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

January 11, 2021

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

RE: **Notice of Exempt Modification for T-Mobile:**
876327 - T-Mobile Site ID: CT11883C
59 McGuire Road, South Windsor, CT 06074
Latitude: 41° 48′ 10.77″ / Longitude: -72° 37′ 1.96″

Dear Ms. Bachman:

T-Mobile currently maintains nine (9) antennas at the 138-foot mount on the existing 150-foot Monopole Tower, located at 59 McGuire Road, South Windsor, CT. The tower is owned by Crown Castle and the property is owned by MCGUIRE Road Associates LLC. T-Mobile now intends to replace nine (9) 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. The new antennas will be installed at the 138-ft level of the tower and some will be capable of providing 5G services. T-Mobile is also proposing tower mount modification as shown on the enclosed Mount Analysis.

Planned Modifications:
Tower:

Remove:
(1) Fiber Line

Remove and Replace:
(3) LNX 6515DS-A1M Antenna **(REMOVE)** - (3) RFS-APXVAARR24_43-U-NA20 Antenna 600/700 MHz **(REPLACE)**

(3) AIR21 KRC118023-1_B2P_B4A Antenna **(REMOVE)** – (3) AIR32_B66A_B2A Antenna 1900/2100 MHz **(REPLACE)**

(3) AIR21 KRC118023-1_B2A_B4P Antenna **(REMOVE)** – (3) AIR6449 B41 Antenna 2500/2500 MHz **(REPLACE)**

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

Install New:
(3) 1 5/8" Hybrid Fiber Line
(3) Diplexer SDX192 6Q-43
(3) Radio 4415 B25

Existing to Remain:

(6) 1 5/8" Coax
(3) TMA

Ground:

Remove S12000 cabinet and replace with (1) 6160 SSG cabinet and (1) B160 battery cabinet.
Upgrade to existing ground cabinet. (Internally)

This facility was approved by the Town of South Windsor in Special Permit No. 96-73P on November, 19, 1996. This approval was given with the following conditions:

4. Monopole must be available for two other co-locaters, if needed.

6. Monopole must be painted an unobtrusive color such as noncontrasting blue, grey, or black. The proposed galvanized steel is acceptable.

7. Routine maintenance must be performed to prevent deterioration of appearance (such as rust, peeling paint, etc.).

This modification complies with the aforementioned condition(s).

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 Mr. Andrew Paterna, Mayor for the Town of South Windsor, Michele M. Lipe, AICP, Planning Director, Crown Castle as the tower owner, and MCGUIRE Road Associates LLC, 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:

The Honorable Andrew Paterna, Mayor
Town of South Windsor
1540 Sullivan Avenue
South Windsor, CT 06074
860-644-2511

Michele M. Lipe, AICP, Planning Director
Planning Department
1540 Sullivan Avenue
South Windsor, CT 06074
860-644-2511 ext. 329

MCGUIRE Road Associates LLC, Property Owner
111 Farm Brook Lane
South Windsor, CT 06074

Crown Castle, Tower Owner

ORIGIN ID:SCHA (201) 236-9224
ANNE MARIE ZSAMBA
CROWN CASTLE
21 HEATHER DRIVE

GANSEVOORT, NY 12831
UNITED STATES US

SHIP DATE: 11JAN21
ACTWGT: 1.00 LB
CAD: 104924194/INET4280

BILL SENDER

TO **MCGUIRE ROAD ASSOCIATES LLC**

111 FARM BROOK LANE

SOUTH WINDSOR CT 06074

(201) 236-9224
INV:
PO:
REF: 1734.7680
DEPT:

J202020071401uv

56BJ1/1136/B766

TRK# 0201 **7725 8549 8674**

TUE - 12 JAN 10:30A
PRIORITY OVERNIGHT

EB QCWA

06074
BDL
CT-US

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

ORIGIN ID:SCHA (201) 236-9224
ANNE MARIE ZSAMBA
CROWN CASTLE
21 HEATHER DRIVE

GANSEVOORT, NY 12831
UNITED STATES US

SHIP DATE: 11JAN21
ACTWGT: 1.00 LB
CAD: 104924194/INET4280

BILL SENDER

TO **MAYOR ANDREW PATERNA**
TOWN OF SOUTH WINDSOR
MAYOR'S OFFICE
1540 SULLIVAN AVENUE
SOUTH WINDSOR CT 06074
(860) 644-2511

INV:
PO:
REF: 1734.7680
DEPT:

56BJ1/1136/B766

J202020071401uv

FedEx Express

TUE - 12 JAN 10:30A
PRIORITY OVERNIGHT

TRK# 0201 **7725 8548 9989**

EB QCWA

06074
BDL
CT-US

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

ORIGIN ID:SCHA (201) 236-9224
ANNE MARIE ZSAMBA
CROWN CASTLE
21 HEATHER DRIVE

GANSEVOORT, NY 12831
UNITED STATES US

SHIP DATE: 11JAN21
ACTWGT: 1.00 LB
CAD: 104924194/INET4280

BILL SENDER

TO **MICHELE M. LIPE, AICP, PLANNING DIR**
TOWN OF SOUTH WINDSOR
PLANNING DEPARTMENT
1540 SULLIVAN AVENUE
SOUTH WINDSOR CT 06074
(860) 644-2511

INV:
PO:
REF: 1734.7680
DEPT:

56BJ1/1136/B766

J202020071401uv

FedEx Express

TUE - 12 JAN 10:30A
PRIORITY OVERNIGHT

TRK# 0201 **7725 8549 4175**

EB QCWA

06074
BDL
CT-US

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Exhibit A

Original Facility Approval

Town of South Windsor
1540 SULLIVAN AVENUE • SOUTH WINDSOR, CONN. 06074
AREA CODE 860 / 644-2511

November 22, 1996

CERTIFIED MAIL

Thomas A. Cookingham, AICP
300 Research Parkway
Third Floor
Meriden, CT 06045

Dear Mr. Cookingham:

Re: Appl #96-73P, Monopole located at: 59 McGuire Road
South Windsor, CT

We are pleased to advise you that the Planning & Zoning Commission voted on November 19, 1996 to approve with modifications the above-referenced application for a Site Plan of Development on property located at 59 McGuire Road zone as shown on plans prepared by URS Greiner, Job No. 23224 and revised through October 25, 1996. This approval is subject to the following modifications:

1. No building permit will be issued until the final mylars have been filed in the Town Clerk's Office.

2. A landscape bond in the amount of $1,000 is required and must be submitted prior to filing of mylars.

3. All plans used in the field by the developer must bear the stamp and authorized signature of the Town of South Windsor.

4. Monopole must be made available to two other co-locaters, if needed.

5. Specification needed on the plans (i.e., quantities, size) for barberry plantings.

6. Monopole must be painted an unobtrusive color such as noncontrasting blue, grey or black. The proposed galvanized steel is acceptable.

7. Routine maintenance must be performed to prevent deterioration of appearance (such as rust, peeling paint, etc.).

8 Drainage of site low spots must be addressed.

Black and white transparent mylars of Drawing #YHA066C1 with the above modifications, together with three blueprint copies of the entire set of plans (including architectural elevations) must be submitted to this Commission within 30 days to be stamped and signed. The letters of approval of this Commission must be reproduced on the mylars.

After the mylars have been signed by the Commission, they will be returned to you for filing in the Office of the Town Clerk within 90 days. After filing these plans, a copy of the receipt must be submitted to the Planning Department.

Very truly yours,

PLANNING & ZONING COMMISSION

Russell G. Levack, Chairman

RGL/pmm

cc: Town Engineer
Chief Building Official
Assessor
Superintendent of Pollution Control
Fire Marshal
SPRINT PCS, 9 Barnes Industrial Road, Wallingford, CT 06492

Exhibit B

Property Card

59 MCGUIRE ROAD

Location	59 MCGUIRE ROAD	**Mblu**	5/ 14/ 1/ /
Acct#	58500059	**Owner**	MCGUIRE ROAD ASSOCIATES LLC
Assessment	$620,700	**Appraisal**	$886,600
PID	8510	**Building Count**	2

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$450,300	$436,300	$886,600
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$315,300	$305,400	$620,700

Owner of Record

Owner	MCGUIRE ROAD ASSOCIATES LLC	**Sale Price**	$650,000
Co-Owner		**Certificate**	
Address	111 FARM BROOK LANE SOUTH WINDSOR, CT 06074	**Book & Page**	1677/ 2
		Sale Date	12/23/2004
		Instrument	00

Ownership History

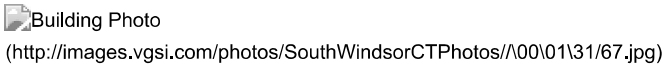
Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
MCGUIRE ROAD ASSOCIATES LLC	$650,000		1677/ 2	00	12/23/2004
KING EDWARD G	$0		738/ 161	00	08/27/1993

Building Information

Building 1 : Section 1

Year Built:	1940
Living Area:	23,972
Replacement Cost:	$729,444
Building Percent Good:	30

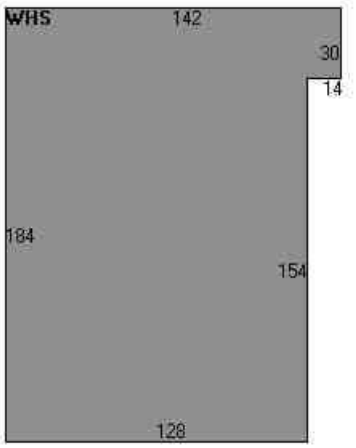
Building Photo


Building Photo
(http://images.vgsi.com/photos/SouthWindsorCTPhotos//\00\01\31/67.jpg)

Replacement Cost
Less Depreciation: $218,800

Building Attributes	
Field	**Description**
STYLE	Warehouse
MODEL	Comm/Ind
Grade	D
Stories:	1.00
Occupancy	7
Exterior Wall 1	Asphalt
Exterior Wall 2	
Roof Structure	Gable
Roof Cover	Asphalt
Interior Wall 1	Minimum
Interior Wall 2	
Interior Floor 1	Concrete
Interior Floor 2	
Heating Fuel	Oil
Heating Type	Forced Hot Air
% Central Air	0
Foundation	Poured Conc
Bldg Use	Industrial
Total Rooms	0
Total Bedrms	0
Total Fixtures	2
% Wet Sprinkler	
% Dry Sprinkler	
1st Floor Use	
Heat/AC	NONE
Frame Type	WOOD FRAME
Baths/Plumbing	AVERAGE
% Finished	0
Class	D
Wall Height	14

Building Layout



(http://images.vgsi.com/photos/SouthWindsorCTPhotos//Sketches/8510_8

Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
WHS	Warehouse	23,972	23,972
		23,972	23,972

Building 2 : Section 1

Year Built: 2019
Living Area: 2,258
Replacement Cost: $205,456
Building Percent Good: 100
Replacement Cost
Less Depreciation: $205,500

Building Attributes : Bldg 2 of 2

Building Photo

Building Photo
(http://images.vgsi.com/photos/SouthWindsorCTPhotos//\00\01\67/45.jpg)

Field	Description
STYLE	Office
MODEL	Comm/Ind
Grade	C
Stories:	1
Occupancy	1
Exterior Wall 1	Vinyl Siding
Exterior Wall 2	Stone/Masonry
Roof Structure	Gable
Roof Cover	Asphalt
Interior Wall 1	Drywall
Interior Wall 2	
Interior Floor 1	Linoleum
Interior Floor 2	
Heating Fuel	Gas
Heating Type	Forced Hot Air
% Central Air	100
Foundation	Poured Conc
Bldg Use	Industrial
Total Rooms	
Total Bedrms	
Total Fixtures	
% Wet Sprinkler	
% Dry Sprinkler	
1st Floor Use	
Heat/AC	HEAT/AC PKGS
Frame Type	WOOD FRAME
Baths/Plumbing	AVERAGE
% Finished	100
Class	C
Wall Height	8

Building Layout


Building Layout
(http://images.vgsi.com/photos/SouthWindsorCTPhotos//Sketches/8510_2

Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	1,209	1,209
AOF	Office	1,049	1,049
CTH	Cathedral Ceiling	160	0
		2,418	2,258

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Land Line Valuation

Use Code	301	**Size (Acres)**	3.94
Description	Industrial	**Frontage**	0
Zone	GC	**Depth**	0
Neighborhood	C600	**Assessed Value**	$305,400
Alt Land Appr	No	**Appraised Value**	$436,300
Category			

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
SHD1	Shed	FR	Frame	7424 S.F.	$26,000	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2019	$375,100	$436,300	$811,400
2018	$251,500	$436,300	$687,800
2017	$251,500	$436,300	$687,800

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2019	$262,600	$305,400	$568,000
2018	$176,100	$305,400	$481,500
2017	$176,100	$305,400	$481,500

Exhibit C

Construction Drawings

T-Mobile

T-MOBILE SITE NUMBER: CT11883C
T-MOBILE SITE NAME: CT883/SPRINT S. WINDSOR
SITE TYPE: MONOPOLE
TOWER HEIGHT: 150'-0"

BUSINESS UNIT #: 876327
SITE ADDRESS: 59 MCGUIRE ROAD
SOUTH WINDSOR, CT 06074
COUNTY: HARTFORD
JURISDICTION: HARTFORD COUNTY

T-MOBILE ANCHOR SITE CONFIGURATION: 67D5A997DB OUTDOOR

SITE INFORMATION

CROWN CASTLE USA INC. SITE NAME:	KINGS LOT
SITE ADDRESS:	59 MCGUIRE ROAD SOUTH WINDSOR, CT 06074
COUNTY:	HARTFORD
MAP/PARCEL #:	5-14-1
AREA OF CONSTRUCTION:	EXISTING
LATITUDE:	41.802900°
LONGITUDE:	-72.617300°
LAT/LONG TYPE:	NAD83
GROUND ELEVATION:	44'
CURRENT ZONING:	GC
JURISDICTION:	HARTFORD COUNTY
OCCUPANCY CLASSIFICATION:	U
TYPE OF CONSTRUCTION:	IIB
A.D.A. COMPLIANCE:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION
PROPERTY OWNER:	59 MCGUIRE ROAD ASSOCIATES 111 FARM BROOK LANE SOUTH WINDSOR CT, 06074
TOWER OWNER:	CROWN CASTLE USA INC 2000 CORPORATE DRIVE CANONSBURG, PA 15317
CARRIER/APPLICANT:	T-MOBILE 4 SYLVAN WAY PARSIPPANY, NJ 07054
ELECTRIC PROVIDER:	EVERSOURCE ENERGY
TELCO PROVIDER:	AT&T PHONE

PROJECT TEAM

A&E FIRM:	CROWN CASTLE USA INC. 2000 CORPORATE DRIVE CANONSBURG, PA 15317 CROWNAE.APPROVAL@CROWNCASTLE.COM
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
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

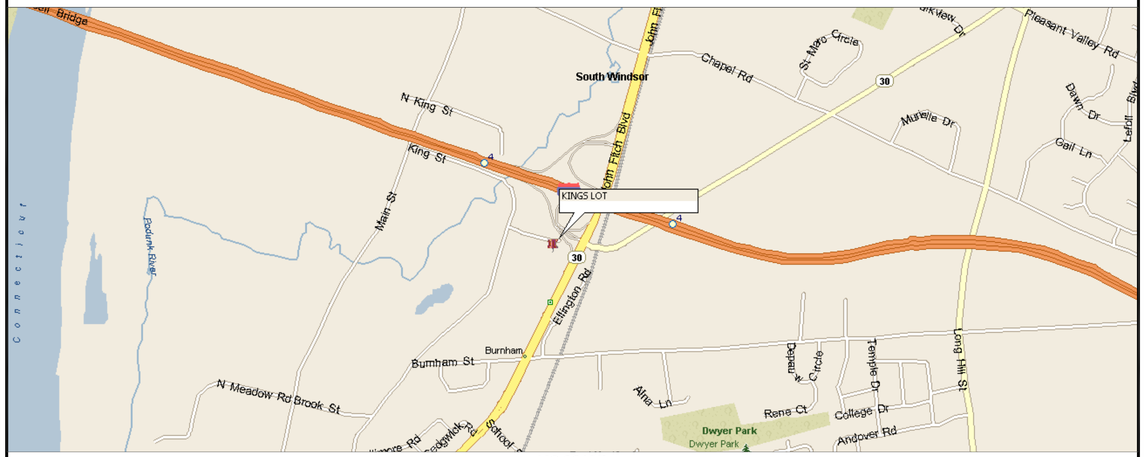
THE PURPOSE OF THIS PROJECT IS TO ENHANCE BROADBAND CONNECTIVITY AND CAPACITY TO THE EXISTING ELIGIBLE WIRELESS FACILITY.

TOWER SCOPE OF WORK:
- REMOVE (9) ANTENNAS
- REMOVE (3) RADIOS
- REMOVE (1) 9x18 HCS FIBER
- REMOVE (3) EXISTING TMAs
- RELOCATE (3) TMAs
- INSTALL (9) ANTENNAS
- INSTALL (6) RADIOS
- INSTALL (3) DIPLEXERS
- INSTALL (3) 6x12 HCS FIBERS

GROUND SCOPE OF WORK:
- REMOVE (1) S12000 CABINET
- REMOVE (3) RUS01 B4 RADIOS
- RELOCATE EXISTING 6131 SSC CLOSER TO PPC
- INSTALL (1) 6160 CABINET
- INSTALL (1) B160 CABINET
- INSTALL (2) BB 6630s
- INSTALL (1) BB 6648
- INSTALL (1) ixe ROUTER
- INSTALL (1) PSU4813 VOLTAGE BOOSTER

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	2018 CT STATE BUILDING CODE
MECHANICAL	2018 CT STATE BUILDING CODE
ELECTRICAL	2017 NEC/2018 CT STATE BUILDING CODE

REFERENCE DOCUMENTS:

STRUCTURAL ANALYSIS:	CROWN CASTLE
DATED:	11/9/20
MOUNT ANALYSIS:	INFINIGY
DATED:	11/6/20
RFDS REVISION:	6
DATED:	11/3/20
ORDER ID:	495800
REVISION:	3

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:
CT11883C

BU #: **876327**
KINGS LOT

59 MCGUIRE ROAD
SOUTH WINDSOR, CT 06074

EXISTING
150'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	9/12/19	RFC	CONSTRUCTION	RMC
1	11/23/20	JTS	CONSTRUCTION	MTJ
2	12/21/20	JJD	CONSTRUCTION	RMC

CONNECTICUT LICENSED PROFESSIONAL ENGINEER
No. 23924
12/21/20

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

SHEET NUMBER: T-1
REVISION: 2

CROWN CASTLE USA INC. SITE ACTIVITY REQUIREMENTS:

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

GENERAL NOTES:

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

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

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

#4 BARS AND SMALLER	40 ksi
#5 BARS AND LARGER	60 ksi

6. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:

CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH	3"
CONCRETE EXPOSED TO EARTH OR WEATHER:	
#6 BARS AND LARGER	2"
#5 BARS AND SMALLER	1–1/2"
CONCRETE NOT EXPOSED TO EARTH OR WEATHER:	
SLAB AND WALLS	3/4"
BEAMS AND COLUMNS	1–1/2"

7. A TOOLED EDGE OR A 3/4" CHAMFER SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNLESS NOTED OTHERWISE, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

GREENFIELD GROUNDING NOTES:

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

ELECTRICAL INSTALLATION NOTES:

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

CONDUCTOR COLOR CODE

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

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

APWA UNIFORM COLOR CODE:

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

ABBREVIATIONS:

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

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

T-MOBILE SITE NUMBER:
CT11883C

BU #: **876327**
KINGS LOT

59 MCGUIRE ROAD
SOUTH WINDSOR, CT 06074

EXISTING
150'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	9/12/19	RFC	CONSTRUCTION	RMC
1	11/23/20	JTS	CONSTRUCTION	MTJ
2	12/21/20	JJD	CONSTRUCTION	RMC

STATE OF CONNECTICUT
No. 23924
LICENSED
PROFESSIONAL ENGINEER
12/21/20

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

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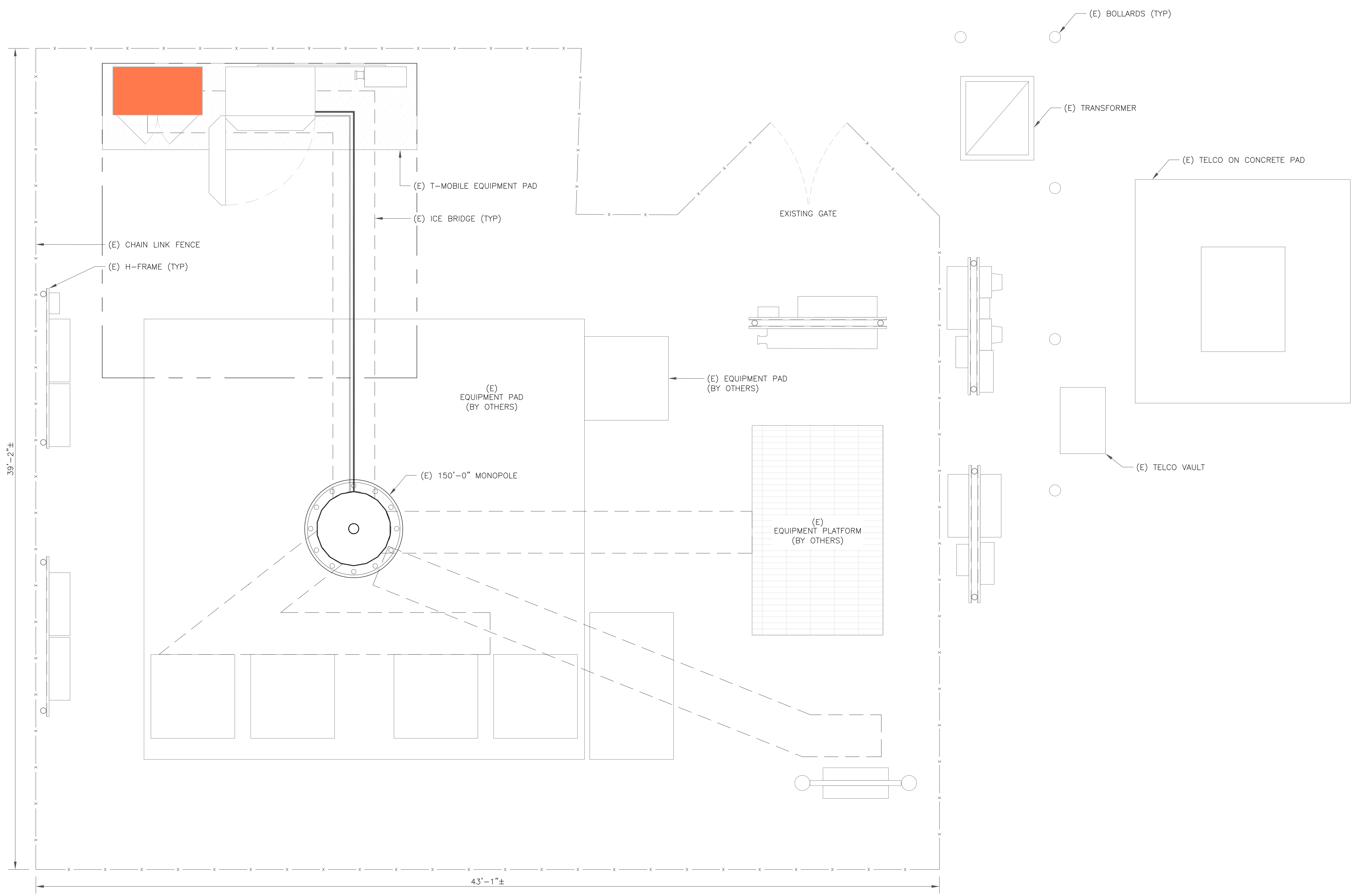
UNLESS THEY ARE ACTING UNDER THE DIRECTION
OF A LICENSED PROFESSIONAL ENGINEER,
TO ALTER THIS DOCUMENT.

