1.2	41	1.5	2		3	.053	8	.053												
208	1.2DL + 1...	Yes	Y		DL	1.2	41	1.5	2	-.027	3	.046	9	.053												
209	1.2DL + 1...	Yes	Y		DL	1.2	41	1.5	2	-.038	3	.038	10	.053												
210	1.2DL + 1...	Yes	Y		DL	1.2	41	1.5	2	-.046	3	.027	11	.053												
211	1.2DL + 1...	Yes	Y		DL	1.2	41	1.5	2	-.053	3		4	-.053												
212	1.2DL + 1...	Yes	Y		DL	1.2	41	1.5	2	-.046	3	-.027	5	-.053												
213	1.2DL + 1...	Yes	Y		DL	1.2	41	1.5	2	-.038	3	-.038	6	-.053												
214	1.2DL + 1...	Yes	Y		DL	1.2	41	1.5	2	-.027	3	-.046	7	-.053												
215	1.2DL + 1...	Yes	Y		DL	1.2	41	1.5	2		3	-.053	8	-.053												
216	1.2DL + 1...	Yes	Y		DL	1.2	41	1.5	2	.027	3	-.046	9	-.053												
217	1.2DL + 1...	Yes	Y		DL	1.2	41	1.5	2	.038	3	-.038	10	-.053												
218	1.2DL + 1...	Yes	Y		DL	1.2	41	1.5	2	.046	3	-.027	11	-.053												
219	1.2DL + 1...	Yes	Y		DL	1.2	42	1.5	2	.053	3		4	.053												
220	1.2DL + 1...	Yes	Y		DL	1.2	42	1.5	2	.046	3	.027	5	.053												
221	1.2DL + 1...	Yes	Y		DL	1.2	42	1.5	2	.038	3	.038	6	.053												
222	1.2DL + 1...	Yes	Y		DL	1.2	42	1.5	2	.027	3	.046	7	.053												
223	1.2DL + 1...	Yes	Y		DL	1.2	42	1.5	2		3	.053	8	.053												
224	1.2DL + 1...	Yes	Y		DL	1.2	42	1.5	2	-.027	3	.046	9	.053												
225	1.2DL + 1...	Yes	Y		DL	1.2	42	1.5	2	-.038	3	.038	10	.053												
226	1.2DL + 1...	Yes	Y		DL	1.2	42	1.5	2	-.046	3	.027	11	.053												
227	1.2DL + 1...	Yes	Y		DL	1.2	42	1.5	2	-.053	3		4	-.053												

Load Combinations (Continued)

