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

January 22, 2021

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

RE: **Notice of Exempt Modification for T-Mobile:**
806361 - T-Mobile Site ID: CTNH110C
131 Manor Road, Guilford, CT 06437
Latitude: 41° 19′ 48.09″ / Longitude: -72° 43′ 18.51″

Dear Ms. Bachman:

T-Mobile currently maintains three (3) antennas at the 128-foot mount on the existing 150-foot Monopole Tower, located at 131 Manor Road, Guilford, CT. The tower is owned by Crown Castle and the property is owned by BW Bishop & Sons, Inc. T-Mobile now intends to replace three (3) existing antennas with three (3) new 1900/2100 MHz antennas, three (3) new 600/700 MHz antennas, and three (3) new 2500/2500 MHz antennas. Some the new antennas with be capable of providing 5G services. The new antennas will be installed at the 128-ft level of the tower. T-Mobile is also proposing a mount replacement pursuant to the enclosed Mount Replacement Analysis.

Planned Modifications:
Tower:

Remove:
(6) 1 5/8" Coax

Remove and Replace:
(3) RFS-APX16DWV-S-E-A20 Antenna **(REMOVE)** – (3) AIR32_B66A_B2A Antenna 1900/2100 MHz **(REPLACE)**

Install New:
(3) AIR6449 B41 Antenna 2500/2500 MHz
(3) RFS-APXVAARR24_43-U-NA20 Antenna 600/700 MHz
(3) Radio 4449 B71/B85
(3) Radio 4415 B25
(3) 1 5/8" Hybrid Fiber Line
(3) Diplexers

Existing to Remain:
(6) 1 5/8" Coax
(3) TMA

Ground:

Install B160 battery cabinet.
Install 6160 cabinet.
Internal upgrade to existing ground cabinet.

The facility was approved by the Connecticut Siting Council in Docket No. 56 on April 14, 1986. This approval included the condition that the monopole shall not exceed 160' feet in height and this proposed exempt modification follows the aforementioned condition.

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 Matthew T. Hoey, III, First Selectman for the Town of Guilford, Erin Mannix, Zoning Enforcement Officer, Crown Castle as the tower owner, and BW Bishop & Sons, Inc., the property owner.

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

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

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

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

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

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

Sincerely,

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

Attachments

cc:

Matthew T. Hoey, III, First Selectman (*via email only to hoeym@ci.guilford.ct.us*)
Town of Guilford
31 Park Street
Guilford, CT 06437
203-453-8015

Erin Mannix, Zoning Enforcement Officer (*via email only to mannixe@ci.guilford.ct.us*)
Town of Guilford
50 Boston Street
Guilford, CT 06437
203-453-8039

BW Bishop & Sons, Inc., Property Owner (*via email only to keith.bishop@bishopsorchards.com*)
1355 Boston Post Road
Guilford, CT 06437

Crown Castle, Tower Owner

From: Zsamba, Anne Marie
To: "keith.bishop@bishopsorchards.com"
Subject: Notice of Exempt Modification - 131 Manor Road, Guilford - T-Mobile - 806361
Date: Friday, January 22, 2021 10:44:00 AM
Attachments: EM-T-MOBILE-131 MANOR RD GUILFORD-806361-CTNH110C-NOTICE.pdf

---

Dear BW Bishop & Sons, as Property Owner:

Attached please find T-Mobile's exempt modification application that is being submitted to the Connecticut Siting Council today, January 22, 2021.

In light of the present circumstances with Covid-19, The Council has advised that electronic notification of this filing is acceptable. If you could kindly confirm receipt. Thank you.

Best,
Anne Marie Zsamba

ANNE MARIE ZSAMBA
Site Acquisition Specialist
T: (201) 236-9224
M: (518) 350-3639
F: (724) 416-6112

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

From: Zsamba, Anne Marie
To: "hoeym@ci.guilford.ct.us"
Subject: Notice of Exempt Modification - 131 Manor Road, Guilford - T-Mobile - 806361
Date: Friday, January 22, 2021 10:44:00 AM
Attachments: EM-T-MOBILE-131 MANOR RD GUILFORD-806361-CTNH110C-NOTICE.pdf

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Dear First Selectman Hoey:

Attached please find T-Mobile's exempt modification application that is being submitted to the Connecticut Siting Council today, January 22, 2021.

In light of the present circumstances with Covid-19, The Council has advised that electronic notification of this filing is acceptable. If you could kindly confirm receipt. Thank you.

Best,
Anne Marie Zsamba

ANNE MARIE ZSAMBA
Site Acquisition Specialist
T: (201) 236-9224
M: (518) 350-3639
F: (724) 416-6112

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

From: Zsamba, Anne Marie
To: "mannixe@ci.guilford.ct.us"
Subject: Notice of Exempt Modification - 131 Manor Road, Guilford - T-Mobile - 806361
Date: Friday, January 22, 2021 10:44:00 AM
Attachments: EM-T-MOBILE-131 MANOR RD GUILFORD-806361-CTNH110C-NOTICE.pdf

---

Dear ZEO Mannix:

Attached please find T-Mobile's exempt modification application that is being submitted to the Connecticut Siting Council today, January 22, 2021.

In light of the present circumstances with Covid-19, The Council has advised that electronic notification of this filing is acceptable. If you could kindly confirm receipt. Thank you.

Best,
Anne Marie Zsamba

ANNE MARIE ZSAMBA
Site Acquisition Specialist
T: (201) 236-9224
M: (518) 350-3639
F: (724) 416-6112

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

Exhibit A

Original Facility Approval

DOCKET NO. 56

AN APPLICATION OF METRO MOBILE CTS OF NEW HAVEN, INC., FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED FOR THE CONSTRUCTION, MAINTENANCE, AND OPERATION OF FACILITIES TO PROVIDE CELLULAR SERVICE IN NEW HAVEN COUNTY.	:	CONNECTICUT SITING COUNCIL April 14, 1986

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

Pursuant to the foregoing opinion, the Council hereby directs that a certificate of environmental compatibility and public need as required by section 16-50k of the General Statutes of Connecticut (CGS) be issued to Metro Mobile CTS of New Haven, Inc., for the construction, maintenance, and operation of cellular mobile phone telecommunication towers and associated equipment in the towns of Wolcott, Naugatuck, West Haven (existing tower), Milford, Hamden (existing tower), Guilford, and North Branford subject to the conditions below.

1. The proposed and alternate Beacon Falls sites are rejected without prejudice.
2. The Wolcott tower shall be constructed to meet Zone C wind loading with 1" of radial ice and shall not exceed 180' in height excluding antennas.
3. The Naugatuck tower shall not exceed 160' in height, excluding antennas. The certificate holder shall offer to remove the existing privately owned, unused tower now on the site.
4. Any future actions requiring the removal of the existing West Haven or Hamden towers to be shared by the certificate holder shall also apply to the equipment mounted on those towers by the certificate holder, regardless of that equipment's status under Chapter 277a of the CGS.

5. The Milford tower shall be a monopole structure not to exceed 100' in height, excluding antennas.
6. The Guilford tower shall be a monopole structure not to exceed 150' in height, excluding antennas.
7. The North Branford Route 17 site is rejected. The North Branford East Reeds Gap Road tower shall not exceed 160' in height, excluding antennas.
8. The certificate holder shall submit a development and management plan for the Wolcott, Naugatuck, Milford, Hamden, Guilford, and North Branford sites pursuant to sections 16-50j-75 through 16-50j-77 of the RSA, except that irrelevant items in section 16-50j-76 need only be identified as such. In addition to the requirements of section 16-50j-76, the D&M plan shall provide plans for evergreen screening around the fenced perimeter at the Wolcott, Milford, Hamden, Guilford, and North Branford sites. The D&M plan shall include a proposal for painting the approved monopole structures to blend with the sky. Any changes to specifications in the D&M plan must be approved by the Council prior to facility operation.
9. All certified facilities shall be constructed, operated, and maintained as specified in the Council's record and in the site development and management plan required by order 8.
10. The certificate holder shall permit public or private entities to share space on the towers approved herein, for due consideration received, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing. In addition to complying with 16-50j-73, the

certificate holder shall notify the Council of the addition of any equipment to any approved tower.

11. A fence not lower than 8' shall surround each tower and associated equipment.

12. Unless necessary to comply with order 13, below, no lights shall be installed on any of these towers.

13. The facilities' construction and any future tower sharing shall be in accordance with all applicable federal, state, and municipal laws and regulations. Shared uses by entities not subject to jurisdiction pursuant to sections 16-50i and 16-50k of the CGS shall be subject to all applicable federal, state, and municipal laws and regulations.

14. Construction activities shall take place during daylight working hours.

15. This decision and order shall be void and the towers and associated equipment shall be dismantled and removed, or reapplication for any new use shall be made to the CSC before any such new use is made, if the towers do not provide or permanently cease to provide cellular service following completion of construction.

16. This decision and order shall be void if all construction authorized herein is not completed within three years of the issuance of this decision, or within three years of the completion of any appeal if appeal of this decision is taken, unless otherwise approved by the Council.

Pursuant to CGS section 16-50p, we hereby direct that a copy of the decision and order shall be served on each person listed below. A notice

of the issuance shall be published in The Record-Journal, The New Haven Register, The Branford Review, The Evening Sentinel, The Waterbury American, and The Waterbury Republican.

The parties to this proceeding are:

Metro Mobile CTS of New Haven, Inc. (Applicant)
5 Eversley Avenue
Norwalk, Connecticut 06855

ATTN: Armand Mascioli
General Manager

Mr. Kevin B. Sullivan, Esq. (its attorneys)
Byrne, Slater, Sandler, Shulman & Rouse, P.C.
111 Pearl Street
P.O. Box 3216
Hartford, Connecticut 06103

Mr. Richard Rubin, Esq.
Fleischman and Walsh, P.C.
1725 N Street, N.W.
Washington, D.C. 20036

Guilford Conservation Commission represented by:

Mr. David B. Damer
Chairman
Guilford Conservation Commission
440 Great Hill Road
Guilford, Connecticut 06437

Mr. Robert W. Griswold, Jr.
100 Rimmon Hill Road
Beacon Falls, Connecticut 06403

Town of Hamden
Memorial Town Hall
2372 Whitney Avenue
Hamden, Connecticut 06518

ATTN: Shirley Gonzales
Town Planner

Guilford Planning and Zoning Commission — represented by:

Mr. David W. Fisher
Chairman
Town Hall
31 Park Street
Guilford, Connecticut 06437

Town of Hamden — represented by:

John DeNicola, Jr.
Mayor
Town of Hamden
Memorial Town Hall
2372 Whitney Avenue
New Haven, Connecticut 06518

Citizens Park Council of New Haven — represented by:

Mr. John J. Ciarleglio
President
Citizens Park Council
of New Haven
36 Elmwood Road
New Haven, Connecticut 06515

Mr. Thomas V. Keating
343 Rimmon Hill Road
Beacon Falls, Connecticut 06403

Ms. Evelyn M. Sirowich
245 Rimmon Hill Road
Beacon Falls, Connecticut 06403

Mr. Jack B. Levine
11 White Birch Lane
Beacon Falls, Connecticut 06403

Southern New England Telephone Company — represented by:

Mr. Peter J. Tyrrell, Esq.
227 Church Street
New Haven, Connecticut 06506

Mr. Dennis Bialecki
96 West Road
Beacon Falls, Connecticut 06403

Brittany Woods Homeowner's Association

represented by:

Mr. Stephen P. Del Sole, Esq.
Del Sole & Del Sole
152 Temple Street
P.O. Box 405
New Haven, Connecticut 06502-0405

Ms. Barbara G. Schlein
Box 2993 Westville Station
New Haven, Connecticut 06515

Mr. & Mrs. Joseph T. Farrell, Jr.
334 Rimmon Hill Road
Beacon Falls, Connecticut 06403

Town of Beacon Falls

represented by:

The Honorable Leonard F. D'Amico
First Selectman
10 Maple Avenue
Beacon Falls, Connecticut 06403

West Rock Ridge Park Association

represented by:

Mr. William L. Doheny Jr., D.D.S.
President
220 Mountain Road
Hamden, Connecticut 06514

Department of Parks,
Recreation & Trees

represented by:

Mr. Robert G. Sheeley
Director
Parks, Recreation & Trees
P.O. Box 1416
New Haven, Connecticut 06506

Town of Wallingford

represented by:

William W. Dickinson, Jr.
Mayor
Municipal Building
350 Center Street
P.O. Box 427
Wallingford, Connecticut 06492

New Haven Sierra Club

represented by:

Ms. Laurie Klein
270 Edgewood Avenue
New Haven, Connecticut 06511

Peter M. Lerner
State Representative
8 Merritt Avenue
Woodbridge, Connecticut 06525

Carleton J. Benson
State Representative
161 Scott Road
Prospect, Connecticut 06712

Dr. Stephen Collins (service waived)
Vice Chairman
West Rock State Park
Advisory Council
Bethany, Connecticut

Mr. Louis Melillo (service wavied)
985 Wintergreen Avenue
Hamden, Connecticut

Mr. John McGeever (service waived)
339 Rimmon Hill
Beacon Falls, Connecticut 06403

Senator John Consoli (service waived)
51 Luke Hill Road
Bethany, Connecticut 06525

Representative George P. Bassing (service waived)
14 Oakwood Drive
Seymour, Connecticut 06483

Dr. George D. Whitney (service waived)
858 Oakwood Road
Orange, Connecticut

Mr. Steve Molnar (service waived)
205 West Road
Beacon Falls, Connecticut

Mr. James W. Grandy (service waived)
President
Hamden Land Conservation Trust
Hamden, Connecticut

Senator Richard S. Eaton (service waived)
269 Mulberry Point Road
Guilford, Connecticut 06437

Representative Robert M. Ward
719 Totoket Road
Northford, Connecticut 06472

Town of North Branford — represented by:

John Gesmonde, Esquire
3127 Whitney Avenue
Hamden, Connecticut 06518

Regina Smith
1887 Middletown Avenue
Northford, Connecticut 06472 — (service waived)

Richard A. Nizolek
The Restland Farm Corporation
Route 17
Northford, Connecticut 06472

Mary Liska
83 Reeds Gap Road
Northford, Connecticut 06472

Ben Bullard
50 Christmas Hill Road
Guilford, Connecticut 06437 — (service waived)

Roland Robichaud
31 Berncliff Drive
North Branford, Connecticut 06471 — (service waived)

Irene Flynn
1926 Middletown Avenue
Northford, Connecticut 06472 — (service waived)

Charles Pope
199 Donalds Road
Guilford, Connecticut 06437

Richard Abate
131 Manor Road
Guilford, Connecticut 06437 — (service waived)

City of Milford — represented by:

Mayor Alberta Jagoe
Alderman Maurice Condon
Alderman Frederick Lisman
City Hall
River Street
Milford, Connecticut 06460

Thomas Scelfo
81 Berncliff Drive
North Branford, Connecticut 06471 — (service waived)

Senator Thomas Scott (service waived)
22 Meyers Court
Milford, Connecticut 06460

Helen Moore (service waived)
385 Oronoque Road
Milford, Connecticut 06460

William Barberi (service waived)
298 Oronoque Road
Milford, Connecticut 06460

C E R T I F I C A T I O N

The undersigned members of the Connecticut Siting Council hereby certify that they have heard this case or read the record thereof, and that we voted as follows:

Dated at New Britain, Connecticut, this 14th day of April, 1986.

Council Members	Vote Cast
Gloria Dibble Pond Chairperson	Yes
Commissioner John Downey Designee: Commissioner Peter G. Boucher	Absent
Commissioner Stanley Pac Designee: Christopher Cooper	No
Owen L. Clark	Yes
Mortimer A. Gelston	Yes
James G. Horsfall	Yes
Pamela B. Katz	Yes
William H. Smith	No
Colin C. Tait	No

STATE OF CONNECTICUT)
: ss. New Britain, April 14, 1986
COUNTY OF HARTFORD)

I hereby certify that the foregoing is a true and correct copy of the decision and order issued by the Connecticut Siting Council, State of Connecticut.

ATTEST:

Christopher S. Wood

Christopher S. Wood, Executive Director
Connecticut Siting Council

Exhibit B

Property Card

All information is for assessment purposes only. Assessments are calculated at 70% of the estimated October 1, 2017 market value which was the date of the last revaluation as completed by eQuality Valuation Services, LLC.

Information on the Property Records for the Municipality of Guilford was last updated on 1/22/2021.

Parcel Information

Location:	LONG HILL RD	Map and Parcel:	090017	Census Tract:	1903
Zoning:	R-5	Developer's Map:		Developer's Lot:	
Total Acreage:	21.2	Farm, Forest, Open Space Acres:	20.2	Unique ID:	580

Value Information

	Appraised Value	Assessed Value
Land	845,130	391,500
Buildings	0	0
Detached Outbuildings	0	0
Total	845,130	391,500

Owner's Information

Owner's Data
BISHOP B W & SONS INC 1355 BOSTON POST RD GUILFORD, CT 06437

Owner History - Sales

Owner Name	Volume	Page	Sale Date	Deed Type	Valid Sale	Sale Price
BISHOP B W & SONS INC	0131	0193	11/19/1987		No	$0

Exhibit C

Construction Drawings

T-Mobile

T-MOBILE SITE NUMBER: CTNH110C
T-MOBILE SITE NAME: NH110/CROWN LONGHILL_ETMP
SITE TYPE: MONOPOLE
TOWER HEIGHT: 150'-0"

BUSINESS UNIT #: 806361
SITE ADDRESS: 131 MANOR ROAD GUILFORD, CT 06437
COUNTY: NEW HAVEN
JURISDICTION: TOWN OF GUILDFORD

T-MOBILE ANCHOR SITE CONFIGURATION: 67D5A997DB ODE+6160

SITE INFORMATION

CROWN CASTLE USA INC. SITE NAME:	NHV 102 943127
SITE ADDRESS:	131 MANOR ROAD GUILFORD, CT 06437
COUNTY:	NEW HAVEN
MAP/PARCEL #:	090017
AREA OF CONSTRUCTION:	EXISTING
LATITUDE:	41.330025
LONGITUDE:	-72.721808
LAT/LONG TYPE:	NAD83
GROUND ELEVATION:	286'
CURRENT ZONING:	R-5
JURISDICTION:	TOWN OF GUILFORD
OCCUPANCY CLASSIFICATION:	U
TYPE OF CONSTRUCTION:	IIB
A.D.A. COMPLIANCE:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION
PROPERTY OWNER:	BISHOP B W & SONS INC 1355 BOSTON POST RD GULFORD, CT 06437
TOWER OWNER:	CROWN CASTLE USA INC 2000 CORPORATE DRIVE CANONSBURG, PA 15317
CARRIER/APPLICANT:	T-MOBILE 35 GRIFFIN ROAD BLOOMFIELD, CT 06002
ELECTRIC PROVIDER:	N/A
TELCO PROVIDER:	N/A

PROJECT TEAM

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

DRAWING INDEX

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

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

PROJECT DESCRIPTION

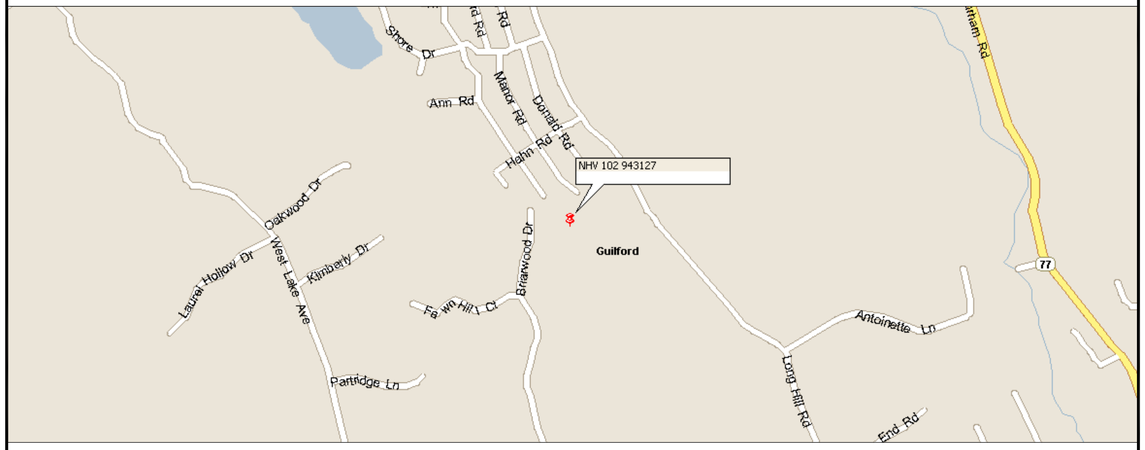
THE PURPOSE OF THIS PROJECT IS TO ENHANCE BROADBAND CONNECTIVITY AND CAPACITY TO THE EXISTING ELIGIBLE WIRELESS FACILITY.

TOWER SCOPE OF WORK:
- REMOVE (3) ANTENNAS
- REMOVE (3) TMAs
- REMOVE (6) 1 5/8" COAX CABLES
- REMOVE (3) SECTOR MOUNTS
- RELOCATE (3) TMAs
- INSTALL (1) SITEPRO1 RMQP-496-HK PLATFORM MOUNT
- INSTALL (9) ANTENNAS
- INSTALL (6) RRHs
- INSTALL (3) DIPLEXERS
- INSTALL (3) 1 5/8" HYBRID CABLE

GROUND SCOPE OF WORK:
- REMOVE (1) RUS01 B2
- INSTALL (1) 6160 CABINET
- INSTALL (1) B160 BATTERY CABINET
- INSTALL (2) BB 6630
- INSTALL (1) BB 6648
- INSTALL (1) PSU 4813 VOLTAGE BOOSTER
- INSTALL (1) IXRE ROUTER

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

LOCATION MAP



NO SCALE

APPLICABLE CODES/REFERENCE DOCUMENTS

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

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

REFERENCE DOCUMENTS:

STRUCTURAL ANALYSIS:	CROWN CASTLE
DATED:	10/26/20
MOUNT ANALYSIS:	PAUL J FORD AND COMPANY
DATED:	10/14/20
RFDS REVISION:	4
DATED:	9/23/20
ORDER ID:	479852
REVISION:	5

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

APPROVALS

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

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

T-Mobile
4 SYLVAN WAY
PARSIPPANY, NJ 07054

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

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

T-MOBILE SITE NUMBER:
CTNH110C

BU #: **806361**
NHV 102 943127

131 MANOR ROAD
GUILFORD, CT 06437

EXISTING
150'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	12/3/20	LHT	CONSTRUCTION	MTJ
1	1/11/21	JJD	CONSTRUCTION	GEH

1/11/21

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

SHEET NUMBER: T-1
REVISION: 1

CROWN CASTLE USA INC. SITE ACTIVITY REQUIREMENTS:

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

GENERAL NOTES:

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

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

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

GREENFIELD GROUNDING NOTES:

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

ELECTRICAL INSTALLATION NOTES:

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.
2. CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED AND TRIP HAZARDS ARE ELIMINATED.
3. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC.
4. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.
   4.1. ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO REQUIREMENT OF THE NATIONAL ELECTRICAL CODE.
   4.2. ALL OVERCURRENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED, 22,000 AIC MINIMUM. VERYIFY AVAILABLE SHORT CIRCUIT CURRENT DOES NOT EXCEED THE RATING OF ELECTRICAL EQUIPMENT IN ACCORDANCE WITH ARTICLE 110.24 NEC OR THE MOST CURRENT ADOPTED CODE PRE THE GOVERNING JURISDICTION.
5. EACH END OF EVERY POWER PHASE CONDUCTOR, GROUNDING CONDUCTOR, AND TELCO CONDUCTOR OR CABLE SHALL BE LABELED WITH COLOR–CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2" PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC AND OSHA.
6. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH LAMICOID TAGS SHOWING THEIR RATED VOLTAGE, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING AND BRANCH CIRCUIT ID NUMBERS (i.e. PANEL BOARD AND CIRCUIT ID'S).
7. PANEL BOARDS (ID NUMBERS) SHALL BE CLEARLY LABELED WITH PLASTIC LABELS.
8. ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.
9. ALL POWER AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE COPPER CONDUCTOR (#14 OR LARGER) WITH TYPE THHW, THWN, THWN–2, XHHW, XHHW–2, THW, THW–2, RHW, OR RHW–2 INSULATION UNLESS OTHERWISE SPECIFIED.
10. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE COPPER CONDUCTOR (#6 OR LARGER) WITH TYPE THHW, THWN, THWN–2, XHHW, XHHW–2, THW, THW–2, RHW, OR RHW–2 INSULATION UNLESS OTHERWISE SPECIFIED.
11. POWER AND CONTROL WIRING IN FLEXIBLE CORD SHALL BE MULTI–CONDUCTOR, TYPE SOOW CORD (#14 OR LARGER) UNLESS OTHERWISE SPECIFIED.
12. POWER AND CONTROL WIRING FOR USE IN CABLE TRAY SHALL BE MULTI–CONDUCTOR, TYPE TC CABLE (#14 OR LARGER), WITH TYPE THHW, THWN, THWN–2, XHHW, XHHW–2, THW, THW–2, RHW, OR RHW–2 INSULATION UNLESS OTHERWISE SPECIFIED.
13. ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP–STYLE, COMPRESSION WIRE LUGS AND WIRE NUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRE NUTS SHALL BE RATED FOR OPERATION NOT LESS THAN 75° C (90° C IF AVAILABLE).
14. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.
15. ELECTRICAL METALLIC TUBING (EMT), INTERMEDIATE METAL CONDUIT (IMC), OR RIGID METAL CONDUIT (RMC) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
16. ELECTRICAL METALLIC TUBING (EMT) OR METAL–CLAD CABLE (MC) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
17. SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE GRADE PVC CONDUIT.
18. LIQUID–TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID–TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
19. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION–TYPE AND APPROVED FOR THE LOCATION USED. SET SCREW FITTINGS ARE NOT ACCEPTABLE.
20. CABINETS, BOXES AND WIRE WAYS SHALL BE LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND THE NEC.
21. WIREWAYS SHALL BE METAL WITH AN ENAMEL FINISH AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARDS (WIREMOLD SPECMATE WIREWAY).
22. SLOTTED WIRING DUCT SHALL BE PVC AND INCLUDE COVER (PANDUIT TYPE F 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**

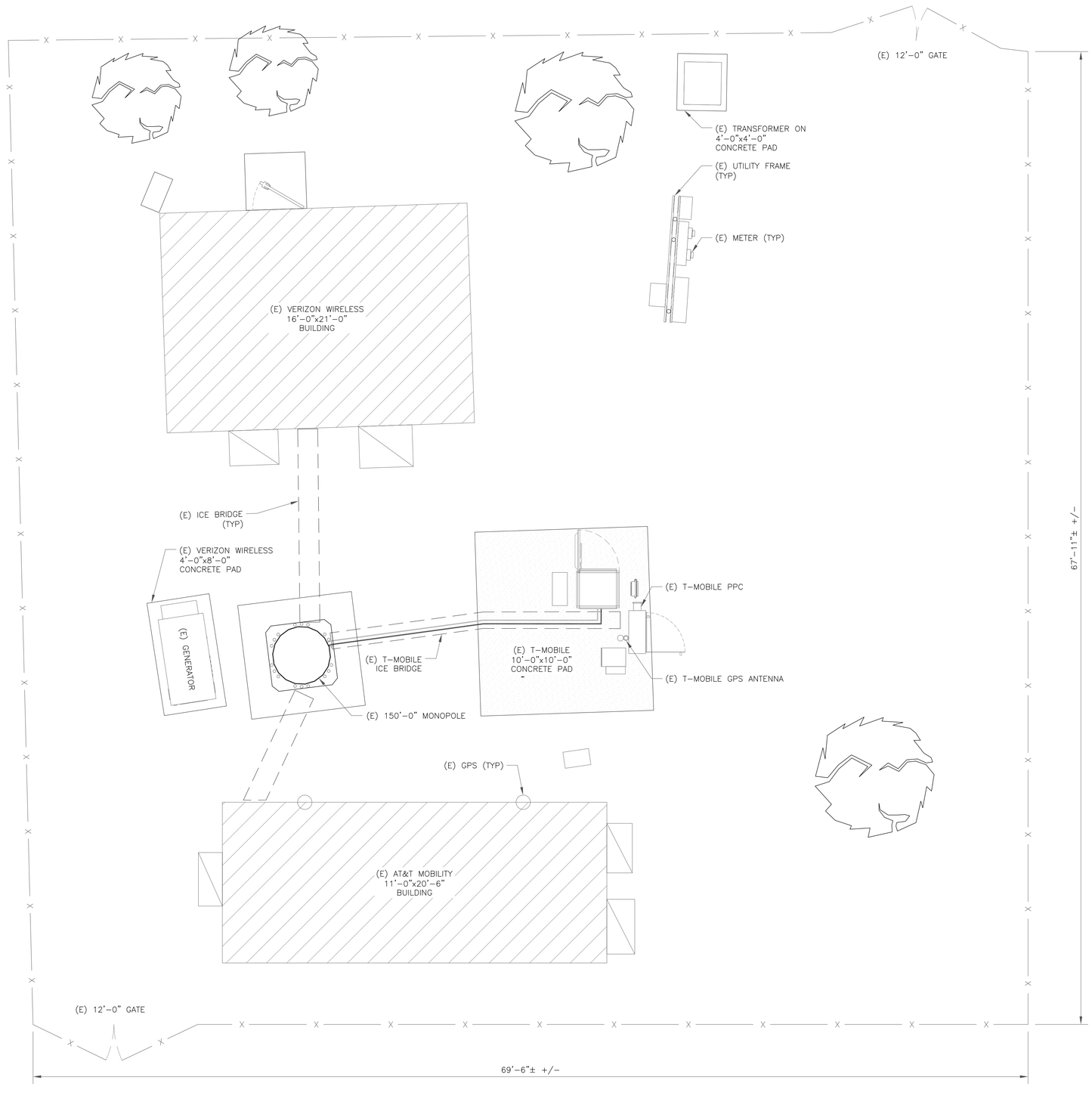
* SEE NEC 210.5(C)(1) AND (2)
** POLARITY MARKED AT TERMINATION

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 GASEO

SITE PLAN DISCLAIMER:

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



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

N

T-Mobile
4 SYLVAN WAY
PARSIPPANY, NJ 07054

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

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

T-MOBILE SITE NUMBER:
CTNH110C

BU #: **806361**
NHV 102 943127

131 MANOR ROAD
GUILFORD, CT 06437

EXISTING
150'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	12/3/20	LHT	CONSTRUCTION	MTJ
1	1/11/21	JJD	CONSTRUCTION	GEH

JACOB E. TUTTLE ENGINEER No. 47802 LICENSED PROFESSIONAL ENGINEER
1/11/21

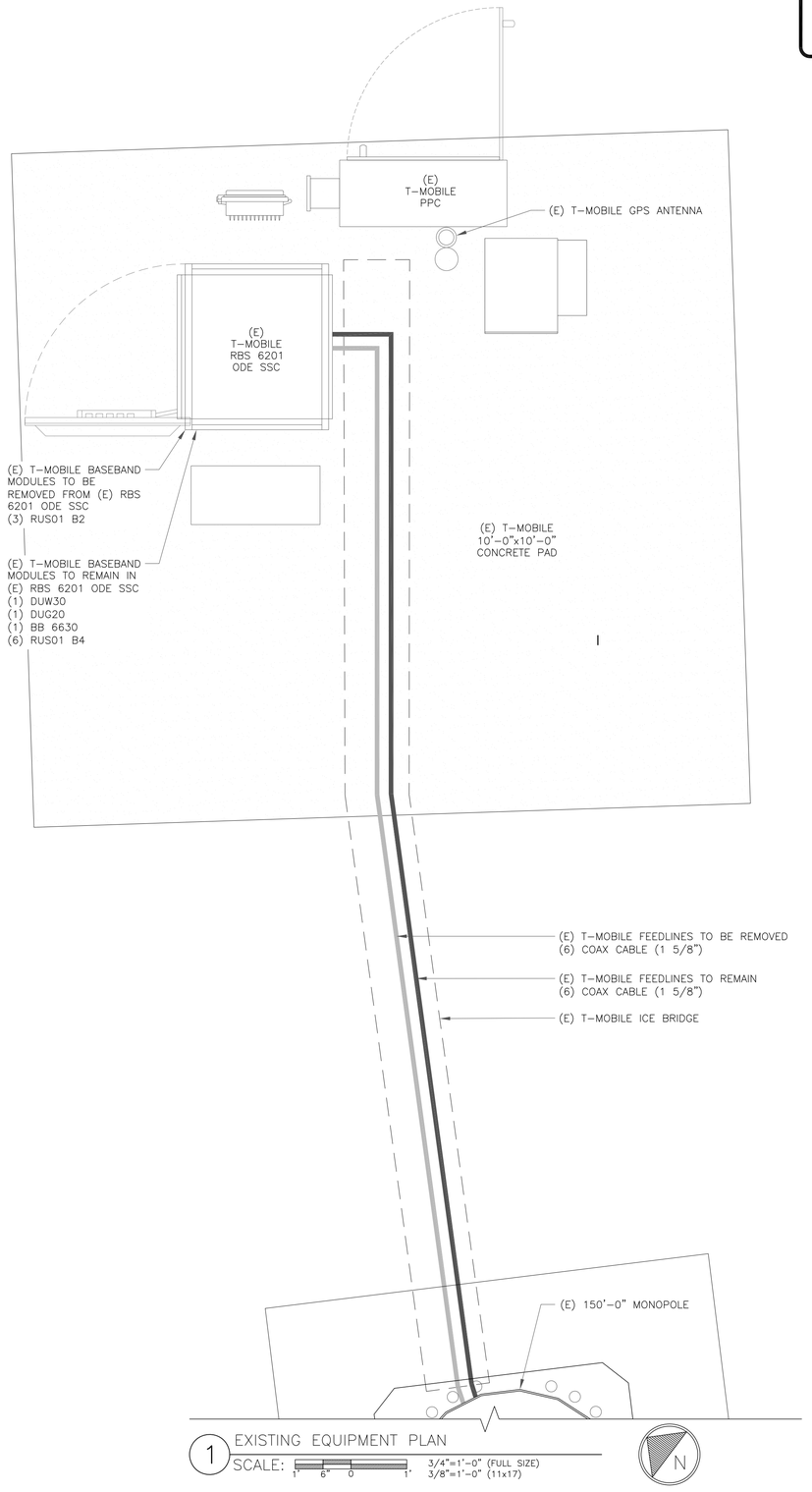
B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/21

SHEET NUMBER: C-1.1
REVISION: 1

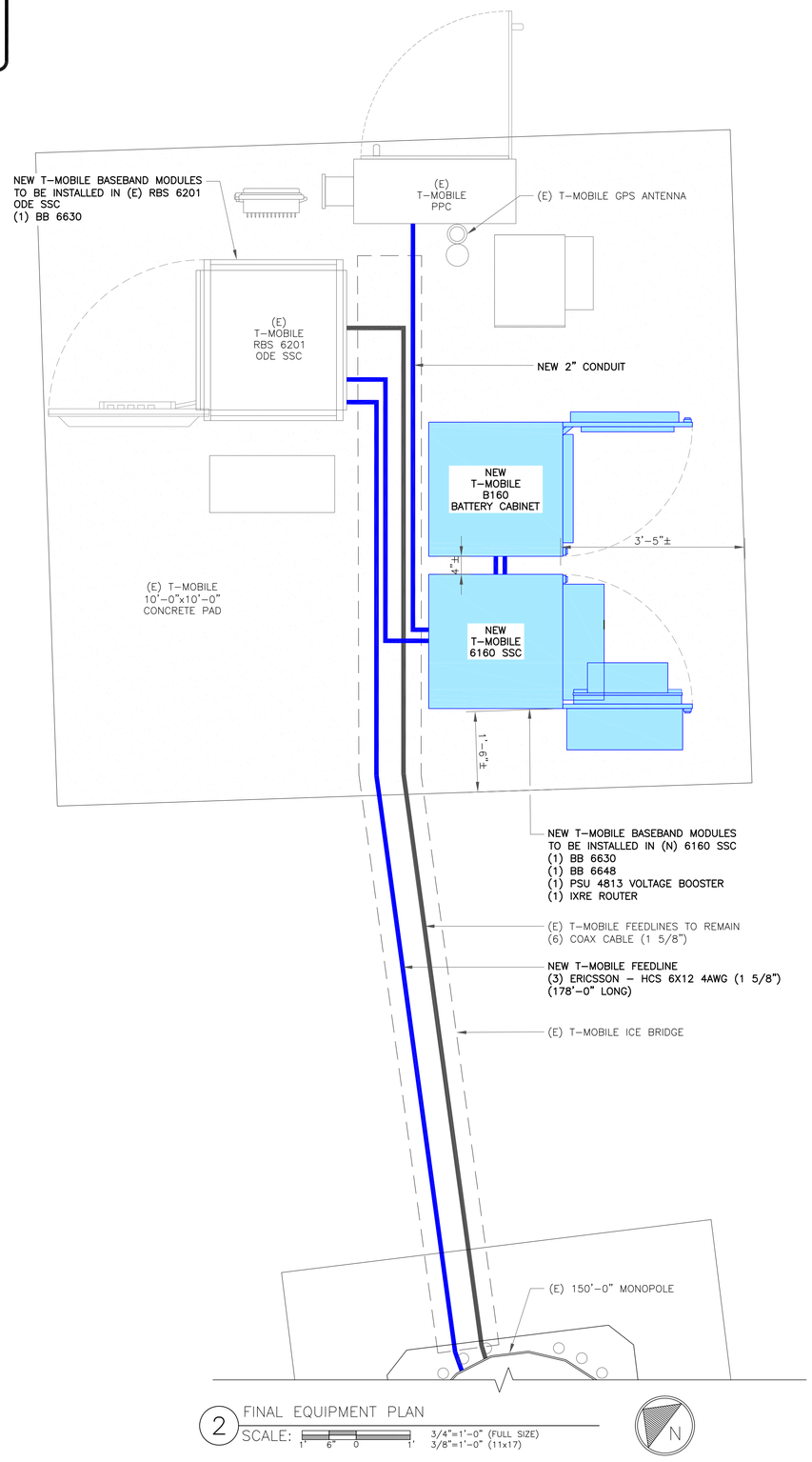
137067.003.01 NHV 102 943127_CC_TMO_NE_CD Upgrades.dwg – Sheet:C-1.1 – User: jdunbar – Jan 11, 2021 – 1:44pm

EQUIPMENT LEGEND:

- EXISTING
- TO BE RELOCATED/REMOVED
- NEW



1 EXISTING EQUIPMENT PLAN
SCALE: 1' 6" 0 1' 3/4"=1'-0" (FULL SIZE) 3/8"=1'-0" (11x17)



2 FINAL EQUIPMENT PLAN
SCALE: 1' 6" 0 1' 3/4"=1'-0" (FULL SIZE) 3/8"=1'-0" (11x17)

T-Mobile
4 SYLVAN WAY
PARSIPPANY, NJ 07054

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131 MANOR ROAD
GUILFORD, CT 06437

EXISTING
150'-0" MONOPOLE

ISSUED FOR:

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JACOB J. DUNBAR
JACOB E. TUTTLE
ENGINEER
No. 47802
LICENSED PROFESSIONAL ENGINEER
1/11/21

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PEC.0001564
Expires 2/10/21

SHEET NUMBER: C-1.2
REVISION: 1

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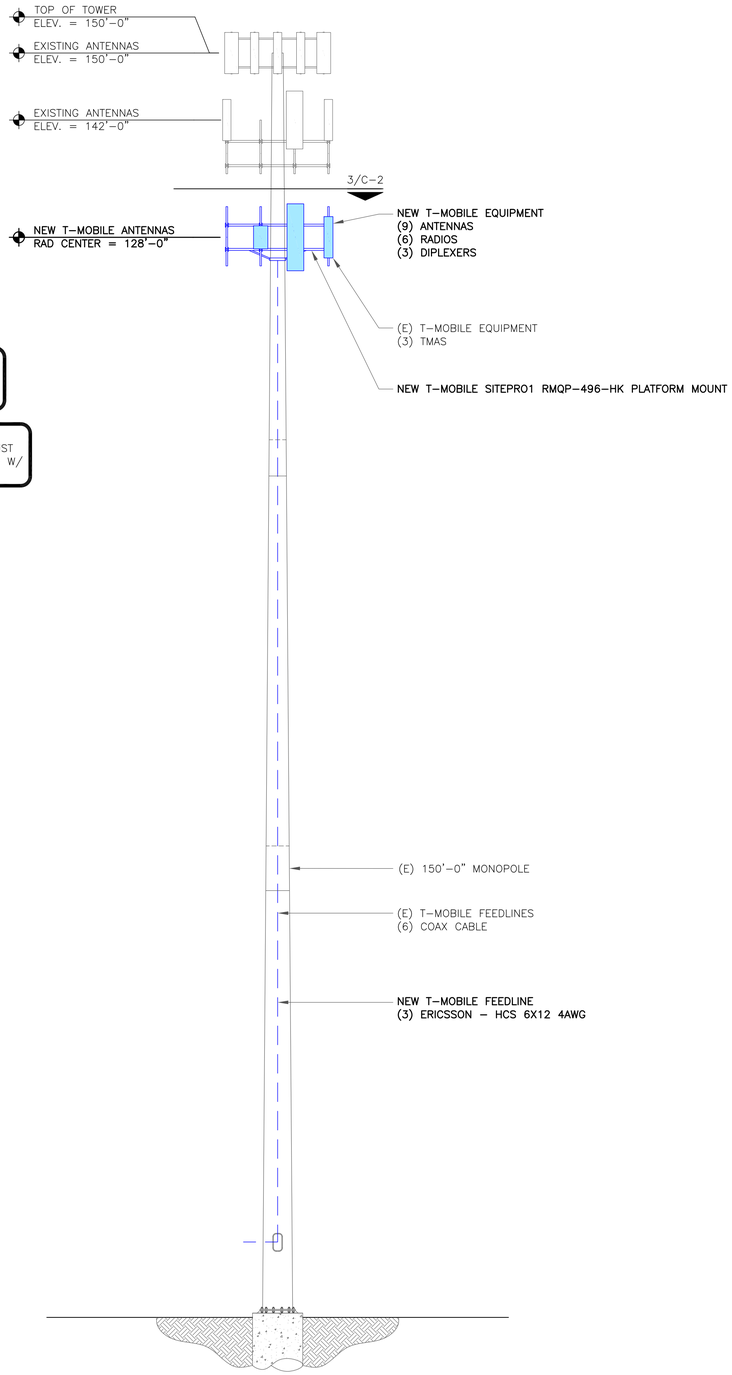
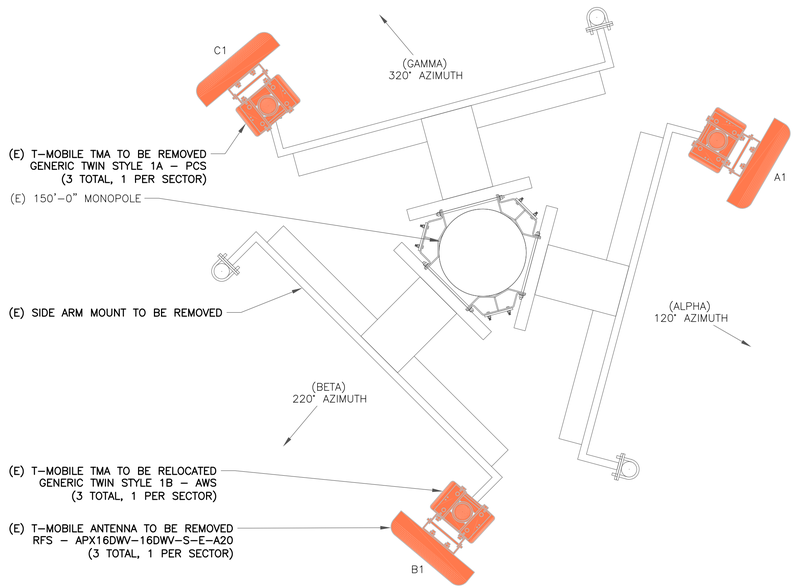
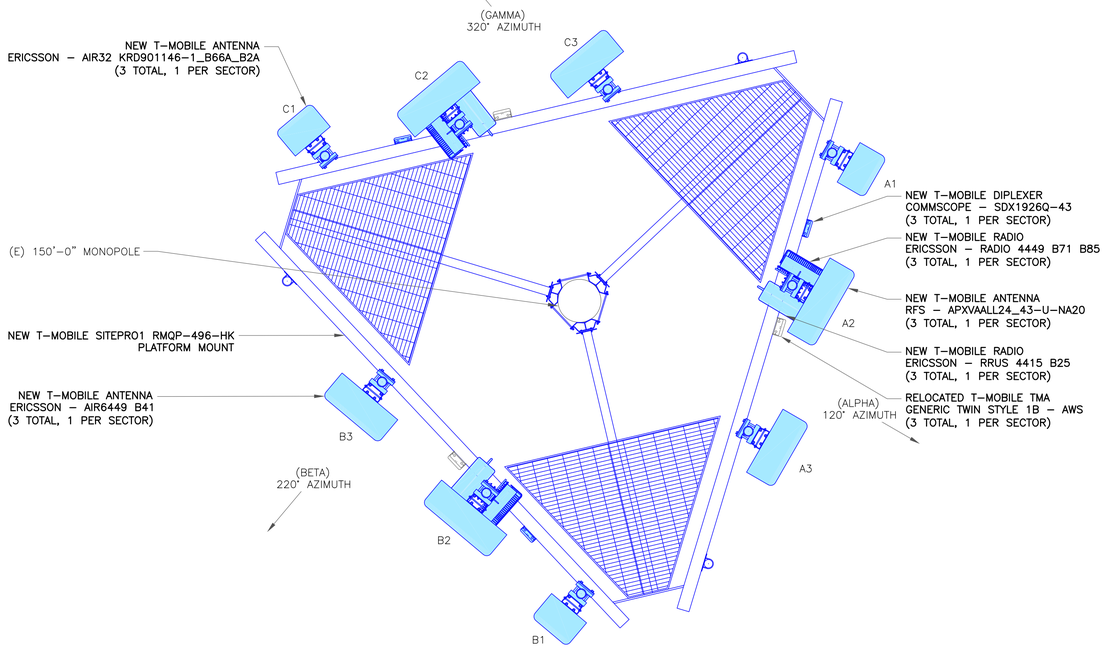


1 FINAL ELEVATION
SCALE: NOT TO SCALE



2 EXISTING ANTENNA PLAN
SCALE: NOT TO SCALE



3 FINAL ANTENNA PLAN
SCALE: NOT TO SCALE

T-Mobile
4 SYLVAN WAY
PARSIPPANY, NJ 07054

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

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CTNH110C

BU #: **806361**
NHV 102 943127

131 MANOR ROAD
GUILFORD, CT 06437

EXISTING
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ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	12/3/20	LHT	CONSTRUCTION	MTJ
1	1/11/21	JJD	CONSTRUCTION	GEH

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

SHEET NUMBER: C-2

REVISION: 1

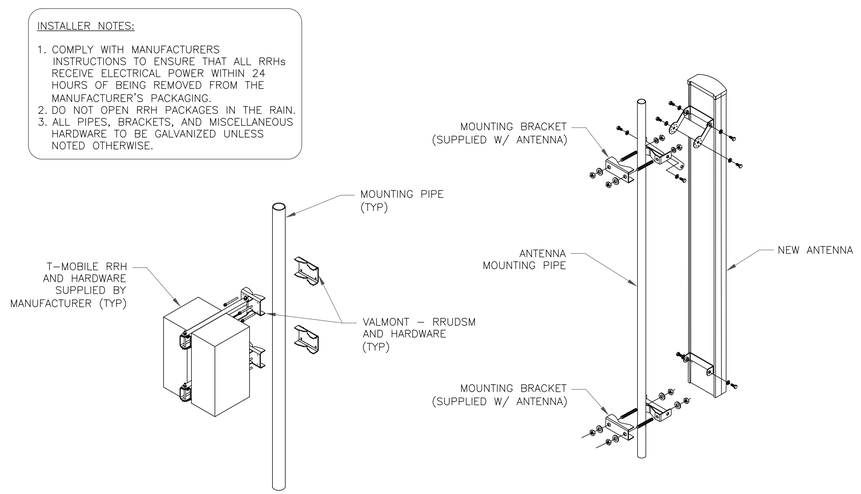
RF SYSTEM SCHEDULE

SECTOR	ANTENNA	TECH	MANUFACTURER	ANTENNA MODEL	AZIMUTH	M-TILT	E-TILT	RAD CENTER	TMA/RRU	CABLE TYPE	CABLE DIAMETER	CABLE LENGTH
ALPHA	A-1	L2100/L1900/ G1900	ERICSSON	AIR32 KRD901146-1_B66A_B2A	120°	0°	2°/2°	128'-0"	–	–	–	–
	A-2	L700/L600/N600/ L1900/U2100	RFS	APXVAALL24_43-U-NA20	120°	0°	2°/2°	128'-0"	(1) GENERIC TWIN STYLE 1B – AWS (1) 4449 B71+B85 (1) RADIO 4415 B25	(2) COAX (1) HYBRID	1 5/8" 6X12	165' 178'
	A-3	L2500/N2500	ERICSSON	AIR6449 B41	120°	0°	–	128'-0"	–	–	–	–
BETA	B-1	L2100/L1900/ G1900	ERICSSON	AIR32 KRD901146-1_B66A_B2A	220°	0°	2°/2°	128'-0"	–	–	–	–
	B-2	L700/L600/N600/ L1900/U2100	RFS	APXVAALL24_43-U-NA20	220°	0°	2°/2°	128'-0"	(1) GENERIC TWIN STYLE 1B – AWS (1) 4449 B71+B85 (1) RADIO 4415 B25	(2) COAX (1) HYBRID	1 5/8" 6X12	165' 178'
	B-3	L2500/N2500	ERICSSON	AIR6449 B41	220°	0°	–	128'-0"	–	–	–	–
GAMMA	C-1	L2100/L1900/ G1900	ERICSSON	AIR32 KRD901146-1_B66A_B2A	320°	0°	2°/2°	128'-0"	–	–	–	–
	C-2	L700/L600/N600/ L1900/U2100	RFS	APXVAALL24_43-U-NA20	320°	0°	2°/2°	128'-0"	(1) GENERIC TWIN STYLE 1B – AWS (1) 4449 B71+B85 (1) RADIO 4415 B25	(2) COAX (1) HYBRID	1 5/8" 6X12	165' 178'
	B-3	L2500/N2500	ERICSSON	AIR6449 B41	320°	0°	–	128'-0"	–	–	–	–

1 ANTENNA & FEEDLINE SCHEDULE
SCALE: NOT TO SCALE

INSTALLER NOTES:

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



2 ANTENNA WITH RRHs MOUNTING DETAIL
SCALE: NOT TO SCALE

T-Mobile
4 SYLVAN WAY
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CROWN CASTLE
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SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

T-MOBILE SITE NUMBER:
CTNH110C

BU #: **806361**
NHV 102 943127

131 MANOR ROAD
GUILFORD, CT 06437

EXISTING
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ISSUED FOR:

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1	1/11/21	JJD	CONSTRUCTION	GEH

1/11/21

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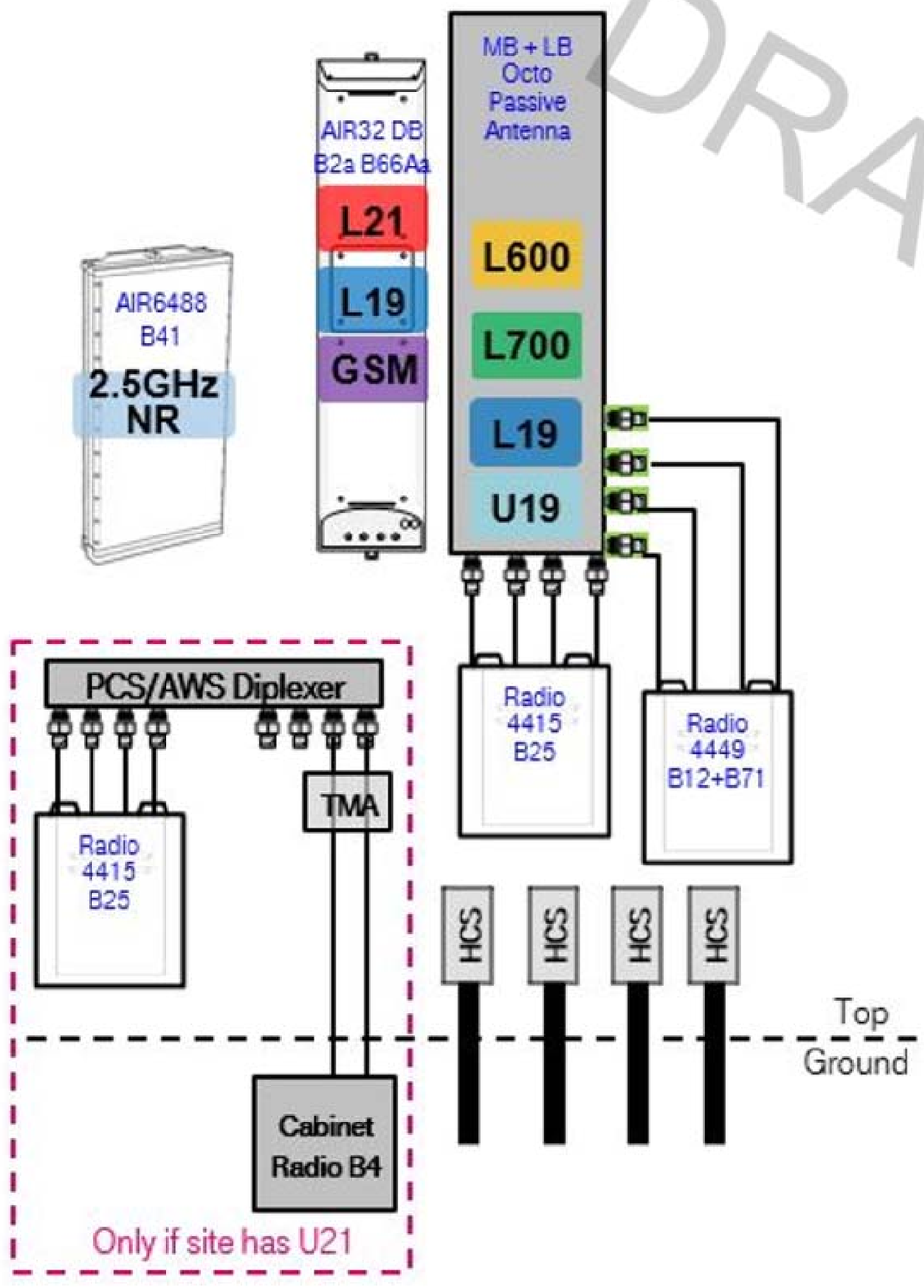
Expires 2/10/21

SHEET NUMBER: C-3
REVISION: 1



1 PLUMBING DIAGRAM
SCALE: NOT TO SCALE

T-Mobile
4 SYLVAN WAY
PARSIPPANY, NJ 07054

CROWN CASTLE
3530 TORINGDON WAY, SUITE 300
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131 MANOR ROAD
GUILFORD, CT 06437

EXISTING
150'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
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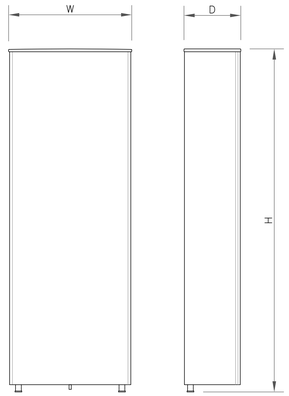
1	1/11/21	JJD	CONSTRUCTION	GEH

1/11/21

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

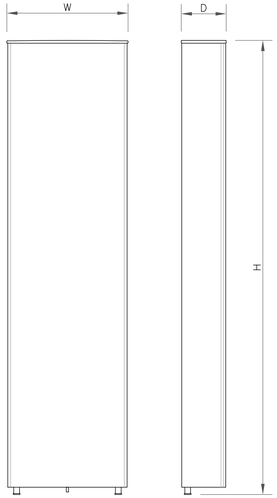
SHEET NUMBER: C-4

REVISION: 1



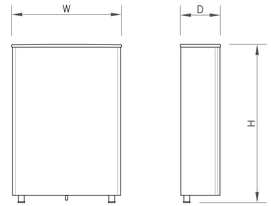
ANTENNA SPECS	
MANUFACTURER	ERICSSON
MODEL #	AIR 32 B2A B66AA
WIDTH	12.87"
DEPTH	8.7"
HEIGHT	59.25"
WEIGHT	171.96 LBS

1 ANTENNA SPECS
SCALE: NOT TO SCALE



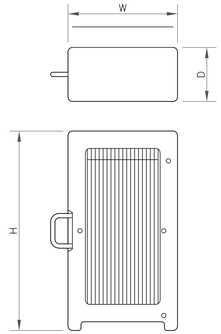
ANTENNA SPECS	
MANUFACTURER	RFS
MODEL #	APXVAALL24_43-U-NA20
WIDTH	24.0"
DEPTH	8.50"
HEIGHT	95.90"
WEIGHT	149.9 LBS

2 ANTENNA SPECS
SCALE: NOT TO SCALE



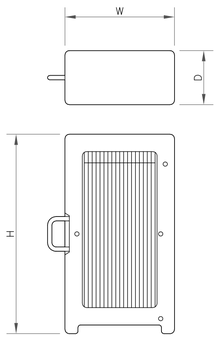
ANTENNA SPECS	
MANUFACTURER	ERICSSON
MODEL #	AIR6449 B41
WIDTH	20.51"
DEPTH	8.54"
HEIGHT	33.11"
WEIGHT	114.63 LBS

3 ANTENNA SPECS
SCALE: NOT TO SCALE



RRU SPECIFICATIONS	
MANUFACTURER	ERICSSON
MODEL #	RADIO 4449 B71+B85
WIDTH	13.2"
DEPTH	10.63"
HEIGHT	17.91"
WEIGHT	73.21 LBS

4 RRU SPECS
SCALE: NOT TO SCALE



RRU SPECIFICATIONS	
MANUFACTURER	ERICSSON
MODEL #	RRUS 4415 B25
WIDTH	13.4"
DEPTH	5.9"
HEIGHT	16.5"
WEIGHT	46 LBS

5 ERICSSON B160 BATTERY CABINET
SCALE: NOT TO SCALE

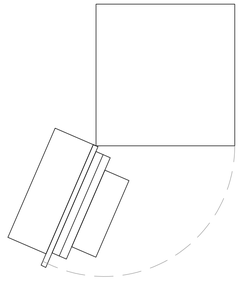
DIPLEXER SPECS	
MANUFACTURER	COMMSCOPE
MODEL #	SDX1926Q-43
WIDTH	6.93"
DEPTH	2.91"
HEIGHT	4.17"
WEIGHT	6.17 LBS

6 ERICSSON 6160 SSC
SCALE: NOT TO SCALE

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

7 RRU SPECS
SCALE: NOT TO SCALE

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



8 DIPLEXER SPECS
SCALE: NOT TO SCALE

T-Mobile
4 SYLVAN WAY
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T-MOBILE SITE NUMBER:
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131 MANOR ROAD
GUILFORD, CT 06437

EXISTING
150'-0" MONOPOLE

ISSUED FOR:

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

SHEET NUMBER: C-5

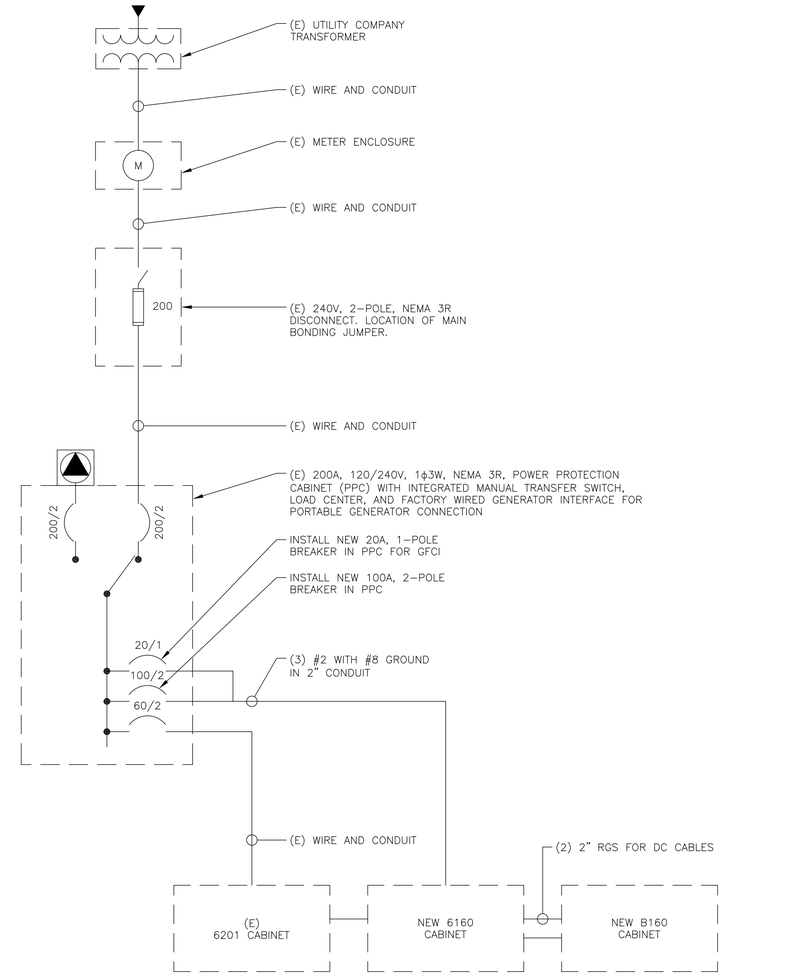
REVISION: 1

FINAL PANEL SCHEDULE							
LOAD	POLES	AMPS	BUS L1	BUS L2	AMPS	POLES	LOAD
TVSS	2	60	1	2	60	2	6201
			3	4			
			5	6	20	1	LED SPOT
			7	8	100	2	6160
BTS	2	50	9	10			
			11	12	20	1	GFCI
			13	14			
			15	16			
			17	18			
			19	20			
			21	22			
			23	24			
			25	26			
			27	28			
			29	30			

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

INSTALL NEW 2P 100A BREAKER IN POSITION 8 AND 10.
INSTALL NEW 1P 20A BREAKER IN POSITION 12.
REPLACE EXISTING WIRES FOR EXISTING 6201 CABINET WITH (3) 1/0 AWG THWN (COPPER) AND (1) #2G AWG. MINIMUM CONDUIT SIZE TO BE 2".
IF 100A BREAKER WILL NOT PROPERLY FIT IN EXISTING PANEL, REPLACE (E) PANEL WITH SQUARE D PANEL QO12040M200RB (OR APPROVED EQUAL).
UPGRADE FEEDER WIRES TO MEET AMPACITY IF NEW PANEL IS REQUIRED.
FINAL PANEL DESIGN AND CALCULATIONS FOR WIRE SIZE WERE BASED OFF OF EXISTING PHOTOS.