SHEET NUMBER: T-2
REVISION: 2

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

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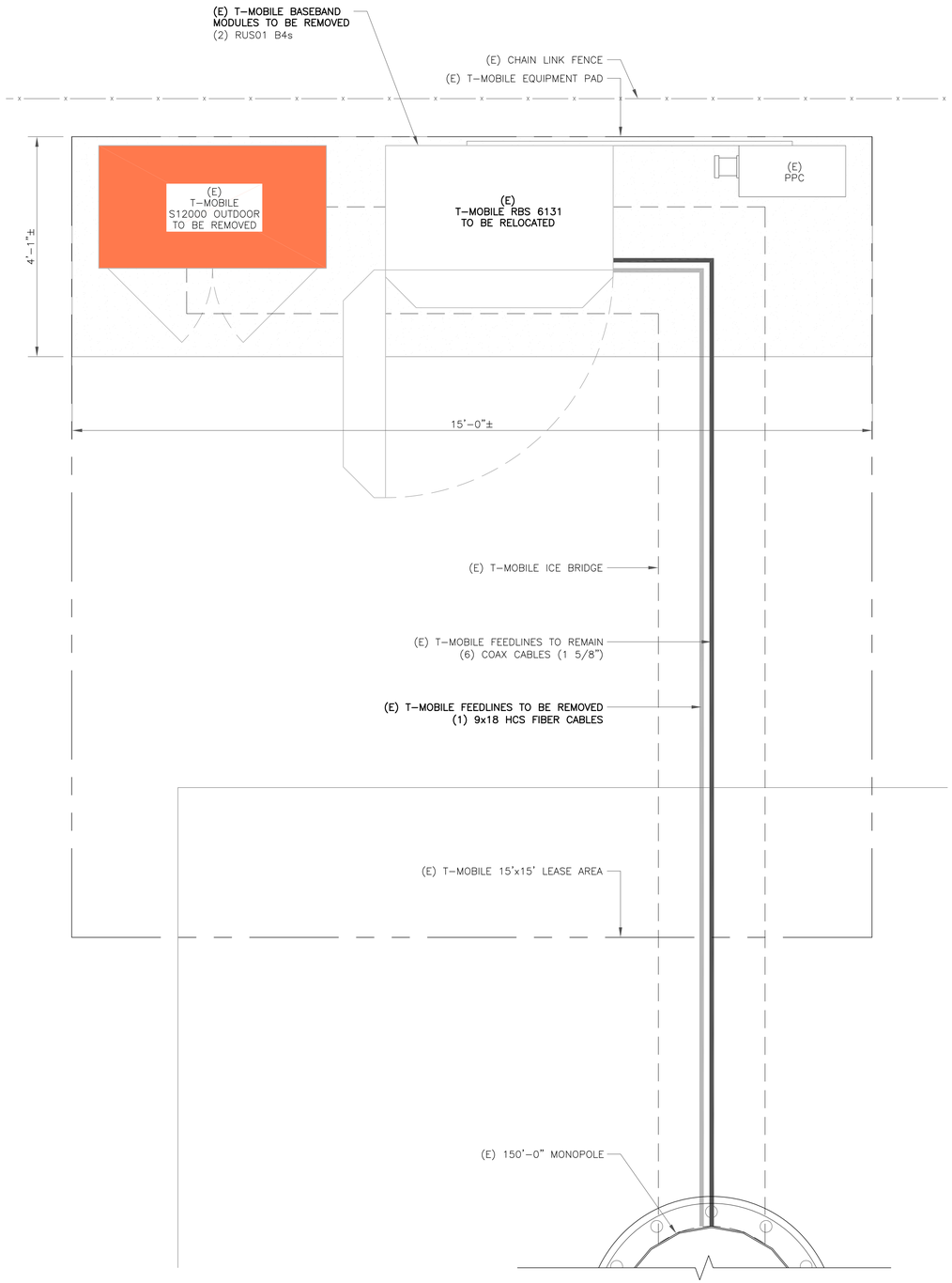
SHEET NUMBER: C-1.1

REVISION: 2

138154_876327_Kings Lot 11.20.20.dwg - Sheet:C-1.1 - User: rcarson - Dec 21, 2020 - 10:49am

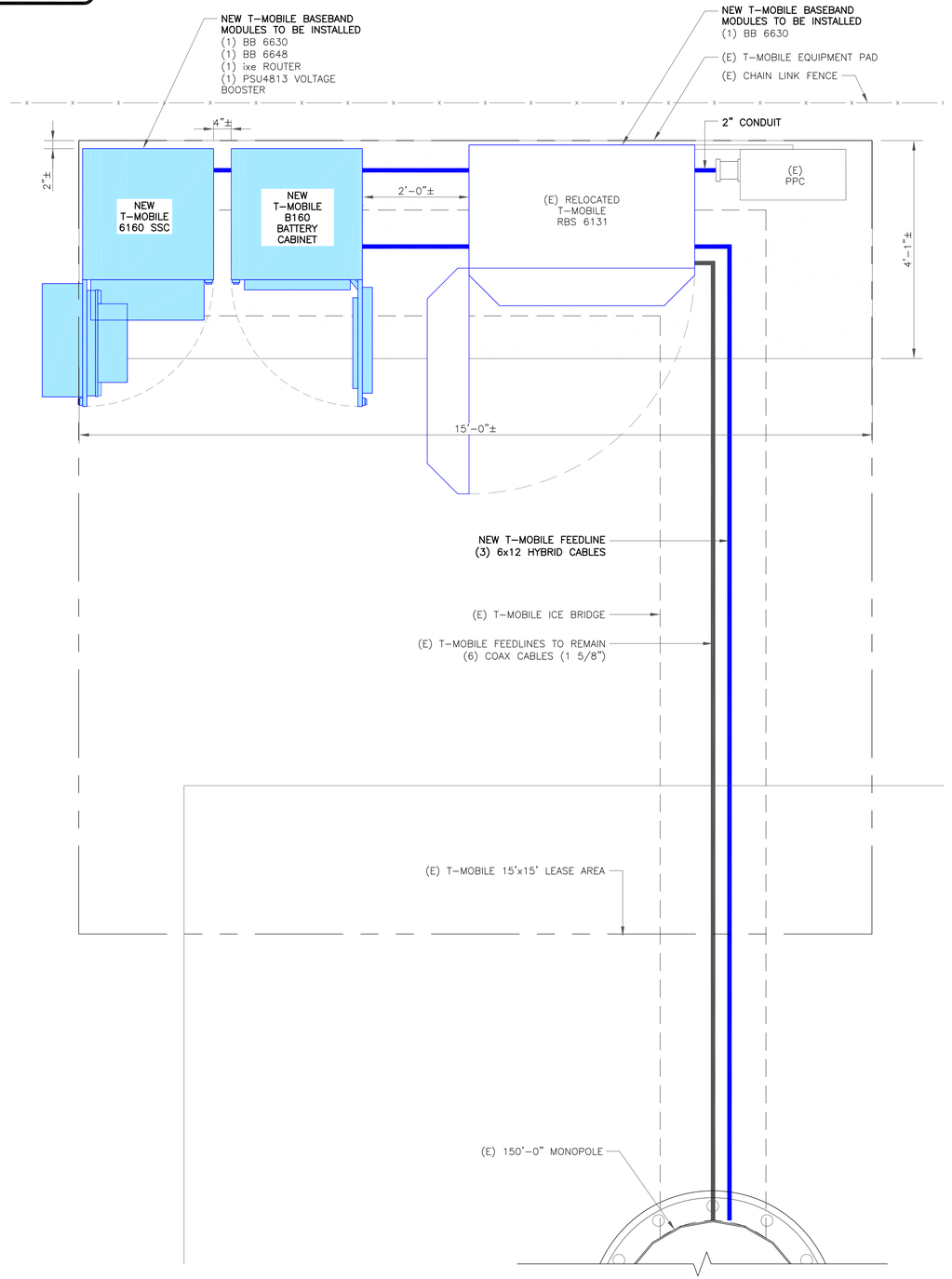
EQUIPMENT LEGEND:

- 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)

N



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

N

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BU #: **876327**
KINGS LOT

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SOUTH WINDSOR, CT 06074

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ISSUED FOR:

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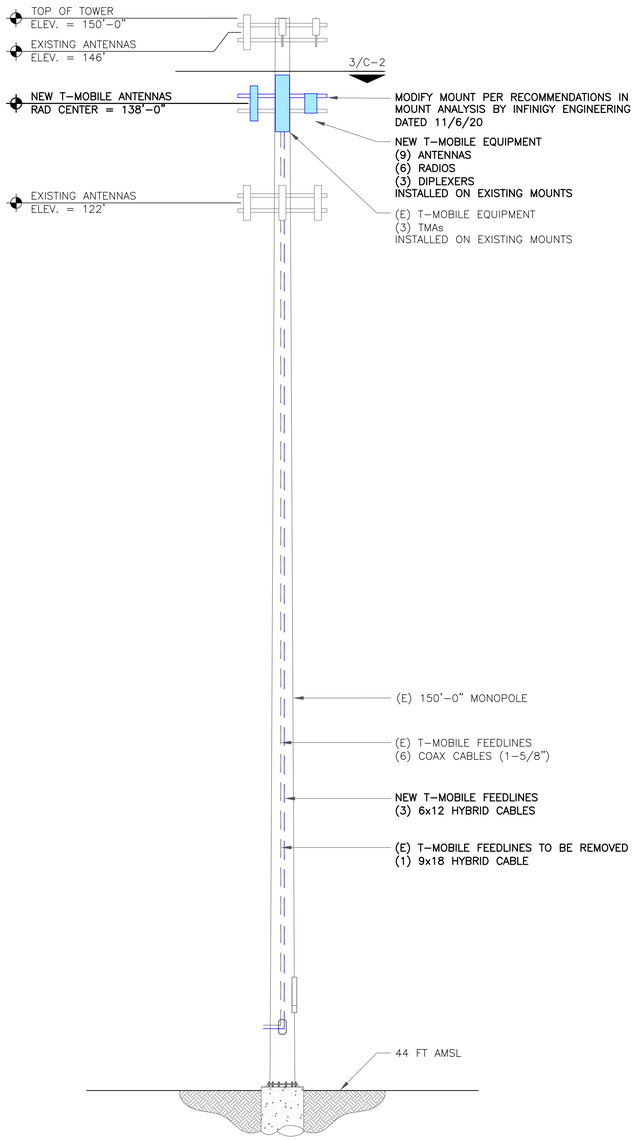
SHEET NUMBER: C-1.2
REVISION: 2

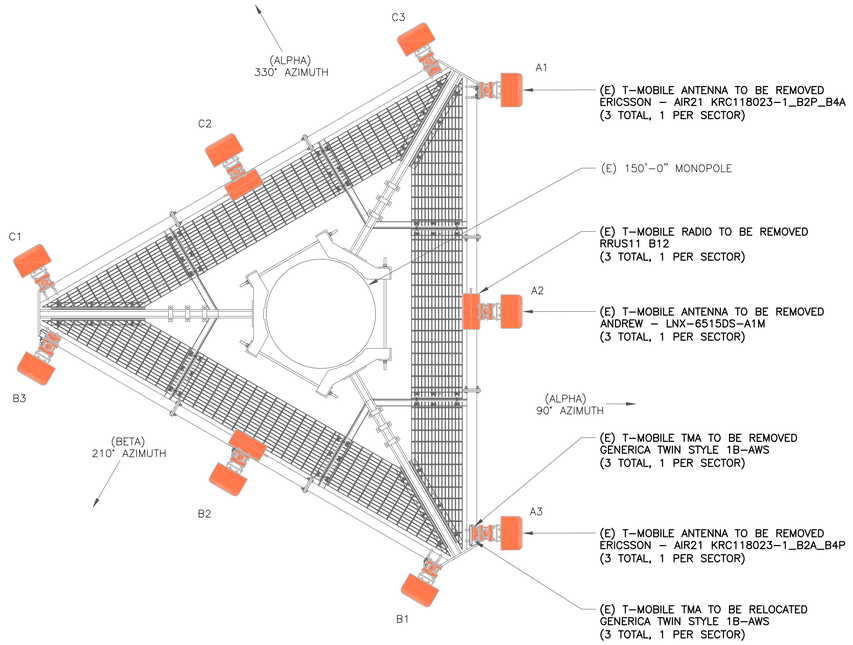
T-MOBILE EQUIPMENT

ANTENNA CL: 138'-0"
MOUNT CL: 138'-0"

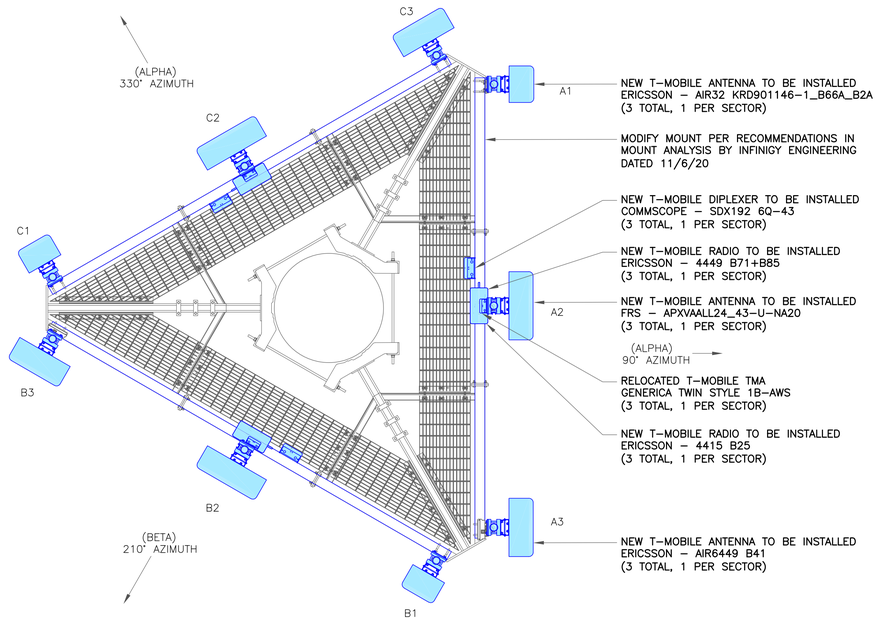
ANY AND ALL TOWER MOUNTED EQUIPMENT MUST NOT TRAP OR INTERFERE W/ EXISTING SAFETY CLIMB



1 FINAL ELEVATION
SCALE: NOT TO SCALE



2 EXISTING ANTENNA PLAN
SCALE: NOT TO SCALE



3 FINAL ANTENNA PLAN
SCALE: NOT TO SCALE

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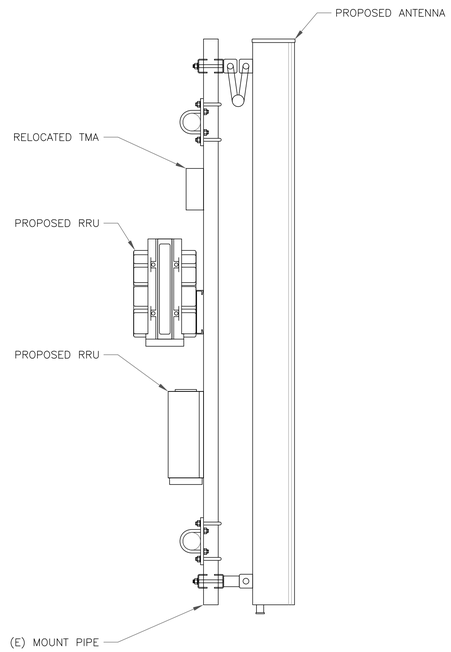
SHEET NUMBER: C-2

REVISION: 2

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	ERICSSON	AIR32 KRD901146-1_B66A_B2A	90°	0°	3°/3°/3°	138'-0"	-	(6) COAX (3) HYBRID	1 5/8" 6X12	110'
	A-2	L700/L600/N600 L900/L2500	RFS	APXVAARR24_43-U-NA20	90°	0°	2°/2°	138'-0"	1B AWS TMA 4449 B71+B12 4415 B25 COMMSCOPE SDX192 SQ-43 DIPLEXER			
	A-3	L2500/N2500	ERICSSON	AIR6449 B41	90°	0°	3°/3°	138'-0"	-			
BETA	B-1	L2100	ERICSSON	AIR32 KRD901146-1_B66A_B2A	210°	0°	3°/3°/3°	138'-0"	-			
	B-2	L700/L600/N600 L900/L2500	RFS	APXVAARR24_43-U-NA20	210°	0°	2°/2°	138'-0"	1B AWS TMA 4449 B71+B12 4415 B25 COMMSCOPE SDX192 SQ-43 DIPLEXER			
	B-3	L2500/N2500	ERICSSON	AIR6449 B41	210°	0°	3°/3°	138'-0"	-			
GAMMA	C-1	L2100	ERICSSON	AIR32 KRD901146-1_B66A_B2A	330°	0°	3°/3°/3°	138'-0"	-			
	C-2	L700/L600/N600 L900/L2500	RFS	APXVAARR24_43-U-NA20	330°	0°	2°/2°	138'-0"	1B AWS TMA 4449 B71+B12 4415 B25 COMMSCOPE SDX192 SQ-43 DIPLEXER			
	B-3	L2500/N2500	ERICSSON	AIR6449 B41	330°	0°	3°/3°	138'-0"	-			

1 ANTENNA & FEEDLINE SCHEDULE
SCALE: NOT TO SCALE



2 ANTENNA WITH RRHs MOUNTING DETAIL
SCALE: NOT TO SCALE

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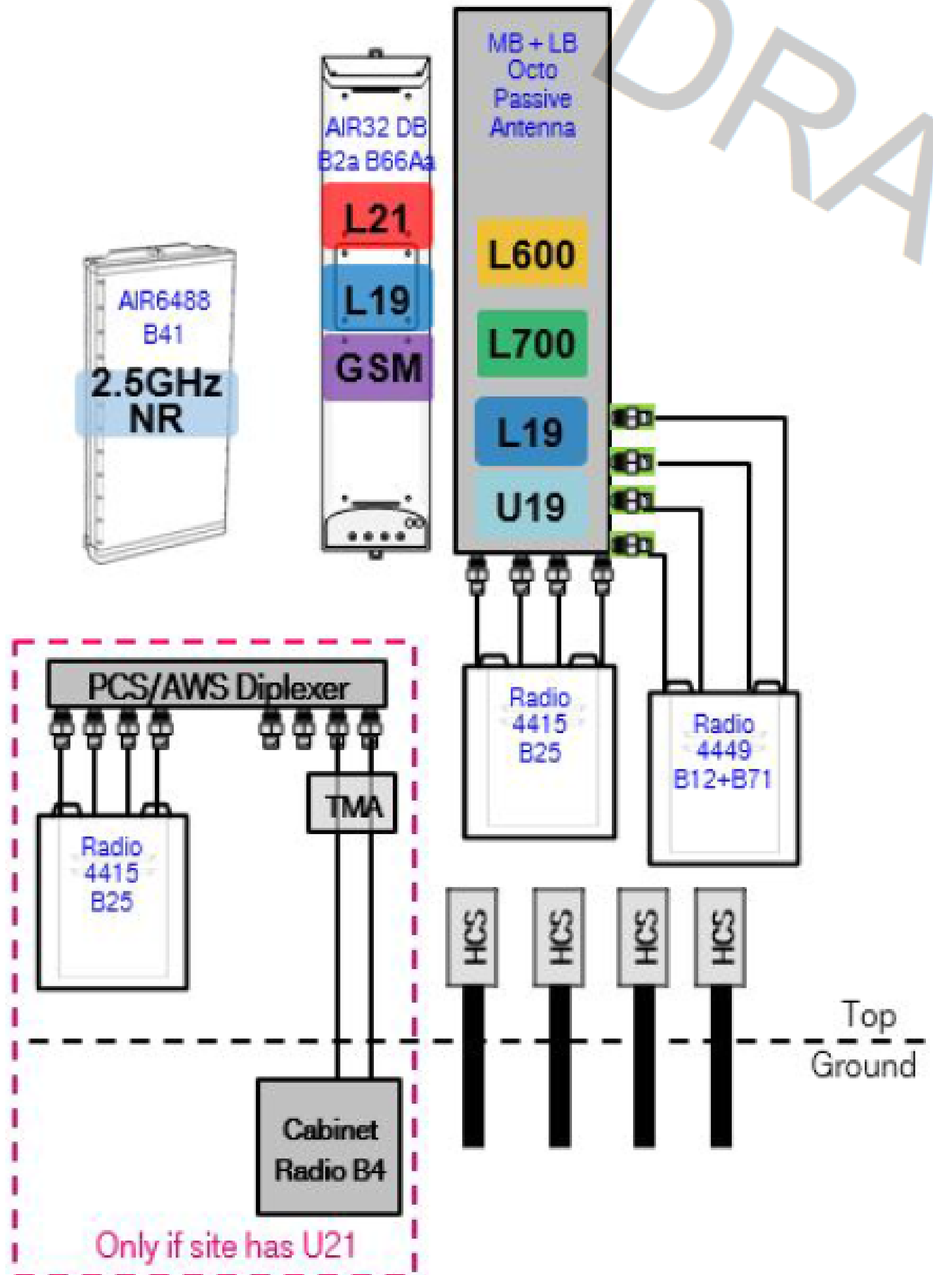
SHEET NUMBER: C-3
REVISION: 2



1 PLUMBING DIAGRAM
SCALE: NOT TO SCALE

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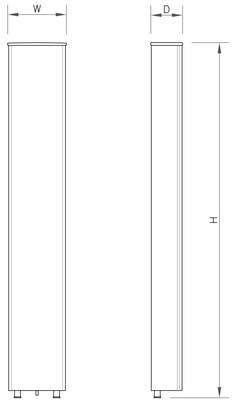
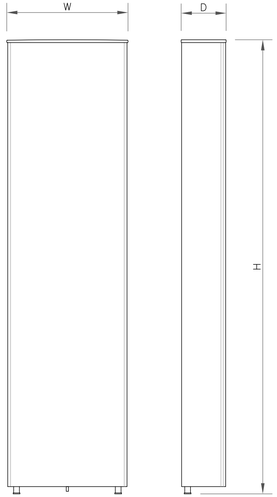
SHEET NUMBER: C-4

REVISION: 2



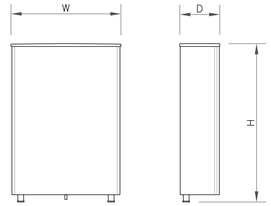
ANTENNA SPECS	
MANUFACTURER	ERICSSON
MODEL #	AIR32 KRD901146 1_B66A_B2A
WIDTH	12.87"
DEPTH	8.70"
HEIGHT	59.25"
WEIGHT	171.96 LBS

1 ANTENNA SPECS
SCALE: NOT TO SCALE



ANTENNA SPECS	
MANUFACTURER	RFS
MODEL #	APXVAALL24_43-U-NA20
WIDTH	24.0"
DEPTH	8.70"
HEIGHT	95.90"
WEIGHT	128.0LBS

2 ANTENNA SPECS ERICSSON
SCALE: NOT TO SCALE

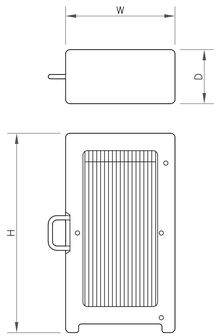


ANTENNA SPECS	
MANUFACTURER	ERICSSON
MODEL #	AIR6449 B41
WIDTH	20.51"
DEPTH	8.54"
HEIGHT	33.11"
WEIGHT	114.63 LBS

3 ANTENNA SPECS ERICSSON
SCALE: NOT TO SCALE

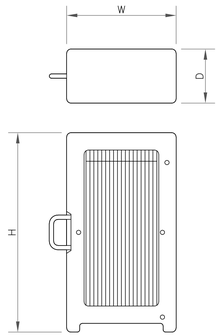
DIPLEXER SPECIFICATIONS	
MANUFACTURER	COMMSCOPE
MODEL #	SDX1926Q-43 | E14F05P86
WIDTH	6.92"
DEPTH	2.91"
HEIGHT	4.17"
WEIGHT	7.39 LBS

4 DIPLEXER SPECS
SCALE: NOT TO SCALE



RRU SPECIFICATIONS	
MANUFACTURER	ERICSSON
MODEL #	4415 B66A
WIDTH	13.20"
DEPTH	5.40"
HEIGHT	14.90"
WEIGHT	46.30 LBS

5 RADIO SPECS ERICSSON
SCALE: NOT TO SCALE



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

6 RRU SPECS
SCALE: NOT TO SCALE

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

7 ERICSSON 6160 SSC
SCALE: NOT TO SCALE

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

8 ERICSSON B160 BATTERY CABINET
SCALE: NOT TO SCALE

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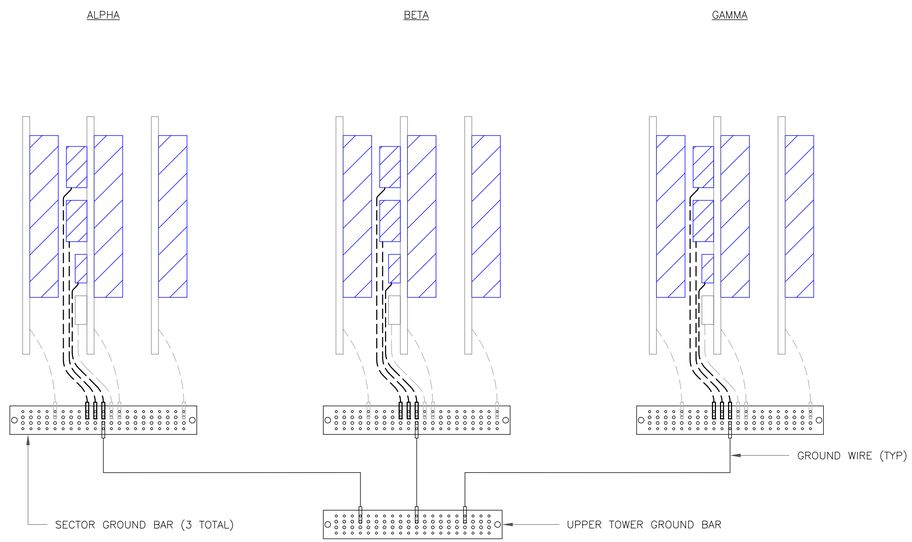
REVISION: 2



NOTE:

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

1 ANTENNA GROUNDING DIAGRAM
SCALE: NOT TO SCALE

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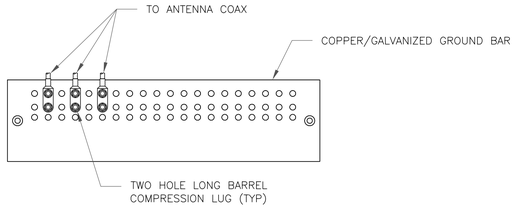
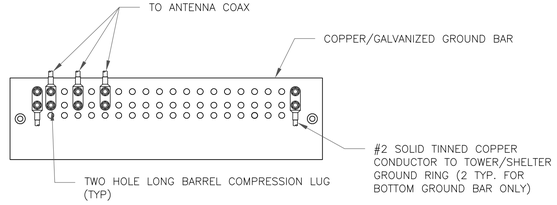
REVISION: 2



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.

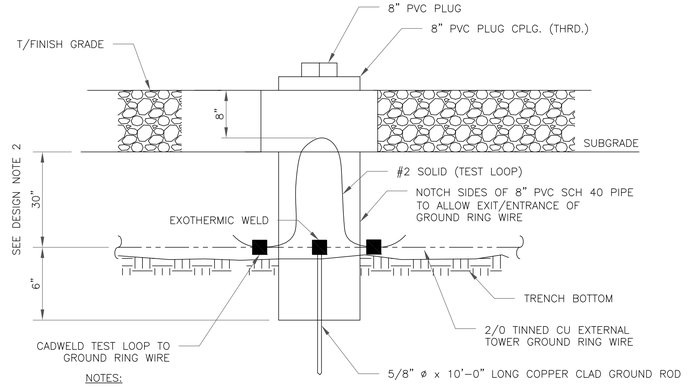
1 ANTENNA SECTOR GROUND BAR DETAIL
SCALE: NOT TO SCALE



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.