	Description	Sol..	PD..	SR..	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...
228	1.2DL + 1...	Yes	Y		DL	1.2	42	1.5	2	-.046	3	-.027	5	-.053												
229	1.2DL + 1...	Yes	Y		DL	1.2	42	1.5	2	-.038	3	-.038	6	-.053												
230	1.2DL + 1...	Yes	Y		DL	1.2	42	1.5	2	-.027	3	-.046	7	-.053												
231	1.2DL + 1...	Yes	Y		DL	1.2	42	1.5	2		3	-.053	8	-.053												
232	1.2DL + 1...	Yes	Y		DL	1.2	42	1.5	2	.027	3	-.046	9	-.053												
233	1.2DL + 1...	Yes	Y		DL	1.2	42	1.5	2	.038	3	-.038	10	-.053												
234	1.2DL + 1...	Yes	Y		DL	1.2	42	1.5	2	.046	3	-.027	11	-.053												
235	1.2DL + 1...	Yes	Y		DL	1.2	43	1.5	2	.053	3		4	.053												
236	1.2DL + 1...	Yes	Y		DL	1.2	43	1.5	2	.046	3	.027	5	.053												
237	1.2DL + 1...	Yes	Y		DL	1.2	43	1.5	2	.038	3	.038	6	.053												
238	1.2DL + 1...	Yes	Y		DL	1.2	43	1.5	2	.027	3	.046	7	.053												
239	1.2DL + 1...	Yes	Y		DL	1.2	43	1.5	2		3	.053	8	.053												
240	1.2DL + 1...	Yes	Y		DL	1.2	43	1.5	2	-.027	3	.046	9	.053												
241	1.2DL + 1...	Yes	Y		DL	1.2	43	1.5	2	-.038	3	.038	10	.053												
242	1.2DL + 1...	Yes	Y		DL	1.2	43	1.5	2	-.046	3	.027	11	.053												
243	1.2DL + 1...	Yes	Y		DL	1.2	43	1.5	2	-.053	3		4	-.053												
244	1.2DL + 1...	Yes	Y		DL	1.2	43	1.5	2	-.046	3	-.027	5	-.053												
245	1.2DL + 1...	Yes	Y		DL	1.2	43	1.5	2	-.038	3	-.038	6	-.053												
246	1.2DL + 1...	Yes	Y		DL	1.2	43	1.5	2	-.027	3	-.046	7	-.053												
247	1.2DL + 1...	Yes	Y		DL	1.2	43	1.5	2		3	-.053	8	-.053												
248	1.2DL + 1...	Yes	Y		DL	1.2	43	1.5	2	.027	3	-.046	9	-.053												
249	1.2DL + 1...	Yes	Y		DL	1.2	43	1.5	2	.038	3	-.038	10	-.053												
250	1.2DL + 1...	Yes	Y		DL	1.2	43	1.5	2	.046	3	-.027	11	-.053												
251	1.2DL + 1...	Yes	Y		DL	1.2	44	1.5	2	.053	3		4	.053												
252	1.2DL + 1...	Yes	Y		DL	1.2	44	1.5	2	.046	3	.027	5	.053												
253	1.2DL + 1...	Yes	Y		DL	1.2	44	1.5	2	.038	3	.038	6	.053												
254	1.2DL + 1...	Yes	Y		DL	1.2	44	1.5	2	.027	3	.046	7	.053												
255	1.2DL + 1...	Yes	Y		DL	1.2	44	1.5	2		3	.053	8	.053												
256	1.2DL + 1...	Yes	Y		DL	1.2	44	1.5	2	-.027	3	.046	9	.053												
257	1.2DL + 1...	Yes	Y		DL	1.2	44	1.5	2	-.038	3	.038	10	.053												
258	1.2DL + 1...	Yes	Y		DL	1.2	44	1.5	2	-.046	3	.027	11	.053												
259	1.2DL + 1...	Yes	Y		DL	1.2	44	1.5	2	-.053	3		4	-.053												
260	1.2DL + 1...	Yes	Y		DL	1.2	44	1.5	2	-.046	3	-.027	5	-.053												
261	1.2DL + 1...	Yes	Y		DL	1.2	44	1.5	2	-.038	3	-.038	6	-.053												
262	1.2DL + 1...	Yes	Y		DL	1.2	44	1.5	2	-.027	3	-.046	7	-.053												
263	1.2DL + 1...	Yes	Y		DL	1.2	44	1.5	2		3	-.053	8	-.053												
264	1.2DL + 1...	Yes	Y		DL	1.2	44	1.5	2	.027	3	-.046	9	-.053												
265	1.2DL + 1...	Yes	Y		DL	1.2	44	1.5	2	.038	3	-.038	10	-.053												
266	1.2DL + 1...	Yes	Y		DL	1.2	44	1.5	2	.046	3	-.027	11	-.053												
267	1.2DL + 1...	Yes	Y		DL	1.2	45	1.5	2	.053	3		4	.053												
268	1.2DL + 1...	Yes	Y		DL	1.2	45	1.5	2	.046	3	.027	5	.053												
269	1.2DL + 1...	Yes	Y		DL	1.2	45	1.5	2	.038	3	.038	6	.053												
270	1.2DL + 1...	Yes	Y		DL	1.2	45	1.5	2	.027	3	.046	7	.053												
271	1.2DL + 1...	Yes	Y		DL	1.2	45	1.5	2		3	.053	8	.053												
272	1.2DL + 1...	Yes	Y		DL	1.2	45	1.5	2	-.027	3	.046	9	.053												
273	1.2DL + 1...	Yes	Y		DL	1.2	45	1.5	2	-.038	3	.038	10	.053												
274	1.2DL + 1...	Yes	Y		DL	1.2	45	1.5	2	-.046	3	.027	11	.053												
275	1.2DL + 1...	Yes	Y		DL	1.2	45	1.5	2	-.053	3		4	-.053												
276	1.2DL + 1...	Yes	Y		DL	1.2	45	1.5	2	-.046	3	-.027	5	-.053												
277	1.2DL + 1...	Yes	Y		DL	1.2	45	1.5	2	-.038	3	-.038	6	-.053												
278	1.2DL + 1...	Yes	Y		DL	1.2	45	1.5	2	-.027	3	-.046	7	-.053												
279	1.2DL + 1...	Yes	Y		DL	1.2	45	1.5	2		3	-.053	8	-.053												