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



NOTES:

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

2 ONE LINE DIAGRAM
SCALE: NOT TO SCALE

T-Mobile
4 SYLVAN WAY
PARSIPPANY, NJ 07054

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3530 TORINGDON WAY, SUITE 300
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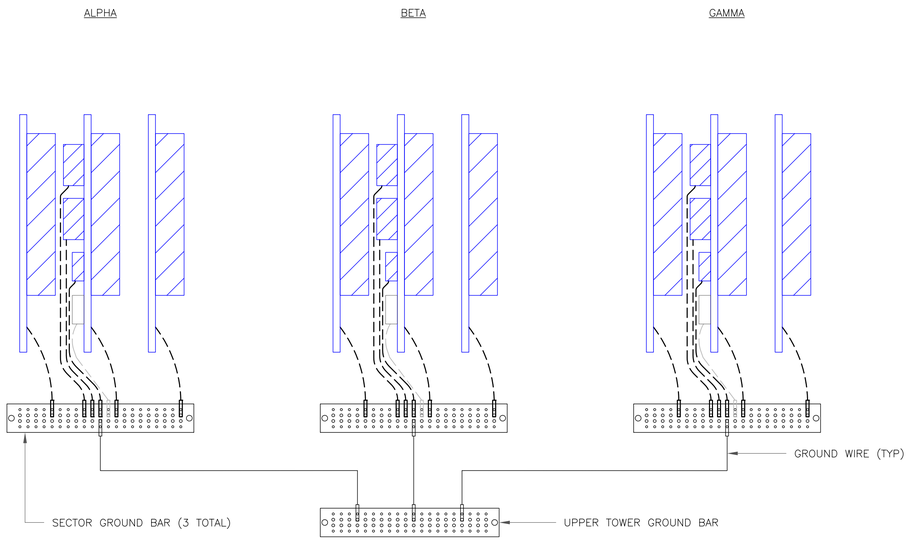
Expires 2/10/21

SHEET NUMBER: E-1
REVISION: 1



NOTE:

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

1 ANTENNA GROUNDING DIAGRAM
SCALE: NOT TO SCALE

T-Mobile
4 SYLVAN WAY
PARSIPPANY, NJ 07054

CROWN CASTLE
3530 TORINGDON WAY, SUITE 300
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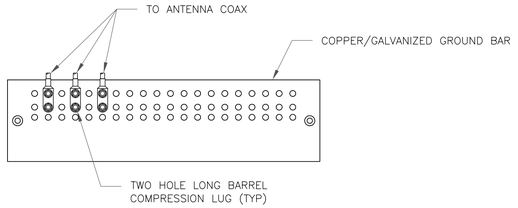
1/11/21

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

SHEET NUMBER: G-1

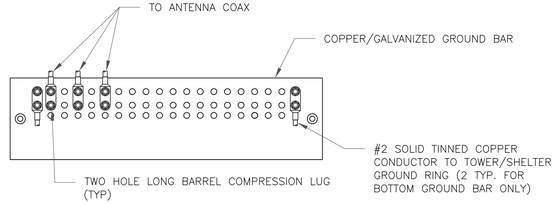
REVISION: 1



NOTES:

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

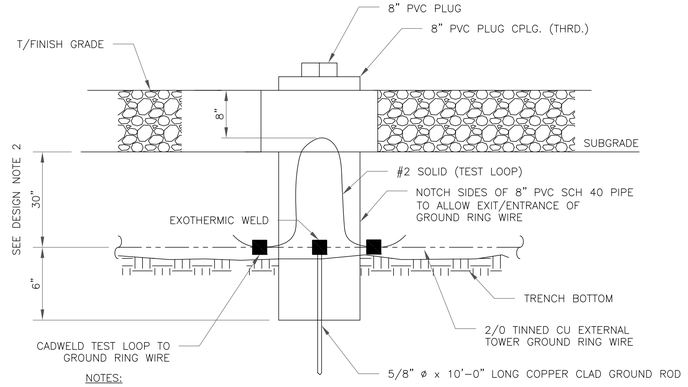
1 ANTENNA SECTOR GROUND BAR DETAIL
SCALE: NOT TO SCALE



NOTES:

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

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



NOTES:

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

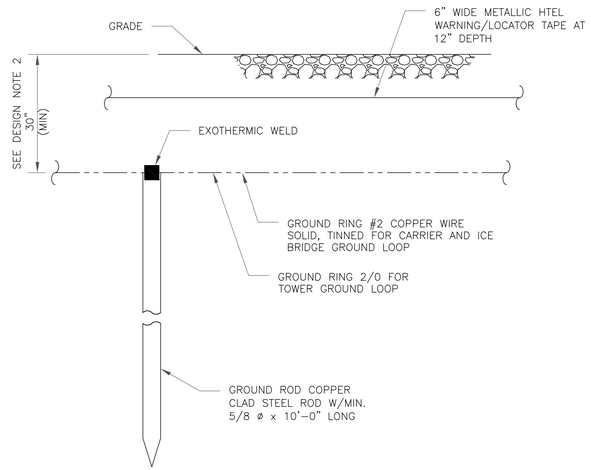
3 INSPECTION WELL DETAIL
SCALE: NOT TO SCALE

NOTES:

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

4 TYPICAL ANTENNA CABLE GROUNDING
SCALE: NOT TO SCALE

5 HARDWARE DETAIL FOR EXTERIOR CONNECTIONS
SCALE: NOT TO SCALE



NOTES:

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

6 GROUND ROD DETAIL
SCALE: NOT TO SCALE

T-Mobile
4 SYLVAN WAY
PARSIPPANY, NJ 07054

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

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

T-MOBILE SITE NUMBER:
CTNH110C

BU #: **806361**
NHV 102 943127

131 MANOR ROAD
GUILFORD, CT 06437

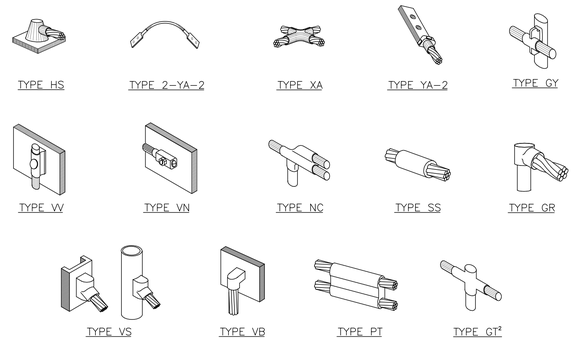
EXISTING
150'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	12/3/20	LHT	CONSTRUCTION	MTJ
1	1/11/21	JJD	CONSTRUCTION	GEH

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

SHEET NUMBER: G-2
REVISION: 1

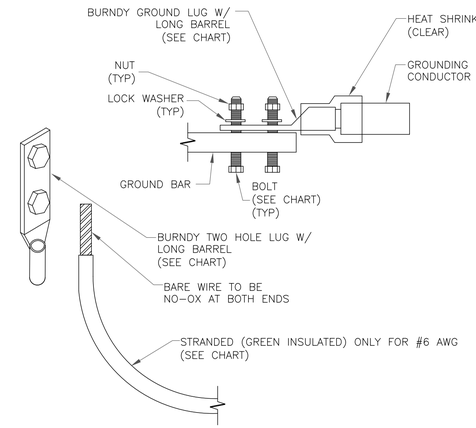


NOTE:

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

1 CADWELD GROUNDING CONNECTIONS
SCALE: NOT TO SCALE

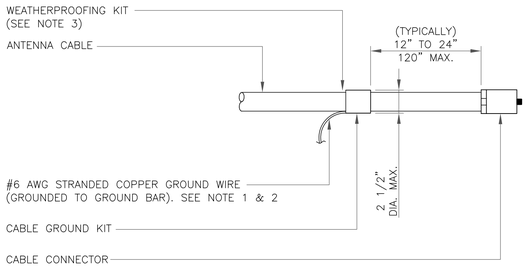
WIRE SIZE	BURNDY LUG	BOLT SIZE
#6 AWG GREEN INSULATED	YA6C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG SOLID TINNED	YA3C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG STRANDED	YA2C-2TC38	3/8" - 16 NC S 2 BOLT
#2/0 AWG STRANDED	YA26-2TC38	3/8" - 16 NC S 2 BOLT
#4/0 AWG STRANDED	YA28-2N	1/2" - 16 NC S 2 BOLT



NOTES:

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

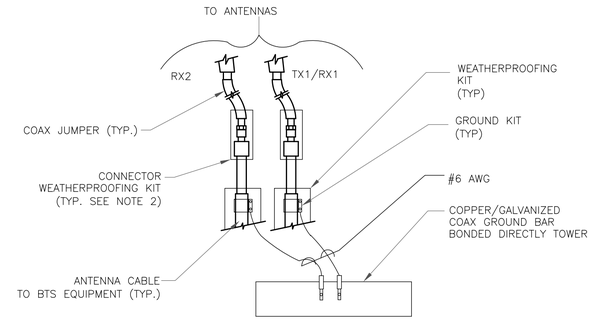
2 MECHANICAL LUG CONNECTION
SCALE: NOT TO SCALE



NOTES:

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

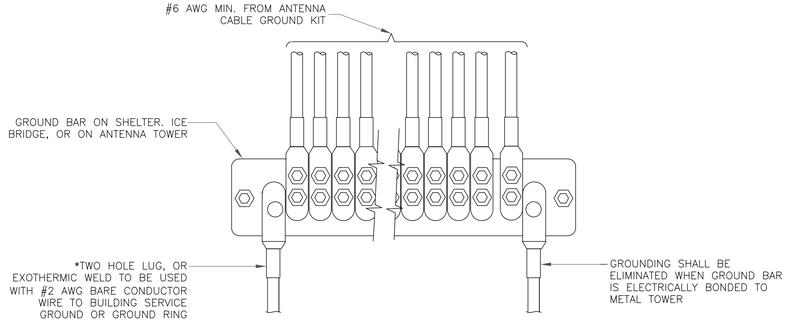
3 CABLE GROUND KIT CONNECTION
SCALE: NOT TO SCALE



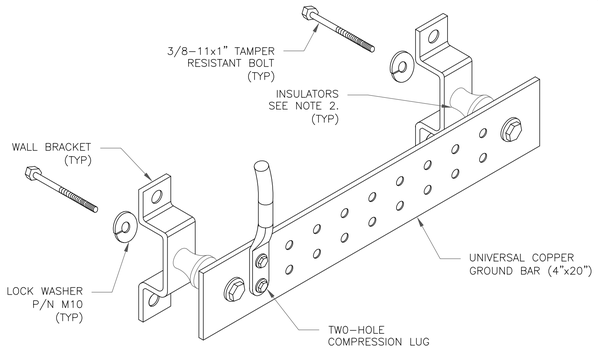
NOTES:

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

4 GROUND CABLE CONNECTION
SCALE: NOT TO SCALE



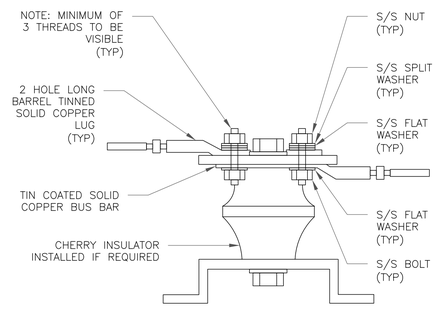
5 GROUNDWIRE INSTALLATION
SCALE: NOT TO SCALE



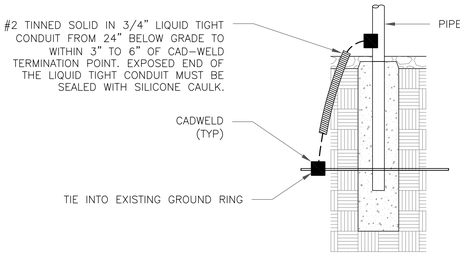
NOTES:

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

6 GROUND BAR DETAIL
SCALE: NOT TO SCALE



7 LUG DETAIL
SCALE: NOT TO SCALE



8 TRANSITIONING GROUND DETAIL
SCALE: NOT TO SCALE

T-Mobile
4 SYLVAN WAY
PARSIPPANY, NJ 07054

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

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

T-MOBILE SITE NUMBER:
CTNH110C

BU #: **806361**
NHV 102 943127

131 MANOR ROAD
GUILFORD, CT 06437

EXISTING
150'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	12/3/20	LHT	CONSTRUCTION	MTJ
1	1/11/21	JJD	CONSTRUCTION	GEH

1/11/21

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

SHEET NUMBER: G-3
REVISION: 1

Exhibit D

Structural Analysis Report

Date: **October 26, 2020**

Denice Nicholson
Crown Castle
3 Corporate Dr
Clifton Park, NY 12065

Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
(724) 416-2000

Subject:	**Structural Analysis Report**	
Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CTNH110C
	Carrier Site Name:	NH110/Crown LongHill_ETMP
Crown Castle Designation:	**Crown Castle BU Number:**	806361
	Crown Castle Site Name:	NHV 102 943127
	Crown Castle JDE Job Number:	559170
	Crown Castle Work Order Number:	1891416
	Crown Castle Order Number:	479852 Rev. 4
Engineering Firm Designation:	**Crown Castle Project Number:**	1891416
Site Data:	**131 Manor Rd, Guilford, New Haven County, CT**	
	Latitude *41° 19' 48.09"*, Longitude *-72° 43' 18.51"*	
	150 Foot - Monopole Tower	

Dear Denice Nicholson,

Crown Castle is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower.

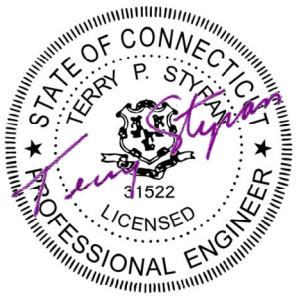
The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC4.7: Proposed Equipment Configuration with Proposed Modifications **Sufficient Capacity - 98.1%**

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

Structural analysis prepared by: Randall Ashworth, EIT / AM

Respectfully submitted by:



Terry P. Styran, P.E.
Senior Project Engineer

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 150 ft Monopole tower designed by Valmont.

The tower has been modified multiple times to accommodate additional loading.

Proposed reinforcement drawings prepared by GPD, in August of 2019 have been considered in this analysis. Reinforcement consists of addition of a transition stiffener from 0' to 3.33'.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	130
Exposure Category:	C
Topographic Factor:	1
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
128.0	128.0	3	commscope	SDX1926Q-43	9	1-5/8
		3	ericsson	AIR 32 B2A B66AA_T-MOBILE w/ Mount Pipe		
		3	ericsson	AIR6449 B41_T-MOBILE w/ Mount Pipe		
		3	ericsson	KRY 112 144/1		
		3	ericsson	RADIO 4449 B71 B85A_T-MOBILE		
		3	ericsson	RRUS 4415 B25_CCIV2		
		3	rfs celwave	APXVAALL24_43-U-NA20_TMO w/ Mount Pipe		
		1	site pro	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)
150.0	150.0	3	alcatel lucent	B4 RRH2X60-4R	1 12 1	1/2 7/8 1-5/8
		3	alcatel lucent	RRH2X60-AWS		
		3	antel	BXA-70063-6CF-2 w/ Mount Pipe		
		6	antel	LPA-80063/6CFX5 w/ Mount Pipe		
		6	commscope	HBXX-6517DS-A2M w/ Mount Pipe		
		1	rfs celwave	DB-T1-6Z-8AB-0Z		
		1	tower mounts	Platform Mount (LP 101-1_KCKR)		
	147.0	1	lucent	KS24019-L112A		
		6	rfs celwave	FD9R6004/2C-3L		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
138.0	142.0	3	cci antennas	HPA-65R-BUU-H6 w/ Mount Pipe	1 2 12	3/8 3/4 1-1/4
		3	ericsson	RRUS 11 B12		
		3	ericsson	RRUS12/RRUS A2		
		6	powerwave technologies	7770.00 w/ Mount Pipe		
		6	powerwave technologies	LGP21401		
		6	powerwave technologies	LGP21903		
		1	raycap	DC6-48-60-18-8F		
	138.0	1	tower mounts	Platform Mount (LP 101-1)		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Clarence Welti Assoc., Inc.	780506	CCISITES
4-POST-MODIFICATION INSPECTION	Vertical Solutions	2045675	CCISITES
4-POST-MODIFICATION INSPECTION	Paul J. Ford and Company	3099221	CCISITES
4-POST-MODIFICATION INSPECTION	Tower Engineering Professionals	3335575	CCISITES
4-POST-MODIFICATION INSPECTION	Tower Engineering Professionals	4037923	CCISITES
4-POST-MODIFICATION INSPECTION	Tower Engineering Professionals	5823375	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	SAC Engineering, Inc.	217669	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Valmont	217668	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Vertical Solutions	1249600	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Paul J. Ford and Company	3002793	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Paul J. Ford and Company	3255562	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Paul J. Ford and Company	3840597	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Paul J. Ford and Company	5605781	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	GPD Group	8611850	CCISITES

3.1) Analysis Method

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

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

3.2) Assumptions

1) 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. Crown Castle should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
150 - 145	Pole	TP16.937x16x0.1875	Pole	21.7%	Pass
145 - 140	Pole	TP17.875x16.937x0.1875	Pole	39.9%	Pass
140 - 135	Pole	TP18.812x17.875x0.1875	Pole	66.3%	Pass
135 - 133	Pole	TP19.187x18.812x0.1875	Pole	75.5%	Pass
133 - 132.75	Pole + Reinf.	TP19.234x19.187x0.45	Reinf. 20 Tension Rupture	53.0%	Pass
132.75 - 127.75	Pole + Reinf.	TP20.171x19.234x0.4375	Reinf. 20 Tension Rupture	68.9%	Pass
127.75 - 123.75	Pole + Reinf.	TP20.921x20.171x0.425	Reinf. 20 Tension Rupture	84.6%	Pass
123.75 - 123.5	Pole + Reinf.	TP20.968x20.921x0.425	Reinf. 20 Tension Rupture	85.6%	Pass
123.5 - 118.75	Pole + Reinf.	TP21.859x20.968x0.7625	Reinf. 20 Tension Rupture	58.4%	Pass
118.75 - 118.5	Pole + Reinf.	TP21.906x21.859x1.0375	Reinf. 19 Tension Rupture	45.2%	Pass
118.5 - 117	Pole + Reinf.	TP22.187x21.906x1.0125	Reinf. 19 Tension Rupture	47.6%	Pass
117 - 116.75	Pole + Reinf.	TP22.234x22.187x0.75	Reinf. 18 Tension Rupture	62.4%	Pass
116.75 - 111.75	Pole + Reinf.	TP23.171x22.234x0.7125	Reinf. 18 Tension Rupture	72.1%	Pass
111.75 - 106.75	Pole + Reinf.	TP24.108x23.171x0.6875	Reinf. 18 Tension Rupture	81.0%	Pass
106.75 - 101.75	Pole + Reinf.	TP25.046x24.108x0.6625	Reinf. 18 Tension Rupture	89.3%	Pass
101.75 - 99.5	Pole + Reinf.	TP26.28x25.046x0.6625	Reinf. 18 Tension Rupture	92.9%	Pass
99.5 - 94.5	Pole + Reinf.	TP26.031x25.093x0.7875	Reinf. 18 Tension Rupture	85.4%	Pass
94.5 - 93.75	Pole + Reinf.	TP26.171x26.031x0.7875	Reinf. 18 Tension Rupture	86.2%	Pass
93.75 - 93.5	Pole + Reinf.	TP26.218x26.171x0.9125	Reinf. 9 Tension Rupture	77.9%	Pass
93.5 - 92.75	Pole + Reinf.	TP26.359x26.218x0.9125	Reinf. 9 Tension Rupture	78.7%	Pass
92.75 - 92.5	Pole + Reinf.	TP26.406x26.359x1.1375	Reinf. 9 Tension Rupture	65.5%	Pass
92.5 - 91.25	Pole + Reinf.	TP26.64x26.406x1.1125	Reinf. 9 Tension Rupture	66.6%	Pass
91.25 - 91	Pole + Reinf.	TP26.687x26.64x1.1125	Reinf. 9 Tension Rupture	66.8%	Pass
91 - 89.25	Pole + Reinf.	TP27.016x26.687x1.1125	Reinf. 9 Tension Rupture	68.4%	Pass
89.25 - 89	Pole + Reinf.	TP27.063x27.016x1.2125	Reinf. 3 Connection	64.9%	Pass

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
89 - 85.75	Pole + Reinf.	TP27.672x27.063x1.1875	Reinf. 9 Tension Rupture	65.0%	Pass
85.75 - 85.5	Pole + Reinf.	TP27.719x27.672x0.8625	Reinf. 17 Tension Rupture	83.7%	Pass
85.5 - 80.5	Pole + Reinf.	TP28.657x27.719x0.8375	Reinf. 17 Tension Rupture	88.2%	Pass
80.5 - 75.5	Pole + Reinf.	TP29.595x28.657x0.8125	Reinf. 17 Tension Rupture	92.4%	Pass
75.5 - 70.5	Pole + Reinf.	TP30.533x29.595x0.7875	Reinf. 17 Tension Rupture	96.3%	Pass
70.5 - 68.08	Pole + Reinf.	TP30.987x30.533x0.7875	Reinf. 17 Tension Rupture	98.1%	Pass
68.08 - 67.83	Pole + Reinf.	TP31.034x30.987x0.8375	Reinf. 16 Tension Rupture	84.1%	Pass
67.83 - 67	Pole + Reinf.	TP31.19x31.034x0.8375	Reinf. 16 Tension Rupture	84.6%	Pass
67 - 66.75	Pole + Reinf.	TP31.237x31.19x1.0625	Reinf. 6 Tension Rupture	68.2%	Pass
66.75 - 63.25	Pole + Reinf.	TP31.894x31.237x1.0375	Reinf. 6 Tension Rupture	70.0%	Pass
63.25 - 63	Pole + Reinf.	TP31.94x31.894x1.2125	Reinf. 8 Tension Rupture	67.1%	Pass
63 - 59.5	Pole + Reinf.	TP32.597x31.94x1.1875	Reinf. 8 Tension Rupture	68.9%	Pass
59.5 - 59.25	Pole + Reinf.	TP32.644x32.597x1.2375	Reinf. 8 Tension Rupture	66.5%	Pass
59.25 - 56.25	Pole + Reinf.	TP33.207x32.644x1.2125	Reinf. 8 Tension Rupture	68.0%	Pass
56.25 - 56	Pole + Reinf.	TP33.254x33.207x1.0625	Reinf. 6 Tension Rupture	70.7%	Pass
56 - 55.75	Pole + Reinf.	TP33.301x33.254x0.8375	Reinf. 16 Tension Rupture	86.8%	Pass
55.75 - 50.75	Pole + Reinf.	TP34.239x33.301x0.825	Reinf. 16 Tension Rupture	89.4%	Pass
50.75 - 50	Pole + Reinf.	TP35.38x34.239x0.8125	Reinf. 16 Tension Rupture	89.8%	Pass
50 - 43.67	Pole + Reinf.	TP34.942x33.754x0.875	Reinf. 16 Tension Rupture	88.3%	Pass
43.67 - 38.67	Pole + Reinf.	TP35.88x34.942x0.8625	Reinf. 16 Tension Rupture	90.3%	Pass
38.67 - 34.5	Pole + Reinf.	TP36.661x35.88x0.85	Reinf. 16 Tension Rupture	91.9%	Pass
34.5 - 34.25	Pole + Reinf.	TP36.708x36.661x1.1	Reinf. 16 Tension Rupture	72.2%	Pass
34.25 - 33	Pole + Reinf.	TP36.942x36.708x1.1	Reinf. 16 Tension Rupture	72.6%	Pass
33 - 32.75	Pole + Reinf.	TP36.989x36.942x1.1	Reinf. 15 Tension Rupture	72.7%	Pass
32.75 - 29.75	Pole + Reinf.	TP37.552x36.989x1.075	Reinf. 15 Tension Rupture	73.6%	Pass
29.75 - 29.5	Pole + Reinf.	TP37.598x37.552x1.125	Reinf. 15 Tension Rupture	71.3%	Pass
29.5 - 25	Pole + Reinf.	TP38.442x37.598x1.1	Reinf. 15 Tension Rupture	72.6%	Pass
25 - 24.75	Pole + Reinf.	TP38.489x38.442x0.8625	Reinf. 15 Tension Rupture	91.4%	Pass
24.75 - 19.75	Pole + Reinf.	TP39.427x38.489x0.85	Reinf. 15 Tension Rupture	93.0%	Pass
19.75 - 14.75	Pole + Reinf.	TP40.364x39.427x0.825	Reinf. 15 Tension Rupture	94.4%	Pass
14.75 - 14.5	Pole + Reinf.	TP40.411x40.364x0.825	Reinf. 15 Tension Rupture	94.5%	Pass
14.5 - 14.25	Pole + Reinf.	TP40.458x40.411x0.825	Reinf. 15 Tension Rupture	94.5%	Pass
14.25 - 12.25	Pole + Reinf.	TP40.833x40.458x0.825	Reinf. 15 Tension Rupture	95.1%	Pass
12.25 - 12	Pole + Reinf.	TP40.88x40.833x0.7875	Reinf. 14 Tension Rupture	96.0%	Pass
12 - 11.5	Pole + Reinf.	TP40.974x40.88x0.7875	Reinf. 14 Tension Rupture	96.2%	Pass
11.5 - 11.25	Pole + Reinf.	TP41.02x40.974x0.9	Reinf. 14 Tension Rupture	91.1%	Pass
11.25 - 9.25	Pole + Reinf.	TP41.396x41.02x0.8875	Reinf. 14 Tension Rupture	91.7%	Pass
9.25 - 9	Pole + Reinf.	TP41.442x41.396x0.85	Reinf. 13 Tension Rupture	92.4%	Pass
9 - 4.5	Pole + Reinf.	TP42.286x41.442x0.825	Reinf. 13 Tension Rupture	93.5%	Pass
4.5 - 4.25	Pole + Reinf.	TP42.333x42.286x0.85	Reinf. 1 Tension Rupture	86.6%	Pass
4.25 - 3	Pole + Reinf.	TP42.567x42.333x0.85	Reinf. 1 Tension Rupture	86.9%	Pass
3 - 2.75	Pole + Reinf.	TP42.614x42.567x0.8375	Reinf. 1 Tension Rupture	87.1%	Pass
2.75 - 0	Pole + Reinf.	TP43.13x42.614x0.825	Reinf. 1 Tension Rupture	87.7%	Pass
				Summary	

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
			Pole	75.5%	Pass
			Reinforcement	98.1%	Pass
			Overall	98.1%	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC4.7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Jump Plate	94.83	91.6	Pass
1	Anchor Rods	0	94.7	Pass
1	Base Plate	0	92.5	Pass
1	Base Foundation (Structure)	0	74.7	Pass
1	Base Foundation (Soil Interaction)	0	24.4	Pass

Structure Rating (max from all components) =	98.1%

Notes:
1) See additional documentation in “Appendix C – Additional Calculations” for calculations supporting the % capacity consumed.

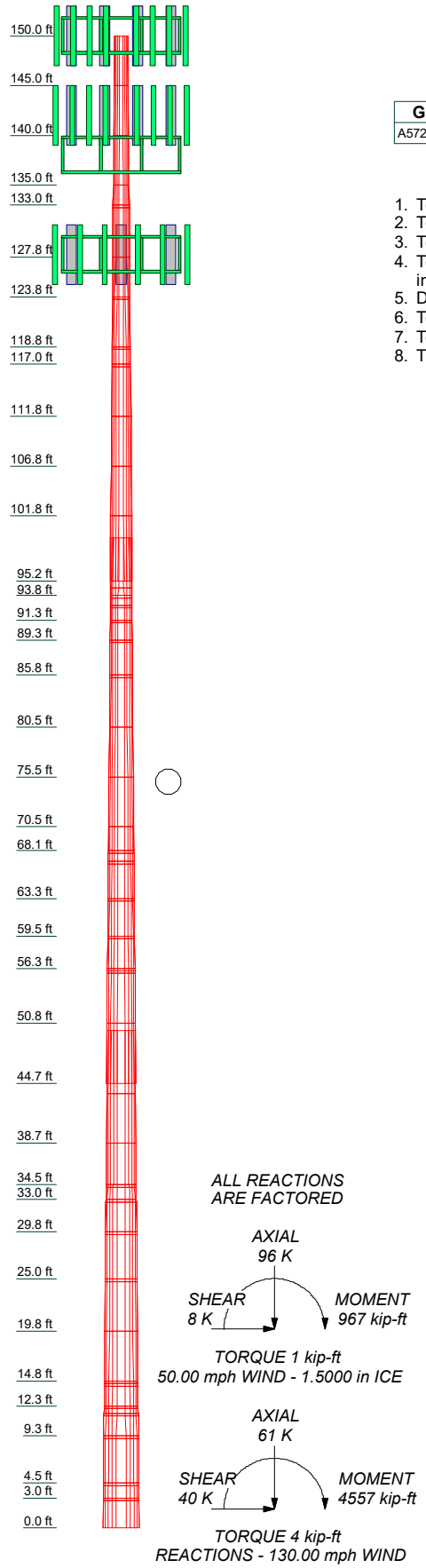
4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the proposed load configuration, once the proposed modifications are installed.

APPENDIX A

TNXTOWER OUTPUT

Section	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68
Length (ft)	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	6.6667	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	6.6667	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	2.7500
Number of Sides	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Thickness (in)	0.1875	0.1875	0.1875	0.1875	0.1875	0.4375	0.3125	0.0000	0.7500	0.0000	0.0000	0.0000	0.7188	0.6875	0.6625	0.6250	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.8375	0.8125	0.7875	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.8250	0.8125	0.8750	0.8625	0.8500	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.8500	0.8250	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Socket Length (ft)																4.3333																												5.3333																																		
Top Dia (in)	16.0000	16.9374	17.8748	18.8122	19.2340	20.1714	21.1088	21.5305	22.4679	22.9896	23.4270	23.9487	24.3861	24.8235	25.2452	25.6826	26.1200	26.5417	26.9791	27.4165	27.8382	28.2756	28.7130	29.1347	29.5721	30.0095	30.4312	30.8686	31.3060	31.7277	32.1651	32.6025	33.0242	33.4616	33.8990	34.3207	34.7581	35.1955	35.6172	36.0546	36.4920	36.9137	37.3511	37.7885	38.2102	38.6476	39.0850	39.5067	39.9441	40.3815	40.8032	41.2406	41.6780	42.0997	42.5371	42.9745	43.3962	43.8336	44.2710	44.6927	45.1301	45.5675	45.9892	46.4266	46.8640	47.2857	47.7231	48.1605	48.5822
Bot Dia (in)	16.9374	17.8748	18.8122	19.2340	20.1714	20.6931	21.1305	21.5522	22.0896	22.5113	22.9487	23.4704	23.9078	24.3452	24.7669	25.2043	25.6417	26.0634	26.5008	26.9382	27.3599	27.7973	28.2347	28.6564	29.0938	29.5312	29.9529	30.3903	30.8277	31.2494	31.6868	32.1242	32.5459	32.9833	33.4207	33.8424	34.2798	34.7172	35.1389	35.5763	36.0137	36.4354	36.8728	37.3102	37.7319	38.1693	38.6067	39.0284	39.4658	39.9032	40.3249	40.7623	41.1997	41.6214	42.0588	42.4962	42.9179	43.3553	43.7927	44.2144	44.6518	45.0892	45.5109	45.9483	46.3857	46.8074	47.2448	47.6822	48.1039	48.5413	48.9787	49.4004
Grade	A572-65																																																																																				
Weight (K)	0.2	0.2	0.2	0.1	0.1	0.4	0.3	0.0	0.7	0.0	0.0	0.0	0.8	0.8	0.8	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.2	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	1.7	1.9	1.5	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



ALL REACTIONS ARE FACTORED

AXIAL 96 K

SHEAR 8 K *MOMENT 967 kip-ft*

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

AXIAL 61 K

SHEAR 40 K *MOMENT 4557 kip-ft*

TORQUE 4 kip-ft
REACTIONS - 130.00 mph WIND

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 130.00 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50.00 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60.00 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.0000 ft
8. TOWER RATING: 98.1%

CROWN CASTLE
The Pathway to Possible

Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
Phone: (724) 416-2000
FAX:

Job: *BU 806361*			
Project:			
Client: Crown Castle	Drawn by: Rashworth		App'd:
Code: TIA-222-H	Date: 10/23/20		Scale: NTS
Path: C:\Users\Rashworth\Desktop\Directory\806361\WO 1891416 - SA\Prod\806361 Modified.eri			Dwg No. E-1

Tower Input Data

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

1) Tower is located in New Haven County, Connecticut.
2) Tower base elevation above sea level: 282.0000 ft.
3) Basic wind speed of 130.00 mph.
4) Risk Category II.
5) Exposure Category C.
6) Simplified Topographic Factor Procedure for wind speed-up calculations is used.
7) Topographic Category: 1.
8) Crest Height: 0.0000 ft.
9) Nominal ice thickness of 1.5000 in.
10) Ice thickness is considered to increase with height.
11) Ice density of 56.00 pcf.
12) A wind speed of 50.00 mph is used in combination with ice.
13) Temperature drop of 50.00 °F.
14) Deflections calculated using a wind speed of 60.00 mph.
15) TOWER RATING: 98.1%.
16) A non-linear (P-delta) analysis was used.
17) Pressures are calculated at each section.
18) Stress ratio used in pole design is 1.05.
19) Tower analysis based on target reliabilities in accordance with Annex S.
20) Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
21) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	*Elevation*	*Section Length*	*Splice Length*	*Number of Sides*	*Top Diameter*	*Bottom Diameter*	*Wall Thickness*	*Bend Radius*	*Pole Grade*
	ft	*ft*	*ft*		*in*	*in*	*in*	*in*	

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	150.0000-145.0000	5.0000	0.00	12	16.0000	16.9374	0.1875	0.7500	A572-65 (65 ksi)
L2	145.0000-140.0000	5.0000	0.00	12	16.9374	17.8748	0.1875	0.7500	A572-65 (65 ksi)
L3	140.0000-135.0000	5.0000	0.00	12	17.8748	18.8122	0.1875	0.7500	A572-65 (65 ksi)
L4	135.0000-133.0000	2.0000	0.00	12	18.8122	19.1871	0.1875	0.7500	A572-65 (65 ksi)
L5	133.0000-132.7500	0.2500	0.00	12	19.1871	19.2340	0.4500	1.8000	A572-65 (65 ksi)
L6	132.7500-127.7500	5.0000	0.00	12	19.2340	20.1714	0.4375	1.7500	A572-65 (65 ksi)
L7	127.7500-123.7500	4.0000	0.00	12	20.1714	20.9213	0.4250	1.7000	A572-65 (65 ksi)
L8	123.7500-123.5000	0.2500	0.00	12	20.9213	20.9681	0.4250	1.7000	A572-65 (65 ksi)
L9	123.5000-118.7500	4.7500	0.00	12	20.9681	21.8587	0.7625	3.0500	A572-65 (65 ksi)
L10	118.7500-118.5000	0.2500	0.00	12	21.8587	21.9055	1.0375	4.1500	A572-65 (65 ksi)
L11	118.5000-117.0000	1.5000	0.00	12	21.9055	22.1868	1.0125	4.0500	A572-65 (65 ksi)
L12	117.0000-116.7500	0.2500	0.00	12	22.1868	22.2336	0.7500	3.0000	A572-65 (65 ksi)
L13	116.7500-111.7500	5.0000	0.00	12	22.2336	23.1710	0.7125	2.8500	A572-65 (65 ksi)
L14	111.7500-106.7500	5.0000	0.00	12	23.1710	24.1084	0.6875	2.7500	A572-65 (65 ksi)
L15	106.7500-101.7500	5.0000	0.00	12	24.1084	25.0458	0.6625	2.6500	A572-65 (65 ksi)
L16	101.7500-95.1667	6.5833	4.33	12	25.0458	26.2800	0.6625	2.6500	A572-65 (65 ksi)
L17	95.1667-94.5000	5.0000	0.00	12	25.0926	26.0307	0.7875	3.1500	A572-65 (65 ksi)
L18	94.5000-93.7500	0.7500	0.00	12	26.0307	26.1714	0.7875	3.1500	A572-65 (65 ksi)
L19	93.7500-93.5000	0.2500	0.00	12	26.1714	26.2183	0.9125	3.6500	A572-65 (65 ksi)
L20	93.5000-92.7500	0.7500	0.00	12	26.2183	26.3590	0.9125	3.6500	A572-65 (65 ksi)
L21	92.7500-92.5000	0.2500	0.00	12	26.3590	26.4059	1.1375	4.5500	A572-65 (65 ksi)
L22	92.5000-91.2500	1.2500	0.00	12	26.4059	26.6404	1.1125	4.4500	A572-65 (65 ksi)
L23	91.2500-91.0000	0.2500	0.00	12	26.6404	26.6873	1.1125	4.4500	A572-65 (65 ksi)
L24	91.0000-89.2500	1.7500	0.00	12	26.6873	27.0156	1.1125	4.4500	A572-65 (65 ksi)
L25	89.2500-89.0000	0.2500	0.00	12	27.0156	27.0625	1.2125	4.8500	A572-65 (65 ksi)
L26	89.0000-85.7500	3.2500	0.00	12	27.0625	27.6723	1.1875	4.7500	A572-65 (65 ksi)
L27	85.7500-85.5000	0.2500	0.00	12	27.6723	27.7192	0.8625	3.4500	A572-65 (65 ksi)
L28	85.5000-80.5000	5.0000	0.00	12	27.7192	28.6572	0.8375	3.3500	A572-65 (65 ksi)
L29	80.5000-75.5000	5.0000	0.00	12	28.6572	29.5953	0.8125	3.2500	A572-65 (65 ksi)
L30	75.5000-70.5000	5.0000	0.00	12	29.5953	30.5334	0.7875	3.1500	A572-65 (65 ksi)
L31	70.5000-68.0830	2.4170	0.00	12	30.5334	30.9868	0.7875	3.1500	A572-65 (65 ksi)
L32	68.0830-67.8330	0.2500	0.00	12	30.9868	31.0337	0.8375	3.3500	A572-65 (65 ksi)
L33	67.8330-67.0000	0.8330	0.00	12	31.0337	31.1900	0.8375	3.3500	A572-65 (65 ksi)
L34	67.0000-66.7500	0.2500	0.00	12	31.1900	31.2369	1.0625	4.2500	A572-65 (65 ksi)
L35	66.7500-	3.5000	0.00	12	31.2369	31.8935	1.0375	4.1500	A572-65

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
	63.2500								(65 ksi)
L36	63.2500-63.0000	0.2500	0.00	12	31.8935	31.9404	1.2125	4.8500	A572-65 (65 ksi)
L37	63.0000-59.5000	3.5000	0.00	12	31.9404	32.5971	1.1875	4.7500	A572-65 (65 ksi)
L38	59.5000-59.2500	0.2500	0.00	12	32.5971	32.6440	1.2375	4.9500	A572-65 (65 ksi)
L39	59.2500-56.2500	3.0000	0.00	12	32.6440	33.2068	1.2125	4.8500	A572-65 (65 ksi)
L40	56.2500-56.0000	0.2500	0.00	12	33.2068	33.2537	1.0625	4.2500	A572-65 (65 ksi)
L41	56.0000-55.7500	0.2500	0.00	12	33.2537	33.3006	0.8375	3.3500	A572-65 (65 ksi)
L42	55.7500-50.7500	5.0000	0.00	12	33.3006	34.2387	0.8250	3.3000	A572-65 (65 ksi)
L43	50.7500-44.6667	6.0833	5.33	12	34.2387	35.3800	0.8125	3.2500	A572-65 (65 ksi)
L44	44.6667-43.6667	6.3333	0.00	12	33.7544	34.9420	0.8750	3.5000	A572-65 (65 ksi)
L45	43.6667-38.6667	5.0000	0.00	12	34.9420	35.8795	0.8625	3.4500	A572-65 (65 ksi)
L46	38.6667-34.5000	4.1667	0.00	12	35.8795	36.6608	0.8500	3.4000	A572-65 (65 ksi)
L47	34.5000-34.2500	0.2500	0.00	12	36.6608	36.7077	1.1000	4.4000	A572-65 (65 ksi)
L48	34.2500-33.0000	1.2500	0.00	12	36.7077	36.9421	1.1000	4.4000	A572-65 (65 ksi)
L49	33.0000-32.7500	0.2500	0.00	12	36.9421	36.9890	1.1000	4.4000	A572-65 (65 ksi)
L50	32.7500-29.7500	3.0000	0.00	12	36.9890	37.5515	1.0750	4.3000	A572-65 (65 ksi)
L51	29.7500-29.5000	0.2500	0.00	12	37.5515	37.5984	1.1250	4.5000	A572-65 (65 ksi)
L52	29.5000-25.0000	4.5000	0.00	12	37.5984	38.4422	1.1000	4.4000	A572-65 (65 ksi)
L53	25.0000-24.7500	0.2500	0.00	12	38.4422	38.4891	0.8625	3.4500	A572-65 (65 ksi)
L54	24.7500-19.7500	5.0000	0.00	12	38.4891	39.4266	0.8500	3.4000	A572-65 (65 ksi)
L55	19.7500-14.7500	5.0000	0.00	12	39.4266	40.3642	0.8250	3.3000	A572-65 (65 ksi)
L56	14.7500-14.5000	0.2500	0.00	12	40.3642	40.4111	0.8250	3.3000	A572-65 (65 ksi)
L57	14.5000-14.2500	0.2500	0.00	12	40.4111	40.4580	0.8250	3.3000	A572-65 (65 ksi)
L58	14.2500-12.2500	2.0000	0.00	12	40.4580	40.8330	0.8250	3.3000	A572-65 (65 ksi)
L59	12.2500-12.0000	0.2500	0.00	12	40.8330	40.8799	0.7875	3.1500	A572-65 (65 ksi)
L60	12.0000-11.5000	0.5000	0.00	12	40.8799	40.9736	0.7875	3.1500	A572-65 (65 ksi)
L61	11.5000-11.2500	0.2500	0.00	12	40.9736	41.0205	0.9000	3.6000	A572-65 (65 ksi)
L62	11.2500-9.2500	2.0000	0.00	12	41.0205	41.3955	0.8875	3.5500	A572-65 (65 ksi)
L63	9.2500-9.0000	0.2500	0.00	12	41.3955	41.4424	0.8500	3.4000	A572-65 (65 ksi)
L64	9.0000-4.5000	4.5000	0.00	12	41.4424	42.2862	0.8250	3.3000	A572-65 (65 ksi)
L65	4.5000-4.2500	0.2500	0.00	12	42.2862	42.3331	0.8500	3.4000	A572-65 (65 ksi)
L66	4.2500-3.0000	1.2500	0.00	12	42.3331	42.5675	0.8500	3.4000	A572-65 (65 ksi)
L67	3.0000-2.7500	0.2500	0.00	12	42.5675	42.6143	0.8375	3.3500	A572-65 (65 ksi)
L68	2.7500-0.0000	2.7500		12	42.6143	43.1300	0.8250	3.3000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	16.4983	9.5468	304.6805	5.6609	8.2880	36.7616	617.3654	4.6986	3.7855	20.189
	17.4687	10.1127	362.1418	5.9965	8.7736	41.2765	733.7976	4.9772	4.0367	21.529
L2	17.4687	10.1127	362.1418	5.9965	8.7736	41.2765	733.7976	4.9772	4.0367	21.529
	18.4392	10.6787	426.4084	6.3320	9.2591	46.0527	864.0190	5.2557	4.2879	22.869
L3	18.4392	10.6787	426.4084	6.3320	9.2591	46.0527	864.0190	5.2557	4.2879	22.869
	19.4096	11.2446	497.8610	6.6676	9.7447	51.0904	1008.8014	5.5343	4.5392	24.209
L4	19.4096	11.2446	497.8610	6.6676	9.7447	51.0904	1008.8014	5.5343	4.5392	24.209
	19.7978	11.4710	528.5395	6.8019	9.9389	53.1787	1070.9643	5.6457	4.6396	24.745
L5	19.7052	27.1501	1216.6410	6.7079	9.9389	122.4117	2465.2446	13.3624	3.9361	8.747
	19.7537	27.2180	1225.7939	6.7247	9.9632	123.0321	2483.7907	13.3959	3.9487	8.775
L6	19.7582	26.4795	1194.1248	6.7291	9.9632	119.8535	2419.6206	13.0324	3.9822	9.102
	20.7286	27.8001	1381.8366	7.0647	10.4488	132.2487	2799.9756	13.6824	4.2334	9.676
L7	20.7330	27.0229	1344.9080	7.0692	10.4488	128.7145	2725.1483	13.2999	4.2669	10.04
	21.5094	28.0492	1504.0278	7.3377	10.8372	138.7835	3047.5681	13.8049	4.4679	10.513
L8	21.5094	28.0492	1504.0278	7.3377	10.8372	138.7835	3047.5681	13.8049	4.4679	10.513
	21.5579	28.1133	1514.3693	7.3544	10.8615	139.4254	3068.5228	13.8365	4.4805	10.542
L9	21.4388	49.6099	2585.2353	7.2336	10.8615	238.0182	5238.3876	24.4165	3.5760	4.69
	22.3608	51.7964	2942.3361	7.5524	11.3228	259.8597	5961.9707	25.4926	3.8146	5.003
L10	22.2638	69.5583	3848.9749	7.4540	11.3228	339.9317	7799.0666	34.2345	3.0776	2.966
	22.3123	69.7149	3875.0261	7.4708	11.3471	341.5002	7851.8534	34.3115	3.0902	2.978
L11	22.3211	68.1165	3795.2595	7.4797	11.3471	334.4705	7690.2248	33.5249	3.1572	3.118
	22.6122	69.0334	3950.5818	7.5804	11.4927	343.7459	8004.9497	33.9761	3.2325	3.193
L12	22.7048	51.7698	3036.5470	7.6744	11.4927	264.2144	6152.8674	25.4795	3.9360	5.248
	22.7534	51.8829	3056.5079	7.6911	11.5170	265.3906	6193.3136	25.5352	3.9486	5.265
L13	22.7666	49.3748	2918.9143	7.7046	11.5170	253.4436	5914.5118	24.3008	4.0491	5.683
	23.7370	51.5254	3317.1825	8.0401	12.0026	276.3724	6721.5110	25.3592	4.3003	6.036
L14	23.7459	49.7729	3211.4910	8.0491	12.0026	267.5667	6507.3514	24.4967	4.3673	6.352
	24.7163	51.8480	3630.1530	8.3847	12.4881	290.6879	7355.6742	25.5180	4.6185	6.718
L15	24.7251	50.0160	3509.3614	8.3936	12.4881	281.0154	7110.9176	24.6163	4.6855	7.073
	25.6956	52.0156	3947.3362	8.7292	12.9737	304.2564	7998.3732	25.6005	4.9368	7.452
L16	25.6956	52.0156	3947.3362	8.7292	12.9737	304.2564	7998.3732	25.6005	4.9368	7.452
	26.9734	54.6485	4577.6010	9.1711	13.6130	336.2659	9275.4608	26.8963	5.2675	7.951
L17	26.5416	61.6317	4647.1305	8.7012	12.9980	357.5274	9416.3462	30.3332	4.6143	5.859
	26.6711	64.0104	5206.2357	9.0371	13.4839	386.1080	10549.2450	31.5040	4.8657	6.179
L18	26.6711	64.0104	5206.2357	9.0371	13.4839	386.1080	10549.2450	31.5040	4.8657	6.179
	26.8168	64.3672	5293.7829	9.0874	13.5568	390.4899	10726.6394	31.6796	4.9034	6.227
L19	26.7727	74.2169	6043.8919	9.0427	13.5568	445.8209	12246.5635	36.5273	4.5684	5.006
	26.8213	74.3547	6077.6230	9.0595	13.5811	447.5070	12314.9120	36.5951	4.5810	5.02
L20	26.8213	74.3547	6077.6230	9.0595	13.5811	447.5070	12314.9120	36.5951	4.5810	5.02
	26.9669	74.7681	6179.5690	9.1098	13.6540	452.5845	12521.4823	36.7986	4.6187	5.062
L21	26.8876	92.3800	7500.7602	9.0293	13.6540	549.3471	15198.5737	45.4666	4.0157	3.53
	26.9361	92.5518	7542.6844	9.0461	13.6783	551.4363	15283.5234	45.5512	4.0283	3.541
L22	26.9449	90.6072	7398.8284	9.0550	13.6783	540.9192	14992.0323	44.5941	4.0953	3.681
	27.1877	91.4473	7606.5438	9.1390	13.7997	551.2096	15412.9200	45.0076	4.1581	3.738
L23	27.1877	91.4473	7606.5438	9.1390	13.7997	551.2096	15412.9200	45.0076	4.1581	3.738
	27.2363	91.6154	7648.5480	9.1558	13.8240	553.2794	15498.0318	45.0903	4.1707	3.749
L24	27.2363	91.6154	7648.5480	9.1558	13.8240	553.2794	15498.0318	45.0903	4.1707	3.749
	27.5762	92.7915	7946.9147	9.2733	13.9941	567.8762	16102.6037	45.6691	4.2587	3.828
L25	27.5409	100.7419	8561.3197	9.2375	13.9941	611.7808	17347.5548	49.5821	3.9907	3.291

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
	27.5895	100.9250	8608.0910	9.2543	14.0184	614.0570	17442.3262	49.6722	4.0033	3.302
L26	27.5983	98.9397	8455.0884	9.2633	14.0184	603.1425	17132.3014	48.6951	4.0703	3.428
	28.2295	101.2711	9067.0114	9.4815	14.3342	632.5423	18372.2233	49.8426	4.2337	3.565
L27	28.3442	74.4574	6830.9372	9.5979	14.3342	476.5470	13841.3308	36.6457	5.1047	5.918
	28.3927	74.5877	6866.8517	9.6147	14.3585	478.2419	13914.1032	36.7098	5.1172	5.933
L28	28.4016	72.4932	6686.4504	9.6236	14.3585	465.6778	13548.5612	35.6789	5.1842	6.19
	29.3727	75.0229	7411.1509	9.9595	14.8444	499.2540	15017.0010	36.9240	5.4356	6.49
L29	29.3815	72.8488	7209.3235	9.9684	14.8444	485.6579	14608.0439	35.8540	5.5026	6.772
	30.3527	75.3030	7962.7701	10.3042	15.3304	519.4117	16134.7311	37.0618	5.7540	7.082
L30	30.3615	73.0494	7737.8897	10.3132	15.3304	504.7427	15679.0623	35.9527	5.8210	7.392
	31.3327	75.4281	8518.6718	10.6490	15.8163	538.6015	17261.1386	37.1234	6.0724	7.711
L31	31.3327	75.4281	8518.6718	10.6490	15.8163	538.6015	17261.1386	37.1234	6.0724	7.711
	31.8021	76.5779	8914.2279	10.8114	16.0512	555.3631	18062.6425	37.6893	6.1940	7.865
L32	31.7845	81.3052	9433.2004	10.7935	16.0512	587.6955	19114.2214	40.0159	6.0600	7.236
	31.8330	81.4317	9477.2943	10.8102	16.0755	589.5502	19203.5678	40.0782	6.0725	7.251
L33	31.8330	81.4317	9477.2943	10.8102	16.0755	589.5502	19203.5678	40.0782	6.0725	7.251
	31.9948	81.8531	9625.2068	10.8662	16.1564	595.7512	19503.2786	40.2856	6.1144	7.301
L34	31.9155	103.0737	11941.5328	10.7856	16.1564	739.1200	24196.7830	50.7297	5.5114	5.187
	31.9640	103.2342	11997.3921	10.8024	16.1807	741.4624	24309.9690	50.8087	5.5240	5.199
L35	31.9728	100.8887	11744.2431	10.8114	16.1807	725.8173	23797.0205	49.6543	5.5910	5.389
	32.6526	103.0823	12527.1063	11.0465	16.5209	758.2601	25383.3137	50.7340	5.7670	5.559
L36	32.5909	119.7865	14392.4282	10.9838	16.5209	871.1672	29162.9615	58.9553	5.2980	4.369
	32.6395	119.9696	14458.5356	11.0006	16.5452	873.8835	29296.9130	59.0454	5.3105	4.38
L37	32.6483	117.5916	14195.0120	11.0096	16.5452	857.9559	28762.9427	57.8750	5.3775	4.528
	33.3281	120.1024	15123.8489	11.2446	16.8853	895.6817	30645.0182	59.1108	5.5535	4.677
L38	33.3105	124.9601	15685.4956	11.2267	16.8853	928.9442	31783.0666	61.5016	5.4195	4.379
	33.3590	125.1470	15755.9811	11.2435	16.9096	931.7779	31925.8893	61.5936	5.4321	4.39
L39	33.3678	122.7164	15474.5736	11.2525	16.9096	915.1360	31355.6814	60.3973	5.4991	4.535
	33.9505	124.9139	16320.8472	11.4540	17.2011	948.8236	33070.4613	61.4788	5.6499	4.66
L40	34.0034	109.9738	14503.8722	11.5077	17.2011	843.1926	29388.7773	54.1258	6.0519	5.696
	34.0520	110.1343	14567.4544	11.5245	17.2254	845.6944	29517.6120	54.2047	6.0645	5.708
L41	34.1314	87.4185	11725.0403	11.6050	17.2254	680.6818	23758.1105	43.0247	6.6675	7.961
	34.1799	87.5450	11776.0089	11.6218	17.2497	682.6779	23861.3866	43.0870	6.6801	7.976
L42	34.1843	86.2715	11613.6528	11.6263	17.2497	673.2658	23532.4092	42.4602	6.7136	8.138
	35.1555	88.7635	12649.3855	11.9621	17.7356	713.2182	25631.0845	43.6867	6.9650	8.442

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
L43	35.1599	87.4513	12471.7146	11.9666	17.7356	703.2005	25271.0751	43.0409	6.9985	8.614
	36.3415	90.4372	13793.3293	12.3752	18.3268	752.6300	27949.0248	44.5104	7.3043	8.99
L44	35.6718	92.6377	12782.6777	11.7708	17.4848	731.0744	25901.1706	45.5935	6.7012	7.658
	35.8659	95.9837	14218.3976	12.1960	18.0999	785.5493	28810.3283	47.2403	7.0194	8.022
L45	35.8703	94.6472	14030.7109	12.2005	18.0999	775.1798	28430.0242	46.5825	7.0529	8.177
	36.8410	97.2511	15220.8557	12.5361	18.5856	818.9596	30841.5802	47.8640	7.3042	8.469
L46	36.8454	95.8758	15016.3332	12.5406	18.5856	807.9553	30427.1622	47.1872	7.3377	8.633
	37.6542	98.0143	16043.6923	12.8203	18.9903	844.8355	32508.8703	48.2396	7.5471	8.879
L47	37.5661	125.9565	20330.6186	12.7308	18.9903	1070.5782	41195.3453	61.9920	6.8771	6.252
	37.6146	126.1225	20411.1270	12.7476	19.0146	1073.4451	41358.4770	62.0737	6.8897	6.263
L48	37.6146	126.1225	20411.1270	12.7476	19.0146	1073.4451	41358.4770	62.0737	6.8897	6.263
	37.8572	126.9528	20816.8582	12.8315	19.1360	1087.8368	42180.5984	62.4823	6.9525	6.32
L49	37.8572	126.9528	20816.8582	12.8315	19.1360	1087.8368	42180.5984	62.4823	6.9525	6.32
	37.9058	127.1188	20898.6443	12.8483	19.1603	1090.7266	42346.3192	62.5640	6.9650	6.332
L50	37.9146	124.3163	20466.3858	12.8572	19.1603	1068.1665	41470.4463	61.1847	7.0320	6.541
	38.4970	126.2635	21443.2485	13.0586	19.4517	1102.3849	43449.8349	62.1430	7.1828	6.682
L51	38.4793	131.9551	22348.4542	13.0407	19.4517	1148.9210	45284.0273	64.9443	7.0488	6.266
	38.5279	132.1249	22434.8472	13.0575	19.4760	1151.9244	45459.0829	65.0279	7.0614	6.277
L52	38.5367	129.2773	21981.4335	13.0664	19.4760	1128.6437	44540.3436	63.6264	7.1284	6.48
	39.4103	132.2661	23541.5117	13.3685	19.9131	1182.2146	47701.4851	65.0973	7.3545	6.686
L53	39.4940	104.3682	18813.1271	13.4535	19.9131	944.7632	38120.4960	51.3669	7.9910	9.265
	39.5426	104.4984	18883.6190	13.4703	19.9373	947.1482	38263.3317	51.4309	8.0036	9.28
L54	39.5470	103.0182	18628.4968	13.4748	19.9373	934.3520	37746.3850	50.7024	8.0371	9.455
	40.5176	105.5843	20055.5225	13.8104	20.4230	982.0067	40637.9258	51.9654	8.2883	9.751
L55	40.5264	102.5453	19503.5235	13.8194	20.4230	954.9784	39519.4262	50.4697	8.3553	10.128
	41.4971	105.0359	20959.4275	14.1550	20.9087	1002.4283	42469.4824	51.6955	8.6066	10.432
L56	41.4971	105.0359	20959.4275	14.1550	20.9087	1002.4283	42469.4824	51.6955	8.6066	10.432
	41.5456	105.1604	21034.0648	14.1718	20.9329	1004.8310	42620.7180	51.7568	8.6192	10.447
L57	41.5456	105.1604	21034.0648	14.1718	20.9329	1004.8310	42620.7180	51.7568	8.6192	10.447
	41.5941	105.2849	21108.8792	14.1886	20.9572	1007.2365	42772.3121	51.8180	8.6317	10.463
L58	41.5941	105.2849	21108.8792	14.1886	20.9572	1007.2365	42772.3121	51.8180	8.6317	10.463
	41.9824	106.2812	21713.7904	14.3229	21.1515	1026.5847	43998.0263	52.3084	8.7322	10.585
L59	41.9956	101.5453	20785.1371	14.3363	21.1515	982.6799	42116.3229	49.9775	8.8327	11.216
	42.0441	101.6642	20858.2169	14.3531	21.1758	985.0041	42264.4025	50.0360	8.8453	11.232
L60	42.0441	101.6642	20858.2169	14.3531	21.1758	985.0041	42264.4025	50.0360	8.8453	11.232

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
	42.1412	101.9019	21004.8901	14.3866	21.2243	989.6608	42561.6021	50.1530	8.8704	11.264
L61	42.1015	116.1333	23804.5435	14.3464	21.2243	1121.5686	48234.4589	57.1573	8.5689	9.521
	42.1501	116.2692	23888.1806	14.3631	21.2486	1124.2230	48403.9304	57.2242	8.5815	9.535
L62	42.1545	114.6901	23578.4250	14.3676	21.2486	1109.6453	47776.2815	56.4470	8.6150	9.707
	42.5427	115.7618	24245.6083	14.5019	21.4429	1130.7069	49128.1758	56.9744	8.7155	9.82
L63	42.5559	110.9731	23285.6961	14.5153	21.4429	1085.9409	47183.1334	54.6176	8.8160	10.372
	42.6045	111.1014	23366.5570	14.5321	21.4672	1088.4792	47346.9795	54.6807	8.8286	10.387
L64	42.6133	107.9001	22721.2343	14.5410	21.4672	1058.4183	46039.3806	53.1051	8.8956	10.782
	43.4869	110.1417	24166.9181	14.8431	21.9042	1103.2981	48968.7280	54.2084	9.1217	11.057
L65	43.4780	113.4109	24854.2353	14.8342	21.9042	1134.6764	50361.4191	55.8174	9.0547	10.653
	43.5266	113.5392	24938.6857	14.8509	21.9285	1137.2711	50532.5385	55.8805	9.0673	10.667
L66	43.5266	113.5392	24938.6857	14.8509	21.9285	1137.2711	50532.5385	55.8805	9.0673	10.667
	43.7692	114.1807	25363.8083	14.9349	22.0499	1150.2889	51393.9521	56.1963	9.1301	10.741
L67	43.7736	112.5353	25013.2822	14.9393	22.0499	1134.3920	50683.6911	55.3864	9.1636	10.942
	43.8222	112.6617	25097.6740	14.9561	22.0742	1136.9672	50854.6919	55.4487	9.1761	10.957
L68	43.8266	111.0134	24745.2806	14.9606	22.0742	1121.0031	50140.6473	54.6374	9.2096	11.163
	44.3604	112.3832	25672.6600	15.1452	22.3413	1149.1101	52019.7693	55.3116	9.3478	11.331

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 150.0000-145.0000				1	1	1			
L2 145.0000-140.0000				1	1	1			
L3 140.0000-135.0000				1	1	1			
L4 135.0000-133.0000				1	1	1			
L5 133.0000-132.7500				1	1	0.919196			
L6 132.7500-127.7500				1	1	0.920307			
L7 127.7500-123.7500				1	1	0.928276			
L8 123.7500-123.5000				1	1	0.927165			
L9 123.5000-118.7500				1	1	0.876127			
L10 118.7500-118.5000				1	1	0.845269			
L11 118.5000-117.0000				1	1	0.856074			
L12 117.0000-116.7500				1	1	0.879028			
L13 116.7500-				1	1	0.896111			

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
111.7500 L14 111.7500-106.7500				1	1	0.901452			
L15 106.7500-101.7500				1	1	0.909427			
L16 101.7500-95.1667				1	1	0.898775			
L17 95.1667-94.5000				1	1	0.908839			
L18 94.5000-93.7500				1	1	0.906001			
L19 93.7500-93.5000				1	1	0.906154			
L20 93.5000-92.7500				1	1	0.903037			
L21 92.7500-92.5000				1	1	0.876104			
L22 92.5000-91.2500				1	1	0.889265			
L23 91.2500-91.0000				1	1	0.88815			
L24 91.0000-89.2500				1	1	0.880453			
L25 89.2500-89.0000				1	1	0.884384			
L26 89.0000-85.7500				1	1	0.88742			
L27 85.7500-85.5000				1	1	0.903433			
L28 85.5000-80.5000				1	1	0.910774			
L29 80.5000-75.5000				1	1	0.919921			
L30 75.5000-70.5000				1	1	0.93091			
L31 70.5000-68.0830				1	1	0.92289			
L32 68.0830-67.8330				1	1	0.923801			
L33 67.8330-67.0000				1	1	0.920966			
L34 67.0000-66.7500				1	1	0.905291			
L35 66.7500-63.2500				1	1	0.913034			
L36 63.2500-63.0000				1	1	0.897596			
L37 63.0000-59.5000				1	1	0.902105			
L38 59.5000-59.2500				1	1	0.896126			
L39 59.2500-56.2500				1	1	0.902333			
L40 56.2500-56.0000				1	1	0.901098			
L41 56.0000-55.7500				1	1	0.928244			
L42 55.7500-50.7500				1	1	0.926136			
L43 50.7500-44.6667				1	1	0.937704			
L44 44.6667-43.6667				1	1	0.935663			
L45 43.6667-				1	1	0.935111			

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
38.6667									
L46 38.6667-34.5000				1	1	0.937455			
L47 34.5000-34.2500				1	1	0.92252			
L48 34.2500-33.0000				1	1	0.918716			
L49 33.0000-32.7500				1	1	0.917961			
L50 32.7500-29.7500				1	1	0.929559			
L51 29.7500-29.5000				1	1	0.917173			
L52 29.5000-25.0000				1	1	0.923897			
L53 25.0000-24.7500				1	1	0.936349			
L54 24.7500-19.7500				1	1	0.937441			
L55 19.7500-14.7500				1	1	0.953114			
L56 14.7500-14.5000				1	1	0.952523			
L57 14.5000-14.2500				1	1	0.951934			
L58 14.2500-12.2500				1	1	0.947272			
L59 12.2500-12.0000				1	1	0.990848			
L60 12.0000-11.5000				1	1	0.989648			
L61 11.5000-11.2500				1	1	0.919523			
L62 11.2500-9.2500				1	1	0.927466			
L63 9.2500-9.0000				1	1	0.912798			
L64 9.0000-4.5000				1	1	0.930002			
L65 4.5000-4.2500				1	1	0.955592			
L66 4.2500-3.0000				1	1	0.952702			
L67 3.0000-2.7500				1	1	0.912717			
L68 2.7500-0.0000				1	1	0.920519			

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
HCS 6X12 4AWG(1-5/8) ***	C	No	Surface Ar (CaAa)	128.0000 - 8.0000	3	3	-0.500 -0.400	1.6600		2.40
9" x 1-1/4" Flate Plate	A	No	Surface Af (CaAa)	29.7500 - 0.0000	1	1	0.500 0.500	9.0000	20.5000	0.00
8" x 1-1/4" Flate Plate	A	No	Surface Af (CaAa)	59.5000 - 29.7500	1	1	0.500 0.500	8.0000	18.5000	0.00
7" x 1-1/4" Flate Plate	A	No	Surface Af (CaAa)	89.2500 - 59.5000	1	1	0.500 0.500	7.0000	16.5000	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
5" x 1-1/4" Flate Plate	A	No	Surface Af (CaAa)	125.0000 - 89.2500	1	1	0.500 0.500	5.0000	12.5000	0.00
***										
9" x 1-1/4" Flate Plate	B	No	Surface Af (CaAa)	29.7500 - 0.0000	1	1	0.500 0.500	9.0000	20.5000	0.00
8" x 1-1/4" Flate Plate	B	No	Surface Af (CaAa)	59.5000 - 29.7500	1	1	0.500 0.500	8.0000	18.5000	0.00
7" x 1-1/4" Flate Plate	B	No	Surface Af (CaAa)	89.2500 - 59.5000	1	1	0.500 0.500	7.0000	16.5000	0.00
5" x 1-1/4" Flate Plate	B	No	Surface Af (CaAa)	125.0000 - 89.2500	1	1	0.500 0.500	5.0000	12.5000	0.00
***										
9" x 1-1/4" Flate Plate	C	No	Surface Af (CaAa)	29.7500 - 0.0000	1	1	0.500 0.500	9.0000	20.5000	0.00
8" x 1-1/4" Flate Plate	C	No	Surface Af (CaAa)	59.5000 - 29.7500	1	1	0.500 0.500	8.0000	18.5000	0.00
7" x 1-1/4" Flate Plate	C	No	Surface Af (CaAa)	89.2500 - 59.5000	1	1	0.500 0.500	7.0000	16.5000	0.00
5" x 1-1/4" Flate Plate	C	No	Surface Af (CaAa)	125.0000 - 89.2500	1	1	0.500 0.500	5.0000	12.5000	0.00
***										
6" x 1" Flate Plate	A	No	Surface Af (CaAa)	70.5833 - 0.0000	1	1	0.000 0.000	6.0000	14.0000	0.00
6" x 1" Flate Plate	B	No	Surface Af (CaAa)	70.5833 - 0.0000	1	1	0.000 0.000	6.0000	14.0000	0.00
6" x 1" Flate Plate	C	No	Surface Af (CaAa)	70.5833 - 0.0000	1	1	0.000 0.000	6.0000	14.0000	0.00
***										
4.5" x 1" Flate Plate	A	No	Surface Af (CaAa)	135.0000 - 70.5833	1	1	0.000 0.000	4.5000	11.0000	0.00
4.5" x 1" Flate Plate	B	No	Surface Af (CaAa)	135.0000 - 70.5833	1	1	0.000 0.000	4.5000	11.0000	0.00
4.5" x 1" Flate Plate	C	No	Surface Af (CaAa)	135.0000 - 70.5833	1	1	0.000 0.000	4.5000	11.0000	0.00
***										
Transition Stiffener	A	No	Surface Af (CaAa)	6.0000 - 0.0000	1	1	0.000 0.000	1.2500	14.5000	0.00
Transition Stiffener	B	No	Surface Af (CaAa)	13.0000 - 0.0000	1	1	0.000 0.000	1.2500	14.5000	0.00
Transition Stiffener	C	No	Surface Af (CaAa)	16.0000 - 0.0000	1	1	0.000 0.000	1.2500	14.5000	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
LDF4-50A(1/2)	A	No	No	Inside Pole	150.0000 - 8.0000	1	No Ice	0.0000	0.15
							1/2" Ice	0.0000	0.15
							1" Ice	0.0000	0.15
							2" Ice	0.0000	0.15
LDF5-50A(7/8)	A	No	No	Inside Pole	150.0000 - 8.0000	12	No Ice	0.0000	0.33
							1/2" Ice	0.0000	0.33
							1" Ice	0.0000	0.33
							2" Ice	0.0000	0.33
HB158-1-08U8-S8J18(1-5/8)	A	No	No	Inside Pole	150.0000 - 8.0000	1	No Ice	0.0000	1.30
							1/2" Ice	0.0000	1.30
							1" Ice	0.0000	1.30
							2" Ice	0.0000	1.30
***									
FB-L98B-002-75000(3/8)	C	No	No	Inside Pole	138.0000 - 8.0000	1	No Ice	0.0000	0.06
							1/2" Ice	0.0000	0.06