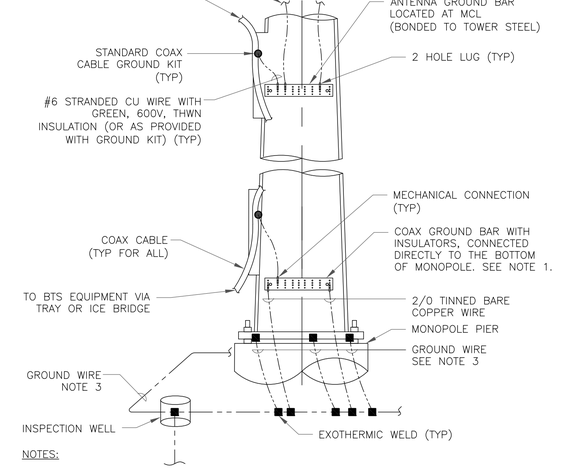
2 TOWER/SHELTER GROUND BAR DETAIL
SCALE: NOT TO SCALE



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)

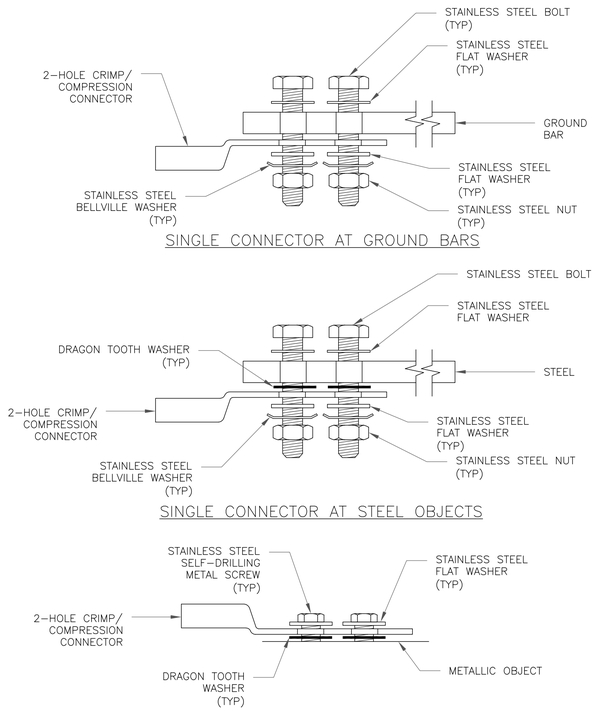
3 INSPECTION WELL DETAIL
SCALE: NOT TO SCALE



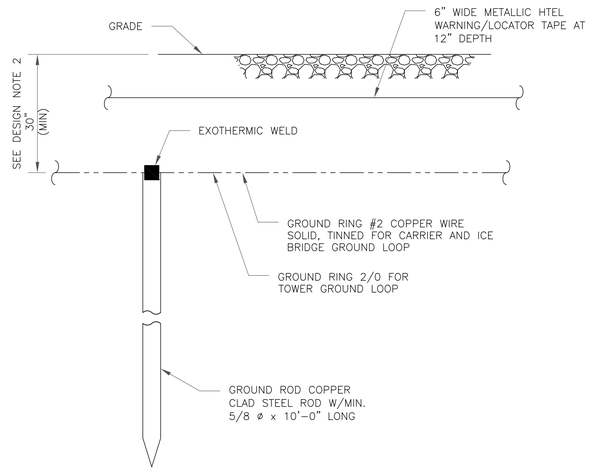
NOTES:

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:
CT11883C

BU #: **876327**
KINGS LOT

59 MCGUIRE ROAD
SOUTH WINDSOR, CT 06074

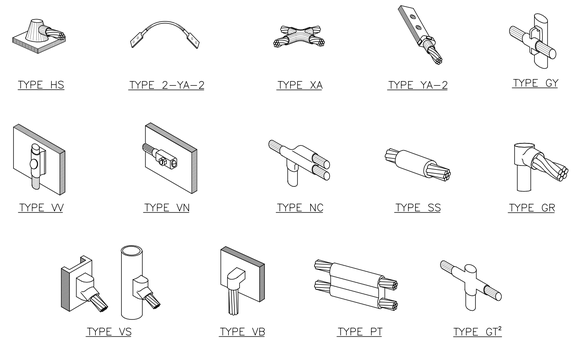
EXISTING
150'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	9/12/19	RFC	CONSTRUCTION	RMC
1	11/23/20	JTS	CONSTRUCTION	MTJ
2	12/21/20	JJD	CONSTRUCTION	RMC

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

SHEET NUMBER: G-2
REVISION: 2

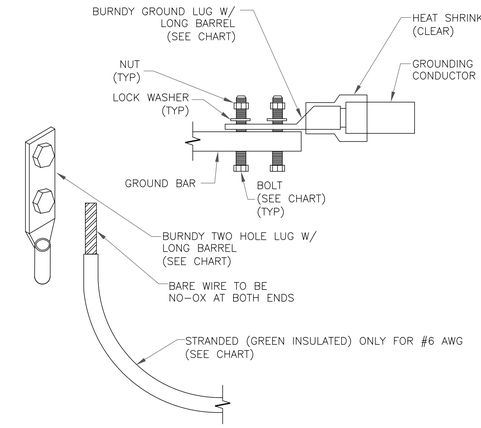


NOTE:

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

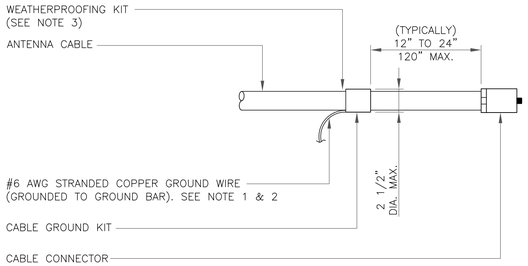
WIRE SIZE	BURNDY LUG	BOLT SIZE
#6 AWG GREEN INSULATED	YA6C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG SOLID TINNED	YA3C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG STRANDED	YA2C-2TC38	3/8" - 16 NC S 2 BOLT
#2/0 AWG STRANDED	YA26-2TC38	3/8" - 16 NC S 2 BOLT
#4/0 AWG STRANDED	YA28-2N	1/2" - 16 NC S 2 BOLT



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.

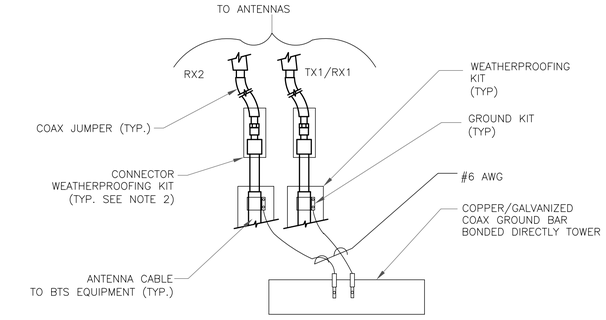
2 MECHANICAL LUG CONNECTION
SCALE: NOT TO SCALE



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.

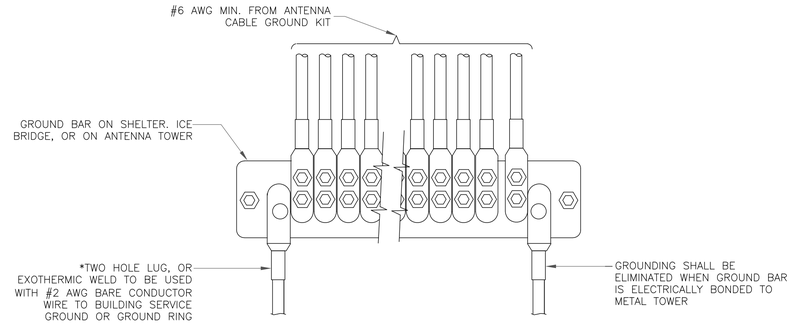
3 CABLE GROUND KIT CONNECTION
SCALE: NOT TO SCALE



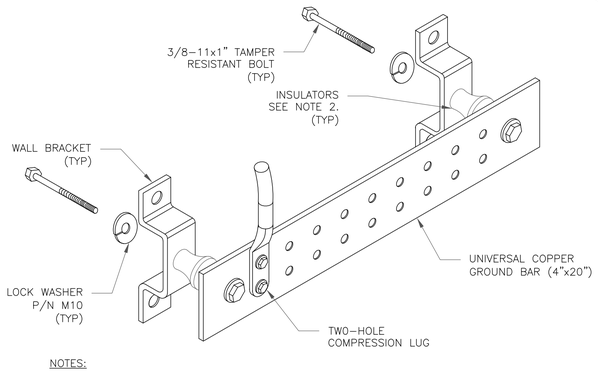
NOTES:

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



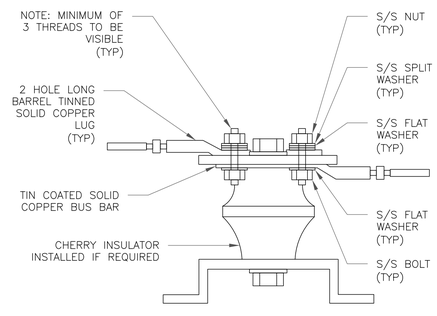
5 GROUNDWIRE INSTALLATION
SCALE: NOT TO SCALE



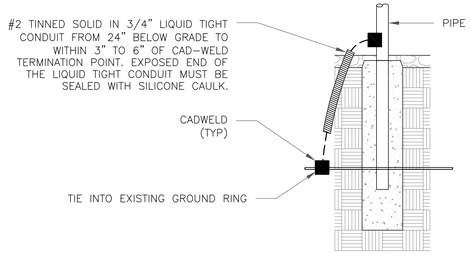
NOTES:

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:
CT11883C

BU #: **876327**
KINGS LOT

59 MCGUIRE ROAD
SOUTH WINDSOR, CT 06074

EXISTING
150'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	9/12/19	RFC	CONSTRUCTION	RMC
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2	12/21/20	JJD	CONSTRUCTION	RMC

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

SHEET NUMBER: G-3
REVISION: 2

Exhibit D

Structural Analysis Report

Date: **November 09, 2020**

Cheryl Schultz
Crown Castle
6325 Ardrey Kell Rd Suite 600
Charlotte, NC 28277

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

Subject:	**Structural Analysis Report**	
Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CT11883C
	Carrier Site Name:	CT883/Sprint S. Windsor
Crown Castle Designation:	**Crown Castle BU Number:**	876327
	Crown Castle Site Name:	KINGS LOT
	Crown Castle JDE Job Number:	578442
	Crown Castle Work Order Number:	1897667
	Crown Castle Order Number:	495800 Rev. 3
Engineering Firm Designation:	**Crown Castle Project Number:**	1897667
Site Data:	**59 McGuire Road, SOUTH WINDSOR, Hartford County, CT** **Latitude *41° 48' 10.77"*, Longitude *-72° 37' 1.96"*** **150 Foot - Monopole Tower**	

Dear Cheryl Schultz,

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:

LC5: Proposed Equipment Configuration **Sufficient Capacity-95.3%**

This analysis utilizes an ultimate 3-second gust wind speed of 125 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by: Emma McCarty

Respectfully submitted by:

Maribel Dentinger

Maribel Dentinger, P.E.
Senior Project Engineer

Maribel Dentinger Digitally signed by Maribel Dentinger Date: 2020.11.09 17:23:35 -05'00'

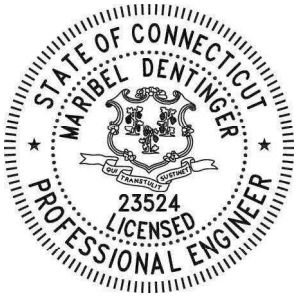


TABLE OF CONTENTS

1) INTRODUCTION

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

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

2) ANALYSIS CRITERIA

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

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
138.0	138.0	3	commscope	SDX1926Q-43	9	1-5/8
		3	ericsson	AIR 32 B2A/B66AA w/ Mount Pipe		
		3	ericsson	AIR6449 B41_T-MOBILE w/ Mount Pipe		
		6	ericsson	KRY 112 144/1		
		6	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	-	Handrail Kit		
		1	tower mounts	Platform Mount [LP 1201-1]		
12.0	13.0	1	lucent	KS24019-L112A	1	1/2
	12.0	1	tower mounts	Side Arm Mount [SO 701-1]		

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
148.0	149.0	3	alcatel lucent	800MHz 2X50W RRH W/FILTER	-	-
		3	alcatel lucent	PCS 1900MHz 4x45W-65MHz		
	148.0	1	tower mounts	Side Arm Mount [SO 102-3]		
146.0	148.0	1	rfs celwave	APXV9ERR18-C-A20	3	1-1/4
		2	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe	1	1
	146.0	1	tower mounts	Platform Mount [LP 301-1]		
124.0	124.0	3	ericsson	RRUS 11	-	-
		1	tower mounts	Side Arm Mount [SO 102-3]		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
122.0	123.0	1	cci antennas	HPA-65R-BUU-H6 w/ Mount Pipe	12 4 2 2	-1/4 3/4 3/8 Conduit
		1	cci antennas	HPA-65R-BUU-H8 w/ Mount Pipe		
		1	cci antennas	TPA-65R-LCUUUU-H8 w/ Mount Pipe		
		1	commscope	SBNHH-1D65A w/ Mount Pipe		
		3	powerwave technologies	7770.00 w/ Mount Pipe		
		1	quintel technology	QS46512-2 w/ Mount Pipe		
		1	quintel technology	QS66512-2 w/ Mount Pipe		
	122.0	6	powerwave technologies	LGP2140X		
		2	raycap	DC6-48-60-18-8F		
		1	tower mounts	T-Arm Mount [TA 602-3]		
13.0	14.0	1	lucent	KS24019-L112A	1	1/2
	13.0	1	tower mounts	Side Arm Mount [SO 701-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH	2192521	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Rohn	1620564	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Rohn	1619441	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Vertical Solutions	2366959	CCISITES
4-POST-MODIFICATION INSPECTION	Vertical Solutions	2366960	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	PJF	5957600	CCISITES
4-POST-MODIFICATION INSPECTION	ETS	6250604	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	TP24x24x0.25	Pole	2.3%	Pass
145 - 140	Pole	TP24x24x0.25	Pole	6.5%	Pass
140 - 135	Pole	TP24x24x0.25	Pole	16.3%	Pass
135 - 130	Pole	TP24x24x0.25	Pole	28.6%	Pass
130 - 125	Pole	TP24x24x0.25	Pole	41.4%	Pass
125 - 120	Pole	TP24x24x0.25	Pole	58.0%	Pass
120 - 115	Pole	TP30x30x0.375	Pole	32.2%	Pass
115 - 110	Pole	TP30x30x0.375	Pole	40.2%	Pass
110 - 105	Pole	TP30x30x0.375	Pole	48.4%	Pass
105 - 100	Pole	TP30x30x0.375	Pole	56.8%	Pass
100 - 95	Pole	TP30x30x0.375	Pole	65.5%	Pass
95 - 90	Pole	TP30x30x0.375	Pole	74.5%	Pass
90 - 85	Pole	TP36x36x0.375	Pole	59.8%	Pass
85 - 80	Pole	TP36x36x0.375	Pole	66.9%	Pass
80 - 78.54	Pole	TP36x36x0.375	Pole	68.9%	Pass
78.54 - 78.29	Pole + Reinf.	TP36x36x0.5125	Reinf. 4 Tension Rupture	52.8%	Pass
78.29 - 73.29	Pole + Reinf.	TP36x36x0.5125	Reinf. 4 Tension Rupture	58.4%	Pass
73.29 - 68.29	Pole + Reinf.	TP36x36x0.5125	Reinf. 4 Tension Rupture	64.1%	Pass
68.29 - 63.29	Pole + Reinf.	TP36x36x0.5125	Reinf. 4 Tension Rupture	69.9%	Pass
63.29 - 60	Pole + Reinf.	TP36x36x0.5125	Reinf. 4 Tension Rupture	73.9%	Pass
60 - 59.75	Pole + Reinf.	TP42x42x0.5875	Pole	47.2%	Pass
59.75 - 54.75	Pole + Reinf.	TP42x42x0.5875	Pole	51.6%	Pass
54.75 - 49.75	Pole + Reinf.	TP42x42x0.5875	Pole	56.2%	Pass
49.75 - 44.75	Pole + Reinf.	TP42x42x0.5875	Pole	60.8%	Pass
44.75 - 39.75	Pole + Reinf.	TP42x42x0.5875	Pole	65.6%	Pass
39.75 - 34.75	Pole + Reinf.	TP42x42x0.5875	Pole	70.6%	Pass
34.75 - 30	Pole + Reinf.	TP42x42x0.5875	Pole	75.4%	Pass
30 - 29.75	Pole + Reinf.	TP42x42x0.65	Pole	65.6%	Pass
29.75 - 24.75	Pole + Reinf.	TP42x42x0.65	Pole	70.4%	Pass

24.75 - 19.75	Pole + Reinf.	TP42x42x0.65	Pole	75.3%	Pass
19.75 - 14.75	Pole + Reinf.	TP42x42x0.65	Pole	80.3%	Pass
14.75 - 9.75	Pole + Reinf.	TP42x42x0.65	Pole	85.3%	Pass
9.75 - 4.75	Pole + Reinf.	TP42x42x0.65	Pole	90.4%	Pass
4.75 - 0	Pole + Reinf.	TP42x42x0.65	Pole	95.3%	Pass
				Summary	
			Pole	95.3%	Pass
			Reinforcement	90.9%	Pass
			Overall	95.3%	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Flange Bolts	120	22.0	Pass
1	Flange Plate	120	35.1	Pass
1	Flange Bolts	90	44.7	Pass
1	Flange Plate	90	76.8	Pass
1	Flange Bolts	60	28.3	Pass
1	Flange Plate	60	49.7	Pass
1	Bridge Stiffener	60	44.0	Pass
1	Flange Bolts	30	42.4	Pass
1	Flange Plate	30	34.0	Pass
1	Bridge Stiffener	30	70.3	Pass
1	Anchor Rods	0	80.0	Pass
1	Base Plate	0	56.3	Pass
1	Base Foundation (Structure)	0	35.9	Pass
1	Base Foundation (Soil Interaction)	0	84.2	Pass

Structure Rating (max from all components) =	95.3%

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

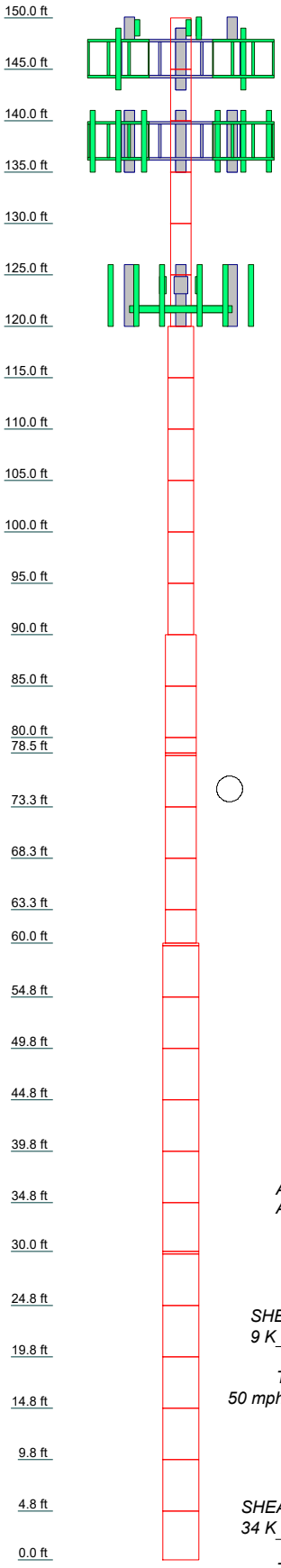
4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT

Section	Size	Length (ft)	Grade	Weight (K)
1	P24x0.25	5.0000	A53-B-42	0.3
2	P24x0.25	5.0000		0.3
3	P24x0.25	5.0000		0.3
4	P24x0.25	5.0000		0.3
5	P24x0.25	5.0000		0.3
6	P24x0.25	5.0000		0.3
7	P30x0.375	5.0000		0.6
8	P30x0.375	5.0000		0.6
9	P30x0.375	5.0000		0.6
10	P30x0.375	5.0000		0.6
11	P30x0.375	5.0000		0.6
12	P30x0.375	5.0000		0.6
13	P36x0.375	5.0000		0.7
14	P36x0.375	5.0000		0.7
15				
16				
17		5.0000		0.9
18		5.0000		0.9
19		5.0000		0.9
20				10.6
21				0
22		5.0000		1.2
23	P42x0.5	5.0000		1.2
24	P42x0.5	5.0000		1.2
25	P42x0.5	5.0000		1.2
26	P42x0.5	5.0000		1.2
27	P42x0.5	2.7500		1.2
28				0
29		5.0000		1.4
30	P42x0.65	5.0000		1.4
31	P42x0.65	5.0000		1.4
32	P42x0.65	5.0000		1.4
33	P42x0.65	5.0000		1.4
34	P42x0.65	4.7500		1.3
				26.6



MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-42	42 ksi	63 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 125 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 2.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.0000 ft
8. TOWER RATING: 95.3%

ALL REACTIONS ARE FACTORED

AXIAL 95 K

SHEAR 9 K *MOMENT 908 kip-ft*

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

AXIAL 55 K

SHEAR 34 K *MOMENT 3146 kip-ft*

TORQUE 2 kip-ft
REACTIONS - 125 mph WIND

CROWN CASTLE
The Pathway to Possible

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

Job: *BU 876327*			
Project:			
Client: Crown Castle	Drawn by: emccarty		App'd:
Code: TIA-222-H	Date: 11/09/20		Scale: NTS
Path: C:\Users\emccarty\Desktop\WORK AREA\876327\WO 1897667 - SA\Prod\876327_RPA.er			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:

3) Tower is located in Hartford County, Connecticut.
4) Tower base elevation above sea level: 58.0000 ft.
5) Basic wind speed of 125 mph.
6) Risk Category II.
7) Exposure Category C.
8) Simplified Topographic Factor Procedure for wind speed-up calculations is used.
9) Topographic Category: 1.
10) Crest Height: 0.0000 ft.
11) Nominal ice thickness of 2.0000 in.
12) Ice thickness is considered to increase with height.
13) Ice density of 56.00 pcf.
14) A wind speed of 50 mph is used in combination with ice.
15) Temperature drop of 50 °F.
16) Deflections calculated using a wind speed of 60 mph.
17) TOWER RATING: 95.3%.
18) A non-linear (P-delta) analysis was used.
19) Pressures are calculated at each section.
20) Stress ratio used in pole design is 1.05.
21) Tower analysis based on target reliabilities in accordance with Annex S.
22) Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
23) 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

Pole Section Geometry

Section	*Elevation*	*Section Length*	*Pole Size*	*Pole Grade*	*Socket Length*
	ft	*ft*			*ft*

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L1	150.0000-145.0000	5.0000	P24x0.25	A53-B-42 (42 ksi)	
L2	145.0000-140.0000	5.0000	P24x0.25	A53-B-42 (42 ksi)	
L3	140.0000-135.0000	5.0000	P24x0.25	A53-B-42 (42 ksi)	
L4	135.0000-130.0000	5.0000	P24x0.25	A53-B-42 (42 ksi)	
L5	130.0000-125.0000	5.0000	P24x0.25	A53-B-42 (42 ksi)	
L6	125.0000-120.0000	5.0000	P24x0.25	A53-B-42 (42 ksi)	
L7	120.0000-115.0000	5.0000	P30x0.375	A53-B-42 (42 ksi)	
L8	115.0000-110.0000	5.0000	P30x0.375	A53-B-42 (42 ksi)	
L9	110.0000-105.0000	5.0000	P30x0.375	A53-B-42 (42 ksi)	
L10	105.0000-100.0000	5.0000	P30x0.375	A53-B-42 (42 ksi)	
L11	100.0000-95.0000	5.0000	P30x0.375	A53-B-42 (42 ksi)	
L12	95.0000-90.0000	5.0000	P30x0.375	A53-B-42 (42 ksi)	
L13	90.0000-85.0000	5.0000	P36x0.375	A53-B-42 (42 ksi)	
L14	85.0000-80.0000	5.0000	P36x0.375	A53-B-42 (42 ksi)	
L15	80.0000-78.5400	1.4600	P36x0.375	A53-B-42 (42 ksi)	
L16	78.5400-78.2900	0.2500	P36x0.5125	A53-B-42 (42 ksi)	
L17	78.2900-73.2900	5.0000	P36x0.5125	A53-B-42 (42 ksi)	
L18	73.2900-68.2900	5.0000	P36x0.5125	A53-B-42 (42 ksi)	
L19	68.2900-63.2900	5.0000	P36x0.5125	A53-B-42 (42 ksi)	
L20	63.2900-60.0000	3.2900	P36x0.5125	A53-B-42 (42 ksi)	
L21	60.0000-59.7500	0.2500	P42x0.5875	A53-B-42 (42 ksi)	
L22	59.7500-54.7500	5.0000	P42x0.5875	A53-B-42 (42 ksi)	
L23	54.7500-49.7500	5.0000	P42x0.5875	A53-B-42 (42 ksi)	
L24	49.7500-44.7500	5.0000	P42x0.5875	A53-B-42 (42 ksi)	
L25	44.7500-39.7500	5.0000	P42x0.5875	A53-B-42 (42 ksi)	
L26	39.7500-34.7500	5.0000	P42x0.5875	A53-B-42 (42 ksi)	
L27	34.7500-30.0000	4.7500	P42x0.5875	A53-B-42 (42 ksi)	
L28	30.0000-29.7500	0.2500	P42x0.65	A53-B-42 (42 ksi)	
L29	29.7500-24.7500	5.0000	P42x0.65	A53-B-42 (42 ksi)	
L30	24.7500-19.7500	5.0000	P42x0.65	A53-B-42 (42 ksi)	
L31	19.7500-14.7500	5.0000	P42x0.65	A53-B-42 (42 ksi)	
L32	14.7500-9.7500	5.0000	P42x0.65	A53-B-42 (42 ksi)	
L33	9.7500-4.7500	5.0000	P42x0.65	A53-B-42 (42 ksi)	
L34	4.7500-0.0000	4.7500	P42x0.65	A53-B-42 (42 ksi)	