Load Combinations (Continued)

	Description	Sol..	PD..	SR..	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...
280	1.2DL + 1...	Yes	Y		DL	1.2	45	1.5	2	.027	3	-.046	9	-.053										
281	1.2DL + 1...	Yes	Y		DL	1.2	45	1.5	2	.038	3	-.038	10	-.053										
282	1.2DL + 1...	Yes	Y		DL	1.2	45	1.5	2	.046	3	-.027	11	-.053										

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N64	max	3960.047	2	1549.943	22	1181.569	42	695.183	182	1125.676	42	1853.677	30
2		min	-3366.797	26	-1550.039	30	-199.035	18	-677.017	254	-139.995	18	-1855.946	22
3	N68	max	1871.149	19	2911.078	22	1178.458	37	1017.075	35	240.387	200	1640.96	24
4		min	-2165.957	11	-3424.817	14	-186.154	29	-112.793	27	-957.454	112	-1638.807	32
5	N66	max	2187.701	33	3396.7	7	1178.447	47	176.775	25	251.589	237	1616.144	19
6		min	-2482.858	9	-2883.344	31	-186.194	23	-969.105	250	-937.013	133	-1618.065	27
7	N163	max	558.209	26	77.105	22	2320.831	2	.079	180	193.403	2	6.44	30
8		min	-1239.477	34	-77.122	30	-1179.345	26	-.077	252	-98.279	26	-6.442	22
9	N163A	max	617.358	39	450.596	32	2290.091	7	82.884	31	47.882	31	11.542	19
10		min	-270.291	31	-1067.074	39	-1148.647	31	-165.262	7	-95.44	7	-11.543	27
11	N167	max	617.486	45	1067.007	45	2290.006	13	165.3	13	47.8	21	11.541	25
12		min	-273.206	22	-450.252	21	-1148.602	21	-82.927	21	-95.36	13	-11.544	33
13	Totals:	max	6678.691	18	6476.44	22	8745.578	42						
14		min	-6678.681	26	-6476.441	30	2287.938	66						