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
							1" Ice	0.0000	0.06
							2" Ice	0.0000	0.06
WR-VG86ST-BRD(3/4)	C	No	No	Inside Pole	138.0000 - 8.0000	2	No Ice	0.0000	0.58
							1/2" Ice	0.0000	0.58
							1" Ice	0.0000	0.58
							2" Ice	0.0000	0.58
LCF114-50J(1-1/4)	C	No	No	Inside Pole	138.0000 - 8.0000	12	No Ice	0.0000	0.70
							1/2" Ice	0.0000	0.70
							1" Ice	0.0000	0.70
							2" Ice	0.0000	0.70
***									
LDF7-50A(1-5/8)	C	No	No	Inside Pole	128.0000 - 8.0000	6	No Ice	0.0000	0.82
							1/2" Ice	0.0000	0.82
							1" Ice	0.0000	0.82
							2" Ice	0.0000	0.82
***									
***									

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	150.0000-145.0000	A	0.000	0.000	0.000	0.000	0.03
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L2	145.0000-140.0000	A	0.000	0.000	0.000	0.000	0.03
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L3	140.0000-135.0000	A	0.000	0.000	0.000	0.000	0.03
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.03
L4	135.0000-133.0000	A	0.000	0.000	1.500	0.000	0.01
		B	0.000	0.000	1.500	0.000	0.00
		C	0.000	0.000	1.500	0.000	0.02
L5	133.0000-132.7500	A	0.000	0.000	0.188	0.000	0.00
		B	0.000	0.000	0.188	0.000	0.00
		C	0.000	0.000	0.188	0.000	0.00
L6	132.7500-127.7500	A	0.000	0.000	3.750	0.000	0.03
		B	0.000	0.000	3.750	0.000	0.00
		C	0.000	0.000	3.874	0.000	0.05
L7	127.7500-123.7500	A	0.000	0.000	4.042	0.000	0.02
		B	0.000	0.000	4.042	0.000	0.00
		C	0.000	0.000	6.034	0.000	0.09
L8	123.7500-123.5000	A	0.000	0.000	0.396	0.000	0.00
		B	0.000	0.000	0.396	0.000	0.00
		C	0.000	0.000	0.520	0.000	0.01
L9	123.5000-118.7500	A	0.000	0.000	7.521	0.000	0.03
		B	0.000	0.000	7.521	0.000	0.00
		C	0.000	0.000	9.886	0.000	0.10
L10	118.7500-118.5000	A	0.000	0.000	0.396	0.000	0.00
		B	0.000	0.000	0.396	0.000	0.00
		C	0.000	0.000	0.520	0.000	0.01
L11	118.5000-117.0000	A	0.000	0.000	2.375	0.000	0.01
		B	0.000	0.000	2.375	0.000	0.00
		C	0.000	0.000	3.122	0.000	0.03
L12	117.0000-116.7500	A	0.000	0.000	0.396	0.000	0.00
		B	0.000	0.000	0.396	0.000	0.00
		C	0.000	0.000	0.520	0.000	0.01
L13	116.7500-111.7500	A	0.000	0.000	7.917	0.000	0.03
		B	0.000	0.000	7.917	0.000	0.00
		C	0.000	0.000	10.407	0.000	0.11

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
L14	111.7500-106.7500	A	0.000	0.000	7.917	0.000	0.03
		B	0.000	0.000	7.917	0.000	0.00
		C	0.000	0.000	10.407	0.000	0.11
L15	106.7500-101.7500	A	0.000	0.000	7.917	0.000	0.03
		B	0.000	0.000	7.917	0.000	0.00
		C	0.000	0.000	10.407	0.000	0.11
L16	101.7500-95.1667	A	0.000	0.000	10.424	0.000	0.04
		B	0.000	0.000	10.424	0.000	0.00
		C	0.000	0.000	13.702	0.000	0.14
L17	95.1667-94.5000	A	0.000	0.000	1.056	0.000	0.00
		B	0.000	0.000	1.056	0.000	0.00
		C	0.000	0.000	1.388	0.000	0.01
L18	94.5000-93.7500	A	0.000	0.000	1.188	0.000	0.00
		B	0.000	0.000	1.188	0.000	0.00
		C	0.000	0.000	1.561	0.000	0.02
L19	93.7500-93.5000	A	0.000	0.000	0.396	0.000	0.00
		B	0.000	0.000	0.396	0.000	0.00
		C	0.000	0.000	0.520	0.000	0.01
L20	93.5000-92.7500	A	0.000	0.000	1.188	0.000	0.00
		B	0.000	0.000	1.188	0.000	0.00
		C	0.000	0.000	1.561	0.000	0.02
L21	92.7500-92.5000	A	0.000	0.000	0.396	0.000	0.00
		B	0.000	0.000	0.396	0.000	0.00
		C	0.000	0.000	0.520	0.000	0.01
L22	92.5000-91.2500	A	0.000	0.000	1.979	0.000	0.01
		B	0.000	0.000	1.979	0.000	0.00
		C	0.000	0.000	2.602	0.000	0.03
L23	91.2500-91.0000	A	0.000	0.000	0.396	0.000	0.00
		B	0.000	0.000	0.396	0.000	0.00
		C	0.000	0.000	0.520	0.000	0.01
L24	91.0000-89.2500	A	0.000	0.000	2.771	0.000	0.01
		B	0.000	0.000	2.771	0.000	0.00
		C	0.000	0.000	3.642	0.000	0.04
L25	89.2500-89.0000	A	0.000	0.000	0.479	0.000	0.00
		B	0.000	0.000	0.479	0.000	0.00
		C	0.000	0.000	0.604	0.000	0.01
L26	89.0000-85.7500	A	0.000	0.000	6.229	0.000	0.02
		B	0.000	0.000	6.229	0.000	0.00
		C	0.000	0.000	7.848	0.000	0.07
L27	85.7500-85.5000	A	0.000	0.000	0.479	0.000	0.00
		B	0.000	0.000	0.479	0.000	0.00
		C	0.000	0.000	0.604	0.000	0.01
L28	85.5000-80.5000	A	0.000	0.000	9.583	0.000	0.03
		B	0.000	0.000	9.583	0.000	0.00
		C	0.000	0.000	12.073	0.000	0.11
L29	80.5000-75.5000	A	0.000	0.000	9.583	0.000	0.03
		B	0.000	0.000	9.583	0.000	0.00
		C	0.000	0.000	12.073	0.000	0.11
L30	75.5000-70.5000	A	0.000	0.000	9.604	0.000	0.03
		B	0.000	0.000	9.604	0.000	0.00
		C	0.000	0.000	12.094	0.000	0.11
L31	70.5000-68.0830	A	0.000	0.000	5.237	0.000	0.01
		B	0.000	0.000	5.237	0.000	0.00
		C	0.000	0.000	6.440	0.000	0.05
L32	68.0830-67.8330	A	0.000	0.000	0.542	0.000	0.00
		B	0.000	0.000	0.542	0.000	0.00
		C	0.000	0.000	0.666	0.000	0.01
L33	67.8330-67.0000	A	0.000	0.000	1.805	0.000	0.00
		B	0.000	0.000	1.805	0.000	0.00
		C	0.000	0.000	2.220	0.000	0.02
L34	67.0000-66.7500	A	0.000	0.000	0.542	0.000	0.00
		B	0.000	0.000	0.542	0.000	0.00
		C	0.000	0.000	0.666	0.000	0.01
L35	66.7500-63.2500	A	0.000	0.000	7.583	0.000	0.02
		B	0.000	0.000	7.583	0.000	0.00
		C	0.000	0.000	9.326	0.000	0.08
L36	63.2500-63.0000	A	0.000	0.000	0.542	0.000	0.00
		B	0.000	0.000	0.542	0.000	0.00
		C	0.000	0.000	0.666	0.000	0.01

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
L37	63.0000-59.5000	A	0.000	0.000	7.583	0.000	0.02
		B	0.000	0.000	7.583	0.000	0.00
		C	0.000	0.000	9.326	0.000	0.08
L38	59.5000-59.2500	A	0.000	0.000	0.583	0.000	0.00
		B	0.000	0.000	0.583	0.000	0.00
		C	0.000	0.000	0.708	0.000	0.01
L39	59.2500-56.2500	A	0.000	0.000	7.000	0.000	0.02
		B	0.000	0.000	7.000	0.000	0.00
		C	0.000	0.000	8.494	0.000	0.07
L40	56.2500-56.0000	A	0.000	0.000	0.583	0.000	0.00
		B	0.000	0.000	0.583	0.000	0.00
		C	0.000	0.000	0.708	0.000	0.01
L41	56.0000-55.7500	A	0.000	0.000	0.583	0.000	0.00
		B	0.000	0.000	0.583	0.000	0.00
		C	0.000	0.000	0.708	0.000	0.01
L42	55.7500-50.7500	A	0.000	0.000	11.667	0.000	0.03
		B	0.000	0.000	11.667	0.000	0.00
		C	0.000	0.000	14.157	0.000	0.11
L43	50.7500-44.6667	A	0.000	0.000	14.194	0.000	0.03
		B	0.000	0.000	14.194	0.000	0.00
		C	0.000	0.000	17.224	0.000	0.13
L44	44.6667-43.6667	A	0.000	0.000	2.333	0.000	0.01
		B	0.000	0.000	2.333	0.000	0.00
		C	0.000	0.000	2.831	0.000	0.02
L45	43.6667-38.6667	A	0.000	0.000	11.667	0.000	0.03
		B	0.000	0.000	11.667	0.000	0.00
		C	0.000	0.000	14.157	0.000	0.11
L46	38.6667-34.5000	A	0.000	0.000	9.722	0.000	0.02
		B	0.000	0.000	9.722	0.000	0.00
		C	0.000	0.000	11.797	0.000	0.09
L47	34.5000-34.2500	A	0.000	0.000	0.583	0.000	0.00
		B	0.000	0.000	0.583	0.000	0.00
		C	0.000	0.000	0.708	0.000	0.01
L48	34.2500-33.0000	A	0.000	0.000	2.917	0.000	0.01
		B	0.000	0.000	2.917	0.000	0.00
		C	0.000	0.000	3.539	0.000	0.03
L49	33.0000-32.7500	A	0.000	0.000	0.583	0.000	0.00
		B	0.000	0.000	0.583	0.000	0.00
		C	0.000	0.000	0.708	0.000	0.01
L50	32.7500-29.7500	A	0.000	0.000	7.000	0.000	0.02
		B	0.000	0.000	7.000	0.000	0.00
		C	0.000	0.000	8.494	0.000	0.07
L51	29.7500-29.5000	A	0.000	0.000	0.625	0.000	0.00
		B	0.000	0.000	0.625	0.000	0.00
		C	0.000	0.000	0.750	0.000	0.01
L52	29.5000-25.0000	A	0.000	0.000	11.250	0.000	0.02
		B	0.000	0.000	11.250	0.000	0.00
		C	0.000	0.000	13.491	0.000	0.10
L53	25.0000-24.7500	A	0.000	0.000	0.625	0.000	0.00
		B	0.000	0.000	0.625	0.000	0.00
		C	0.000	0.000	0.750	0.000	0.01
L54	24.7500-19.7500	A	0.000	0.000	12.500	0.000	0.03
		B	0.000	0.000	12.500	0.000	0.00
		C	0.000	0.000	14.990	0.000	0.11
L55	19.7500-14.7500	A	0.000	0.000	12.500	0.000	0.03
		B	0.000	0.000	12.500	0.000	0.00
		C	0.000	0.000	15.250	0.000	0.11
L56	14.7500-14.5000	A	0.000	0.000	0.625	0.000	0.00
		B	0.000	0.000	0.625	0.000	0.00
		C	0.000	0.000	0.802	0.000	0.01
L57	14.5000-14.2500	A	0.000	0.000	0.625	0.000	0.00
		B	0.000	0.000	0.625	0.000	0.00
		C	0.000	0.000	0.802	0.000	0.01
L58	14.2500-12.2500	A	0.000	0.000	5.000	0.000	0.01
		B	0.000	0.000	5.156	0.000	0.00
		C	0.000	0.000	6.413	0.000	0.04
L59	12.2500-12.0000	A	0.000	0.000	0.625	0.000	0.00
		B	0.000	0.000	0.677	0.000	0.00
		C	0.000	0.000	0.802	0.000	0.01

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
L60	12.0000-11.5000	A	0.000	0.000	1.250	0.000	0.00
		B	0.000	0.000	1.354	0.000	0.00
		C	0.000	0.000	1.603	0.000	0.01
L61	11.5000-11.2500	A	0.000	0.000	0.625	0.000	0.00
		B	0.000	0.000	0.677	0.000	0.00
		C	0.000	0.000	0.802	0.000	0.01
L62	11.2500-9.2500	A	0.000	0.000	5.000	0.000	0.01
		B	0.000	0.000	5.417	0.000	0.00
		C	0.000	0.000	6.413	0.000	0.04
L63	9.2500-9.0000	A	0.000	0.000	0.625	0.000	0.00
		B	0.000	0.000	0.677	0.000	0.00
		C	0.000	0.000	0.802	0.000	0.01
L64	9.0000-4.5000	A	0.000	0.000	11.493	0.000	0.01
		B	0.000	0.000	12.188	0.000	0.00
		C	0.000	0.000	12.685	0.000	0.02
L65	4.5000-4.2500	A	0.000	0.000	0.666	0.000	0.00
		B	0.000	0.000	0.677	0.000	0.00
		C	0.000	0.000	0.677	0.000	0.00
L66	4.2500-3.0000	A	0.000	0.000	3.328	0.000	0.00
		B	0.000	0.000	3.385	0.000	0.00
		C	0.000	0.000	3.385	0.000	0.00
L67	3.0000-2.7500	A	0.000	0.000	0.666	0.000	0.00
		B	0.000	0.000	0.677	0.000	0.00
		C	0.000	0.000	0.677	0.000	0.00
L68	2.7500-0.0000	A	0.000	0.000	7.321	0.000	0.00
		B	0.000	0.000	7.448	0.000	0.00
		C	0.000	0.000	7.448	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	150.0000-145.0000	A	1.481	0.000	0.000	0.000	0.000	0.03
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L2	145.0000-140.0000	A	1.476	0.000	0.000	0.000	0.000	0.03
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L3	140.0000-135.0000	A	1.471	0.000	0.000	0.000	0.000	0.03
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.03
L4	135.0000-133.0000	A	1.467	0.000	0.000	2.087	0.000	0.03
		B		0.000	0.000	2.087	0.000	0.02
		C		0.000	0.000	2.087	0.000	0.04
L5	133.0000-132.7500	A	1.466	0.000	0.000	0.261	0.000	0.00
		B		0.000	0.000	0.261	0.000	0.00
		C		0.000	0.000	0.261	0.000	0.00
L6	132.7500-127.7500	A	1.463	0.000	0.000	5.213	0.000	0.07
		B		0.000	0.000	5.213	0.000	0.05
		C		0.000	0.000	5.460	0.000	0.10
L7	127.7500-123.7500	A	1.457	0.000	0.000	5.572	0.000	0.07
		B		0.000	0.000	5.572	0.000	0.05
		C		0.000	0.000	9.520	0.000	0.18
L8	123.7500-123.5000	A	1.455	0.000	0.000	0.541	0.000	0.01
		B		0.000	0.000	0.541	0.000	0.00
		C		0.000	0.000	0.788	0.000	0.01
L9	123.5000-118.7500	A	1.452	0.000	0.000	10.280	0.000	0.12
		B		0.000	0.000	10.280	0.000	0.09
		C		0.000	0.000	14.961	0.000	0.24
L10	118.7500-118.5000	A	1.449	0.000	0.000	0.541	0.000	0.01
		B		0.000	0.000	0.541	0.000	0.00
		C		0.000	0.000	0.787	0.000	0.01
L11	118.5000-117.0000	A	1.448	0.000	0.000	3.244	0.000	0.04
		B		0.000	0.000	3.244	0.000	0.03
		C		0.000	0.000	4.721	0.000	0.08

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
L12	117.0000-116.7500	A	1.447	0.000	0.000	0.541	0.000	0.01
		B		0.000	0.000	0.541	0.000	0.00
		C		0.000	0.000	0.787	0.000	0.01
L13	116.7500-111.7500	A	1.444	0.000	0.000	10.804	0.000	0.12
		B		0.000	0.000	10.804	0.000	0.10
		C		0.000	0.000	15.721	0.000	0.25
L14	111.7500-106.7500	A	1.437	0.000	0.000	10.791	0.000	0.12
		B		0.000	0.000	10.791	0.000	0.10
		C		0.000	0.000	15.700	0.000	0.25
L15	106.7500-101.7500	A	1.430	0.000	0.000	10.777	0.000	0.12
		B		0.000	0.000	10.777	0.000	0.10
		C		0.000	0.000	15.678	0.000	0.25
L16	101.7500-95.1667	A	1.422	0.000	0.000	14.169	0.000	0.16
		B		0.000	0.000	14.169	0.000	0.12
		C		0.000	0.000	20.608	0.000	0.33
L17	95.1667-94.5000	A	1.417	0.000	0.000	1.435	0.000	0.02
		B		0.000	0.000	1.435	0.000	0.01
		C		0.000	0.000	2.087	0.000	0.03
L18	94.5000-93.7500	A	1.416	0.000	0.000	1.612	0.000	0.02
		B		0.000	0.000	1.612	0.000	0.01
		C		0.000	0.000	2.345	0.000	0.04
L19	93.7500-93.5000	A	1.415	0.000	0.000	0.537	0.000	0.01
		B		0.000	0.000	0.537	0.000	0.00
		C		0.000	0.000	0.781	0.000	0.01
L20	93.5000-92.7500	A	1.414	0.000	0.000	1.612	0.000	0.02
		B		0.000	0.000	1.612	0.000	0.01
		C		0.000	0.000	2.344	0.000	0.04
L21	92.7500-92.5000	A	1.414	0.000	0.000	0.537	0.000	0.01
		B		0.000	0.000	0.537	0.000	0.00
		C		0.000	0.000	0.781	0.000	0.01
L22	92.5000-91.2500	A	1.412	0.000	0.000	2.685	0.000	0.03
		B		0.000	0.000	2.685	0.000	0.02
		C		0.000	0.000	3.905	0.000	0.06
L23	91.2500-91.0000	A	1.411	0.000	0.000	0.537	0.000	0.01
		B		0.000	0.000	0.537	0.000	0.00
		C		0.000	0.000	0.781	0.000	0.01
L24	91.0000-89.2500	A	1.410	0.000	0.000	3.758	0.000	0.04
		B		0.000	0.000	3.758	0.000	0.03
		C		0.000	0.000	5.464	0.000	0.09
L25	89.2500-89.0000	A	1.408	0.000	0.000	0.620	0.000	0.01
		B		0.000	0.000	0.620	0.000	0.01
		C		0.000	0.000	0.864	0.000	0.01
L26	89.0000-85.7500	A	1.405	0.000	0.000	8.056	0.000	0.09
		B		0.000	0.000	8.056	0.000	0.07
		C		0.000	0.000	11.221	0.000	0.17
L27	85.7500-85.5000	A	1.403	0.000	0.000	0.619	0.000	0.01
		B		0.000	0.000	0.619	0.000	0.01
		C		0.000	0.000	0.863	0.000	0.01
L28	85.5000-80.5000	A	1.398	0.000	0.000	12.380	0.000	0.13
		B		0.000	0.000	12.380	0.000	0.10
		C		0.000	0.000	17.240	0.000	0.26
L29	80.5000-75.5000	A	1.390	0.000	0.000	12.362	0.000	0.13
		B		0.000	0.000	12.362	0.000	0.10
		C		0.000	0.000	17.212	0.000	0.26
L30	75.5000-70.5000	A	1.380	0.000	0.000	12.365	0.000	0.13
		B		0.000	0.000	12.365	0.000	0.10
		C		0.000	0.000	17.203	0.000	0.26
L31	70.5000-68.0830	A	1.373	0.000	0.000	6.564	0.000	0.07
		B		0.000	0.000	6.564	0.000	0.05
		C		0.000	0.000	8.899	0.000	0.13
L32	68.0830-67.8330	A	1.371	0.000	0.000	0.679	0.000	0.01
		B		0.000	0.000	0.679	0.000	0.01
		C		0.000	0.000	0.920	0.000	0.01
L33	67.8330-67.0000	A	1.369	0.000	0.000	2.261	0.000	0.02
		B		0.000	0.000	2.261	0.000	0.02
		C		0.000	0.000	3.065	0.000	0.04
L34	67.0000-66.7500	A	1.368	0.000	0.000	0.678	0.000	0.01
		B		0.000	0.000	0.678	0.000	0.01
		C		0.000	0.000	0.920	0.000	0.01

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L35	66.7500-63.2500	A	1.364	0.000	0.000	9.494	0.000	0.09
		B		0.000	0.000	9.494	0.000	0.08
		C		0.000	0.000	12.866	0.000	0.18
L36	63.2500-63.0000	A	1.360	0.000	0.000	0.678	0.000	0.01
		B		0.000	0.000	0.678	0.000	0.01
		C		0.000	0.000	0.918	0.000	0.01
L37	63.0000-59.5000	A	1.356	0.000	0.000	9.482	0.000	0.09
		B		0.000	0.000	9.482	0.000	0.08
		C		0.000	0.000	12.848	0.000	0.18
L38	59.5000-59.2500	A	1.352	0.000	0.000	0.719	0.000	0.01
		B		0.000	0.000	0.719	0.000	0.01
		C		0.000	0.000	0.959	0.000	0.01
L39	59.2500-56.2500	A	1.348	0.000	0.000	8.618	0.000	0.08
		B		0.000	0.000	8.618	0.000	0.07
		C		0.000	0.000	11.497	0.000	0.16
L40	56.2500-56.0000	A	1.345	0.000	0.000	0.718	0.000	0.01
		B		0.000	0.000	0.718	0.000	0.01
		C		0.000	0.000	0.957	0.000	0.01
L41	56.0000-55.7500	A	1.344	0.000	0.000	0.718	0.000	0.01
		B		0.000	0.000	0.718	0.000	0.01
		C		0.000	0.000	0.957	0.000	0.01
L42	55.7500-50.7500	A	1.337	0.000	0.000	14.342	0.000	0.14
		B		0.000	0.000	14.342	0.000	0.11
		C		0.000	0.000	19.126	0.000	0.26
L43	50.7500-44.6667	A	1.323	0.000	0.000	17.413	0.000	0.17
		B		0.000	0.000	17.413	0.000	0.13
		C		0.000	0.000	23.212	0.000	0.32
L44	44.6667-43.6667	A	1.313	0.000	0.000	2.862	0.000	0.03
		B		0.000	0.000	2.862	0.000	0.02
		C		0.000	0.000	3.816	0.000	0.05
L45	43.6667-38.6667	A	1.303	0.000	0.000	14.274	0.000	0.13
		B		0.000	0.000	14.274	0.000	0.11
		C		0.000	0.000	19.015	0.000	0.26
L46	38.6667-34.5000	A	1.288	0.000	0.000	11.869	0.000	0.11
		B		0.000	0.000	11.869	0.000	0.09
		C		0.000	0.000	15.805	0.000	0.21
L47	34.5000-34.2500	A	1.280	0.000	0.000	0.711	0.000	0.01
		B		0.000	0.000	0.711	0.000	0.01
		C		0.000	0.000	0.947	0.000	0.01
L48	34.2500-33.0000	A	1.277	0.000	0.000	3.555	0.000	0.03
		B		0.000	0.000	3.555	0.000	0.03
		C		0.000	0.000	4.733	0.000	0.06
L49	33.0000-32.7500	A	1.275	0.000	0.000	0.711	0.000	0.01
		B		0.000	0.000	0.711	0.000	0.01
		C		0.000	0.000	0.946	0.000	0.01
L50	32.7500-29.7500	A	1.268	0.000	0.000	8.522	0.000	0.08
		B		0.000	0.000	8.522	0.000	0.06
		C		0.000	0.000	11.340	0.000	0.15
L51	29.7500-29.5000	A	1.261	0.000	0.000	0.751	0.000	0.01
		B		0.000	0.000	0.751	0.000	0.01
		C		0.000	0.000	0.986	0.000	0.01
L52	29.5000-25.0000	A	1.251	0.000	0.000	13.501	0.000	0.12
		B		0.000	0.000	13.501	0.000	0.10
		C		0.000	0.000	17.710	0.000	0.23
L53	25.0000-24.7500	A	1.239	0.000	0.000	0.749	0.000	0.01
		B		0.000	0.000	0.749	0.000	0.01
		C		0.000	0.000	0.982	0.000	0.01
L54	24.7500-19.7500	A	1.226	0.000	0.000	14.951	0.000	0.13
		B		0.000	0.000	14.951	0.000	0.10
		C		0.000	0.000	19.596	0.000	0.25
L55	19.7500-14.7500	A	1.195	0.000	0.000	14.890	0.000	0.13
		B		0.000	0.000	14.890	0.000	0.10
		C		0.000	0.000	20.043	0.000	0.26
L56	14.7500-14.5000	A	1.175	0.000	0.000	0.743	0.000	0.01
		B		0.000	0.000	0.743	0.000	0.00
		C		0.000	0.000	1.080	0.000	0.01
L57	14.5000-14.2500	A	1.173	0.000	0.000	0.742	0.000	0.01
		B		0.000	0.000	0.742	0.000	0.00
		C		0.000	0.000	1.080	0.000	0.01

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L58	14.2500-12.2500	A	1.164	0.000	0.000	5.931	0.000	0.05
		B		0.000	0.000	6.230	0.000	0.05
		C		0.000	0.000	8.623	0.000	0.11
L59	12.2500-12.0000	A	1.154	0.000	0.000	0.740	0.000	0.01
		B		0.000	0.000	0.840	0.000	0.01
		C		0.000	0.000	1.076	0.000	0.01
L60	12.0000-11.5000	A	1.150	0.000	0.000	1.480	0.000	0.01
		B		0.000	0.000	1.678	0.000	0.01
		C		0.000	0.000	2.150	0.000	0.03
L61	11.5000-11.2500	A	1.146	0.000	0.000	0.740	0.000	0.01
		B		0.000	0.000	0.839	0.000	0.01
		C		0.000	0.000	1.074	0.000	0.01
L62	11.2500-9.2500	A	1.134	0.000	0.000	5.907	0.000	0.05
		B		0.000	0.000	6.696	0.000	0.05
		C		0.000	0.000	8.574	0.000	0.11
L63	9.2500-9.0000	A	1.121	0.000	0.000	0.737	0.000	0.01
		B		0.000	0.000	0.835	0.000	0.01
		C		0.000	0.000	1.069	0.000	0.01
L64	9.0000-4.5000	A	1.088	0.000	0.000	13.670	0.000	0.10
		B		0.000	0.000	14.951	0.000	0.12
		C		0.000	0.000	15.990	0.000	0.15
L65	4.5000-4.2500	A	1.042	0.000	0.000	0.805	0.000	0.01
		B		0.000	0.000	0.824	0.000	0.01
		C		0.000	0.000	0.832	0.000	0.01
L66	4.2500-3.0000	A	1.022	0.000	0.000	4.011	0.000	0.03
		B		0.000	0.000	4.108	0.000	0.03
		C		0.000	0.000	4.146	0.000	0.03
L67	3.0000-2.7500	A	0.999	0.000	0.000	0.799	0.000	0.01
		B		0.000	0.000	0.818	0.000	0.01
		C		0.000	0.000	0.826	0.000	0.01
L68	2.7500-0.0000	A	0.928	0.000	0.000	8.686	0.000	0.06
		B		0.000	0.000	8.894	0.000	0.06
		C		0.000	0.000	8.972	0.000	0.06

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	150.0000-145.0000	0.0000	0.0000	0.0000	0.0000
L2	145.0000-140.0000	0.0000	0.0000	0.0000	0.0000
L3	140.0000-135.0000	0.0000	0.0000	0.0000	0.0000
L4	135.0000-133.0000	0.0000	0.0000	0.0000	0.0000
L5	133.0000-132.7500	0.0000	0.0000	0.0000	0.0000
L6	132.7500-127.7500	0.0566	0.0412	0.0789	0.0573
L7	127.7500-123.7500	0.8600	0.6249	1.0888	0.7911
L8	123.7500-123.5000	0.6549	0.4758	0.8590	0.6241
L9	123.5000-118.7500	0.6657	0.4837	0.8736	0.6347
L10	118.7500-118.5000	0.6763	0.4914	0.8879	0.6451
L11	118.5000-117.0000	0.6796	0.4938	0.8925	0.6484
L12	117.0000-116.7500	0.6823	0.4957	0.8964	0.6513
L13	116.7500-111.7500	0.6923	0.5030	0.9101	0.6613

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L14	111.7500-106.7500	0.7112	0.5167	0.9361	0.6801
L15	106.7500-101.7500	0.7296	0.5301	0.9615	0.6985
L16	101.7500-95.1667	0.7506	0.5453	0.9903	0.7195
L17	95.1667-94.5000	0.7568	0.5498	0.9990	0.7258
L18	94.5000-93.7500	0.7593	0.5517	1.0019	0.7279
L19	93.7500-93.5000	0.7614	0.5532	1.0047	0.7300
L20	93.5000-92.7500	0.7632	0.5545	1.0072	0.7317
L21	92.7500-92.5000	0.7656	0.5562	1.0103	0.7340
L22	92.5000-91.2500	0.7682	0.5581	1.0139	0.7366
L23	91.2500-91.0000	0.7708	0.5600	1.0175	0.7392
L24	91.0000-89.2500	0.7743	0.5626	1.0223	0.7427
L25	89.2500-89.0000	0.6858	0.4982	0.9418	0.6843
L26	89.0000-85.7500	0.6914	0.5023	0.9496	0.6899
L27	85.7500-85.5000	0.6962	0.5058	0.9565	0.6949
L28	85.5000-80.5000	0.7045	0.5118	0.9679	0.7032
L29	80.5000-75.5000	0.7201	0.5232	0.9895	0.7189
L30	75.5000-70.5000	0.7343	0.5335	1.0095	0.7334
L31	70.5000-68.0830	0.6877	0.4996	0.9672	0.7027
L32	68.0830-67.8330	0.6916	0.5025	0.9725	0.7066
L33	67.8330-67.0000	0.6931	0.5036	0.9746	0.7081
L34	67.0000-66.7500	0.6951	0.5050	0.9774	0.7101
L35	66.7500-63.2500	0.7004	0.5089	0.9846	0.7153
L36	63.2500-63.0000	0.7060	0.5130	0.9923	0.7209
L37	63.0000-59.5000	0.7112	0.5168	0.9993	0.7261
L38	59.5000-59.2500	0.6812	0.4949	0.9699	0.7047
L39	59.2500-56.2500	0.6856	0.4981	0.9758	0.7090
L40	56.2500-56.0000	0.6896	0.5010	0.9813	0.7130
L41	56.0000-55.7500	0.6899	0.5012	0.9816	0.7132
L42	55.7500-50.7500	0.6968	0.5063	0.9910	0.7200
L43	50.7500-44.6667	0.7113	0.5168	1.0103	0.7340
L44	44.6667-43.6667	0.7120	0.5173	1.0114	0.7348
L45	43.6667-38.6667	0.7197	0.5229	1.0200	0.7411
L46	38.6667-34.5000	0.7314	0.5314	1.0350	0.7520
L47	34.5000-34.2500	0.7375	0.5358	1.0427	0.7575
L48	34.2500-33.0000	0.7394	0.5372	1.0450	0.7592
L49	33.0000-32.7500	0.7413	0.5386	1.0474	0.7609
L50	32.7500-29.7500	0.7453	0.5415	1.0523	0.7645
L51	29.7500-29.5000	0.7155	0.5199	1.0211	0.7419
L52	29.5000-25.0000	0.7212	0.5240	1.0279	0.7468
L53	25.0000-24.7500	0.7265	0.5278	1.0339	0.7512
L54	24.7500-19.7500	0.7327	0.5323	1.0409	0.7563
L55	19.7500-14.7500	0.7410	0.6450	1.0455	0.9304
L56	14.7500-14.5000	0.7370	0.9559	1.0288	1.4124
L57	14.5000-14.2500	0.7375	0.9566	1.0293	1.4129
L58	14.2500-12.2500	0.8716	0.8745	1.2193	1.2871
L59	12.2500-12.0000	1.0895	0.7378	1.5252	1.0816
L60	12.0000-11.5000	1.0907	0.7387	1.5261	1.0822
L61	11.5000-11.2500	1.0922	0.7397	1.5272	1.0830
L62	11.2500-9.2500	1.0958	0.7421	1.5293	1.0843
L63	9.2500-9.0000	1.0993	0.7445	1.5310	1.0852
L64	9.0000-4.5000	0.4459	0.2826	0.6435	0.4601
L65	4.5000-4.2500	0.0829	0.0479	0.1137	0.1177
L66	4.2500-3.0000	0.0831	0.0480	0.1136	0.1170
L67	3.0000-2.7500	0.0832	0.0481	0.1134	0.1162
L68	2.7500-0.0000	0.0836	0.0483	0.1125	0.1133

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
L4	32	4.5" x 1" Flate Plate	133.00 - 135.00	1.0000	1.0000
L4	33	4.5" x 1" Flate Plate	133.00 - 135.00	1.0000	1.0000
L4	34	4.5" x 1" Flate Plate	133.00 - 135.00	1.0000	1.0000
L5	32	4.5" x 1" Flate Plate	132.75 - 133.00	1.0000	1.0000
L5	33	4.5" x 1" Flate Plate	132.75 - 133.00	1.0000	1.0000
L5	34	4.5" x 1" Flate Plate	132.75 - 133.00	1.0000	1.0000
L6	11	HCS 6X12 4AWG(1-5/8)	127.75 - 128.00	1.0000	1.0000
L6	32	4.5" x 1" Flate Plate	127.75 - 132.75	1.0000	1.0000
L6	33	4.5" x 1" Flate Plate	127.75 - 132.75	1.0000	1.0000
L6	34	4.5" x 1" Flate Plate	127.75 - 132.75	1.0000	1.0000
L7	11	HCS 6X12 4AWG(1-5/8)	123.75 - 127.75	1.0000	1.0000
L7	16	5" x 1-1/4" Flate Plate	123.75 - 125.00	1.0000	1.0000
L7	21	5" x 1-1/4" Flate Plate	123.75 - 125.00	1.0000	1.0000
L7	26	5" x 1-1/4" Flate Plate	123.75 - 125.00	1.0000	1.0000
L7	32	4.5" x 1" Flate Plate	123.75 - 127.75	1.0000	1.0000
L7	33	4.5" x 1" Flate Plate	123.75 - 127.75	1.0000	1.0000
L7	34	4.5" x 1" Flate Plate	123.75 - 127.75	1.0000	1.0000
L8	11	HCS 6X12 4AWG(1-5/8)	123.50 - 123.75	1.0000	1.0000
L8	16	5" x 1-1/4" Flate Plate	123.50 - 123.75	1.0000	1.0000
L8	21	5" x 1-1/4" Flate Plate	123.50 - 123.75	1.0000	1.0000
L8	26	5" x 1-1/4" Flate Plate	123.50 - 123.75	1.0000	1.0000
L8	32	4.5" x 1" Flate Plate	123.50 - 123.75	1.0000	1.0000
L8	33	4.5" x 1" Flate Plate	123.50 - 123.75	1.0000	1.0000
L8	34	4.5" x 1" Flate Plate	123.50 - 123.75	1.0000	1.0000
L9	11	HCS 6X12 4AWG(1-5/8)	118.75 - 123.50	1.0000	1.0000
L9	16	5" x 1-1/4" Flate Plate	118.75 - 123.50	1.0000	1.0000
L9	21	5" x 1-1/4" Flate Plate	118.75 - 123.50	1.0000	1.0000
L9	26	5" x 1-1/4" Flate Plate	118.75 - 123.50	1.0000	1.0000
L9	32	4.5" x 1" Flate Plate	118.75 - 123.50	1.0000	1.0000
L9	33	4.5" x 1" Flate Plate	118.75 - 123.50	1.0000	1.0000
L9	34	4.5" x 1" Flate Plate	118.75 - 123.50	1.0000	1.0000
L10	11	HCS 6X12 4AWG(1-5/8)	118.50 - 118.75	1.0000	1.0000
L10	16	5" x 1-1/4" Flate Plate	118.50 - 118.75	1.0000	1.0000
L10	21	5" x 1-1/4" Flate Plate	118.50 - 118.75	1.0000	1.0000
L10	26	5" x 1-1/4" Flate Plate	118.50 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L10	32	4.5" x 1" Flate Plate	118.75 118.50 - 118.75	1.0000	1.0000
L10	33	4.5" x 1" Flate Plate	118.50 - 118.75	1.0000	1.0000
L10	34	4.5" x 1" Flate Plate	118.50 - 118.75	1.0000	1.0000
L11	11	HCS 6X12 4AWG(1-5/8)	117.00 - 118.50	1.0000	1.0000
L11	16	5" x 1-1/4" Flate Plate	117.00 - 118.50	1.0000	1.0000
L11	21	5" x 1-1/4" Flate Plate	117.00 - 118.50	1.0000	1.0000
L11	26	5" x 1-1/4" Flate Plate	117.00 - 118.50	1.0000	1.0000
L11	32	4.5" x 1" Flate Plate	117.00 - 118.50	1.0000	1.0000
L11	33	4.5" x 1" Flate Plate	117.00 - 118.50	1.0000	1.0000
L11	34	4.5" x 1" Flate Plate	117.00 - 118.50	1.0000	1.0000
L12	11	HCS 6X12 4AWG(1-5/8)	116.75 - 117.00	1.0000	1.0000
L12	16	5" x 1-1/4" Flate Plate	116.75 - 117.00	1.0000	1.0000
L12	21	5" x 1-1/4" Flate Plate	116.75 - 117.00	1.0000	1.0000
L12	26	5" x 1-1/4" Flate Plate	116.75 - 117.00	1.0000	1.0000
L12	32	4.5" x 1" Flate Plate	116.75 - 117.00	1.0000	1.0000
L12	33	4.5" x 1" Flate Plate	116.75 - 117.00	1.0000	1.0000
L12	34	4.5" x 1" Flate Plate	116.75 - 117.00	1.0000	1.0000
L13	11	HCS 6X12 4AWG(1-5/8)	111.75 - 116.75	1.0000	1.0000
L13	16	5" x 1-1/4" Flate Plate	111.75 - 116.75	1.0000	1.0000
L13	21	5" x 1-1/4" Flate Plate	111.75 - 116.75	1.0000	1.0000
L13	26	5" x 1-1/4" Flate Plate	111.75 - 116.75	1.0000	1.0000
L13	32	4.5" x 1" Flate Plate	111.75 - 116.75	1.0000	1.0000
L13	33	4.5" x 1" Flate Plate	111.75 - 116.75	1.0000	1.0000
L13	34	4.5" x 1" Flate Plate	111.75 - 116.75	1.0000	1.0000
L14	11	HCS 6X12 4AWG(1-5/8)	106.75 - 111.75	1.0000	1.0000
L14	16	5" x 1-1/4" Flate Plate	106.75 - 111.75	1.0000	1.0000
L14	21	5" x 1-1/4" Flate Plate	106.75 - 111.75	1.0000	1.0000
L14	26	5" x 1-1/4" Flate Plate	106.75 - 111.75	1.0000	1.0000
L14	32	4.5" x 1" Flate Plate	106.75 - 111.75	1.0000	1.0000
L14	33	4.5" x 1" Flate Plate	106.75 - 111.75	1.0000	1.0000
L14	34	4.5" x 1" Flate Plate	106.75 - 111.75	1.0000	1.0000
L15	11	HCS 6X12 4AWG(1-5/8)	101.75 - 106.75	1.0000	1.0000
L15	16	5" x 1-1/4" Flate Plate	101.75 - 106.75	1.0000	1.0000
L15	21	5" x 1-1/4" Flate Plate	101.75 - 106.75	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L15	26	5" x 1-1/4" Flate Plate	101.75 - 106.75	1.0000	1.0000
L15	32	4.5" x 1" Flate Plate	101.75 - 106.75	1.0000	1.0000
L15	33	4.5" x 1" Flate Plate	101.75 - 106.75	1.0000	1.0000
L15	34	4.5" x 1" Flate Plate	101.75 - 106.75	1.0000	1.0000
L16	11	HCS 6X12 4AWG(1-5/8)	95.17 - 101.75	1.0000	1.0000
L16	16	5" x 1-1/4" Flate Plate	95.17 - 101.75	1.0000	1.0000
L16	21	5" x 1-1/4" Flate Plate	95.17 - 101.75	1.0000	1.0000
L16	26	5" x 1-1/4" Flate Plate	95.17 - 101.75	1.0000	1.0000
L16	32	4.5" x 1" Flate Plate	95.17 - 101.75	1.0000	1.0000
L16	33	4.5" x 1" Flate Plate	95.17 - 101.75	1.0000	1.0000
L16	34	4.5" x 1" Flate Plate	95.17 - 101.75	1.0000	1.0000
L17	11	HCS 6X12 4AWG(1-5/8)	94.50 - 95.17	1.0000	1.0000
L17	16	5" x 1-1/4" Flate Plate	94.50 - 95.17	1.0000	1.0000
L17	21	5" x 1-1/4" Flate Plate	94.50 - 95.17	1.0000	1.0000
L17	26	5" x 1-1/4" Flate Plate	94.50 - 95.17	1.0000	1.0000
L17	32	4.5" x 1" Flate Plate	94.50 - 95.17	1.0000	1.0000
L17	33	4.5" x 1" Flate Plate	94.50 - 95.17	1.0000	1.0000
L17	34	4.5" x 1" Flate Plate	94.50 - 95.17	1.0000	1.0000
L18	11	HCS 6X12 4AWG(1-5/8)	93.75 - 94.50	1.0000	1.0000
L18	16	5" x 1-1/4" Flate Plate	93.75 - 94.50	1.0000	1.0000
L18	21	5" x 1-1/4" Flate Plate	93.75 - 94.50	1.0000	1.0000
L18	26	5" x 1-1/4" Flate Plate	93.75 - 94.50	1.0000	1.0000
L18	32	4.5" x 1" Flate Plate	93.75 - 94.50	1.0000	1.0000
L18	33	4.5" x 1" Flate Plate	93.75 - 94.50	1.0000	1.0000
L18	34	4.5" x 1" Flate Plate	93.75 - 94.50	1.0000	1.0000
L19	11	HCS 6X12 4AWG(1-5/8)	93.50 - 93.75	1.0000	1.0000
L19	16	5" x 1-1/4" Flate Plate	93.50 - 93.75	1.0000	1.0000
L19	21	5" x 1-1/4" Flate Plate	93.50 - 93.75	1.0000	1.0000
L19	26	5" x 1-1/4" Flate Plate	93.50 - 93.75	1.0000	1.0000
L19	32	4.5" x 1" Flate Plate	93.50 - 93.75	1.0000	1.0000
L19	33	4.5" x 1" Flate Plate	93.50 - 93.75	1.0000	1.0000
L19	34	4.5" x 1" Flate Plate	93.50 - 93.75	1.0000	1.0000
L20	11	HCS 6X12 4AWG(1-5/8)	92.75 - 93.50	1.0000	1.0000
L20	16	5" x 1-1/4" Flate Plate	92.75 - 93.50	1.0000	1.0000
L20	21	5" x 1-1/4" Flate Plate	92.75 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L20	26	5" x 1-1/4" Flate Plate	93.50 92.75 - 93.50	1.0000	1.0000
L20	32	4.5" x 1" Flate Plate	92.75 - 93.50	1.0000	1.0000
L20	33	4.5" x 1" Flate Plate	92.75 - 93.50	1.0000	1.0000
L20	34	4.5" x 1" Flate Plate	92.75 - 93.50	1.0000	1.0000
L21	11	HCS 6X12 4AWG(1-5/8)	92.50 - 92.75	1.0000	1.0000
L21	16	5" x 1-1/4" Flate Plate	92.50 - 92.75	1.0000	1.0000
L21	21	5" x 1-1/4" Flate Plate	92.50 - 92.75	1.0000	1.0000
L21	26	5" x 1-1/4" Flate Plate	92.50 - 92.75	1.0000	1.0000
L21	32	4.5" x 1" Flate Plate	92.50 - 92.75	1.0000	1.0000
L21	33	4.5" x 1" Flate Plate	92.50 - 92.75	1.0000	1.0000
L21	34	4.5" x 1" Flate Plate	92.50 - 92.75	1.0000	1.0000
L22	11	HCS 6X12 4AWG(1-5/8)	91.25 - 92.50	1.0000	1.0000
L22	16	5" x 1-1/4" Flate Plate	91.25 - 92.50	1.0000	1.0000
L22	21	5" x 1-1/4" Flate Plate	91.25 - 92.50	1.0000	1.0000
L22	26	5" x 1-1/4" Flate Plate	91.25 - 92.50	1.0000	1.0000
L22	32	4.5" x 1" Flate Plate	91.25 - 92.50	1.0000	1.0000
L22	33	4.5" x 1" Flate Plate	91.25 - 92.50	1.0000	1.0000
L22	34	4.5" x 1" Flate Plate	91.25 - 92.50	1.0000	1.0000
L23	11	HCS 6X12 4AWG(1-5/8)	91.00 - 91.25	1.0000	1.0000
L23	16	5" x 1-1/4" Flate Plate	91.00 - 91.25	1.0000	1.0000
L23	21	5" x 1-1/4" Flate Plate	91.00 - 91.25	1.0000	1.0000
L23	26	5" x 1-1/4" Flate Plate	91.00 - 91.25	1.0000	1.0000
L23	32	4.5" x 1" Flate Plate	91.00 - 91.25	1.0000	1.0000
L23	33	4.5" x 1" Flate Plate	91.00 - 91.25	1.0000	1.0000
L23	34	4.5" x 1" Flate Plate	91.00 - 91.25	1.0000	1.0000
L24	11	HCS 6X12 4AWG(1-5/8)	89.25 - 91.00	1.0000	1.0000
L24	16	5" x 1-1/4" Flate Plate	89.25 - 91.00	1.0000	1.0000
L24	21	5" x 1-1/4" Flate Plate	89.25 - 91.00	1.0000	1.0000
L24	26	5" x 1-1/4" Flate Plate	89.25 - 91.00	1.0000	1.0000
L24	32	4.5" x 1" Flate Plate	89.25 - 91.00	1.0000	1.0000
L24	33	4.5" x 1" Flate Plate	89.25 - 91.00	1.0000	1.0000
L24	34	4.5" x 1" Flate Plate	89.25 - 91.00	1.0000	1.0000
L25	11	HCS 6X12 4AWG(1-5/8)	89.00 - 89.25	1.0000	1.0000
L25	15	7" x 1-1/4" Flate Plate	89.00 - 89.25	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L25	20	7" x 1-1/4" Flate Plate	89.00 - 89.25	1.0000	1.0000
L25	25	7" x 1-1/4" Flate Plate	89.00 - 89.25	1.0000	1.0000
L25	32	4.5" x 1" Flate Plate	89.00 - 89.25	1.0000	1.0000
L25	33	4.5" x 1" Flate Plate	89.00 - 89.25	1.0000	1.0000
L25	34	4.5" x 1" Flate Plate	89.00 - 89.25	1.0000	1.0000
L26	11	HCS 6X12 4AWG(1-5/8)	85.75 - 89.00	1.0000	1.0000
L26	15	7" x 1-1/4" Flate Plate	85.75 - 89.00	1.0000	1.0000
L26	20	7" x 1-1/4" Flate Plate	85.75 - 89.00	1.0000	1.0000
L26	25	7" x 1-1/4" Flate Plate	85.75 - 89.00	1.0000	1.0000
L26	32	4.5" x 1" Flate Plate	85.75 - 89.00	1.0000	1.0000
L26	33	4.5" x 1" Flate Plate	85.75 - 89.00	1.0000	1.0000
L26	34	4.5" x 1" Flate Plate	85.75 - 89.00	1.0000	1.0000
L27	11	HCS 6X12 4AWG(1-5/8)	85.50 - 85.75	1.0000	1.0000
L27	15	7" x 1-1/4" Flate Plate	85.50 - 85.75	1.0000	1.0000
L27	20	7" x 1-1/4" Flate Plate	85.50 - 85.75	1.0000	1.0000
L27	25	7" x 1-1/4" Flate Plate	85.50 - 85.75	1.0000	1.0000
L27	32	4.5" x 1" Flate Plate	85.50 - 85.75	1.0000	1.0000
L27	33	4.5" x 1" Flate Plate	85.50 - 85.75	1.0000	1.0000
L27	34	4.5" x 1" Flate Plate	85.50 - 85.75	1.0000	1.0000
L28	11	HCS 6X12 4AWG(1-5/8)	80.50 - 85.50	1.0000	1.0000
L28	15	7" x 1-1/4" Flate Plate	80.50 - 85.50	1.0000	1.0000
L28	20	7" x 1-1/4" Flate Plate	80.50 - 85.50	1.0000	1.0000
L28	25	7" x 1-1/4" Flate Plate	80.50 - 85.50	1.0000	1.0000
L28	32	4.5" x 1" Flate Plate	80.50 - 85.50	1.0000	1.0000
L28	33	4.5" x 1" Flate Plate	80.50 - 85.50	1.0000	1.0000
L28	34	4.5" x 1" Flate Plate	80.50 - 85.50	1.0000	1.0000
L29	11	HCS 6X12 4AWG(1-5/8)	75.50 - 80.50	1.0000	1.0000
L29	15	7" x 1-1/4" Flate Plate	75.50 - 80.50	1.0000	1.0000
L29	20	7" x 1-1/4" Flate Plate	75.50 - 80.50	1.0000	1.0000
L29	25	7" x 1-1/4" Flate Plate	75.50 - 80.50	1.0000	1.0000
L29	32	4.5" x 1" Flate Plate	75.50 - 80.50	1.0000	1.0000
L29	33	4.5" x 1" Flate Plate	75.50 - 80.50	1.0000	1.0000
L29	34	4.5" x 1" Flate Plate	75.50 - 80.50	1.0000	1.0000
L30	11	HCS 6X12 4AWG(1-5/8)	70.50 - 75.50	1.0000	1.0000
L30	15	7" x 1-1/4" Flate Plate	70.50 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L30	20	7" x 1-1/4" Flate Plate	75.50 70.50 - 75.50	1.0000	1.0000
L30	25	7" x 1-1/4" Flate Plate	70.50 - 75.50	1.0000	1.0000
L30	28	6" x 1" Flate Plate	70.50 - 70.58	1.0000	1.0000
L30	29	6" x 1" Flate Plate	70.50 - 70.58	1.0000	1.0000
L30	30	6" x 1" Flate Plate	70.50 - 70.58	1.0000	1.0000
L30	32	4.5" x 1" Flate Plate	70.58 - 75.50	1.0000	1.0000
L30	33	4.5" x 1" Flate Plate	70.58 - 75.50	1.0000	1.0000
L30	34	4.5" x 1" Flate Plate	70.58 - 75.50	1.0000	1.0000
L31	11	HCS 6X12 4AWG(1-5/8)	68.08 - 70.50	1.0000	1.0000
L31	15	7" x 1-1/4" Flate Plate	68.08 - 70.50	1.0000	1.0000
L31	20	7" x 1-1/4" Flate Plate	68.08 - 70.50	1.0000	1.0000
L31	25	7" x 1-1/4" Flate Plate	68.08 - 70.50	1.0000	1.0000
L31	28	6" x 1" Flate Plate	68.08 - 70.50	1.0000	1.0000
L31	29	6" x 1" Flate Plate	68.08 - 70.50	1.0000	1.0000
L31	30	6" x 1" Flate Plate	68.08 - 70.50	1.0000	1.0000
L32	11	HCS 6X12 4AWG(1-5/8)	67.83 - 68.08	1.0000	1.0000
L32	15	7" x 1-1/4" Flate Plate	67.83 - 68.08	1.0000	1.0000
L32	20	7" x 1-1/4" Flate Plate	67.83 - 68.08	1.0000	1.0000
L32	25	7" x 1-1/4" Flate Plate	67.83 - 68.08	1.0000	1.0000
L32	28	6" x 1" Flate Plate	67.83 - 68.08	1.0000	1.0000
L32	29	6" x 1" Flate Plate	67.83 - 68.08	1.0000	1.0000
L32	30	6" x 1" Flate Plate	67.83 - 68.08	1.0000	1.0000
L33	11	HCS 6X12 4AWG(1-5/8)	67.00 - 67.83	1.0000	1.0000
L33	15	7" x 1-1/4" Flate Plate	67.00 - 67.83	1.0000	1.0000
L33	20	7" x 1-1/4" Flate Plate	67.00 - 67.83	1.0000	1.0000
L33	25	7" x 1-1/4" Flate Plate	67.00 - 67.83	1.0000	1.0000
L33	28	6" x 1" Flate Plate	67.00 - 67.83	1.0000	1.0000
L33	29	6" x 1" Flate Plate	67.00 - 67.83	1.0000	1.0000
L33	30	6" x 1" Flate Plate	67.00 - 67.83	1.0000	1.0000
L34	11	HCS 6X12 4AWG(1-5/8)	66.75 - 67.00	1.0000	1.0000
L34	15	7" x 1-1/4" Flate Plate	66.75 - 67.00	1.0000	1.0000
L34	20	7" x 1-1/4" Flate Plate	66.75 - 67.00	1.0000	1.0000
L34	25	7" x 1-1/4" Flate Plate	66.75 - 67.00	1.0000	1.0000
L34	28	6" x 1" Flate Plate	66.75 - 67.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L34	29	6" x 1" Flate Plate	66.75 - 67.00	1.0000	1.0000
L34	30	6" x 1" Flate Plate	66.75 - 67.00	1.0000	1.0000
L35	11	HCS 6X12 4AWG(1-5/8)	63.25 - 66.75	1.0000	1.0000
L35	15	7" x 1-1/4" Flate Plate	63.25 - 66.75	1.0000	1.0000
L35	20	7" x 1-1/4" Flate Plate	63.25 - 66.75	1.0000	1.0000
L35	25	7" x 1-1/4" Flate Plate	63.25 - 66.75	1.0000	1.0000
L35	28	6" x 1" Flate Plate	63.25 - 66.75	1.0000	1.0000
L35	29	6" x 1" Flate Plate	63.25 - 66.75	1.0000	1.0000
L35	30	6" x 1" Flate Plate	63.25 - 66.75	1.0000	1.0000
L36	11	HCS 6X12 4AWG(1-5/8)	63.00 - 63.25	1.0000	1.0000
L36	15	7" x 1-1/4" Flate Plate	63.00 - 63.25	1.0000	1.0000
L36	20	7" x 1-1/4" Flate Plate	63.00 - 63.25	1.0000	1.0000
L36	25	7" x 1-1/4" Flate Plate	63.00 - 63.25	1.0000	1.0000
L36	28	6" x 1" Flate Plate	63.00 - 63.25	1.0000	1.0000
L36	29	6" x 1" Flate Plate	63.00 - 63.25	1.0000	1.0000
L36	30	6" x 1" Flate Plate	63.00 - 63.25	1.0000	1.0000
L37	11	HCS 6X12 4AWG(1-5/8)	59.50 - 63.00	1.0000	1.0000
L37	15	7" x 1-1/4" Flate Plate	59.50 - 63.00	1.0000	1.0000
L37	20	7" x 1-1/4" Flate Plate	59.50 - 63.00	1.0000	1.0000
L37	25	7" x 1-1/4" Flate Plate	59.50 - 63.00	1.0000	1.0000
L37	28	6" x 1" Flate Plate	59.50 - 63.00	1.0000	1.0000
L37	29	6" x 1" Flate Plate	59.50 - 63.00	1.0000	1.0000
L37	30	6" x 1" Flate Plate	59.50 - 63.00	1.0000	1.0000
L38	11	HCS 6X12 4AWG(1-5/8)	59.25 - 59.50	1.0000	1.0000
L38	14	8" x 1-1/4" Flate Plate	59.25 - 59.50	1.0000	1.0000
L38	19	8" x 1-1/4" Flate Plate	59.25 - 59.50	1.0000	1.0000
L38	24	8" x 1-1/4" Flate Plate	59.25 - 59.50	1.0000	1.0000
L38	28	6" x 1" Flate Plate	59.25 - 59.50	1.0000	1.0000
L38	29	6" x 1" Flate Plate	59.25 - 59.50	1.0000	1.0000
L38	30	6" x 1" Flate Plate	59.25 - 59.50	1.0000	1.0000
L39	11	HCS 6X12 4AWG(1-5/8)	56.25 - 59.25	1.0000	1.0000
L39	14	8" x 1-1/4" Flate Plate	56.25 - 59.25	1.0000	1.0000
L39	19	8" x 1-1/4" Flate Plate	56.25 - 59.25	1.0000	1.0000
L39	24	8" x 1-1/4" Flate Plate	56.25 - 59.25	1.0000	1.0000
L39	28	6" x 1" Flate Plate	56.25 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L39	29	6" x 1" Flate Plate	59.25 56.25 - 59.25	1.0000	1.0000
L39	30	6" x 1" Flate Plate	56.25 - 59.25	1.0000	1.0000
L40	11	HCS 6X12 4AWG(1-5/8)	56.00 - 56.25	1.0000	1.0000
L40	14	8" x 1-1/4" Flate Plate	56.00 - 56.25	1.0000	1.0000
L40	19	8" x 1-1/4" Flate Plate	56.00 - 56.25	1.0000	1.0000
L40	24	8" x 1-1/4" Flate Plate	56.00 - 56.25	1.0000	1.0000
L40	28	6" x 1" Flate Plate	56.00 - 56.25	1.0000	1.0000
L40	29	6" x 1" Flate Plate	56.00 - 56.25	1.0000	1.0000
L40	30	6" x 1" Flate Plate	56.00 - 56.25	1.0000	1.0000
L41	11	HCS 6X12 4AWG(1-5/8)	55.75 - 56.00	1.0000	1.0000
L41	14	8" x 1-1/4" Flate Plate	55.75 - 56.00	1.0000	1.0000
L41	19	8" x 1-1/4" Flate Plate	55.75 - 56.00	1.0000	1.0000
L41	24	8" x 1-1/4" Flate Plate	55.75 - 56.00	1.0000	1.0000
L41	28	6" x 1" Flate Plate	55.75 - 56.00	1.0000	1.0000
L41	29	6" x 1" Flate Plate	55.75 - 56.00	1.0000	1.0000
L41	30	6" x 1" Flate Plate	55.75 - 56.00	1.0000	1.0000
L42	11	HCS 6X12 4AWG(1-5/8)	50.75 - 55.75	1.0000	1.0000
L42	14	8" x 1-1/4" Flate Plate	50.75 - 55.75	1.0000	1.0000
L42	19	8" x 1-1/4" Flate Plate	50.75 - 55.75	1.0000	1.0000
L42	24	8" x 1-1/4" Flate Plate	50.75 - 55.75	1.0000	1.0000
L42	28	6" x 1" Flate Plate	50.75 - 55.75	1.0000	1.0000
L42	29	6" x 1" Flate Plate	50.75 - 55.75	1.0000	1.0000
L42	30	6" x 1" Flate Plate	50.75 - 55.75	1.0000	1.0000
L43	11	HCS 6X12 4AWG(1-5/8)	44.67 - 50.75	1.0000	1.0000
L43	14	8" x 1-1/4" Flate Plate	44.67 - 50.75	1.0000	1.0000
L43	19	8" x 1-1/4" Flate Plate	44.67 - 50.75	1.0000	1.0000
L43	24	8" x 1-1/4" Flate Plate	44.67 - 50.75	1.0000	1.0000
L43	28	6" x 1" Flate Plate	44.67 - 50.75	1.0000	1.0000
L43	29	6" x 1" Flate Plate	44.67 - 50.75	1.0000	1.0000
L43	30	6" x 1" Flate Plate	44.67 - 50.75	1.0000	1.0000
L44	11	HCS 6X12 4AWG(1-5/8)	43.67 - 44.67	1.0000	1.0000
L44	14	8" x 1-1/4" Flate Plate	43.67 - 44.67	1.0000	1.0000
L44	19	8" x 1-1/4" Flate Plate	43.67 - 44.67	1.0000	1.0000
L44	24	8" x 1-1/4" Flate Plate	43.67 - 44.67	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L44	28	6" x 1" Flate Plate	43.67 - 44.67	1.0000	1.0000
L44	29	6" x 1" Flate Plate	43.67 - 44.67	1.0000	1.0000
L44	30	6" x 1" Flate Plate	43.67 - 44.67	1.0000	1.0000
L45	11	HCS 6X12 4AWG(1-5/8)	38.67 - 43.67	1.0000	1.0000
L45	14	8" x 1-1/4" Flate Plate	38.67 - 43.67	1.0000	1.0000
L45	19	8" x 1-1/4" Flate Plate	38.67 - 43.67	1.0000	1.0000
L45	24	8" x 1-1/4" Flate Plate	38.67 - 43.67	1.0000	1.0000
L45	28	6" x 1" Flate Plate	38.67 - 43.67	1.0000	1.0000
L45	29	6" x 1" Flate Plate	38.67 - 43.67	1.0000	1.0000
L45	30	6" x 1" Flate Plate	38.67 - 43.67	1.0000	1.0000
L46	11	HCS 6X12 4AWG(1-5/8)	34.50 - 38.67	1.0000	1.0000
L46	14	8" x 1-1/4" Flate Plate	34.50 - 38.67	1.0000	1.0000
L46	19	8" x 1-1/4" Flate Plate	34.50 - 38.67	1.0000	1.0000
L46	24	8" x 1-1/4" Flate Plate	34.50 - 38.67	1.0000	1.0000
L46	28	6" x 1" Flate Plate	34.50 - 38.67	1.0000	1.0000
L46	29	6" x 1" Flate Plate	34.50 - 38.67	1.0000	1.0000
L46	30	6" x 1" Flate Plate	34.50 - 38.67	1.0000	1.0000
L47	11	HCS 6X12 4AWG(1-5/8)	34.25 - 34.50	1.0000	1.0000
L47	14	8" x 1-1/4" Flate Plate	34.25 - 34.50	1.0000	1.0000
L47	19	8" x 1-1/4" Flate Plate	34.25 - 34.50	1.0000	1.0000
L47	24	8" x 1-1/4" Flate Plate	34.25 - 34.50	1.0000	1.0000
L47	28	6" x 1" Flate Plate	34.25 - 34.50	1.0000	1.0000
L47	29	6" x 1" Flate Plate	34.25 - 34.50	1.0000	1.0000
L47	30	6" x 1" Flate Plate	34.25 - 34.50	1.0000	1.0000
L48	11	HCS 6X12 4AWG(1-5/8)	33.00 - 34.25	1.0000	1.0000
L48	14	8" x 1-1/4" Flate Plate	33.00 - 34.25	1.0000	1.0000
L48	19	8" x 1-1/4" Flate Plate	33.00 - 34.25	1.0000	1.0000
L48	24	8" x 1-1/4" Flate Plate	33.00 - 34.25	1.0000	1.0000
L48	28	6" x 1" Flate Plate	33.00 - 34.25	1.0000	1.0000
L48	29	6" x 1" Flate Plate	33.00 - 34.25	1.0000	1.0000
L48	30	6" x 1" Flate Plate	33.00 - 34.25	1.0000	1.0000
L49	11	HCS 6X12 4AWG(1-5/8)	32.75 - 33.00	1.0000	1.0000
L49	14	8" x 1-1/4" Flate Plate	32.75 - 33.00	1.0000	1.0000
L49	19	8" x 1-1/4" Flate Plate	32.75 - 33.00	1.0000	1.0000
L49	24	8" x 1-1/4" Flate Plate	32.75 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L49	28	6" x 1" Flate Plate	33.00 32.75 - 33.00	1.0000	1.0000
L49	29	6" x 1" Flate Plate	32.75 - 33.00	1.0000	1.0000
L49	30	6" x 1" Flate Plate	32.75 - 33.00	1.0000	1.0000
L50	11	HCS 6X12 4AWG(1-5/8)	29.75 - 32.75	1.0000	1.0000
L50	14	8" x 1-1/4" Flate Plate	29.75 - 32.75	1.0000	1.0000
L50	19	8" x 1-1/4" Flate Plate	29.75 - 32.75	1.0000	1.0000
L50	24	8" x 1-1/4" Flate Plate	29.75 - 32.75	1.0000	1.0000
L50	28	6" x 1" Flate Plate	29.75 - 32.75	1.0000	1.0000
L50	29	6" x 1" Flate Plate	29.75 - 32.75	1.0000	1.0000
L50	30	6" x 1" Flate Plate	29.75 - 32.75	1.0000	1.0000
L51	11	HCS 6X12 4AWG(1-5/8)	29.50 - 29.75	1.0000	1.0000
L51	13	9" x 1-1/4" Flate Plate	29.50 - 29.75	1.0000	1.0000
L51	18	9" x 1-1/4" Flate Plate	29.50 - 29.75	1.0000	1.0000
L51	23	9" x 1-1/4" Flate Plate	29.50 - 29.75	1.0000	1.0000
L51	28	6" x 1" Flate Plate	29.50 - 29.75	1.0000	1.0000
L51	29	6" x 1" Flate Plate	29.50 - 29.75	1.0000	1.0000
L51	30	6" x 1" Flate Plate	29.50 - 29.75	1.0000	1.0000
L52	11	HCS 6X12 4AWG(1-5/8)	25.00 - 29.50	1.0000	1.0000
L52	13	9" x 1-1/4" Flate Plate	25.00 - 29.50	1.0000	1.0000
L52	18	9" x 1-1/4" Flate Plate	25.00 - 29.50	1.0000	1.0000
L52	23	9" x 1-1/4" Flate Plate	25.00 - 29.50	1.0000	1.0000
L52	28	6" x 1" Flate Plate	25.00 - 29.50	1.0000	1.0000
L52	29	6" x 1" Flate Plate	25.00 - 29.50	1.0000	1.0000
L52	30	6" x 1" Flate Plate	25.00 - 29.50	1.0000	1.0000
L53	11	HCS 6X12 4AWG(1-5/8)	24.75 - 25.00	1.0000	1.0000
L53	13	9" x 1-1/4" Flate Plate	24.75 - 25.00	1.0000	1.0000
L53	18	9" x 1-1/4" Flate Plate	24.75 - 25.00	1.0000	1.0000
L53	23	9" x 1-1/4" Flate Plate	24.75 - 25.00	1.0000	1.0000
L53	28	6" x 1" Flate Plate	24.75 - 25.00	1.0000	1.0000
L53	29	6" x 1" Flate Plate	24.75 - 25.00	1.0000	1.0000
L53	30	6" x 1" Flate Plate	24.75 - 25.00	1.0000	1.0000
L54	11	HCS 6X12 4AWG(1-5/8)	19.75 - 24.75	1.0000	1.0000
L54	13	9" x 1-1/4" Flate Plate	19.75 - 24.75	1.0000	1.0000
L54	18	9" x 1-1/4" Flate Plate	19.75 - 24.75	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L54	23	9" x 1-1/4" Flate Plate	19.75 - 24.75	1.0000	1.0000
L54	28	6" x 1" Flate Plate	19.75 - 24.75	1.0000	1.0000
L54	29	6" x 1" Flate Plate	19.75 - 24.75	1.0000	1.0000
L54	30	6" x 1" Flate Plate	19.75 - 24.75	1.0000	1.0000
L55	11	HCS 6X12 4AWG(1-5/8)	14.75 - 19.75	1.0000	1.0000
L55	13	9" x 1-1/4" Flate Plate	14.75 - 19.75	1.0000	1.0000
L55	18	9" x 1-1/4" Flate Plate	14.75 - 19.75	1.0000	1.0000
L55	23	9" x 1-1/4" Flate Plate	14.75 - 19.75	1.0000	1.0000
L55	28	6" x 1" Flate Plate	14.75 - 19.75	1.0000	1.0000
L55	29	6" x 1" Flate Plate	14.75 - 19.75	1.0000	1.0000
L55	30	6" x 1" Flate Plate	14.75 - 19.75	1.0000	1.0000
L55	38	Transition Stiffener	14.75 - 16.00	1.0000	1.0000
L56	11	HCS 6X12 4AWG(1-5/8)	14.50 - 14.75	1.0000	1.0000
L56	13	9" x 1-1/4" Flate Plate	14.50 - 14.75	1.0000	1.0000
L56	18	9" x 1-1/4" Flate Plate	14.50 - 14.75	1.0000	1.0000
L56	23	9" x 1-1/4" Flate Plate	14.50 - 14.75	1.0000	1.0000
L56	28	6" x 1" Flate Plate	14.50 - 14.75	1.0000	1.0000
L56	29	6" x 1" Flate Plate	14.50 - 14.75	1.0000	1.0000
L56	30	6" x 1" Flate Plate	14.50 - 14.75	1.0000	1.0000
L56	38	Transition Stiffener	14.50 - 14.75	1.0000	1.0000
L57	11	HCS 6X12 4AWG(1-5/8)	14.25 - 14.50	1.0000	1.0000
L57	13	9" x 1-1/4" Flate Plate	14.25 - 14.50	1.0000	1.0000
L57	18	9" x 1-1/4" Flate Plate	14.25 - 14.50	1.0000	1.0000
L57	23	9" x 1-1/4" Flate Plate	14.25 - 14.50	1.0000	1.0000
L57	28	6" x 1" Flate Plate	14.25 - 14.50	1.0000	1.0000
L57	29	6" x 1" Flate Plate	14.25 - 14.50	1.0000	1.0000
L57	30	6" x 1" Flate Plate	14.25 - 14.50	1.0000	1.0000
L57	38	Transition Stiffener	14.25 - 14.50	1.0000	1.0000
L58	11	HCS 6X12 4AWG(1-5/8)	12.25 - 14.25	1.0000	1.0000
L58	13	9" x 1-1/4" Flate Plate	12.25 - 14.25	1.0000	1.0000
L58	18	9" x 1-1/4" Flate Plate	12.25 - 14.25	1.0000	1.0000
L58	23	9" x 1-1/4" Flate Plate	12.25 - 14.25	1.0000	1.0000
L58	28	6" x 1" Flate Plate	12.25 - 14.25	1.0000	1.0000
L58	29	6" x 1" Flate Plate	12.25 - 14.25	1.0000	1.0000
L58	30	6" x 1" Flate Plate	12.25 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L58	37	Transition Stiffener	14.25 12.25 - 13.00	1.0000	1.0000
L58	38	Transition Stiffener	12.25 - 14.25	1.0000	1.0000
L59	11	HCS 6X12 4AWG(1-5/8)	12.00 - 12.25	1.0000	1.0000
L59	13	9" x 1-1/4" Flate Plate	12.00 - 12.25	1.0000	1.0000
L59	18	9" x 1-1/4" Flate Plate	12.00 - 12.25	1.0000	1.0000
L59	23	9" x 1-1/4" Flate Plate	12.00 - 12.25	1.0000	1.0000
L59	28	6" x 1" Flate Plate	12.00 - 12.25	1.0000	1.0000
L59	29	6" x 1" Flate Plate	12.00 - 12.25	1.0000	1.0000
L59	30	6" x 1" Flate Plate	12.00 - 12.25	1.0000	1.0000
L59	37	Transition Stiffener	12.00 - 12.25	1.0000	1.0000
L59	38	Transition Stiffener	12.00 - 12.25	1.0000	1.0000
L60	11	HCS 6X12 4AWG(1-5/8)	11.50 - 12.00	1.0000	1.0000
L60	13	9" x 1-1/4" Flate Plate	11.50 - 12.00	1.0000	1.0000
L60	18	9" x 1-1/4" Flate Plate	11.50 - 12.00	1.0000	1.0000
L60	23	9" x 1-1/4" Flate Plate	11.50 - 12.00	1.0000	1.0000
L60	28	6" x 1" Flate Plate	11.50 - 12.00	1.0000	1.0000
L60	29	6" x 1" Flate Plate	11.50 - 12.00	1.0000	1.0000
L60	30	6" x 1" Flate Plate	11.50 - 12.00	1.0000	1.0000
L60	37	Transition Stiffener	11.50 - 12.00	1.0000	1.0000
L60	38	Transition Stiffener	11.50 - 12.00	1.0000	1.0000
L61	11	HCS 6X12 4AWG(1-5/8)	11.25 - 11.50	1.0000	1.0000
L61	13	9" x 1-1/4" Flate Plate	11.25 - 11.50	1.0000	1.0000
L61	18	9" x 1-1/4" Flate Plate	11.25 - 11.50	1.0000	1.0000
L61	23	9" x 1-1/4" Flate Plate	11.25 - 11.50	1.0000	1.0000
L61	28	6" x 1" Flate Plate	11.25 - 11.50	1.0000	1.0000
L61	29	6" x 1" Flate Plate	11.25 - 11.50	1.0000	1.0000
L61	30	6" x 1" Flate Plate	11.25 - 11.50	1.0000	1.0000
L61	37	Transition Stiffener	11.25 - 11.50	1.0000	1.0000
L61	38	Transition Stiffener	11.25 - 11.50	1.0000	1.0000
L62	11	HCS 6X12 4AWG(1-5/8)	9.25 - 11.25	1.0000	1.0000
L62	13	9" x 1-1/4" Flate Plate	9.25 - 11.25	1.0000	1.0000
L62	18	9" x 1-1/4" Flate Plate	9.25 - 11.25	1.0000	1.0000
L62	23	9" x 1-1/4" Flate Plate	9.25 - 11.25	1.0000	1.0000
L62	28	6" x 1" Flate Plate	9.25 - 11.25	1.0000	1.0000
L62	29	6" x 1" Flate Plate	9.25 - 11.25	1.0000	1.0000
L62	30	6" x 1" Flate Plate	9.25 - 11.25	1.0000	1.0000
L62	37	Transition Stiffener	9.25 - 11.25	1.0000	1.0000
L62	38	Transition Stiffener	9.25 - 11.25	1.0000	1.0000
L63	11	HCS 6X12 4AWG(1-5/8)	9.00 - 9.25	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L63	13	9" x 1-1/4" Flate Plate	9.00 - 9.25	1.0000	1.0000
L63	18	9" x 1-1/4" Flate Plate	9.00 - 9.25	1.0000	1.0000
L63	23	9" x 1-1/4" Flate Plate	9.00 - 9.25	1.0000	1.0000
L63	28	6" x 1" Flate Plate	9.00 - 9.25	1.0000	1.0000
L63	29	6" x 1" Flate Plate	9.00 - 9.25	1.0000	1.0000
L63	30	6" x 1" Flate Plate	9.00 - 9.25	1.0000	1.0000
L63	37	Transition Stiffener	9.00 - 9.25	1.0000	1.0000
L63	38	Transition Stiffener	9.00 - 9.25	1.0000	1.0000
L64	11	HCS 6X12 4AWG(1-5/8)	8.00 - 9.00	1.0000	1.0000
L64	13	9" x 1-1/4" Flate Plate	4.50 - 9.00	1.0000	1.0000
L64	18	9" x 1-1/4" Flate Plate	4.50 - 9.00	1.0000	1.0000
L64	23	9" x 1-1/4" Flate Plate	4.50 - 9.00	1.0000	1.0000
L64	28	6" x 1" Flate Plate	4.50 - 9.00	1.0000	1.0000
L64	29	6" x 1" Flate Plate	4.50 - 9.00	1.0000	1.0000
L64	30	6" x 1" Flate Plate	4.50 - 9.00	1.0000	1.0000
L64	36	Transition Stiffener	4.50 - 6.00	1.0000	1.0000
L64	37	Transition Stiffener	4.50 - 9.00	1.0000	1.0000
L64	38	Transition Stiffener	4.50 - 9.00	1.0000	1.0000
L65	13	9" x 1-1/4" Flate Plate	4.25 - 4.50	1.0000	1.0000
L65	18	9" x 1-1/4" Flate Plate	4.25 - 4.50	1.0000	1.0000
L65	23	9" x 1-1/4" Flate Plate	4.25 - 4.50	1.0000	1.0000
L65	28	6" x 1" Flate Plate	4.25 - 4.50	1.0000	1.0000
L65	29	6" x 1" Flate Plate	4.25 - 4.50	1.0000	1.0000
L65	30	6" x 1" Flate Plate	4.25 - 4.50	1.0000	1.0000
L65	36	Transition Stiffener	4.25 - 4.50	1.0000	1.0000
L65	37	Transition Stiffener	4.25 - 4.50	1.0000	1.0000
L65	38	Transition Stiffener	4.25 - 4.50	1.0000	1.0000
L66	13	9" x 1-1/4" Flate Plate	3.00 - 4.25	1.0000	1.0000
L66	18	9" x 1-1/4" Flate Plate	3.00 - 4.25	1.0000	1.0000
L66	23	9" x 1-1/4" Flate Plate	3.00 - 4.25	1.0000	1.0000
L66	28	6" x 1" Flate Plate	3.00 - 4.25	1.0000	1.0000
L66	29	6" x 1" Flate Plate	3.00 - 4.25	1.0000	1.0000
L66	30	6" x 1" Flate Plate	3.00 - 4.25	1.0000	1.0000
L66	36	Transition Stiffener	3.00 - 4.25	1.0000	1.0000
L66	37	Transition Stiffener	3.00 - 4.25	1.0000	1.0000
L66	38	Transition Stiffener	3.00 - 4.25	1.0000	1.0000
L67	13	9" x 1-1/4" Flate Plate	2.75 - 3.00	1.0000	1.0000
L67	18	9" x 1-1/4" Flate Plate	2.75 - 3.00	1.0000	1.0000
L67	23	9" x 1-1/4" Flate Plate	2.75 - 3.00	1.0000	1.0000
L67	28	6" x 1" Flate Plate	2.75 - 3.00	1.0000	1.0000
L67	29	6" x 1" Flate Plate	2.75 - 3.00	1.0000	1.0000
L67	30	6" x 1" Flate Plate	2.75 - 3.00	1.0000	1.0000
L67	36	Transition Stiffener	2.75 - 3.00	1.0000	1.0000
L67	37	Transition Stiffener	2.75 - 3.00	1.0000	1.0000
L67	38	Transition Stiffener	2.75 - 3.00	1.0000	1.0000
L68	13	9" x 1-1/4" Flate Plate	0.00 - 2.75	1.0000	1.0000
L68	18	9" x 1-1/4" Flate Plate	0.00 - 2.75	1.0000	1.0000
L68	23	9" x 1-1/4" Flate Plate	0.00 - 2.75	1.0000	1.0000
L68	28	6" x 1" Flate Plate	0.00 - 2.75	1.0000	1.0000
L68	29	6" x 1" Flate Plate	0.00 - 2.75	1.0000	1.0000
L68	30	6" x 1" Flate Plate	0.00 - 2.75	1.0000	1.0000
L68	36	Transition Stiffener	0.00 - 2.75	1.0000	1.0000
L68	37	Transition Stiffener	0.00 - 2.75	1.0000	1.0000
L68	38	Transition Stiffener	0.00 - 2.75	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