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 135.0000-130.0000				1	1	1			
L5 130.0000-125.0000				1	1	1			
L6 125.0000-120.0000				1	1	1			
L7 120.0000-115.0000				1	1	1			
L8 115.0000-110.0000				1	1	1			
L9 110.0000-105.0000				1	1	1			
L10 105.0000-100.0000				1	1	1			
L11 100.0000-95.0000				1	1	1			
L12 95.0000-90.0000				1	1	1			
L13 90.0000-85.0000				1	1	1			
L14 85.0000-80.0000				1	1	1			
L15 80.0000-78.5400				1	1	1			
L16 78.5400-78.2900				1	1	0.970816			
L17 78.2900-73.2900				1	1	0.970816			
L18 73.2900-68.2900				1	1	0.970816			
L19 68.2900-63.2900				1	1	0.970816			
L20 63.2900-60.0000				1	1	0.970816			
L21 60.0000-59.7500				1	1	0.960474			
L22 59.7500-54.7500				1	1	0.960474			
L23 54.7500-49.7500				1	1	0.960474			
L24 49.7500-44.7500				1	1	0.960474			
L25 44.7500-39.7500				1	1	0.960474			
L26 39.7500-34.7500				1	1	0.960474			
L27 34.7500-30.0000				1	1	0.960474			
L28 30.0000-29.7500				1	1	0.985195			
L29 29.7500-24.7500				1	1	0.985195			
L30 24.7500-19.7500				1	1	0.985195			
L31 19.7500-14.7500				1	1	0.985195			

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
L32 14.7500-9.7500				1	1	0.985195			
L33 9.7500-4.7500				1	1	0.985195			
L34 4.7500-0.0000				1	1	0.985195			

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
******										
3.25x1.25	B	No	Surface Af (CaAa)	15.0000 - 0.0000	1	1	-0.500 -0.500	3.2500	0.0000	13.82
3.25x1.25	A	No	Surface Af (CaAa)	15.0000 - 0.0000	1	1	-0.500 -0.500	3.2500	0.0000	13.82
3.25x1.25	C	No	Surface Af (CaAa)	15.0000 - 0.0000	1	1	-0.500 -0.500	3.2500	0.0000	13.82
3x1.25	B	No	Surface Af (CaAa)	46.5000 - 30.4000	1	1	-0.500 -0.500	3.0000	8.5000	12.76
3x1.25	A	No	Surface Af (CaAa)	46.5000 - 30.4000	1	1	-0.500 -0.500	3.0000	8.5000	12.76
3x1.25	C	No	Surface Af (CaAa)	46.5000 - 30.4000	1	1	-0.500 -0.500	3.0000	8.5000	12.76
8x1.25	B	No	Surface Af (CaAa)	66.0000 - 60.4000	1	1	-0.500 -0.500	8.0000	18.5000	34.03
8x1.25	A	No	Surface Af (CaAa)	66.0000 - 60.4000	1	1	-0.500 -0.500	8.0000	18.5000	34.03
8x1.25	C	No	Surface Af (CaAa)	66.0000 - 60.4000	1	1	-0.500 -0.500	8.0000	18.5000	34.03
JUMP PLATE	B	No	Surface Af (CaAa)	93.7500 - 86.2500	1	1	-0.500 -0.500	6.0000	28.0000	34.03
JUMP PLATE	A	No	Surface Af (CaAa)	93.7500 - 86.2500	1	1	-0.500 -0.500	6.0000	28.0000	34.03
JUMP PLATE	C	No	Surface Af (CaAa)	93.7500 - 86.2500	1	1	-0.500 -0.500	6.0000	28.0000	34.03
6x1	C	No	Surface Af (CaAa)	29.5000 - 1.2500	1	1	-0.250 -0.250	6.0000	14.0000	0.00
6x1	B	No	Surface Af (CaAa)	29.5000 - 1.0800	1	1	-0.250 -0.250	6.0000	14.0000	0.00
6x1	A	No	Surface Af (CaAa)	29.5000 - 4.8300	1	1	-0.250 -0.250	6.0000	14.0000	0.00
6.5x1.25	A	No	Surface Af (CaAa)	59.5400 - 30.0600	1	1	-0.125 -0.125	6.5000	15.5000	0.00
6.5x1.25	C	No	Surface Af (CaAa)	59.5400 - 30.0600	1	1	-0.125 -0.125	6.5000	15.5000	0.00
6.5x1.25	B	No	Surface Af (CaAa)	59.5400 - 30.0600	1	1	-0.125 -0.125	6.5000	15.5000	0.00
CCI-045100 (L)	A	No	Surface Af (CaAa)	80.0400 - 60.0400	1	1	-0.125 -0.125	4.5000	11.0000	0.00
CCI-045100 (L)	C	No	Surface Af (CaAa)	80.0400 - 60.0400	1	1	-0.125 -0.125	4.5000	11.0000	0.00
CCI-045100 (L)	B	No	Surface Af (CaAa)	80.0400 - 60.0400	1	1	-0.125 -0.125	4.5000	11.0000	0.00
*****										
HB114-1-08U4-M5J(1-1/4)	C	No	Surface Ar (CaAa)	146.0000 - 0.0000	4	4	-0.500 -0.380	1.5400		1.08
HCS 6X12 4AWG(1-5/8)	A	No	Surface Ar (CaAa)	138.0000 - 0.0000	4	4	-0.230 -0.060	1.6600		2.40
***										

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
*****									
***									
138									
AL7-50(1-5/8)	A	No	No	Inside Pole	138.0000 - 0.0000	5	No Ice	0.0000	0.52
							1/2" Ice	0.0000	0.52
							1" Ice	0.0000	0.52
							2" Ice	0.0000	0.52
122									
LDF6-50A(1-1/4)	C	No	No	Inside Pole	122.0000 - 0.0000	12	No Ice	0.0000	0.60
							1/2" Ice	0.0000	0.60
							1" Ice	0.0000	0.60
							2" Ice	0.0000	0.60
FB-L98B-002-75000(3/8)	C	No	No	Inside Pole	122.0000 - 0.0000	2	No Ice	0.0000	0.06
							1/2" Ice	0.0000	0.06
							1" Ice	0.0000	0.06
							2" Ice	0.0000	0.06
WR-VG86ST-BRD(3/4)	C	No	No	Inside Pole	122.0000 - 0.0000	4	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
2" Rigid Conduit	C	No	No	Inside Pole	122.0000 - 0.0000	2	No Ice	0.0000	2.80
							1/2" Ice	0.0000	2.80
							1" Ice	0.0000	2.80
							2" Ice	0.0000	2.80
13									
LDF4-50A(1/2)	B	No	No	Inside Pole	13.0000 - 0.0000	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
12									
LDF4-50A(1/2)	B	No	No	Inside Pole	12.0000 - 0.0000	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
***									

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-	A	0.000	0.000	0.000	0.000	0.00
	145.0000	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.616	0.000	0.00
L2	145.0000-	A	0.000	0.000	0.000	0.000	0.00
	140.0000	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	3.080	0.000	0.02
L3	140.0000-	A	0.000	0.000	1.992	0.000	0.04
	135.0000	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	3.080	0.000	0.02
L4	135.0000-	A	0.000	0.000	3.320	0.000	0.06
	130.0000	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	3.080	0.000	0.02
L5	130.0000-	A	0.000	0.000	3.320	0.000	0.06
	125.0000	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	3.080	0.000	0.02
L6	125.0000-	A	0.000	0.000	3.320	0.000	0.06
	120.0000	B	0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C	0.000	0.000	3.080	0.000	0.05
L7	120.0000-	A	0.000	0.000	3.320	0.000	0.06
	115.0000	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	3.080	0.000	0.10
L8	115.0000-	A	0.000	0.000	3.320	0.000	0.06
	110.0000	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	3.080	0.000	0.10
L9	110.0000-	A	0.000	0.000	3.320	0.000	0.06
	105.0000	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	3.080	0.000	0.10
L10	105.0000-	A	0.000	0.000	3.320	0.000	0.06
	100.0000	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	3.080	0.000	0.10
L11	100.0000-	A	0.000	0.000	3.320	0.000	0.06
	95.0000	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	3.080	0.000	0.10
L12	95.0000-90.0000	A	0.000	0.000	6.070	0.000	0.19
		B	0.000	0.000	2.750	0.000	0.13
		C	0.000	0.000	5.830	0.000	0.23
L13	90.0000-85.0000	A	0.000	0.000	6.070	0.000	0.19
		B	0.000	0.000	2.750	0.000	0.13
		C	0.000	0.000	5.830	0.000	0.23
L14	85.0000-80.0000	A	0.000	0.000	3.350	0.000	0.06
		B	0.000	0.000	0.030	0.000	0.00
		C	0.000	0.000	3.110	0.000	0.10
L15	80.0000-78.5400	A	0.000	0.000	2.064	0.000	0.02
		B	0.000	0.000	1.095	0.000	0.00
		C	0.000	0.000	1.994	0.000	0.03
L16	78.5400-78.2900	A	0.000	0.000	0.353	0.000	0.00
		B	0.000	0.000	0.188	0.000	0.00
		C	0.000	0.000	0.342	0.000	0.00
L17	78.2900-73.2900	A	0.000	0.000	7.070	0.000	0.06
		B	0.000	0.000	3.750	0.000	0.00
		C	0.000	0.000	6.830	0.000	0.10
L18	73.2900-68.2900	A	0.000	0.000	7.070	0.000	0.06
		B	0.000	0.000	3.750	0.000	0.00
		C	0.000	0.000	6.830	0.000	0.10
L19	68.2900-63.2900	A	0.000	0.000	9.678	0.000	0.15
		B	0.000	0.000	6.358	0.000	0.09
		C	0.000	0.000	9.438	0.000	0.19
L20	63.2900-60.0000	A	0.000	0.000	7.403	0.000	0.14
		B	0.000	0.000	5.218	0.000	0.10
		C	0.000	0.000	7.245	0.000	0.16
L21	60.0000-59.7500	A	0.000	0.000	0.166	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.154	0.000	0.00
L22	59.7500-54.7500	A	0.000	0.000	8.509	0.000	0.06
		B	0.000	0.000	5.189	0.000	0.00
		C	0.000	0.000	8.269	0.000	0.10
L23	54.7500-49.7500	A	0.000	0.000	8.737	0.000	0.06
		B	0.000	0.000	5.417	0.000	0.00
		C	0.000	0.000	8.497	0.000	0.10
L24	49.7500-44.7500	A	0.000	0.000	9.612	0.000	0.08
		B	0.000	0.000	6.292	0.000	0.02
		C	0.000	0.000	9.372	0.000	0.12
L25	44.7500-39.7500	A	0.000	0.000	11.237	0.000	0.12
		B	0.000	0.000	7.917	0.000	0.06
		C	0.000	0.000	10.997	0.000	0.16
L26	39.7500-34.7500	A	0.000	0.000	11.237	0.000	0.12
		B	0.000	0.000	7.917	0.000	0.06
		C	0.000	0.000	10.997	0.000	0.16
L27	34.7500-30.0000	A	0.000	0.000	10.410	0.000	0.11
		B	0.000	0.000	7.256	0.000	0.06
		C	0.000	0.000	10.182	0.000	0.15
L28	30.0000-29.7500	A	0.000	0.000	0.166	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.154	0.000	0.00
L29	29.7500-24.7500	A	0.000	0.000	8.070	0.000	0.06
		B	0.000	0.000	4.750	0.000	0.00

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C	0.000	0.000	7.830	0.000	0.10
L30	24.7500-19.7500	A	0.000	0.000	8.320	0.000	0.06
		B	0.000	0.000	5.000	0.000	0.00
		C	0.000	0.000	8.080	0.000	0.10
L31	19.7500-14.7500	A	0.000	0.000	8.455	0.000	0.06
		B	0.000	0.000	5.135	0.000	0.00
		C	0.000	0.000	8.215	0.000	0.10
L32	14.7500-9.7500	A	0.000	0.000	11.028	0.000	0.13
		B	0.000	0.000	7.708	0.000	0.07
		C	0.000	0.000	10.788	0.000	0.17
L33	9.7500-4.7500	A	0.000	0.000	10.948	0.000	0.13
		B	0.000	0.000	7.708	0.000	0.07
		C	0.000	0.000	10.788	0.000	0.17
L34	4.7500-0.0000	A	0.000	0.000	5.727	0.000	0.12
		B	0.000	0.000	6.243	0.000	0.07
		C	0.000	0.000	8.999	0.000	0.16

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-	A	1.975	0.000	0.000	0.000	0.000	0.00
	145.0000	B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	1.264	0.000	0.02
L2	145.0000-	A	1.968	0.000	0.000	0.000	0.000	0.00
	140.0000	B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	6.310	0.000	0.10
L3	140.0000-	A	1.961	0.000	0.000	3.961	0.000	0.09
	135.0000	B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	6.301	0.000	0.10
L4	135.0000-	A	1.954	0.000	0.000	6.592	0.000	0.15
	130.0000	B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	6.292	0.000	0.10
L5	130.0000-	A	1.946	0.000	0.000	6.583	0.000	0.15
	125.0000	B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	6.283	0.000	0.10
L6	125.0000-	A	1.938	0.000	0.000	6.573	0.000	0.14
	120.0000	B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	6.273	0.000	0.13
L7	120.0000-	A	1.930	0.000	0.000	6.563	0.000	0.14
	115.0000	B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	6.263	0.000	0.18
L8	115.0000-	A	1.922	0.000	0.000	6.552	0.000	0.14
	110.0000	B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	6.252	0.000	0.18
L9	110.0000-	A	1.913	0.000	0.000	6.541	0.000	0.14
	105.0000	B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	6.241	0.000	0.18
L10	105.0000-	A	1.904	0.000	0.000	6.530	0.000	0.14
	100.0000	B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	6.230	0.000	0.18
L11	100.0000-	A	1.895	0.000	0.000	6.518	0.000	0.14
	95.0000	B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	6.218	0.000	0.17
L12	95.0000-90.0000	A	1.885	0.000	0.000	10.093	0.000	0.37
		B		0.000	0.000	3.587	0.000	0.22
		C		0.000	0.000	9.793	0.000	0.40
L13	90.0000-85.0000	A	1.874	0.000	0.000	10.075	0.000	0.36
		B		0.000	0.000	3.582	0.000	0.22
		C		0.000	0.000	9.775	0.000	0.40
L14	85.0000-80.0000	A	1.863	0.000	0.000	6.524	0.000	0.14
		B		0.000	0.000	0.045	0.000	0.00
		C		0.000	0.000	6.224	0.000	0.17
L15	80.0000-78.5400	A	1.856	0.000	0.000	3.526	0.000	0.06
		B		0.000	0.000	1.637	0.000	0.02

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C		0.000	0.000	3.438	0.000	0.07
L16	78.5400-78.2900	A	1.854	0.000	0.000	0.604	0.000	0.01
		B		0.000	0.000	0.280	0.000	0.00
		C		0.000	0.000	0.589	0.000	0.01
L17	78.2900-73.2900	A	1.847	0.000	0.000	12.057	0.000	0.20
		B		0.000	0.000	5.597	0.000	0.06
		C		0.000	0.000	11.757	0.000	0.24
L18	73.2900-68.2900	A	1.835	0.000	0.000	12.028	0.000	0.20
		B		0.000	0.000	5.585	0.000	0.06
		C		0.000	0.000	11.728	0.000	0.24
L19	68.2900-63.2900	A	1.821	0.000	0.000	15.137	0.000	0.34
		B		0.000	0.000	8.710	0.000	0.20
		C		0.000	0.000	14.837	0.000	0.38
L20	63.2900-60.0000	A	1.810	0.000	0.000	11.177	0.000	0.28
		B		0.000	0.000	6.958	0.000	0.19
		C		0.000	0.000	10.979	0.000	0.30
L21	60.0000-59.7500	A	1.804	0.000	0.000	0.320	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.305	0.000	0.01
L22	59.7500-54.7500	A	1.796	0.000	0.000	13.305	0.000	0.21
		B		0.000	0.000	6.910	0.000	0.07
		C		0.000	0.000	13.005	0.000	0.24
L23	54.7500-49.7500	A	1.780	0.000	0.000	13.572	0.000	0.21
		B		0.000	0.000	7.197	0.000	0.08
		C		0.000	0.000	13.272	0.000	0.25
L24	49.7500-44.7500	A	1.762	0.000	0.000	15.023	0.000	0.25
		B		0.000	0.000	8.671	0.000	0.12
		C		0.000	0.000	14.723	0.000	0.28
L25	44.7500-39.7500	A	1.743	0.000	0.000	17.730	0.000	0.32
		B		0.000	0.000	11.402	0.000	0.19
		C		0.000	0.000	17.430	0.000	0.36
L26	39.7500-34.7500	A	1.721	0.000	0.000	17.659	0.000	0.32
		B		0.000	0.000	11.358	0.000	0.19
		C		0.000	0.000	17.359	0.000	0.35
L27	34.7500-30.0000	A	1.697	0.000	0.000	16.281	0.000	0.29
		B		0.000	0.000	10.324	0.000	0.17
		C		0.000	0.000	15.996	0.000	0.32
L28	30.0000-29.7500	A	1.683	0.000	0.000	0.313	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.298	0.000	0.01
L29	29.7500-24.7500	A	1.668	0.000	0.000	12.569	0.000	0.19
		B		0.000	0.000	6.334	0.000	0.06
		C		0.000	0.000	12.269	0.000	0.23
L30	24.7500-19.7500	A	1.634	0.000	0.000	12.827	0.000	0.19
		B		0.000	0.000	6.634	0.000	0.06
		C		0.000	0.000	12.527	0.000	0.23
L31	19.7500-14.7500	A	1.593	0.000	0.000	12.950	0.000	0.19
		B		0.000	0.000	6.808	0.000	0.07
		C		0.000	0.000	12.650	0.000	0.23
L32	14.7500-9.7500	A	1.540	0.000	0.000	16.862	0.000	0.29
		B		0.000	0.000	10.788	0.000	0.17
		C		0.000	0.000	16.562	0.000	0.32
L33	9.7500-4.7500	A	1.461	0.000	0.000	16.503	0.000	0.28
		B		0.000	0.000	10.630	0.000	0.16
		C		0.000	0.000	16.306	0.000	0.31
L34	4.7500-0.0000	A	1.307	0.000	0.000	9.308	0.000	0.20
		B		0.000	0.000	8.443	0.000	0.13
		C		0.000	0.000	13.438	0.000	0.27

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-	0.9471	0.7189	0.8072	0.6127

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
	145.0000				
L2	145.0000-140.0000	3.4503	2.6189	2.7081	2.0555
L3	140.0000-135.0000	0.5769	1.6442	0.4878	1.2635
L4	135.0000-130.0000	-0.8259	1.1684	-0.5497	0.8935
L5	130.0000-125.0000	-0.8259	1.1684	-0.5498	0.8933
L6	125.0000-120.0000	-0.8259	1.1684	-0.5499	0.8931
L7	120.0000-115.0000	-0.9066	1.2879	-0.6210	1.0128
L8	115.0000-110.0000	-0.9066	1.2879	-0.6211	1.0125
L9	110.0000-105.0000	-0.9066	1.2879	-0.6211	1.0121
L10	105.0000-100.0000	-0.9066	1.2879	-0.6211	1.0117
L11	100.0000-95.0000	-0.9066	1.2879	-0.6212	1.0113
L12	95.0000-90.0000	-0.4060	0.5767	-0.4638	0.7547
L13	90.0000-85.0000	-0.4420	0.6297	-0.5208	0.8497
L14	85.0000-80.0000	-0.9659	1.3761	-0.6786	1.1067
L15	80.0000-78.5400	-0.5614	0.7998	-0.4763	0.7764
L16	78.5400-78.2900	-0.5614	0.7998	-0.4763	0.7763
L17	78.2900-73.2900	-0.5614	0.7998	-0.4763	0.7761
L18	73.2900-68.2900	-0.5614	0.7998	-0.4763	0.7756
L19	68.2900-63.2900	-0.3406	0.4852	-0.4042	0.6579
L20	63.2900-60.0000	-0.3043	0.4335	-0.3691	0.6004
L21	60.0000-59.7500	-1.0249	1.4633	-0.7314	1.1920
L22	59.7500-54.7500	-0.5335	0.7617	-0.4888	0.7963
L23	54.7500-49.7500	-0.5225	0.7460	-0.4816	0.7840
L24	49.7500-44.7500	-0.3743	0.5344	-0.4495	0.7311
L25	44.7500-39.7500	-0.3352	0.4785	-0.3973	0.6455
L26	39.7500-34.7500	-0.3352	0.4785	-0.3972	0.6447
L27	34.7500-30.0000	-0.3413	0.4872	-0.4048	0.6562
L28	30.0000-29.7500	-1.0249	1.4633	-0.7297	1.1821
L29	29.7500-24.7500	-0.5561	0.7939	-0.4985	0.8069
L30	24.7500-19.7500	-0.5430	0.7752	-0.4900	0.7918
L31	19.7500-14.7500	-0.5362	0.7655	-0.4845	0.7812
L32	14.7500-9.7500	-0.3423	0.4886	-0.4028	0.6476
L33	9.7500-4.7500	-0.3088	0.4728	-0.3722	0.6304
L34	4.7500-0.0000	1.9091	-0.5596	1.1946	-0.1581

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

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	26	HB114-1-08U4-M5J(1-1/4)	145.00 - 146.00	1.0000	1.0000
L2	26	HB114-1-08U4-M5J(1-1/4)	140.00 - 145.00	1.0000	1.0000
L3	26	HB114-1-08U4-M5J(1-1/4)	135.00 - 140.00	1.0000	1.0000
L3	31	HCS 6X12 4AWG(1-5/8)	135.00 - 138.00	1.0000	1.0000
L4	26	HB114-1-08U4-M5J(1-1/4)	130.00 - 135.00	1.0000	1.0000
L4	31	HCS 6X12 4AWG(1-5/8)	130.00 -	1.0000	1.0000