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

	Member	Shape	Code C...	Loc[in]	LC	Shear ...	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-...	phi*Mn z-...	Cb	Eqn
1	MP10	PIPE 2.0	.707	80	4	.172	80		16	14916.096	32130	1871.625	1871.625	1	H1-1b
2	MP6	PIPE 2.0	.697	80	9	.173	80		5	14916.096	32130	1871.625	1871.625	1	H1-1b
3	MP2	PIPE 2.0	.676	80	14	.174	80		10	14916.096	32130	1871.625	1871.625	1...	H1-1b
4	MP7	PIPE 2.0	.641	80	17	.153	80		3	14916.096	32130	1871.625	1871.625	1...	H1-1b
5	MP11	PIPE 2.0	.641	80	11	.158	80		14	14916.096	32130	1871.625	1871.625	1...	H1-1b
6	MP3	PIPE 2.0	.620	80	6	.157	80		8	14916.096	32130	1871.625	1871.625	1	H1-1b
7	M10	PIPE 2.0	.593	98.438	10	.329	143.75		3	6295.422	32130	1871.625	1871.625	3...	H3-6
8	M15	PIPE 2.0	.589	98.438	15	.330	143.75		9	6295.422	32130	1871.625	1871.625	3...	H3-6
9	M20	PIPE 2.0	.587	98.438	4	.332	143.75		14	6295.422	32130	1871.625	1871.625	1	H3-6
10	M9	L2.5x2.5x4	.580	18.357	14	.142	0	y	16	34802.985	37485	1082.622	2466.905	1...	H2-1
11	M8	L2.5x2.5x4	.571	18.357	9	.140	0	y	11	34802.985	37485	1082.622	2466.905	1...	H2-1
12	M7	L2.5x2.5x4	.550	18.357	3	.141	0	y	6	34802.985	37485	1082.622	2466.905	1...	H2-1
13	MP12	PIPE 2.0	.531	80	12	.252	16		15	14916.096	32130	1871.625	1871.625	1...	H1-1b
14	MP8	PIPE 2.0	.521	80	17	.249	16		5	14916.096	32130	1871.625	1871.625	1...	H1-1b
15	MP9	PIPE 2.0	.511	80	4	.234	80		14	14916.096	32130	1871.625	1871.625	1	H1-1b
16	MP5	PIPE 2.0	.511	80	9	.239	16		4	14916.096	32130	1871.625	1871.625	1	H1-1b
17	MP4	PIPE 2.0	.504	80	6	.253	16		10	14916.096	32130	1871.625	1871.625	1	H1-1b
18	MP1	PIPE 2.0	.492	80	14	.237	80		9	14916.096	32130	1871.625	1871.625	1...	H1-1b
19	M39	PL 6x0.375	.351	0	10	.312	1.625	y	34	70050.692	70875	553.875	8859.375	1...	H1-1b
20	M38	PL 6x0.375	.350	0	10	.329	1.625	y	34	70050.692	70875	553.875	8859.375	1...	H1-1b
21	M41	PL 6x0.375	.346	0	15	.312	1.625	y	39	70050.692	70875	553.875	8859.375	1...	H1-1b
22	M46	PL 6x0.375	.345	0	5	.328	1.625	y	45	68719.518	70875	553.875	8842.083	1	H1-1b
23	M40	PL 6x0.375	.341	0	16	.329	1.625	y	40	70050.692	70875	553.875	8859.375	1...	H1-1b
24	M37	PL 6x0.375	.338	0	4	.312	1.625	y	44	70050.692	70875	553.875	8859.375	1...	H1-1b
25	M29	Pl 6"x0.5"	.298	6.81	2	.114	6.81	y	159	93601.218	94500	984.375	11812.5	1...	H1-1b
26	M30	Pl 6"x0.5"	.292	6.81	7	.114	6.81	y	228	93600.967	94500	984.375	11812.5	1...	H1-1b