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L4	32	4.5" x 1" Flate Plate	133.00 - 135.00	Auto	0.0000
L4	33	4.5" x 1" Flate Plate	133.00 - 135.00	Auto	0.0000
L4	34	4.5" x 1" Flate Plate	133.00 - 135.00	Auto	0.0000
L5	32	4.5" x 1" Flate Plate	132.75 - 133.00	Auto	0.1239
L5	33	4.5" x 1" Flate Plate	132.75 - 133.00	Auto	0.1239
L5	34	4.5" x 1" Flate Plate	132.75 - 133.00	Auto	0.1239
L6	32	4.5" x 1" Flate Plate	127.75 - 132.75	Auto	0.0872
L6	33	4.5" x 1" Flate Plate	127.75 - 132.75	Auto	0.0872
L6	34	4.5" x 1" Flate Plate	127.75 - 132.75	Auto	0.0872
L7	16	5" x 1-1/4" Flate Plate	123.75 - 125.00	Auto	0.1127
L7	21	5" x 1-1/4" Flate Plate	123.75 - 125.00	Auto	0.1127
L7	26	5" x 1-1/4" Flate Plate	123.75 - 125.00	Auto	0.1127
L7	32	4.5" x 1" Flate Plate	123.75 - 127.75	Auto	0.0295
L7	33	4.5" x 1" Flate Plate	123.75 - 127.75	Auto	0.0295
L7	34	4.5" x 1" Flate Plate	123.75 - 127.75	Auto	0.0295
L8	16	5" x 1-1/4" Flate Plate	123.50 - 123.75	Auto	0.1052
L8	21	5" x 1-1/4" Flate Plate	123.50 - 123.75	Auto	0.1052
L8	26	5" x 1-1/4" Flate Plate	123.50 - 123.75	Auto	0.1052
L8	32	4.5" x 1" Flate Plate	123.50 - 123.75	Auto	0.0057
L8	33	4.5" x 1" Flate Plate	123.50 - 123.75	Auto	0.0057
L8	34	4.5" x 1" Flate Plate	123.50 - 123.75	Auto	0.0057
L9	16	5" x 1-1/4" Flate Plate	118.75 - 123.50	Auto	0.2609
L9	21	5" x 1-1/4" Flate Plate	118.75 - 123.50	Auto	0.2609
L9	26	5" x 1-1/4" Flate Plate	118.75 - 123.50	Auto	0.2609
L9	32	4.5" x 1" Flate Plate	118.75 - 123.50	Auto	0.1788
L9	33	4.5" x 1" Flate Plate	118.75 - 123.50	Auto	0.1788
L9	34	4.5" x 1" Flate Plate	118.75 - 123.50	Auto	0.1788
L10	16	5" x 1-1/4" Flate Plate	118.50 - 118.75	Auto	0.3832
L10	21	5" x 1-1/4" Flate Plate	118.50 - 118.75	Auto	0.3832
L10	26	5" x 1-1/4" Flate Plate	118.50 - 118.75	Auto	0.3832
L10	32	4.5" x 1" Flate Plate	118.50 - 118.75	Auto	0.3147
L10	33	4.5" x 1" Flate Plate	118.50 - 118.75	Auto	0.3147
L10	34	4.5" x 1" Flate Plate	118.50 - 118.75	Auto	0.3147
L11	16	5" x 1-1/4" Flate Plate	117.00 - 118.50	Auto	0.3610

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L11	21	5" x 1-1/4" Flate Plate	117.00 - 118.50	Auto	0.3610
L11	26	5" x 1-1/4" Flate Plate	117.00 - 118.50	Auto	0.3610
L11	32	4.5" x 1" Flate Plate	117.00 - 118.50	Auto	0.2900
L11	33	4.5" x 1" Flate Plate	117.00 - 118.50	Auto	0.2900
L11	34	4.5" x 1" Flate Plate	117.00 - 118.50	Auto	0.2900
L12	16	5" x 1-1/4" Flate Plate	116.75 - 117.00	Auto	0.2115
L12	21	5" x 1-1/4" Flate Plate	116.75 - 117.00	Auto	0.2115
L12	26	5" x 1-1/4" Flate Plate	116.75 - 117.00	Auto	0.2115
L12	32	4.5" x 1" Flate Plate	116.75 - 117.00	Auto	0.1239
L12	33	4.5" x 1" Flate Plate	116.75 - 117.00	Auto	0.1239
L12	34	4.5" x 1" Flate Plate	116.75 - 117.00	Auto	0.1239
L13	16	5" x 1-1/4" Flate Plate	111.75 - 116.75	Auto	0.1651
L13	21	5" x 1-1/4" Flate Plate	111.75 - 116.75	Auto	0.1651
L13	26	5" x 1-1/4" Flate Plate	111.75 - 116.75	Auto	0.1651
L13	32	4.5" x 1" Flate Plate	111.75 - 116.75	Auto	0.0723
L13	33	4.5" x 1" Flate Plate	111.75 - 116.75	Auto	0.0723
L13	34	4.5" x 1" Flate Plate	111.75 - 116.75	Auto	0.0723
L14	16	5" x 1-1/4" Flate Plate	106.75 - 111.75	Auto	0.1014
L14	21	5" x 1-1/4" Flate Plate	106.75 - 111.75	Auto	0.1014
L14	26	5" x 1-1/4" Flate Plate	106.75 - 111.75	Auto	0.1014
L14	32	4.5" x 1" Flate Plate	106.75 - 111.75	Auto	0.0078
L14	33	4.5" x 1" Flate Plate	106.75 - 111.75	Auto	0.0078
L14	34	4.5" x 1" Flate Plate	106.75 - 111.75	Auto	0.0078
L15	16	5" x 1-1/4" Flate Plate	101.75 - 106.75	Auto	0.0378
L15	21	5" x 1-1/4" Flate Plate	101.75 - 106.75	Auto	0.0378
L15	26	5" x 1-1/4" Flate Plate	101.75 - 106.75	Auto	0.0378
L15	32	4.5" x 1" Flate Plate	101.75 - 106.75	Auto	0.0000
L15	33	4.5" x 1" Flate Plate	101.75 - 106.75	Auto	0.0000
L15	34	4.5" x 1" Flate Plate	101.75 - 106.75	Auto	0.0000
L16	16	5" x 1-1/4" Flate Plate	95.17 - 101.75	Auto	0.0012
L16	21	5" x 1-1/4" Flate Plate	95.17 - 101.75	Auto	0.0012
L16	26	5" x 1-1/4" Flate Plate	95.17 - 101.75	Auto	0.0012
L16	32	4.5" x 1" Flate Plate	95.17 - 101.75	Auto	0.0000
L16	33	4.5" x 1" Flate Plate	95.17 - 101.75	Auto	0.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L16	34	4.5" x 1" Flate Plate	95.17 - 101.75	Auto	0.0000
L17	16	5" x 1-1/4" Flate Plate	94.50 - 95.17	Auto	0.0302
L17	21	5" x 1-1/4" Flate Plate	94.50 - 95.17	Auto	0.0302
L17	26	5" x 1-1/4" Flate Plate	94.50 - 95.17	Auto	0.0302
L17	32	4.5" x 1" Flate Plate	94.50 - 95.17	Auto	0.0000
L17	33	4.5" x 1" Flate Plate	94.50 - 95.17	Auto	0.0000
L17	34	4.5" x 1" Flate Plate	94.50 - 95.17	Auto	0.0000
L18	16	5" x 1-1/4" Flate Plate	93.75 - 94.50	Auto	0.0231
L18	21	5" x 1-1/4" Flate Plate	93.75 - 94.50	Auto	0.0231
L18	26	5" x 1-1/4" Flate Plate	93.75 - 94.50	Auto	0.0231
L18	32	4.5" x 1" Flate Plate	93.75 - 94.50	Auto	0.0000
L18	33	4.5" x 1" Flate Plate	93.75 - 94.50	Auto	0.0000
L18	34	4.5" x 1" Flate Plate	93.75 - 94.50	Auto	0.0000
L19	16	5" x 1-1/4" Flate Plate	93.50 - 93.75	Auto	0.0851
L19	21	5" x 1-1/4" Flate Plate	93.50 - 93.75	Auto	0.0851
L19	26	5" x 1-1/4" Flate Plate	93.50 - 93.75	Auto	0.0851
L19	32	4.5" x 1" Flate Plate	93.50 - 93.75	Auto	0.0000
L19	33	4.5" x 1" Flate Plate	93.50 - 93.75	Auto	0.0000
L19	34	4.5" x 1" Flate Plate	93.50 - 93.75	Auto	0.0000
L20	16	5" x 1-1/4" Flate Plate	92.75 - 93.50	Auto	0.0800
L20	21	5" x 1-1/4" Flate Plate	92.75 - 93.50	Auto	0.0800
L20	26	5" x 1-1/4" Flate Plate	92.75 - 93.50	Auto	0.0800
L20	32	4.5" x 1" Flate Plate	92.75 - 93.50	Auto	0.0000
L20	33	4.5" x 1" Flate Plate	92.75 - 93.50	Auto	0.0000
L20	34	4.5" x 1" Flate Plate	92.75 - 93.50	Auto	0.0000
L21	16	5" x 1-1/4" Flate Plate	92.50 - 92.75	Auto	0.1956
L21	21	5" x 1-1/4" Flate Plate	92.50 - 92.75	Auto	0.1956
L21	26	5" x 1-1/4" Flate Plate	92.50 - 92.75	Auto	0.1956
L21	32	4.5" x 1" Flate Plate	92.50 - 92.75	Auto	0.1062
L21	33	4.5" x 1" Flate Plate	92.50 - 92.75	Auto	0.1062
L21	34	4.5" x 1" Flate Plate	92.50 - 92.75	Auto	0.1062
L22	16	5" x 1-1/4" Flate Plate	91.25 - 92.50	Auto	0.1747
L22	21	5" x 1-1/4" Flate Plate	91.25 - 92.50	Auto	0.1747
L22	26	5" x 1-1/4" Flate Plate	91.25 - 92.50	Auto	0.1747

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L22	32	4.5" x 1" Flate Plate	91.25 - 92.50	Auto	0.0830
L22	33	4.5" x 1" Flate Plate	91.25 - 92.50	Auto	0.0830
L22	34	4.5" x 1" Flate Plate	91.25 - 92.50	Auto	0.0830
L23	16	5" x 1-1/4" Flate Plate	91.00 - 91.25	Auto	0.1671
L23	21	5" x 1-1/4" Flate Plate	91.00 - 91.25	Auto	0.1671
L23	26	5" x 1-1/4" Flate Plate	91.00 - 91.25	Auto	0.1671
L23	32	4.5" x 1" Flate Plate	91.00 - 91.25	Auto	0.0746
L23	33	4.5" x 1" Flate Plate	91.00 - 91.25	Auto	0.0746
L23	34	4.5" x 1" Flate Plate	91.00 - 91.25	Auto	0.0746
L24	16	5" x 1-1/4" Flate Plate	89.25 - 91.00	Auto	0.1571
L24	21	5" x 1-1/4" Flate Plate	89.25 - 91.00	Auto	0.1571
L24	26	5" x 1-1/4" Flate Plate	89.25 - 91.00	Auto	0.1571
L24	32	4.5" x 1" Flate Plate	89.25 - 91.00	Auto	0.0634
L24	33	4.5" x 1" Flate Plate	89.25 - 91.00	Auto	0.0634
L24	34	4.5" x 1" Flate Plate	89.25 - 91.00	Auto	0.0634
L25	15	7" x 1-1/4" Flate Plate	89.00 - 89.25	Auto	0.4290
L25	20	7" x 1-1/4" Flate Plate	89.00 - 89.25	Auto	0.4290
L25	25	7" x 1-1/4" Flate Plate	89.00 - 89.25	Auto	0.4290
L25	32	4.5" x 1" Flate Plate	89.00 - 89.25	Auto	0.1118
L25	33	4.5" x 1" Flate Plate	89.00 - 89.25	Auto	0.1118
L25	34	4.5" x 1" Flate Plate	89.00 - 89.25	Auto	0.1118
L26	15	7" x 1-1/4" Flate Plate	85.75 - 89.00	Auto	0.4069
L26	20	7" x 1-1/4" Flate Plate	85.75 - 89.00	Auto	0.4069
L26	25	7" x 1-1/4" Flate Plate	85.75 - 89.00	Auto	0.4069
L26	32	4.5" x 1" Flate Plate	85.75 - 89.00	Auto	0.0773
L26	33	4.5" x 1" Flate Plate	85.75 - 89.00	Auto	0.0773
L26	34	4.5" x 1" Flate Plate	85.75 - 89.00	Auto	0.0773
L27	15	7" x 1-1/4" Flate Plate	85.50 - 85.75	Auto	0.2699
L27	20	7" x 1-1/4" Flate Plate	85.50 - 85.75	Auto	0.2699
L27	25	7" x 1-1/4" Flate Plate	85.50 - 85.75	Auto	0.2699
L27	32	4.5" x 1" Flate Plate	85.50 - 85.75	Auto	0.0000
L27	33	4.5" x 1" Flate Plate	85.50 - 85.75	Auto	0.0000
L27	34	4.5" x 1" Flate Plate	85.50 - 85.75	Auto	0.0000
L28	15	7" x 1-1/4" Flate Plate	80.50 - 85.50	Auto	0.2414

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L28	20	7" x 1-1/4" Flate Plate	80.50 - 85.50	Auto	0.2414
L28	25	7" x 1-1/4" Flate Plate	80.50 - 85.50	Auto	0.2414
L28	32	4.5" x 1" Flate Plate	80.50 - 85.50	Auto	0.0000
L28	33	4.5" x 1" Flate Plate	80.50 - 85.50	Auto	0.0000
L28	34	4.5" x 1" Flate Plate	80.50 - 85.50	Auto	0.0000
L29	15	7" x 1-1/4" Flate Plate	75.50 - 80.50	Auto	0.1960
L29	20	7" x 1-1/4" Flate Plate	75.50 - 80.50	Auto	0.1960
L29	25	7" x 1-1/4" Flate Plate	75.50 - 80.50	Auto	0.1960
L29	32	4.5" x 1" Flate Plate	75.50 - 80.50	Auto	0.0000
L29	33	4.5" x 1" Flate Plate	75.50 - 80.50	Auto	0.0000
L29	34	4.5" x 1" Flate Plate	75.50 - 80.50	Auto	0.0000
L30	15	7" x 1-1/4" Flate Plate	70.50 - 75.50	Auto	0.1505
L30	20	7" x 1-1/4" Flate Plate	70.50 - 75.50	Auto	0.1505
L30	25	7" x 1-1/4" Flate Plate	70.50 - 75.50	Auto	0.1505
L30	28	6" x 1" Flate Plate	70.50 - 70.58	Auto	0.0000
L30	29	6" x 1" Flate Plate	70.50 - 70.58	Auto	0.0000
L30	30	6" x 1" Flate Plate	70.50 - 70.58	Auto	0.0000
L30	32	4.5" x 1" Flate Plate	70.58 - 75.50	Auto	0.0000
L30	33	4.5" x 1" Flate Plate	70.58 - 75.50	Auto	0.0000
L30	34	4.5" x 1" Flate Plate	70.58 - 75.50	Auto	0.0000
L31	15	7" x 1-1/4" Flate Plate	68.08 - 70.50	Auto	0.1238
L31	20	7" x 1-1/4" Flate Plate	68.08 - 70.50	Auto	0.1238
L31	25	7" x 1-1/4" Flate Plate	68.08 - 70.50	Auto	0.1238
L31	28	6" x 1" Flate Plate	68.08 - 70.50	Auto	0.0000
L31	29	6" x 1" Flate Plate	68.08 - 70.50	Auto	0.0000
L31	30	6" x 1" Flate Plate	68.08 - 70.50	Auto	0.0000
L32	15	7" x 1-1/4" Flate Plate	67.83 - 68.08	Auto	0.1334
L32	20	7" x 1-1/4" Flate Plate	67.83 - 68.08	Auto	0.1334
L32	25	7" x 1-1/4" Flate Plate	67.83 - 68.08	Auto	0.1334
L32	28	6" x 1" Flate Plate	67.83 - 68.08	Auto	0.0000
L32	29	6" x 1" Flate Plate	67.83 - 68.08	Auto	0.0000
L32	30	6" x 1" Flate Plate	67.83 - 68.08	Auto	0.0000
L33	15	7" x 1-1/4" Flate Plate	67.00 - 67.83	Auto	0.1295
L33	20	7" x 1-1/4" Flate Plate	67.00 - 67.83	Auto	0.1295

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L33	25	7" x 1-1/4" Flate Plate	67.00 - 67.83	Auto	0.1295
L33	28	6" x 1" Flate Plate	67.00 - 67.83	Auto	0.0000
L33	29	6" x 1" Flate Plate	67.00 - 67.83	Auto	0.0000
L33	30	6" x 1" Flate Plate	67.00 - 67.83	Auto	0.0000
L34	15	7" x 1-1/4" Flate Plate	66.75 - 67.00	Auto	0.2118
L34	20	7" x 1-1/4" Flate Plate	66.75 - 67.00	Auto	0.2118
L34	25	7" x 1-1/4" Flate Plate	66.75 - 67.00	Auto	0.2118
L34	28	6" x 1" Flate Plate	66.75 - 67.00	Auto	0.0804
L34	29	6" x 1" Flate Plate	66.75 - 67.00	Auto	0.0804
L34	30	6" x 1" Flate Plate	66.75 - 67.00	Auto	0.0804
L35	15	7" x 1-1/4" Flate Plate	63.25 - 66.75	Auto	0.1887
L35	20	7" x 1-1/4" Flate Plate	63.25 - 66.75	Auto	0.1887
L35	25	7" x 1-1/4" Flate Plate	63.25 - 66.75	Auto	0.1887
L35	28	6" x 1" Flate Plate	63.25 - 66.75	Auto	0.0535
L35	29	6" x 1" Flate Plate	63.25 - 66.75	Auto	0.0535
L35	30	6" x 1" Flate Plate	63.25 - 66.75	Auto	0.0535
L36	15	7" x 1-1/4" Flate Plate	63.00 - 63.25	Auto	0.2422
L36	20	7" x 1-1/4" Flate Plate	63.00 - 63.25	Auto	0.2422
L36	25	7" x 1-1/4" Flate Plate	63.00 - 63.25	Auto	0.2422
L36	28	6" x 1" Flate Plate	63.00 - 63.25	Auto	0.1160
L36	29	6" x 1" Flate Plate	63.00 - 63.25	Auto	0.1160
L36	30	6" x 1" Flate Plate	63.00 - 63.25	Auto	0.1160
L37	15	7" x 1-1/4" Flate Plate	59.50 - 63.00	Auto	0.2192
L37	20	7" x 1-1/4" Flate Plate	59.50 - 63.00	Auto	0.2192
L37	25	7" x 1-1/4" Flate Plate	59.50 - 63.00	Auto	0.2192
L37	28	6" x 1" Flate Plate	59.50 - 63.00	Auto	0.0891
L37	29	6" x 1" Flate Plate	59.50 - 63.00	Auto	0.0891
L37	30	6" x 1" Flate Plate	59.50 - 63.00	Auto	0.0891
L38	14	8" x 1-1/4" Flate Plate	59.25 - 59.50	Auto	0.3218
L38	19	8" x 1-1/4" Flate Plate	59.25 - 59.50	Auto	0.3218
L38	24	8" x 1-1/4" Flate Plate	59.25 - 59.50	Auto	0.3218
L38	28	6" x 1" Flate Plate	59.25 - 59.50	Auto	0.0957
L38	29	6" x 1" Flate Plate	59.25 - 59.50	Auto	0.0957
L38	30	6" x 1" Flate Plate	59.25 - 59.50	Auto	0.0957

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L39	14	8" x 1-1/4" Flate Plate	56.25 - 59.25	Auto	0.3032
L39	19	8" x 1-1/4" Flate Plate	56.25 - 59.25	Auto	0.3032
L39	24	8" x 1-1/4" Flate Plate	56.25 - 59.25	Auto	0.3032
L39	28	6" x 1" Flate Plate	56.25 - 59.25	Auto	0.0709
L39	29	6" x 1" Flate Plate	56.25 - 59.25	Auto	0.0709
L39	30	6" x 1" Flate Plate	56.25 - 59.25	Auto	0.0709
L40	14	8" x 1-1/4" Flate Plate	56.00 - 56.25	Auto	0.2427
L40	19	8" x 1-1/4" Flate Plate	56.00 - 56.25	Auto	0.2427
L40	24	8" x 1-1/4" Flate Plate	56.00 - 56.25	Auto	0.2427
L40	28	6" x 1" Flate Plate	56.00 - 56.25	Auto	0.0000
L40	29	6" x 1" Flate Plate	56.00 - 56.25	Auto	0.0000
L40	30	6" x 1" Flate Plate	56.00 - 56.25	Auto	0.0000
L41	14	8" x 1-1/4" Flate Plate	55.75 - 56.00	Auto	0.1658
L41	19	8" x 1-1/4" Flate Plate	55.75 - 56.00	Auto	0.1658
L41	24	8" x 1-1/4" Flate Plate	55.75 - 56.00	Auto	0.1658
L41	28	6" x 1" Flate Plate	55.75 - 56.00	Auto	0.0000
L41	29	6" x 1" Flate Plate	55.75 - 56.00	Auto	0.0000
L41	30	6" x 1" Flate Plate	55.75 - 56.00	Auto	0.0000
L42	14	8" x 1-1/4" Flate Plate	50.75 - 55.75	Auto	0.1451
L42	19	8" x 1-1/4" Flate Plate	50.75 - 55.75	Auto	0.1451
L42	24	8" x 1-1/4" Flate Plate	50.75 - 55.75	Auto	0.1451
L42	28	6" x 1" Flate Plate	50.75 - 55.75	Auto	0.0000
L42	29	6" x 1" Flate Plate	50.75 - 55.75	Auto	0.0000
L42	30	6" x 1" Flate Plate	50.75 - 55.75	Auto	0.0000
L43	14	8" x 1-1/4" Flate Plate	44.67 - 50.75	Auto	0.1061
L43	19	8" x 1-1/4" Flate Plate	44.67 - 50.75	Auto	0.1061
L43	24	8" x 1-1/4" Flate Plate	44.67 - 50.75	Auto	0.1061
L43	28	6" x 1" Flate Plate	44.67 - 50.75	Auto	0.0000
L43	29	6" x 1" Flate Plate	44.67 - 50.75	Auto	0.0000
L43	30	6" x 1" Flate Plate	44.67 - 50.75	Auto	0.0000
L44	14	8" x 1-1/4" Flate Plate	43.67 - 44.67	Auto	0.1257
L44	19	8" x 1-1/4" Flate Plate	43.67 - 44.67	Auto	0.1257
L44	24	8" x 1-1/4" Flate Plate	43.67 - 44.67	Auto	0.1257
L44	28	6" x 1" Flate Plate	43.67 - 44.67	Auto	0.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L44	29	6" x 1" Flate Plate	43.67 - 44.67	Auto	0.0000
L44	30	6" x 1" Flate Plate	43.67 - 44.67	Auto	0.0000
L45	14	8" x 1-1/4" Flate Plate	38.67 - 43.67	Auto	0.1027
L45	19	8" x 1-1/4" Flate Plate	38.67 - 43.67	Auto	0.1027
L45	24	8" x 1-1/4" Flate Plate	38.67 - 43.67	Auto	0.1027
L45	28	6" x 1" Flate Plate	38.67 - 43.67	Auto	0.0000
L45	29	6" x 1" Flate Plate	38.67 - 43.67	Auto	0.0000
L45	30	6" x 1" Flate Plate	38.67 - 43.67	Auto	0.0000
L46	14	8" x 1-1/4" Flate Plate	34.50 - 38.67	Auto	0.0697
L46	19	8" x 1-1/4" Flate Plate	34.50 - 38.67	Auto	0.0697
L46	24	8" x 1-1/4" Flate Plate	34.50 - 38.67	Auto	0.0697
L46	28	6" x 1" Flate Plate	34.50 - 38.67	Auto	0.0000
L46	29	6" x 1" Flate Plate	34.50 - 38.67	Auto	0.0000
L46	30	6" x 1" Flate Plate	34.50 - 38.67	Auto	0.0000
L47	14	8" x 1-1/4" Flate Plate	34.25 - 34.50	Auto	0.1396
L47	19	8" x 1-1/4" Flate Plate	34.25 - 34.50	Auto	0.1396
L47	24	8" x 1-1/4" Flate Plate	34.25 - 34.50	Auto	0.1396
L47	28	6" x 1" Flate Plate	34.25 - 34.50	Auto	0.0000
L47	29	6" x 1" Flate Plate	34.25 - 34.50	Auto	0.0000
L47	30	6" x 1" Flate Plate	34.25 - 34.50	Auto	0.0000
L48	14	8" x 1-1/4" Flate Plate	33.00 - 34.25	Auto	0.1349
L48	19	8" x 1-1/4" Flate Plate	33.00 - 34.25	Auto	0.1349
L48	24	8" x 1-1/4" Flate Plate	33.00 - 34.25	Auto	0.1349
L48	28	6" x 1" Flate Plate	33.00 - 34.25	Auto	0.0000
L48	29	6" x 1" Flate Plate	33.00 - 34.25	Auto	0.0000
L48	30	6" x 1" Flate Plate	33.00 - 34.25	Auto	0.0000
L49	14	8" x 1-1/4" Flate Plate	32.75 - 33.00	Auto	0.1302
L49	19	8" x 1-1/4" Flate Plate	32.75 - 33.00	Auto	0.1302
L49	24	8" x 1-1/4" Flate Plate	32.75 - 33.00	Auto	0.1302
L49	28	6" x 1" Flate Plate	32.75 - 33.00	Auto	0.0000
L49	29	6" x 1" Flate Plate	32.75 - 33.00	Auto	0.0000
L49	30	6" x 1" Flate Plate	32.75 - 33.00	Auto	0.0000
L50	14	8" x 1-1/4" Flate Plate	29.75 - 32.75	Auto	0.1116
L50	19	8" x 1-1/4" Flate Plate	29.75 - 32.75	Auto	0.1116

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L50	24	8" x 1-1/4" Flate Plate	29.75 - 32.75	Auto	0.1116
L50	28	6" x 1" Flate Plate	29.75 - 32.75	Auto	0.0000
L50	29	6" x 1" Flate Plate	29.75 - 32.75	Auto	0.0000
L50	30	6" x 1" Flate Plate	29.75 - 32.75	Auto	0.0000
L51	13	9" x 1-1/4" Flate Plate	29.50 - 29.75	Auto	0.2161
L51	18	9" x 1-1/4" Flate Plate	29.50 - 29.75	Auto	0.2161
L51	23	9" x 1-1/4" Flate Plate	29.50 - 29.75	Auto	0.2161
L51	28	6" x 1" Flate Plate	29.50 - 29.75	Auto	0.0000
L51	29	6" x 1" Flate Plate	29.50 - 29.75	Auto	0.0000
L51	30	6" x 1" Flate Plate	29.50 - 29.75	Auto	0.0000
L52	13	9" x 1-1/4" Flate Plate	25.00 - 29.50	Auto	0.1954
L52	18	9" x 1-1/4" Flate Plate	25.00 - 29.50	Auto	0.1954
L52	23	9" x 1-1/4" Flate Plate	25.00 - 29.50	Auto	0.1954
L52	28	6" x 1" Flate Plate	25.00 - 29.50	Auto	0.0000
L52	29	6" x 1" Flate Plate	25.00 - 29.50	Auto	0.0000
L52	30	6" x 1" Flate Plate	25.00 - 29.50	Auto	0.0000
L53	13	9" x 1-1/4" Flate Plate	24.75 - 25.00	Auto	0.1114
L53	18	9" x 1-1/4" Flate Plate	24.75 - 25.00	Auto	0.1114
L53	23	9" x 1-1/4" Flate Plate	24.75 - 25.00	Auto	0.1114
L53	28	6" x 1" Flate Plate	24.75 - 25.00	Auto	0.0000
L53	29	6" x 1" Flate Plate	24.75 - 25.00	Auto	0.0000
L53	30	6" x 1" Flate Plate	24.75 - 25.00	Auto	0.0000
L54	13	9" x 1-1/4" Flate Plate	19.75 - 24.75	Auto	0.0930
L54	18	9" x 1-1/4" Flate Plate	19.75 - 24.75	Auto	0.0930
L54	23	9" x 1-1/4" Flate Plate	19.75 - 24.75	Auto	0.0930
L54	28	6" x 1" Flate Plate	19.75 - 24.75	Auto	0.0000
L54	29	6" x 1" Flate Plate	19.75 - 24.75	Auto	0.0000
L54	30	6" x 1" Flate Plate	19.75 - 24.75	Auto	0.0000
L55	13	9" x 1-1/4" Flate Plate	14.75 - 19.75	Auto	0.0577
L55	18	9" x 1-1/4" Flate Plate	14.75 - 19.75	Auto	0.0577
L55	23	9" x 1-1/4" Flate Plate	14.75 - 19.75	Auto	0.0577
L55	28	6" x 1" Flate Plate	14.75 - 19.75	Auto	0.0000
L55	29	6" x 1" Flate Plate	14.75 - 19.75	Auto	0.0000
L55	30	6" x 1" Flate Plate	14.75 - 19.75	Auto	0.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L55	38	Transition Stiffener	14.75 - 16.00	Auto	0.0000
L56	13	9" x 1-1/4" Flate Plate	14.50 - 14.75	Auto	0.0430
L56	18	9" x 1-1/4" Flate Plate	14.50 - 14.75	Auto	0.0430
L56	23	9" x 1-1/4" Flate Plate	14.50 - 14.75	Auto	0.0430
L56	28	6" x 1" Flate Plate	14.50 - 14.75	Auto	0.0000
L56	29	6" x 1" Flate Plate	14.50 - 14.75	Auto	0.0000
L56	30	6" x 1" Flate Plate	14.50 - 14.75	Auto	0.0000
L56	38	Transition Stiffener	14.50 - 14.75	Auto	0.0000
L57	13	9" x 1-1/4" Flate Plate	14.25 - 14.50	Auto	0.0416
L57	18	9" x 1-1/4" Flate Plate	14.25 - 14.50	Auto	0.0416
L57	23	9" x 1-1/4" Flate Plate	14.25 - 14.50	Auto	0.0416
L57	28	6" x 1" Flate Plate	14.25 - 14.50	Auto	0.0000
L57	29	6" x 1" Flate Plate	14.25 - 14.50	Auto	0.0000
L57	30	6" x 1" Flate Plate	14.25 - 14.50	Auto	0.0000
L57	38	Transition Stiffener	14.25 - 14.50	Auto	0.0000
L58	13	9" x 1-1/4" Flate Plate	12.25 - 14.25	Auto	0.0353
L58	18	9" x 1-1/4" Flate Plate	12.25 - 14.25	Auto	0.0353
L58	23	9" x 1-1/4" Flate Plate	12.25 - 14.25	Auto	0.0353
L58	28	6" x 1" Flate Plate	12.25 - 14.25	Auto	0.0000
L58	29	6" x 1" Flate Plate	12.25 - 14.25	Auto	0.0000
L58	30	6" x 1" Flate Plate	12.25 - 14.25	Auto	0.0000
L58	37	Transition Stiffener	12.25 - 13.00	Auto	0.0000
L58	38	Transition Stiffener	12.25 - 14.25	Auto	0.0000
L59	13	9" x 1-1/4" Flate Plate	12.00 - 12.25	Auto	0.0179
L59	18	9" x 1-1/4" Flate Plate	12.00 - 12.25	Auto	0.0179
L59	23	9" x 1-1/4" Flate Plate	12.00 - 12.25	Auto	0.0179
L59	28	6" x 1" Flate Plate	12.00 - 12.25	Auto	0.0000
L59	29	6" x 1" Flate Plate	12.00 - 12.25	Auto	0.0000
L59	30	6" x 1" Flate Plate	12.00 - 12.25	Auto	0.0000
L59	37	Transition Stiffener	12.00 - 12.25	Auto	0.0000
L59	38	Transition Stiffener	12.00 - 12.25	Auto	0.0000
L60	13	9" x 1-1/4" Flate Plate	11.50 - 12.00	Auto	0.0158
L60	18	9" x 1-1/4" Flate Plate	11.50 - 12.00	Auto	0.0158
L60	23	9" x 1-1/4" Flate Plate	11.50 - 12.00	Auto	0.0158

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L60	28	6" x 1" Flate Plate	11.50 - 12.00	Auto	0.0000
L60	29	6" x 1" Flate Plate	11.50 - 12.00	Auto	0.0000
L60	30	6" x 1" Flate Plate	11.50 - 12.00	Auto	0.0000
L60	37	Transition Stiffener	11.50 - 12.00	Auto	0.0000
L60	38	Transition Stiffener	11.50 - 12.00	Auto	0.0000
L61	13	9" x 1-1/4" Flate Plate	11.25 - 11.50	Auto	0.0472
L61	18	9" x 1-1/4" Flate Plate	11.25 - 11.50	Auto	0.0472
L61	23	9" x 1-1/4" Flate Plate	11.25 - 11.50	Auto	0.0472
L61	28	6" x 1" Flate Plate	11.25 - 11.50	Auto	0.0000
L61	29	6" x 1" Flate Plate	11.25 - 11.50	Auto	0.0000
L61	30	6" x 1" Flate Plate	11.25 - 11.50	Auto	0.0000
L61	37	Transition Stiffener	11.25 - 11.50	Auto	0.0000
L61	38	Transition Stiffener	11.25 - 11.50	Auto	0.0000
L62	13	9" x 1-1/4" Flate Plate	9.25 - 11.25	Auto	0.0372
L62	18	9" x 1-1/4" Flate Plate	9.25 - 11.25	Auto	0.0372
L62	23	9" x 1-1/4" Flate Plate	9.25 - 11.25	Auto	0.0372
L62	28	6" x 1" Flate Plate	9.25 - 11.25	Auto	0.0000
L62	29	6" x 1" Flate Plate	9.25 - 11.25	Auto	0.0000
L62	30	6" x 1" Flate Plate	9.25 - 11.25	Auto	0.0000
L62	37	Transition Stiffener	9.25 - 11.25	Auto	0.0000
L62	38	Transition Stiffener	9.25 - 11.25	Auto	0.0000
L63	13	9" x 1-1/4" Flate Plate	9.00 - 9.25	Auto	0.0197
L63	18	9" x 1-1/4" Flate Plate	9.00 - 9.25	Auto	0.0197
L63	23	9" x 1-1/4" Flate Plate	9.00 - 9.25	Auto	0.0197
L63	28	6" x 1" Flate Plate	9.00 - 9.25	Auto	0.0000
L63	29	6" x 1" Flate Plate	9.00 - 9.25	Auto	0.0000
L63	30	6" x 1" Flate Plate	9.00 - 9.25	Auto	0.0000
L63	37	Transition Stiffener	9.00 - 9.25	Auto	0.0000
L63	38	Transition Stiffener	9.00 - 9.25	Auto	0.0000
L64	13	9" x 1-1/4" Flate Plate	4.50 - 9.00	Auto	0.0027
L64	18	9" x 1-1/4" Flate Plate	4.50 - 9.00	Auto	0.0027
L64	23	9" x 1-1/4" Flate Plate	4.50 - 9.00	Auto	0.0027
L64	28	6" x 1" Flate Plate	4.50 - 9.00	Auto	0.0000
L64	29	6" x 1" Flate Plate	4.50 - 9.00	Auto	0.0000
L64	30	6" x 1" Flate Plate	4.50 - 9.00	Auto	0.0000
L64	36	Transition Stiffener	4.50 - 6.00	Auto	0.0000
L64	37	Transition Stiffener	4.50 - 9.00	Auto	0.0000
L64	38	Transition Stiffener	4.50 - 9.00	Auto	0.0000
L65	13	9" x 1-1/4" Flate Plate	4.25 - 4.50	Auto	0.0000
L65	18	9" x 1-1/4" Flate Plate	4.25 - 4.50	Auto	0.0000
L65	23	9" x 1-1/4" Flate Plate	4.25 - 4.50	Auto	0.0000
L65	28	6" x 1" Flate Plate	4.25 - 4.50	Auto	0.0000
L65	29	6" x 1" Flate Plate	4.25 - 4.50	Auto	0.0000
L65	30	6" x 1" Flate Plate	4.25 - 4.50	Auto	0.0000
L65	36	Transition Stiffener	4.25 - 4.50	Auto	0.0000
L65	37	Transition Stiffener	4.25 - 4.50	Auto	0.0000
L65	38	Transition Stiffener	4.25 - 4.50	Auto	0.0000
L66	13	9" x 1-1/4" Flate Plate	3.00 - 4.25	Auto	0.0000
L66	18	9" x 1-1/4" Flate Plate	3.00 - 4.25	Auto	0.0000
L66	23	9" x 1-1/4" Flate Plate	3.00 - 4.25	Auto	0.0000
L66	28	6" x 1" Flate Plate	3.00 - 4.25	Auto	0.0000
L66	29	6" x 1" Flate Plate	3.00 - 4.25	Auto	0.0000
L66	30	6" x 1" Flate Plate	3.00 - 4.25	Auto	0.0000
L66	36	Transition Stiffener	3.00 - 4.25	Auto	0.0000
L66	37	Transition Stiffener	3.00 - 4.25	Auto	0.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L66	38	Transition Stiffener	3.00 - 4.25	Auto	0.0000
L67	13	9" x 1-1/4" Flate Plate	2.75 - 3.00	Auto	0.0000
L67	18	9" x 1-1/4" Flate Plate	2.75 - 3.00	Auto	0.0000
L67	23	9" x 1-1/4" Flate Plate	2.75 - 3.00	Auto	0.0000
L67	28	6" x 1" Flate Plate	2.75 - 3.00	Auto	0.0000
L67	29	6" x 1" Flate Plate	2.75 - 3.00	Auto	0.0000
L67	30	6" x 1" Flate Plate	2.75 - 3.00	Auto	0.0000
L67	36	Transition Stiffener	2.75 - 3.00	Auto	0.0000
L67	37	Transition Stiffener	2.75 - 3.00	Auto	0.0000
L67	38	Transition Stiffener	2.75 - 3.00	Auto	0.0000
L68	13	9" x 1-1/4" Flate Plate	0.00 - 2.75	Auto	0.0000
L68	18	9" x 1-1/4" Flate Plate	0.00 - 2.75	Auto	0.0000
L68	23	9" x 1-1/4" Flate Plate	0.00 - 2.75	Auto	0.0000
L68	28	6" x 1" Flate Plate	0.00 - 2.75	Auto	0.0000
L68	29	6" x 1" Flate Plate	0.00 - 2.75	Auto	0.0000
L68	30	6" x 1" Flate Plate	0.00 - 2.75	Auto	0.0000
L68	36	Transition Stiffener	0.00 - 2.75	Auto	0.0000
L68	37	Transition Stiffener	0.00 - 2.75	Auto	0.0000
L68	38	Transition Stiffener	0.00 - 2.75	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
KS24019-L112A	A	From Leg	4.0000 0.00 -3.00	0.0000	150.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.1000 0.1800 0.2600 0.4200	0.1000 0.1800 0.2600 0.4200	0.01 0.01 0.01 0.01
LPA-80063/6CFX5 w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.0000	150.0000	No Ice 1/2" Ice 1" Ice 2" Ice	9.8047 10.3732 10.9065 11.9981	10.1945 11.3625 12.2463 14.0626	0.05 0.14 0.25 0.48
(2) LPA-80063/6CFX5 w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.0000	150.0000	No Ice 1/2" Ice 1" Ice 2" Ice	9.8047 10.3732 10.9065 11.9981	10.1945 11.3625 12.2463 14.0626	0.05 0.14 0.25 0.48
(3) LPA-80063/6CFX5 w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.0000	150.0000	No Ice 1/2" Ice 1" Ice 2" Ice	9.8047 10.3732 10.9065 11.9981	10.1945 11.3625 12.2463 14.0626	0.05 0.14 0.25 0.48
BXA-70063-6CF-2 w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.0000	150.0000	No Ice 1/2" Ice 1" Ice 2" Ice	7.8065 8.3569 8.8720 9.9271	5.8008 6.9529 7.8191 9.6015	0.04 0.10 0.17 0.34
BXA-70063-6CF-2 w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.0000	150.0000	No Ice 1/2" Ice 1" Ice 2" Ice	7.8065 8.3569 8.8720 9.9271	5.8008 6.9529 7.8191 9.6015	0.04 0.10 0.17 0.34
BXA-70063-6CF-2 w/ Mount Pipe	C	From Leg	4.0000 0.00	0.0000	150.0000	No Ice 1/2"	7.8065 8.3569	5.8008 6.9529	0.04 0.10

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			Ice	8.8720	7.8191	0.17
						1" Ice	9.9271	9.6015	0.34
						2" Ice			
(2) HBXX-6517DS-A2M w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.0000	150.0000	No Ice 1/2" Ice 1" Ice 2" Ice	7.9700 8.7300 9.5000 11.1100	5.9900 6.7200 7.4700 9.0200	0.08 0.14 0.22 0.40
(2) HBXX-6517DS-A2M w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.0000	150.0000	No Ice 1/2" Ice 1" Ice 2" Ice	7.9700 8.7300 9.5000 11.1100	5.9900 6.7200 7.4700 9.0200	0.08 0.14 0.22 0.40
(2) HBXX-6517DS-A2M w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.0000	150.0000	No Ice 1/2" Ice 1" Ice 2" Ice	7.9700 8.7300 9.5000 11.1100	5.9900 6.7200 7.4700 9.0200	0.08 0.14 0.22 0.40
RRH2X60-AWS	A	From Leg	4.0000 0.00 0.00	0.0000	150.0000	No Ice 1/2" Ice 1" Ice 2" Ice	3.5002 3.7609 4.0285 4.5849	1.8157 2.0519 2.2894 2.7852	0.06 0.08 0.11 0.17
RRH2X60-AWS	B	From Leg	4.0000 0.00 0.00	0.0000	150.0000	No Ice 1/2" Ice 1" Ice 2" Ice	3.5002 3.7609 4.0285 4.5849	1.8157 2.0519 2.2894 2.7852	0.06 0.08 0.11 0.17
RRH2X60-AWS	C	From Leg	4.0000 0.00 0.00	0.0000	150.0000	No Ice 1/2" Ice 1" Ice 2" Ice	3.5002 3.7609 4.0285 4.5849	1.8157 2.0519 2.2894 2.7852	0.06 0.08 0.11 0.17
B4 RRH2X60-4R	A	From Leg	4.0000 0.00 0.00	0.0000	150.0000	No Ice 1/2" Ice 1" Ice 2" Ice	3.3554 3.6120 3.8757 4.4240	2.0048 2.2369 2.4759 2.9750	0.06 0.08 0.10 0.17
B4 RRH2X60-4R	B	From Leg	4.0000 0.00 0.00	0.0000	150.0000	No Ice 1/2" Ice 1" Ice 2" Ice	3.3554 3.6120 3.8757 4.4240	2.0048 2.2369 2.4759 2.9750	0.06 0.08 0.10 0.17
B4 RRH2X60-4R	C	From Leg	4.0000 0.00 0.00	0.0000	150.0000	No Ice 1/2" Ice 1" Ice 2" Ice	3.3554 3.6120 3.8757 4.4240	2.0048 2.2369 2.4759 2.9750	0.06 0.08 0.10 0.17
(2) FD9R6004/2C-3L	A	From Leg	4.0000 0.00 -3.00	0.0000	150.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.3142 0.3862 0.4656 0.6468	0.0762 0.1189 0.1685 0.2940	0.00 0.01 0.01 0.02
(3) FD9R6004/2C-3L	B	From Leg	4.0000 0.00 -3.00	0.0000	150.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.3142 0.3862 0.4656 0.6468	0.0762 0.1189 0.1685 0.2940	0.00 0.01 0.01 0.02
FD9R6004/2C-3L	C	From Leg	4.0000 0.00 -3.00	0.0000	150.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.3142 0.3862 0.4656 0.6468	0.0762 0.1189 0.1685 0.2940	0.00 0.01 0.01 0.02
DB-T1-6Z-8AB-0Z	C	From Leg	4.0000 0.00	0.0000	150.0000	No Ice 1/2"	4.8000 5.0704	2.0000 2.1926	0.04 0.08

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			Ice	5.3481	2.3926	0.12
						1" Ice	5.9259	2.8148	0.21
						2" Ice			
Platform Mount (LP 101-1_KCKR)	C	None		0.0000	150.0000	No Ice	47.0500	47.0500	1.78
						1/2"	55.2000	55.2000	2.73
						Ice	63.9600	63.9600	3.86
						1" Ice	84.7100	84.7100	6.59
						2" Ice			
***									
(2) LGP21903	A	From Leg	4.0000 0.00 4.00	0.0000	138.0000	No Ice	0.2310	0.1575	0.01
						1/2"	0.2941	0.2129	0.01
						Ice	0.3647	0.2756	0.02
						1" Ice	0.5280	0.4234	0.03
						2" Ice			
(2) LGP21903	B	From Leg	4.0000 0.00 4.00	0.0000	138.0000	No Ice	0.2310	0.1575	0.01
						1/2"	0.2941	0.2129	0.01
						Ice	0.3647	0.2756	0.02
						1" Ice	0.5280	0.4234	0.03
						2" Ice			
(2) LGP21903	C	From Leg	4.0000 0.00 4.00	0.0000	138.0000	No Ice	0.2310	0.1575	0.01
						1/2"	0.2941	0.2129	0.01
						Ice	0.3647	0.2756	0.02
						1" Ice	0.5280	0.4234	0.03
						2" Ice			
RRUS 11 B12	A	From Leg	4.0000 0.00 4.00	0.0000	138.0000	No Ice	2.8333	1.1821	0.05
						1/2"	3.0426	1.3299	0.07
						Ice	3.2593	1.4848	0.10
						1" Ice	3.7148	1.8259	0.15
						2" Ice			
RRUS 11 B12	B	From Leg	4.0000 0.00 4.00	0.0000	138.0000	No Ice	2.8333	1.1821	0.05
						1/2"	3.0426	1.3299	0.07
						Ice	3.2593	1.4848	0.10
						1" Ice	3.7148	1.8259	0.15
						2" Ice			
RRUS 11 B12	C	From Leg	4.0000 0.00 4.00	0.0000	138.0000	No Ice	2.8333	1.1821	0.05
						1/2"	3.0426	1.3299	0.07
						Ice	3.2593	1.4848	0.10
						1" Ice	3.7148	1.8259	0.15
						2" Ice			
RRUS12/RRUS A2	A	From Leg	4.0000 0.00 4.00	0.0000	138.0000	No Ice	3.1435	1.8351	0.07
						1/2"	3.3632	2.0121	0.10
						Ice	3.5904	2.1965	0.13
						1" Ice	4.0669	2.5875	0.20
						2" Ice			
RRUS12/RRUS A2	B	From Leg	4.0000 0.00 4.00	0.0000	138.0000	No Ice	3.1435	1.8351	0.07
						1/2"	3.3632	2.0121	0.10
						Ice	3.5904	2.1965	0.13
						1" Ice	4.0669	2.5875	0.20
						2" Ice			
RRUS12/RRUS A2	C	From Leg	4.0000 0.00 4.00	0.0000	138.0000	No Ice	3.1435	1.8351	0.07
						1/2"	3.3632	2.0121	0.10
						Ice	3.5904	2.1965	0.13
						1" Ice	4.0669	2.5875	0.20
						2" Ice			
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.0000 0.00 4.00	0.0000	138.0000	No Ice	5.7460	4.2543	0.06
						1/2"	6.1791	5.0137	0.10
						Ice	6.6067	5.7109	0.16
						1" Ice	7.4880	7.1553	0.29
						2" Ice			
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.0000 0.00 4.00	0.0000	138.0000	No Ice	5.7460	4.2543	0.06
						1/2"	6.1791	5.0137	0.10
						Ice	6.6067	5.7109	0.16
						1" Ice	7.4880	7.1553	0.29
						2" Ice			
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.0000	0.0000	138.0000	No Ice	5.7460	4.2543	0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00 4.00			1/2" Ice 1" Ice 2" Ice	6.1791 6.6067 7.4880	5.0137 5.7109 7.1553	0.10 0.16 0.29
HPA-65R-BUU-H6 w/ Mount Pipe	A	From Leg	4.0000 0.00 4.00	0.0000	138.0000	No Ice 1/2" Ice 1" Ice 2" Ice	9.2200 9.9800 10.7600 12.3600	6.2500 6.9600 7.7000 9.2200	0.07 0.14 0.22 0.42
HPA-65R-BUU-H6 w/ Mount Pipe	B	From Leg	4.0000 0.00 4.00	0.0000	138.0000	No Ice 1/2" Ice 1" Ice 2" Ice	9.2200 9.9800 10.7600 12.3600	6.2500 6.9600 7.7000 9.2200	0.07 0.14 0.22 0.42
HPA-65R-BUU-H6 w/ Mount Pipe	C	From Leg	4.0000 0.00 4.00	0.0000	138.0000	No Ice 1/2" Ice 1" Ice 2" Ice	9.2200 9.9800 10.7600 12.3600	6.2500 6.9600 7.7000 9.2200	0.07 0.14 0.22 0.42
(2) LGP21401	A	From Leg	4.0000 0.00 4.00	0.0000	138.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.1040 1.2388 1.3810 1.6877	0.2070 0.2738 0.3475 0.5208	0.01 0.02 0.03 0.05
(2) LGP21401	B	From Leg	4.0000 0.00 4.00	0.0000	138.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.1040 1.2388 1.3810 1.6877	0.2070 0.2738 0.3475 0.5208	0.01 0.02 0.03 0.05
(2) LGP21401	C	From Leg	4.0000 0.00 4.00	0.0000	138.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.1040 1.2388 1.3810 1.6877	0.2070 0.2738 0.3475 0.5208	0.01 0.02 0.03 0.05
DC6-48-60-18-8F	A	From Leg	4.0000 0.00 4.00	0.0000	138.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.2117 1.8924 2.1051 2.5703	1.2117 1.8924 2.1051 2.5703	0.02 0.04 0.07 0.13
Platform Mount (LP 101-1)	C	None		0.0000	138.0000	No Ice 1/2" Ice 1" Ice 2" Ice	35.8300 40.9800 46.5700 60.4600	35.8300 40.9800 46.5700 60.4600	1.50 2.32 3.26 5.51
4' x 2" Pipe Mount	A	From Leg	4.0000 0.00 0.00	0.0000	138.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.7852 1.0284 1.2809 1.8136	0.7852 1.0284 1.2809 1.8136	0.03 0.04 0.04 0.07
4' x 2" Pipe Mount	B	From Leg	4.0000 0.00 0.00	0.0000	138.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.7852 1.0284 1.2809 1.8136	0.7852 1.0284 1.2809 1.8136	0.03 0.04 0.04 0.07
4' x 2" Pipe Mount	C	From Leg	4.0000 0.00 0.00	0.0000	138.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.7852 1.0284 1.2809 1.8136	0.7852 1.0284 1.2809 1.8136	0.03 0.04 0.04 0.07
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KRY 112 144/1	A	From Leg	2.0000 0.00 2.00	0.0000	128.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.3500 0.4259 0.5093 0.6981	0.1750 0.2343 0.3009 0.4565	0.01 0.01 0.02 0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
KRY 112 144/1	B	From Leg	2.0000 0.00 2.00	0.0000	128.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.3500 0.4259 0.5093 0.6981	0.1750 0.2343 0.3009 0.4565	0.01 0.01 0.02 0.03
KRY 112 144/1	C	From Leg	2.0000 0.00 2.00	0.0000	128.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.3500 0.4259 0.5093 0.6981	0.1750 0.2343 0.3009 0.4565	0.01 0.01 0.02 0.03
AIR6449 B41_T-MOBILE w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.0000	128.0000	No Ice 1/2" Ice 1" Ice 2" Ice	5.8701 6.2332 6.6061 7.3816	3.2700 3.7282 4.2026 5.2001	0.13 0.18 0.23 0.36
AIR6449 B41_T-MOBILE w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.0000	128.0000	No Ice 1/2" Ice 1" Ice 2" Ice	5.8701 6.2332 6.6061 7.3816	3.2700 3.7282 4.2026 5.2001	0.13 0.18 0.23 0.36
AIR6449 B41_T-MOBILE w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.0000	128.0000	No Ice 1/2" Ice 1" Ice 2" Ice	5.8701 6.2332 6.6061 7.3816	3.2700 3.7282 4.2026 5.2001	0.13 0.18 0.23 0.36
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.0000	128.0000	No Ice 1/2" Ice 1" Ice 2" Ice	20.4801 21.2306 21.9900 23.4441	10.8686 12.3931 13.9417 16.2912	0.18 0.32 0.46 0.79
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.0000	128.0000	No Ice 1/2" Ice 1" Ice 2" Ice	20.4801 21.2306 21.9900 23.4441	10.8686 12.3931 13.9417 16.2912	0.18 0.32 0.46 0.79
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.0000	128.0000	No Ice 1/2" Ice 1" Ice 2" Ice	20.4801 21.2306 21.9900 23.4441	10.8686 12.3931 13.9417 16.2912	0.18 0.32 0.46 0.79
AIR 32 B2A B66AA_T-MOBILE w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.0000	128.0000	No Ice 1/2" Ice 1" Ice 2" Ice	7.0872 7.5606 8.0206 8.9662	6.3915 7.2487 7.9915 9.5258	0.19 0.26 0.33 0.49
AIR 32 B2A B66AA_T-MOBILE w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.0000	128.0000	No Ice 1/2" Ice 1" Ice 2" Ice	7.0872 7.5606 8.0206 8.9662	6.3915 7.2487 7.9915 9.5258	0.19 0.26 0.33 0.49
AIR 32 B2A B66AA_T-MOBILE w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.0000	128.0000	No Ice 1/2" Ice 1" Ice 2" Ice	7.0872 7.5606 8.0206 8.9662	6.3915 7.2487 7.9915 9.5258	0.19 0.26 0.33 0.49
SDX1926Q-43	A	From Leg	4.0000 0.00 0.00	0.0000	128.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.2410 0.3063 0.3791 0.5469	0.1013 0.1444 0.1948 0.3180	0.01 0.01 0.01 0.02
SDX1926Q-43	B	From Leg	4.0000 0.00 0.00	0.0000	128.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.2410 0.3063 0.3791 0.5469	0.1013 0.1444 0.1948 0.3180	0.01 0.01 0.01 0.02