Tower Section	*Feed Line Record No.*	*Description*	*Feed Line Segment Elev.*	*K_a No Ice*	*K_a Ice*
			135.00		
L5	26	HB114-1-08U4-M5J(1-1/4)	125.00 - 130.00	1.0000	1.0000
L5	31	HCS 6X12 4AWG(1-5/8)	125.00 - 130.00	1.0000	1.0000
L6	26	HB114-1-08U4-M5J(1-1/4)	120.00 - 125.00	1.0000	1.0000
L6	31	HCS 6X12 4AWG(1-5/8)	120.00 - 125.00	1.0000	1.0000
L7	26	HB114-1-08U4-M5J(1-1/4)	115.00 - 120.00	1.0000	1.0000
L7	31	HCS 6X12 4AWG(1-5/8)	115.00 - 120.00	1.0000	1.0000
L8	26	HB114-1-08U4-M5J(1-1/4)	110.00 - 115.00	1.0000	1.0000
L8	31	HCS 6X12 4AWG(1-5/8)	110.00 - 115.00	1.0000	1.0000
L9	26	HB114-1-08U4-M5J(1-1/4)	105.00 - 110.00	1.0000	1.0000
L9	31	HCS 6X12 4AWG(1-5/8)	105.00 - 110.00	1.0000	1.0000
L10	26	HB114-1-08U4-M5J(1-1/4)	100.00 - 105.00	1.0000	1.0000
L10	31	HCS 6X12 4AWG(1-5/8)	100.00 - 105.00	1.0000	1.0000
L11	26	HB114-1-08U4-M5J(1-1/4)	95.00 - 100.00	1.0000	1.0000
L11	31	HCS 6X12 4AWG(1-5/8)	95.00 - 100.00	1.0000	1.0000
L12	11	JUMP PLATE	90.00 - 93.75	1.0000	1.0000
L12	12	JUMP PLATE	90.00 - 93.75	1.0000	1.0000
L12	13	JUMP PLATE	90.00 - 93.75	1.0000	1.0000
L12	26	HB114-1-08U4-M5J(1-1/4)	90.00 - 95.00	1.0000	1.0000
L12	31	HCS 6X12 4AWG(1-5/8)	90.00 - 95.00	1.0000	1.0000
L13	11	JUMP PLATE	86.25 - 90.00	1.0000	1.0000
L13	12	JUMP PLATE	86.25 - 90.00	1.0000	1.0000
L13	13	JUMP PLATE	86.25 - 90.00	1.0000	1.0000
L13	26	HB114-1-08U4-M5J(1-1/4)	85.00 - 90.00	1.0000	1.0000
L13	31	HCS 6X12 4AWG(1-5/8)	85.00 - 90.00	1.0000	1.0000
L14	20	CCI-045100 (L)	80.00 - 80.04	1.0000	1.0000
L14	21	CCI-045100 (L)	80.00 - 80.04	1.0000	1.0000
L14	22	CCI-045100 (L)	80.00 - 80.04	1.0000	1.0000
L14	26	HB114-1-08U4-M5J(1-1/4)	80.00 - 85.00	1.0000	1.0000
L14	31	HCS 6X12 4AWG(1-5/8)	80.00 - 85.00	1.0000	1.0000
L15	20	CCI-045100 (L)	78.54 - 80.00	1.0000	1.0000
L15	21	CCI-045100 (L)	78.54 - 80.00	1.0000	1.0000
L15	22	CCI-045100 (L)	78.54 - 80.00	1.0000	1.0000
L15	26	HB114-1-08U4-M5J(1-1/4)	78.54 - 80.00	1.0000	1.0000
L15	31	HCS 6X12 4AWG(1-5/8)	78.54 - 80.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L16	20	CCI-045100 (L)	78.29 - 78.54	1.0000	1.0000
L16	21	CCI-045100 (L)	78.29 - 78.54	1.0000	1.0000
L16	22	CCI-045100 (L)	78.29 - 78.54	1.0000	1.0000
L16	26	HB114-1-08U4-M5J(1-1/4)	78.29 - 78.54	1.0000	1.0000
L16	31	HCS 6X12 4AWG(1-5/8)	78.29 - 78.54	1.0000	1.0000
L17	20	CCI-045100 (L)	73.29 - 78.29	1.0000	1.0000
L17	21	CCI-045100 (L)	73.29 - 78.29	1.0000	1.0000
L17	22	CCI-045100 (L)	73.29 - 78.29	1.0000	1.0000
L17	26	HB114-1-08U4-M5J(1-1/4)	73.29 - 78.29	1.0000	1.0000
L17	31	HCS 6X12 4AWG(1-5/8)	73.29 - 78.29	1.0000	1.0000
L18	20	CCI-045100 (L)	68.29 - 73.29	1.0000	1.0000
L18	21	CCI-045100 (L)	68.29 - 73.29	1.0000	1.0000
L18	22	CCI-045100 (L)	68.29 - 73.29	1.0000	1.0000
L18	26	HB114-1-08U4-M5J(1-1/4)	68.29 - 73.29	1.0000	1.0000
L18	31	HCS 6X12 4AWG(1-5/8)	68.29 - 73.29	1.0000	1.0000
L19	8	8x1.25	63.29 - 66.00	1.0000	1.0000
L19	9	8x1.25	63.29 - 66.00	1.0000	1.0000
L19	10	8x1.25	63.29 - 66.00	1.0000	1.0000
L19	20	CCI-045100 (L)	63.29 - 68.29	1.0000	1.0000
L19	21	CCI-045100 (L)	63.29 - 68.29	1.0000	1.0000
L19	22	CCI-045100 (L)	63.29 - 68.29	1.0000	1.0000
L19	26	HB114-1-08U4-M5J(1-1/4)	63.29 - 68.29	1.0000	1.0000
L19	31	HCS 6X12 4AWG(1-5/8)	63.29 - 68.29	1.0000	1.0000
L20	8	8x1.25	60.40 - 63.29	1.0000	1.0000
L20	9	8x1.25	60.40 - 63.29	1.0000	1.0000
L20	10	8x1.25	60.40 - 63.29	1.0000	1.0000
L20	20	CCI-045100 (L)	60.04 - 63.29	1.0000	1.0000
L20	21	CCI-045100 (L)	60.04 - 63.29	1.0000	1.0000
L20	22	CCI-045100 (L)	60.04 - 63.29	1.0000	1.0000
L20	26	HB114-1-08U4-M5J(1-1/4)	60.00 - 63.29	1.0000	1.0000
L20	31	HCS 6X12 4AWG(1-5/8)	60.00 - 63.29	1.0000	1.0000
L21	26	HB114-1-08U4-M5J(1-1/4)	59.75 - 60.00	1.0000	1.0000
L21	31	HCS 6X12 4AWG(1-5/8)	59.75 - 60.00	1.0000	1.0000
L22	17	6.5x1.25	54.75 - 59.54	1.0000	1.0000
L22	18	6.5x1.25	54.75 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			59.54		
L22	19	6.5x1.25	54.75 - 59.54	1.0000	1.0000
L22	26	HB114-1-08U4-M5J(1-1/4)	54.75 - 59.75	1.0000	1.0000
L22	31	HCS 6X12 4AWG(1-5/8)	54.75 - 59.75	1.0000	1.0000
L23	17	6.5x1.25	49.75 - 54.75	1.0000	1.0000
L23	18	6.5x1.25	49.75 - 54.75	1.0000	1.0000
L23	19	6.5x1.25	49.75 - 54.75	1.0000	1.0000
L23	26	HB114-1-08U4-M5J(1-1/4)	49.75 - 54.75	1.0000	1.0000
L23	31	HCS 6X12 4AWG(1-5/8)	49.75 - 54.75	1.0000	1.0000
L24	5	3x1.25	44.75 - 46.50	1.0000	1.0000
L24	6	3x1.25	44.75 - 46.50	1.0000	1.0000
L24	7	3x1.25	44.75 - 46.50	1.0000	1.0000
L24	17	6.5x1.25	44.75 - 49.75	1.0000	1.0000
L24	18	6.5x1.25	44.75 - 49.75	1.0000	1.0000
L24	19	6.5x1.25	44.75 - 49.75	1.0000	1.0000
L24	26	HB114-1-08U4-M5J(1-1/4)	44.75 - 49.75	1.0000	1.0000
L24	31	HCS 6X12 4AWG(1-5/8)	44.75 - 49.75	1.0000	1.0000
L25	5	3x1.25	39.75 - 44.75	1.0000	1.0000
L25	6	3x1.25	39.75 - 44.75	1.0000	1.0000
L25	7	3x1.25	39.75 - 44.75	1.0000	1.0000
L25	17	6.5x1.25	39.75 - 44.75	1.0000	1.0000
L25	18	6.5x1.25	39.75 - 44.75	1.0000	1.0000
L25	19	6.5x1.25	39.75 - 44.75	1.0000	1.0000
L25	26	HB114-1-08U4-M5J(1-1/4)	39.75 - 44.75	1.0000	1.0000
L25	31	HCS 6X12 4AWG(1-5/8)	39.75 - 44.75	1.0000	1.0000
L26	5	3x1.25	34.75 - 39.75	1.0000	1.0000
L26	6	3x1.25	34.75 - 39.75	1.0000	1.0000
L26	7	3x1.25	34.75 - 39.75	1.0000	1.0000
L26	17	6.5x1.25	34.75 - 39.75	1.0000	1.0000
L26	18	6.5x1.25	34.75 - 39.75	1.0000	1.0000
L26	19	6.5x1.25	34.75 - 39.75	1.0000	1.0000
L26	26	HB114-1-08U4-M5J(1-1/4)	34.75 - 39.75	1.0000	1.0000
L26	31	HCS 6X12 4AWG(1-5/8)	34.75 - 39.75	1.0000	1.0000
L27	5	3x1.25	30.40 - 34.75	1.0000	1.0000
L27	6	3x1.25	30.40 - 34.75	1.0000	1.0000

Tower Section	*Feed Line Record No.*	*Description*	*Feed Line Segment Elev.*	*K_a No Ice*	*K_a Ice*
L27	7	3x1.25	30.40 - 34.75	1.0000	1.0000
L27	17	6.5x1.25	30.06 - 34.75	1.0000	1.0000
L27	18	6.5x1.25	30.06 - 34.75	1.0000	1.0000
L27	19	6.5x1.25	30.06 - 34.75	1.0000	1.0000
L27	26	HB114-1-08U4-M5J(1-1/4)	30.00 - 34.75	1.0000	1.0000
L27	31	HCS 6X12 4AWG(1-5/8)	30.00 - 34.75	1.0000	1.0000
L28	26	HB114-1-08U4-M5J(1-1/4)	29.75 - 30.00	1.0000	1.0000
L28	31	HCS 6X12 4AWG(1-5/8)	29.75 - 30.00	1.0000	1.0000
L29	14	6x1	24.75 - 29.50	1.0000	1.0000
L29	15	6x1	24.75 - 29.50	1.0000	1.0000
L29	16	6x1	24.75 - 29.50	1.0000	1.0000
L29	26	HB114-1-08U4-M5J(1-1/4)	24.75 - 29.75	1.0000	1.0000
L29	31	HCS 6X12 4AWG(1-5/8)	24.75 - 29.75	1.0000	1.0000
L30	14	6x1	19.75 - 24.75	1.0000	1.0000
L30	15	6x1	19.75 - 24.75	1.0000	1.0000
L30	16	6x1	19.75 - 24.75	1.0000	1.0000
L30	26	HB114-1-08U4-M5J(1-1/4)	19.75 - 24.75	1.0000	1.0000
L30	31	HCS 6X12 4AWG(1-5/8)	19.75 - 24.75	1.0000	1.0000
L31	2	3.25x1.25	14.75 - 15.00	1.0000	1.0000
L31	3	3.25x1.25	14.75 - 15.00	1.0000	1.0000
L31	4	3.25x1.25	14.75 - 15.00	1.0000	1.0000
L31	14	6x1	14.75 - 19.75	1.0000	1.0000
L31	15	6x1	14.75 - 19.75	1.0000	1.0000
L31	16	6x1	14.75 - 19.75	1.0000	1.0000
L31	26	HB114-1-08U4-M5J(1-1/4)	14.75 - 19.75	1.0000	1.0000
L31	31	HCS 6X12 4AWG(1-5/8)	14.75 - 19.75	1.0000	1.0000
L32	2	3.25x1.25	9.75 - 14.75	1.0000	1.0000
L32	3	3.25x1.25	9.75 - 14.75	1.0000	1.0000
L32	4	3.25x1.25	9.75 - 14.75	1.0000	1.0000
L32	14	6x1	9.75 - 14.75	1.0000	1.0000
L32	15	6x1	9.75 - 14.75	1.0000	1.0000
L32	16	6x1	9.75 - 14.75	1.0000	1.0000
L32	26	HB114-1-08U4-M5J(1-1/4)	9.75 - 14.75	1.0000	1.0000
L32	31	HCS 6X12 4AWG(1-5/8)	9.75 - 14.75	1.0000	1.0000
L33	2	3.25x1.25	4.75 - 9.75	1.0000	1.0000
L33	3	3.25x1.25	4.75 - 9.75	1.0000	1.0000
L33	4	3.25x1.25	4.75 - 9.75	1.0000	1.0000
L33	14	6x1	4.75 - 9.75	1.0000	1.0000
L33	15	6x1	4.75 - 9.75	1.0000	1.0000
L33	16	6x1	4.83 - 9.75	1.0000	1.0000
L33	26	HB114-1-08U4-M5J(1-1/4)	4.75 - 9.75	1.0000	1.0000
L33	31	HCS 6X12 4AWG(1-5/8)	4.75 - 9.75	1.0000	1.0000
L34	2	3.25x1.25	0.00 - 4.75	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L34	3	3.25x1.25	0.00 - 4.75	1.0000	1.0000
L34	4	3.25x1.25	0.00 - 4.75	1.0000	1.0000
L34	14	6x1	1.25 - 4.75	1.0000	1.0000
L34	15	6x1	1.08 - 4.75	1.0000	1.0000
L34	26	HB114-1-08U4-M5J(1-1/4)	0.00 - 4.75	1.0000	1.0000
L34	31	HCS 6X12 4AWG(1-5/8)	0.00 - 4.75	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
L12	11	JUMP PLATE	90.00 - 93.75	Manual	1.0000
L12	12	JUMP PLATE	90.00 - 93.75	Manual	1.0000
L12	13	JUMP PLATE	90.00 - 93.75	Manual	1.0000
L13	11	JUMP PLATE	86.25 - 90.00	Manual	1.0000
L13	12	JUMP PLATE	86.25 - 90.00	Manual	1.0000
L13	13	JUMP PLATE	86.25 - 90.00	Manual	1.0000
L14	20	CCI-045100 (L)	80.00 - 80.04	Manual	1.0000
L14	21	CCI-045100 (L)	80.00 - 80.04	Manual	1.0000
L14	22	CCI-045100 (L)	80.00 - 80.04	Manual	1.0000
L15	20	CCI-045100 (L)	78.54 - 80.00	Manual	1.0000
L15	21	CCI-045100 (L)	78.54 - 80.00	Manual	1.0000
L15	22	CCI-045100 (L)	78.54 - 80.00	Manual	1.0000
L16	20	CCI-045100 (L)	78.29 - 78.54	Manual	1.0000
L16	21	CCI-045100 (L)	78.29 - 78.54	Manual	1.0000
L16	22	CCI-045100 (L)	78.29 - 78.54	Manual	1.0000
L17	20	CCI-045100 (L)	73.29 - 78.29	Manual	1.0000
L17	21	CCI-045100 (L)	73.29 - 78.29	Manual	1.0000
L17	22	CCI-045100 (L)	73.29 - 78.29	Manual	1.0000
L18	20	CCI-045100 (L)	68.29 - 73.29	Manual	1.0000
L18	21	CCI-045100 (L)	68.29 - 73.29	Manual	1.0000
L18	22	CCI-045100 (L)	68.29 - 73.29	Manual	1.0000
L19	8	8x1.25	63.29 - 66.00	Manual	1.0000
L19	9	8x1.25	63.29 - 66.00	Manual	1.0000
L19	10	8x1.25	63.29 - 66.00	Manual	1.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L19	20	CCI-045100 (L)	63.29 - 68.29	Manual	1.0000
L19	21	CCI-045100 (L)	63.29 - 68.29	Manual	1.0000
L19	22	CCI-045100 (L)	63.29 - 68.29	Manual	1.0000
L20	8	8x1.25	60.40 - 63.29	Manual	1.0000
L20	9	8x1.25	60.40 - 63.29	Manual	1.0000
L20	10	8x1.25	60.40 - 63.29	Manual	1.0000
L20	20	CCI-045100 (L)	60.04 - 63.29	Manual	1.0000
L20	21	CCI-045100 (L)	60.04 - 63.29	Manual	1.0000
L20	22	CCI-045100 (L)	60.04 - 63.29	Manual	1.0000
L22	17	6.5x1.25	54.75 - 59.54	Manual	1.0000
L22	18	6.5x1.25	54.75 - 59.54	Manual	1.0000
L22	19	6.5x1.25	54.75 - 59.54	Manual	1.0000
L23	17	6.5x1.25	49.75 - 54.75	Manual	1.0000
L23	18	6.5x1.25	49.75 - 54.75	Manual	1.0000
L23	19	6.5x1.25	49.75 - 54.75	Manual	1.0000
L24	5	3x1.25	44.75 - 46.50	Manual	1.0000
L24	6	3x1.25	44.75 - 46.50	Manual	1.0000
L24	7	3x1.25	44.75 - 46.50	Manual	1.0000
L24	17	6.5x1.25	44.75 - 49.75	Manual	1.0000
L24	18	6.5x1.25	44.75 - 49.75	Manual	1.0000
L24	19	6.5x1.25	44.75 - 49.75	Manual	1.0000
L25	5	3x1.25	39.75 - 44.75	Manual	1.0000
L25	6	3x1.25	39.75 - 44.75	Manual	1.0000
L25	7	3x1.25	39.75 - 44.75	Manual	1.0000
L25	17	6.5x1.25	39.75 - 44.75	Manual	1.0000
L25	18	6.5x1.25	39.75 - 44.75	Manual	1.0000
L25	19	6.5x1.25	39.75 - 44.75	Manual	1.0000
L26	5	3x1.25	34.75 - 39.75	Manual	1.0000
L26	6	3x1.25	34.75 - 39.75	Manual	1.0000
L26	7	3x1.25	34.75 - 39.75	Manual	1.0000
L26	17	6.5x1.25	34.75 - 39.75	Manual	1.0000
L26	18	6.5x1.25	34.75 - 39.75	Manual	1.0000
L26	19	6.5x1.25	34.75 - 39.75	Manual	1.0000
L27	5	3x1.25	30.40 - 34.75	Manual	1.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L27	6	3x1.25	30.40 - 34.75	Manual	1.0000
L27	7	3x1.25	30.40 - 34.75	Manual	1.0000
L27	17	6.5x1.25	30.06 - 34.75	Manual	1.0000
L27	18	6.5x1.25	30.06 - 34.75	Manual	1.0000
L27	19	6.5x1.25	30.06 - 34.75	Manual	1.0000
L29	14	6x1	24.75 - 29.50	Manual	1.0000
L29	15	6x1	24.75 - 29.50	Manual	1.0000
L29	16	6x1	24.75 - 29.50	Manual	1.0000
L30	14	6x1	19.75 - 24.75	Manual	1.0000
L30	15	6x1	19.75 - 24.75	Manual	1.0000
L30	16	6x1	19.75 - 24.75	Manual	1.0000
L31	2	3.25x1.25	14.75 - 15.00	Manual	1.0000
L31	3	3.25x1.25	14.75 - 15.00	Manual	1.0000
L31	4	3.25x1.25	14.75 - 15.00	Manual	1.0000
L31	14	6x1	14.75 - 19.75	Manual	1.0000
L31	15	6x1	14.75 - 19.75	Manual	1.0000
L31	16	6x1	14.75 - 19.75	Manual	1.0000
L32	2	3.25x1.25	9.75 - 14.75	Manual	1.0000
L32	3	3.25x1.25	9.75 - 14.75	Manual	1.0000
L32	4	3.25x1.25	9.75 - 14.75	Manual	1.0000
L32	14	6x1	9.75 - 14.75	Manual	1.0000
L32	15	6x1	9.75 - 14.75	Manual	1.0000
L32	16	6x1	9.75 - 14.75	Manual	1.0000
L33	2	3.25x1.25	4.75 - 9.75	Manual	1.0000
L33	3	3.25x1.25	4.75 - 9.75	Manual	1.0000
L33	4	3.25x1.25	4.75 - 9.75	Manual	1.0000
L33	14	6x1	4.75 - 9.75	Manual	1.0000
L33	15	6x1	4.75 - 9.75	Manual	1.0000
L33	16	6x1	4.83 - 9.75	Manual	1.0000
L34	2	3.25x1.25	0.00 - 4.75	Manual	1.0000
L34	3	3.25x1.25	0.00 - 4.75	Manual	1.0000
L34	4	3.25x1.25	0.00 - 4.75	Manual	1.0000
L34	14	6x1	1.25 - 4.75	Manual	1.0000
L34	15	6x1	1.08 - 4.75	Manual	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) PCS 1900MHz 4x45W-65MHz	A	From Leg	1.0000 0.00 1.00	0.00	148.0000	No Ice 1/2" Ice 1" Ice 2" Ice	2.3218 2.5266 2.7388 3.1855	2.2381 2.4407 2.6507 3.0929	0.06 0.08 0.11 0.17
PCS 1900MHz 4x45W-65MHz	B	From Leg	1.0000 0.00 1.00	0.00	148.0000	No Ice 1/2" Ice 1" Ice 2" Ice	2.3218 2.5266 2.7388 3.1855	2.2381 2.4407 2.6507 3.0929	0.06 0.08 0.11 0.17
800MHz 2X50W RRH W/FILTER	B	From Leg	1.0000 0.00 1.00	0.00	148.0000	No Ice 1/2" Ice 1" Ice 2" Ice	2.0583 2.2398 2.4287 2.8287	1.9317 2.1087 2.2931 2.6843	0.06 0.09 0.11 0.17
(2) 800MHz 2X50W RRH W/FILTER	C	From Leg	1.0000 0.00 1.00	0.00	148.0000	No Ice 1/2" Ice 1" Ice 2" Ice	2.0583 2.2398 2.4287 2.8287	1.9317 2.1087 2.2931 2.6843	0.06 0.09 0.11 0.17
2.375" OD x 4' Mount Pipe	A	From Leg	0.0000 0.00 0.00	0.00	148.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.8657 1.1106 1.3648 1.9008	0.8657 1.1106 1.3648 1.9008	0.02 0.03 0.04 0.06
2.375" OD x 4' Mount Pipe	B	From Leg	0.0000 0.00 0.00	0.00	148.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.8657 1.1106 1.3648 1.9008	0.8657 1.1106 1.3648 1.9008	0.02 0.03 0.04 0.06
2.375" OD x 4' Mount Pipe	C	From Leg	0.0000 0.00 0.00	0.00	148.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.8657 1.1106 1.3648 1.9008	0.8657 1.1106 1.3648 1.9008	0.02 0.03 0.04 0.06
Side Arm Mount [SO 102-3]	C	None		0.00	148.0000	No Ice 1/2" Ice 1" Ice 2" Ice	3.6000 4.1800 4.7500 5.9000	3.6000 4.1800 4.7500 5.9000	0.07 0.11 0.14 0.20
**********									
APXV9ERR18-C-A20	A	From Leg	4.0000 0.00 2.00	0.00	146.0000	No Ice 1/2" Ice 1" Ice 2" Ice	4.6600 5.1200 5.6000 6.5800	3.1100 3.5500 4.0000 4.9400	0.07 0.12 0.18 0.32
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.0000 0.00 2.00	0.00	146.0000	No Ice 1/2" Ice 1" Ice 2" Ice	4.6000 5.0500 5.5000 6.4400	4.0100 4.4500 4.8900 5.8200	0.10 0.16 0.23 0.42
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.0000 0.00 2.00	0.00	146.0000	No Ice 1/2" Ice 1" Ice 2" Ice	4.6000 5.0500 5.5000 6.4400	4.0100 4.4500 4.8900 5.8200	0.10 0.16 0.23 0.42
Platform Mount [LP 301-1]	C	None		0.00	146.0000	No Ice 1/2" Ice 1" Ice 2" Ice	23.8100 30.2400 36.3300 48.0500	23.8100 30.2400 36.3300 48.0500	1.59 2.10 2.73 4.34
**********									
AIR6449 B41_T-MOBILE w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.00	138.0000	No Ice 1/2" Ice	5.8701 6.2332 6.6061	3.2700 3.7282 4.2026	0.13 0.18 0.23

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice	7.3816	5.2001	0.36
						2" Ice			
AIR6449 B41_T-MOBILE w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.00	138.0000	No Ice	5.8701	3.2700	0.13
						1/2" Ice	6.2332	3.7282	0.18
						1" Ice	6.6061	4.2026	0.23
						2" Ice	7.3816	5.2001	0.36
AIR6449 B41_T-MOBILE w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.00	138.0000	No Ice	5.8701	3.2700	0.13
						1/2" Ice	6.2332	3.7282	0.18
						1" Ice	6.6061	4.2026	0.23
						2" Ice	7.3816	5.2001	0.36
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.00	138.0000	No Ice	20.4801	10.8686	0.18
						1/2" Ice	21.2306	12.3931	0.32
						1" Ice	21.9900	13.9417	0.46
						2" Ice	23.4441	16.2912	0.79
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.00	138.0000	No Ice	20.4801	10.8686	0.18
						1/2" Ice	21.2306	12.3931	0.32
						1" Ice	21.9900	13.9417	0.46
						2" Ice	23.4441	16.2912	0.79
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.00	138.0000	No Ice	20.4801	10.8686	0.18
						1/2" Ice	21.2306	12.3931	0.32
						1" Ice	21.9900	13.9417	0.46
						2" Ice	23.4441	16.2912	0.79
AIR 32 B2A/B66AA w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.00	138.0000	No Ice	6.7474	6.0700	0.15
						1/2" Ice	7.2017	6.8671	0.21
						1" Ice	7.6475	7.5828	0.28
						2" Ice	8.5651	9.0629	0.44
AIR 32 B2A/B66AA w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.00	138.0000	No Ice	6.7474	6.0700	0.15
						1/2" Ice	7.2017	6.8671	0.21
						1" Ice	7.6475	7.5828	0.28
						2" Ice	8.5651	9.0629	0.44
AIR 32 B2A/B66AA w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.00	138.0000	No Ice	6.7474	6.0700	0.15
						1/2" Ice	7.2017	6.8671	0.21
						1" Ice	7.6475	7.5828	0.28
						2" Ice	8.5651	9.0629	0.44
RADIO 4449 B71 B85A_T-MOBILE	A	From Leg	4.0000 0.00 0.00	0.00	138.0000	No Ice	1.9701	1.5865	0.07
						1/2" Ice	2.1466	1.7488	0.09
						1" Ice	2.3306	1.9185	0.12
						2" Ice	2.7207	2.2800	0.17
RADIO 4449 B71 B85A_T-MOBILE	B	From Leg	4.0000 0.00 0.00	0.00	138.0000	No Ice	1.9701	1.5865	0.07
						1/2" Ice	2.1466	1.7488	0.09
						1" Ice	2.3306	1.9185	0.12
						2" Ice	2.7207	2.2800	0.17
RADIO 4449 B71 B85A_T-MOBILE	C	From Leg	4.0000 0.00 0.00	0.00	138.0000	No Ice	1.9701	1.5865	0.07
						1/2" Ice	2.1466	1.7488	0.09
						1" Ice	2.3306	1.9185	0.12
						2" Ice	2.7207	2.2800	0.17
(2) KRY 112 144/1	A	From Leg	4.0000 0.00 0.00	0.00	138.0000	No Ice	0.3500	0.1750	0.01
						1/2" Ice	0.4259	0.2343	0.01
						1" Ice	0.5093	0.3009	0.02
						2" Ice	0.6981	0.4565	0.03
(2) KRY 112 144/1	B	From Leg	4.0000 0.00 0.00	0.00	138.0000	No Ice	0.3500	0.1750	0.01
						1/2" Ice	0.4259	0.2343	0.01
						1" Ice	0.5093	0.3009	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
						1" Ice	0.6981	0.4565	0.03
						2" Ice			
(2) KRY 112 144/1	C	From Leg	4.0000	0.00	138.0000	No Ice	0.3500	0.1750	0.01
			0.00			1/2"	0.4259	0.2343	0.01
			0.00			Ice	0.5093	0.3009	0.02
						1" Ice	0.6981	0.4565	0.03
						2" Ice			
RRUS 4415 B25_CCIV2	A	From Leg	4.0000	0.00	138.0000	No Ice	1.8425	0.8202	0.05
			0.00			1/2"	2.0123	0.9434	0.06
			0.00			Ice	2.1895	1.0750	0.08
						1" Ice	2.5662	1.3683	0.12
						2" Ice			
RRUS 4415 B25_CCIV2	B	From Leg	4.0000	0.00	138.0000	No Ice	1.8425	0.8202	0.05
			0.00			1/2"	2.0123	0.9434	0.06
			0.00			Ice	2.1895	1.0750	0.08
						1" Ice	2.5662	1.3683	0.12
						2" Ice			
RRUS 4415 B25_CCIV2	C	From Leg	4.0000	0.00	138.0000	No Ice	1.8425	0.8202	0.05
			0.00			1/2"	2.0123	0.9434	0.06
			0.00			Ice	2.1895	1.0750	0.08
						1" Ice	2.5662	1.3683	0.12
						2" Ice			
RADIO 4449 B71 B85A_T-MOBILE	A	From Leg	4.0000	0.00	138.0000	No Ice	1.9701	1.5865	0.07
			0.00			1/2"	2.1466	1.7488	0.09
			0.00			Ice	2.3306	1.9185	0.12
						1" Ice	2.7207	2.2800	0.17
						2" Ice			
RADIO 4449 B71 B85A_T-MOBILE	B	From Leg	4.0000	0.00	138.0000	No Ice	1.9701	1.5865	0.07
			0.00			1/2"	2.1466	1.7488	0.09
			0.00			Ice	2.3306	1.9185	0.12
						1" Ice	2.7207	2.2800	0.17
						2" Ice			
RADIO 4449 B71 B85A_T-MOBILE	C	From Leg	4.0000	0.00	138.0000	No Ice	1.9701	1.5865	0.07
			0.00			1/2"	2.1466	1.7488	0.09
			0.00			Ice	2.3306	1.9185	0.12
						1" Ice	2.7207	2.2800	0.17
						2" Ice			
SDX1926Q-43	A	From Leg	4.0000	0.00	138.0000	No Ice	0.2410	0.1013	0.01
			0.00			1/2"	0.3063	0.1444	0.01
			0.00			Ice	0.3791	0.1948	0.01
						1" Ice	0.5469	0.3180	0.02
						2" Ice			
SDX1926Q-43	B	From Leg	4.0000	0.00	138.0000	No Ice	0.2410	0.1013	0.01
			0.00			1/2"	0.3063	0.1444	0.01
			0.00			Ice	0.3791	0.1948	0.01
						1" Ice	0.5469	0.3180	0.02
						2" Ice			
SDX1926Q-43	C	From Leg	4.0000	0.00	138.0000	No Ice	0.2410	0.1013	0.01
			0.00			1/2"	0.3063	0.1444	0.01
			0.00			Ice	0.3791	0.1948	0.01
						1" Ice	0.5469	0.3180	0.02
						2" Ice			
Platform Mount [LP 1201-1_HR-1]	C	None		0.00	138.0000	No Ice	26.3900	26.3900	2.36
						1/2"	31.4000	31.4000	3.06
						Ice	36.2000	36.2000	3.86
						1" Ice	45.4000	45.4000	5.76
						2" Ice			
**********									
RRUS 11	A	From Leg	1.0000	0.00	124.0000	No Ice	2.7845	1.1872	0.05
			0.00			1/2"	2.9919	1.3342	0.07
			0.00			Ice	3.2066	1.4897	0.09
						1" Ice	3.6584	1.8326	0.15
						2" Ice			
RRUS 11	B	From Leg	1.0000	0.00	124.0000	No Ice	2.7845	1.1872	0.05
			0.00			1/2"	2.9919	1.3342	0.07