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

	Member	Shape	Code C...	Loc[in]	LC	Shear ...	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-...	phi*Mn z-...	Cb	Eqn
27	M28	Pl 6"x0.5"	.289	6.81	13	.102	6.81	y	106	93600.986	94500	984.375	11812.5	1....	H1-1b
28	M101	LL2.5x2.5x3x0	.238	42	15	.013	84	y	13	30884.34	56700	3208.8	2426.842	1....	H1-1b
29	M98	LL2.5x2.5x3x0	.237	42	5	.012	84	y	7	30884.34	56700	3208.8	2426.842	1....	H1-1b
30	M5	L2x2x3	.234	25.584	9	.012	0	z	2	9381.273	22743	542.224	1044.394	1....	H2-1
31	M2	L2x2x3	.227	25.584	11	.011	0	y	2	9381.273	22743	542.224	1044.393	1....	H2-1
32	M1	L2x2x3	.219	26.117	14	.010	51.168	y	38	9381.273	22743	542.224	1044.277	1....	H2-1
33	M6	L2x2x3	.212	26.117	6	.010	51.168	z	45	9381.273	22743	542.224	1044.276	1....	H2-1
34	M3	L2x2x3	.204	25.584	3	.010	51.168	y	44	9381.256	22743	542.224	1044.014	1....	H2-1
35	M4	L2x2x3	.197	25.584	17	.010	51.168	z	40	9381.256	22743	542.224	1044.013	1....	H2-1
36	M93	HSS4X4X4	.193	0	46	.062	25.699	z	14	105230.3...	106155	12311.25	12311.25	1	H1-1b
37	M90	HSS4X4X4	.192	0	41	.063	25.699	z	9	105230.3...	106155	12311.25	12311.25	1	H1-1b
38	M87	HSS4X4X4	.192	0	35	.063	25.699	z	3	105230.3...	106155	12311.25	12311.25	1	H1-1b
39	M86	HSS4X4X4	.190	62.5	13	.092	62.5	y	182	101706.2...	106155	12311.25	12311.25	1	H1-1b
40	M88	HSS4X4X4	.187	28.688	38	.063	2.988	z	6	105230.3...	106155	12311.25	12311.25	1	H1-1b
41	M92	HSS4X4X4	.185	28.687	43	.065	2.988	z	12	105230.3...	106155	12311.25	12311.25	1	H1-1b
42	M85	HSS4X4X4	.185	28.687	49	.064	2.988	z	17	105230.3...	106155	12311.25	12311.25	1	H1-1b
43	M91	HSS4X4X4	.185	20.182	13	.092	62.5	y	112	101706.2...	106155	12311.25	12311.25	1	H1-1b
44	M89	HSS4X4X4	.183	20.182	8	.092	62.5	y	235	101706.2...	106155	12311.25	12311.25	1	H1-1b
45	H3	PIPE 3.0	.157	140.6...	4	.096	98.438		16	28250.554	65205	5748.75	5748.75	1	H1-1b
46	H2	PIPE 3.0	.156	9.375	10	.098	51.563		6	28250.554	65205	5748.75	5748.75	1	H1-1b
47	H1	PIPE 3.0	.152	9.375	15	.097	51.563		11	28250.554	65205	5748.75	5748.75	1	H1-1b
48	M95	LL2.5x2.5x3x0	.142	42	3	.008	84	y	2	30884.34	56700	3208.8	2426.842	1....	H1-1b
49	M35	Pl 6"x0.5"	.031	0	10	.180	1.108	y	3	94215.213	94500	984.375	11812.5	1....	H1-1b
50	M31	Pl 6"x0.5"	.031	0	15	.179	1.108	y	9	94215.213	94500	984.375	11812.5	1....	H1-1b
51	M33	Pl 6"x0.5"	.030	0	5	.178	1.108	y	14	94215.213	94500	984.375	11812.5	1....	H1-1b
52	M36	Pl 6"x0.5"	.030	0	2	.173	1.108	y	170	94215.213	94500	984.375	11812.5	1....	H1-1b
53	M34	Pl 6"x0.5"	.029	0	12	.173	1.108	y	100	94215.213	94500	984.375	11812.5	1....	H1-1b
54	M32	Pl 6"x0.5"	.028	0	7	.173	1.108	y	223	94215.213	94500	984.375	11812.5	1....	H1-1b

Envelope AISI S100-16: LRFD Cold Formed Steel Code Checks

Member	Shape	Code ...	Loc[in]	LC	Shear ...	Loc[in]	Dir	LC	phi*Pn[lb]	phi*Tn[lb]	phi*Mny...	phi*Mnz...	phi*V...	phi*V...	Cb	Eqn
No Data to Print ...																

APPENDIX D

ADDITIONAL CALCUATIONS

Trylon

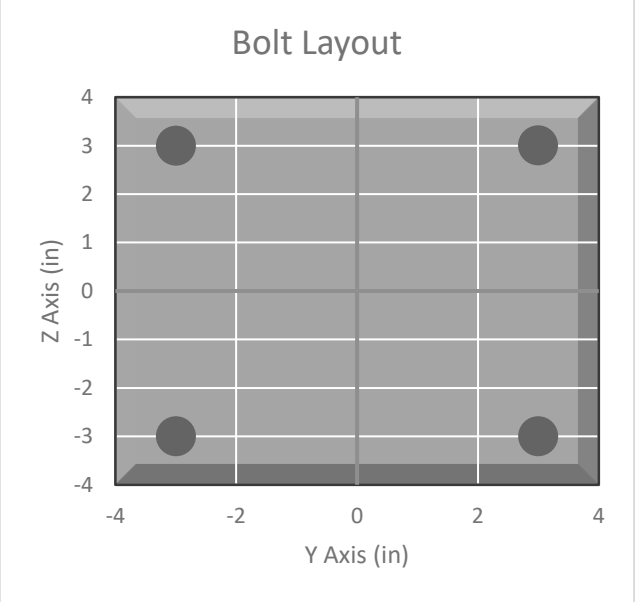
Analysis date: 10/11/21

BOLT TOOL 1.5.2

Project Data	
Job Code:	193322
Carrier Site ID:	CT11057C
Carrier Site Name:	MIDDLETOWN_1