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
SDX1926Q-43	C	From Leg	4.0000 0.00 0.00	0.0000	128.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.2410 0.3063 0.3791 0.5469	0.1013 0.1444 0.1948 0.3180	0.01 0.01 0.01 0.02
RRUS 4415 B25_CCIV2	A	From Leg	4.0000 0.00 0.00	0.0000	128.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.8425 2.0123 2.1895 2.5662	0.8202 0.9434 1.0750 1.3683	0.05 0.06 0.08 0.12
RRUS 4415 B25_CCIV2	B	From Leg	4.0000 0.00 0.00	0.0000	128.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.8425 2.0123 2.1895 2.5662	0.8202 0.9434 1.0750 1.3683	0.05 0.06 0.08 0.12
RRUS 4415 B25_CCIV2	C	From Leg	4.0000 0.00 0.00	0.0000	128.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.8425 2.0123 2.1895 2.5662	0.8202 0.9434 1.0750 1.3683	0.05 0.06 0.08 0.12
RADIO 4449 B71 B85A_T-MOBILE	A	From Leg	4.0000 0.00 0.00	0.0000	128.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.9701 2.1466 2.3306 2.7207	1.5865 1.7488 1.9185 2.2800	0.07 0.09 0.12 0.17
RADIO 4449 B71 B85A_T-MOBILE	B	From Leg	4.0000 0.00 0.00	0.0000	128.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.9701 2.1466 2.3306 2.7207	1.5865 1.7488 1.9185 2.2800	0.07 0.09 0.12 0.17
RADIO 4449 B71 B85A_T-MOBILE	C	From Leg	4.0000 0.00 0.00	0.0000	128.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.9701 2.1466 2.3306 2.7207	1.5865 1.7488 1.9185 2.2800	0.07 0.09 0.12 0.17
Site Pro 1 RMQP-496-HK	C	None		0.0000	128.0000	No Ice 1/2" Ice 1" Ice 2" Ice	23.1400 28.1700 33.2000 43.2600	23.1400 28.1700 33.2000 43.2600	1.95 2.34 2.73 3.50
8' x 2" Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.0000	128.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.9000 2.7281 3.4009 4.3962	1.9000 2.7281 3.4009 4.3962	0.03 0.04 0.06 0.12
8' x 2" Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.0000	128.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.9000 2.7281 3.4009 4.3962	1.9000 2.7281 3.4009 4.3962	0.03 0.04 0.06 0.12
8' x 2" Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.0000	128.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.9000 2.7281 3.4009 4.3962	1.9000 2.7281 3.4009 4.3962	0.03 0.04 0.06 0.12
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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	150 - 145	Pole	Max Tension	26	0.00	-0.00	0.00
			Max. Compression	26	-12.00	2.10	-2.97
			Max. Mx	20	-2.35	55.00	-0.24
			Max. My	14	-2.35	0.33	-54.88
			Max. Vy	20	-11.17	55.00	-0.24
			Max. Vx	14	11.13	0.33	-54.88
			Max. Torque	22			4.78
L2	145 - 140	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-12.42	2.13	-3.01
			Max. Mx	20	-2.58	111.91	-0.52

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	-2.59	0.60	-111.58
			Max. Vy	20	-11.60	111.91	-0.52
			Max. Vx	14	11.56	0.60	-111.58
			Max. Torque	22			4.78
L3	140 - 135	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-21.52	2.16	-2.59
			Max. Mx	20	-5.35	202.35	-0.73
			Max. My	14	-5.36	0.86	-201.69
			Max. Vy	20	-17.98	202.35	-0.73
			Max. Vx	14	17.93	0.86	-201.69
			Max. Torque	22			4.78
L4	135 - 133	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-21.79	2.17	-2.60
			Max. Mx	20	-5.53	238.46	-0.84
			Max. My	14	-5.54	0.97	-237.71
			Max. Vy	20	-18.15	238.46	-0.84
			Max. Vx	14	18.10	0.97	-237.71
			Max. Torque	10			-4.53
L5	133 - 132.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-21.83	2.17	-2.61
			Max. Mx	20	-5.58	243.00	-0.85
			Max. My	14	-5.59	0.98	-242.24
			Max. Vy	20	-18.17	243.00	-0.85
			Max. Vx	14	18.12	0.98	-242.24
			Max. Torque	10			-4.52
L6	132.75 - 127.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-31.68	2.20	-2.65
			Max. Mx	20	-10.22	336.70	-1.12
			Max. My	14	-10.23	1.24	-335.71
			Max. Vy	20	-24.92	336.70	-1.12
			Max. Vx	14	24.87	1.24	-335.71
			Max. Torque	10			-4.52
L7	127.75 - 123.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-32.58	2.22	-2.76
			Max. Mx	20	-10.85	437.12	-1.38
			Max. My	14	-10.86	1.45	-435.98
			Max. Vy	20	-25.30	437.12	-1.38
			Max. Vx	14	25.26	1.45	-435.98
			Max. Torque	10			-4.52
L8	123.75 - 123.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-32.64	2.22	-2.76
			Max. Mx	20	-10.90	443.44	-1.39
			Max. My	14	-10.91	1.46	-442.30
			Max. Vy	20	-25.32	443.44	-1.39
			Max. Vx	14	25.28	1.46	-442.30
			Max. Torque	10			-4.52
L9	123.5 - 118.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-34.18	2.25	-2.89
			Max. Mx	20	-11.96	564.97	-1.69
			Max. My	14	-11.97	1.71	-563.64
			Max. Vy	20	-25.86	564.97	-1.69
			Max. Vx	14	25.81	1.71	-563.64
			Max. Torque	10			-4.52
L10	118.75 - 118.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-34.27	2.25	-2.90
			Max. Mx	20	-12.04	571.43	-1.71
			Max. My	14	-12.05	1.72	-570.10
			Max. Vy	20	-25.88	571.43	-1.71
			Max. Vx	14	25.83	1.72	-570.10
			Max. Torque	10			-4.52
L11	118.5 - 117	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-34.85	2.26	-2.94
			Max. Mx	20	-12.45	610.39	-1.80
			Max. My	14	-12.46	1.80	-608.99

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	20	-26.07	610.39	-1.80
			Max. Vx	14	26.02	1.80	-608.99
			Max. Torque	10			-4.51
L12	117 - 116.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-34.93	2.26	-2.95
			Max. Mx	20	-12.52	616.91	-1.82
			Max. My	14	-12.53	1.81	-615.50
			Max. Vy	20	-26.09	616.91	-1.82
			Max. Vx	14	26.04	1.81	-615.50
			Max. Torque	10			-4.51
L13	116.75 - 111.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-36.57	2.29	-3.08
			Max. Mx	20	-13.67	748.71	-2.13
			Max. My	14	-13.68	2.07	-747.10
			Max. Vy	20	-26.65	748.71	-2.13
			Max. Vx	14	26.60	2.07	-747.10
			Max. Torque	10			-4.51
L14	111.75 - 106.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-38.23	2.31	-3.22
			Max. Mx	20	-14.87	883.27	-2.44
			Max. My	14	-14.88	2.32	-881.46
			Max. Vy	20	-27.20	883.27	-2.44
			Max. Vx	14	27.15	2.32	-881.46
			Max. Torque	10			-4.51
L15	106.75 - 101.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-39.91	2.33	-3.36
			Max. Mx	20	-16.10	1020.57	-2.75
			Max. My	14	-16.11	2.58	-1018.56
			Max. Vy	20	-27.74	1020.57	-2.75
			Max. Vx	14	27.70	2.58	-1018.56
			Max. Torque	10			-4.51
L16	101.75 - 95.1667	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-40.67	2.34	-3.42
			Max. Mx	20	-16.66	1083.25	-2.89
			Max. My	14	-16.67	2.69	-1081.15
			Max. Vy	20	-27.99	1083.25	-2.89
			Max. Vx	14	27.94	2.69	-1081.15
			Max. Torque	10			-4.50
L17	95.1667 - 94.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43.64	2.36	-3.56
			Max. Mx	20	-18.89	1224.92	-3.20
			Max. My	14	-18.90	2.94	-1222.61
			Max. Vy	20	-28.68	1224.92	-3.20
			Max. Vx	14	28.63	2.94	-1222.61
			Max. Torque	10			-4.50
L18	94.5 - 93.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43.93	2.36	-3.58
			Max. Mx	20	-19.11	1246.45	-3.24
			Max. My	14	-19.12	2.98	-1244.12
			Max. Vy	20	-28.76	1246.45	-3.24
			Max. Vx	14	28.71	2.98	-1244.12
			Max. Torque	10			-4.50
L19	93.75 - 93.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-44.04	2.36	-3.59
			Max. Mx	20	-19.20	1253.64	-3.26
			Max. My	14	-19.21	2.99	-1251.30
			Max. Vy	20	-28.79	1253.64	-3.26
			Max. Vx	14	28.74	2.99	-1251.30
			Max. Torque	10			-4.50
L20	93.5 - 92.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-44.35	2.37	-3.61
			Max. Mx	20	-19.44	1275.26	-3.30
			Max. My	14	-19.44	3.03	-1272.89
			Max. Vy	20	-28.88	1275.26	-3.30

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	14	28.83	3.03	-1272.89
			Max. Torque	10			-4.50
L21	92.75 - 92.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-44.47	2.37	-3.62
			Max. Mx	20	-19.54	1282.49	-3.32
			Max. My	14	-19.55	3.04	-1280.11
			Max. Vy	20	-28.91	1282.49	-3.32
			Max. Vx	14	28.86	3.04	-1280.11
			Max. Torque	10			-4.50
L22	92.5 - 91.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-45.07	2.37	-3.65
			Max. Mx	20	-20.00	1318.72	-3.40
			Max. My	14	-20.01	3.10	-1316.29
			Max. Vy	20	-29.07	1318.72	-3.40
			Max. Vx	14	29.02	3.10	-1316.29
			Max. Torque	10			-4.50
L23	91.25 - 91	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-45.19	2.37	-3.66
			Max. Mx	20	-20.10	1325.99	-3.41
			Max. My	14	-20.11	3.11	-1323.55
			Max. Vy	20	-29.10	1325.99	-3.41
			Max. Vx	14	29.05	3.11	-1323.55
			Max. Torque	10			-4.50
L24	91 - 89.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-46.03	2.38	-3.71
			Max. Mx	20	-20.75	1377.10	-3.52
			Max. My	14	-20.76	3.20	-1374.59
			Max. Vy	20	-29.33	1377.10	-3.52
			Max. Vx	14	29.28	3.20	-1374.59
			Max. Torque	10			-4.50
L25	89.25 - 89	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-46.16	2.38	-3.71
			Max. Mx	20	-20.87	1384.43	-3.54
			Max. My	14	-20.88	3.21	-1381.91
			Max. Vy	20	-29.35	1384.43	-3.54
			Max. Vx	14	29.30	3.21	-1381.91
			Max. Torque	10			-4.50
L26	89 - 85.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-47.84	2.39	-3.81
			Max. Mx	20	-22.19	1480.49	-3.74
			Max. My	14	-22.20	3.38	-1477.85
			Max. Vy	20	-29.78	1480.49	-3.74
			Max. Vx	14	29.73	3.38	-1477.85
			Max. Torque	10			-4.50
L27	85.75 - 85.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-47.95	2.39	-3.82
			Max. Mx	20	-22.28	1487.94	-3.75
			Max. My	14	-22.29	3.39	-1485.28
			Max. Vy	20	-29.80	1487.94	-3.75
			Max. Vx	14	29.75	3.39	-1485.28
			Max. Torque	10			-4.49
L28	85.5 - 80.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-50.10	2.41	-3.96
			Max. Mx	20	-23.92	1638.37	-4.06
			Max. My	14	-23.92	3.64	-1635.52
			Max. Vy	20	-30.39	1638.37	-4.06
			Max. Vx	14	30.34	3.64	-1635.52
			Max. Torque	10			-4.49
L29	80.5 - 75.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-52.27	2.43	-4.11
			Max. Mx	20	-25.60	1791.67	-4.37
			Max. My	14	-25.60	3.88	-1788.63
			Max. Vy	20	-30.96	1791.67	-4.37
			Max. Vx	14	30.91	3.88	-1788.63
			Max. Torque	10			-4.49
L30	75.5 - 70.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-54.47	2.44	-4.25
			Max. Mx	20	-27.31	1947.82	-4.68
			Max. My	14	-27.31	4.13	-1944.58

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	20	-31.53	1947.82	-4.68
			Max. Vx	14	31.48	4.13	-1944.58
			Max. Torque	10			-4.49
L31	70.5 - 68.083	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-55.56	2.45	-4.32
			Max. Mx	20	-28.14	2024.30	-4.82
			Max. My	14	-28.15	4.25	-2020.97
			Max. Vy	20	-31.80	2024.30	-4.82
			Max. Vx	14	31.75	4.25	-2020.97
			Max. Torque	10			-4.48
L32	68.083 - 67.833	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-55.67	2.45	-4.33
			Max. Mx	20	-28.25	2032.25	-4.84
			Max. My	14	-28.26	4.26	-2028.91
			Max. Vy	20	-31.81	2032.25	-4.84
			Max. Vx	14	31.76	4.26	-2028.91
			Max. Torque	10			-4.48
L33	67.833 - 67	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-56.06	2.45	-4.36
			Max. Mx	20	-28.54	2058.79	-4.89
			Max. My	14	-28.55	4.30	-2055.42
			Max. Vy	20	-31.92	2058.79	-4.89
			Max. Vx	14	31.87	4.30	-2055.42
			Max. Torque	10			-4.48
L34	67 - 66.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-56.20	2.45	-4.36
			Max. Mx	20	-28.66	2066.77	-4.91
			Max. My	14	-28.67	4.31	-2063.39
			Max. Vy	20	-31.94	2066.77	-4.91
			Max. Vx	14	31.89	4.31	-2063.39
			Max. Torque	10			-4.48
L35	66.75 - 63.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-58.10	2.46	-4.46
			Max. Mx	20	-30.17	2179.29	-5.12
			Max. My	14	-30.17	4.48	-2175.78
			Max. Vy	20	-32.38	2179.29	-5.12
			Max. Vx	14	32.33	4.48	-2175.78
			Max. Torque	10			-4.48
L36	63.25 - 63	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-58.25	2.46	-4.47
			Max. Mx	20	-30.30	2187.39	-5.14
			Max. My	14	-30.31	4.49	-2183.87
			Max. Vy	20	-32.40	2187.39	-5.14
			Max. Vx	14	32.35	4.49	-2183.87
			Max. Torque	10			-4.48
L37	63 - 59.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-60.36	2.46	-4.56
			Max. Mx	20	-32.00	2301.56	-5.35
			Max. My	14	-32.00	4.66	-2297.91
			Max. Vy	20	-32.86	2301.56	-5.35
			Max. Vx	14	32.81	4.66	-2297.91
			Max. Torque	10			-4.48
L38	59.5 - 59.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-60.51	2.46	-4.56
			Max. Mx	20	-32.14	2309.78	-5.37
			Max. My	14	-32.14	4.67	-2306.12
			Max. Vy	20	-32.88	2309.78	-5.37
			Max. Vx	14	32.83	4.67	-2306.12
			Max. Torque	10			-4.48
L39	59.25 - 56.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-62.38	2.46	-4.64
			Max. Mx	20	-33.65	2408.98	-5.55
			Max. My	14	-33.65	4.82	-2405.21
			Max. Vy	20	-33.27	2408.98	-5.55
			Max. Vx	14	33.22	4.82	-2405.21

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Torque	10			-4.48
L40	56.25 - 56	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-62.52	2.46	-4.64
			Max. Mx	20	-33.77	2417.30	-5.57
			Max. My	14	-33.77	4.83	-2413.52
			Max. Vy	20	-33.29	2417.30	-5.57
			Max. Vx	14	33.24	4.83	-2413.52
			Max. Torque	10			-4.48
L41	56 - 55.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-62.65	2.46	-4.65
			Max. Mx	20	-33.87	2425.63	-5.58
			Max. My	14	-33.87	4.84	-2421.84
			Max. Vy	20	-33.32	2425.63	-5.58
			Max. Vx	14	33.27	4.84	-2421.84
			Max. Torque	10			-4.48
L42	55.75 - 50.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-65.14	2.46	-4.78
			Max. Mx	20	-35.81	2593.59	-5.89
			Max. My	14	-35.82	5.08	-2589.62
			Max. Vy	20	-33.89	2593.59	-5.89
			Max. Vx	14	33.84	5.08	-2589.62
			Max. Torque	10			-4.48
L43	50.75 - 44.6667	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-65.51	2.46	-4.80
			Max. Mx	20	-36.11	2619.02	-5.94
			Max. My	14	-36.12	5.12	-2615.02
			Max. Vy	20	-33.96	2619.02	-5.94
			Max. Vx	14	33.91	5.12	-2615.02
			Max. Torque	10			-4.48
L44	44.6667 - 43.6667	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-70.99	2.46	-4.97
			Max. Mx	20	-40.51	2836.85	-6.33
			Max. My	14	-40.51	5.42	-2832.62
			Max. Vy	20	-34.83	2836.85	-6.33
			Max. Vx	14	34.78	5.42	-2832.62
			Max. Torque	10			-4.47
L45	43.6667 - 38.6667	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-73.65	2.46	-5.10
			Max. Mx	20	-42.65	3012.15	-6.64
			Max. My	14	-42.66	5.66	-3007.74
			Max. Vy	20	-35.33	3012.15	-6.64
			Max. Vx	14	35.29	5.66	-3007.74
			Max. Torque	10			-4.47
L46	38.6667 - 34.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-75.88	2.46	-5.21
			Max. Mx	20	-44.46	3160.14	-6.89
			Max. My	14	-44.47	5.85	-3155.58
			Max. Vy	20	-35.75	3160.14	-6.89
			Max. Vx	14	35.70	5.85	-3155.58
			Max. Torque	10			-4.47
L47	34.5 - 34.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-76.04	2.46	-5.22
			Max. Mx	20	-44.61	3169.08	-6.91
			Max. My	14	-44.61	5.86	-3164.51
			Max. Vy	20	-35.75	3169.08	-6.91
			Max. Vx	14	35.70	5.86	-3164.51
			Max. Torque	10			-4.47
L48	34.25 - 33	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-76.84	2.46	-5.25
			Max. Mx	20	-45.26	3213.85	-6.98
			Max. My	14	-45.26	5.92	-3209.23
			Max. Vy	20	-35.91	3213.85	-6.98
			Max. Vx	14	35.86	5.92	-3209.23
			Max. Torque	10			-4.47

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L49	33 - 32.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-77.00	2.46	-5.26
			Max. Mx	20	-45.41	3222.82	-7.00
			Max. My	14	-45.41	5.93	-3218.20
			Max. Vy	20	-35.92	3222.82	-7.00
			Max. Vx	14	35.87	5.93	-3218.20
			Max. Torque	10			-4.47
L50	32.75 - 29.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-78.92	2.46	-5.34
			Max. Mx	20	-46.99	3331.03	-7.18
			Max. My	14	-47.00	6.07	-3326.30
			Max. Vy	20	-36.25	3331.03	-7.18
			Max. Vx	14	36.20	6.07	-3326.30
			Max. Torque	10			-4.47
L51	29.75 - 29.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-79.08	2.46	-5.35
			Max. Mx	20	-47.14	3340.09	-7.20
			Max. My	14	-47.14	6.09	-3335.36
			Max. Vy	20	-36.26	3340.09	-7.20
			Max. Vx	14	36.21	6.09	-3335.36
			Max. Torque	10			-4.47
L52	29.5 - 25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-82.05	2.46	-5.47
			Max. Mx	20	-49.60	3504.28	-7.47
			Max. My	14	-49.61	6.29	-3499.38
			Max. Vy	20	-36.74	3504.28	-7.47
			Max. Vx	14	36.69	6.29	-3499.38
			Max. Torque	10			-4.47
L53	25 - 24.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-82.19	2.46	-5.48
			Max. Mx	20	-49.73	3513.46	-7.49
			Max. My	14	-49.73	6.31	-3508.56
			Max. Vy	20	-36.74	3513.46	-7.49
			Max. Vx	14	36.70	6.31	-3508.56
			Max. Torque	10			-4.47
L54	24.75 - 19.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-85.02	2.46	-5.62
			Max. Mx	20	-52.04	3698.23	-7.79
			Max. My	14	-52.04	6.54	-3693.15
			Max. Vy	20	-37.19	3698.23	-7.79
			Max. Vx	14	37.14	6.54	-3693.15
			Max. Torque	10			-4.47
L55	19.75 - 14.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-87.86	2.46	-5.78
			Max. Mx	20	-54.38	3885.04	-8.09
			Max. My	14	-54.38	6.76	-3879.80
			Max. Vy	20	-37.58	3885.04	-8.09
			Max. Vx	14	37.53	6.76	-3879.80
			Max. Torque	10			-4.47
L56	14.75 - 14.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-88.00	2.46	-5.79
			Max. Mx	20	-54.51	3894.43	-8.11
			Max. My	14	-54.52	6.77	-3889.18
			Max. Vy	20	-37.59	3894.43	-8.11
			Max. Vx	14	37.53	6.77	-3889.18
			Max. Torque	10			-4.47
L57	14.5 - 14.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-88.15	2.46	-5.81
			Max. Mx	20	-54.63	3903.83	-8.12
			Max. My	14	-54.63	6.78	-3898.57
			Max. Vy	20	-37.62	3903.83	-8.12
			Max. Vx	14	37.55	6.78	-3898.57
			Max. Torque	10			-4.47
L58	14.25 - 12.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-89.31	2.45	-5.89

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	20	-55.57	3979.26	-8.25
			Max. My	14	-55.57	6.88	-3973.84
			Max. Vy	20	-37.85	3979.26	-8.25
			Max. Vx	14	37.72	6.88	-3973.84
			Max. Torque	10			-4.47
L59	12.25 - 12	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-89.46	2.44	-5.90
			Max. Mx	20	-55.70	3988.72	-8.26
			Max. My	14	-55.70	6.89	-3983.27
			Max. Vy	20	-37.85	3988.72	-8.26
			Max. Vx	14	37.72	6.89	-3983.27
			Max. Torque	10			-4.47
L60	12 - 11.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-89.75	2.43	-5.92
			Max. Mx	20	-55.94	4007.65	-8.29
			Max. My	14	-55.94	6.91	-4002.14
			Max. Vy	20	-37.91	4007.65	-8.29
			Max. Vx	14	37.76	6.91	-4002.14
			Max. Torque	10			-4.47
L61	11.5 - 11.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-89.90	2.43	-5.93
			Max. Mx	20	-56.07	4017.13	-8.31
			Max. My	14	-56.07	6.92	-4011.58
			Max. Vy	20	-37.93	4017.13	-8.31
			Max. Vx	14	37.77	6.92	-4011.58
			Max. Torque	10			-4.47
L62	11.25 - 9.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-91.12	2.40	-6.00
			Max. Mx	20	-57.05	4093.20	-8.43
			Max. My	14	-57.05	7.01	-4087.31
			Max. Vy	20	-38.17	4093.20	-8.43
			Max. Vx	14	37.95	7.01	-4087.31
			Max. Torque	10			-4.47
L63	9.25 - 9	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-91.27	2.40	-6.01
			Max. Mx	20	-57.18	4102.74	-8.44
			Max. My	14	-57.19	7.02	-4096.79
			Max. Vy	20	-38.18	4102.74	-8.44
			Max. Vx	14	37.95	7.02	-4096.79
			Max. Torque	10			-4.47
L64	9 - 4.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-93.76	2.36	-6.06
			Max. Mx	20	-59.21	4275.60	-8.66
			Max. My	14	-59.22	7.22	-4268.30
			Max. Vy	20	-38.68	4275.60	-8.66
			Max. Vx	14	38.30	7.22	-4268.30
			Max. Torque	10			-4.47
L65	4.5 - 4.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-93.90	2.36	-6.06
			Max. Mx	20	-59.35	4285.26	-8.67
			Max. My	14	-59.35	7.23	-4277.87
			Max. Vy	20	-38.68	4285.26	-8.67
			Max. Vx	14	38.30	7.23	-4277.87
			Max. Torque	10			-4.47
L66	4.25 - 3	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-94.62	2.36	-6.06
			Max. Mx	20	-59.92	4333.69	-8.72
			Max. My	14	-59.93	7.29	-4325.80
			Max. Vy	20	-38.85	4333.69	-8.72
			Max. Vx	14	38.43	7.29	-4325.80
			Max. Torque	10			-4.47
L67	3 - 2.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-94.75	2.36	-6.06
			Max. Mx	20	-60.05	4343.40	-8.73
			Max. My	14	-60.06	7.30	-4335.40
			Max. Vy	20	-38.85	4343.40	-8.73
			Max. Vx	14	38.42	7.30	-4335.40
			Max. Torque	10			-4.47
L68	2.75 - 0	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	-96.23	2.36	-6.06
			Max. Mx	20	-61.28	4450.62	-8.85
			Max. My	14	-61.28	7.42	-4441.33
			Max. Vy	20	-39.17	4450.62	-8.85
			Max. Vx	14	38.66	7.42	-4441.33
			Max. Torque	10			-4.47

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	33	96.23	0.00	-7.88
	Max. H_x	21	45.98	39.14	-0.04
	Max. H_z	3	45.98	-0.04	38.63
	Max. M_x	2	4437.56	-0.04	38.63
	Max. M_z	8	4449.74	-39.14	0.04
	Max. Torsion	22	4.46	33.50	19.29
	Min. Vert	7	45.98	-33.51	19.35
	Min. H_x	8	61.31	-39.14	0.04
	Min. H_z	15	45.98	0.04	-38.63
	Min. M_x	14	-4441.33	0.04	-38.63
	Min. M_z	20	-4450.62	39.14	-0.04
	Min. Torsion	10	-4.47	-33.50	-19.29

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	51.09	0.00	0.00	1.50	0.34	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	61.31	0.04	-38.63	-4437.56	-6.60	-2.56
0.9 Dead+1.0 Wind 0 deg - No Ice	45.98	0.04	-38.63	-4385.25	-6.62	-2.55
1.2 Dead+1.0 Wind 30 deg - No Ice	61.31	20.00	-34.56	-3939.99	-2282.85	-0.38
0.9 Dead+1.0 Wind 30 deg - No Ice	45.98	20.00	-34.56	-3893.82	-2255.92	-0.37
1.2 Dead+1.0 Wind 60 deg - No Ice	61.31	33.51	-19.35	-2223.89	-3853.54	1.90
0.9 Dead+1.0 Wind 60 deg - No Ice	45.98	33.51	-19.35	-2197.90	-3807.81	1.90
1.2 Dead+1.0 Wind 90 deg - No Ice	61.31	39.14	-0.04	-5.17	-4449.74	3.68
0.9 Dead+1.0 Wind 90 deg - No Ice	45.98	39.14	-0.04	-5.55	-4396.96	3.67
1.2 Dead+1.0 Wind 120 deg - No Ice	61.31	33.50	19.29	2215.65	-3846.90	4.47
0.9 Dead+1.0 Wind 120 deg - No Ice	45.98	33.50	19.29	2188.85	-3801.25	4.45
1.2 Dead+1.0 Wind 150 deg - No Ice	61.31	19.49	33.77	3845.65	-2218.16	4.06
0.9 Dead+1.0 Wind 150 deg - No Ice	45.98	19.49	33.77	3799.48	-2191.90	4.04
1.2 Dead+1.0 Wind 180 deg - No Ice	61.31	-0.04	38.63	4441.33	7.42	2.56
0.9 Dead+1.0 Wind 180 deg - No Ice	45.98	-0.04	38.63	4388.04	7.21	2.55
1.2 Dead+1.0 Wind 210 deg - No Ice	61.31	-20.00	34.56	3943.76	2283.71	0.38

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
0.9 Dead+1.0 Wind 210 deg - No Ice	45.98	-20.00	34.56	3896.61	2256.56	0.37
1.2 Dead+1.0 Wind 240 deg - No Ice	61.31	-33.51	19.35	2227.63	3854.44	-1.91
0.9 Dead+1.0 Wind 240 deg - No Ice	45.98	-33.51	19.35	2200.66	3808.47	-1.90
1.2 Dead+1.0 Wind 270 deg - No Ice	61.31	-39.14	0.04	8.85	4450.62	-3.68
0.9 Dead+1.0 Wind 270 deg - No Ice	45.98	-39.14	0.04	8.28	4397.60	-3.67
1.2 Dead+1.0 Wind 300 deg - No Ice	61.31	-33.50	-19.29	-2211.97	3847.72	-4.46
0.9 Dead+1.0 Wind 300 deg - No Ice	45.98	-33.50	-19.29	-2186.13	3801.85	-4.45
1.2 Dead+1.0 Wind 330 deg - No Ice	61.31	-19.49	-33.77	-3841.93	2218.95	-4.05
0.9 Dead+1.0 Wind 330 deg - No Ice	45.98	-19.49	-33.77	-3796.73	2192.48	-4.04
1.2 Dead+1.0 Ice+1.0 Temp	96.23	-0.00	0.00	6.06	2.36	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	96.23	0.00	-7.88	-954.04	2.04	-0.55
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	96.23	3.94	-6.82	-825.58	-477.38	-0.10
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	96.23	6.82	-3.94	-474.24	-828.24	0.38
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	96.23	7.87	-0.00	5.86	-956.52	0.75
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	96.23	6.82	3.94	486.07	-827.84	0.93
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	96.23	3.93	6.82	837.71	-476.69	0.85
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	96.23	-0.00	7.88	966.57	2.85	0.55
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	96.23	-3.94	6.82	838.12	482.28	0.10
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	96.23	-6.82	3.94	486.77	833.14	-0.38
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	96.23	-7.87	0.00	6.67	961.42	-0.75
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	96.23	-6.82	-3.94	-473.54	832.74	-0.93
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	96.23	-3.93	-6.82	-825.18	481.58	-0.85
Dead+Wind 0 deg - Service	51.09	0.01	-7.75	-884.14	-1.03	-0.52
Dead+Wind 30 deg - Service	51.09	4.01	-6.93	-784.96	-455.22	-0.08
Dead+Wind 60 deg - Service	51.09	6.72	-3.88	-442.50	-768.55	0.39
Dead+Wind 90 deg - Service	51.09	7.85	-0.01	0.17	-887.50	0.75
Dead+Wind 120 deg - Service	51.09	6.72	3.87	443.24	-767.21	0.92
Dead+Wind 150 deg - Service	51.09	3.91	6.78	768.44	-442.26	0.83
Dead+Wind 180 deg - Service	51.09	-0.01	7.75	887.28	1.76	0.52
Dead+Wind 210 deg - Service	51.09	-4.01	6.93	788.09	455.95	0.08
Dead+Wind 240 deg - Service	51.09	-6.72	3.88	445.63	769.29	-0.39
Dead+Wind 270 deg - Service	51.09	-7.85	0.01	2.97	888.23	-0.75
Dead+Wind 300 deg - Service	51.09	-6.72	-3.87	-440.11	767.94	-0.92
Dead+Wind 330 deg - Service	51.09	-3.91	-6.78	-765.30	442.99	-0.83

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.00	-51.09	0.00	0.00	51.09	0.00	0.000%
2	0.04	-61.31	-38.63	-0.04	61.31	38.63	0.000%
3	0.04	-45.98	-38.63	-0.04	45.98	38.63	0.000%
4	20.00	-61.31	-34.56	-20.00	61.31	34.56	0.000%
5	20.00	-45.98	-34.56	-20.00	45.98	34.56	0.000%
6	33.51	-61.31	-19.35	-33.51	61.31	19.35	0.000%
7	33.51	-45.98	-19.35	-33.51	45.98	19.35	0.000%
8	39.14	-61.31	-0.04	-39.14	61.31	0.04	0.000%
9	39.14	-45.98	-0.04	-39.14	45.98	0.04	0.000%
10	33.50	-61.31	19.29	-33.50	61.31	-19.29	0.000%
11	33.50	-45.98	19.29	-33.50	45.98	-19.29	0.000%
12	19.49	-61.31	33.77	-19.49	61.31	-33.77	0.000%
13	19.49	-45.98	33.77	-19.49	45.98	-33.77	0.000%
14	-0.04	-61.31	38.63	0.04	61.31	-38.63	0.000%
15	-0.04	-45.98	38.63	0.04	45.98	-38.63	0.000%
16	-20.00	-61.31	34.56	20.00	61.31	-34.56	0.000%
17	-20.00	-45.98	34.56	20.00	45.98	-34.56	0.000%
18	-33.51	-61.31	19.35	33.51	61.31	-19.35	0.000%
19	-33.51	-45.98	19.35	33.51	45.98	-19.35	0.000%
20	-39.14	-61.31	0.04	39.14	61.31	-0.04	0.000%
21	-39.14	-45.98	0.04	39.14	45.98	-0.04	0.000%
22	-33.50	-61.31	-19.29	33.50	61.31	19.29	0.000%
23	-33.50	-45.98	-19.29	33.50	45.98	19.29	0.000%
24	-19.49	-61.31	-33.77	19.49	61.31	33.77	0.000%
25	-19.49	-45.98	-33.77	19.49	45.98	33.77	0.000%
26	0.00	-96.23	0.00	0.00	96.23	-0.00	0.000%
27	0.00	-96.23	-7.88	-0.00	96.23	7.88	0.000%
28	3.94	-96.23	-6.82	-3.94	96.23	6.82	0.000%
29	6.82	-96.23	-3.94	-6.82	96.23	3.94	0.000%
30	7.87	-96.23	-0.00	-7.87	96.23	0.00	0.000%
31	6.82	-96.23	3.94	-6.82	96.23	-3.94	0.000%
32	3.93	-96.23	6.82	-3.93	96.23	-6.82	0.000%
33	-0.00	-96.23	7.88	0.00	96.23	-7.88	0.000%
34	-3.94	-96.23	6.82	3.94	96.23	-6.82	0.000%
35	-6.82	-96.23	3.94	6.82	96.23	-3.94	0.000%
36	-7.87	-96.23	0.00	7.87	96.23	-0.00	0.000%
37	-6.82	-96.23	-3.94	6.82	96.23	3.94	0.000%
38	-3.93	-96.23	-6.82	3.93	96.23	6.82	0.000%
39	0.01	-51.09	-7.75	-0.01	51.09	7.75	0.000%
40	4.01	-51.09	-6.93	-4.01	51.09	6.93	0.000%
41	6.72	-51.09	-3.88	-6.72	51.09	3.88	0.000%
42	7.85	-51.09	-0.01	-7.85	51.09	0.01	0.000%
43	6.72	-51.09	3.87	-6.72	51.09	-3.87	0.000%
44	3.91	-51.09	6.78	-3.91	51.09	-6.78	0.000%
45	-0.01	-51.09	7.75	0.01	51.09	-7.75	0.000%
46	-4.01	-51.09	6.93	4.01	51.09	-6.93	0.000%
47	-6.72	-51.09	3.88	6.72	51.09	-3.88	0.000%
48	-7.85	-51.09	0.01	7.85	51.09	-0.01	0.000%
49	-6.72	-51.09	-3.87	6.72	51.09	3.87	0.000%
50	-3.91	-51.09	-6.78	3.91	51.09	6.78	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	6	0.00000001	0.00007617
3	Yes	5	0.00000001	0.00069892
4	Yes	7	0.00000001	0.00007985
5	Yes	6	0.00000001	0.00050424
6	Yes	7	0.00000001	0.00007691
7	Yes	6	0.00000001	0.00048727
8	Yes	6	0.00000001	0.00011367
9	Yes	6	0.00000001	0.00003546
10	Yes	7	0.00000001	0.00008373

11	Yes	6	0.00000001	0.00053332
12	Yes	7	0.00000001	0.00007474
13	Yes	6	0.00000001	0.00047299
14	Yes	6	0.00000001	0.00009263
15	Yes	5	0.00000001	0.00084707
16	Yes	7	0.00000001	0.00008074
17	Yes	6	0.00000001	0.00050993
18	Yes	7	0.00000001	0.00008103
19	Yes	6	0.00000001	0.00051472
20	Yes	6	0.00000001	0.00013020
21	Yes	6	0.00000001	0.00004050
22	Yes	7	0.00000001	0.00007431
23	Yes	6	0.00000001	0.00047023
24	Yes	7	0.00000001	0.00008316
25	Yes	6	0.00000001	0.00052961
26	Yes	5	0.00000001	0.00021652
27	Yes	7	0.00000001	0.00019499
28	Yes	7	0.00000001	0.00024185
29	Yes	7	0.00000001	0.00024103
30	Yes	7	0.00000001	0.00019594
31	Yes	7	0.00000001	0.00025016
32	Yes	7	0.00000001	0.00024533
33	Yes	7	0.00000001	0.00019937
34	Yes	7	0.00000001	0.00025087
35	Yes	7	0.00000001	0.00025168
36	Yes	7	0.00000001	0.00019859
37	Yes	7	0.00000001	0.00024291
38	Yes	7	0.00000001	0.00024772
39	Yes	5	0.00000001	0.00009677
40	Yes	5	0.00000001	0.00046811
41	Yes	5	0.00000001	0.00042375
42	Yes	5	0.00000001	0.00013426
43	Yes	5	0.00000001	0.00054046
44	Yes	5	0.00000001	0.00040326
45	Yes	5	0.00000001	0.00010029
46	Yes	5	0.00000001	0.00048614
47	Yes	5	0.00000001	0.00049153
48	Yes	5	0.00000001	0.00013779
49	Yes	5	0.00000001	0.00039837
50	Yes	5	0.00000001	0.00052779

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 145	25.434	46	1.7151	0.0220
L2	145 - 140	23.648	46	1.6901	0.0168
L3	140 - 135	21.908	46	1.6284	0.0123
L4	135 - 133	20.250	46	1.5318	0.0087
L5	133 - 132.75	19.618	46	1.4823	0.0074
L6	132.75 - 127.75	19.541	46	1.4795	0.0073
L7	127.75 - 123.75	18.024	46	1.4151	0.0060
L8	123.75 - 123.5	16.865	46	1.3528	0.0051
L9	123.5 - 118.75	16.794	46	1.3486	0.0050
L10	118.75 - 118.5	15.477	46	1.2990	0.0045
L11	118.5 - 117	15.409	46	1.2969	0.0044
L12	117 - 116.75	15.003	46	1.2841	0.0043
L13	116.75 - 111.75	14.936	46	1.2812	0.0043
L14	111.75 - 106.75	13.627	46	1.2185	0.0038
L15	106.75 - 101.75	12.387	46	1.1501	0.0033
L16	101.75 - 95.1667	11.221	46	1.0768	0.0028
L17	99.5 - 94.5	10.721	46	1.0432	0.0026
L18	94.5 - 93.75	9.648	46	1.0034	0.0024
L19	93.75 - 93.5	9.491	46	0.9933	0.0024
L20	93.5 - 92.75	9.439	46	0.9904	0.0024
L21	92.75 - 92.5	9.284	46	0.9815	0.0023
L22	92.5 - 91.25	9.233	46	0.9791	0.0023

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L23	91.25 - 91	8.978	46	0.9668	0.0023
L24	91 - 89.25	8.927	46	0.9643	0.0023
L25	89.25 - 89	8.577	46	0.9472	0.0022
L26	89 - 85.75	8.528	46	0.9449	0.0022
L27	85.75 - 85.5	7.895	46	0.9143	0.0020
L28	85.5 - 80.5	7.847	46	0.9112	0.0020
L29	80.5 - 75.5	6.927	46	0.8472	0.0018
L30	75.5 - 70.5	6.074	46	0.7820	0.0016
L31	70.5 - 68.083	5.290	46	0.7155	0.0014
L32	68.083 - 67.833	4.935	46	0.6837	0.0013
L33	67.833 - 67	4.900	46	0.6806	0.0013
L34	67 - 66.75	4.782	46	0.6704	0.0012
L35	66.75 - 63.25	4.747	46	0.6679	0.0012
L36	63.25 - 63	4.270	46	0.6325	0.0011
L37	63 - 59.5	4.237	46	0.6303	0.0011
L38	59.5 - 59.25	3.787	46	0.5992	0.0011
L39	59.25 - 56.25	3.755	46	0.5971	0.0011
L40	56.25 - 56	3.388	46	0.5713	0.0010
L41	56 - 55.75	3.358	46	0.5689	0.0010
L42	55.75 - 50.75	3.329	46	0.5660	0.0010
L43	50.75 - 44.6667	2.768	46	0.5060	0.0008
L44	50 - 43.6667	2.689	46	0.4970	0.0008
L45	43.6667 - 38.6667	2.055	46	0.4539	0.0007
L46	38.6667 - 34.5	1.610	46	0.3958	0.0006
L47	34.5 - 34.25	1.286	46	0.3478	0.0005
L48	34.25 - 33	1.267	46	0.3455	0.0005
L49	33 - 32.75	1.178	46	0.3344	0.0005
L50	32.75 - 29.75	1.161	46	0.3321	0.0005
L51	29.75 - 29.5	0.961	46	0.3049	0.0005
L52	29.5 - 25	0.945	46	0.3027	0.0004
L53	25 - 24.75	0.678	46	0.2634	0.0004
L54	24.75 - 19.75	0.664	46	0.2607	0.0004
L55	19.75 - 14.75	0.420	46	0.2065	0.0003
L56	14.75 - 14.5	0.232	46	0.1520	0.0002
L57	14.5 - 14.25	0.225	46	0.1493	0.0002
L58	14.25 - 12.25	0.217	46	0.1466	0.0002
L59	12.25 - 12	0.160	46	0.1252	0.0002
L60	12 - 11.5	0.153	46	0.1224	0.0002
L61	11.5 - 11.25	0.141	46	0.1168	0.0002
L62	11.25 - 9.25	0.135	46	0.1144	0.0002
L63	9.25 - 9	0.091	46	0.0947	0.0001
L64	9 - 4.5	0.086	46	0.0921	0.0001
L65	4.5 - 4.25	0.021	46	0.0453	0.0001
L66	4.25 - 3	0.019	46	0.0428	0.0001
L67	3 - 2.75	0.010	46	0.0304	0.0000
L68	2.75 - 0	0.008	46	0.0279	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.0000	KS24019-L112A	46	25.434	1.7151	0.0220	6481
138.0000	(2) LGP21903	46	21.233	1.5974	0.0109	3081
128.0000	KRY 112 144/1	46	18.099	1.4187	0.0061	4059

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 145	126.808	16	8.5423	0.1088
L2	145 - 140	117.961	16	8.4269	0.0829
L3	140 - 135	109.333	16	8.1268	0.0609
L4	135 - 133	101.097	16	7.6517	0.0427
L5	133 - 132.75	97.958	16	7.4070	0.0363
L6	132.75 - 127.75	97.572	16	7.3930	0.0360
L7	127.75 - 123.75	90.027	16	7.0738	0.0296
L8	123.75 - 123.5	84.252	16	6.7645	0.0250
L9	123.5 - 118.75	83.900	16	6.7438	0.0247
L10	118.75 - 118.5	77.337	16	6.4970	0.0219
L11	118.5 - 117	76.998	16	6.4865	0.0218
L12	117 - 116.75	74.978	16	6.4225	0.0212
L13	116.75 - 111.75	74.643	16	6.4082	0.0210
L14	111.75 - 106.75	68.117	16	6.0956	0.0184
L15	106.75 - 101.75	61.930	16	5.7545	0.0160
L16	101.75 - 95.1667	56.111	16	5.3888	0.0138
L17	99.5 - 94.5	53.617	16	5.2212	0.0129
L18	94.5 - 93.75	48.255	16	5.0224	0.0119
L19	93.75 - 93.5	47.472	16	4.9721	0.0117
L20	93.5 - 92.75	47.212	16	4.9573	0.0116
L21	92.75 - 92.5	46.439	16	4.9132	0.0114
L22	92.5 - 91.25	46.182	16	4.9010	0.0114
L23	91.25 - 91	44.910	16	4.8396	0.0111
L24	91 - 89.25	44.658	16	4.8271	0.0110
L25	89.25 - 89	42.907	16	4.7415	0.0107
L26	89 - 85.75	42.660	16	4.7300	0.0106
L27	85.75 - 85.5	39.499	16	4.5770	0.0100
L28	85.5 - 80.5	39.260	16	4.5614	0.0100
L29	80.5 - 75.5	34.658	16	4.2417	0.0088
L30	75.5 - 70.5	30.394	16	3.9153	0.0077
L31	70.5 - 68.083	26.473	16	3.5827	0.0067
L32	68.083 - 67.833	24.702	16	3.4235	0.0063
L33	67.833 - 67	24.523	16	3.4080	0.0062
L34	67 - 66.75	23.934	16	3.3568	0.0061
L35	66.75 - 63.25	23.758	16	3.3443	0.0061
L36	63.25 - 63	21.374	16	3.1670	0.0056
L37	63 - 59.5	21.209	16	3.1561	0.0056
L38	59.5 - 59.25	18.954	16	3.0008	0.0052
L39	59.25 - 56.25	18.797	16	2.9902	0.0051
L40	56.25 - 56	16.961	16	2.8611	0.0048
L41	56 - 55.75	16.811	16	2.8491	0.0048
L42	55.75 - 50.75	16.663	16	2.8342	0.0048
L43	50.75 - 44.6667	13.854	16	2.5340	0.0041
L44	50 - 43.6667	13.460	16	2.4888	0.0040
L45	43.6667 - 38.6667	10.286	16	2.2729	0.0036
L46	38.6667 - 34.5	8.060	16	1.9822	0.0030
L47	34.5 - 34.25	6.436	16	1.7414	0.0026
L48	34.25 - 33	6.345	16	1.7301	0.0026
L49	33 - 32.75	5.899	16	1.6743	0.0025
L50	32.75 - 29.75	5.812	16	1.6631	0.0024
L51	29.75 - 29.5	4.810	16	1.5266	0.0022
L52	29.5 - 25	4.731	16	1.5158	0.0022
L53	25 - 24.75	3.395	16	1.3188	0.0019
L54	24.75 - 19.75	3.327	16	1.3053	0.0018
L55	19.75 - 14.75	2.103	16	1.0338	0.0014
L56	14.75 - 14.5	1.163	16	0.7607	0.0010
L57	14.5 - 14.25	1.124	16	0.7473	0.0010
L58	14.25 - 12.25	1.085	16	0.7338	0.0010
L59	12.25 - 12	0.800	16	0.6266	0.0008
L60	12 - 11.5	0.768	16	0.6126	0.0008
L61	11.5 - 11.25	0.705	16	0.5849	0.0008
L62	11.25 - 9.25	0.675	16	0.5727	0.0008
L63	9.25 - 9	0.456	16	0.4738	0.0006
L64	9 - 4.5	0.431	16	0.4611	0.0006
L65	4.5 - 4.25	0.107	16	0.2267	0.0003
L66	4.25 - 3	0.096	16	0.2142	0.0003
L67	3 - 2.75	0.048	16	0.1523	0.0002
L68	2.75 - 0	0.040	16	0.1398	0.0002

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

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.0000	KS24019-L112A	16	126.808	8.5423	0.1088	1413
138.0000	(2) LGP21903	16	105.980	7.9748	0.0536	651
128.0000	KRY 112 144/1	16	90.397	7.0918	0.0299	843

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	150 - 145 (1)	TP16.9374x16x0.1875	5.0000	0.0000	0.0	10.1127	-2.34	591.60	0.004
L2	145 - 140 (2)	TP17.8748x16.9374x0.1875	5.0000	0.0000	0.0	10.6787	-2.58	624.70	0.004
L3	140 - 135 (3)	TP18.8122x17.8748x0.1875	5.0000	0.0000	0.0	11.2446	-5.35	657.81	0.008
L4	135 - 133 (4)	TP19.1871x18.8122x0.1875	2.0000	0.0000	0.0	11.4710	-5.53	671.05	0.008
L5	133 - 132.75 (5)	TP19.234x19.1871x0.45	0.2500	0.0000	0.0	27.2180	-5.58	1592.25	0.004
L6	132.75 - 127.75 (6)	TP20.1714x19.234x0.4375	5.0000	0.0000	0.0	27.8001	-10.21	1626.31	0.006
L7	127.75 - 123.75 (7)	TP20.9213x20.1714x0.425	4.0000	0.0000	0.0	28.0492	-10.84	1640.88	0.007
L8	123.75 - 123.5 (8)	TP20.9681x20.9213x0.425	0.2500	0.0000	0.0	28.1133	-10.90	1644.63	0.007
L9	123.5 - 118.75 (9)	TP21.8587x20.9681x0.7625	4.7500	0.0000	0.0	51.7964	-11.89	3030.09	0.004
L10	118.75 - 118.5 (10)	TP21.9055x21.8587x1.0375	0.2500	0.0000	0.0	69.7149	-11.98	4078.32	0.003
L11	118.5 - 117 (11)	TP22.1868x21.9055x1.0125	1.5000	0.0000	0.0	69.0334	-12.38	4038.45	0.003
L12	117 - 116.75 (12)	TP22.2336x22.1868x0.75	0.2500	0.0000	0.0	51.8829	-12.45	3035.15	0.004
L13	116.75 - 111.75 (13)	TP23.171x22.2336x0.7125	5.0000	0.0000	0.0	51.5254	-13.59	3014.24	0.005
L14	111.75 - 106.75 (14)	TP24.1084x23.171x0.6875	5.0000	0.0000	0.0	51.8480	-14.78	3033.11	0.005
L15	106.75 - 101.75 (15)	TP25.0458x24.1084x0.6625	5.0000	0.0000	0.0	52.0156	-16.00	3042.91	0.005
L16	101.75 - 95.1667 (16)	TP26.28x25.0458x0.6625	6.5833	0.0000	0.0	52.9155	-16.56	3095.56	0.005
L17	95.1667 - 94.5 (17)	TP26.0307x25.0926x0.7875	5.0000	0.0000	0.0	64.0104	-18.79	3744.61	0.005
L18	94.5 - 93.75 (18)	TP26.1714x26.0307x0.7875	0.7500	0.0000	0.0	64.3672	-19.01	3765.48	0.005
L19	93.75 - 93.5 (19)	TP26.2183x26.1714x0.9125	0.2500	0.0000	0.0	74.3547	-19.10	4349.75	0.004
L20	93.5 - 92.75 (20)	TP26.359x26.2183x0.9125	0.7500	0.0000	0.0	74.7681	-19.33	4373.94	0.004
L21	92.75 - 92.5	TP26.4059x26.359x1.137	0.2500	0.0000	0.0	92.551	-19.44	5414.28	0.004

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
	(21)	5				8			
L22	92.5 - 91.25	TP26.6404x26.4059x1.11	1.2500	0.0000	0.0	91.447	-19.89	5349.67	0.004
	(22)	25				3			
L23	91.25 - 91	TP26.6873x26.6404x1.11	0.2500	0.0000	0.0	91.615	-20.00	5359.50	0.004
	(23)	25				4			
L24	91 - 89.25	TP27.0156x26.6873x1.11	1.7500	0.0000	0.0	92.791	-20.64	5428.30	0.004
	(24)	25				5			
L25	89.25 - 89	TP27.0625x27.0156x1.21	0.2500	0.0000	0.0	100.92	-20.76	5904.11	0.004
	(25)	25				50			
L26	89 - 85.75	TP27.6723x27.0625x1.18	3.2500	0.0000	0.0	101.27	-22.08	5924.36	0.004
	(26)	75				10			
L27	85.75 - 85.5	TP27.7192x27.6723x0.86	0.2500	0.0000	0.0	74.587	-22.17	4363.38	0.005
	(27)	25				7			
L28	85.5 - 80.5	TP28.6572x27.7192x0.83	5.0000	0.0000	0.0	75.022	-23.81	4388.84	0.005
	(28)	75				9			
L29	80.5 - 75.5	TP29.5953x28.6572x0.81	5.0000	0.0000	0.0	75.303	-25.49	4405.23	0.006
	(29)	25				0			
L30	75.5 - 70.5	TP30.5334x29.5953x0.78	5.0000	0.0000	0.0	75.428	-27.21	4412.54	0.006
	(30)	75				1			
L31	70.5 - 68.083	TP30.9868x30.5334x0.78	2.4170	0.0000	0.0	76.577	-28.04	4479.81	0.006
	(31)	75				9			
L32	68.083 -	TP31.0337x30.9868x0.83	0.2500	0.0000	0.0	81.431	-28.15	4763.75	0.006
	67.833 (32)	75				7			
L33	67.833 - 67	TP31.19x31.0337x0.8375	0.8330	0.0000	0.0	81.853	-28.45	4788.41	0.006
	(33)					1			
L34	67 - 66.75	TP31.2369x31.19x1.0625	0.2500	0.0000	0.0	103.23	-28.57	6039.20	0.005
	(34)					40			
L35	66.75 - 63.25	TP31.8935x31.2369x1.03	3.5000	0.0000	0.0	103.08	-30.07	6030.32	0.005
	(35)	75				20			
L36	63.25 - 63	TP31.9404x31.8935x1.21	0.2500	0.0000	0.0	119.97	-30.21	7018.22	0.004
	(36)	25				00			
L37	63 - 59.5 (37)	TP32.5971x31.9404x1.18	3.5000	0.0000	0.0	120.10	-31.91	7025.99	0.005
		75				20			
L38	59.5 - 59.25	TP32.644x32.5971x1.237	0.2500	0.0000	0.0	125.14	-32.05	7321.10	0.004
	(38)	5				70			
L39	59.25 - 56.25	TP33.2068x32.644x1.212	3.0000	0.0000	0.0	124.91	-33.56	7307.46	0.005
	(39)	5				40			
L40	56.25 - 56	TP33.2537x33.2068x1.06	0.2500	0.0000	0.0	110.13	-33.68	6442.85	0.005
	(40)	25				40			
L41	56 - 55.75	TP33.3006x33.2537x0.83	0.2500	0.0000	0.0	87.545	-33.78	5121.38	0.007
	(41)	75				0			
L42	55.75 - 50.75	TP34.2387x33.3006x0.82	5.0000	0.0000	0.0	88.763	-35.73	5192.66	0.007
	(42)	5				5			
L43	50.75 -	TP35.38x34.2387x0.8125	6.0833	0.0000	0.0	87.819	-36.03	5137.44	0.007
	44.6667 (43)					4			
L44	44.6667 -	TP34.942x33.7544x0.875	6.3333	0.0000	0.0	95.983	-40.43	5615.05	0.007
	43.6667 (44)					7			
L45	43.6667 -	TP35.8795x34.942x0.862	5.0000	0.0000	0.0	97.251	-42.59	5689.19	0.007
	38.6667 (45)	5				1			
L46	38.6667 -	TP36.6608x35.8795x0.85	4.1667	0.0000	0.0	98.014	-44.40	5733.84	0.008
	34.5 (46)					3			
L47	34.5 - 34.25	TP36.7077x36.6608x1.1	0.2500	0.0000	0.0	126.12	-44.55	7378.17	0.006
	(47)					30			
L48	34.25 - 33	TP36.9421x36.7077x1.1	1.2500	0.0000	0.0	126.95	-45.20	7426.74	0.006
	(48)					30			
L49	33 - 32.75	TP36.989x36.9421x1.1	0.2500	0.0000	0.0	127.11	-45.35	7436.45	0.006
	(49)					90			
L50	32.75 - 29.75	TP37.5515x36.989x1.075	3.0000	0.0000	0.0	126.26	-46.94	7386.41	0.006
	(50)					30			
L51	29.75 - 29.5	TP37.5984x37.5515x1.12	0.2500	0.0000	0.0	132.12	-47.09	7729.31	0.006
	(51)	5				50			
L52	29.5 - 25 (52)	TP38.4422x37.5984x1.1	4.5000	0.0000	0.0	132.26	-49.56	7737.57	0.006
						60			
L53	25 - 24.75	TP38.4891x38.4422x0.86	0.2500	0.0000	0.0	104.49	-49.69	6113.16	0.008
	(53)	25				80			
L54	24.75 - 19.75	TP39.4266x38.4891x0.85	5.0000	0.0000	0.0	105.58	-52.00	6176.68	0.008
	(54)					40			
L55	19.75 - 14.75	TP40.3642x39.4266x0.82	5.0000	0.0000	0.0	105.03	-54.36	6144.60	0.009
	(55)	5				60			

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L56	14.75 - 14.5 (56)	TP40.4111x40.3642x0.825	0.2500	0.0000	0.0	105.1600	-54.49	6151.88	0.009
L57	14.5 - 14.25 (57)	TP40.458x40.4111x0.825	0.2500	0.0000	0.0	105.2850	-54.61	6159.17	0.009
L58	14.25 - 12.25 (58)	TP40.833x40.458x0.825	2.0000	0.0000	0.0	106.2810	-55.55	6217.45	0.009
L59	12.25 - 12 (59)	TP40.8799x40.833x0.7875	0.2500	0.0000	0.0	101.6640	-55.68	5947.36	0.009
L60	12 - 11.5 (60)	TP40.9736x40.8799x0.7875	0.5000	0.0000	0.0	101.9020	-55.92	5961.26	0.009
L61	11.5 - 11.25 (61)	TP41.0205x40.9736x0.9	0.2500	0.0000	0.0	116.2690	-56.05	6801.75	0.008
L62	11.25 - 9.25 (62)	TP41.3955x41.0205x0.8875	2.0000	0.0000	0.0	115.7620	-57.04	6772.06	0.008
L63	9.25 - 9 (63)	TP41.4424x41.3955x0.85	0.2500	0.0000	0.0	111.1010	-57.17	6499.43	0.009
L64	9 - 4.5 (64)	TP42.2862x41.4424x0.825	4.5000	0.0000	0.0	108.4600	-57.70	6344.94	0.009
L65	4.5 - 4.25 (65)	TP42.3331x42.2862x0.85	0.2500	0.0000	0.0	113.4110	-59.23	6634.54	0.009
L66	4.25 - 3 (66)	TP42.5675x42.3331x0.85	1.2500	0.0000	0.0	113.5390	-59.37	6642.04	0.009
L67	3 - 2.75 (67)	TP42.6143x42.5675x0.8375	0.2500	0.0000	0.0	112.5350	-59.95	6583.31	0.009
L68	2.75 - 0 (68)	TP43.13x42.6143x0.825	2.7500	0.0000	0.0	111.0130	-60.08	6494.28	0.009