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	3.2066	1.4897	0.09
						1" Ice	3.6584	1.8326	0.15
						2" Ice			
RRUS 11	C	From Leg	1.0000	0.00	124.0000	No Ice	2.7845	1.1872	0.05
			0.00			1/2"	2.9919	1.3342	0.07
			0.00			Ice	3.2066	1.4897	0.09
						1" Ice	3.6584	1.8326	0.15
						2" Ice			
Side Arm Mount [SO 102-3]	C	None		0.00	124.0000	No Ice	3.6000	3.6000	0.07
						1/2"	4.1800	4.1800	0.11
						Ice	4.7500	4.7500	0.14
						1" Ice	5.9000	5.9000	0.20
						2" Ice			
6' x 2" Mount Pipe	A	From Leg	4.0000	0.00	124.0000	No Ice	1.4250	1.4250	0.02
			0.00			1/2"	1.9250	1.9250	0.03
			0.00			Ice	2.2939	2.2939	0.05
						1" Ice	3.0596	3.0596	0.09
						2" Ice			
6' x 2" Mount Pipe	B	From Leg	4.0000	0.00	124.0000	No Ice	1.4250	1.4250	0.02
			0.00			1/2"	1.9250	1.9250	0.03
			0.00			Ice	2.2939	2.2939	0.05
						1" Ice	3.0596	3.0596	0.09
						2" Ice			
6' x 2" Mount Pipe	C	From Leg	4.0000	0.00	124.0000	No Ice	1.4250	1.4250	0.02
			0.00			1/2"	1.9250	1.9250	0.03
			0.00			Ice	2.2939	2.2939	0.05
						1" Ice	3.0596	3.0596	0.09
						2" Ice			
**********									
7770.00 w/ Mount Pipe	A	From Leg	4.0000	0.00	122.0000	No Ice	5.7460	4.2543	0.06
			0.00			1/2"	6.1791	5.0137	0.10
			1.00			Ice	6.6067	5.7109	0.16
						1" Ice	7.4880	7.1553	0.29
						2" Ice			
7770.00 w/ Mount Pipe	B	From Leg	4.0000	0.00	122.0000	No Ice	5.7460	4.2543	0.06
			0.00			1/2"	6.1791	5.0137	0.10
			1.00			Ice	6.6067	5.7109	0.16
						1" Ice	7.4880	7.1553	0.29
						2" Ice			
7770.00 w/ Mount Pipe	C	From Leg	4.0000	0.00	122.0000	No Ice	5.7460	4.2543	0.06
			0.00			1/2"	6.1791	5.0137	0.10
			1.00			Ice	6.6067	5.7109	0.16
						1" Ice	7.4880	7.1553	0.29
						2" Ice			
QS46512-2 w/ Mount Pipe	A	From Leg	4.0000	0.00	122.0000	No Ice	2.9500	3.3300	0.09
			0.00			1/2"	3.2500	3.6300	0.15
			1.00			Ice	3.5500	3.9400	0.21
						1" Ice	4.1900	4.6000	0.37
						2" Ice			
SBNHH-1D65A w/ Mount Pipe	A	From Leg	4.0000	0.00	122.0000	No Ice	3.0400	2.4500	0.05
			0.00			1/2"	3.3400	2.7500	0.10
			1.00			Ice	3.6500	3.0500	0.16
						1" Ice	4.3100	3.6800	0.31
						2" Ice			
QS66512-2 w/ Mount Pipe	B	From Leg	4.0000	0.00	122.0000	No Ice	4.0400	4.1800	0.14
			0.00			1/2"	4.4200	4.5700	0.21
			1.00			Ice	4.8200	4.9700	0.29
						1" Ice	5.6300	5.7900	0.48
						2" Ice			
HPA-65R-BUU-H6 w/ Mount Pipe	B	From Leg	4.0000	0.00	122.0000	No Ice	9.2200	6.2500	0.07
			0.00			1/2"	9.9800	6.9600	0.14
			1.00			Ice	10.7600	7.7000	0.22
						1" Ice	12.3600	9.2200	0.42
						2" Ice			
HPA-65R-BUU-H8 w/	C	From Leg	4.0000	0.00	122.0000	No Ice	12.2500	8.3300	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
Mount Pipe			0.00 1.00			1/2" Ice 1" Ice 2" Ice	13.1900 14.1600 16.1400	9.2300 10.1500 12.0500	0.19 0.30 0.54
TPA-65R-LCUUUU-H8 w/ Mount Pipe	C	From Leg	4.0000 0.00 1.00	0.00	122.0000	No Ice 1/2" Ice 1" Ice 2" Ice	11.8500 12.7700 13.7100 15.6400	8.9900 9.8800 10.7900 12.6600	0.11 0.21 0.32 0.58
(2) DC6-48-60-18-8F	A	From Leg	4.0000 0.00 0.00	0.00	122.0000	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
(2) LGP2140X	B	From Leg	4.0000 0.00 0.00	0.00	122.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.0800 1.2137 1.3548 1.6593	0.3580 0.4536 0.5563 0.7825	0.02 0.03 0.04 0.06
(4) LGP2140X	C	From Leg	4.0000 0.00 0.00	0.00	122.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.0800 1.2137 1.3548 1.6593	0.3580 0.4536 0.5563 0.7825	0.02 0.03 0.04 0.06
T-Arm Mount [TA 602-3]	C	None		0.00	122.0000	No Ice 1/2" Ice 1" Ice 2" Ice	13.4000 16.4400 19.7000 25.8600	13.4000 16.4400 19.7000 25.8600	0.77 1.00 1.29 2.05
**********									
KS24019-L112A	A	From Leg	4.0000 0.00 1.00	0.00	13.0000	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
Side Arm Mount [SO 701-1]	A	None		0.00	13.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.8500 1.1400 1.4300 2.0100	1.6700 2.3400 3.0100 4.3500	0.07 0.08 0.09 0.12
**********									
KS24019-L112A	A	From Leg	4.0000 0.00 1.00	0.00	12.0000	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
Side Arm Mount [SO 701-1]	A	None		0.00	12.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.8500 1.1400 1.4300 2.0100	1.6700 2.3400 3.0100 4.3500	0.07 0.08 0.09 0.12
**********									
Bridge Stiffener (138.5" x 15.5" x 1.25")	A	None		0.00	30.0000	No Ice 1/2" Ice 1" Ice 2" Ice	2.4045 3.7047 5.0172 7.6792	21.8330 22.7112 23.5969 25.3904	0.55 0.63 0.72 0.94
Bridge Stiffener (138.5" x 15.5" x 1.25")	B	None		0.00	30.0000	No Ice 1/2" Ice 1" Ice 2" Ice	2.4045 3.7047 5.0172 7.6792	21.8330 22.7112 23.5969 25.3904	0.55 0.63 0.72 0.94
Bridge Stiffener (138.5" x 15.5" x 1.25")	C	None		0.00	30.0000	No Ice 1/2" Ice	2.4045 3.7047 5.0172	21.8330 22.7112 23.5969	0.55 0.63 0.72

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice	7.6792	25.3904	0.94
						2" Ice			
Bridge Stiffener (138.5" x 15.5" x 1.25")	A	None		0.00	60.0000	No Ice	2.4045	21.8330	0.55
						1/2" Ice	3.7047	22.7112	0.63
						1" Ice	5.0172	23.5969	0.72
						2" Ice	7.6792	25.3904	0.94
Bridge Stiffener (138.5" x 15.5" x 1.25")	B	None		0.00	60.0000	No Ice	2.4045	21.8330	0.55
						1/2" Ice	3.7047	22.7112	0.63
						1" Ice	5.0172	23.5969	0.72
						2" Ice	7.6792	25.3904	0.94
Bridge Stiffener (138.5" x 15.5" x 1.25")	C	None		0.00	60.0000	No Ice	2.4045	21.8330	0.55
						1/2" Ice	3.7047	22.7112	0.63
						1" Ice	5.0172	23.5969	0.72
						2" Ice	7.6792	25.3904	0.94

Tower Pressures - No Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg % 	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 150.0000-145.0000	147.5000	1.374	49.48	10.000	A	0.000	10.000	10.000	100.00	0.000	0.000
					B	0.000	10.000		100.00	0.000	0.000
					C	0.000	10.000		100.00	0.616	0.000
L2 145.0000-140.0000	142.5000	1.364	49.12	10.000	A	0.000	10.000	10.000	100.00	0.000	0.000
					B	0.000	10.000		100.00	0.000	0.000
					C	0.000	10.000		100.00	3.080	0.000
L3 140.0000-135.0000	137.5000	1.353	48.75	10.000	A	0.000	10.000	10.000	100.00	1.992	0.000
					B	0.000	10.000		100.00	0.000	0.000
					C	0.000	10.000		100.00	3.080	0.000
L4 135.0000-130.0000	132.5000	1.343	48.38	10.000	A	0.000	10.000	10.000	100.00	3.320	0.000
					B	0.000	10.000		100.00	0.000	0.000
					C	0.000	10.000		100.00	3.080	0.000
L5 130.0000-125.0000	127.5000	1.332	47.99	10.000	A	0.000	10.000	10.000	100.00	3.320	0.000
					B	0.000	10.000		100.00	0.000	0.000
					C	0.000	10.000		100.00	3.080	0.000
L6 125.0000-120.0000	122.5000	1.321	47.58	10.000	A	0.000	10.000	10.000	100.00	3.320	0.000
					B	0.000	10.000		100.00	0.000	0.000
					C	0.000	10.000		100.00	3.080	0.000
L7 120.0000-115.0000	117.5000	1.309	47.17	12.500	A	0.000	12.500	12.500	100.00	3.320	0.000
					B	0.000	12.500		100.00	0.000	0.000
					C	0.000	12.500		100.00	3.080	0.000
L8 115.0000-110.0000	112.5000	1.297	46.74	12.500	A	0.000	12.500	12.500	100.00	3.320	0.000
					B	0.000	12.500		100.00	0.000	0.000
					C	0.000	12.500		100.00	3.080	0.000
L9 110.0000-105.0000	107.5000	1.285	46.29	12.500	A	0.000	12.500	12.500	100.00	3.320	0.000
					B	0.000	12.500		100.00	0.000	0.000
					C	0.000	12.500		100.00	3.080	0.000
L10 105.0000-100.0000	102.5000	1.272	45.83	12.500	A	0.000	12.500	12.500	100.00	3.320	0.000
					B	0.000	12.500		100.00	0.000	0.000
					C	0.000	12.500		100.00	3.080	0.000
L11 100.0000-95.0000	97.5000	1.259	45.35	12.500	A	0.000	12.500	12.500	100.00	3.320	0.000
					B	0.000	12.500		100.00	0.000	0.000
					C	0.000	12.500		100.00	3.080	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L12 95.0000-90.0000	92.5000	1.245	44.85	12.500	A	0.000	12.500	12.500	100.00	6.070	0.000
					B	0.000	12.500		100.00	2.750	0.000
					C	0.000	12.500		100.00	5.830	0.000
L13 90.0000-85.0000	87.5000	1.231	44.33	15.000	A	0.000	15.000	15.000	100.00	6.070	0.000
					B	0.000	15.000		100.00	2.750	0.000
					C	0.000	15.000		100.00	5.830	0.000
L14 85.0000-80.0000	82.5000	1.215	43.78	15.000	A	0.000	15.000	15.000	100.00	3.350	0.000
					B	0.000	15.000		100.00	0.030	0.000
					C	0.000	15.000		100.00	3.110	0.000
L15 80.0000-78.5400	79.2700	1.205	43.42	4.380	A	0.000	4.380	4.380	100.00	2.064	0.000
					B	0.000	4.380		100.00	1.095	0.000
					C	0.000	4.380		100.00	1.994	0.000
L16 78.5400-78.2900	78.4150	1.202	43.32	0.750	A	0.000	0.750	0.750	100.00	0.353	0.000
					B	0.000	0.750		100.00	0.188	0.000
					C	0.000	0.750		100.00	0.342	0.000
L17 78.2900-73.2900	75.7900	1.194	43.01	15.000	A	0.000	15.000	15.000	100.00	7.070	0.000
					B	0.000	15.000		100.00	3.750	0.000
					C	0.000	15.000		100.00	6.830	0.000
L18 73.2900-68.2900	70.7900	1.177	42.39	15.000	A	0.000	15.000	15.000	100.00	7.070	0.000
					B	0.000	15.000		100.00	3.750	0.000
					C	0.000	15.000		100.00	6.830	0.000
L19 68.2900-63.2900	65.7900	1.159	41.75	15.000	A	0.000	15.000	15.000	100.00	9.678	0.000
					B	0.000	15.000		100.00	6.358	0.000
					C	0.000	15.000		100.00	9.438	0.000
L20 63.2900-60.0000	61.6450	1.143	41.18	9.870	A	0.000	9.870	9.870	100.00	7.403	0.000
					B	0.000	9.870		100.00	5.218	0.000
					C	0.000	9.870		100.00	7.245	0.000
L21 60.0000-59.7500	59.8750	1.136	40.93	0.875	A	0.000	0.875	0.875	100.00	0.166	0.000
					B	0.000	0.875		100.00	0.000	0.000
					C	0.000	0.875		100.00	0.154	0.000
L22 59.7500-54.7500	57.2500	1.125	40.54	17.500	A	0.000	17.500	17.500	100.00	8.509	0.000
					B	0.000	17.500		100.00	5.189	0.000
					C	0.000	17.500		100.00	8.269	0.000
L23 54.7500-49.7500	52.2500	1.104	39.77	17.500	A	0.000	17.500	17.500	100.00	8.737	0.000
					B	0.000	17.500		100.00	5.417	0.000
					C	0.000	17.500		100.00	8.497	0.000
L24 49.7500-44.7500	47.2500	1.081	38.94	17.500	A	0.000	17.500	17.500	100.00	9.612	0.000
					B	0.000	17.500		100.00	6.292	0.000
					C	0.000	17.500		100.00	9.372	0.000
L25 44.7500-39.7500	42.2500	1.056	38.03	17.500	A	0.000	17.500	17.500	100.00	11.237	0.000
					B	0.000	17.500		100.00	7.917	0.000
					C	0.000	17.500		100.00	10.997	0.000
L26 39.7500-34.7500	37.2500	1.028	37.03	17.500	A	0.000	17.500	17.500	100.00	11.237	0.000
					B	0.000	17.500		100.00	7.917	0.000
					C	0.000	17.500		100.00	10.997	0.000
L27 34.7500-30.0000	32.3750	0.998	35.96	16.625	A	0.000	16.625	16.625	100.00	10.410	0.000
					B	0.000	16.625		100.00	7.256	0.000
					C	0.000	16.625		100.00	10.182	0.000
L28 30.0000-29.7500	29.8750	0.981	35.35	0.875	A	0.000	0.875	0.875	100.00	0.166	0.000
					B	0.000	0.875		100.00	0.000	0.000
					C	0.000	0.875		100.00	0.154	0.000
L29 29.7500-24.7500	27.2500	0.963	34.68	17.500	A	0.000	17.500	17.500	100.00	8.070	0.000
					B	0.000	17.500		100.00	4.750	0.000
					C	0.000	17.500		100.00	7.830	0.000
L30 24.7500-19.7500	22.2500	0.922	33.23	17.500	A	0.000	17.500	17.500	100.00	8.320	0.000
					B	0.000	17.500		100.00	5.000	0.000
					C	0.000	17.500		100.00	8.080	0.000
L31 19.7500-14.7500	17.2500	0.874	31.49	17.500	A	0.000	17.500	17.500	100.00	8.455	0.000
					B	0.000	17.500		100.00	5.135	0.000
					C	0.000	17.500		100.00	8.215	0.000
L32 14.7500-9.7500	12.2500	0.85	30.62	17.500	A	0.000	17.500	17.500	100.00	11.028	0.000
					B	0.000	17.500		100.00	7.708	0.000
					C	0.000	17.500		100.00	10.788	0.000
L33 9.7500-4.7500	7.2500	0.85	30.62	17.500	A	0.000	17.500	17.500	100.00	10.948	0.000
					B	0.000	17.500		100.00	7.708	0.000
					C	0.000	17.500		100.00	10.788	0.000
L34 4.7500-0.0000	2.3750	0.85	30.62	16.625	A	0.000	16.625	16.625	100.00	5.727	0.000
					B	0.000	16.625		100.00	6.243	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
					C	0.000	16.625		100.00	8.999	0.000

Tower Pressure - With Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 150.0000-145.0000	147.5000	1.374	7.92	1.9746	11.645	A	0.000	11.645	11.645	100.00	0.000	0.000
						B	0.000	11.645		100.00	0.000	0.000
						C	0.000	11.645		100.00	1.264	0.000
L2 145.0000-140.0000	142.5000	1.364	7.86	1.9678	11.640	A	0.000	11.640	11.640	100.00	0.000	0.000
						B	0.000	11.640		100.00	0.000	0.000
						C	0.000	11.640		100.00	6.310	0.000
L3 140.0000-135.0000	137.5000	1.353	7.80	1.9608	11.634	A	0.000	11.634	11.634	100.00	3.961	0.000
						B	0.000	11.634		100.00	0.000	0.000
						C	0.000	11.634		100.00	6.301	0.000
L4 135.0000-130.0000	132.5000	1.343	7.74	1.9535	11.628	A	0.000	11.628	11.628	100.00	6.592	0.000
						B	0.000	11.628		100.00	0.000	0.000
						C	0.000	11.628		100.00	6.292	0.000
L5 130.0000-125.0000	127.5000	1.332	7.68	1.9460	11.622	A	0.000	11.622	11.622	100.00	6.583	0.000
						B	0.000	11.622		100.00	0.000	0.000
						C	0.000	11.622		100.00	6.283	0.000
L6 125.0000-120.0000	122.5000	1.321	7.61	1.9383	11.615	A	0.000	11.615	11.615	100.00	6.573	0.000
						B	0.000	11.615		100.00	0.000	0.000
						C	0.000	11.615		100.00	6.273	0.000
L7 120.0000-115.0000	117.5000	1.309	7.55	1.9302	14.108	A	0.000	14.108	14.108	100.00	6.563	0.000
						B	0.000	14.108		100.00	0.000	0.000
						C	0.000	14.108		100.00	6.263	0.000
L8 115.0000-110.0000	112.5000	1.297	7.48	1.9218	14.102	A	0.000	14.102	14.102	100.00	6.552	0.000
						B	0.000	14.102		100.00	0.000	0.000
						C	0.000	14.102		100.00	6.252	0.000
L9 110.0000-105.0000	107.5000	1.285	7.41	1.9131	14.094	A	0.000	14.094	14.094	100.00	6.541	0.000
						B	0.000	14.094		100.00	0.000	0.000
						C	0.000	14.094		100.00	6.241	0.000
L10 105.0000-100.0000	102.5000	1.272	7.33	1.9040	14.087	A	0.000	14.087	14.087	100.00	6.530	0.000
						B	0.000	14.087		100.00	0.000	0.000
						C	0.000	14.087		100.00	6.230	0.000
L11 100.0000-95.0000	97.5000	1.259	7.26	1.8945	14.079	A	0.000	14.079	14.079	100.00	6.518	0.000
						B	0.000	14.079		100.00	0.000	0.000
						C	0.000	14.079		100.00	6.218	0.000
L12 95.0000-90.0000	92.5000	1.245	7.18	1.8846	14.070	A	0.000	14.070	14.070	100.00	10.093	0.000
						B	0.000	14.070		100.00	3.587	0.000
						C	0.000	14.070		100.00	9.793	0.000
L13 90.0000-85.0000	87.5000	1.231	7.09	1.8741	16.562	A	0.000	16.562	16.562	100.00	10.075	0.000
						B	0.000	16.562		100.00	3.582	0.000
						C	0.000	16.562		100.00	9.775	0.000
L14 85.0000-80.0000	82.5000	1.215	7.01	1.8631	16.553	A	0.000	16.553	16.553	100.00	6.524	0.000
						B	0.000	16.553		100.00	0.045	0.000
						C	0.000	16.553		100.00	6.224	0.000
L15 80.0000-78.5400	79.2700	1.205	6.95	1.8557	4.832	A	0.000	4.832	4.832	100.00	3.526	0.000
						B	0.000	4.832		100.00	1.637	0.000
						C	0.000	4.832		100.00	3.438	0.000
L16 78.5400-78.2900	78.4150	1.202	6.93	1.8537	0.827	A	0.000	0.827	0.827	100.00	0.604	0.000
						B	0.000	0.827		100.00	0.280	0.000
						C	0.000	0.827		100.00	0.589	0.000
L17 78.2900-73.2900	75.7900	1.194	6.88	1.8474	16.539	A	0.000	16.539	16.539	100.00	12.057	0.000
						B	0.000	16.539		100.00	5.597	0.000
						C	0.000	16.539		100.00	11.757	0.000
L18 73.2900-68.2900	70.7900	1.177	6.78	1.8348	16.529	A	0.000	16.529	16.529	100.00	12.028	0.000
						B	0.000	16.529		100.00	5.585	0.000
						C	0.000	16.529		100.00	11.728	0.000
L19 68.2900-	65.7900	1.159	6.68	1.8214	16.518	A	0.000	16.518	16.518	100.00	15.137	0.000

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
63.2900						B	0.000	16.518		100.00	8.710	0.000
						C	0.000	16.518		100.00	14.837	0.000
L20 63.2900-60.0000	61.6450	1.143	6.59	1.8096	10.862	A	0.000	10.862	10.862	100.00	11.177	0.000
						B	0.000	10.862		100.00	6.958	0.000
						C	0.000	10.862		100.00	10.979	0.000
L21 60.0000-59.7500	59.8750	1.136	6.55	1.8044	0.950	A	0.000	0.950	0.950	100.00	0.320	0.000
						B	0.000	0.950		100.00	0.000	0.000
						C	0.000	0.950		100.00	0.305	0.000
L22 59.7500-54.7500	57.2500	1.125	6.49	1.7963	18.997	A	0.000	18.997	18.997	100.00	13.305	0.000
						B	0.000	18.997		100.00	6.910	0.000
						C	0.000	18.997		100.00	13.005	0.000
L23 54.7500-49.7500	52.2500	1.104	6.36	1.7799	18.983	A	0.000	18.983	18.983	100.00	13.572	0.000
						B	0.000	18.983		100.00	7.197	0.000
						C	0.000	18.983		100.00	13.272	0.000
L24 49.7500-44.7500	47.2500	1.081	6.23	1.7621	18.968	A	0.000	18.968	18.968	100.00	15.023	0.000
						B	0.000	18.968		100.00	8.671	0.000
						C	0.000	18.968		100.00	14.723	0.000
L25 44.7500-39.7500	42.2500	1.056	6.08	1.7425	18.952	A	0.000	18.952	18.952	100.00	17.730	0.000
						B	0.000	18.952		100.00	11.402	0.000
						C	0.000	18.952		100.00	17.430	0.000
L26 39.7500-34.7500	37.2500	1.028	5.93	1.7207	18.934	A	0.000	18.934	18.934	100.00	17.659	0.000
						B	0.000	18.934		100.00	11.358	0.000
						C	0.000	18.934		100.00	17.359	0.000
L27 34.7500-30.0000	32.3750	0.998	5.75	1.6968	17.968	A	0.000	17.968	17.968	100.00	16.281	0.000
						B	0.000	17.968		100.00	10.324	0.000
						C	0.000	17.968		100.00	15.996	0.000
L28 30.0000-29.7500	29.8750	0.981	5.66	1.6832	0.945	A	0.000	0.945	0.945	100.00	0.313	0.000
						B	0.000	0.945		100.00	0.000	0.000
						C	0.000	0.945		100.00	0.298	0.000
L29 29.7500-24.7500	27.2500	0.963	5.55	1.6678	18.890	A	0.000	18.890	18.890	100.00	12.569	0.000
						B	0.000	18.890		100.00	6.334	0.000
						C	0.000	18.890		100.00	12.269	0.000
L30 24.7500-19.7500	22.2500	0.922	5.32	1.6343	18.862	A	0.000	18.862	18.862	100.00	12.827	0.000
						B	0.000	18.862		100.00	6.634	0.000
						C	0.000	18.862		100.00	12.527	0.000
L31 19.7500-14.7500	17.2500	0.874	5.04	1.5932	18.828	A	0.000	18.828	18.828	100.00	12.950	0.000
						B	0.000	18.828		100.00	6.808	0.000
						C	0.000	18.828		100.00	12.650	0.000
L32 14.7500-9.7500	12.2500	0.85	4.90	1.5396	18.783	A	0.000	18.783	18.783	100.00	16.862	0.000
						B	0.000	18.783		100.00	10.788	0.000
						C	0.000	18.783		100.00	16.562	0.000
L33 9.7500-4.7500	7.2500	0.85	4.90	1.4609	18.717	A	0.000	18.717	18.717	100.00	16.503	0.000
						B	0.000	18.717		100.00	10.630	0.000
						C	0.000	18.717		100.00	16.306	0.000
L34 4.7500-0.0000	2.3750	0.85	4.90	1.3067	17.659	A	0.000	17.659	17.659	100.00	9.308	0.000
						B	0.000	17.659		100.00	8.443	0.000
						C	0.000	17.659		100.00	13.438	0.000