Code	
Design Standard:	TIA-222-H
Slip Check:	No
Pretension Standard:	AISC

Bolt Properties		
Connection Type:	Bolt	
Diameter:	0.625	in
Grade:	A325	--
Yield Strength (Fy):	92	ksi
Ultimate Strength (Fu):	120	ksi
Number of Bolts:	4	--
Threads Included:	Yes	--
Double Shear:	No	--
Connection Pipe Size:	-	in



Connection Description
Standoff to Monopole

Bolt Check*		
Tensile Capacity (ϕT_n):	20340.1	lbs
Shear Capacity (ϕV_n):	13805.8	lbs
Tension Force (T_u):	2400.6	lbs
Shear Force (V_u):	563.1	lbs
Tension Usage:	11.2%	--
Shear Usage:	3.9%	--
Interaction:	11.2%	Pass
Controlling Member:	M86	--
Controlling LC:	5	--

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

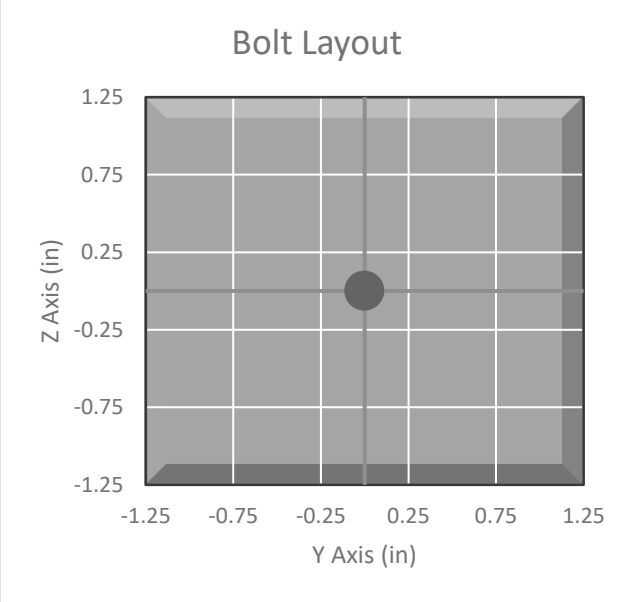
1825 W. Walnut Hill Lane, Suite 120
Irving, Texas 75038

BOLT TOOL 1.5.2

Project Data	
Job Code:	193322
Carrier Site ID:	CT11057C
Carrier Site Name:	MIDDLETOWN_1

Code	
Design Standard:	TIA-222-H
Slip Check:	No
Pretension Standard:	AISC

Bolt Properties		
Connection Type:	Bolt	
Diameter:	0.625	in
Grade:	A325	--
Yield Strength (Fy):	92	ksi
Ultimate Strength (Fu):	120	ksi
Number of Bolts:	1	--
Threads Included:	Yes	--
Double Shear:	No	--
Connection Pipe Size:	-	in



Connection Description
Kicker to Monopole

Bolt Check*		
Tensile Capacity (ϕT_n):	20340.1	lbs
Shear Capacity (ϕV_n):	13805.8	lbs
Tension Force (T_u):	0.3	lbs
Shear Force (V_u):	2608.6	lbs
Tension Usage:	0.0%	--
Shear Usage:	18.0%	--
Interaction:	18.0%	Pass
Controlling Member:	M100	--
Controlling LC:	2	--

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

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: CT11057C

Middletown_1
90 Industrial Park Road
Middletown, Connecticut 06457

October 20, 2021

EBI Project Number: 6221006341

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**14.73%**

October 20, 2021

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

Emissions Analysis for Site: CT11057C - Middletown_1

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **90 Industrial Park Road** in **Middletown, 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 90 Industrial Park Road in Middletown, 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 UMTS channels (AWS Band - 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

7) 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.

8) 1 LTE Traffic channel (LTE 1C and 2C BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 60 Watts.

9) 1 LTE Broadcast channel (LTE 1C and 2C BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 20 Watts.