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	150 - 145 (1)	TP16.9374x16x0.1875	55.37	246.96	0.224	0.00	246.96	0.000
L2	145 - 140 (2)	TP17.8748x16.9374x0.1875	112.42	270.48	0.416	0.00	270.48	0.000
L3	140 - 135 (3)	TP18.8122x17.8748x0.1875	202.94	294.47	0.689	0.00	294.47	0.000
L4	135 - 133 (4)	TP19.1871x18.8122x0.1875	239.11	304.18	0.786	0.00	304.18	0.000
L5	133 - 132.75 (5)	TP19.234x19.1871x0.45	243.65	755.73	0.322	0.00	755.73	0.000
L6	132.75 - 127.75 (6)	TP20.1714x19.234x0.4375	337.49	812.34	0.415	0.00	812.34	0.000
L7	127.75 - 123.75 (7)	TP20.9213x20.1714x0.425	438.04	852.48	0.514	0.00	852.48	0.000
L8	123.75 - 123.5 (8)	TP20.9681x20.9213x0.425	444.38	856.42	0.519	0.00	856.42	0.000
L9	123.5 - 118.75 (9)	TP21.8587x20.9681x0.7625	566.35	1596.19	0.355	0.00	1596.19	0.000
L10	118.75 - 118.5 (10)	TP21.9055x21.8587x1.0375	572.86	2097.67	0.273	0.00	2097.67	0.000
L11	118.5 - 117 (11)	TP22.1868x21.9055x1.0125	612.14	2111.46	0.290	0.00	2111.46	0.000
L12	117 - 116.75 (12)	TP22.2336x22.1868x0.75	618.72	1630.16	0.380	0.00	1630.16	0.000
L13	116.75 - 111.75 (13)	TP23.171x22.2336x0.7125	751.98	1697.62	0.443	0.00	1697.62	0.000
L14	111.75 - 106.75 (14)	TP24.1084x23.171x0.6875	888.51	1785.55	0.498	0.00	1785.55	0.000
L15	106.75 - 101.75 (15)	TP25.0458x24.1084x0.6625	1028.26	1868.89	0.550	0.00	1868.89	0.000
L16	101.75 - 95.1667 (16)	TP26.28x25.0458x0.6625	1092.18	1934.99	0.564	0.00	1934.99	0.000
L17	95.1667 - 94.5 (17)	TP26.0307x25.0926x0.7875	1236.92	2371.67	0.522	0.00	2371.67	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 $\frac{M_{uy}}{\phi M_{ny}}$
L18	94.5 - 93.75 (18)	TP26.1714x26.0307x0.7875	1258.95	2398.58	0.525	0.00	2398.58	0.000
L19	93.75 - 93.5 (19)	TP26.2183x26.1714x0.9125	1266.31	2748.81	0.461	0.00	2748.81	0.000
L20	93.5 - 92.75 (20)	TP26.359x26.2183x0.9125	1288.43	2780.00	0.463	0.00	2780.00	0.000
L21	92.75 - 92.5 (21)	TP26.4059x26.359x1.1375	1295.83	3387.20	0.383	0.00	3387.20	0.000
L22	92.5 - 91.25 (22)	TP26.6404x26.4059x1.1125	1332.93	3385.81	0.394	0.00	3385.81	0.000
L23	91.25 - 91 (23)	TP26.6873x26.6404x1.1125	1340.38	3398.52	0.394	0.00	3398.52	0.000
L24	91 - 89.25 (24)	TP27.0156x26.6873x1.1125	1392.76	3488.18	0.399	0.00	3488.18	0.000
L25	89.25 - 89 (25)	TP27.0625x27.0156x1.2125	1400.28	3771.84	0.371	0.00	3771.84	0.000
L26	89 - 85.75 (26)	TP27.6723x27.0625x1.1875	1498.83	3885.39	0.386	0.00	3885.39	0.000
L27	85.75 - 85.5 (27)	TP27.7192x27.6723x0.8625	1506.47	2937.60	0.513	0.00	2937.60	0.000
L28	85.5 - 80.5 (28)	TP28.6572x27.7192x0.8375	1661.02	3066.67	0.542	0.00	3066.67	0.000
L29	80.5 - 75.5 (29)	TP29.5953x28.6572x0.8125	1818.74	3190.48	0.570	0.00	3190.48	0.000
L30	75.5 - 70.5 (30)	TP30.5334x29.5953x0.7875	1979.57	3308.36	0.598	0.00	3308.36	0.000
L31	70.5 - 68.083 (31)	TP30.9868x30.5334x0.7875	2058.40	3411.32	0.603	0.00	3411.32	0.000
L32	68.083 - 67.833 (32)	TP31.0337x30.9868x0.8375	2066.60	3621.31	0.571	0.00	3621.31	0.000
L33	67.833 - 67 (33)	TP31.19x31.0337x0.8375	2093.96	3659.40	0.572	0.00	3659.40	0.000
L34	67 - 66.75 (34)	TP31.2369x31.19x1.0625	2102.19	4554.43	0.462	0.00	4554.43	0.000
L35	66.75 - 63.25 (35)	TP31.8935x31.2369x1.0375	2218.25	4657.62	0.476	0.00	4657.62	0.000
L36	63.25 - 63 (36)	TP31.9404x31.8935x1.2125	2226.60	5367.83	0.415	0.00	5367.83	0.000
L37	63 - 59.5 (37)	TP32.5971x31.9404x1.1875	2344.41	5501.73	0.426	0.00	5501.73	0.000
L38	59.5 - 59.25 (38)	TP32.644x32.5971x1.2375	2352.88	5723.44	0.411	0.00	5723.44	0.000
L39	59.25 - 56.25 (39)	TP33.2068x32.644x1.2125	2455.28	5828.15	0.421	0.00	5828.15	0.000
L40	56.25 - 56 (40)	TP33.2537x33.2068x1.0625	2463.87	5194.68	0.474	0.00	5194.68	0.000
L41	56 - 55.75 (41)	TP33.3006x33.2537x0.8375	2472.46	4193.35	0.590	0.00	4193.35	0.000
L42	55.75 - 50.75 (42)	TP34.2387x33.3006x0.825	2645.86	4380.94	0.604	0.00	4380.94	0.000
L43	50.75 - 44.6667 (43)	TP35.38x34.2387x0.8125	2672.12	4356.28	0.613	0.00	4356.28	0.000
L44	44.6667 - 43.6667 (44)	TP34.942x33.7544x0.875	2897.00	4825.23	0.600	0.00	4825.23	0.000
L45	43.6667 - 38.6667 (45)	TP35.8795x34.942x0.8625	3077.96	5030.46	0.612	0.00	5030.46	0.000
L46	38.6667 - 34.5 (46)	TP36.6608x35.8795x0.85	3230.70	5189.40	0.623	0.00	5189.40	0.000
L47	34.5 - 34.25 (47)	TP36.7077x36.6608x1.1	3239.93	6593.63	0.491	0.00	6593.63	0.000
L48	34.25 - 33 (48)	TP36.9421x36.7077x1.1	3286.13	6682.03	0.492	0.00	6682.03	0.000
L49	33 - 32.75 (49)	TP36.989x36.9421x1.1	3295.38	6699.79	0.492	0.00	6699.79	0.000
L50	32.75 - 29.75 (50)	TP37.5515x36.989x1.075	3407.03	6771.40	0.503	0.00	6771.40	0.000
L51	29.75 - 29.5 (51)	TP37.5984x37.5515x1.125	3416.38	7075.70	0.483	0.00	7075.70	0.000
L52	29.5 - 25 (52)	TP38.4422x37.5984x1.1	3585.72	7261.75	0.494	0.00	7261.75	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 $\frac{M_{uy}}{\phi M_{ny}}$
L53	25 - 24.75 (53)	TP38.4891x38.4422x0.8625	3595.19	5817.86	0.618	0.00	5817.86	0.000
L54	24.75 - 19.75 (54)	TP39.4266x38.4891x0.85	3785.68	6031.97	0.628	0.00	6031.97	0.000
L55	19.75 - 14.75 (55)	TP40.3642x39.4266x0.825	3978.19	6157.42	0.646	0.00	6157.42	0.000
L56	14.75 - 14.5 (56)	TP40.4111x40.3642x0.825	3987.87	6172.17	0.646	0.00	6172.17	0.000
L57	14.5 - 14.25 (57)	TP40.458x40.4111x0.825	3997.54	6186.95	0.646	0.00	6186.95	0.000
L58	14.25 - 12.25 (58)	TP40.833x40.458x0.825	4075.15	6305.80	0.646	0.00	6305.80	0.000
L59	12.25 - 12 (59)	TP40.8799x40.833x0.7875	4084.88	6050.39	0.675	0.00	6050.39	0.000
L60	12 - 11.5 (60)	TP40.9736x40.8799x0.7875	4104.33	6078.99	0.675	0.00	6078.99	0.000
L61	11.5 - 11.25 (61)	TP41.0205x40.9736x0.9	4114.07	6905.54	0.596	0.00	6905.54	0.000
L62	11.25 - 9.25 (62)	TP41.3955x41.0205x0.8875	4192.12	6945.37	0.604	0.00	6945.37	0.000
L63	9.25 - 9 (63)	TP41.4424x41.3955x0.85	4201.90	6685.98	0.628	0.00	6685.98	0.000
L64	9 - 4.5 (64)	TP42.2862x41.4424x0.825	4245.94	6569.72	0.646	0.00	6569.72	0.000
L65	4.5 - 4.25 (65)	TP42.3331x42.2862x0.85	4378.66	6969.75	0.628	0.00	6969.75	0.000
L66	4.25 - 3 (66)	TP42.5675x42.3331x0.85	4388.52	6985.68	0.628	0.00	6985.68	0.000
L67	3 - 2.75 (67)	TP42.6143x42.5675x0.8375	4437.95	6968.00	0.637	0.00	6968.00	0.000
L68	2.75 - 0 (68)	TP43.13x42.6143x0.825	4447.86	6885.76	0.646	0.00	6885.76	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	150 - 145 (1)	TP16.9374x16x0.1875	11.20	177.48	0.063	2.18	261.49	0.008
L2	145 - 140 (2)	TP17.8748x16.9374x0.1875	11.63	187.41	0.062	2.18	291.58	0.007
L3	140 - 135 (3)	TP18.8122x17.8748x0.1875	18.00	197.34	0.091	1.93	323.30	0.006
L4	135 - 133 (4)	TP19.1871x18.8122x0.1875	18.17	201.32	0.090	1.93	336.45	0.006
L5	133 - 132.75 (5)	TP19.234x19.1871x0.45	18.19	477.68	0.038	1.93	789.26	0.002
L6	132.75 - 127.75 (6)	TP20.1714x19.234x0.4375	24.95	487.89	0.051	1.93	846.91	0.002
L7	127.75 - 123.75 (7)	TP20.9213x20.1714x0.425	25.33	492.26	0.051	1.93	887.51	0.002
L8	123.75 - 123.5 (8)	TP20.9681x20.9213x0.425	25.35	493.39	0.051	1.93	891.57	0.002
L9	123.5 - 118.75 (9)	TP21.8587x20.9681x0.7625	26.04	909.03	0.029	0.38	1686.87	0.000
L10	118.75 - 118.5 (10)	TP21.9055x21.8587x1.0375	26.07	1223.50	0.021	0.38	2245.87	0.000
L11	118.5 - 117 (11)	TP22.1868x21.9055x1.0125	26.29	1211.54	0.022	0.38	2256.54	0.000
L12	117 - 116.75 (12)	TP22.2336x22.1868x0.75	26.32	910.55	0.029	0.38	1720.72	0.000
L13	116.75 - 111.75 (13)	TP23.171x22.2336x0.7125	26.98	904.27	0.030	0.38	1786.40	0.000
L14	111.75 - 106.75 (14)	TP24.1084x23.171x0.6875	27.63	909.93	0.030	0.38	1874.62	0.000
L15	106.75 - 101.75 (15)	TP25.0458x24.1084x0.6625	28.27	912.87	0.031	0.38	1957.96	0.000
L16	101.75 - 95.1667 (16)	TP26.28x25.0458x0.6625	28.55	928.67	0.031	0.38	2026.28	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 $\frac{T_u}{\phi T_n}$
L17	95.1667 - 94.5 (17)	TP26.0307x25.0926x0.7875	29.33	1123.38	0.026	0.38	2494.43	0.000
L18	94.5 - 93.75 (18)	TP26.1714x26.0307x0.7875	29.42	1129.64	0.026	0.38	2522.32	0.000
L19	93.75 - 93.5 (19)	TP26.2183x26.1714x0.9125	29.45	1304.93	0.023	0.38	2904.72	0.000
L20	93.5 - 92.75 (20)	TP26.359x26.2183x0.9125	29.56	1312.18	0.023	0.38	2937.12	0.000
L21	92.75 - 92.5 (21)	TP26.4059x26.359x1.1375	29.59	1624.28	0.018	0.38	3610.27	0.000
L22	92.5 - 91.25 (22)	TP26.6404x26.4059x1.1125	29.77	1604.90	0.019	0.38	3603.82	0.000
L23	91.25 - 91 (23)	TP26.6873x26.6404x1.1125	29.80	1607.85	0.019	0.38	3617.07	0.000
L24	91 - 89.25 (24)	TP27.0156x26.6873x1.1125	30.06	1628.49	0.018	0.38	3710.54	0.000
L25	89.25 - 89 (25)	TP27.0625x27.0156x1.2125	30.08	1771.23	0.017	0.38	4027.51	0.000
L26	89 - 85.75 (26)	TP27.6723x27.0625x1.1875	30.56	1777.31	0.017	0.38	4140.56	0.000
L27	85.75 - 85.5 (27)	TP27.7192x27.6723x0.8625	30.58	1309.01	0.023	0.38	3092.41	0.000
L28	85.5 - 80.5 (28)	TP28.6572x27.7192x0.8375	31.23	1316.65	0.024	0.38	3221.98	0.000
L29	80.5 - 75.5 (29)	TP29.5953x28.6572x0.8125	31.86	1321.57	0.024	0.38	3345.97	0.000
L30	75.5 - 70.5 (30)	TP30.5334x29.5953x0.7875	32.48	1323.76	0.025	0.38	3463.67	0.000
L31	70.5 - 68.083 (31)	TP30.9868x30.5334x0.7875	32.77	1343.94	0.024	0.38	3570.07	0.000
L32	68.083 - 67.833 (32)	TP31.0337x30.9868x0.8375	32.79	1429.13	0.023	0.38	3795.97	0.000
L33	67.833 - 67 (33)	TP31.19x31.0337x0.8375	32.90	1436.52	0.023	0.38	3835.37	0.000
L34	67 - 66.75 (34)	TP31.2369x31.19x1.0625	32.92	1811.76	0.018	0.38	4808.82	0.000
L35	66.75 - 63.25 (35)	TP31.8935x31.2369x1.0375	33.39	1809.10	0.018	0.38	4910.23	0.000
L36	63.25 - 63 (36)	TP31.9404x31.8935x1.2125	33.42	2105.47	0.016	0.38	5690.91	0.000
L37	63 - 59.5 (37)	TP32.5971x31.9404x1.1875	33.90	2107.80	0.016	0.38	5823.59	0.000
L38	59.5 - 59.25 (38)	TP32.644x32.5971x1.2375	33.92	2196.33	0.015	0.38	6067.60	0.000
L39	59.25 - 56.25 (39)	TP33.2068x32.644x1.2125	34.33	2192.24	0.016	0.38	6169.65	0.000
L40	56.25 - 56 (40)	TP33.2537x33.2068x1.0625	34.36	1932.86	0.018	0.38	5473.15	0.000
L41	56 - 55.75 (41)	TP33.3006x33.2537x0.8375	34.39	1536.41	0.022	0.38	4387.32	0.000
L42	55.75 - 50.75 (42)	TP34.2387x33.3006x0.825	34.97	1557.80	0.022	0.38	4578.63	0.000
L43	50.75 - 44.6667 (43)	TP35.38x34.2387x0.8125	35.05	1541.23	0.023	0.38	4550.71	0.000
L44	44.6667 - 43.6667 (44)	TP34.942x33.7544x0.875	35.94	1684.51	0.021	0.38	5047.87	0.000
L45	43.6667 - 38.6667 (45)	TP35.8795x34.942x0.8625	36.46	1706.76	0.021	0.38	5257.15	0.000
L46	38.6667 - 34.5 (46)	TP36.6608x35.8795x0.85	36.88	1720.15	0.021	0.38	5418.52	0.000
L47	34.5 - 34.25 (47)	TP36.7077x36.6608x1.1	36.89	2213.45	0.017	0.38	6932.88	0.000
L48	34.25 - 33 (48)	TP36.9421x36.7077x1.1	37.04	2228.02	0.017	0.38	7024.46	0.000
L49	33 - 32.75 (49)	TP36.989x36.9421x1.1	37.05	2230.93	0.017	0.38	7042.84	0.000
L50	32.75 - 29.75 (50)	TP37.5515x36.989x1.075	37.38	2215.92	0.017	0.38	7109.97	0.000
L51	29.75 - 29.5	TP37.5984x37.5515x1.12	37.39	2318.79	0.016	0.38	7439.40	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 $\frac{T_u}{\phi T_n}$
	(51)	5						
L52	29.5 - 25 (52)	TP38.4422x37.5984x1.1	37.87	2321.27	0.016	0.38	7624.75	0.000
L53	25 - 24.75 (53)	TP38.4891x38.4422x0.86 25	37.88	1833.95	0.021	0.38	6069.90	0.000
L54	24.75 - 19.75 (54)	TP39.4266x38.4891x0.85	38.32	1853.00	0.021	0.38	6287.82	0.000
L55	19.75 - 14.75 (55)	TP40.3642x39.4266x0.82 5	38.71	1843.38	0.021	0.38	6411.25	0.000
L56	14.75 - 14.5 (56)	TP40.4111x40.3642x0.82 5	38.71	1845.57	0.021	0.38	6426.46	0.000
L57	14.5 - 14.25 (57)	TP40.458x40.4111x0.825	38.72	1847.75	0.021	0.38	6441.69	0.000
L58	14.25 - 12.25 (58)	TP40.833x40.458x0.825	38.89	1865.24	0.021	0.38	6564.17	0.000
L59	12.25 - 12 (59)	TP40.8799x40.833x0.787 5	38.89	1784.21	0.022	0.38	6292.26	0.000
L60	12 - 11.5 (60)	TP40.9736x40.8799x0.78 75	38.93	1788.38	0.022	0.38	6321.72	0.000
L61	11.5 - 11.25 (61)	TP41.0205x40.9736x0.9	38.94	2040.52	0.019	0.38	7201.25	0.000
L62	11.25 - 9.25 (62)	TP41.3955x41.0205x0.88 75	39.11	2031.62	0.019	0.38	7239.07	0.000
L63	9.25 - 9 (63)	TP41.4424x41.3955x0.85	39.11	1949.83	0.020	0.38	6962.12	0.000
L64	9 - 4.5 (64)	TP42.2862x41.4424x0.82 5	39.31	1913.32	0.021	0.38	6836.13	0.000
L65	4.5 - 4.25 (65)	TP42.3331x42.2862x0.85	39.48	1992.61	0.020	0.38	7254.57	0.000
L66	4.25 - 3 (66)	TP42.5675x42.3331x0.85	39.64	2003.87	0.020	0.38	7270.99	0.000
L67	3 - 2.75 (67)	TP42.6143x42.5675x0.83 75	39.64	1977.21	0.020	0.38	7249.59	0.000
L68	2.75 - 0 (68)	TP43.13x42.6143x0.825	39.82	1960.31	0.020	0.38	7161.72	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	150 - 145 (1)	0.004	0.224	0.000	0.063	0.008	0.233	1.050	4.8.2
L2	145 - 140 (2)	0.004	0.416	0.000	0.062	0.007	0.425	1.050	4.8.2
L3	140 - 135 (3)	0.008	0.689	0.000	0.091	0.006	0.707	1.050	4.8.2
L4	135 - 133 (4)	0.008	0.786	0.000	0.090	0.006	0.804	1.050	4.8.2
L5	133 - 132.75 (5)	0.004	0.322	0.000	0.038	0.002	0.328	1.050	4.8.2
L6	132.75 - 127.75 (6)	0.006	0.415	0.000	0.051	0.002	0.425	1.050	4.8.2
L7	127.75 - 123.75 (7)	0.007	0.514	0.000	0.051	0.002	0.523	1.050	4.8.2
L8	123.75 - 123.5 (8)	0.007	0.519	0.000	0.051	0.002	0.528	1.050	4.8.2
L9	123.5 - 118.75 (9)	0.004	0.355	0.000	0.029	0.000	0.360	1.050	4.8.2
L10	118.75 - 118.5 (10)	0.003	0.273	0.000	0.021	0.000	0.276	1.050	4.8.2
L11	118.5 - 117 (11)	0.003	0.290	0.000	0.022	0.000	0.293	1.050	4.8.2
L12	117 - 116.75 (12)	0.004	0.380	0.000	0.029	0.000	0.384	1.050	4.8.2
L13	116.75 - 111.75 (13)	0.005	0.443	0.000	0.030	0.000	0.448	1.050	4.8.2
L14	111.75 - 106.75 (14)	0.005	0.498	0.000	0.030	0.000	0.503	1.050	4.8.2
L15	106.75 - 101.75 (15)	0.005	0.550	0.000	0.031	0.000	0.556	1.050	4.8.2
L16	101.75 -	0.005	0.564	0.000	0.031	0.000	0.571	1.050	4.8.2

Section No.	Elevation ft	Ratio $P_u/\phi P_n$	Ratio $M_{ux}/\phi M_{nx}$	Ratio $M_{uy}/\phi M_{ny}$	Ratio $V_u/\phi V_n$	Ratio $T_u/\phi T_n$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	95.1667 (16)								
L17	95.1667 - 94.5 (17)	0.005	0.522	0.000	0.026	0.000	0.527	1.050	4.8.2
L18	94.5 - 93.75 (18)	0.005	0.525	0.000	0.026	0.000	0.531	1.050	4.8.2
L19	93.75 - 93.5 (19)	0.004	0.461	0.000	0.023	0.000	0.466	1.050	4.8.2
L20	93.5 - 92.75 (20)	0.004	0.463	0.000	0.023	0.000	0.468	1.050	4.8.2
L21	92.75 - 92.5 (21)	0.004	0.383	0.000	0.018	0.000	0.386	1.050	4.8.2
L22	92.5 - 91.25 (22)	0.004	0.394	0.000	0.019	0.000	0.398	1.050	4.8.2
L23	91.25 - 91 (23)	0.004	0.394	0.000	0.019	0.000	0.398	1.050	4.8.2
L24	91 - 89.25 (24)	0.004	0.399	0.000	0.018	0.000	0.403	1.050	4.8.2
L25	89.25 - 89 (25)	0.004	0.371	0.000	0.017	0.000	0.375	1.050	4.8.2
L26	89 - 85.75 (26)	0.004	0.386	0.000	0.017	0.000	0.390	1.050	4.8.2
L27	85.75 - 85.5 (27)	0.005	0.513	0.000	0.023	0.000	0.518	1.050	4.8.2
L28	85.5 - 80.5 (28)	0.005	0.542	0.000	0.024	0.000	0.548	1.050	4.8.2
L29	80.5 - 75.5 (29)	0.006	0.570	0.000	0.024	0.000	0.576	1.050	4.8.2
L30	75.5 - 70.5 (30)	0.006	0.598	0.000	0.025	0.000	0.605	1.050	4.8.2
L31	70.5 - 68.083 (31)	0.006	0.603	0.000	0.024	0.000	0.610	1.050	4.8.2
L32	68.083 - 67.833 (32)	0.006	0.571	0.000	0.023	0.000	0.577	1.050	4.8.2
L33	67.833 - 67 (33)	0.006	0.572	0.000	0.023	0.000	0.579	1.050	4.8.2
L34	67 - 66.75 (34)	0.005	0.462	0.000	0.018	0.000	0.467	1.050	4.8.2
L35	66.75 - 63.25 (35)	0.005	0.476	0.000	0.018	0.000	0.482	1.050	4.8.2
L36	63.25 - 63 (36)	0.004	0.415	0.000	0.016	0.000	0.419	1.050	4.8.2
L37	63 - 59.5 (37)	0.005	0.426	0.000	0.016	0.000	0.431	1.050	4.8.2
L38	59.5 - 59.25 (38)	0.004	0.411	0.000	0.015	0.000	0.416	1.050	4.8.2
L39	59.25 - 56.25 (39)	0.005	0.421	0.000	0.016	0.000	0.426	1.050	4.8.2
L40	56.25 - 56 (40)	0.005	0.474	0.000	0.018	0.000	0.480	1.050	4.8.2
L41	56 - 55.75 (41)	0.007	0.590	0.000	0.022	0.000	0.597	1.050	4.8.2
L42	55.75 - 50.75 (42)	0.007	0.604	0.000	0.022	0.000	0.611	1.050	4.8.2
L43	50.75 - 44.6667 (43)	0.007	0.613	0.000	0.023	0.000	0.621	1.050	4.8.2
L44	44.6667 - 43.6667 (44)	0.007	0.600	0.000	0.021	0.000	0.608	1.050	4.8.2
L45	43.6667 - 38.6667 (45)	0.007	0.612	0.000	0.021	0.000	0.620	1.050	4.8.2
L46	38.6667 - 34.5 (46)	0.008	0.623	0.000	0.021	0.000	0.631	1.050	4.8.2
L47	34.5 - 34.25 (47)	0.006	0.491	0.000	0.017	0.000	0.498	1.050	4.8.2
L48	34.25 - 33 (48)	0.006	0.492	0.000	0.017	0.000	0.498	1.050	4.8.2
L49	33 - 32.75 (49)	0.006	0.492	0.000	0.017	0.000	0.498	1.050	4.8.2
L50	32.75 - 29.75 (50)	0.006	0.503	0.000	0.017	0.000	0.510	1.050	4.8.2
L51	29.75 - 29.5	0.006	0.483	0.000	0.016	0.000	0.489	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
	(51)								
L52	29.5 - 25 (52)	0.006	0.494	0.000	0.016	0.000	0.500	1.050	4.8.2
L53	25 - 24.75 (53)	0.008	0.618	0.000	0.021	0.000	0.627	1.050	4.8.2
L54	24.75 - 19.75 (54)	0.008	0.628	0.000	0.021	0.000	0.636	1.050	4.8.2
L55	19.75 - 14.75 (55)	0.009	0.646	0.000	0.021	0.000	0.655	1.050	4.8.2
L56	14.75 - 14.5 (56)	0.009	0.646	0.000	0.021	0.000	0.655	1.050	4.8.2
L57	14.5 - 14.25 (57)	0.009	0.646	0.000	0.021	0.000	0.655	1.050	4.8.2
L58	14.25 - 12.25 (58)	0.009	0.646	0.000	0.021	0.000	0.656	1.050	4.8.2
L59	12.25 - 12 (59)	0.009	0.675	0.000	0.022	0.000	0.685	1.050	4.8.2
L60	12 - 11.5 (60)	0.009	0.675	0.000	0.022	0.000	0.685	1.050	4.8.2
L61	11.5 - 11.25 (61)	0.008	0.596	0.000	0.019	0.000	0.604	1.050	4.8.2
L62	11.25 - 9.25 (62)	0.008	0.604	0.000	0.019	0.000	0.612	1.050	4.8.2
L63	9.25 - 9 (63)	0.009	0.628	0.000	0.020	0.000	0.638	1.050	4.8.2
L64	9 - 4.5 (64)	0.009	0.646	0.000	0.021	0.000	0.656	1.050	4.8.2
L65	4.5 - 4.25 (65)	0.009	0.628	0.000	0.020	0.000	0.638	1.050	4.8.2
L66	4.25 - 3 (66)	0.009	0.628	0.000	0.020	0.000	0.638	1.050	4.8.2
L67	3 - 2.75 (67)	0.009	0.637	0.000	0.020	0.000	0.646	1.050	4.8.2
L68	2.75 - 0 (68)	0.009	0.646	0.000	0.020	0.000	0.656	1.050	4.8.2

Section Capacity Table

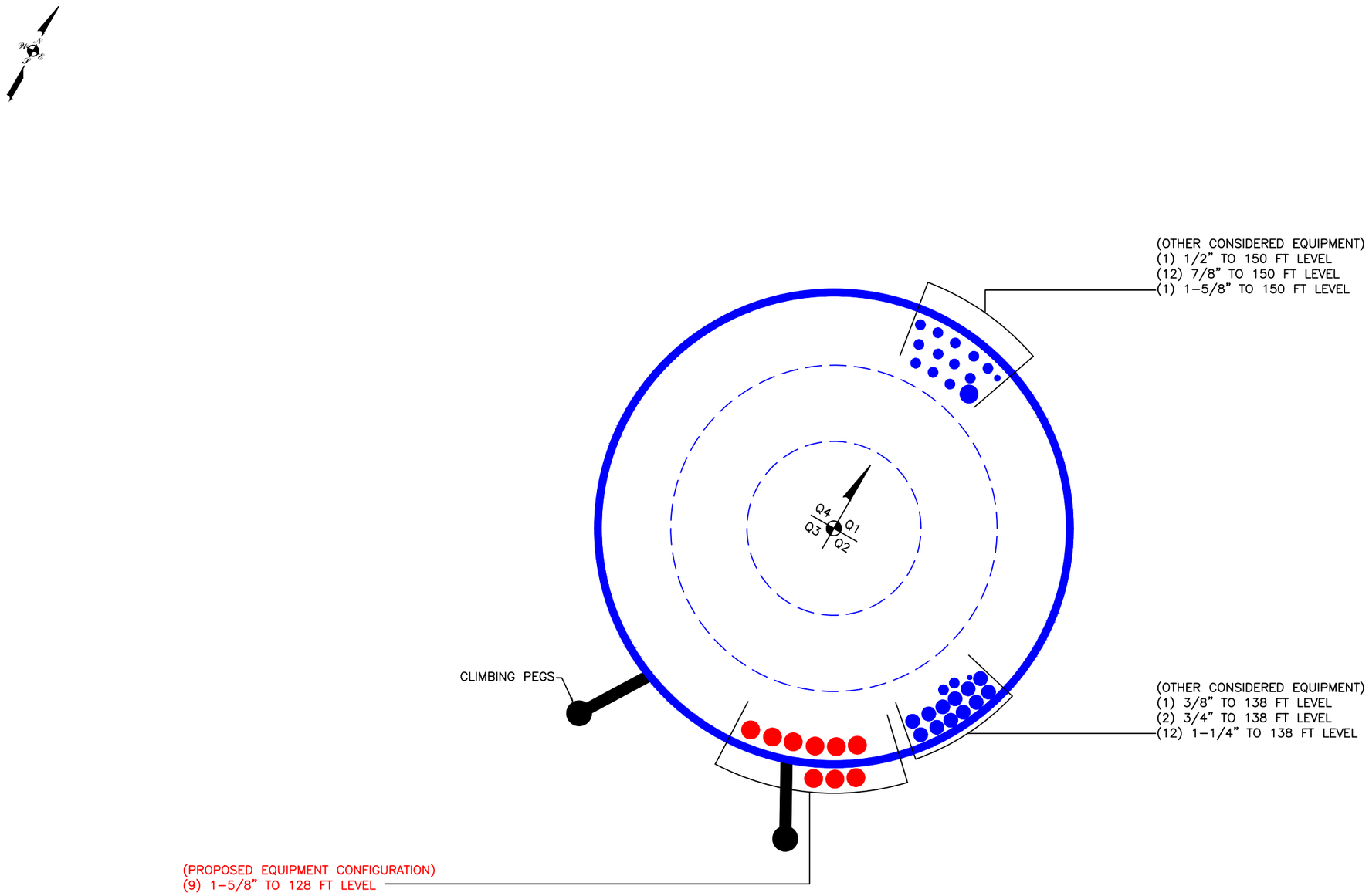
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	150 - 145	Pole	TP16.9374x16x0.1875	1	-2.34	621.18	22.2	Pass
L2	145 - 140	Pole	TP17.8748x16.9374x0.1875	2	-2.58	655.94	40.4	Pass
L3	140 - 135	Pole	TP18.8122x17.8748x0.1875	3	-5.35	690.70	67.3	Pass
L4	135 - 133	Pole	TP19.1871x18.8122x0.1875	4	-5.53	704.61	76.5	Pass
L5	133 - 132.75	Pole	TP19.234x19.1871x0.45	5	-5.58	1671.86	31.2	Pass
L6	132.75 - 127.75	Pole	TP20.1714x19.234x0.4375	6	-10.21	1707.63	40.4	Pass
L7	127.75 - 123.75	Pole	TP20.9213x20.1714x0.425	7	-10.84	1722.92	49.8	Pass
L8	123.75 - 123.5	Pole	TP20.9681x20.9213x0.425	8	-10.90	1726.86	50.3	Pass
L9	123.5 - 118.75	Pole	TP21.8587x20.9681x0.7625	9	-11.89	3181.59	34.2	Pass
L10	118.75 - 118.5	Pole	TP21.9055x21.8587x1.0375	10	-11.98	4282.24	26.3	Pass
L11	118.5 - 117	Pole	TP22.1868x21.9055x1.0125	11	-12.38	4240.37	27.9	Pass
L12	117 - 116.75	Pole	TP22.2336x22.1868x0.75	12	-12.45	3186.91	36.6	Pass
L13	116.75 - 111.75	Pole	TP23.171x22.2336x0.7125	13	-13.59	3164.95	42.7	Pass
L14	111.75 - 106.75	Pole	TP24.1084x23.171x0.6875	14	-14.78	3184.77	47.9	Pass
L15	106.75 - 101.75	Pole	TP25.0458x24.1084x0.6625	15	-16.00	3195.06	53.0	Pass
L16	101.75 - 95.1667	Pole	TP26.28x25.0458x0.6625	16	-16.56	3250.34	54.4	Pass
L17	95.1667 - 94.5	Pole	TP26.0307x25.0926x0.7875	17	-18.79	3931.84	50.2	Pass
L18	94.5 - 93.75	Pole	TP26.1714x26.0307x0.7875	18	-19.01	3953.75	50.5	Pass
L19	93.75 - 93.5	Pole	TP26.2183x26.1714x0.9125	19	-19.10	4567.24	44.3	Pass
L20	93.5 - 92.75	Pole	TP26.359x26.2183x0.9125	20	-19.33	4592.64	44.6	Pass
L21	92.75 - 92.5	Pole	TP26.4059x26.359x1.1375	21	-19.44	5684.99	36.8	Pass
L22	92.5 - 91.25	Pole	TP26.6404x26.4059x1.1125	22	-19.89	5617.15	37.9	Pass
L23	91.25 - 91	Pole	TP26.6873x26.6404x1.1125	23	-20.00	5627.47	38.0	Pass
L24	91 - 89.25	Pole	TP27.0156x26.6873x1.1125	24	-20.64	5699.71	38.4	Pass
L25	89.25 - 89	Pole	TP27.0625x27.0156x1.2125	25	-20.76	6199.32	35.7	Pass
L26	89 - 85.75	Pole	TP27.6723x27.0625x1.1875	26	-22.08	6220.58	37.1	Pass
L27	85.75 - 85.5	Pole	TP27.7192x27.6723x0.8625	27	-22.17	4581.55	49.4	Pass
L28	85.5 - 80.5	Pole	TP28.6572x27.7192x0.8375	28	-23.81	4608.28	52.2	Pass
L29	80.5 - 75.5	Pole	TP29.5953x28.6572x0.8125	29	-25.49	4625.49	54.9	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L30	75.5 - 70.5	Pole	TP30.5334x29.5953x0.7875	30	-27.21	4633.17	57.6	Pass
L31	70.5 - 68.083	Pole	TP30.9868x30.5334x0.7875	31	-28.04	4703.80	58.1	Pass
L32	68.083 - 67.833	Pole	TP31.0337x30.9868x0.8375	32	-28.15	5001.94	55.0	Pass
L33	67.833 - 67	Pole	TP31.19x31.0337x0.8375	33	-28.45	5027.83	55.1	Pass
L34	67 - 66.75	Pole	TP31.2369x31.19x1.0625	34	-28.57	6341.16	44.4	Pass
L35	66.75 - 63.25	Pole	TP31.8935x31.2369x1.0375	35	-30.07	6331.84	45.9	Pass
L36	63.25 - 63	Pole	TP31.9404x31.8935x1.2125	36	-30.21	7369.13	39.9	Pass
L37	63 - 59.5	Pole	TP32.5971x31.9404x1.1875	37	-31.91	7377.29	41.0	Pass
L38	59.5 - 59.25	Pole	TP32.644x32.5971x1.2375	38	-32.05	7687.15	39.6	Pass
L39	59.25 - 56.25	Pole	TP33.2068x32.644x1.2125	39	-33.56	7672.83	40.6	Pass
L40	56.25 - 56	Pole	TP33.2537x33.2068x1.0625	40	-33.68	6764.99	45.7	Pass
L41	56 - 55.75	Pole	TP33.3006x33.2537x0.8375	41	-33.78	5377.45	56.8	Pass
L42	55.75 - 50.75	Pole	TP34.2387x33.3006x0.825	42	-35.73	5452.29	58.2	Pass
L43	50.75 - 44.6667	Pole	TP35.38x34.2387x0.8125	43	-36.03	5394.31	59.1	Pass
L44	44.6667 - 43.6667	Pole	TP34.942x33.7544x0.875	44	-40.43	5895.80	57.9	Pass
L45	43.6667 - 38.6667	Pole	TP35.8795x34.942x0.8625	45	-42.59	5973.65	59.0	Pass
L46	38.6667 - 34.5	Pole	TP36.6608x35.8795x0.85	46	-44.40	6020.53	60.1	Pass
L47	34.5 - 34.25	Pole	TP36.7077x36.6608x1.1	47	-44.55	7747.08	47.4	Pass
L48	34.25 - 33	Pole	TP36.9421x36.7077x1.1	48	-45.20	7798.08	47.4	Pass
L49	33 - 32.75	Pole	TP36.989x36.9421x1.1	49	-45.35	7808.27	47.5	Pass
L50	32.75 - 29.75	Pole	TP37.5515x36.989x1.075	50	-46.94	7755.73	48.6	Pass
L51	29.75 - 29.5	Pole	TP37.5984x37.5515x1.125	51	-47.09	8115.78	46.6	Pass
L52	29.5 - 25	Pole	TP38.4422x37.5984x1.1	52	-49.56	8124.45	47.7	Pass
L53	25 - 24.75	Pole	TP38.4891x38.4422x0.8625	53	-49.69	6418.82	59.7	Pass
L54	24.75 - 19.75	Pole	TP39.4266x38.4891x0.85	54	-52.00	6485.51	60.6	Pass
L55	19.75 - 14.75	Pole	TP40.3642x39.4266x0.825	55	-54.36	6451.83	62.4	Pass
L56	14.75 - 14.5	Pole	TP40.4111x40.3642x0.825	56	-54.49	6459.47	62.4	Pass
L57	14.5 - 14.25	Pole	TP40.458x40.4111x0.825	57	-54.61	6467.13	62.4	Pass
L58	14.25 - 12.25	Pole	TP40.833x40.458x0.825	58	-55.55	6528.32	62.4	Pass
L59	12.25 - 12	Pole	TP40.8799x40.833x0.7875	59	-55.68	6244.73	65.2	Pass
L60	12 - 11.5	Pole	TP40.9736x40.8799x0.7875	60	-55.92	6259.32	65.2	Pass
L61	11.5 - 11.25	Pole	TP41.0205x40.9736x0.9	61	-56.05	7141.84	57.6	Pass
L62	11.25 - 9.25	Pole	TP41.3955x41.0205x0.8875	62	-57.04	7110.66	58.3	Pass
L63	9.25 - 9	Pole	TP41.4424x41.3955x0.85	63	-57.17	6824.40	60.7	Pass
L64	9 - 4.5	Pole	TP42.2862x41.4424x0.825	64	-57.70	6662.19	62.5	Pass
L65	4.5 - 4.25	Pole	TP42.3331x42.2862x0.85	65	-59.23	6966.27	60.7	Pass
L66	4.25 - 3	Pole	TP42.5675x42.3331x0.85	66	-59.37	6974.14	60.7	Pass
L67	3 - 2.75	Pole	TP42.6143x42.5675x0.8375	67	-59.95	6912.48	61.6	Pass
L68	2.75 - 0	Pole	TP43.13x42.6143x0.825	68	-60.08	6818.99	62.4	Pass
							Summary	
						Pole (L4)	76.5	Pass
						RATING =	**76.5**	**Pass**

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

APPENDIX B

BASE LEVEL DRAWING


(OTHER CONSIDERED EQUIPMENT)
(1) 1/2" TO 150 FT LEVEL
(12) 7/8" TO 150 FT LEVEL
(1) 1-5/8" TO 150 FT LEVEL
Q4
Q1
Q3
Q2
CLIMBING PEGS
(OTHER CONSIDERED EQUIPMENT)
(1) 3/8" TO 138 FT LEVEL
(2) 3/4" TO 138 FT LEVEL
(12) 1-1/4" TO 138 FT LEVEL
(PROPOSED EQUIPMENT CONFIGURATION)
(9) 1-5/8" TO 128 FT LEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

CCIpole

per TIA-222- H

Site BU: 806361

Work Order: 1891416

CROWN CASTLE

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	150	54.8333	4.3333	12	16	26.28	0.1875	Auto	A572-65
2	99.5	54.8333	5.3333	12	25.09	35.38	0.3125	Auto	A572-65
3	50	50	0	12	33.75	43.13	0.375	Auto	A572-65

Reinforcement Configuration

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number	1	2	3	4	5	6	7	8	9	10	11	12
1	0	29.75	plate	PL9x1-1/4 {Bar #1}	3				■				■				■
2	29.75	59.5	plate	PL8x1-1/4 {Bar #2}	3				■				■				■
3	59.5	89.25	plate	PL7x1-1/4 {Bar #3}	3				■				■				■
4	89.25	123.75	plate	PL5x1-1/4 {Bar #4}	3				■				■				■
5	25	34.5	plate	MS-650 (1.1875")	3			■				■				■	
6	56	67	plate	MS-600 (1.1875")	3			■				■				■	
7	85.75	92.75	plate	MS-450 (1.1875")	3			■				■				■	
8	56.25	63.25	plate	CCI-SFP-045100	3		■				■				■		
9	85.75	93.75	plate	CCI-SFP-040075	3		■				■				■		
10	0	4.5	plate	ransistion Stiffener TS	1										■		
11	0	11.5	plate	ransistion Stiffener TS	1						■						
12	0	14.5	plate	ransistion Stiffener TS	1		■										
13	3	9.25	plate	CCI-AFP-060100	1									■			
14	9.25	12.25	plate	CCI-AFP-060100	2					■				■			
15	12.25	33	plate	CCI-AFP-060100	3	■				■				■			
16	33	68.083	plate	CCI-AFP-060100	3	■				■				■			
17	68.083	91.25	plate	CCI-AFP-045100	3	■				■				■			
18	91.25	117	plate	CCI-AFP-045100	3	■				■				■			
19	117	118.75	plate	CCI-AFP-045100	6	■	■			■	■			■	■		
20	118.75	133	plate	CCI-AFP-045100	3		■				■				■		
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Reinforcement Details

	B (in)	H (in)	Gross Area (in^2)	Pole Face to Centroid (in)	Bottom Termination Length (in)	Top Termination Length (in)	L_u (in)	Net Area (in^2)	Bolt Hole Size (in)	Reinforcement Material
1	9	1.25	11.25	0.625	n/a	n/a	15.000	9.647	1.2200	A572-65
2	8	1.25	10	0.625	n/a	n/a	18.000	8.397	1.2200	A572-65
3	7	1.25	8.75	0.625	n/a	n/a	18.000	7.147	1.2200	A572-65
4	5	1.25	6.25	0.625	n/a	15.000	18.000	4.647	1.2200	A572-65
5	6.5	1.25	8.125	0.625	33.000	33.000	19.250	6.563	1.1875	A572-65
6	6	1	6	0.5	24.000	24.000	16.375	4.750	1.1875	A572-65
7	4.5	1	4.5	0.5	18.000	18.000	20.625	3.250	1.1875	A572-65
8	4.5	1	4.5	0.5	18.000	18.000	20.000	3.250	1.1875	A572-65
9	4	0.75	3	0.375	12.000	12.000	16.000	2.063	1.1875	A572-65
10	1	6	6	3	n/a	n/a	0.000	6.000	0.0000	A572-65
11	1	6	6	3	n/a	n/a	0.000	6.000	0.0000	A572-65
12	1	6	6	3	n/a	n/a	0.000	6.000	0.0000	A572-65
13	6	1	6	0.5	30.000	30.000	16.000	4.750	1.1875	A572-65
14	6	1	6	0.5	30.000	30.000	16.000	4.750	1.1875	A572-65
15	6	1	6	0.5	30.000	30.000	16.000	4.750	1.1875	A572-65
16	6	1	6	0.5	30.000	30.000	16.000	4.750	1.1875	A572-65
17	4.5	1	4.5	0.5	24.000	24.000	20.000	3.250	1.1875	A572-65
18	4.5	1	4.5	0.5	24.000	24.000	20.000	3.250	1.1875	A572-65
19	4.5	1	4.5	0.5	24.000	24.000	20.000	3.250	1.1875	A572-65
20	4.5	1	4.5	0.5	24.000	24.000	20.000	3.250	1.1875	A572-65

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	150 - 145	5		12	16.000	16.937	0.1875	A572-65	1.000
2	145 - 140	5		12	16.937	17.875	0.1875	A572-65	1.000
3	140 - 135	5		12	17.875	18.812	0.1875	A572-65	1.000
4	135 - 133	2		12	18.812	19.187	0.1875	A572-65	1.000
5	133 - 132.75	0.25		12	19.187	19.234	0.45	A572-65	0.919
6	132.75 - 127.75	5		12	19.234	20.171	0.4375	A572-65	0.920
7	127.75 - 123.75	4		12	20.171	20.921	0.425	A572-65	0.928
8	123.75 - 123.5	0.25		12	20.921	20.968	0.425	A572-65	0.927
9	123.5 - 118.75	4.75		12	20.968	21.859	0.7625	A572-65	0.876
10	118.75 - 118.5	0.25		12	21.859	21.906	1.0375	A572-65	0.845
11	118.5 - 117	1.5		12	21.906	22.187	1.0125	A572-65	0.856
12	117 - 116.75	0.25		12	22.187	22.234	0.75	A572-65	0.879
13	116.75 - 111.75	5		12	22.234	23.171	0.7125	A572-65	0.896
14	111.75 - 106.75	5		12	23.171	24.108	0.6875	A572-65	0.901
15	106.75 - 101.75	5		12	24.108	25.046	0.6625	A572-65	0.909
16	101.75 - 99.5	6.5833	4.3333	12	25.046	26.280	0.6625	A572-65	0.899
17	99.5 - 94.5	5		12	25.093	26.031	0.7875	A572-65	0.909
18	94.5 - 93.75	0.75		12	26.031	26.171	0.7875	A572-65	0.906
19	93.75 - 93.5	0.25		12	26.171	26.218	0.9125	A572-65	0.906
20	93.5 - 92.75	0.75		12	26.218	26.359	0.9125	A572-65	0.903
21	92.75 - 92.5	0.25		12	26.359	26.406	1.1375	A572-65	0.876
22	92.5 - 91.25	1.25		12	26.406	26.640	1.1125	A572-65	0.889
23	91.25 - 91	0.25		12	26.640	26.687	1.1125	A572-65	0.888
24	91 - 89.25	1.75		12	26.687	27.016	1.1125	A572-65	0.880
25	89.25 - 89	0.25		12	27.016	27.063	1.2125	A572-65	0.884
26	89 - 85.75	3.25		12	27.063	27.672	1.1875	A572-65	0.887
27	85.75 - 85.5	0.25		12	27.672	27.719	0.8625	A572-65	0.903
28	85.5 - 80.5	5		12	27.719	28.657	0.8375	A572-65	0.911
29	80.5 - 75.5	5		12	28.657	29.595	0.8125	A572-65	0.920
30	75.5 - 70.5	5		12	29.595	30.533	0.7875	A572-65	0.931
31	70.5 - 68.083	2.417		12	30.533	30.987	0.7875	A572-65	0.923
32	68.083 - 67.833	0.25		12	30.987	31.034	0.8375	A572-65	0.924
33	67.833 - 67	0.833		12	31.034	31.190	0.8375	A572-65	0.921
34	67 - 66.75	0.25		12	31.190	31.237	1.0625	A572-65	0.905
35	66.75 - 63.25	3.5		12	31.237	31.894	1.0375	A572-65	0.913
36	63.25 - 63	0.25		12	31.894	31.940	1.2125	A572-65	0.898
37	63 - 59.5	3.5		12	31.940	32.597	1.1875	A572-65	0.902
38	59.5 - 59.25	0.25		12	32.597	32.644	1.2375	A572-65	0.896
39	59.25 - 56.25	3		12	32.644	33.207	1.2125	A572-65	0.902
40	56.25 - 56	0.25		12	33.207	33.254	1.0625	A572-65	0.901
41	56 - 55.75	0.25		12	33.254	33.301	0.8375	A572-65	0.928
42	55.75 - 50.75	5		12	33.301	34.239	0.825	A572-65	0.926
43	50.75 - 50	6.0833	5.3333	12	34.239	35.380	0.8125	A572-65	0.938
44	50 - 43.6667	6.3333		12	33.754	34.942	0.875	A572-65	0.936
45	43.6667 - 38.6667	5		12	34.942	35.880	0.8625	A572-65	0.935
46	38.6667 - 34.5	4.1667		12	35.880	36.661	0.85	A572-65	0.937
47	34.5 - 34.25	0.25		12	36.661	36.708	1.1	A572-65	0.923
48	34.25 - 33	1.25		12	36.708	36.942	1.1	A572-65	0.919
49	33 - 32.75	0.25		12	36.942	36.989	1.1	A572-65	0.918
50	32.75 - 29.75	3		12	36.989	37.552	1.075	A572-65	0.930
51	29.75 - 29.5	0.25		12	37.552	37.598	1.125	A572-65	0.917
52	29.5 - 25	4.5		12	37.598	38.442	1.1	A572-65	0.924
53	25 - 24.75	0.25		12	38.442	38.489	0.8625	A572-65	0.936
54	24.75 - 19.75	5		12	38.489	39.427	0.85	A572-65	0.937
55	19.75 - 14.75	5		12	39.427	40.364	0.825	A572-65	0.953
56	14.75 - 14.5	0.25		12	40.364	40.411	0.825	A572-65	0.953
57	14.5 - 14.25	0.25		12	40.411	40.458	0.825	A572-65	0.952
58	14.25 - 12.25	2		12	40.458	40.833	0.825	A572-65	0.947
59	12.25 - 12	0.25		12	40.833	40.880	0.7875	A572-65	0.991
60	12 - 11.5	0.5		12	40.880	40.974	0.7875	A572-65	0.990
61	11.5 - 11.25	0.25		12	40.974	41.020	0.9	A572-65	0.920
62	11.25 - 9.25	2		12	41.020	41.396	0.8875	A572-65	0.927
63	9.25 - 9	0.25		12	41.396	41.442	0.85	A572-65	0.913
64	9 - 4.5	4.5		12	41.442	42.286	0.825	A572-65	0.930
65	4.5 - 4.25	0.25		12	42.286	42.333	0.85	A572-65	0.956
66	4.25 - 3	1.25		12	42.333	42.567	0.85	A572-65	0.953
67	3 - 2.75	0.25		12	42.567	42.614	0.8375	A572-65	0.913
68	2.75 - 0	2.75		12	42.614	43.130	0.825	A572-65	0.921

TNX Section Forces

Increment (ft): 5		TNX Output		
	Section Height (ft)	P_u (K)	M_{ux} (kip-ft)	V_u (K)
1	150 - 145	2.35	55.37	11.20
2	145 - 140	2.58	112.42	11.63
3	140 - 135	5.35	202.94	18.00
4	135 - 133	5.53	239.11	18.17
5	133 - 132.75	5.58	243.65	18.19
6	132.75 - 127.75	10.21	337.49	24.95
7	127.75 - 123.75	10.84	438.04	25.33
8	123.75 - 123.5	10.90	444.38	25.35
9	123.5 - 118.75	11.89	566.35	26.04
10	118.75 - 118.5	11.98	572.86	26.07
11	118.5 - 117	12.38	612.14	26.29
12	117 - 116.75	12.45	618.72	26.32
13	116.75 - 111.75	13.59	751.98	26.98
14	111.75 - 106.75	14.78	888.51	27.63
15	106.75 - 101.75	16.00	1028.26	28.27
16	101.75 - 99.5	16.56	1092.18	28.55
17	99.5 - 94.5	18.79	1236.92	29.33
18	94.5 - 93.75	19.01	1258.95	29.42
19	93.75 - 93.5	19.10	1266.31	29.45
20	93.5 - 92.75	19.33	1288.44	29.56
21	92.75 - 92.5	19.44	1295.83	29.59
22	92.5 - 91.25	19.89	1332.93	29.77
23	91.25 - 91	20.00	1340.38	29.80
24	91 - 89.25	20.64	1392.76	30.06
25	89.25 - 89	20.76	1400.28	30.08
26	89 - 85.75	22.08	1498.82	30.56
27	85.75 - 85.5	22.17	1506.47	30.58
28	85.5 - 80.5	23.81	1661.02	31.23
29	80.5 - 75.5	25.49	1818.74	31.86
30	75.5 - 70.5	27.21	1979.57	32.48
31	70.5 - 68.083	28.04	2058.40	32.77
32	68.083 - 67.833	28.15	2066.60	32.79
33	67.833 - 67	28.45	2093.96	32.90
34	67 - 66.75	28.57	2102.19	32.92
35	66.75 - 63.25	30.07	2218.25	33.39
36	63.25 - 63	30.21	2226.60	33.42
37	63 - 59.5	31.91	2344.41	33.90
38	59.5 - 59.25	32.05	2352.89	33.92
39	59.25 - 56.25	33.56	2455.28	34.33
40	56.25 - 56	33.68	2463.86	34.36
41	56 - 55.75	33.78	2472.46	34.39
42	55.75 - 50.75	35.73	2645.86	34.97
43	50.75 - 50	36.03	2672.11	35.05
44	50 - 43.6667	40.43	2897.00	35.94
45	43.6667 - 38.6667	42.59	3077.95	36.46
46	38.6667 - 34.5	44.40	3230.70	36.88
47	34.5 - 34.25	44.55	3239.92	36.89
48	34.25 - 33	45.20	3286.13	37.04
49	33 - 32.75	45.35	3295.39	37.05
50	32.75 - 29.75	46.94	3407.04	37.38
51	29.75 - 29.5	47.09	3416.38	37.39
52	29.5 - 25	49.56	3585.73	37.87
53	25 - 24.75	49.69	3595.20	37.88
54	24.75 - 19.75	52.00	3785.68	38.32
55	19.75 - 14.75	54.36	3978.19	38.71
56	14.75 - 14.5	54.49	3987.87	38.71
57	14.5 - 14.25	54.61	3997.55	38.72
58	14.25 - 12.25	55.55	4075.15	38.89
59	12.25 - 12	55.68	4084.87	38.89
60	12 - 11.5	55.92	4104.33	38.93
61	11.5 - 11.25	56.05	4114.07	38.94
62	11.25 - 9.25	57.04	4192.12	39.11
63	9.25 - 9	57.17	4201.90	39.11
64	9 - 4.5	59.21	4378.66	39.48
65	4.5 - 4.25	59.34	4388.53	39.48
66	4.25 - 3	59.92	4437.95	39.64
67	3 - 2.75	60.05	4447.86	39.64
68	2.75 - 0	61.28	4557.26	39.96

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
150 - 145	Pole	TP16.937x16x0.1875	Pole	21.7%	Pass
145 - 140	Pole	TP17.875x16.937x0.1875	Pole	39.9%	Pass
140 - 135	Pole	TP18.812x17.875x0.1875	Pole	66.3%	Pass
135 - 133	Pole	TP19.187x18.812x0.1875	Pole	75.5%	Pass
133 - 132.75	Pole + Reinf.	TP19.234x19.187x0.45	Reinf. 20 Tension Rupture	53.0%	Pass
132.75 - 127.75	Pole + Reinf.	TP20.171x19.234x0.4375	Reinf. 20 Tension Rupture	68.9%	Pass
127.75 - 123.75	Pole + Reinf.	TP20.921x20.171x0.425	Reinf. 20 Tension Rupture	84.6%	Pass
123.75 - 123.5	Pole + Reinf.	TP20.968x20.921x0.425	Reinf. 20 Tension Rupture	85.6%	Pass
123.5 - 118.75	Pole + Reinf.	TP21.859x20.968x0.7625	Reinf. 20 Tension Rupture	58.4%	Pass
118.75 - 118.5	Pole + Reinf.	TP21.906x21.859x1.0375	Reinf. 19 Tension Rupture	45.2%	Pass
118.5 - 117	Pole + Reinf.	TP22.187x21.906x1.0125	Reinf. 19 Tension Rupture	47.6%	Pass
117 - 116.75	Pole + Reinf.	TP22.234x22.187x0.75	Reinf. 18 Tension Rupture	62.4%	Pass
116.75 - 111.75	Pole + Reinf.	TP23.171x22.234x0.7125	Reinf. 18 Tension Rupture	72.1%	Pass
111.75 - 106.75	Pole + Reinf.	TP24.108x23.171x0.6875	Reinf. 18 Tension Rupture	81.0%	Pass
106.75 - 101.75	Pole + Reinf.	TP25.046x24.108x0.6625	Reinf. 18 Tension Rupture	89.3%	Pass
101.75 - 99.5	Pole + Reinf.	TP26.28x25.046x0.6625	Reinf. 18 Tension Rupture	92.9%	Pass
99.5 - 94.5	Pole + Reinf.	TP26.031x25.093x0.7875	Reinf. 18 Tension Rupture	85.4%	Pass
94.5 - 93.75	Pole + Reinf.	TP26.171x26.031x0.7875	Reinf. 18 Tension Rupture	86.2%	Pass
93.75 - 93.5	Pole + Reinf.	TP26.218x26.171x0.9125	Reinf. 9 Tension Rupture	77.9%	Pass
93.5 - 92.75	Pole + Reinf.	TP26.359x26.218x0.9125	Reinf. 9 Tension Rupture	78.7%	Pass
92.75 - 92.5	Pole + Reinf.	TP26.406x26.359x1.1375	Reinf. 9 Tension Rupture	65.5%	Pass
92.5 - 91.25	Pole + Reinf.	TP26.64x26.406x1.1125	Reinf. 9 Tension Rupture	66.6%	Pass
91.25 - 91	Pole + Reinf.	TP26.687x26.64x1.1125	Reinf. 9 Tension Rupture	66.8%	Pass
91 - 89.25	Pole + Reinf.	TP27.016x26.687x1.1125	Reinf. 9 Tension Rupture	68.4%	Pass
89.25 - 89	Pole + Reinf.	TP27.063x27.016x1.2125	Reinf. 3 Connection	64.9%	Pass
89 - 85.75	Pole + Reinf.	TP27.672x27.063x1.1875	Reinf. 9 Tension Rupture	65.0%	Pass
85.75 - 85.5	Pole + Reinf.	TP27.719x27.672x0.8625	Reinf. 17 Tension Rupture	83.7%	Pass
85.5 - 80.5	Pole + Reinf.	TP28.657x27.719x0.8375	Reinf. 17 Tension Rupture	88.2%	Pass
80.5 - 75.5	Pole + Reinf.	TP29.595x28.657x0.8125	Reinf. 17 Tension Rupture	92.4%	Pass
75.5 - 70.5	Pole + Reinf.	TP30.533x29.595x0.7875	Reinf. 17 Tension Rupture	96.3%	Pass
70.5 - 68.08	Pole + Reinf.	TP30.987x30.533x0.7875	Reinf. 17 Tension Rupture	98.1%	Pass
68.08 - 67.83	Pole + Reinf.	TP31.034x30.987x0.8375	Reinf. 16 Tension Rupture	84.1%	Pass
67.83 - 67	Pole + Reinf.	TP31.19x31.034x0.8375	Reinf. 16 Tension Rupture	84.6%	Pass
67 - 66.75	Pole + Reinf.	TP31.237x31.19x1.0625	Reinf. 6 Tension Rupture	68.2%	Pass
66.75 - 63.25	Pole + Reinf.	TP31.894x31.237x1.0375	Reinf. 6 Tension Rupture	70.0%	Pass
63.25 - 63	Pole + Reinf.	TP31.94x31.894x1.2125	Reinf. 8 Tension Rupture	67.1%	Pass
63 - 59.5	Pole + Reinf.	TP32.597x31.94x1.1875	Reinf. 8 Tension Rupture	68.9%	Pass
59.5 - 59.25	Pole + Reinf.	TP32.644x32.597x1.2375	Reinf. 8 Tension Rupture	66.5%	Pass
59.25 - 56.25	Pole + Reinf.	TP33.207x32.644x1.2125	Reinf. 8 Tension Rupture	68.0%	Pass
56.25 - 56	Pole + Reinf.	TP33.254x33.207x1.0625	Reinf. 6 Tension Rupture	70.7%	Pass
56 - 55.75	Pole + Reinf.	TP33.301x33.254x0.8375	Reinf. 16 Tension Rupture	86.8%	Pass
55.75 - 50.75	Pole + Reinf.	TP34.239x33.301x0.825	Reinf. 16 Tension Rupture	89.4%	Pass
50.75 - 50	Pole + Reinf.	TP35.38x34.239x0.8125	Reinf. 16 Tension Rupture	89.8%	Pass
50 - 43.67	Pole + Reinf.	TP34.942x33.754x0.875	Reinf. 16 Tension Rupture	88.3%	Pass
43.67 - 38.67	Pole + Reinf.	TP35.88x34.942x0.8625	Reinf. 16 Tension Rupture	90.3%	Pass
38.67 - 34.5	Pole + Reinf.	TP36.661x35.88x0.85	Reinf. 16 Tension Rupture	91.9%	Pass
34.5 - 34.25	Pole + Reinf.	TP36.708x36.661x1.1	Reinf. 16 Tension Rupture	72.2%	Pass
34.25 - 33	Pole + Reinf.	TP36.942x36.708x1.1	Reinf. 16 Tension Rupture	72.6%	Pass
33 - 32.75	Pole + Reinf.	TP36.989x36.942x1.1	Reinf. 15 Tension Rupture	72.7%	Pass
32.75 - 29.75	Pole + Reinf.	TP37.552x36.989x1.075	Reinf. 15 Tension Rupture	73.6%	Pass
29.75 - 29.5	Pole + Reinf.	TP37.598x37.552x1.125	Reinf. 15 Tension Rupture	71.3%	Pass
29.5 - 25	Pole + Reinf.	TP38.442x37.598x1.1	Reinf. 15 Tension Rupture	72.6%	Pass
25 - 24.75	Pole + Reinf.	TP38.489x38.442x0.8625	Reinf. 15 Tension Rupture	91.4%	Pass
24.75 - 19.75	Pole + Reinf.	TP39.427x38.489x0.85	Reinf. 15 Tension Rupture	93.0%	Pass
19.75 - 14.75	Pole + Reinf.	TP40.364x39.427x0.825	Reinf. 15 Tension Rupture	94.4%	Pass
14.75 - 14.5	Pole + Reinf.	TP40.411x40.364x0.825	Reinf. 15 Tension Rupture	94.5%	Pass
14.5 - 14.25	Pole + Reinf.	TP40.458x40.411x0.825	Reinf. 15 Tension Rupture	94.5%	Pass
14.25 - 12.25	Pole + Reinf.	TP40.833x40.458x0.825	Reinf. 15 Tension Rupture	95.1%	Pass
12.25 - 12	Pole + Reinf.	TP40.88x40.833x0.7875	Reinf. 14 Tension Rupture	96.0%	Pass
12 - 11.5	Pole + Reinf.	TP40.974x40.88x0.7875	Reinf. 14 Tension Rupture	96.2%	Pass
11.5 - 11.25	Pole + Reinf.	TP41.02x40.974x0.9	Reinf. 14 Tension Rupture	91.1%	Pass
11.25 - 9.25	Pole + Reinf.	TP41.396x41.02x0.8875	Reinf. 14 Tension Rupture	91.7%	Pass
9.25 - 9	Pole + Reinf.	TP41.442x41.396x0.85	Reinf. 13 Tension Rupture	92.4%	Pass
9 - 4.5	Pole + Reinf.	TP42.286x41.442x0.825	Reinf. 13 Tension Rupture	93.5%	Pass
4.5 - 4.25	Pole + Reinf.	TP42.333x42.286x0.85	Reinf. 1 Tension Rupture	86.6%	Pass
4.25 - 3	Pole + Reinf.	TP42.567x42.333x0.85	Reinf. 1 Tension Rupture	86.9%	Pass
3 - 2.75	Pole + Reinf.	TP42.614x42.567x0.8375	Reinf. 1 Tension Rupture	87.1%	Pass
2.75 - 0	Pole + Reinf.	TP43.13x42.614x0.825	Reinf. 1 Tension Rupture	87.7%	Pass
				Summary	
			Pole	75.5%	Pass
			Reinforcement	98.1%	Pass
			Overall	98.1%	Pass

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in^4)			Area (in^2)			% Capacity*	Axial (kips)																		
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15	R16	R17	R18	R19	R20
150 - 145	363	n/a	363	10.10	n/a	10.10	21.7%																				
145 - 140	427	n/a	427	10.66	n/a	10.66	39.9%																				
140 - 135	499	n/a	499	11.23	n/a	11.23	66.3%																				
135 - 133	529	n/a	529	11.45	n/a	11.45	75.5%																				
133 - 132.75	533	703	1236	11.48	13.50	24.98	32.0%																				108.7
132.75 - 127.75	616	768	1384	12.05	13.50	25.55	42.6%																				141.2
127.75 - 123.75	688	823	1511	12.50	13.50	26.00	53.2%																				173.5
123.75 - 123.5	692	826	1519	12.53	13.50	26.03	53.8%																				175.4
123.5 - 118.75	785	2166	2951	13.07	32.25	45.32	37.4%				167.9																119.6
118.75 - 118.5	790	3072	3863	13.09	45.75	58.84	29.0%				130.1															92.6	
118.5 - 117	822	3147	3968	13.26	45.75	59.01	30.8%				136.9															97.5	
117 - 116.75	827	2236	3063	13.29	32.25	45.54	40.4%				179.6														127.9		
116.75 - 111.75	937	2416	3353	13.86	32.25	46.11	47.7%				207.2														147.7		
111.75 - 106.75	1056	2604	3660	14.42	32.25	46.67	54.8%				232.8														166.0		
106.75 - 101.75	1185	2798	3983	14.99	32.25	47.24	61.8%				256.7														183.1		
101.75 - 99.5	1247	2888	4135	15.24	32.25	47.49	64.9%				266.8														190.3		
99.5 - 94.5	2188	3010	5198	25.84	32.25	58.09	48.6%				245.5														175.1		
94.5 - 93.75	2224	3041	5265	25.98	32.25	58.23	49.2%				247.9														176.9		
93.75 - 93.5	2236	3876	6112	26.03	41.25	67.28	42.7%				215.2					101.4									153.5		
93.5 - 92.75	2273	3915	6188	26.17	41.25	67.42	43.2%				217.4					102.5									155.1		
92.75 - 92.5	2285	5208	7493	26.22	54.75	80.97	36.0%				180.9			129.0		85.3									129.0		
92.5 - 91.25	2347	5296	7644	26.45	54.75	81.20	36.7%				183.9			131.2		86.7									131.2		
91.25 - 91	2360	5314	7674	26.50	54.75	81.25	36.9%				184.5			131.7		87.0								131.7			
91 - 89.25	2449	5440	7889	26.83	54.75	81.58	37.9%				188.7			134.7		89.0								134.7			
89.25 - 89	2462	6244	8706	26.88	62.25	89.13	34.6%			241.1				122.9		81.2								122.9			
89 - 85.75	2634	6514	9148	27.49	62.25	89.74	36.3%			250.9				128.0		84.6								128.0			
85.75 - 85.5	2648	4213	6860	27.54	39.75	67.29	48.7%			336.9														171.8			
85.5 - 80.5	2929	4486	7415	28.48	39.75	68.23	51.9%			354.8														180.9			
80.5 - 75.5	3229	4769	7998	29.42	39.75	69.17	55.1%			371.5														189.5			
75.5 - 70.5	3550	5060	8610	30.37	39.75	70.12	58.1%			387.1														197.5			
70.5 - 68.08	3712	5204	8916	30.82	39.75	70.57	59.5%			394.2														201.2			
68.08 - 67.83	3729	5812	9541	30.87	44.25	75.12	56.0%			370.4													252.0				
67.83 - 67	3786	5868	9654	31.03	44.25	75.28	56.4%			372.7													253.6				
67 - 66.75	3803	8250	12054	31.07	62.25	93.32	45.5%			300.1			204.2										204.2				
66.75 - 63.25	4051	8584	12635	31.73	62.25	93.98	47.1%			308.3			209.8										209.8				
63.25 - 63	4069	10451	14520	31.78	75.75	107.53	41.3%			269.7			183.5		137.6								183.5				
63 - 59.5	4328	10866	15194	32.44	75.75	108.19	42.7%			276.8			188.4		141.3								188.4				
59.5 - 59.25	4347	11461	15808	32.49	79.50	111.99	41.3%		305.6				182.0		136.5								182.0				
59.25 - 56.25	4578	11842	16419	33.05	79.50	112.55	42.5%		312.1				185.9		139.5								185.9				
56.25 - 56	4597	9882	14479	33.10	66.00	99.10	48.5%		355.7				211.9										211.9				
56 - 55.75	4617	7233	11850	33.15	48.00	81.15	59.5%		436.7														260.1				
55.75 - 50.75	5022	7627	12649	34.09	48.00	82.09	62.1%		449.8														268.0				
50.75 - 50	5085	7686	12771	34.23	48.00	82.23	62.5%		451.7														269.1				
50 - 43.67	6375	7928	14303	41.68	48.00	89.68	57.7%		444.3														264.8				
43.67 - 38.67	6907	8340	15247	42.81	48.00	90.81	59.6%		454.4														270.8				
38.67 - 34.5	7373	8691	16064	43.75	48.00	91.75	61.1%		462.3														275.6				
34.5 - 34.25	7402	13146	20548	43.81	72.38	116.18	48.0%		362.9			294.9											216.3				
34.25 - 33	7546	13307	20854	44.09	72.38	116.47	48.4%		365.0			296.5											217.6				
33 - 32.75	7575	13340	20915	44.15	72.38	116.52	48.5%		365.4			296.9										217.8					
32.75 - 29.75	7930	13731	21661	44.83	72.38	117.20	49.4%		370.2			300.8										220.7					
29.75 - 29.5	7960	14506	22466	44.88	76.13	121.01	47.9%	403.1				291.2										213.6					
29.5 - 25	8514	15135	23649	45.90	76.13	122.03	49.2%	410.8				296.7										217.7					
25 - 24.75	8545	10315	18860	45.96	51.75	97.71	62.0%	517.1														274.0					
24.75 - 19.75	9191	10801	19993	47.09	51.75	98.84	63.7%	525.8														278.7					
19.75 - 14.75	9869	11299	21169	48.22	51.75	99.97	65.3%	534.0														283.1					
14.75 - 14.5	9904	11325	21229	48.27	51.75	100.02	65.4%	534.4														283.3					
14.5 - 14.25	9939	11350	21289	48.33	51.75	100.08	65.5%	534.8														283.5					
14.25 - 12.25	10220	11553	21773	48.78	51.75	100.53	66.2%	537.9														285.2					
12.25 - 12	10273	10673	20947	48.84	51.75	100.59	72.4%	578.6											299.5		287.9						
12 - 11.5	10345	10720	21065	48.95	51.75	100.70	72.5%	579.3											299.9		288.3						
11.5 - 11.25	10387	13354	23741	49.01	57.75	106.76	65.0%	537.0										273.8	295.9		273.0						
11.25 - 9.25	10677	13586	24263	49.46	57.75	107.21	65.7%	540.1										275.3	297.5		274.6						
9.25 - 9	10690	12521	23210	49.52	51.75	101.27	67.8%	561.0										312.3	298.0	276.9							
9 - 4.5	11362	13008	24370	50.54	51.75	102.29	69.2%	567.7										315.7	301.4	280.2							
4.5 - 4.25	11401	13451	24852	50.59	57.75	108.34	67.5%	526.2									277.5	310.8	300.9	238.7							
4.25 - 3	11593	13589	25181	50.87	57.75	108.62	67.9%	528.0									278.4	311.7	301.8	239.6							
3 - 2.75	11631	13579	25209	50.93	51.75	102.68	66.6%	529.0									312.3	312.3	312.3								
2.75 - 0	12062	13884	25946	51.55	51.75	103.30	67.4%	532.8									314.2	314.2	314.2								

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

BU# 806361
WO# 1891416
Elevation: 94' 10"

Done By: RAA
Checked By:
Date: 10/23/2020

Bolted Bridge Stiffeners Reinforcement Check

TIA Rev. H

Description:

This sheet is for the analysis of a reinforced flange connection using existing bolted bridge stiffeners.