Tower Pressure - Service

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 150.0000-145.0000	147.5000	1.374	10.74	10.000	A	0.000	10.000	10.000	100.00	0.000	0.000
					B	0.000	10.000		100.00	0.000	0.000
					C	0.000	10.000		100.00	0.616	0.000
L2 145.0000-140.0000	142.5000	1.364	10.66	10.000	A	0.000	10.000	10.000	100.00	0.000	0.000
					B	0.000	10.000		100.00	0.000	0.000
					C	0.000	10.000		100.00	3.080	0.000
L3 140.0000-	137.5000	1.353	10.58	10.000	A	0.000	10.000	10.000	100.00	1.992	0.000

Section Elevation	z	K_Z	q_z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
ft	ft		psf	ft^2		ft^2	ft^2	ft^2		ft^2	ft^2
135.0000					B	0.000	10.000		100.00	0.000	0.000
					C	0.000	10.000		100.00	3.080	0.000
L4 135.0000-130.0000	132.5000	1.343	10.50	10.000	A	0.000	10.000	10.000	100.00	3.320	0.000
					B	0.000	10.000		100.00	0.000	0.000
					C	0.000	10.000		100.00	3.080	0.000
L5 130.0000-125.0000	127.5000	1.332	10.41	10.000	A	0.000	10.000	10.000	100.00	3.320	0.000
					B	0.000	10.000		100.00	0.000	0.000
					C	0.000	10.000		100.00	3.080	0.000
L6 125.0000-120.0000	122.5000	1.321	10.33	10.000	A	0.000	10.000	10.000	100.00	3.320	0.000
					B	0.000	10.000		100.00	0.000	0.000
					C	0.000	10.000		100.00	3.080	0.000
L7 120.0000-115.0000	117.5000	1.309	10.24	12.500	A	0.000	12.500	12.500	100.00	3.320	0.000
					B	0.000	12.500		100.00	0.000	0.000
					C	0.000	12.500		100.00	3.080	0.000
L8 115.0000-110.0000	112.5000	1.297	10.14	12.500	A	0.000	12.500	12.500	100.00	3.320	0.000
					B	0.000	12.500		100.00	0.000	0.000
					C	0.000	12.500		100.00	3.080	0.000
L9 110.0000-105.0000	107.5000	1.285	10.05	12.500	A	0.000	12.500	12.500	100.00	3.320	0.000
					B	0.000	12.500		100.00	0.000	0.000
					C	0.000	12.500		100.00	3.080	0.000
L10 105.0000-100.0000	102.5000	1.272	9.95	12.500	A	0.000	12.500	12.500	100.00	3.320	0.000
					B	0.000	12.500		100.00	0.000	0.000
					C	0.000	12.500		100.00	3.080	0.000
L11 100.0000-95.0000	97.5000	1.259	9.84	12.500	A	0.000	12.500	12.500	100.00	3.320	0.000
					B	0.000	12.500		100.00	0.000	0.000
					C	0.000	12.500		100.00	3.080	0.000
L12 95.0000-90.0000	92.5000	1.245	9.73	12.500	A	0.000	12.500	12.500	100.00	6.070	0.000
					B	0.000	12.500		100.00	2.750	0.000
					C	0.000	12.500		100.00	5.830	0.000
L13 90.0000-85.0000	87.5000	1.231	9.62	15.000	A	0.000	15.000	15.000	100.00	6.070	0.000
					B	0.000	15.000		100.00	2.750	0.000
					C	0.000	15.000		100.00	5.830	0.000
L14 85.0000-80.0000	82.5000	1.215	9.50	15.000	A	0.000	15.000	15.000	100.00	3.350	0.000
					B	0.000	15.000		100.00	0.030	0.000
					C	0.000	15.000		100.00	3.110	0.000
L15 80.0000-78.5400	79.2700	1.205	9.42	4.380	A	0.000	4.380	4.380	100.00	2.064	0.000
					B	0.000	4.380		100.00	1.095	0.000
					C	0.000	4.380		100.00	1.994	0.000
L16 78.5400-78.2900	78.4150	1.202	9.40	0.750	A	0.000	0.750	0.750	100.00	0.353	0.000
					B	0.000	0.750		100.00	0.188	0.000
					C	0.000	0.750		100.00	0.342	0.000
L17 78.2900-73.2900	75.7900	1.194	9.33	15.000	A	0.000	15.000	15.000	100.00	7.070	0.000
					B	0.000	15.000		100.00	3.750	0.000
					C	0.000	15.000		100.00	6.830	0.000
L18 73.2900-68.2900	70.7900	1.177	9.20	15.000	A	0.000	15.000	15.000	100.00	7.070	0.000
					B	0.000	15.000		100.00	3.750	0.000
					C	0.000	15.000		100.00	6.830	0.000
L19 68.2900-63.2900	65.7900	1.159	9.06	15.000	A	0.000	15.000	15.000	100.00	9.678	0.000
					B	0.000	15.000		100.00	6.358	0.000
					C	0.000	15.000		100.00	9.438	0.000
L20 63.2900-60.0000	61.6450	1.143	8.94	9.870	A	0.000	9.870	9.870	100.00	7.403	0.000
					B	0.000	9.870		100.00	5.218	0.000
					C	0.000	9.870		100.00	7.245	0.000
L21 60.0000-59.7500	59.8750	1.136	8.88	0.875	A	0.000	0.875	0.875	100.00	0.166	0.000
					B	0.000	0.875		100.00	0.000	0.000
					C	0.000	0.875		100.00	0.154	0.000
L22 59.7500-54.7500	57.2500	1.125	8.80	17.500	A	0.000	17.500	17.500	100.00	8.509	0.000
					B	0.000	17.500		100.00	5.189	0.000
					C	0.000	17.500		100.00	8.269	0.000
L23 54.7500-49.7500	52.2500	1.104	8.63	17.500	A	0.000	17.500	17.500	100.00	8.737	0.000
					B	0.000	17.500		100.00	5.417	0.000
					C	0.000	17.500		100.00	8.497	0.000
L24 49.7500-44.7500	47.2500	1.081	8.45	17.500	A	0.000	17.500	17.500	100.00	9.612	0.000
					B	0.000	17.500		100.00	6.292	0.000
					C	0.000	17.500		100.00	9.372	0.000
L25 44.7500-39.7500	42.2500	1.056	8.25	17.500	A	0.000	17.500	17.500	100.00	11.237	0.000
					B	0.000	17.500		100.00	7.917	0.000
					C	0.000	17.500		100.00	10.997	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L26 39.7500-34.7500	37.2500	1.028	8.04	17.500	A	0.000	17.500	17.500	100.00	11.237	0.000
					B	0.000	17.500		100.00	7.917	0.000
					C	0.000	17.500		100.00	10.997	0.000
L27 34.7500-30.0000	32.3750	0.998	7.80	16.625	A	0.000	16.625	16.625	100.00	10.410	0.000
					B	0.000	16.625		100.00	7.256	0.000
					C	0.000	16.625		100.00	10.182	0.000
L28 30.0000-29.7500	29.8750	0.981	7.67	0.875	A	0.000	0.875	0.875	100.00	0.166	0.000
					B	0.000	0.875		100.00	0.000	0.000
					C	0.000	0.875		100.00	0.154	0.000
L29 29.7500-24.7500	27.2500	0.963	7.52	17.500	A	0.000	17.500	17.500	100.00	8.070	0.000
					B	0.000	17.500		100.00	4.750	0.000
					C	0.000	17.500		100.00	7.830	0.000
L30 24.7500-19.7500	22.2500	0.922	7.21	17.500	A	0.000	17.500	17.500	100.00	8.320	0.000
					B	0.000	17.500		100.00	5.000	0.000
					C	0.000	17.500		100.00	8.080	0.000
L31 19.7500-14.7500	17.2500	0.874	6.83	17.500	A	0.000	17.500	17.500	100.00	8.455	0.000
					B	0.000	17.500		100.00	5.135	0.000
					C	0.000	17.500		100.00	8.215	0.000
L32 14.7500-9.7500	12.2500	0.85	6.64	17.500	A	0.000	17.500	17.500	100.00	11.028	0.000
					B	0.000	17.500		100.00	7.708	0.000
					C	0.000	17.500		100.00	10.788	0.000
L33 9.7500-4.7500	7.2500	0.85	6.64	17.500	A	0.000	17.500	17.500	100.00	10.948	0.000
					B	0.000	17.500		100.00	7.708	0.000
					C	0.000	17.500		100.00	10.788	0.000
L34 4.7500-0.0000	2.3750	0.85	6.64	16.625	A	0.000	16.625	16.625	100.00	5.727	0.000
					B	0.000	16.625		100.00	6.243	0.000
					C	0.000	16.625		100.00	8.999	0.000

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

Comb. No.	Description
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	39	0.00	-0.00	-0.00
			Max. Compression	26	-8.03	0.00	-0.56
			Max. Mx	20	-2.94	7.33	-0.15
			Max. My	14	-2.93	0.01	-7.60
			Max. Vy	20	-3.29	7.33	-0.15
			Max. Vx	2	-3.34	-0.00	7.28
			Max. Torque	8			-0.17
L2	145 - 140	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-8.83	0.02	-0.69
			Max. Mx	20	-3.32	24.69	-0.19
			Max. My	14	-3.31	0.02	-25.20
			Max. Vy	20	-3.65	24.69	-0.19
			Max. Vx	2	-3.69	-0.01	24.82
			Max. Torque	8			-0.17
L3	140 - 135	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-22.62	0.12	-0.78
			Max. Mx	20	-8.53	61.80	-0.23
			Max. My	14	-8.52	0.08	-62.49
			Max. Vy	20	-9.98	61.80	-0.23
			Max. Vx	2	-10.03	0.02	62.10
			Max. Torque	8			-0.17
L4	135 - 130	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-23.57	0.29	-0.85
			Max. Mx	20	-9.00	112.63	-0.25
			Max. My	14	-8.99	0.16	-113.48
			Max. Vy	20	-10.33	112.63	-0.25
			Max. Vx	2	-10.37	0.06	113.10
			Max. Torque	8			-0.17
L5	130 - 125	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-24.53	0.46	-0.92
			Max. Mx	20	-9.48	165.14	-0.28
			Max. My	14	-9.47	0.25	-166.15
			Max. Vy	20	-10.66	165.14	-0.28
			Max. Vx	2	-10.70	0.11	165.77
			Max. Torque	8			-0.17
L6	125 - 120	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-32.86	2.10	-2.38
			Max. Mx	20	-12.08	231.62	-0.99
			Max. My	14	-12.09	0.75	-232.29
			Max. Vy	20	-15.17	231.62	-0.99
			Max. Vx	2	-14.93	0.03	230.89
			Max. Torque	22			2.09
L7	120 - 115	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-34.30	2.31	-2.46

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	-12.98	308.57	-1.52
			Max. My	14	-12.99	1.35	-307.98
			Max. Vy	20	-15.60	308.57	-1.52
			Max. Vx	2	-15.36	-0.40	306.59
			Max. Torque	22			2.09
L8	115 - 110	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-35.74	2.51	-2.54
			Max. Mx	20	-13.89	387.65	-2.04
			Max. My	14	-13.90	1.94	-385.80
			Max. Vy	20	-16.01	387.65	-2.04
			Max. Vx	2	-15.78	-0.84	384.43
			Max. Torque	22			2.09
L9	110 - 105	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-37.18	2.72	-2.61
			Max. Mx	20	-14.81	468.79	-2.56
			Max. My	14	-14.82	2.54	-465.67
			Max. Vy	20	-16.42	468.79	-2.56
			Max. Vx	2	-16.18	-1.28	464.32
			Max. Torque	22			2.09
L10	105 - 100	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-38.61	2.92	-2.69
			Max. Mx	20	-15.74	551.89	-3.09
			Max. My	14	-15.75	3.13	-547.52
			Max. Vy	20	-16.80	551.89	-3.09
			Max. Vx	2	-16.57	-1.72	546.18
			Max. Torque	22			2.09
L11	100 - 95	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-40.04	3.12	-2.76
			Max. Mx	20	-16.68	636.87	-3.61
			Max. My	14	-16.69	3.72	-631.25
			Max. Vy	20	-17.17	636.87	-3.61
			Max. Vx	2	-16.94	-2.16	629.93
			Max. Torque	22			2.09
L12	95 - 90	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-42.22	3.32	-2.83
			Max. Mx	20	-18.08	724.64	-4.13
			Max. My	14	-18.07	4.31	-718.41
			Max. Vy	20	-17.92	724.64	-4.13
			Max. Vx	2	-18.01	-2.60	717.27
			Max. Torque	22			2.11
L13	90 - 85	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-44.60	3.54	-2.90
			Max. Mx	20	-19.61	815.67	-4.65
			Max. My	14	-19.57	4.92	-810.96
			Max. Vy	20	-18.47	815.67	-4.65
			Max. Vx	2	-19.23	-3.04	810.34
			Max. Torque	22			2.11
L14	85 - 80	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-46.23	3.76	-2.98
			Max. Mx	20	-20.69	909.13	-5.17
			Max. My	2	-20.64	-3.47	907.50
			Max. Vy	20	-18.89	909.13	-5.17
			Max. Vx	2	-19.65	-3.47	907.50
			Max. Torque	22			2.11
L15	80 - 78.54	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-46.77	3.83	-3.00
			Max. Mx	20	-21.01	936.82	-5.32
			Max. My	2	-20.96	-3.59	936.27
			Max. Vy	20	-19.02	936.82	-5.32
			Max. Vx	2	-19.77	-3.59	936.27
			Max. Torque	22			2.11
L16	78.54 - 78.29	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-46.87	3.84	-3.00
			Max. Mx	20	-21.08	941.57	-5.34
			Max. My	2	-21.03	-3.61	941.21
			Max. Vy	20	-19.03	941.57	-5.34
			Max. Vx	2	-19.79	-3.61	941.21
			Max. Torque	22			2.11

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L17	78.29 - 73.29	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-48.97	4.06	-3.07
			Max. Mx	20	-22.43	1037.86	-5.86
			Max. My	2	-22.39	-4.04	1041.21
			Max. Vy	20	-19.46	1037.86	-5.86
			Max. Vx	2	-20.22	-4.04	1041.21
			Max. Torque	22			2.11
L18	73.29 - 68.29	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-51.06	4.27	-3.14
			Max. Mx	20	-23.80	1136.24	-6.38
			Max. My	2	-23.75	-4.48	1143.30
			Max. Vy	20	-19.87	1136.24	-6.38
			Max. Vx	2	-20.63	-4.48	1143.30
			Max. Torque	22			2.11
L19	68.29 - 63.29	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-53.62	4.49	-3.21
			Max. Mx	20	-25.48	1237.72	-6.89
			Max. My	2	-25.44	-4.91	1248.50
			Max. Vy	20	-20.70	1237.72	-6.89
			Max. Vx	2	-21.46	-4.91	1248.50
			Max. Torque	22			2.11
L20	63.29 - 60	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-55.50	4.62	-3.25
			Max. Mx	20	-26.73	1306.76	-7.23
			Max. My	2	-26.69	-5.19	1320.00
			Max. Vy	20	-21.25	1306.76	-7.23
			Max. Vx	2	-22.02	-5.19	1320.00
			Max. Torque	22			2.11
L21	60 - 59.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-58.63	4.64	-3.26
			Max. Mx	20	-28.69	1312.83	-7.26
			Max. My	2	-28.65	-5.21	1326.26
			Max. Vy	20	-24.29	1312.83	-7.26
			Max. Vx	2	-25.05	-5.21	1326.26
			Max. Torque	22			2.11
L22	59.75 - 54.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-61.17	4.88	-3.33
			Max. Mx	20	-30.41	1435.53	-7.78
			Max. My	2	-30.37	-5.63	1452.69
			Max. Vy	20	-24.76	1435.53	-7.78
			Max. Vx	2	-25.52	-5.63	1452.69
			Max. Torque	22			2.11
L23	54.75 - 49.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-63.72	5.11	-3.40
			Max. Mx	20	-32.14	1560.50	-8.29
			Max. My	2	-32.10	-6.05	1581.40
			Max. Vy	20	-25.20	1560.50	-8.29
			Max. Vx	2	-25.97	-6.05	1581.40
			Max. Torque	22			2.11
L24	49.75 - 44.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-66.38	5.32	-3.46
			Max. Mx	20	-33.95	1688.78	-8.81
			Max. My	2	-33.91	-6.47	1713.40
			Max. Vy	20	-26.09	1688.78	-8.81
			Max. Vx	2	-26.84	-6.47	1713.40
			Max. Torque	22			2.11
L25	44.75 - 39.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-69.29	5.53	-3.51
			Max. Mx	20	-35.91	1821.41	-9.32
			Max. My	2	-35.88	-6.89	1849.74
			Max. Vy	20	-26.95	1821.41	-9.32
			Max. Vx	2	-27.71	-6.89	1849.74

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Torque	22			2.11
L26	39.75 - 34.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-72.18	5.73	-3.56
			Max. Mx	20	-37.88	1958.24	-9.83
			Max. My	2	-37.85	-7.30	1990.27
			Max. Vy	20	-27.77	1958.24	-9.83
			Max. Vx	2	-28.53	-7.30	1990.27
			Max. Torque	22			2.11
L27	34.75 - 30	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-74.88	5.93	-3.61
			Max. Mx	20	-39.75	2091.92	-10.31
			Max. My	2	-39.72	-7.70	2127.47
			Max. Vy	20	-28.50	2091.92	-10.31
			Max. Vx	2	-29.26	-7.70	2127.47
			Max. Torque	22			2.11
L28	30 - 29.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-77.94	5.94	-3.62
			Max. Mx	20	-41.78	2099.69	-10.34
			Max. My	2	-41.75	-7.72	2135.43
			Max. Vy	20	-31.10	2099.69	-10.34
			Max. Vx	2	-31.86	-7.72	2135.43
			Max. Torque	22			2.11
L29	29.75 - 24.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-80.60	6.14	-3.66
			Max. Mx	20	-43.75	2256.05	-10.85
			Max. My	2	-43.72	-8.14	2295.49
			Max. Vy	20	-31.42	2256.05	-10.85
			Max. Vx	2	-32.18	-8.14	2295.49
			Max. Torque	22			2.11
L30	24.75 - 19.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-83.25	6.33	-3.71
			Max. Mx	20	-45.73	2413.85	-11.35
			Max. My	2	-45.71	-8.55	2456.99
			Max. Vy	20	-31.69	2413.85	-11.35
			Max. Vx	2	-32.45	-8.55	2456.99
			Max. Torque	22			2.11
L31	19.75 - 14.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-85.89	6.53	-3.76
			Max. Mx	20	-47.74	2572.91	-11.85
			Max. My	2	-47.72	-8.97	2619.73
			Max. Vy	20	-31.92	2572.91	-11.85
			Max. Vx	2	-32.67	-8.97	2619.73
			Max. Torque	22			2.11
L32	14.75 - 9.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-89.12	6.72	-3.68
			Max. Mx	20	-50.15	2734.27	-12.28
			Max. My	2	-50.14	-9.38	2784.81
			Max. Vy	20	-32.61	2734.27	-12.28
			Max. Vx	2	-33.35	-9.38	2784.81
			Max. Torque	22			2.11
L33	9.75 - 4.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-92.03	6.90	-3.72
			Max. Mx	20	-52.41	2898.64	-12.78
			Max. My	2	-52.41	-9.79	2952.77
			Max. Vy	20	-33.14	2898.64	-12.78
			Max. Vx	2	-33.87	-9.79	2952.77
			Max. Torque	22			2.07
L34	4.75 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-94.64	7.00	-3.76
			Max. Mx	20	-54.57	3057.17	-13.24
			Max. My	2	-54.57	-10.17	3113.87
			Max. Vy	20	-33.61	3057.17	-13.24
			Max. Vx	2	-34.00	-10.17	3113.87
			Max. Torque	22			2.07

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	35	94.64	7.51	-4.33
	Max. H_x	20	54.59	33.59	-0.10
	Max. H_z	2	54.59	-0.10	33.98
	Max. M_x	2	3113.87	-0.10	33.98
	Max. M_z	8	3026.76	-32.72	0.10
	Max. Torsion	22	2.07	28.93	16.52
	Min. Vert	25	40.94	16.28	28.08
	Min. H_x	8	54.59	-32.72	0.10
	Min. H_z	14	54.59	0.10	-33.85
	Min. M_x	14	-3103.20	0.10	-33.85
	Min. M_z	20	-3057.17	33.59	-0.10
	Min. Torsion	10	-2.06	-29.32	-16.75

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	45.49	0.00	0.00	0.43	2.00	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	54.59	0.10	-33.98	-3113.87	-10.17	-1.40
0.9 Dead+1.0 Wind 0 deg - No Ice	40.94	0.10	-33.98	-3081.05	-10.68	-1.40
1.2 Dead+1.0 Wind 30 deg - No Ice	54.59	17.21	-29.49	-2706.34	-1582.76	-0.40
0.9 Dead+1.0 Wind 30 deg - No Ice	40.94	17.21	-29.49	-2677.81	-1566.60	-0.40
1.2 Dead+1.0 Wind 60 deg - No Ice	54.59	29.53	-16.98	-1559.35	-2712.84	0.70
0.9 Dead+1.0 Wind 60 deg - No Ice	40.94	29.53	-16.98	-1542.96	-2684.70	0.70
1.2 Dead+1.0 Wind 90 deg - No Ice	54.59	32.72	-0.10	-12.12	-3026.76	1.57
0.9 Dead+1.0 Wind 90 deg - No Ice	40.94	32.72	-0.10	-12.13	-2995.03	1.55
1.2 Dead+1.0 Wind 120 deg - No Ice	54.59	29.32	16.75	1532.77	-2690.23	2.06
0.9 Dead+1.0 Wind 120 deg - No Ice	40.94	29.32	16.75	1516.38	-2662.32	2.05
1.2 Dead+1.0 Wind 150 deg - No Ice	54.59	16.54	28.53	2612.80	-1513.47	1.97
0.9 Dead+1.0 Wind 150 deg - No Ice	40.94	16.54	28.53	2584.85	-1497.99	1.96
1.2 Dead+1.0 Wind 180 deg - No Ice	54.59	-0.10	33.85	3103.20	15.19	1.41
0.9 Dead+1.0 Wind 180 deg - No Ice	40.94	-0.10	33.85	3070.18	14.39	1.40
1.2 Dead+1.0 Wind 210 deg - No Ice	54.59	-16.94	29.04	2686.21	1575.51	0.41
0.9 Dead+1.0 Wind 210 deg - No Ice	40.94	-16.94	29.04	2657.48	1558.11	0.41
1.2 Dead+1.0 Wind 240 deg - No Ice	54.59	-29.64	17.05	1566.39	2728.11	-0.70
0.9 Dead+1.0 Wind 240 deg - No Ice	40.94	-29.64	17.05	1549.64	2698.58	-0.70
1.2 Dead+1.0 Wind 270 deg - No Ice	54.59	-33.59	0.10	13.24	3057.17	-1.57
0.9 Dead+1.0 Wind 270 deg - No Ice	40.94	-33.59	0.10	12.94	3024.00	-1.56
1.2 Dead+1.0 Wind 300 deg	54.59	-28.93	-16.52	-1511.16	2659.77	-2.07

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
- No Ice 0.9 Dead+1.0 Wind 300 deg	40.94	-28.93	-16.52	-1495.26	2630.86	-2.06
- No Ice 1.2 Dead+1.0 Wind 330 deg	54.59	-16.28	-28.08	-2590.39	1506.20	-1.97
- No Ice 0.9 Dead+1.0 Wind 330 deg	40.94	-16.28	-28.08	-2562.86	1489.48	-1.96
- No Ice 1.2 Dead+1.0 Ice+1.0 Temp	94.64	-0.00	0.00	3.76	7.00	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	94.64	0.02	-8.64	-891.71	4.84	-0.36
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	94.64	4.35	-7.48	-771.86	-444.72	-0.13
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	94.64	7.49	-4.31	-444.15	-771.14	0.13
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	94.64	8.52	-0.02	1.53	-878.54	0.34
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	94.64	7.43	4.26	445.57	-764.88	0.48
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	94.64	4.25	7.34	765.53	-433.92	0.48
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	94.64	-0.02	8.61	897.23	9.50	0.36
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	94.64	-4.34	7.47	779.13	458.81	0.13
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	94.64	-7.51	4.33	452.97	787.39	-0.13
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	94.64	-8.53	0.02	6.19	893.40	-0.34
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	94.64	-7.41	-4.25	-436.75	777.32	-0.48
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	94.64	-4.24	-7.33	-757.37	448.01	-0.48
Dead+Wind 0 deg - Service	45.49	0.02	-7.37	-671.16	-0.65	-0.31
Dead+Wind 30 deg - Service	45.49	3.73	-6.40	-583.28	-339.78	-0.09
Dead+Wind 60 deg - Service	45.49	6.41	-3.69	-335.93	-583.48	0.15
Dead+Wind 90 deg - Service	45.49	7.10	-0.02	-2.26	-651.12	0.34
Dead+Wind 120 deg - Service	45.49	6.36	3.63	330.89	-578.60	0.45
Dead+Wind 150 deg - Service	45.49	3.59	6.19	563.76	-324.81	0.43
Dead+Wind 180 deg - Service	45.49	-0.02	7.35	669.54	4.82	0.31
Dead+Wind 210 deg - Service	45.49	-3.68	6.30	579.62	341.29	0.09
Dead+Wind 240 deg - Service	45.49	-6.43	3.70	338.14	589.87	-0.15
Dead+Wind 270 deg - Service	45.49	-7.29	0.02	3.20	660.79	-0.34
Dead+Wind 300 deg - Service	45.49	-6.28	-3.59	-325.52	575.10	-0.45
Dead+Wind 330 deg - Service	45.49	-3.53	-6.09	-558.22	326.32	-0.43