10) 1 NR Traffic channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 120 Watts.

11) 1 NR Broadcast channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 40 Watts.

12) 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.

13) 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.

14) The antennas used in this modeling are the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz / 2100 MHz channel(s) in Sector A, the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz / 2100 MHz channel(s) in Sector B, the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz / 2100 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.

15) The antenna mounting height centerline of the proposed antennas is 183 feet above ground level (AGL).

16) 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.

17) 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:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449
Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz
Gain:	22.65 dBd / 17.3 dBd / 22.65 dBd / 17.3 dBd	Gain:	22.65 dBd / 17.3 dBd / 22.65 dBd / 17.3 dBd	Gain:	22.65 dBd / 17.3 dBd / 22.65 dBd / 17.3 dBd
Height (AGL):	183 feet	Height (AGL):	183 feet	Height (AGL):	183 feet
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts
ERP (W):	36,356.09	ERP (W):	36,356.09	ERP (W):	36,356.09
Antenna A1 MPE %:	**4.17%**	Antenna B1 MPE %:	**4.17%**	Antenna C1 MPE %:	**4.17%**
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20
Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz / 2100 MHz
Gain:	12.95 dBd / 12.95 dBd / 13.35 dBd / 15.65 dBd / 15.65 dBd / 16.35 dBd / 16.35 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.35 dBd / 15.65 dBd / 15.65 dBd / 16.35 dBd / 16.35 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.35 dBd / 15.65 dBd / 15.65 dBd / 16.35 dBd / 16.35 dBd
Height (AGL):	183 feet	Height (AGL):	183 feet	Height (AGL):	183 feet
Channel Count:	15	Channel Count:	15	Channel Count:	15
Total TX Power (W):	620 Watts	Total TX Power (W):	620 Watts	Total TX Power (W):	620 Watts
ERP (W):	20,641.14	ERP (W):	20,641.14	ERP (W):	20,641.14
Antenna A2 MPE %:	**3.01%**	Antenna B2 MPE %:	**3.01%**	Antenna C2 MPE %:	**3.01%**

Site Composite MPE %	
Carrier	**MPE %**
T-Mobile (Max at Sector A):	7.19%
Metro PCS	0.48%
AT&T	3.36%
Verizon	3.7%
Site Total MPE % :	14.73%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	7.19%
T-Mobile Sector B Total:	7.19%
T-Mobile Sector C Total:	7.19%
Site Total MPE % :	14.73%

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 2500 MHz LTE 1C & 2C Traffic	1	11044.63	183.0	12.67	2500 MHz LTE 1C & 2C Traffic	1000	1.27%
T-Mobile 2500 MHz LTE 1C & 2C Broadcast	1	1074.06	183.0	1.23	2500 MHz LTE 1C & 2C Broadcast	1000	0.12%
T-Mobile 2500 MHz NR Traffic	1	22089.26	183.0	25.35	2500 MHz NR Traffic	1000	2.53%
T-Mobile 2500 MHz NR Broadcast	1	2148.13	183.0	2.47	2500 MHz NR Broadcast	1000	0.25%
T-Mobile 600 MHz LTE	2	591.73	183.0	1.36	600 MHz LTE	400	0.34%
T-Mobile 600 MHz NR	1	1577.94	183.0	1.81	600 MHz NR	400	0.45%
T-Mobile 700 MHz LTE	2	648.82	183.0	1.49	700 MHz LTE	467	0.32%
T-Mobile 1900 MHz GSM	4	1101.85	183.0	5.06	1900 MHz GSM	1000	0.51%
T-Mobile 1900 MHz LTE	2	2203.69	183.0	5.06	1900 MHz LTE	1000	0.51%
T-Mobile 2100 MHz UMTS	2	1294.56	183.0	2.97	2100 MHz UMTS	1000	0.30%
T-Mobile 2100 MHz LTE	2	2589.11	183.0	5.94	2100 MHz LTE	1000	0.59%
						Total:	**7.19%**

• 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:	7.19%
Sector B:	7.19%
Sector C:	7.19%
T-Mobile Maximum MPE % (Sector A):	7.19%
Site Total:	14.73%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **14.73%** 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.

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

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