Assumptions / Notes:

1. For analysis purposes, load is distributed between flange bolts and existing bridge stiffeners.
2. The plastification of the pole is not considered.
3. All shear and axial loads are taken by the flange bolts.

1. PARAMETERS

Flange Elevation: 94'- 10"

1.1 tnxTower Reactions

Apply TIA-222-H Section 15.5? No / Yes

Plate Compression Force: $P_{comp} := 175.1\,kip$

Plate Tension Force: $P_{tens} := 175.1\,kip$

1.2 Existing Bridge Stiffener Properties

(Verify existing bolted connection for reduced moment.)

Number of Existing Bridge Stiffeners: $N_{exist} := 1$

Existing Bridge Stiffener Grade: $Fy_{Ex} := 65ksi$ $Fu_{Ex} := 80ksi$

Thickness of Existing Bridge Stiffeners: $t_{exist} := 1in$

Width of Existing Bridge Stiffeners: $w_{exist} := 6in$

Gross Area of One Existing Bridge Stiffener: $A_{g\_exist} := w_{exist} \cdot t_{exist} = 6 \cdot in^2$

Radius of Gyration about x-axis: $r_{x2} := \frac{t_{exist}}{\sqrt{12}} = 0.29 \cdot in$

2. Existing Bridge Stiffener Checks

2.1 Available Compression Strength

[AISC 15th Edition E3-1]

Resistance Factor: $\phi_c := 0.9$

Unbraced Length: $L_u := 24in$

Effective Length Factor: $K := 1.0$

Effective Length of Member: $L_c := K \cdot L_u = 24 \cdot in$ [AISC 15th Edition E3-2]

Strength of Bridge Stiffener: $Fy_{Ex} = 65 \cdot ksi$ $Fu_{Ex} = 80 \cdot ksi$

Elastic Buckling Stress:
[AISC 15th Ed., Eq. E3-4]

$$F_e := \frac{\pi^2 \cdot 29000ksi}{\left(\frac{L_c}{r_{x2}}\right)^2} = 41.41 \cdot ksi$$

Determination of Crticial Stress:
[AISC 15th Ed., Eqs. E3-2 and E3-3]

$$F_{cr} := \begin{cases} \left(0.658^{\frac{Fy_{Ex}}{F_e}} \cdot Fy_{Ex}\right) & \text{if } 4.71 \cdot \sqrt{\frac{E}{Fy_{Ex}}} \geq \frac{L_c}{r_{x2}} \\ \left(0.877 \cdot F_e\right) & \text{otherwise} \end{cases}$$

$$F_{cr} = 33.7 \cdot ksi$$

Allowable Compressive Strength:
[AISC 15th Ed., Eqs. J4-6 and E3-1]

$$\phi P_n := \begin{cases} \left(\phi_c \cdot Fy_{Ex} \cdot A_{g\_exist}\right) & \text{if } \frac{L_c}{r_{x2}} \leq 25 \\ \left(\phi_c \cdot F_{cr} \cdot A_{g\_exist}\right) & \text{otherwise} \end{cases}$$

$$\phi P_n = 181.96 \cdot kip$$

Check Compressive Strength:

$$Check_{comp} := \begin{cases} \text{"OK"} & \text{if } \frac{P_{comp}}{\phi P_n} \leq 100\% \\ \text{"N/G"} & \text{otherwise} \end{cases}$$

$$Check_{comp} = \text{"OK"}$$

$$Capacity_{comp} = 91.65 \cdot \%$$

2.2 Available Tension Strength

[AISC 15th Edition Ch. D2]

Gross Section Yield

Available Tension Yield Strength:

$$\phi P_{ty} := 0.9 \cdot Fy_{Ex} \cdot A_{g\_exist} = 351 \cdot kip$$

Net Section Fracture

Bolt Hole Diameter:

$$BH := 1.1875in$$

Thickness:

$$T := t_{exist} = 1 \cdot in$$

Net Area:

$$A_{net} := A_{g\_exist} - \left(BH + \frac{1}{16}in\right) \cdot T = 4.75 \cdot in^2$$

Net Area Limitation:

$$A_e := A_{net} = 4.75 \cdot in^2$$

Available Fractile Strength:

$$\phi P_{tr} := 0.75 \cdot Fu_{Ex} \cdot A_e = 285 \cdot kip$$

Tension Check

Controlling Mode of Failure:

$$Check_{mode} := \begin{cases} \text{"Fracture Controls"} & \text{if } \frac{P_{tens}}{\phi P_{tr}} > \frac{P_{tens}}{\phi P_{ty}} \\ \text{"Yield Controls"} & \text{otherwise} \end{cases}$$

$Check_{mode} = \text{"Fracture Controls"}$

$$\phi P_{nt} := \begin{cases} \phi P_{tr} & \text{if } Check_{mode} = \text{"Fracture Controls"} \\ \phi P_{ty} & \text{otherwise} \end{cases}$$

Controlling Tension Mode Check:

$$Check_{tension} := \begin{cases} \text{"OK"} & \text{if } \frac{P_{tens}}{\phi P_{nt}} \le 100\% \\ \text{"N/G"} & \text{otherwise} \end{cases}$$

$Check_{tension} = \text{"OK"}$

$Capacity_{tension} = 58.51 \cdot \%$

SUMMARY

Number of Existing Bridge Stiffeners: $N_{exist} = 1$

Thickness: $t_{exist} = 1 \cdot in$

Width: $w_{exist} = 6 \cdot in$

Controlling Capacity of Existing Bridge Stiffeners: $Capacity_{exist} = 91.6 \cdot \%$

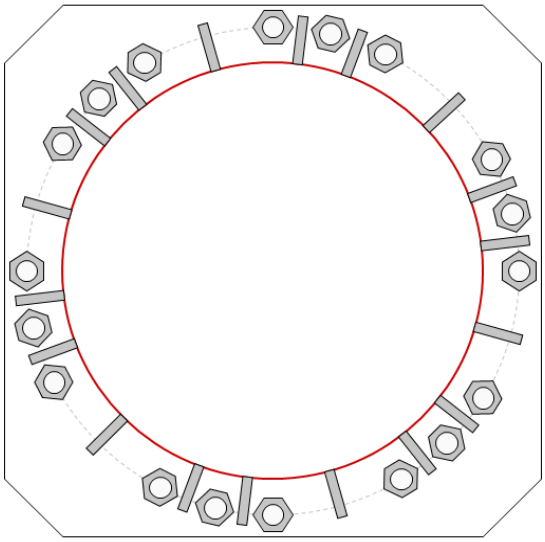
Monopole Base Plate Connection

Site Info	
BU #	806361
Site Name	NHV 102 943127
Order #	479852 Rev. 4

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	0

Applied Loads	
Moment (kip-ft)	4557.26
Axial Force (kips)	61.28
Shear Force (kips)	39.96

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

GROUP 1: (12) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 50.6" BC
pos. (deg): 62.8, 90, 121.4, 148.6, 242.8, 270, 301.4, 328.6, 0, 27.2, 1

GROUP 2: (6) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 50.6" BC
pos. (deg): 76.4, 135, 256.4, 315, 13.6, 193.6

Base Plate Data

55.1" OD x 2.5" Plate (A572-60; Fy=60 ksi, Fu=75 ksi)

Stiffener Data

(18) 18"H x 5"W x 1"T, Notch: 0.75"
plate: Fy= 50 ksi ; weld: Fy= 70 ksi
horiz. weld: 0.5" groove, 45° dbl bevel, 0.5" fillet
vert. weld: 0.5" fillet

Pole Data

43.13" x 0.375" 12-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

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

GROUP 1:		
Pu_t = 240.13	ϕPn_t = 243.75	**Stress Rating**
Vu = 3.33	ϕVn = 149.1	**92.5%**
Mu = n/a	ϕMn = n/a	**Pass**
GROUP 2:		
Pu_t = 243.08	ϕPn_t = 243.75	**Stress Rating**
Vu = 0	ϕVn = 149.1	**94.7%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary

Max Stress (ksi):	34.68	(Roark's Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	**61.2%**	**Pass**

Stiffener Summary

Horizontal Weld:	**91.6%**	**Pass**
Vertical Weld:	**45.5%**	**Pass**
Plate Flexure+Shear:	**19.3%**	**Pass**
Plate Tension+Shear:	**92.5%**	**Pass**
Plate Compression:	**81.1%**	**Pass**

Pole Summary

Punching Shear:	**14.5%**	**Pass**

Drilled Pier Foundation

BU # :	806361
Site Name:	NHV 102 943127
Order Number:	479852 Rev 4

TIA-222 Revison:	H
Tower Type:	Monopole

Applied Loads	Comp.	Uplift
Moment (kip-ft)	4557.26	
Axial Force (kips)	61.28	
Shear Force (kips)	39.96	

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

Pier Design Data		
Depth	33	ft
Ext. Above Grade	0.5	ft
Pier Section 1		
From 0.5' above grade to 23' below grade		
Pier Diameter	6	ft
Rebar Quantity	32	
Rebar Size	11	
Rebar Cage Diameter	61	in
Tie Size	4	
Tie Spacing		in

Rebar & Pier Options

Embedded Pole Inputs

Belled Pier Inputs

Pier Section 2		
From 23' below grade to 33' below grade		
Pier Diameter	6	ft
Rebar Quantity	16	
Rebar Size	11	
Rebar Cage Diameter	61	in
Tie Size	4	
Tie Spacing		in

Analysis Results		
Soil Lateral Check	*Compression*	*Uplift*
$D_{v=0}$ (ft from TOC)	7.69	-
Soil Safety Factor	5.20	-
Max Moment (kip-ft)	4797.03	-
Rating*	*24.4%*	-
Soil Vertical Check	*Compression*	*Uplift*
Skin Friction (kips)	418.46	-
End Bearing (kips)	783.03	-
Weight of Concrete (kips)	121.77	-
Total Capacity (kips)	1201.49	-
Axial (kips)	183.05	-
Rating*	*14.5%*	-
Reinforced Concrete Flexure	*Compression*	*Uplift*
Critical Depth (ft from TOC)	7.50	-
Critical Moment (kip-ft)	4796.80	-
Critical Moment Capacity	6114.67	-
Rating*	*74.7%*	-
Reinforced Concrete Shear	*Compression*	*Uplift*
Critical Depth (ft from TOC)	18.00	-
Critical Shear (kip)	269.25	-
Critical Shear Capacity	351.11	-
Rating*	*73.0%*	-

Soil Interaction Rating*	**24.4%**
Structural Foundation Rating*	**74.7%**

*Rating per TIA-222-H Section 15.5

Check Limitation	
Apply TIA-222-H Section 15.5:	☑
N/A	☐
Shear Design Options	
Check Shear along Depth of Pier:	☑
Utilize Shear-Friction Methodology:	☐

Go to Soil Calculations

Soil Profile

Groundwater Depth	10	# of Layers	5

Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ_{soil} (pcf)	$\gamma_{concrete}$ (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	3.33	3.33	135	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
2	3.33	5	1.67	135	150	0	38	0.000	0.000	0.00	0.00			Cohesionless
3	5	10	5	135	150	0	38	0.000	0.000	0.80	0.80			Cohesionless
4	10	15	5	75	87.6	0	38	0.000	0.000	0.80	0.80			Cohesionless
5	15	33	18	75	87.6	0	38	0.000	0.000	1.20	1.20	36.92541		Cohesionless

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LPile for Windows, Version 2016-09.010

Analysis of Individual Piles and Drilled Shafts
Subjected to Lateral Loading Using the p-y Method

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This copy of LPile is being used by:

Rafael E. Del Toro
Crown Castle

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Files Used for Analysis

Path to file locations:
\SA Models - Letters\Work Area\RDel Toro\Tep. LPile\806361\

Name of input data file:
806361.lp9d

Name of output report file:
806361.lp9o

Name of plot output file:
806361.lp9p

Name of runtime message file:
806361.lp9r

Date and Time of Analysis

Date: October 23, 2020 Time: 13:58:19

Problem Title

Project Name: 806361 NHV 102 943127

Job Number: 479852 Rev 4

Client:

Engineer: Rafael Del Toro

Description:

Program Options and Settings

Computational Options:
- Use unfactored loads in computations (conventional analysis)

Engineering Units Used for Data Input and Computations:
- US Customary System Units (pounds, feet, inches)

Analysis Control Options:

- Maximum number of iterations allowed	=	500
- Deflection tolerance for convergence	=	1.0000E-05 in
- Maximum allowable deflection	=	100.0000 in
- Number of pile increments	=	67

Loading Type and Number of Cycles of Loading:
- Static loading specified

- Use of p-y modification factors for p-y curves not selected

- No distributed lateral loads are entered
- Loading by lateral soil movements acting on pile not selected
- Input of shear resistance at the pile tip not selected
- Computation of pile-head foundation stiffness matrix not selected
- Push-over analysis of pile not selected
- Buckling analysis of pile not selected

Output Options:
- Output files use decimal points to denote decimal symbols.
- Values of pile-head deflection, bending moment, shear force, and soil reaction are printed for full length of pile.
- Printing Increment (nodal spacing of output points) = 1
- No p-y curves to be computed and reported for user-specified depths
- Print using wide report formats

Pile Structural Properties and Geometry

Number of pile sections defined	=	1
Total length of pile	=	33.500 ft
Depth of ground surface below top of pile	=	0.5000 ft

Pile diameters used for p-y curve computations are defined using 2 points.

p-y curves are computed using pile diameter values interpolated with depth over the length of the pile. A summary of values of pile diameter vs. depth follows.

Point No.	Depth Below Pile Head feet	Pile Diameter inches
1	0.000	72.0000
2	33.500	72.0000

Input Structural Properties for Pile Sections:

Pile Section No. 1:

Section 1 is an elastic pile		
Cross-sectional Shape	=	Circular Pile
Length of section	=	33.500000 ft
Width of top of section	=	72.000000 in
Width of bottom of section	=	72.000000 in
Top Area	=	4072. sq. in

Bottom Area	=	4072. sq. in
Moment of Inertia at Top	=	1319167. in^4
Moment of Inertia at Bottom	=	1319167. in^4
Elastic Modulus	=	3122019. psi

Ground Slope and Pile Batter Angles

Ground Slope Angle	=	0.000 degrees
	=	0.000 radians
Pile Batter Angle	=	0.000 degrees
	=	0.000 radians

Soil and Rock Layering Information

The soil profile is modelled using 3 layers

Layer 1 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer	=	0.500000 ft
Distance from top of pile to bottom of layer	=	3.830000 ft
Effective unit weight at top of layer	=	135.000000 pcf
Effective unit weight at bottom of layer	=	135.000000 pcf
Friction angle at top of layer	=	20.000000 deg.
Friction angle at bottom of layer	=	20.000000 deg.
Subgrade k at top of layer	=	0.0000 pci
Subgrade k at bottom of layer	=	0.0000 pci

NOTE: Default values for subgrade k will be computed for this layer.

Layer 2 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer	=	3.830000 ft
Distance from top of pile to bottom of layer	=	10.500000 ft
Effective unit weight at top of layer	=	135.000000 pcf
Effective unit weight at bottom of layer	=	135.000000 pcf
Friction angle at top of layer	=	38.000000 deg.
Friction angle at bottom of layer	=	38.000000 deg.
Subgrade k at top of layer	=	0.0000 pci
Subgrade k at bottom of layer	=	0.0000 pci

NOTE: Default values for subgrade k will be computed for this layer.

Layer 3 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer	=	10.500000 ft
Distance from top of pile to bottom of layer	=	34.000000 ft
Effective unit weight at top of layer	=	75.000000 pcf
Effective unit weight at bottom of layer	=	75.000000 pcf
Friction angle at top of layer	=	38.000000 deg.
Friction angle at bottom of layer	=	38.000000 deg.
Subgrade k at top of layer	=	0.0000 pci
Subgrade k at bottom of layer	=	0.0000 pci

NOTE: Default values for subgrade k will be computed for this layer.

(Depth of the lowest soil layer extends 0.500 ft below the pile tip)

Summary of Input Soil Properties

Layer Num.	Soil Type Name (p-y Curve Type)	Layer Depth ft	Effective Unit Wt. pcf	Angle of Friction deg.	kpy pci
1	Sand	0.5000	135.0000	20.0000	default
	(Reese, et al.)	3.8300	135.0000	20.0000	default
2	Sand	3.8300	135.0000	38.0000	default
	(Reese, et al.)	10.5000	135.0000	38.0000	default
3	Sand	10.5000	75.0000	38.0000	default
	(Reese, et al.)	34.0000	75.0000	38.0000	default

Static Loading Type

Static loading criteria were used when computing p-y curves for all analyses.

Pile-head Loading and Pile-head Fixity Conditions

Number of loads specified = 1

Load	Load	Condition	Condition	Axial Thrust
Compute Top y				

No.	Type	1	2	Force, lbs vs. Pile Length
1	1	V = 39960. lbs	M = 54687120. in-lbs	61280. No

V = shear force applied normal to pile axis
M = bending moment applied to pile head
y = lateral deflection normal to pile axis
S = pile slope relative to original pile batter angle
R = rotational stiffness applied to pile head
Values of top y vs. pile lengths can be computed only for load types with specified shear loading (Load Types 1, 2, and 3).
Thrust force is assumed to be acting axially for all pile batter angles.

Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness

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Axial thrust force values were determined from pile-head loading conditions

Number of Pile Sections Analyzed = 1

Pile Section No. 1:

Moment-curvature properties were derived from elastic section properties

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Layering Correction Equivalent Depths of Soil & Rock Layers

Layer No.	Top of Layer Below Pile Head ft	Equivalent Top Depth Below Grnd Surf ft	Same Layer Type As Layer Above	Layer is Rock or is Below Rock Layer	F0 Integral for Layer lbs	F1 Integral for Layer lbs
1	0.5000	0.00	N.A.	No	0.00	21043.
2	3.8300	3.3300	Yes	No	21043.	593743.
3	10.5000	10.0000	Yes	No	614786.	N.A.

Notes: The F0 integral of Layer n+1 equals the sum of the F0 and F1 integrals for Layer n. Layering correction equivalent depths are computed only for soil types with both shallow-depth and deep-depth expressions for peak lateral load transfer. These soil types are soft and stiff clays,

non-liquefied sands, and cemented c-phi soil.

Computed Values of Pile Loading and Deflection
for Lateral Loading for Load Case Number 1

Pile-head conditions are Shear and Moment (Loading Type 1)

Shear force at pile head = 39960.0 lbs
Applied moment at pile head = 54687120.0 in-lbs
Axial thrust load on pile head = 61280.0 lbs

Depth X	Deflect. y	Bending Moment	Shear Force	Slope S	Total Stress	Bending Stiffness	Soil Res. Es*h	Soil Spr. Lat. Load	Distrib. p
feet	inches	in-lbs	lbs	radians	psi*	in-lb^2	lb/inch	lb/inch	lb/inch
0.00	0.3892	5.47E+07	39960.	-0.00321	1507.	4.12E+12	0.00	0.00	0.00
0.5000	0.3702	5.49E+07	39960.	-0.00313	1514.	4.12E+12	0.00	0.00	0.00
1.0000	0.3516	5.52E+07	39913.	-0.00305	1521.	4.12E+12	-15.5804	265.8564	0.00
1.5000	0.3335	5.54E+07	39778.	-0.00297	1527.	4.12E+12	-29.5585	531.7128	0.00
2.0000	0.3160	5.56E+07	39563.	-0.00289	1534.	4.12E+12	-41.9988	797.5692	0.00
2.5000	0.2988	5.59E+07	39278.	-0.00281	1540.	4.12E+12	-52.9659	1063.	0.00
3.0000	0.2822	5.61E+07	38932.	-0.00273	1547.	4.12E+12	-62.5250	1329.	0.00
3.5000	0.2661	5.64E+07	38532.	-0.00265	1553.	4.12E+12	-70.7416	1595.	0.00
4.0000	0.2505	5.66E+07	33298.	-0.00257	1559.	4.12E+12	-1674.	40100.	0.00
4.5000	0.2353	5.68E+07	22525.	-0.00248	1564.	4.12E+12	-1917.	48887.	0.00
5.0000	0.2207	5.69E+07	10315.	-0.00240	1567.	4.12E+12	-2153.	58535.	0.00
5.5000	0.2065	5.69E+07	-3276.	-0.00232	1567.	4.12E+12	-2378.	69080.	0.00
6.0000	0.1929	5.68E+07	-18177.	-0.00223	1566.	4.12E+12	-2589.	80558.	0.00

```
    6.5000     0.1797   5.67E+07    -34074.   -0.00215      1561.   4.12E+12
-2710.     90474.       0.00
    7.0000     0.1670   5.64E+07    -50390.   -0.00207      1555.   4.12E+12
-2729.     98013.       0.00
    7.5000     0.1549   5.61E+07    -66749.   -0.00199      1545.   4.12E+12
-2725.    105553.       0.00
    8.0000     0.1432   5.56E+07    -83020.   -0.00191      1533.   4.12E+12
-2699.    113092.       0.00
    8.5000     0.1320   5.51E+07    -99079.   -0.00183      1518.   4.12E+12
-2654.    120632.       0.00
    9.0000     0.1213   5.44E+07   -114814.   -0.00175      1500.   4.12E+12
-2591.    128171.       0.00
    9.5000     0.1111   5.37E+07   -130123.   -0.00167      1480.   4.12E+12
-2512.    135711.       0.00
   10.0000     0.1013   5.29E+07   -144914.   -0.00159      1458.   4.12E+12
-2418.    143250.       0.00
   10.5000    0.09199   5.20E+07   -159105.   -0.00151      1433.   4.12E+12
-2312.    150790.       0.00
   11.0000    0.08314   5.10E+07   -172623.   -0.00144      1406.   4.12E+12
-2194.    158329.       0.00
   11.5000    0.07474   4.99E+07   -185403.   -0.00136      1376.   4.12E+12
-2066.    165869.       0.00
   12.0000    0.06677   4.87E+07   -197390.   -0.00129      1345.   4.12E+12
-1930.    173408.       0.00
   12.5000    0.05923   4.75E+07   -208538.   -0.00122      1312.   4.12E+12
-1786.    180948.       0.00
   13.0000    0.05210   4.62E+07   -218807.   -0.00115      1277.   4.12E+12
-1637.    188487.       0.00
   13.5000    0.04538   4.49E+07   -228166.   -0.00109      1240.   4.12E+12
-1483.    196026.       0.00
   14.0000    0.03905   4.35E+07   -236588.   -0.00102      1202.   4.12E+12
-1325.    203566.       0.00
   14.5000    0.03310   4.21E+07   -244057.  -9.61E-04      1163.   4.12E+12
-1165.    211105.       0.00
   15.0000    0.02752   4.06E+07   -250559.  -9.01E-04      1122.   4.12E+12
-1003.    218645.       0.00
   15.5000    0.02229   3.90E+07   -256089.  -8.43E-04      1081.   4.12E+12
-840.3557    226184.       0.00
   16.0000    0.01741   3.75E+07   -260644.  -7.87E-04      1038.   4.12E+12
-678.0389    233724.       0.00
   16.5000    0.01285   3.59E+07   -264228.  -7.34E-04   995.2803   4.12E+12
-516.6217    241263.       0.00
   17.0000    0.00860   3.43E+07   -266848.  -6.82E-04   951.7691   4.12E+12
-356.7685    248803.       0.00
   17.5000    0.00466   3.27E+07   -268516.  -6.34E-04   907.9068   4.12E+12
-199.0674    256342.       0.00
   18.0000    0.00100   3.11E+07   -269245.  -5.87E-04   863.8485   4.12E+12
-44.0316    263882.       0.00
   18.5000   -0.00239   2.95E+07   -269053.  -5.43E-04   819.7464   4.12E+12
107.8992    271421.       0.00
```

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   19.0000   -0.00551   2.79E+07   -267961.  -5.01E-04   775.7500   4.12E+12
256.3569    278961.       0.00
   19.5000   -0.00840   2.63E+07   -265988.  -4.62E-04   732.0050   4.12E+12
401.0427    286500.       0.00
   20.0000   -0.01105   2.47E+07   -263160.  -4.25E-04   688.6536   4.12E+12
541.7248    294040.       0.00
   20.5000   -0.01349   2.31E+07   -259500.  -3.90E-04   645.8340   4.12E+12
678.2354    301579.       0.00
   21.0000   -0.01573   2.16E+07   -255034.  -3.57E-04   603.6804   4.12E+12
810.4678    309119.       0.00
   21.5000   -0.01778   2.01E+07   -249788.  -3.27E-04   562.3228   4.12E+12
938.3729    316658.       0.00
   22.0000   -0.01965   1.86E+07   -243787.  -2.99E-04   521.8868   4.12E+12
1062.    324198.       0.00
   22.5000   -0.02137   1.71E+07   -237057.  -2.73E-04   482.4937   4.12E+12
1181.    331737.       0.00
   23.0000   -0.02293   1.57E+07   -229624.  -2.49E-04   444.2610   4.12E+12
1296.    339277.       0.00
   23.5000   -0.02435   1.44E+07   -221512.  -2.27E-04   407.3017   4.12E+12
1408.    346816.       0.00
   24.0000   -0.02565   1.31E+07   -212745.  -2.07E-04   371.7250   4.12E+12
1515.    354356.       0.00
   24.5000   -0.02683   1.18E+07   -203757.  -1.89E-04   337.6364   4.12E+12
1481.    331141.       0.00
   25.0000   -0.02791   1.06E+07   -194715.  -1.72E-04   305.0025   4.12E+12
1533.    329516.       0.00
   25.5000   -0.02890   9484214.   -185370.  -1.58E-04   273.8746   4.12E+12
1582.    328453.       0.00
   26.0000   -0.02981   8400532.   -175737.  -1.45E-04   244.3010   4.12E+12
1629.    327826.       0.00
   26.5000   -0.03064   7375476.   -165833.  -1.33E-04   216.3273   4.12E+12
1673.    327535.       0.00
   27.0000   -0.03141   6410629.   -155673.  -1.23E-04   189.9967   4.12E+12
1714.    327497.       0.00
   27.5000   -0.03212   5507493.   -145268.  -1.15E-04   165.3501   4.12E+12
1754.    327645.       0.00
   28.0000   -0.03278   4667494.   -134632.  -1.07E-04   142.4266   4.12E+12
1792.    327922.       0.00
   28.5000   -0.03340   3891990.   -123774.  -1.01E-04   121.2631   4.12E+12
1828.    328281.       0.00
   29.0000   -0.03399   3182278.   -112705.  -9.57E-05   101.8951   4.12E+12
1862.    328681.       0.00
   29.5000   -0.03455   2539599.   -101434.  -9.16E-05    84.3565   4.12E+12
1895.    329089.       0.00
   30.0000   -0.03509   1965144.    -89967.  -8.83E-05    68.6796   4.12E+12
1927.    329476.       0.00
   30.5000   -0.03561   1460055.    -78314.  -8.58E-05    54.8958   4.12E+12
1958.    329818.       0.00
   31.0000   -0.03612   1025437.    -66357.  -8.40E-05    43.0351   4.12E+12
2028.    336903.       0.00
```

```
   31.5000   -0.03662    663832.    -53973.  -8.27E-05    33.1669   4.12E+12
2100.    344079.       0.00
   32.0000   -0.03711    377826.    -41153.  -8.20E-05    25.3618   4.12E+12
2173.    351332.       0.00
   32.5000   -0.03760    170052.    -27891.  -8.16E-05    19.6917   4.12E+12
2248.    358655.       0.00
   33.0000   -0.03809     43197.    -14176.  -8.14E-05    16.2298   4.12E+12
2324.    366041.       0.00
   33.5000   -0.03858       0.00       0.00  -8.14E-05    15.0509   4.12E+12
2401.    186742.       0.00

* The above values of total stress are combined axial and bending stresses.


Output Summary for Load Case No. 1:

Pile-head deflection             =     0.38923253 inches
Computed slope at pile head      =    -0.00321363 radians
Maximum bending moment           =      56882336. inch-lbs
Maximum shear force              =       -269245. lbs
Depth of maximum bending moment  =     5.50000000 feet below pile head
Depth of maximum shear force     =    18.00000000 feet below pile head
Number of iterations             =              9
Number of zero deflection points =              1


--------------------------------------------------------------------------------
            Summary of Pile-head Responses for Conventional Analyses
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Definitions of Pile-head Loading Conditions:

Load Type 1: Load 1 = Shear, V, lbs, and Load 2 = Moment, M, in-lbs
Load Type 2: Load 1 = Shear, V, lbs, and Load 2 = Slope, S, radians
Load Type 3: Load 1 = Shear, V, lbs, and Load 2 = Rot. Stiffness, R, in-lbs/rad.
Load Type 4: Load 1 = Top Deflection, y, inches, and Load 2 = Moment, M, in-lbs
Load Type 5: Load 1 = Top Deflection, y, inches, and Load 2 = Slope, S, radians


Load Load                Load                  Axial    Pile-head  Pile-head  Max
Shear Max Moment
Case Type   Pile-head    Type     Pile-head   Loading  Deflection  Rotation    in
Pile    in Pile
 No.  1      Load 1       2        Load 2       lbs      inches     radians      lbs
     in-lbs
---- ----- ---------- ---------- ---------- ---------- ---------- ----------
---------- ----------
  1  V, lb     39960.  M, in-lb    5.47E+07     61280.     0.3892   -0.00321
-269245.   5.69E+07
```

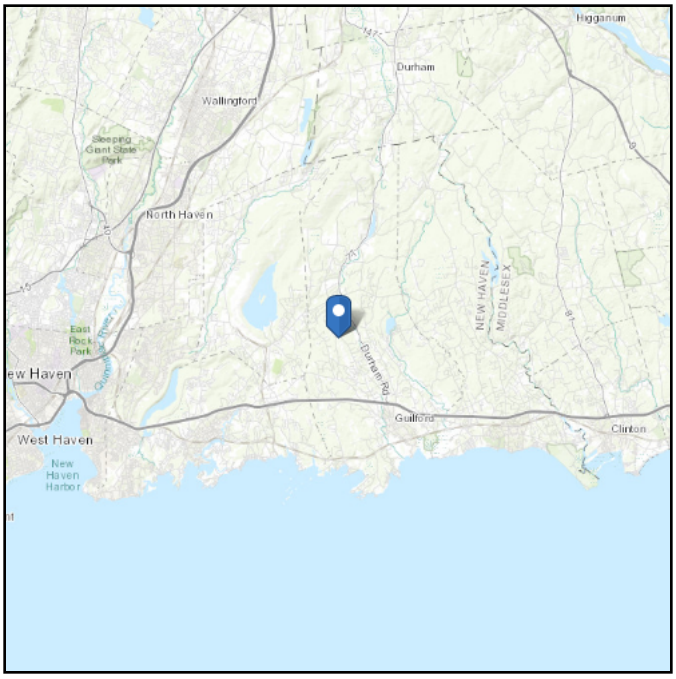
```
Maximum pile-head deflection = 0.3892325303 inches
Maximum pile-head rotation   = -0.0032136255 radians = -0.184127 deg.

The analysis ended normally.
```

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard:	ASCE/SEI 7-10	**Elevation:**	281.72 ft (NAVD 88)
Risk Category:	II	**Latitude:**	41.330025
Soil Class:	D - Stiff Soil	**Longitude:**	-72.721808



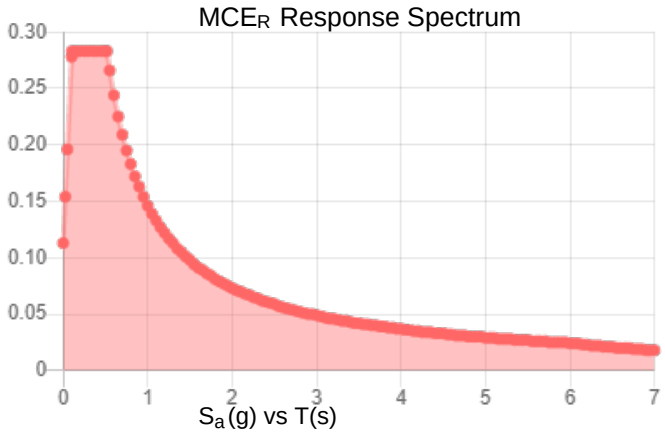
Seismic

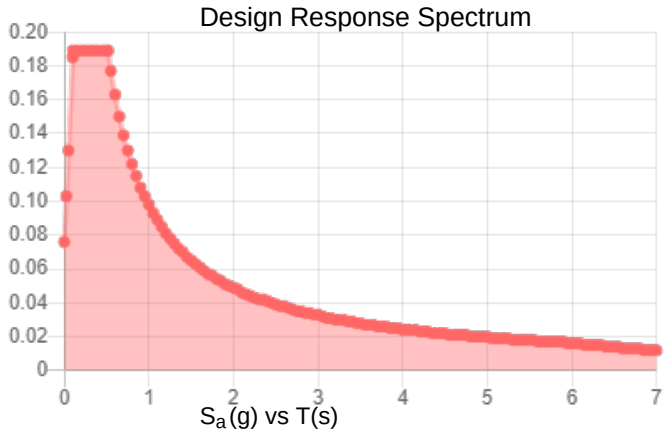
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.177	S_{DS} :	0.189
S_1 :	0.061	S_{D1} :	0.098
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.091
S_{MS} :	0.283	PGA_M :	0.145
S_{M1} :	0.146	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B





Data Accessed: Wed Oct 21 2020

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

Ice

Results:

Ice Thickness:	0.75 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Wed Oct 21 2020

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 50-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Exhibit E

Mount Analysis

PAUL J. FORD & COMPANY

Date: October 14, 2020

Darcy Tarr
Crown Castle
6325 Ardrey Kell Road
Charlotte, NC 28277

Paul J Ford and Company
250 E. Broad Street, Suite 600
Columbus, OH 43215
614.221.6679

Subject:	**Mount Replacement Report**	
Carrier Designation:	***T-Mobile* Equipment Change-out**	
	Carrier Site Number:	CTNH110C
	Carrier Site Name:	NH110/Crown LongHill_ETMP
Crown Castle Designation:	**Crown Castle BU Number:**	806361
	Crown Castle Site Name:	NHV 102 943127
	Crown Castle JDE Job Number:	559170
	Crown Castle Purchase Order Number:	1577601
	Crown Castle Order Number:	479852 Rev. 4
Engineering Firm Designation:	**Paul J Ford and Company Project Number:**	A37520-2235.001.7190
Site Data:	**131 Manor Rd, Guilford, New Haven County, CT 06437** **Latitude 41.330025°, Longitude -72.721808°**	
Structure Information:	**Tower Height & Type:**	**150 Foot Monopole**
	Mount Elevation:	**128 Foot**
	Mount Type:	**(3)-Sector 12.5 Foot Platform Type**

Dear Darcy Tarr,

Paul J Ford and Company is pleased to submit this "Mount Replacement Report" to determine the structural integrity of the T-Mobile 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 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:

12.5' Platform Type **SUFFICIENT***

***The mount has sufficient capacity once the changes, as described in Section 4.1 Recommendations of this report, are completed.**

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

Respectfully submitted by:

Angela Sage, E.I.
Structural Designer
asage@pauljford.com BKK

STATE OF CONNECTICUT JUSTIN T. KLINE No. 30301 LICENSED PROFESSIONAL ENGINEER

Justin T. Kline
2020.10.19
14:02:19-04'00'

TABLE OF CONTENTS

1) INTRODUCTION

The proposed mount under consideration is a (3)-Sector 12.5' Platform Type mount, designed by SitePro1.

2) ANALYSIS CRITERIA

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:	0.177
Seismic S_1:	0.061
Maintenance Loading Wind Speed:	30 mph
Maintenance Load at Mid/End-Points, L_v:	250 lb
Maintenance Load at Mount Pipes, L_m:	500 lb

Table 1 - Proposed Equipment Configuration

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount / Modification Details
128	128	3	ERICSSON	AIR 32 B2A B66AA_T-MOBILE	(3)-SECTOR 12.5' MOUNT
		3	ERICSSON	AIR6449 B41_T-MOBILE	
		3	RFS CELWAVE	APXVAALL24_43-U-NA20_TMO	
		3	COMMSCOPE	SDX1926Q-43	
		3	ERICSSON	KRY 112 144/1	
		3	ERICSSON	RADIO 4449 B71 B85A_T-MOBILE	
		3	ERICSSON	RRUS 4415 B25_CCIV2	

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
Mount Manufacturer Drawings	Model #:SitePro1 RMQP-496-HK Dated: 7/14/2014	-	MNF
Order	ID: 479852 Rev. 4 Dated: 4/22/2019	-	CCISites
Radio Frequency Data Sheet	RFDS ID #: CTNH110C Version 4, Dated: 9/23/2020	-	Crown Castle

3.1) Analysis Method

RISA-3D (version 17.0.3), 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.

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

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

3.2) Assumptions

1) *The analysis of the existing tower or the effect of the mount attachment to the tower is not within the current scope of work.*
2) *The antenna mounting system was properly fabricated, installed and maintained in good condition, twist free and plumb in accordance with its original design and manufacturer's specifications and all bolts are tightened as specified by the manufacturer and AISC requirements.*
3) *The configuration of antennas, mounts, and other appurtenances are as specified in Table 1.*
4) *All member connections have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report. All U-Bolt connections have been properly tightened. This 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) *Steel grades are as follows, unless noted otherwise:*
   - *a) Channel, Solid Round, Angle, Unistrut* — *ASTM A53 (GR 35)*
   - *b) Pipe* — *ASTM A53 (GR 35)*
   - *c) HSS (Rectangular), Plate* — *Q235 Gr B (Fy = 34 ksi, Fu = 58 ksi)*
   - *d) HSS (Round)* — *ASTM A53 (GR 35)*
   - *e) Connection Bolts* — *ASTM A325*
   - *f) Threaded Rods* — *SAE J429 (GR2)*
   - *g) U-Bolts* — *SAE J429 (GR2)*
6) *Proposed equipment is to be installed in the locations specified in Appendix A. Any changes to the proposed equipment locations will render this report invalid.*

This analysis may be affected if any assumptions are not valid or have been made in error. Paul J Ford and Company should be notified to determine the effect on the structural integrity of the mount.

4) ANALYSIS RESULTS

Table 3- Mount Component Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Face Horizontals	128	10.6	Pass
1,2	Bracing Members		22.6	Pass
1,2	Support Rails		21.5	Pass
1,2	Grating Support Members		25.5	Pass
1,2	Standoff Members		24.8	Pass
1,2	Kick-Brace		10.9	Pass
1,2	Corner Plates		43.0	Pass
1,2	Mount Pipes		88.5	Pass
1,2	Mount to Tower Connection		19.9	Pass

Mount Rating (max from all components) =	88.5%

Notes:
1) See additional documentation in “Appendix B – Software Analysis Output” for calculations supporting the % capacity consumed.
2) Rating per TIA-222-H, Section 15.5

4.1) Recommendations

The proposed mount has sufficient capacity to support the proposed loading configuration. In order for the results of this analysis to be considered valid, the mount listed below shall be installed.

- Mount Replacement, SitePro1 RMQP-496-HK

Beyond the mount replacement, no structural modifications are required at this time, provided that the above-listed changes are implemented.

STANDARD CONDITIONS FOR FURNISHING OF PROFESSIONAL ENGINEERING SERVICES ON EXISTING MOUNTS BY PAUL J. FORD AND COMPANY

1) It is the responsibility of the client to ensure that the information provided to Paul J. Ford and Company is accurate and complete. Paul J. Ford and Company will rely on the accuracy and completeness of such information in performing or furnishing services under this project.

2) If the existing conditions are not as represented on the referenced drawings and/or documents, Paul J. Ford and Company should be contacted immediately to evaluate the significance of the deviation.

3) The mount has been analyzed according to the minimum design loads recommended by the Reference Standard. If additional design loads are required, Paul J. Ford and Company should be made aware of this prior to the start of the project.

4) The standard of care for all Professional Engineering Services performed or furnished by Paul J. Ford and Company under this project will be the skill and care used by members of the Consultant's profession practicing under similar circumstances at the same time and in the same locality.

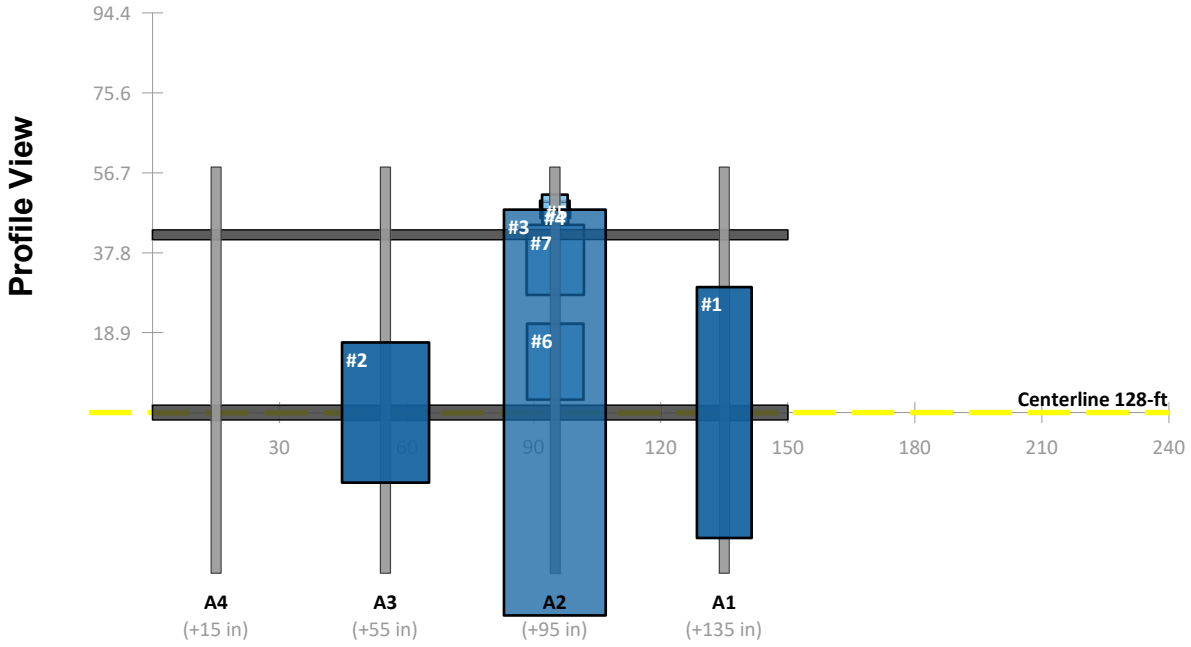
5) All Services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. Paul J. Ford and Company is not responsible for the conclusions, opinions and/or recommendations made by others based on the information supplied herein.

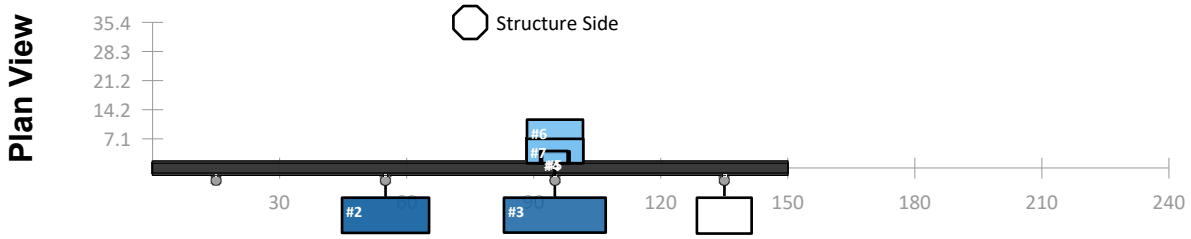
****

APPENDIX A

SOFTWARE INPUT CALCULATION

ALL SECTORS TYPICAL





Ref ID	Type	Manufacturer	Model	Height (in)	Width (in)	Depth (in)	Center Line (ft)	Mount Pipe	Tangential Offset (in)	Normal Offset (in)
#1	Antenna	ERICSSON	AIR 32 B2A B66AA_T-MOBILE	59.25	12.87	8.70	128.00	A1	0.00	3.00
#2	Antenna	ERICSSON	AIR6449 B41_T-MOBILE	33.11	20.51	8.54	128.00	A3	0.00	3.00
#3	Antenna	RFS CELWAVE	APXVAALL24_43-U-NA20_TMO	95.90	24.00	8.50	128.00	A2	0.00	3.00
#4	TME/RRH	COMMSCOPE	SDX1926Q-43	4.17	6.93	2.91	132.00	A2	0.00	-3.00
#5	TME/RRH	ERICSSON	KRY 112 144/1	7.00	6.00	3.00	132.00	A2	0.00	-3.00
#6	TME/RRH	ERICSSON	RADIO 4449 B71 B85A_T-MOBILE	17.91	13.20	10.63	129.00	A2	0.00	-3.00
#7	TME/RRH	ERICSSON	RRUS 4415 B25_CCIV2	16.50	13.40	5.90	131.00	A2	0.00	-3.00

1. A 6" tolerance for proposed equipment is acceptable.

2. Contractor to verify location of existing equipment prior to installation of proposed equipment. Notify for any deviations.

3. Install shall not cause harm to the structure, climbing facility, safety climb, or any system installed on the structure

PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 • Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com

Project Number: 37520-2235.001.7190
Date: 10/13/2020
Engineer: AMS

Mount Loading per TIA-222-H (Version v3.0 - Effective 9/14/2020)

Structure & Wind Speed

Structure Type = Mount
Mount Type = 3 Sectors
Mount Centerline (z) = 128.00 ft
Risa $^{C}/_{L}$ Y-Coordinate = 0.00 in

Ultimate Wind Speed = 130 mph
Ice Wind Speed = 50 mph
Service Wind Speed = 30 mph
Non-Op Wind Speed = - mph
Op Wind Speed = - mph
Ice Thickness = 1.5 in

Topography

Risk Category = II
Exposure Category = C
Topographic Category = 1
Structure Base Height (Z_b) = 281 ft
Crest Height (H) = ft

Velocity Pressure Coefficients

z_g = 900 ft (Table 2-4)
α' = 9.50 (Table 2-4)
K_z = 1.33 (Section 2.6.5.2)
K_{zmin} = 0.85
K_{zcalc} = 1.33
K_{zmax} = 2.01

Override
K_{zt} = 1.00 (Section 2.6.6.2.1)
K_d = 0.95 (Section 16.6)
K_e = 0.99 (Section 2.6.8)
G_h = 1.00 (Section 16.6)
K_{es} = 1.0 (Annex S - Wind Force)
q_z = 54.24 psf (Section 2.6.11.6)

Ice Loading

h = 1.00 in (Bar Grating Height)

I_i = 1.00 (Table 2-3)
K_{es} = 1.0 (Annex S - Ice)
q_z = 8.11 psf (Section 2.6.11.6)
K_{iz} = 1.15 (Section 2.6.10)
t_{iz} = 1.72 in (Section 2.6.10)

W_i = 12.68 psf (Grating Ice Weight)

Wind Pressure

Override
K_a = 0.9 (on all Appurt. / Member Forces)
$(q_z)(G_h)(K_{es})$ = 54.24 psf
$(q_{iz})(G_h)(K_{es})$ = 8.11 psf (Ice)

Analysis Settings

Analysis Scope = Client
Analysis Wind Direction Increment = 30°
EPA Calculation Method = TIA
Construction Duration =

File Suffix = _Client.r3d

Maintenance Point Loads

	Load	Label	Node #		Load	Label	Node #
L_{m1} =	500 lbs	N125A	110	L_{v1} =	250 lbs	N20	13
L_{m2} =	500 lbs	N119	104	L_{v2} =	250 lbs	N20	13
L_{m3} =	500 lbs	N113	98	L_{v3} =	250 lbs	N21	14
L_{m4} =	500 lbs	N88	80	L_{v4} =	250 lbs	N21	14

Risa3D Source: G:\TOWER\375_Crown_Castle\2020\37520-2235_806361_NHV 102 943127\37520-2235.001.7190_MA\RISA\37520-2235.001.7190.r3d (60 Total Populated Members)

Antennas

Item	Include Loading	Status	Mounting Location	Manufacturer	Antenna	Height (in)	Width (in)	Depth (in)	Flat or Round	Weight (lbs)	Sector / Face	Position	Quantity	Orientation	Use tnxTower C_AA_A (CFD)	Top/Bottom Mounting Point Spacing	Override Spacing (in)	Max Antenna C/L (ft)	Min Antenna C/L (ft)	Antenna C/L (ft)	Antenna Top Mount Location from Mount Pipe Bottom (in)	Antenna Bottom Mount Location from Mount Pipe Bottom (in)	Override Top Antenna Mounting Location (in)	Override Bottom Antenna Mounting Location (in)	Normal Wind Force per Antenna (lbs)	Transverse Wind Force per Antenna (lbs)
1	Yes	Proposed	Mount	ERICSSON	AIR 32 B2A B66AA_T-MOBILE	59.25	12.87	8.7	Flat	171.96	A	1	1	Normal	No	53.25		130.115	126.552	128	70.63	17.38			334.364	243.164
2	Yes	Proposed	Mount	ERICSSON	AIR 32 B2A B66AA_T-MOBILE	59.25	12.87	8.7	Flat	171.96	B	1	1	Normal	No	53.25		130.115	126.552	128	70.63	17.38			334.364	243.164
3	Yes	Proposed	Mount	ERICSSON	AIR 32 B2A B66AA_T-MOBILE	59.25	12.87	8.7	Flat	171.96	C	1	1	Normal	No	53.25		130.115	126.552	128	70.63	17.38			334.364	243.164
4	Yes	Proposed	Mount	ERICSSON	AIR6449 B41_T-MOBILE	33.11	20.51	8.54	Flat	114.63	A	3	1	Normal	No	27.11		131.204	125.463	128	57.56	30.45			276.243	120.889
5	Yes	Proposed	Mount	ERICSSON	AIR6449 B41_T-MOBILE	33.11	20.51	8.54	Flat	114.63	B	3	1	Normal	No	27.11		131.204	125.463	128	57.56	30.45			276.243	120.889
6	Yes	Proposed	Mount	ERICSSON	AIR6449 B41_T-MOBILE	33.11	20.51	8.54	Flat	114.63	C	3	1	Normal	No	27.11		131.204	125.463	128	57.56	30.45			276.243	120.889
7	Yes	Proposed	Mount	RFS CELWAVE	APXVAALL24_43-U-NA20_TMO	95.9	24	8.5	Flat	149.9	A	2	1	Normal	No	89.90	80	129.000	127.667	128	84.00	4.00			988.131	426.302
8	Yes	Proposed	Mount	RFS CELWAVE	APXVAALL24_43-U-NA20_TMO	95.9	24	8.5	Flat	149.9	B	2	1	Normal	No	89.90	80	129.000	127.667	128	84.00	4.00			988.131	426.302
9	Yes	Proposed	Mount	RFS CELWAVE	APXVAALL24_43-U-NA20_TMO	95.9	24	8.5	Flat	149.9	C	2	1	Normal	No	89.90	80	129.000	127.667	128	84.00	4.00			988.131	426.302
10	Yes	Proposed	Mount	COMMSCOPE	SDX1926Q-43	4.173	6.929	2.913	Flat	6.17	A	2	1	Normal	No	1.00		132.292	124.375	132	92.50	91.50			11.762	4.945
11	Yes	Proposed	Mount	COMMSCOPE	SDX1926Q-43	4.173	6.929	2.913	Flat	6.17	B	2	1	Normal	No	1.00		132.292	124.375	132	92.50	91.50			11.762	4.945
12	Yes	Proposed	Mount	COMMSCOPE	SDX1926Q-43	4.173	6.929	2.913	Flat	6.17	C	2	1	Normal	No	1.00		132.292	124.375	132	92.50	91.50			11.762	4.945
13	Yes	Existing	Mount	ERICSSON	KRY 112 144/1	7	6	3	Flat	11	A	2	1	Normal	No	1.00		132.292	124.375	132	92.50	91.50			17.085	8.543
14	Yes	Existing	Mount	ERICSSON	KRY 112 144/1	7	6	3	Flat	11	B	2	1	Normal	No	1.00		132.292	124.375	132	92.50	91.50			17.085	8.543
15	Yes	Existing	Mount	ERICSSON	KRY 112 144/1	7	6	3	Flat	11	C	2	1	Normal	No	1.00		132.292	124.375	132	92.50	91.50			17.085	8.543
16	Yes	Proposed	Mount	ERICSSON	RADIO 4449 B71 B85A_T-MOBILE	17.91	13.2	10.63	Flat	73.21	A	2	1	Normal	No	11.91		131.837	124.830	129	61.96	50.05			96.169	77.445
17	Yes	Proposed	Mount	ERICSSON	RADIO 4449 B71 B85A_T-MOBILE	17.91	13.2	10.63	Flat	73.21	B	2	1	Normal	No	11.91		131.837	124.830	129	61.96	50.05			96.169	77.445
18	Yes	Proposed	Mount	ERICSSON	RADIO 4449 B71 B85A_T-MOBILE	17.91	13.2	10.63	Flat	73.21	C	2	1	Normal	No	11.91		131.837	124.830	129	61.96	50.05			96.169	77.445
19	Yes	Proposed	Mount	ERICSSON	RRUS 4415 B25_CCIV2	16.5	13.4	5.9	Flat	46	A	2	1	Normal	No	10.50		131.896	124.771	131	85.25	74.75			89.941	40.036
20	Yes	Proposed	Mount	ERICSSON	RRUS 4415 B25_CCIV2	16.5	13.4	5.9	Flat	46	B	2	1	Normal	No	10.50		131.896	124.771	131	85.25	74.75			89.941	40.036
21	Yes	Proposed	Mount	ERICSSON	RRUS 4415 B25_CCIV2	16.5	13.4	5.9	Flat	46	C	2	1	Normal	No	10.50		131.896	124.771	131	85.25	74.75			89.941	40.036

Dishes

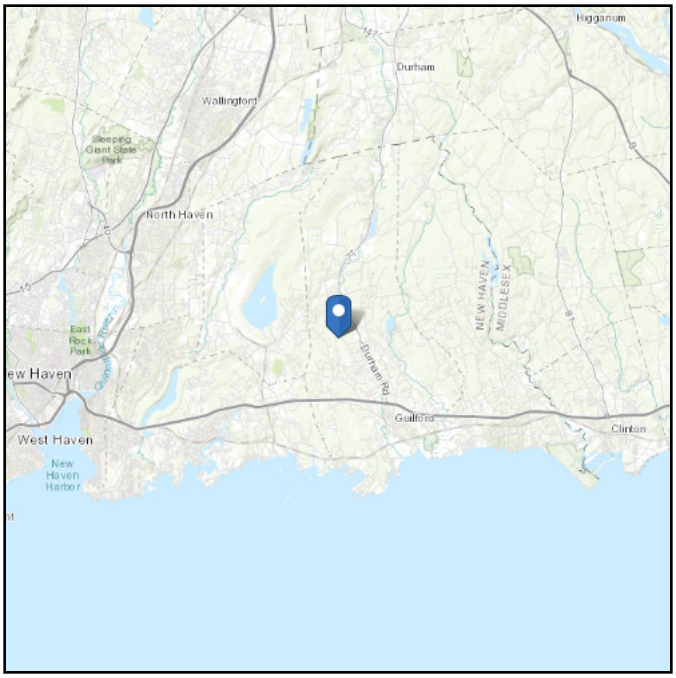
Item	Include Loading	Status	Mounting Location	Manufacturer	Microwave Dish	Dia (in)	Dish Type	Weight (lbs)	Sector / Face	Position	Top/Bottom Mounting Point Spacing	Override Spacing (in)	Max Dish C/L (ft)	Min Dish C/L (ft)	Dish C/L (ft)	Dish Top Mount Location from Mount Pipe Bottom	Dish Bottom Mount Location from Mount Pipe Bottom	Override Top Dish Mounting Location (in)	Override Bottom Dish Mounting Location (in)

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 281.72 ft (NAVD 88)
Latitude: 41.330025
Longitude: -72.721808



Wind

Results:

Wind Speed:	127 Vmph ← Jurisdiction requires 130 mph ultimate wind speed
10-year MRI	78 Vmph
25-year MRI	88 Vmph
50-year MRI	95 Vmph
100-year MRI	104 Vmph
Data Source:	ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, incorporating errata of March 12, 2014
Date Accessed:	Mon Oct 12 2020

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

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

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

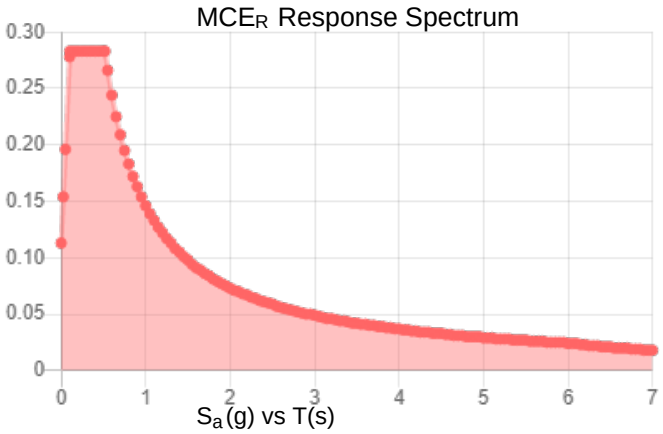
Seismic

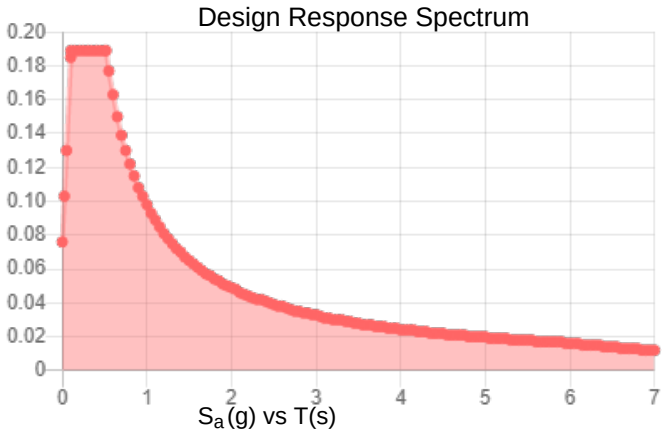
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.177	S_{DS} :	0.189
S_1 :	0.061	S_{D1} :	0.098
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.091
S_{MS} :	0.283	PGA_M :	0.145
S_{M1} :	0.146	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B





Data Accessed: Mon Oct 12 2020

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

Ice

Results:

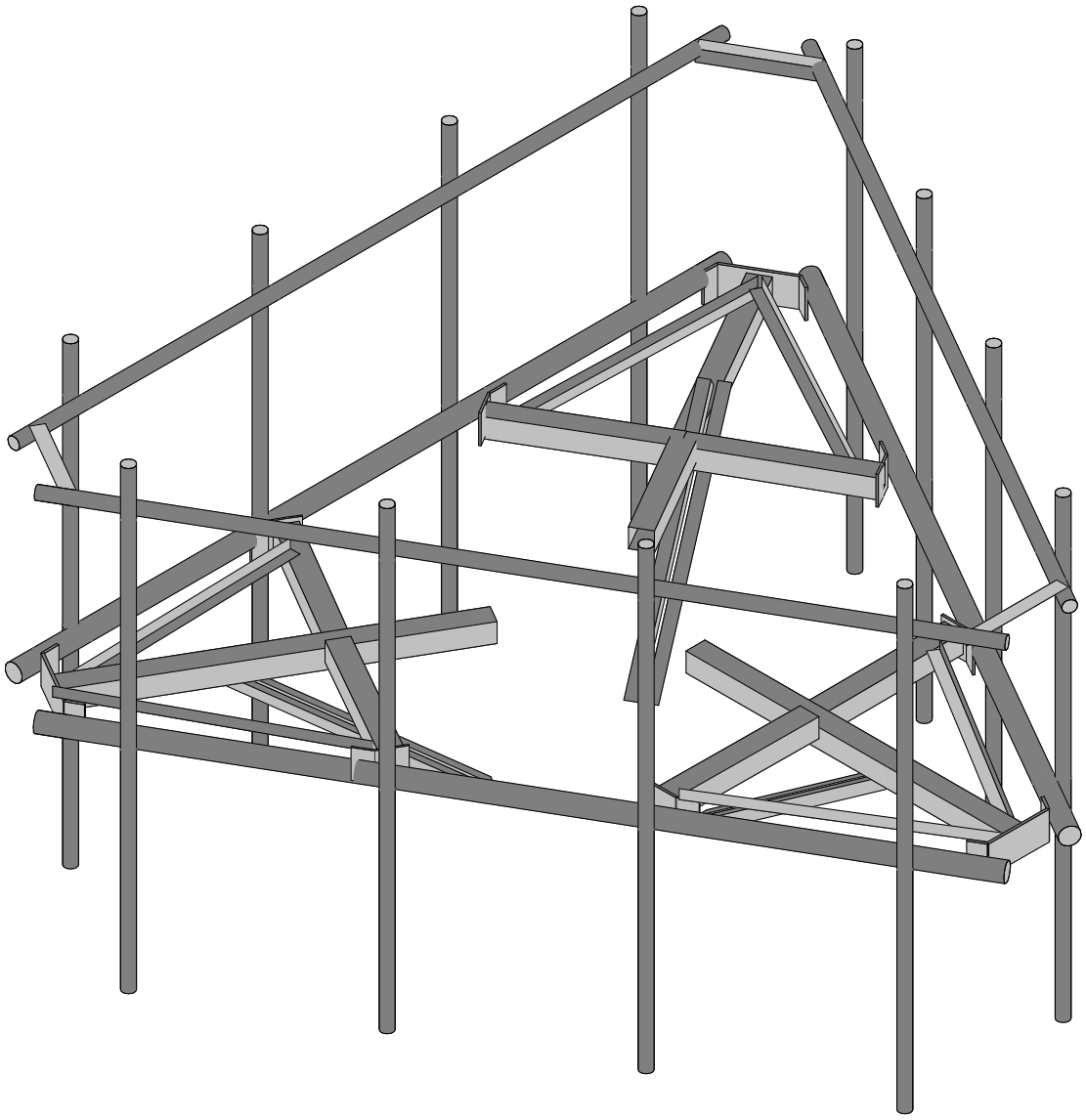
Ice Thickness:	0.75 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Mon Oct 12 2020

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.

APPENDIX B

SOFTWARE ANALYSIS OUTPUT



Envelope Only Solution

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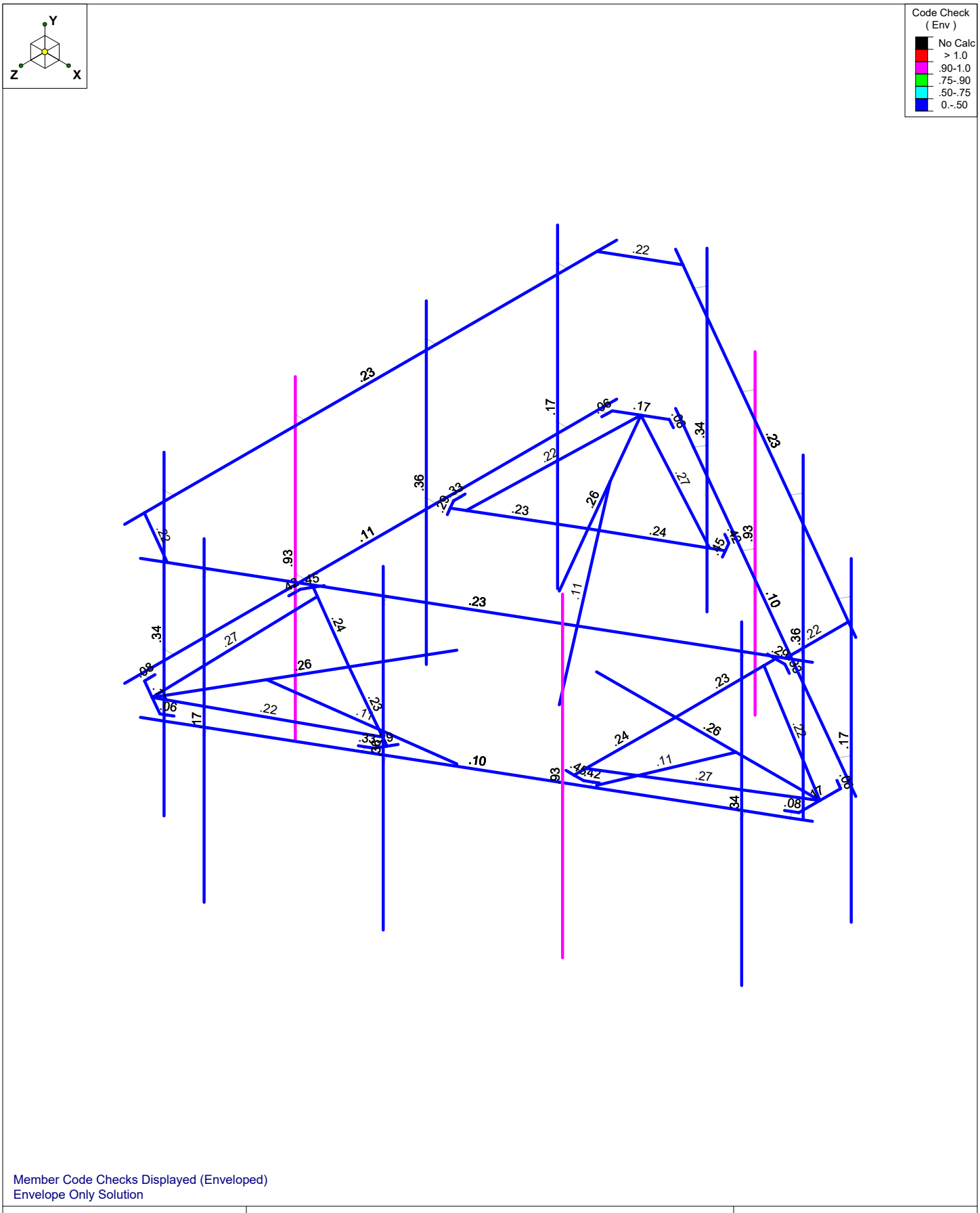

Member Code Checks Displayed (Enveloped)
Envelope Only Solution

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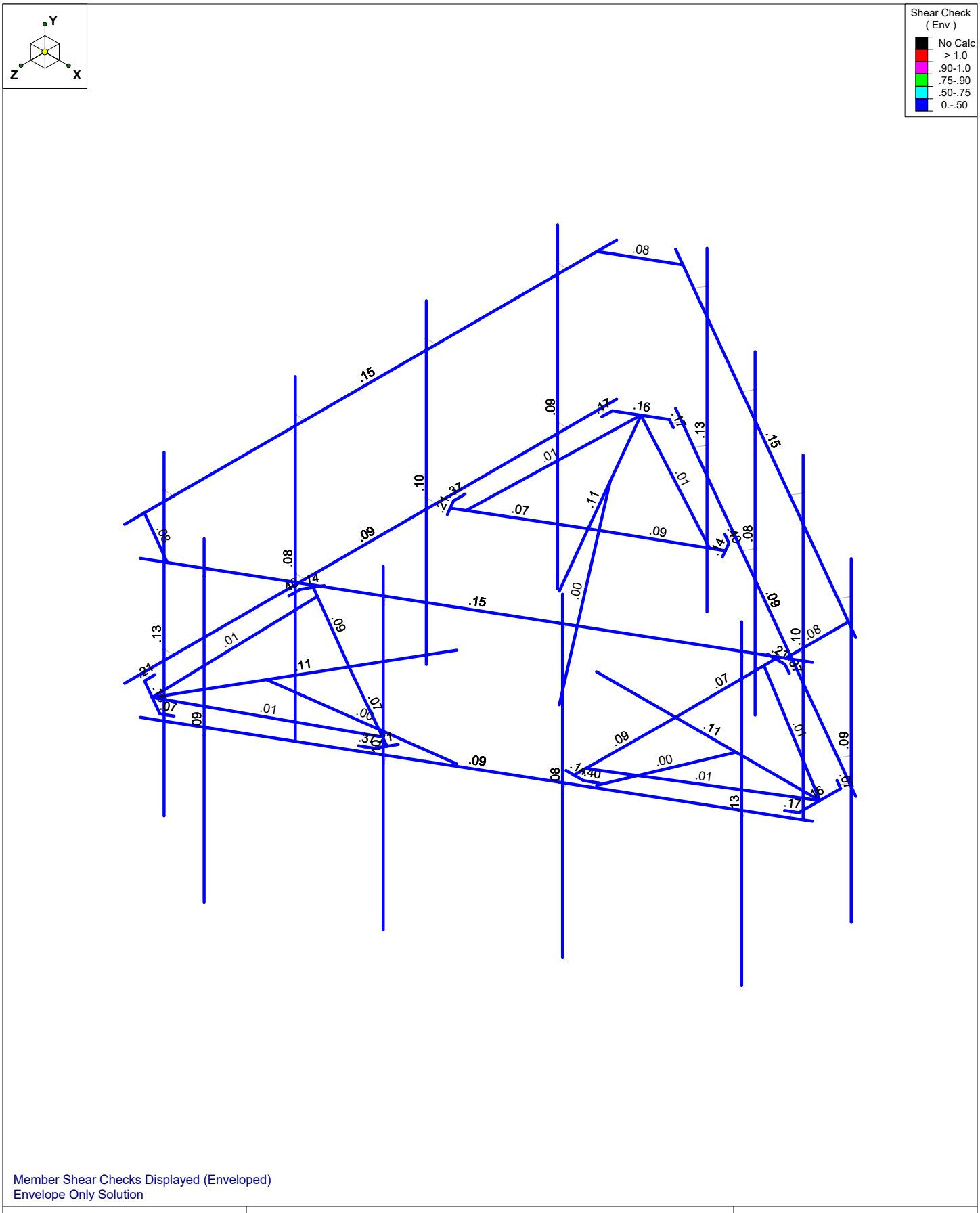

Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

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AMS		Oct 13, 2020 at 4:31 PM
37520-2235.001.7190		37520-2235.001.7190_Client.r3d

(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	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 15th(360-16): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	None
Cold Formed Steel Code	None
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?	Yes
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	4
Cd X	4
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	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
2	A53 Gr.B	29000	11154	.3	.65	.49	35	1.6	60	1.2
3	Q235 Gr B	29000	11154	.3	.65	.527	34	1.4	58	1.3

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M10	N18	N19			RIGID	None	None	RIGID	Typical
2	M14	N25	N26			RIGID	None	None	RIGID	Typical
3	M21	N36	N37			RIGID	None	None	RIGID	Typical
4	M22	N39	N38			RIGID	None	None	RIGID	Typical
5	M25	N43	N44			RIGID	None	None	RIGID	Typical
6	M29	N50	N51			RIGID	None	None	RIGID	Typical
7	M36	N62	N61			RIGID	None	None	RIGID	Typical
8	M37	N64	N63			RIGID	None	None	RIGID	Typical
9	M40	N68	N69			RIGID	None	None	RIGID	Typical
10	M43	N73	N74			RIGID	None	None	RIGID	Typical
11	M50	N85	N84			RIGID	None	None	RIGID	Typical
12	M51	N86	N87			RIGID	None	None	RIGID	Typical
13	M52	N89	N88			RIGID	None	None	RIGID	Typical
14	M76	N137	N136			RIGID	None	None	RIGID	Typical
15	M64	N114	N113			RIGID	None	None	RIGID	Typical
16	M65	N116	N115			RIGID	None	None	RIGID	Typical
17	M67	N120	N119			RIGID	None	None	RIGID	Typical
18	M68	N122	N121			RIGID	None	None	RIGID	Typical
19	M70A	N126A	N125A			RIGID	None	None	RIGID	Typical
20	M71A	N128A	N127A			RIGID	None	None	RIGID	Typical
21	M73A	N132A	N131A			RIGID	None	None	RIGID	Typical
22	M74A	N134A	N133A			RIGID	None	None	RIGID	Typical
23	M76A	N138	N137A			RIGID	None	None	RIGID	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
24	M77	N140	N139			RIGID	None	None	RIGID	Typical
25	M79	N144	N143			RIGID	None	None	RIGID	Typical
26	M80	N146	N145			RIGID	None	None	RIGID	Typical
27	M82	N150	N149			RIGID	None	None	RIGID	Typical
28	M83	N152	N151			RIGID	None	None	RIGID	Typical
29	M85A	N156A	N155A			RIGID	None	None	RIGID	Typical
30	M86A	N158A	N157			RIGID	None	None	RIGID	Typical
31	M88	N162	N161			RIGID	None	None	RIGID	Typical
32	M89	N164	N163			RIGID	None	None	RIGID	Typical
33	M91	N168	N167			RIGID	None	None	RIGID	Typical
34	M92	N170	N169			RIGID	None	None	RIGID	Typical
35	M94	N174	N173			RIGID	None	None	RIGID	Typical
36	M95	N176	N175			RIGID	None	None	RIGID	Typical
37	M15	N29	N27			PL6x0.375	None	None	Q235 Gr B	Typical
38	M16	N28	N29			PL6x0.375	None	None	Q235 Gr B	Typical
39	M18	N33	N31			PL6x0.375	None	None	Q235 Gr B	Typical
40	M19	N32	N33			PL6x0.375	None	None	Q235 Gr B	Typical
41	M30	N54	N52			PL6x0.375	None	None	Q235 Gr B	Typical
42	M31	N53	N54			PL6x0.375	None	None	Q235 Gr B	Typical
43	M33	N58	N56			PL6x0.375	None	None	Q235 Gr B	Typical
44	M34	N57	N58			PL6x0.375	None	None	Q235 Gr B	Typical
45	M44	N77	N75			PL6x0.375	None	None	Q235 Gr B	Typical
46	M45	N76	N77			PL6x0.375	None	None	Q235 Gr B	Typical
47	M47	N81	N79			PL6x0.375	None	None	Q235 Gr B	Typical
48	M48	N80	N81			PL6x0.375	None	None	Q235 Gr B	Typical
49	M9	N17	N22			PL 6" x 1/2"	None	None	Q235 Gr B	Typical
50	M12	N24	N22			PL 6" x 1/2"	None	None	Q235 Gr B	Typical
51	M13	N23	N24			PL 6" x 1/2"	None	None	Q235 Gr B	Typical
52	M24	N42	N47			PL 6" x 1/2"	None	None	Q235 Gr B	Typical
53	M27	N49	N47			PL 6" x 1/2"	None	None	Q235 Gr B	Typical
54	M28	N48	N49			PL 6" x 1/2"	None	None	Q235 Gr B	Typical
55	M39	N67	N70			PL 6" x 1/2"	None	None	Q235 Gr B	Typical
56	M41	N72	N70			PL 6" x 1/2"	None	None	Q235 Gr B	Typical
57	M42	N71	N72			PL 6" x 1/2"	None	None	Q235 Gr B	Typical
58	CBA1	N1	N2			PIPE_3.0	None	None	A53 Gr.B	Typical
59	CBC1	N20	N21			PIPE_3.0	None	None	A53 Gr.B	Typical
60	CBB1	N45	N46			PIPE_3.0	None	None	A53 Gr.B	Typical
61	CBA2	N124	N125			PIPE_2.0	None	None	A53 Gr.B	Typical
62	CBC2	N126	N127			PIPE_2.0	None	None	A53 Gr.B	Typical
63	CBB2	N128	N129			PIPE_2.0	None	None	A53 Gr.B	Typical
64	C4	N111	N112			PIPE_2.0	None	None	A53 Gr.B	Typical
65	C3	N117	N118			PIPE_2.0	None	None	A53 Gr.B	Typical
66	C2	N123	N124A			PIPE_2.0	None	None	A53 Gr.B	Typical
67	C1	N129A	N130A			PIPE_2.0	None	None	A53 Gr.B	Typical
68	B4	N135A	N136A			PIPE_2.0	None	None	A53 Gr.B	Typical
69	B3	N141	N142			PIPE_2.0	None	None	A53 Gr.B	Typical
70	B2	N147	N148			PIPE_2.0	None	None	A53 Gr.B	Typical
71	B1	N153	N154A			PIPE_2.0	None	None	A53 Gr.B	Typical
72	A4	N159B	N160A			PIPE_2.0	None	None	A53 Gr.B	Typical
73	A3	N165	N166			PIPE_2.0	None	None	A53 Gr.B	Typical
74	A2	N171	N172			PIPE_2.0	None	None	A53 Gr.B	Typical
75	A1	N177	N178			PIPE_2.0	None	None	A53 Gr.B	Typical
76	M94A	N167A	N166A			LL2.5x2.5x3x3	None	None	A53 Gr.B	Typical
77	M95B	N169A	N168A			LL2.5x2.5x3x3	None	None	A53 Gr.B	Typical
78	M96	N171A	N170A			LL2.5x2.5x3x3	None	None	A53 Gr.B	Typical
79	M2	N16	N4		270	L2x2x3	None	None	A53 Gr.B	Typical
80	M3	N16	N6			L2x2x3	None	None	A53 Gr.B	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
81	M4	N41	N8		270	L2x2x3	None	None	A53 Gr.B	Typical
82	M5	N41	N10			L2x2x3	None	None	A53 Gr.B	Typical
83	M6	N66	N12		270	L2x2x3	None	None	A53 Gr.B	Typical
84	M7	N66	N14			L2x2x3	None	None	A53 Gr.B	Typical
85	M73	N131	N130		90	L2.5x2.5x4	None	None	A53 Gr.B	Typical
86	M74	N133	N132		90	L2.5x2.5x4	None	None	A53 Gr.B	Typical
87	M75	N135	N134		90	L2.5x2.5x4	None	None	A53 Gr.B	Typical
88	M17	N30	N35			HSS4X4X4	None	None	Q235 Gr B	Typical
89	M20	N34	N35			HSS4X4X4	None	None	Q235 Gr B	Typical
90	M32	N55	N60			HSS4X4X4	None	None	Q235 Gr B	Typical
91	M35	N59	N60			HSS4X4X4	None	None	Q235 Gr B	Typical
92	M38	N65	N66			HSS4X4X4	None	None	Q235 Gr B	Typical
93	M46	N78	N83			HSS4X4X4	None	None	Q235 Gr B	Typical
94	M49	N82	N83			HSS4X4X4	None	None	Q235 Gr B	Typical
95	M93	N172A	N16			HSS4X4X4	None	None	Q235 Gr B	Typical
96	M95A	N176A	N41			HSS4X4X4	None	None	Q235 Gr B	Typical

Member Advanced Data

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
1	M10	BenPIN					Yes	** NA **			None
2	M14	BenPIN					Yes	** NA **			None
3	M21		BenPIN				Yes	** NA **			None
4	M22	BenPIN					Yes	** NA **			None
5	M25	BenPIN					Yes	** NA **			None
6	M29	BenPIN					Yes	** NA **			None
7	M36	BenPIN					Yes	** NA **			None
8	M37	BenPIN					Yes	** NA **			None
9	M40	BenPIN					Yes	** NA **			None
10	M43	BenPIN					Yes	** NA **			None
11	M50	BenPIN					Yes	** NA **			None
12	M51		BenPIN				Yes	** NA **			None
13	M52						Yes	** NA **			None
14	M76						Yes	** NA **			None
15	M64						Yes	** NA **			None
16	M65						Yes	** NA **			None
17	M67						Yes	** NA **			None
18	M68						Yes	** NA **			None
19	M70A						Yes	** NA **			None
20	M71A						Yes	** NA **			None
21	M73A						Yes	** NA **			None
22	M74A						Yes	** NA **			None
23	M76A						Yes	** NA **			None
24	M77						Yes	** NA **			None
25	M79						Yes	** NA **			None
26	M80						Yes	** NA **			None
27	M82						Yes	** NA **			None
28	M83						Yes	** NA **			None
29	M85A						Yes	** NA **			None
30	M86A						Yes	** NA **			None
31	M88						Yes	** NA **			None
32	M89						Yes	** NA **			None
33	M91						Yes	** NA **			None
34	M92						Yes	** NA **			None
35	M94						Yes	** NA **			None
36	M95						Yes	** NA **			None

Member Advanced Data (Continued)

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
37	M15						Yes	** NA **			None
38	M16						Yes	** NA **			None
39	M18						Yes	** NA **			None
40	M19						Yes	** NA **			None
41	M30						Yes	** NA **			None
42	M31						Yes	** NA **			None
43	M33						Yes	** NA **			None
44	M34						Yes	** NA **			None
45	M44						Yes	** NA **			None
46	M45						Yes	** NA **			None
47	M47						Yes	** NA **			None
48	M48						Yes	** NA **			None
49	M9						Yes	** NA **			None
50	M12						Yes	** NA **			None
51	M13						Yes	** NA **			None
52	M24						Yes	** NA **			None
53	M27						Yes	** NA **			None
54	M28						Yes	** NA **			None
55	M39						Yes	** NA **			None
56	M41						Yes	** NA **			None
57	M42						Yes	** NA **			None
58	CBA1						Yes	** NA **			None
59	CBC1						Yes	** NA **			None
60	CBB1						Yes	** NA **			None
61	CBA2						Yes	** NA **			None
62	CBC2						Yes	** NA **			None
63	CBB2						Yes	** NA **			None
64	C4						Yes	** NA **			None
65	C3						Yes	** NA **			None
66	C2						Yes	** NA **			None
67	C1						Yes	** NA **			None
68	B4						Yes	** NA **			None
69	B3						Yes	** NA **			None
70	B2						Yes	** NA **			None
71	B1						Yes	** NA **			None
72	A4						Yes	** NA **			None
73	A3						Yes	** NA **			None
74	A2						Yes	** NA **			None
75	A1						Yes	** NA **			None
76	M94A	BenPIN					Yes	** NA **			None
77	M95B	BenPIN					Yes	** NA **			None
78	M96	BenPIN					Yes	** NA **			None
79	M2	BenPIN	BenPIN				Yes	** NA **			None
80	M3	BenPIN	BenPIN				Yes	** NA **			None
81	M4	BenPIN	BenPIN				Yes	** NA **			None
82	M5	BenPIN	BenPIN				Yes	** NA **			None
83	M6	BenPIN	BenPIN				Yes	** NA **			None
84	M7	BenPIN	BenPIN				Yes	** NA **			None
85	M73						Yes	** NA **			None
86	M74						Yes	** NA **			None
87	M75						Yes	** NA **			None
88	M17						Yes	** NA **			None
89	M20						Yes	** NA **			None
90	M32						Yes	** NA **			None
91	M35						Yes	** NA **			None
92	M38						Yes	** NA **			None
93	M46						Yes	** NA **			None

Member Advanced Data (Continued)

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
94	M49						Yes	** NA **			None
95	M93						Yes	** NA **			None
96	M95A						Yes	** NA **			None

Hot Rolled Steel Design Parameters

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torqu...	Kyy	Kzz	Cb	Function
1	M15	PL6x0.375	5.363			Lbyy						Lateral
2	M16	PL6x0.375	3.499			Lbyy						Lateral
3	M18	PL6x0.375	5.363			Lbyy						Lateral
4	M19	PL6x0.375	3.499			Lbyy						Lateral
5	M30	PL6x0.375	5.363			Lbyy						Lateral
6	M31	PL6x0.375	3.499			Lbyy						Lateral
7	M33	PL6x0.375	5.363			Lbyy						Lateral
8	M34	PL6x0.375	3.499			Lbyy						Lateral
9	M44	PL6x0.375	5.363			Lbyy						Lateral
10	M45	PL6x0.375	3.499			Lbyy						Lateral
11	M47	PL6x0.375	5.363			Lbyy						Lateral
12	M48	PL6x0.375	3.499			Lbyy						Lateral
13	M9	PL 6" x 1/2"	3.184			Lbyy						Lateral
14	M12	PL 6" x 1/2"	12.707			Lbyy						Lateral
15	M13	PL 6" x 1/2"	3.184			Lbyy						Lateral
16	M24	PL 6" x 1/2"	3.184			Lbyy						Lateral
17	M27	PL 6" x 1/2"	12.707			Lbyy						Lateral
18	M28	PL 6" x 1/2"	3.184			Lbyy						Lateral
19	M39	PL 6" x 1/2"	3.184			Lbyy						Lateral
20	M41	PL 6" x 1/2"	12.707			Lbyy						Lateral
21	M42	PL 6" x 1/2"	3.184			Lbyy						Lateral
22	CBA1	PIPE_3.0	150			Lbyy						Lateral
23	CBC1	PIPE_3.0	150			Lbyy						Lateral
24	CBB1	PIPE_3.0	150			Lbyy						Lateral
25	CBA2	PIPE_2.0	150			Lbyy						Lateral
26	CBC2	PIPE_2.0	150			Lbyy						Lateral
27	CBB2	PIPE_2.0	150			Lbyy						Lateral
28	C4	PIPE_2.0	96									Lateral
29	C3	PIPE_2.0	96									Lateral
30	C2	PIPE_2.0	96									Lateral
31	C1	PIPE_2.0	96									Lateral
32	B4	PIPE_2.0	96									Lateral
33	B3	PIPE_2.0	96									Lateral
34	B2	PIPE_2.0	96									Lateral
35	B1	PIPE_2.0	96									Lateral
36	A4	PIPE_2.0	96									Lateral
37	A3	PIPE_2.0	96									Lateral
38	A2	PIPE_2.0	96									Lateral
39	A1	PIPE_2.0	96									Lateral
40	M94A	LL2.5x2.5x3...	52									Lateral
41	M95B	LL2.5x2.5x3...	52									Lateral
42	M96	LL2.5x2.5x3...	52									Lateral
43	M2	L2x2x3	51.837			Lbyy						Lateral
44	M3	L2x2x3	51.837			Lbyy						Lateral
45	M4	L2x2x3	51.837			Lbyy						Lateral
46	M5	L2x2x3	51.837			Lbyy						Lateral
47	M6	L2x2x3	51.837			Lbyy						Lateral
48	M7	L2x2x3	51.837			Lbyy						Lateral
49	M73	L2.5x2.5x4	19.173									Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torqu...	Kyy	Kzz	Cb	Function
50	M74	L2.5x2.5x4	19.173									Lateral
51	M75	L2.5x2.5x4	19.173									Lateral
52	M17	HSS4X4X4	30.71			Lbyy						Lateral
53	M20	HSS4X4X4	30.71			Lbyy						Lateral
54	M32	HSS4X4X4	30.71			Lbyy						Lateral
55	M35	HSS4X4X4	30.71			Lbyy						Lateral
56	M38	HSS4X4X4	68.014			Lbyy						Lateral
57	M46	HSS4X4X4	30.71			Lbyy						Lateral
58	M49	HSS4X4X4	30.71			Lbyy						Lateral
59	M93	HSS4X4X4	68.014			Lbyy						Lateral
60	M95A	HSS4X4X4	68.014			Lbyy						Lateral

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(Me...	Surface(...
1	Dead	None		-1.1			36		3	
2	Wind 0	None					72	120		
3	Wind 30	None					72	120		
4	Wind 60	None					72	120		
5	Wind 90	None					72	120		
6	Wind 120	None					72	120		
7	Wind 150	None					72	120		
8	Ice Load	None					36	60	3	
9	Ice 0	None					72	120		
10	Ice 30	None					72	120		
11	Ice 60	None					72	120		
12	Ice 90	None					72	120		
13	Ice 120	None					72	120		
14	Ice 150	None					72	120		
15	Lm1	None				1				
16	Lm2	None				1				
17	Lm3	None				1				
18	Lm4	None				1				
19	Lv1	None				1				
20	Lv2	None				1				
21	Lv3	None				1				
22	Lv4	None				1				
23	BLC 1 Transient Area Loads	None						75		
24	BLC 8 Transient Area Loads	None						75		

Load Combinations

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.4 D	Yes	Y		1	1.4																		
2	1.2 D + 1.0 Wo @ 0	Yes	Y		1	1.2	2	1																
3	1.2 D + 1.0 Wo @ 30	Yes	Y		1	1.2	3	1																
4	1.2 D + 1.0 Wo @ 60	Yes	Y		1	1.2	4	1																
5	1.2 D + 1.0 Wo @ 90	Yes	Y		1	1.2	5	1																
6	1.2 D + 1.0 Wo @ 120	Yes	Y		1	1.2	6	1																
7	1.2 D + 1.0 Wo @ 150	Yes	Y		1	1.2	7	1																
8	1.2 D + 1.0 Wo @ 180	Yes	Y		1	1.2	2	-1																
9	1.2 D + 1.0 Wo @ 210	Yes	Y		1	1.2	3	-1																
10	1.2 D + 1.0 Wo @ 240	Yes	Y		1	1.2	4	-1																
11	1.2 D + 1.0 Wo @ 270	Yes	Y		1	1.2	5	-1																
12	1.2 D + 1.0 Wo @ 300	Yes	Y		1	1.2	6	-1																
13	1.2 D + 1.0 Wo @ 330	Yes	Y		1	1.2	7	-1																

Load Combinations (Continued)

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
14	1.2 D + 1.0 Di + 1.0 Wi @ 0	Yes	Y		1	1.2	8	1	9	1																
15	1.2 D + 1.0 Di + 1.0 Wi @ 30	Yes	Y		1	1.2	8	1	10	1																
16	1.2 D + 1.0 Di + 1.0 Wi @ 60	Yes	Y		1	1.2	8	1	11	1																
17	1.2 D + 1.0 Di + 1.0 Wi @ 90	Yes	Y		1	1.2	8	1	12	1																
18	1.2 D + 1.0 Di + 1.0 Wi @ 120	Yes	Y		1	1.2	8	1	13	1																
19	1.2 D + 1.0 Di + 1.0 Wi @ 150	Yes	Y		1	1.2	8	1	14	1																
20	1.2 D + 1.0 Di + 1.0 Wi @ 180	Yes	Y		1	1.2	8	1	9	-1																
21	1.2 D + 1.0 Di + 1.0 Wi @ 210	Yes	Y		1	1.2	8	1	10	-1																
22	1.2 D + 1.0 Di + 1.0 Wi @ 240	Yes	Y		1	1.2	8	1	11	-1																
23	1.2 D + 1.0 Di + 1.0 Wi @ 270	Yes	Y		1	1.2	8	1	12	-1																
24	1.2 D + 1.0 Di + 1.0 Wi @ 300	Yes	Y		1	1.2	8	1	13	-1																
25	1.2 D + 1.0 Di + 1.0 Wi @ 330	Yes	Y		1	1.2	8	1	14	-1																
26	1.2 D + 1.5 Lm1 + 1.0 Wm @ 0	Yes	Y		1	1.2	15	1.5	2	.053																
27	1.2 D + 1.5 Lm1 + 1.0 Wm @ 30	Yes	Y		1	1.2	15	1.5	3	.053																
28	1.2 D + 1.5 Lm1 + 1.0 Wm @ 60	Yes	Y		1	1.2	15	1.5	4	.053																
29	1.2 D + 1.5 Lm1 + 1.0 Wm @ 90	Yes	Y		1	1.2	15	1.5	5	.053																
30	1.2 D + 1.5 Lm1 + 1.0 Wm @ 120	Yes	Y		1	1.2	15	1.5	6	.053																
31	1.2 D + 1.5 Lm1 + 1.0 Wm @ 150	Yes	Y		1	1.2	15	1.5	7	.053																
32	1.2 D + 1.5 Lm1 + 1.0 Wm @ 180	Yes	Y		1	1.2	15	1.5	2	.053																
33	1.2 D + 1.5 Lm1 + 1.0 Wm @ 210	Yes	Y		1	1.2	15	1.5	3	.053																
34	1.2 D + 1.5 Lm1 + 1.0 Wm @ 240	Yes	Y		1	1.2	15	1.5	4	.053																
35	1.2 D + 1.5 Lm1 + 1.0 Wm @ 270	Yes	Y		1	1.2	15	1.5	5	.053																
36	1.2 D + 1.5 Lm1 + 1.0 Wm @ 300	Yes	Y		1	1.2	15	1.5	6	.053																
37	1.2 D + 1.5 Lm1 + 1.0 Wm @ 330	Yes	Y		1	1.2	15	1.5	7	.053																
38	1.2 D + 1.5 Lm2 + 1.0 Wm @ 0	Yes	Y		1	1.2	16	1.5	2	.053																
39	1.2 D + 1.5 Lm2 + 1.0 Wm @ 30	Yes	Y		1	1.2	16	1.5	3	.053																
40	1.2 D + 1.5 Lm2 + 1.0 Wm @ 60	Yes	Y		1	1.2	16	1.5	4	.053																
41	1.2 D + 1.5 Lm2 + 1.0 Wm @ 90	Yes	Y		1	1.2	16	1.5	5	.053																
42	1.2 D + 1.5 Lm2 + 1.0 Wm @ 120	Yes	Y		1	1.2	16	1.5	6	.053																
43	1.2 D + 1.5 Lm2 + 1.0 Wm @ 150	Yes	Y		1	1.2	16	1.5	7	.053																
44	1.2 D + 1.5 Lm2 + 1.0 Wm @ 180	Yes	Y		1	1.2	16	1.5	2	.053																
45	1.2 D + 1.5 Lm2 + 1.0 Wm @ 210	Yes	Y		1	1.2	16	1.5	3	.053																
46	1.2 D + 1.5 Lm2 + 1.0 Wm @ 240	Yes	Y		1	1.2	16	1.5	4	.053																
47	1.2 D + 1.5 Lm2 + 1.0 Wm @ 270	Yes	Y		1	1.2	16	1.5	5	.053																
48	1.2 D + 1.5 Lm2 + 1.0 Wm @ 300	Yes	Y		1	1.2	16	1.5	6	.053																
49	1.2 D + 1.5 Lm2 + 1.0 Wm @ 330	Yes	Y		1	1.2	16	1.5	7	.053																
50	1.2 D + 1.5 Lm3 + 1.0 Wm @ 0	Yes	Y		1	1.2	17	1.5	2	.053																
51	1.2 D + 1.5 Lm3 + 1.0 Wm @ 30	Yes	Y		1	1.2	17	1.5	3	.053																
52	1.2 D + 1.5 Lm3 + 1.0 Wm @ 60	Yes	Y		1	1.2	17	1.5	4	.053																
53	1.2 D + 1.5 Lm3 + 1.0 Wm @ 90	Yes	Y		1	1.2	17	1.5	5	.053																
54	1.2 D + 1.5 Lm3 + 1.0 Wm @ 120	Yes	Y		1	1.2	17	1.5	6	.053																
55	1.2 D + 1.5 Lm3 + 1.0 Wm @ 150	Yes	Y		1	1.2	17	1.5	7	.053																
56	1.2 D + 1.5 Lm3 + 1.0 Wm @ 180	Yes	Y		1	1.2	17	1.5	2	.053																
57	1.2 D + 1.5 Lm3 + 1.0 Wm @ 210	Yes	Y		1	1.2	17	1.5	3	.053																
58	1.2 D + 1.5 Lm3 + 1.0 Wm @ 240	Yes	Y		1	1.2	17	1.5	4	.053																
59	1.2 D + 1.5 Lm3 + 1.0 Wm @ 270	Yes	Y		1	1.2	17	1.5	5	.053																
60	1.2 D + 1.5 Lm3 + 1.0 Wm @ 300	Yes	Y		1	1.2	17	1.5	6	.053																
61	1.2 D + 1.5 Lm3 + 1.0 Wm @ 330	Yes	Y		1	1.2	17	1.5	7	.053																
62	1.2 D + 1.5 Lm4 + 1.0 Wm @ 0	Yes	Y		1	1.2	18	1.5	2	.053																
63	1.2 D + 1.5 Lm4 + 1.0 Wm @ 30	Yes	Y		1	1.2	18	1.5	3	.053																
64	1.2 D + 1.5 Lm4 + 1.0 Wm @ 60	Yes	Y		1	1.2	18	1.5	4	.053																
65	1.2 D + 1.5 Lm4 + 1.0 Wm @ 90	Yes	Y		1	1.2	18	1.5	5	.053																
66	1.2 D + 1.5 Lm4 + 1.0 Wm @ 120	Yes	Y		1	1.2	18	1.5	6	.053																
67	1.2 D + 1.5 Lm4 + 1.0 Wm @ 150	Yes	Y		1	1.2	18	1.5	7	.053																
68	1.2 D + 1.5 Lm4 + 1.0 Wm @ 180	Yes	Y		1	1.2	18	1.5	2	-.0...																
69	1.2 D + 1.5 Lm4 + 1.0 Wm @ 210	Yes	Y		1	1.2	18	1.5	3	-.0...																
70	1.2 D + 1.5 Lm4 + 1.0 Wm @ 240	Yes	Y		1	1.2	18	1.5	4	-.0...																

Load Combinations (Continued)

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
71	1.2 D + 1.5 Lm4 + 1.0 Wm @ 270	Yes	Y		1	1.2	18	1.5	5	-.0...																
72	1.2 D + 1.5 Lm4 + 1.0 Wm @ 300	Yes	Y		1	1.2	18	1.5	6	-.0...																
73	1.2 D + 1.5 Lm4 + 1.0 Wm @ 330	Yes	Y		1	1.2	18	1.5	7	-.0...																
74	1.2 D + 1.5 Lv1	Yes	Y		1	1.2	19	1.5																		
75	1.2 D + 1.5 Lv2	Yes	Y		1	1.2	20	1.5																		
76	1.2 D + 1.5 Lv3	Yes	Y		1	1.2	21	1.5																		
77	1.2 D + 1.5 Lv4	Yes	Y		1	1.2	22	1.5																		
78	1.0 D	Yes	Y		1	1																				

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N65	max	1474.019	12	478.302	25	1770.912	2	.198	13	2.683	8	.709	14
2		min	-4588.778	6	69.335	8	-1766.696	8	-.454	7	-2.666	2	.173	8
3	N172A	max	2527.149	11	478.291	21	4292.772	2	.78	15	2.683	4	.291	3
4		min	-964.366	5	-57.115	64	-1603.797	8	-.024	69	-2.666	10	-.668	55
5	N176A	max	3211.461	11	478.3	17	1169.568	3	.146	32	2.683	12	-.002	5
6		min	-1657.22	5	-49.29	26	-3932.972	21	-.486	17	-2.666	6	-.88	38
7	N166A	max	4021.474	17	2898.632	17	39.03	2	0	78	0	78	0	78
8		min	1255.945	11	876.662	11	-38.608	8	0	1	0	1	0	1
9	N168A	max	-626.198	8	2898.629	25	-1087.734	7	0	78	0	78	0	78
10		min	-2010.669	25	876.671	7	-3482.732	25	0	1	0	1	0	1
11	N170A	max	-628.069	3	2898.627	21	3482.654	21	0	78	0	78	0	78
12		min	-2010.799	21	876.692	3	1087.672	3	0	1	0	1	0	1
13	Totals:	max	6697.732	11	9752.132	16	6697.689	2						
14		min	-6697.729	5	3359.487	78	-6697.691	8						

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

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pnc ...	phi*Pnt [...	phi*Mn y...	phi*Mn z...	Cb	Eqn
1	C2	PIPE_2.0	.929	44	5	.082	44		10	14916.0...	32130	1.872	1.872	1....	H1-1b
2	B2	PIPE_2.0	.929	44	13	.082	44		6	14916.0...	32130	1.872	1.872	1....	H1-1b
3	A2	PIPE_2.0	.929	44	9	.082	44		2	14916.0...	32130	1.872	1.872	1....	H1-1b
4	M33	PL6x0.375	.451	2.849	12	.139	2.849	y	6	60835.0...	68850	.538	8.606	1....	H1-1b
5	M47	PL6x0.375	.451	2.849	8	.139	2.849	y	2	60835.0...	68850	.538	8.606	1....	H1-1b
6	M18	PL6x0.375	.451	2.849	4	.139	2.849	y	10	60835.0...	68850	.538	8.606	1....	H1-1b
7	M48	PL6x0.375	.416	1.422	12	.396	3.499	y	17	65316.7...	68850	.538	8.606	1....	H1-1b
8	M19	PL6x0.375	.416	1.422	8	.396	3.499	y	25	65316.7...	68850	.538	8.606	1....	H1-1b
9	M34	PL6x0.375	.416	1.422	4	.396	3.499	y	21	65316.7...	68850	.538	8.606	1....	H1-1b
10	B3	PIPE_2.0	.358	44	13	.095	44		7	14916.0...	32130	1.872	1.872	2....	H1-1b
11	C3	PIPE_2.0	.358	44	5	.095	44		11	14916.0...	32130	1.872	1.872	1....	H1-1b
12	A3	PIPE_2.0	.358	44	9	.095	44		3	14916.0...	32130	1.872	1.872	1....	H1-1b
13	A1	PIPE_2.0	.341	44	10	.130	44		3	14916.0...	32130	1.872	1.872	1....	H1-1b
14	B1	PIPE_2.0	.341	44	2	.130	44		7	14916.0...	32130	1.872	1.872	2....	H1-1b
15	C1	PIPE_2.0	.341	44	6	.130	44		11	14916.0...	32130	1.872	1.872	1....	H1-1b
16	M16	PL6x0.375	.334	1.422	6	.367	3.499	y	22	65316.7...	68850	.538	8.606	2....	H1-1b
17	M31	PL6x0.375	.334	1.422	2	.367	3.499	y	18	65316.7...	68850	.538	8.606	2....	H1-1b
18	M45	PL6x0.375	.334	1.422	10	.367	3.499	y	14	65316.7...	68850	.538	8.606	2....	H1-1b
19	M30	PL6x0.375	.285	2.849	6	.215	2.849	y	14	60835.0...	68850	.538	8.606	1....	H1-1b
20	M44	PL6x0.375	.285	2.849	2	.215	2.849	y	22	60835.0...	68850	.538	8.606	1....	H1-1b
21	M15	PL6x0.375	.285	2.849	10	.215	2.849	y	18	60835.0...	68850	.538	8.606	1....	H1-1b
22	M7	L2x2x3	.268	25.918	7	.009	51.837	y	14	9165.131	22743	.542	1.041	1....	H2-1
23	M5	L2x2x3	.268	25.918	11	.009	51.837	y	18	9165.131	22743	.542	1.041	1....	H2-1
24	M3	L2x2x3	.268	25.918	3	.009	51.837	y	22	9165.131	22743	.542	1.041	1....	H2-1
25	M95A	HSS4X4X4	.260	0	6	.105	0	z	12	93367.2...	103122	11.96	11.96	2....	H1-1b
26	M38	HSS4X4X4	.260	0	2	.105	0	z	8	93367.2...	103122	11.96	11.96	2....	H1-1b

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

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pnc ...	phi*Pnt [...	phi*Mn y...	phi*Mn z...	Cb	Eqn
27	M93	HSS4X4X4	.260	0	10	.105	0	z	4	93367.2...	103122	11.96	11.96	2....	H1-1b
28	M49	HSS4X4X4	.237	30.71	18	.088	30.71	y	19	101053....	103122	11.96	11.96	1....	H1-1b
29	M35	HSS4X4X4	.237	30.71	22	.088	30.71	y	23	101053....	103122	11.96	11.96	1....	H1-1b
30	M20	HSS4X4X4	.237	30.71	14	.088	30.71	y	15	101053....	103122	11.96	11.96	1....	H1-1b
31	M32	HSS4X4X4	.227	30.71	19	.072	30.71	y	19	101053....	103122	11.96	11.96	1....	H1-1b
32	M17	HSS4X4X4	.227	30.71	23	.072	30.71	y	23	101053....	103122	11.96	11.96	1....	H1-1b
33	M46	HSS4X4X4	.227	30.71	15	.072	30.71	y	15	101053....	103122	11.96	11.96	1....	H1-1b
34	CBC2	PIPE_2.0	.226	95.313	11	.147	143.75		6	6295.422	32130	1.872	1.872	3....	H1-1b
35	CBB2	PIPE_2.0	.226	95.312	7	.147	143.75		2	6295.422	32130	1.872	1.872	3....	H1-1b
36	CBA2	PIPE_2.0	.226	95.313	3	.147	143.75		10	6295.422	32130	1.872	1.872	3....	H1-1b
37	M73	L2.5x2.5x4	.222	0	5	.080	19.173	z	6	34569.0...	37485	1.083	2.467	2....	H2-1
38	M74	L2.5x2.5x4	.222	0	13	.080	19.173	z	2	34569.0...	37485	1.083	2.467	2....	H2-1
39	M75	L2.5x2.5x4	.222	0	9	.080	19.173	z	10	34569.0...	37485	1.083	2.467	2....	H2-1
40	M2	L2x2x3	.218	25.918	11	.011	51.837	z	17	9165.131	22743	.542	1.04	1....	H2-1
41	M6	L2x2x3	.218	25.918	3	.011	51.837	z	21	9165.131	22743	.542	1.04	1....	H2-1
42	M4	L2x2x3	.218	25.918	7	.011	51.837	z	25	9165.131	22743	.542	1.04	1....	H2-1
43	B4	PIPE_2.0	.169	86	5	.085	44		7	14916.0...	32130	1.872	1.872	1....	H1-1b
44	A4	PIPE_2.0	.169	86	13	.085	44		3	14916.0...	32130	1.872	1.872	1....	H1-1b
45	C4	PIPE_2.0	.169	86	9	.085	44		11	14916.0...	32130	1.872	1.872	2....	H1-1b
46	M27	PL 6" x 1/2"	.168	6.354	2	.160	6.354	y	22	62633.4...	91800	.956	11.475	1....	H1-1b
47	M12	PL 6" x 1/2"	.168	6.354	6	.160	6.354	y	14	62633.4...	91800	.956	11.475	1....	H1-1b
48	M41	PL 6" x 1/2"	.168	6.354	10	.160	6.354	y	18	62633.4...	91800	.956	11.475	1....	H1-1b
49	M94A	LL2.5x2.5x3...	.114	52	17	.003	52	y	17	43610.3...	56700	3.844	2.479	1	H1-1b*
50	M95B	LL2.5x2.5x3...	.114	52	25	.003	0	y	25	43610.3...	56700	3.844	2.479	1	H1-1b*
51	M96	LL2.5x2.5x3...	.114	52	21	.003	52	y	21	43610.3...	56700	3.844	2.479	1	H1-1b*
52	CBC1	PIPE_3.0	.111	95.313	45	.093	56.25		5	28250.5...	65205	5.749	5.749	2....	H1-1b
53	CBA1	PIPE_3.0	.105	100	6	.093	56.25		9	28250.5...	65205	5.749	5.749	2....	H1-1b
54	CBB1	PIPE_3.0	.105	100	10	.093	56.25		13	28250.5...	65205	5.749	5.749	2....	H1-1b
55	M13	PL 6" x 1/2"	.077	1.659	10	.167	3.184	y	15	89622.19	91800	.956	11.475	2....	H1-1b
56	M28	PL 6" x 1/2"	.077	1.659	6	.211	3.184	y	32	89622.19	91800	.956	11.475	2....	H1-1b
57	M42	PL 6" x 1/2"	.077	1.659	2	.167	3.184	y	19	89622.19	91800	.956	11.475	2....	H1-1b
58	M9	PL 6" x 1/2"	.059	1.659	13	.167	3.184	y	71	89622.19	91800	.956	11.475	2....	H1-1b
59	M39	PL 6" x 1/2"	.059	1.659	5	.068	3.184	y	16	89622.19	91800	.956	11.475	2....	H1-1b
60	M24	PL 6" x 1/2"	.059	1.659	9	.068	3.184	y	20	89622.19	91800	.956	11.475	2....	H1-1b

APPENDIX C

ADDITIONAL CALCULATIONS

PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 • Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com

Project # 37520-2235.001.7190
By AMS
Date: 10/13/20
v3.6, Effective 08/10/2020

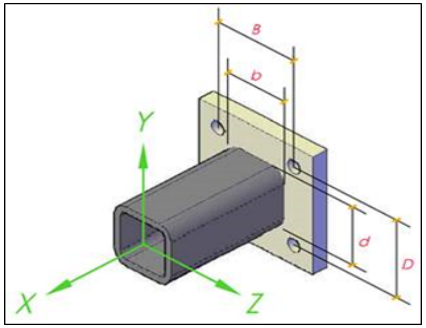
MOUNT TO TOWER CONNECTION CHECKS-LRFD

TIA Rev.	**H-15.5**	**AISC**	**15th**
Mount Type	**3-Sector**	**Checks**	**Bolts & Welds**

REACTIONS FROM RISA-3D

NODE	LC	Horizontal Shear (k)	Vertical Shear (k)	Axial along member(k)	Moment about horizontal axis (ft-k)	Moment about Vertical axis (ft-k)	Torque (ft-k)
N65	**Envelope**	**1.64**	**0.48**	**4.56**	**0.71**	**2.49**	**0.43**

Bolt Information	Type	Dia (in)	Quantity	Vertical Bolt spacing (D) (in)	Horizontal Bolt spacing (B) (in)
	A325N	**0.625**	**4**	**6**	**6**



CHECKS	Forces	Strength	**Rating**
TENSION (K)	4.34	20.7	**20.9%**
		Reduced Tensile Rating	**-**
SHEAR (k)	0.73	12.4	**5.9%**

Note: Tension reduction not required if tension or shear capacity < 30%

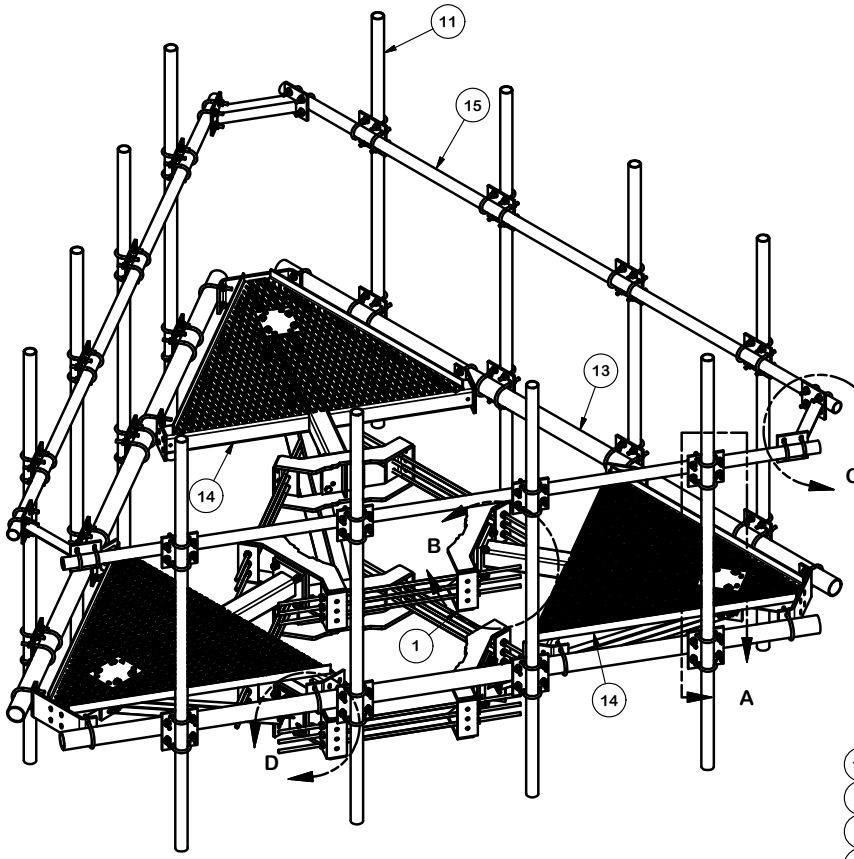
Standoff Member	Type	Width (b) (in)	Depth (d) (in)	thickness (in)	Weld Size	Weld Assumed?	Stiffeners present
	Rectangle	**4**	**4**	**0.25**	**0.375**	**No**	**No**

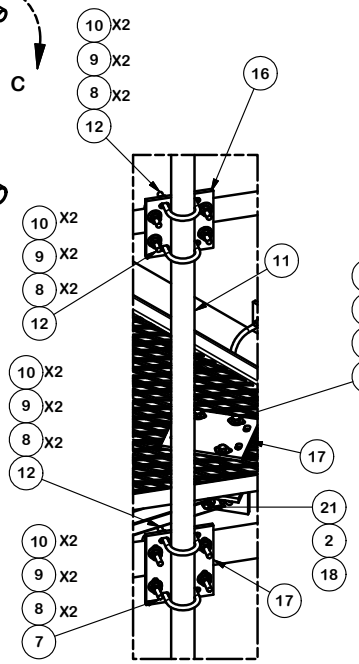
WELDS CHECKS	Resultant (k)	Strength (k)	**Rating**
	1.46	8.35	**17.4%**

Controlling Rating per TIA-222-H Section 15.5:	**19.9%**

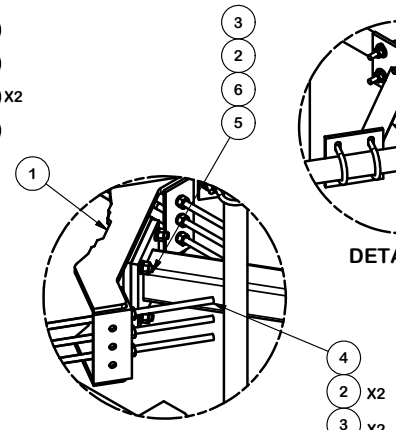
APPENDIX D

MANUFACTURER DRAWINGS (FOR REFERENCE ONLY)





DETAIL A



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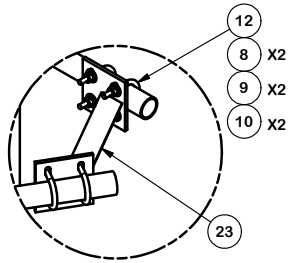
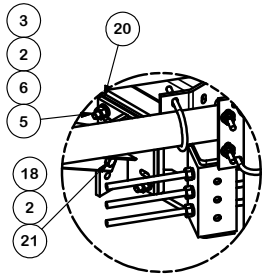


DETAIL C



DETAIL D

PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	6	X-LWRM	RING MOUNT WELDMENT		68.16	408.95
2	66	G58LW	5/8" HDG LOCKWASHER		0.03	1.72
3	60	A58NUT	5/8" HDG A325 HEX NUT		0.13	7.78
4	18	G58R-24	5/8" x 24" THREADED ROD (HDG.)		0.55	9.88
4	18	G58R-48	5/8" x 48" THREADED ROD (HDG.)		0.55	9.88
5	24	A58234	5/8" x 2-3/4" HDG A325 HEX BOLT	2 3/4 in	0.36	8.53
6	24	A58FW	5/8" HDG A325 FLATWASHER		0.03	0.82
7	36	X-UB1306	1/2" X 3-5/8" X 6" X 3" U-BOLT (HDG.)		0.73	26.34
8	264	G12FW	1/2" HDG USS FLATWASHER		0.03	8.99
9	252	G12LW	1/2" HDG LOCKWASHER		0.01	3.50
10	252	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	18.03
11	12	P296	2-3/8" X 96" SCH. 40 GALVANIZED PIPE	96 in	30.76	369.08
12	84	X-UB1212	1/2" X 2-1/2" X 4-1/2" X 2" U-BOLT (HDG.)		0.73	61.46
13	3	P3150	3-1/2" X 150" SCH 40 GALVANIZED PIPE	150 in	94.80	284.40
14	3	X-SV196	LOW PROFILE PLATFORM CORNER		212.10	636.31
15	3	P2150	2-3/8" OD X 150" SCH 40 GALVANIZED PIPE	150 in	48.06	144.17
16	12	SCX2	CROSSOVER PLATE	7 in	4.80	57.56
17	15	SCX4	CROSSOVER PLATE	8 1/2 in	6.02	90.32
18	6	G58NUT	5/8" HDG HEAVY 2H HEX NUT		0.13	0.78
19	6	X-253993	PLATFORM REINFORCEMENT KIT ANGLE	52 25/32 in	14.33	85.99
20	6	X-253992	T-BRACKET FOR REINFORCEMENT KIT		13.55	81.27
21	6	G5802	5/8" x 2" HDG HEX BOLT GR5		0.27	1.62
22	12	G12065	1/2" x 6-1/2" HDG HEX BOLT GR5 FULL THREAD	6 1/2 in	0.41	4.91
23	3	X-AHCP	ANGLE HANDRAIL CORNER PLATE		12.92	38.76
					TOTAL WT. #	2448.72

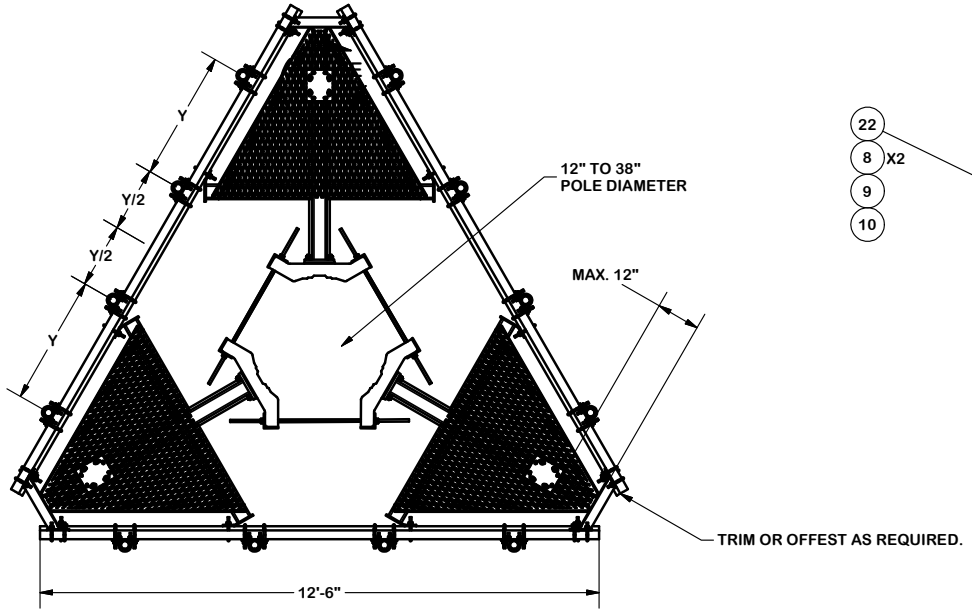
TOLERANCE NOTES

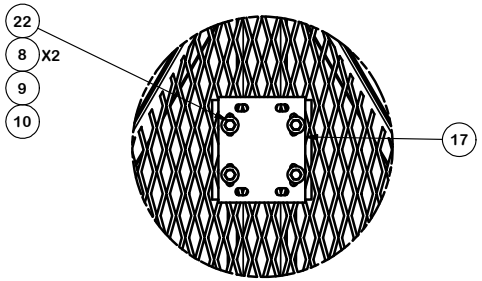
TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES *(± 0.030")*
DRILLED AND GAS CUT HOLES *(± 0.030")* - NO CONING OF HOLES
LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

DESCRIPTION
12' 6" LOW PROFILE PLATFORM
WITH TWELVE 2-3/8" ANTENNA MOUTING
PIPES, AND HANDRAIL

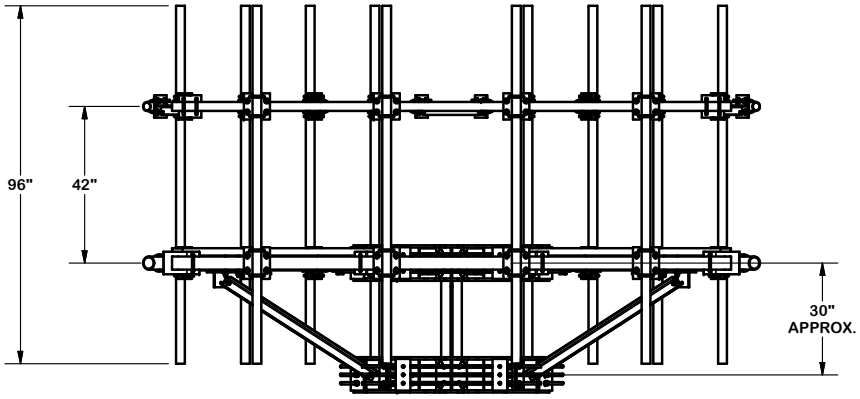
SITE PRO 1
A valmont COMPANY
Engineering Support Team: 1-888-753-7446
Locations:
New York, NY
Atlanta, GA
Los Angeles, CA
Plymouth, IN
Salem, OR
Dallas, TX

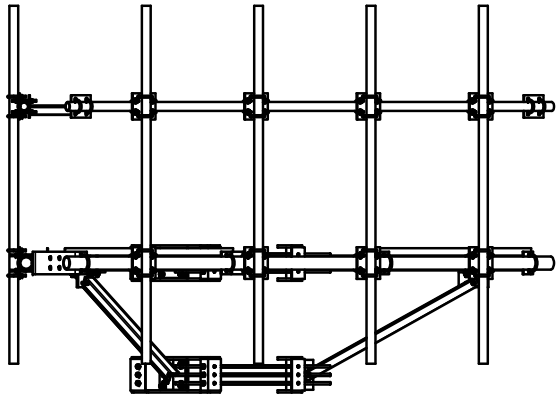
CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.	PAGE
4488	CEK 7/14/2014		RMQP-496-HK	1 OF 3
CLASS / SUB	DRAWING USAGE	CHECKED BY	DWG. NO.	
81 / 02	CUSTOMER	BMC 7/14/2014	RMQP-496-HK	





DETAIL E





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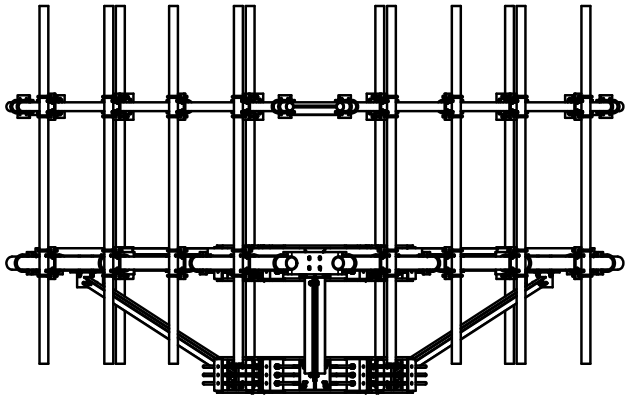
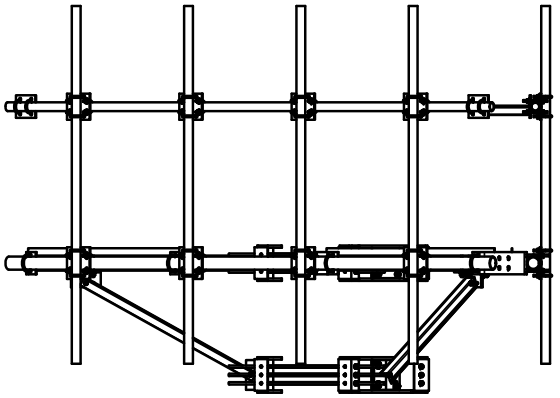
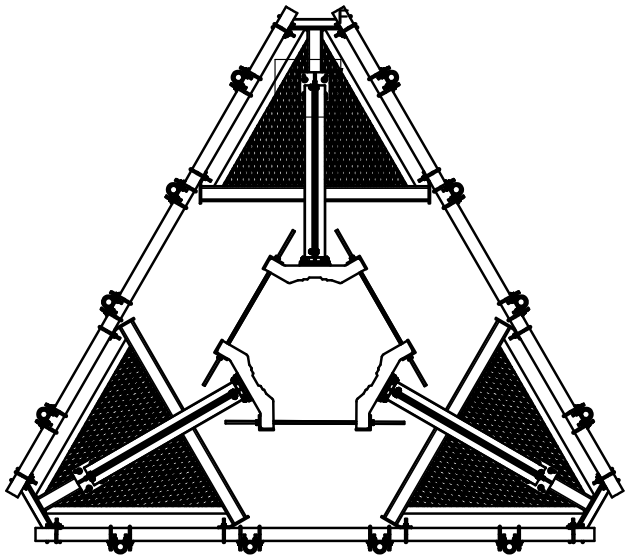
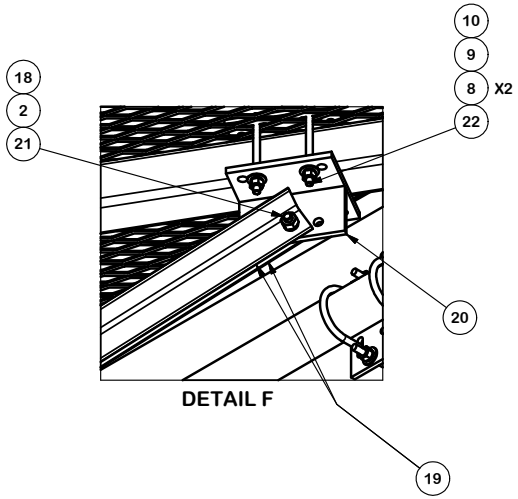
CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.
4488	CEK 7/14/2014		RMQP-496-HK

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	02	CUSTOMER	BMC 7/14/2014	RMQP-496-HK









DETAIL F

TOLERANCE NOTES

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CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.
4488	CEK 7/14/2014		RMQP-496-HK

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	02	CUSTOMER	BMC 7/14/2014	RMQP-496-HK

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: CTNH110C

NH110/Crown LongHill_ETMP
131 Manor Road
Guilford, Connecticut 06437

November 12, 2020

EBI Project Number: 6220005860

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**19.61%**

21 B Street, Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

November 12, 2020

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

Emissions Analysis for Site: CTNH110C - NH110/Crown LongHill_ETMP

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **131 Manor Road** in **Guilford, 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 131 Manor Road in Guilford, 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 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) 4 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 channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 120 Watts.

9) 1 NR channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 120 Watts.

10) 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.

11) 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.

12) The antennas used in this modeling are the Ericsson AIR 32 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s), the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 2100 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s) in Sector A, the Ericsson AIR 32 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s), the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 2100 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s) in Sector B, the Ericsson AIR 32 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s), the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 2100 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all calculations. This value is a very conservative

estimate as gain reductions for these particular antennas are typically much higher in this direction.

13) The antenna mounting height centerline of the proposed antennas is 128 feet above ground level (AGL).

14) 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.

15) 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 32	Make / Model:	Ericsson AIR 32	Make / Model:	Ericsson AIR 32
Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz
Gain:	15.35 dBd / 15.35 dBd / 15.85 dBd	Gain:	15.35 dBd / 15.35 dBd / 15.85 dBd	Gain:	15.35 dBd / 15.35 dBd / 15.85 dBd
Height (AGL):	128 feet	Height (AGL):	128 feet	Height (AGL):	128 feet
Channel Count:	8	Channel Count:	8	Channel Count:	8
Total TX Power (W):	360 Watts	Total TX Power (W):	360 Watts	Total TX Power (W):	360 Watts
ERP (W):	12,841.53	ERP (W):	12,841.53	ERP (W):	12,841.53
Antenna A1 MPE %:	**2.82%**	Antenna B1 MPE %:	**2.82%**	Antenna C1 MPE %:	**2.82%**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20
Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 2100 MHz
Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 16.45 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 16.45 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 16.45 dBd
Height (AGL):	128 feet	Height (AGL):	128 feet	Height (AGL):	128 feet
Channel Count:	9	Channel Count:	9	Channel Count:	9
Total TX Power (W):	380 Watts	Total TX Power (W):	380 Watts	Total TX Power (W):	380 Watts
ERP (W):	11,010.27	ERP (W):	11,010.27	ERP (W):	11,010.27
Antenna A2 MPE %:	**3.67%**	Antenna B2 MPE %:	**3.67%**	Antenna C2 MPE %:	**3.67%**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449
Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz
Gain:	22.05 dBd / 22.05 dBd	Gain:	22.05 dBd / 22.05 dBd	Gain:	22.05 dBd / 22.05 dBd
Height (AGL):	128 feet	Height (AGL):	128 feet	Height (AGL):	128 feet
Channel Count:	2	Channel Count:	2	Channel Count:	2
Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts
ERP (W):	38,477.89	ERP (W):	38,477.89	ERP (W):	38,477.89
Antenna A3 MPE %:	**8.44%**	Antenna B3 MPE %:	**8.44%**	Antenna C3 MPE %:	**8.44%**

Site Composite MPE %	
Carrier	**MPE %**
T-Mobile (Max at Sector A):	14.93%
AT&T	2.48%
Verizon	2.2%
Site Total MPE % :	19.61%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	14.93%
T-Mobile Sector B Total:	14.93%
T-Mobile Sector C Total:	14.93%
Site Total MPE % :	19.61%

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 1900 MHz GSM	4	1028.30	128.0	9.03	1900 MHz GSM	1000	0.90%
T-Mobile 1900 MHz LTE	2	2056.61	128.0	9.03	1900 MHz LTE	1000	0.90%
T-Mobile 2100 MHz LTE	2	2307.55	128.0	10.13	2100 MHz LTE	1000	1.01%
T-Mobile 600 MHz LTE	2	591.73	128.0	2.60	600 MHz LTE	400	0.65%
T-Mobile 600 MHz NR	1	1577.94	128.0	3.46	600 MHz NR	400	0.87%
T-Mobile 700 MHz LTE	2	695.22	128.0	3.05	700 MHz LTE	467	0.65%
T-Mobile 1900 MHz LTE	2	2104.51	128.0	9.24	1900 MHz LTE	1000	0.92%
T-Mobile 2100 MHz UMTS	2	1324.71	128.0	5.81	2100 MHz UMTS	1000	0.58%
T-Mobile 2500 MHz LTE	1	19238.94	128.0	42.22	2500 MHz LTE	1000	4.22%
T-Mobile 2500 MHz NR	1	19238.94	128.0	42.22	2500 MHz NR	1000	4.22%
						Total:	**14.93%**

• 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:	14.93%
Sector B:	14.93%
Sector C:	14.93%
T-Mobile Maximum MPE % (Sector A):	14.93%
Site Total:	19.61%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **19.61%** 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.