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-45.49	0.00	0.00	45.49	0.00	0.000%
2	0.10	-54.59	-33.98	-0.10	54.59	33.98	0.000%
3	0.10	-40.94	-33.98	-0.10	40.94	33.98	0.000%
4	17.21	-54.59	-29.49	-17.21	54.59	29.49	0.000%
5	17.21	-40.94	-29.49	-17.21	40.94	29.49	0.000%
6	29.53	-54.59	-16.98	-29.53	54.59	16.98	0.000%
7	29.53	-40.94	-16.98	-29.53	40.94	16.98	0.000%
8	32.72	-54.59	-0.10	-32.72	54.59	0.10	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
9	32.72	-40.94	-0.10	-32.72	40.94	0.10	0.000%
10	29.32	-54.59	16.75	-29.32	54.59	-16.75	0.000%
11	29.32	-40.94	16.75	-29.32	40.94	-16.75	0.000%
12	16.54	-54.59	28.53	-16.54	54.59	-28.53	0.000%
13	16.54	-40.94	28.53	-16.54	40.94	-28.53	0.000%
14	-0.10	-54.59	33.85	0.10	54.59	-33.85	0.000%
15	-0.10	-40.94	33.85	0.10	40.94	-33.85	0.000%
16	-16.94	-54.59	29.04	16.94	54.59	-29.04	0.000%
17	-16.94	-40.94	29.04	16.94	40.94	-29.04	0.000%
18	-29.64	-54.59	17.05	29.64	54.59	-17.05	0.000%
19	-29.64	-40.94	17.05	29.64	40.94	-17.05	0.000%
20	-33.59	-54.59	0.10	33.59	54.59	-0.10	0.000%
21	-33.59	-40.94	0.10	33.59	40.94	-0.10	0.000%
22	-28.93	-54.59	-16.52	28.93	54.59	16.52	0.000%
23	-28.93	-40.94	-16.52	28.93	40.94	16.52	0.000%
24	-16.28	-54.59	-28.08	16.28	54.59	28.08	0.000%
25	-16.28	-40.94	-28.08	16.28	40.94	28.08	0.000%
26	0.00	-94.64	0.00	0.00	94.64	-0.00	0.000%
27	0.02	-94.64	-8.64	-0.02	94.64	8.64	0.000%
28	4.35	-94.64	-7.48	-4.35	94.64	7.48	0.000%
29	7.49	-94.64	-4.31	-7.49	94.64	4.31	0.000%
30	8.52	-94.64	-0.02	-8.52	94.64	0.02	0.000%
31	7.43	-94.64	4.26	-7.43	94.64	-4.26	0.000%
32	4.25	-94.64	7.34	-4.25	94.64	-7.34	0.000%
33	-0.02	-94.64	8.61	0.02	94.64	-8.61	0.000%
34	-4.34	-94.64	7.47	4.34	94.64	-7.47	0.000%
35	-7.51	-94.64	4.33	7.51	94.64	-4.33	0.000%
36	-8.53	-94.64	0.02	8.53	94.64	-0.02	0.000%
37	-7.41	-94.64	-4.25	7.41	94.64	4.25	0.000%
38	-4.24	-94.64	-7.33	4.24	94.64	7.33	0.000%
39	0.02	-45.49	-7.37	-0.02	45.49	7.37	0.000%
40	3.73	-45.49	-6.40	-3.73	45.49	6.40	0.000%
41	6.41	-45.49	-3.69	-6.41	45.49	3.69	0.000%
42	7.10	-45.49	-0.02	-7.10	45.49	0.02	0.000%
43	6.36	-45.49	3.63	-6.36	45.49	-3.63	0.000%
44	3.59	-45.49	6.19	-3.59	45.49	-6.19	0.000%
45	-0.02	-45.49	7.35	0.02	45.49	-7.35	0.000%
46	-3.68	-45.49	6.30	3.68	45.49	-6.30	0.000%
47	-6.43	-45.49	3.70	6.43	45.49	-3.70	0.000%
48	-7.29	-45.49	0.02	7.29	45.49	-0.02	0.000%
49	-6.28	-45.49	-3.59	6.28	45.49	3.59	0.000%
50	-3.53	-45.49	-6.09	3.53	45.49	6.09	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00031879
3	Yes	5	0.00000001	0.00014847
4	Yes	6	0.00000001	0.00034289
5	Yes	6	0.00000001	0.00011591
6	Yes	6	0.00000001	0.00033663
7	Yes	6	0.00000001	0.00011385
8	Yes	5	0.00000001	0.00035779
9	Yes	5	0.00000001	0.00016912
10	Yes	6	0.00000001	0.00034845
11	Yes	6	0.00000001	0.00011877
12	Yes	6	0.00000001	0.00030711
13	Yes	6	0.00000001	0.00010457
14	Yes	5	0.00000001	0.00045156
15	Yes	5	0.00000001	0.00021287
16	Yes	6	0.00000001	0.00034799
17	Yes	6	0.00000001	0.00011781
18	Yes	6	0.00000001	0.00035086
19	Yes	6	0.00000001	0.00011865

20	Yes	5	0.00000001	0.00049043
21	Yes	5	0.00000001	0.00023293
22	Yes	6	0.00000001	0.00031176
23	Yes	6	0.00000001	0.00010579
24	Yes	6	0.00000001	0.00033267
25	Yes	6	0.00000001	0.00011417
26	Yes	4	0.00000001	0.00078025
27	Yes	6	0.00000001	0.00082888
28	Yes	6	0.00000001	0.00095484
29	Yes	6	0.00000001	0.00095436
30	Yes	6	0.00000001	0.00082140
31	Yes	6	0.00000001	0.00096017
32	Yes	6	0.00000001	0.00094758
33	Yes	6	0.00000001	0.00084125
34	Yes	6	0.00000001	0.00098899
35	Yes	6	0.00000001	0.00099148
36	Yes	6	0.00000001	0.00084004
37	Yes	6	0.00000001	0.00095953
38	Yes	6	0.00000001	0.00095599
39	Yes	4	0.00000001	0.00058670
40	Yes	5	0.00000001	0.00008318
41	Yes	5	0.00000001	0.00008088
42	Yes	4	0.00000001	0.00060211
43	Yes	5	0.00000001	0.00009366
44	Yes	5	0.00000001	0.00007217
45	Yes	4	0.00000001	0.00060531
46	Yes	5	0.00000001	0.00008773
47	Yes	5	0.00000001	0.00008982
48	Yes	4	0.00000001	0.00062732
49	Yes	5	0.00000001	0.00007367
50	Yes	5	0.00000001	0.00008867

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 145	18.50	47	1.04	0.00
L2	145 - 140	17.41	47	1.04	0.00
L3	140 - 135	16.33	47	1.03	0.00
L4	135 - 130	15.25	47	1.02	0.00
L5	130 - 125	14.18	47	1.00	0.00
L6	125 - 120	13.15	47	0.97	0.00
L7	120 - 115	12.15	47	0.93	0.00
L8	115 - 110	11.20	47	0.90	0.00
L9	110 - 105	10.26	47	0.88	0.00
L10	105 - 100	9.36	47	0.84	0.00
L11	100 - 95	8.50	47	0.80	0.00
L12	95 - 90	7.69	47	0.75	0.00
L13	90 - 85	6.93	47	0.70	0.00
L14	85 - 80	6.22	47	0.66	0.00
L15	80 - 78.54	5.55	47	0.62	0.00
L16	78.54 - 78.29	5.36	47	0.61	0.00
L17	78.29 - 73.29	5.33	47	0.61	0.00
L18	73.29 - 68.29	4.71	47	0.57	0.00
L19	68.29 - 63.29	4.13	47	0.54	0.00
L20	63.29 - 60	3.59	47	0.49	0.00
L21	60 - 59.75	3.26	47	0.46	0.00
L22	59.75 - 54.75	3.23	47	0.46	0.00
L23	54.75 - 49.75	2.76	47	0.44	0.00
L24	49.75 - 44.75	2.32	47	0.41	0.00
L25	44.75 - 39.75	1.91	47	0.38	0.00
L26	39.75 - 34.75	1.53	47	0.34	0.00
L27	34.75 - 30	1.19	47	0.31	0.00
L28	30 - 29.75	0.90	47	0.27	0.00
L29	29.75 - 24.75	0.89	47	0.27	0.00
L30	24.75 - 19.75	0.63	47	0.23	0.00
L31	19.75 - 14.75	0.41	47	0.19	0.00
L32	14.75 - 9.75	0.23	47	0.15	0.00

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L33	9.75 - 4.75	0.10	47	0.10	0.00
L34	4.75 - 0	0.02	47	0.05	0.00

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
148.0000	(2) PCS 1900MHz 4x45W-65MHz	47	18.06	1.04	0.00	143847
146.0000	APXV9ERR18-C-A20	47	17.63	1.04	0.00	143847
138.0000	AIR6449 B41_T-MOBILE w/ Mount Pipe	47	15.89	1.03	0.00	31103
124.0000	RRUS 11	47	12.95	0.96	0.00	7227
122.0000	7770.00 w/ Mount Pipe	47	12.55	0.94	0.00	7448
60.0000	Bridge Stiffener (138.5" x 15.5" x 1.25")	47	3.26	0.46	0.00	8163
30.0000	Bridge Stiffener (138.5" x 15.5" x 1.25")	47	0.90	0.27	0.00	7447
13.0000	KS24019-L112A	47	0.18	0.13	0.00	6325
12.0000	KS24019-L112A	47	0.15	0.12	0.00	6289

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 145	85.56	18	4.81	0.01
L2	145 - 140	80.53	18	4.80	0.01
L3	140 - 135	75.52	18	4.79	0.01
L4	135 - 130	70.54	18	4.74	0.01
L5	130 - 125	65.63	18	4.65	0.01
L6	125 - 120	60.84	18	4.50	0.01
L7	120 - 115	56.24	18	4.29	0.01
L8	115 - 110	51.81	18	4.19	0.01
L9	110 - 105	47.50	18	4.06	0.01
L10	105 - 100	43.34	18	3.90	0.01
L11	100 - 95	39.36	18	3.71	0.01
L12	95 - 90	35.60	18	3.48	0.01
L13	90 - 85	32.08	18	3.23	0.01
L14	85 - 80	28.79	18	3.07	0.01
L15	80 - 78.54	25.68	18	2.88	0.00
L16	78.54 - 78.29	24.80	18	2.82	0.00
L17	78.29 - 73.29	24.66	18	2.81	0.00
L18	73.29 - 68.29	21.79	18	2.65	0.00
L19	68.29 - 63.29	19.11	18	2.48	0.00
L20	63.29 - 60	16.61	18	2.29	0.00
L21	60 - 59.75	15.08	18	2.15	0.00
L22	59.75 - 54.75	14.97	18	2.15	0.00
L23	54.75 - 49.75	12.78	18	2.02	0.00
L24	49.75 - 44.75	10.73	18	1.89	0.00
L25	44.75 - 39.75	8.83	18	1.75	0.00
L26	39.75 - 34.75	7.08	18	1.59	0.00
L27	34.75 - 30	5.50	18	1.42	0.00
L28	30 - 29.75	4.17	18	1.25	0.00
L29	29.75 - 24.75	4.11	18	1.24	0.00
L30	24.75 - 19.75	2.90	18	1.06	0.00
L31	19.75 - 14.75	1.88	18	0.88	0.00
L32	14.75 - 9.75	1.07	18	0.67	0.00
L33	9.75 - 4.75	0.48	18	0.46	0.00
L34	4.75 - 0	0.12	18	0.23	0.00

Critical Deflections and Radius of Curvature - Design Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
148.0000	(2) PCS 1900MHz 4x45W-65MHz	18	83.55	4.81	0.01	32602
146.0000	APXV9ERR18-C-A20	18	81.54	4.80	0.01	32602
138.0000	AIR6449 B41_T-MOBILE w/ Mount Pipe	18	73.52	4.77	0.01	6865
124.0000	RRUS 11	18	59.91	4.46	0.01	1581
122.0000	7770.00 w/ Mount Pipe	18	58.06	4.36	0.01	1633
60.0000	Bridge Stiffener (138.5" x 15.5" x 1.25")	18	15.08	2.15	0.00	1767
30.0000	Bridge Stiffener (138.5" x 15.5" x 1.25")	18	4.17	1.25	0.00	1609
13.0000	KS24019-L112A	18	0.84	0.60	0.00	1367
12.0000	KS24019-L112A	18	0.72	0.56	0.00	1359

Compression Checks

Pole Design Data

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
L1	150 - 145 (1)	P24x0.25	5.0000	0.0000	0.0	18.6532	-2.93	662.26	0.004
L2	145 - 140 (2)	P24x0.25	5.0000	0.0000	0.0	18.6532	-3.31	662.26	0.005
L3	140 - 135 (3)	P24x0.25	5.0000	0.0000	0.0	18.6532	-8.52	662.26	0.013
L4	135 - 130 (4)	P24x0.25	5.0000	0.0000	0.0	18.6532	-8.98	662.26	0.014
L5	130 - 125 (5)	P24x0.25	5.0000	0.0000	0.0	18.6532	-9.46	662.26	0.014
L6	125 - 120 (6)	P24x0.25	5.0000	0.0000	0.0	18.6532	-12.06	662.26	0.018
L7	120 - 115 (7)	P30x0.375	5.0000	0.0000	0.0	34.9011	-12.97	1311.06	0.010
L8	115 - 110 (8)	P30x0.375	5.0000	0.0000	0.0	34.9011	-13.87	1311.06	0.011
L9	110 - 105 (9)	P30x0.375	5.0000	0.0000	0.0	34.9011	-14.79	1311.06	0.011
L10	105 - 100 (10)	P30x0.375	5.0000	0.0000	0.0	34.9011	-15.72	1311.06	0.012
L11	100 - 95 (11)	P30x0.375	5.0000	0.0000	0.0	34.9011	-16.66	1311.06	0.013
L12	95 - 90 (12)	P30x0.375	5.0000	0.0000	0.0	34.9011	-18.04	1311.06	0.014
L13	90 - 85 (13)	P36x0.375	5.0000	0.0000	0.0	41.9697	-19.53	1490.10	0.013
L14	85 - 80 (14)	P36x0.375	5.0000	0.0000	0.0	41.9697	-20.62	1490.10	0.014
L15	80 - 78.54 (15)	P36x0.375	1.4600	0.0000	0.0	41.9697	-20.94	1490.10	0.014
L16	78.54 - 78.29 (16)	P36x0.5125	0.2500	0.0000	0.0	57.1372	-21.01	2159.79	0.010
L17	78.29 - 73.29 (17)	P36x0.5125	5.0000	0.0000	0.0	57.1372	-22.37	2159.79	0.010
L18	73.29 - 68.29 (18)	P36x0.5125	5.0000	0.0000	0.0	57.1372	-23.73	2159.79	0.011
L19	68.29 - 63.29	P36x0.5125	5.0000	0.0000	0.0	57.137	-25.42	2159.79	0.012

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
	(19)					2			
L20	63.29 - 60 (20)	P36x0.5125	3.2900	0.0000	0.0	57.137 2	-26.67	2159.79	0.012
L21	60 - 59.75 (21)	P42x0.5875	0.2500	0.0000	0.0	76.434 5	-28.63	2889.22	0.010
L22	59.75 - 54.75 (22)	P42x0.5875	5.0000	0.0000	0.0	76.434 5	-30.35	2889.22	0.011
L23	54.75 - 49.75 (23)	P42x0.5875	5.0000	0.0000	0.0	76.434 5	-32.09	2889.22	0.011
L24	49.75 - 44.75 (24)	P42x0.5875	5.0000	0.0000	0.0	76.434 5	-33.89	2889.22	0.012
L25	44.75 - 39.75 (25)	P42x0.5875	5.0000	0.0000	0.0	76.434 5	-35.86	2889.22	0.012
L26	39.75 - 34.75 (26)	P42x0.5875	5.0000	0.0000	0.0	76.434 5	-37.84	2889.22	0.013
L27	34.75 - 30 (27)	P42x0.5875	4.7500	0.0000	0.0	76.434 5	-39.71	2889.22	0.014
L28	30 - 29.75 (28)	P42x0.65	0.2500	0.0000	0.0	84.438 2	-41.74	3191.76	0.013
L29	29.75 - 24.75 (29)	P42x0.65	5.0000	0.0000	0.0	84.438 2	-43.71	3191.76	0.014
L30	24.75 - 19.75 (30)	P42x0.65	5.0000	0.0000	0.0	84.438 2	-45.70	3191.76	0.014
L31	19.75 - 14.75 (31)	P42x0.65	5.0000	0.0000	0.0	84.438 2	-47.71	3191.76	0.015
L32	14.75 - 9.75 (32)	P42x0.65	5.0000	0.0000	0.0	84.438 2	-50.13	3191.76	0.016
L33	9.75 - 4.75 (33)	P42x0.65	5.0000	0.0000	0.0	84.438 2	-52.40	3191.76	0.016
L34	4.75 - 0 (34)	P42x0.65	4.7500	0.0000	0.0	84.438 2	-54.57	3191.76	0.017

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)	P24x0.25	7.60	396.68	0.019	0.00	396.68	0.000
L2	145 - 140 (2)	P24x0.25	25.20	396.68	0.064	0.00	396.68	0.000
L3	140 - 135 (3)	P24x0.25	62.49	396.68	0.158	0.00	396.68	0.000
L4	135 - 130 (4)	P24x0.25	113.48	396.68	0.286	0.00	396.68	0.000
L5	130 - 125 (5)	P24x0.25	166.36	396.68	0.419	0.00	396.68	0.000
L6	125 - 120 (6)	P24x0.25	233.33	396.68	0.588	0.00	396.68	0.000
L7	120 - 115 (7)	P30x0.375	310.23	947.86	0.327	0.00	947.86	0.000
L8	115 - 110 (8)	P30x0.375	389.26	947.86	0.411	0.00	947.86	0.000
L9	110 - 105 (9)	P30x0.375	470.36	947.86	0.496	0.00	947.86	0.000
L10	105 - 100 (10)	P30x0.375	553.61	947.86	0.584	0.00	947.86	0.000
L11	100 - 95 (11)	P30x0.375	638.81	947.86	0.674	0.00	947.86	0.000
L12	95 - 90 (12)	P30x0.375	727.55	947.86	0.768	0.00	947.86	0.000
L13	90 - 85 (13)	P36x0.375	821.89	1338.81	0.614	0.00	1338.81	0.000
L14	85 - 80 (14)	P36x0.375	920.27	1338.81	0.687	0.00	1338.81	0.000
L15	80 - 78.54 (15)	P36x0.375	949.39	1338.81	0.709	0.00	1338.81	0.000
L16	78.54 - 78.29 (16)	P36x0.5125	954.39	1894.72	0.504	0.00	1894.72	0.000
L17	78.29 - 73.29 (17)	P36x0.5125	1055.60	1894.72	0.557	0.00	1894.72	0.000
L18	73.29 - 68.29 (18)	P36x0.5125	1158.91	1894.72	0.612	0.00	1894.72	0.000
L19	68.29 - 63.29 (19)	P36x0.5125	1265.32	1894.72	0.668	0.00	1894.72	0.000
L20	63.29 - 60 (20)	P36x0.5125	1337.61	1894.72	0.706	0.00	1894.72	0.000
L21	60 - 59.75 (21)	P42x0.5875	1343.93	2949.82	0.456	0.00	2949.82	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 $\frac{M_{uy}}{\phi M_{ny}}$
L22	59.75 - 54.75 (22)	P42x0.5875	1471.58	2949.82	0.499	0.00	2949.82	0.000
L23	54.75 - 49.75 (23)	P42x0.5875	1601.51	2949.82	0.543	0.00	2949.82	0.000
L24	49.75 - 44.75 (24)	P42x0.5875	1734.73	2949.82	0.588	0.00	2949.82	0.000
L25	44.75 - 39.75 (25)	P42x0.5875	1872.28	2949.82	0.635	0.00	2949.82	0.000
L26	39.75 - 34.75 (26)	P42x0.5875	2014.03	2949.82	0.683	0.00	2949.82	0.000
L27	34.75 - 30 (27)	P42x0.5875	2152.38	2949.82	0.730	0.00	2949.82	0.000
L28	30 - 29.75 (28)	P42x0.65	2160.41	3306.63	0.653	0.00	3306.63	0.000
L29	29.75 - 24.75 (29)	P42x0.65	2321.67	3306.63	0.702	0.00	3306.63	0.000
L30	24.75 - 19.75 (30)	P42x0.65	2484.37	3306.63	0.751	0.00	3306.63	0.000
L31	19.75 - 14.75 (31)	P42x0.65	2648.30	3306.63	0.801	0.00	3306.63	0.000
L32	14.75 - 9.75 (32)	P42x0.65	2814.47	3306.63	0.851	0.00	3306.63	0.000
L33	9.75 - 4.75 (33)	P42x0.65	2983.61	3306.63	0.902	0.00	3306.63	0.000
L34	4.75 - 0 (34)	P42x0.65	3145.82	3306.63	0.951	0.00	3306.63	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)	P24x0.25	3.34	201.86	0.017	0.02	324.23	0.000
L2	145 - 140 (2)	P24x0.25	3.69	201.86	0.018	0.02	324.23	0.000
L3	140 - 135 (3)	P24x0.25	10.03	201.86	0.050	0.02	324.23	0.000
L4	135 - 130 (4)	P24x0.25	10.40	201.86	0.051	0.11	324.23	0.000
L5	130 - 125 (5)	P24x0.25	10.75	201.86	0.053	0.11	324.23	0.000
L6	125 - 120 (6)	P24x0.25	15.16	201.86	0.075	0.38	324.23	0.001
L7	120 - 115 (7)	P30x0.375	15.59	395.78	0.039	0.38	994.73	0.000
L8	115 - 110 (8)	P30x0.375	16.01	395.78	0.040	0.38	994.73	0.000
L9	110 - 105 (9)	P30x0.375	16.42	395.78	0.041	0.38	994.73	0.000
L10	105 - 100 (10)	P30x0.375	16.85	395.78	0.043	0.71	994.73	0.001
L11	100 - 95 (11)	P30x0.375	17.22	395.78	0.044	0.71	994.73	0.001
L12	95 - 90 (12)	P30x0.375	18.26	395.78	0.046	0.73	994.73	0.001
L13	90 - 85 (13)	P36x0.375	19.46	454.19	0.043	0.74	1094.28	0.001
L14	85 - 80 (14)	P36x0.375	19.88	454.19	0.044	0.74	1094.28	0.001
L15	80 - 78.54 (15)	P36x0.375	20.00	454.19	0.044	0.74	1094.28	0.001
L16	78.54 - 78.29 (16)	P36x0.5125	20.02	647.94	0.031	0.74	2021.57	0.000
L17	78.29 - 73.29 (17)	P36x0.5125	20.45	647.94	0.032	0.74	2021.57	0.000
L18	73.29 - 68.29 (18)	P36x0.5125	20.86	647.94	0.032	0.74	2021.57	0.000
L19	68.29 - 63.29 (19)	P36x0.5125	21.69	647.94	0.033	0.74	2021.57	0.000
L20	63.29 - 60 (20)	P36x0.5125	22.25	647.94	0.034	0.74	2021.57	0.000
L21	60 - 59.75 (21)	P42x0.5875	25.29	866.77	0.029	0.74	3155.82	0.000
L22	59.75 - 54.75 (22)	P42x0.5875	25.75	866.77	0.030	0.74	3155.82	0.000
L23	54.75 - 49.75 (23)	P42x0.5875	26.20	866.77	0.030	0.74	3155.82	0.000
L24	49.75 - 44.75 (24)	P42x0.5875	27.07	866.77	0.031	0.74	3155.82	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 $\frac{T_u}{\phi T_n}$
L25	44.75 - 39.75 (25)	P42x0.5875	27.93	866.77	0.032	0.74	3155.82	0.000
L26	39.75 - 34.75 (26)	P42x0.5875	28.75	866.77	0.033	0.74	3155.82	0.000
L27	34.75 - 30 (27)	P42x0.5875	29.49	866.77	0.034	0.74	3155.82	0.000
L28	30 - 29.75 (28)	P42x0.65	32.09	957.53	0.034	0.74	3481.03	0.000
L29	29.75 - 24.75 (29)	P42x0.65	32.40	957.53	0.034	0.74	3481.03	0.000
L30	24.75 - 19.75 (30)	P42x0.65	32.67	957.53	0.034	0.74	3481.03	0.000
L31	19.75 - 14.75 (31)	P42x0.65	32.90	957.53	0.034	0.74	3481.03	0.000
L32	14.75 - 9.75 (32)	P42x0.65	33.57	957.53	0.035	0.70	3481.03	0.000
L33	9.75 - 4.75 (33)	P42x0.65	34.09	957.53	0.036	0.70	3481.03	0.000
L34	4.75 - 0 (34)	P42x0.65	34.22	957.53	0.036	0.70	3481.03	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	0.019	0.000	0.017	0.000	0.024	1.050	4.8.2
L2	145 - 140 (2)	0.005	0.064	0.000	0.018	0.000	0.069	1.050	4.8.2
L3	140 - 135 (3)	0.013	0.158	0.000	0.050	0.000	0.173	1.050	4.8.2
L4	135 - 130 (4)	0.014	0.286	0.000	0.051	0.000	0.302	1.050	4.8.2
L5	130 - 125 (5)	0.014	0.419	0.000	0.053	0.000	0.437	1.050	4.8.2
L6	125 - 120 (6)	0.018	0.588	0.000	0.075	0.001	0.612	1.050	4.8.2
L7	120 - 115 (7)	0.010	0.327	0.000	0.039	0.000	0.339	1.050	4.8.2
L8	115 - 110 (8)	0.011	0.411	0.000	0.040	0.000	0.423	1.050	4.8.2
L9	110 - 105 (9)	0.011	0.496	0.000	0.041	0.000	0.509	1.050	4.8.2
L10	105 - 100 (10)	0.012	0.584	0.000	0.043	0.001	0.598	1.050	4.8.2
L11	100 - 95 (11)	0.013	0.674	0.000	0.044	0.001	0.689	1.050	4.8.2
L12	95 - 90 (12)	0.014	0.768	0.000	0.046	0.001	0.784	1.050	4.8.2
L13	90 - 85 (13)	0.013	0.614	0.000	0.043	0.001	0.629	1.050	4.8.2
L14	85 - 80 (14)	0.014	0.687	0.000	0.044	0.001	0.703	1.050	4.8.2
L15	80 - 78.54 (15)	0.014	0.709	0.000	0.044	0.001	0.725	1.050	4.8.2
L16	78.54 - 78.29 (16)	0.010	0.504	0.000	0.031	0.000	0.514	1.050	4.8.2
L17	78.29 - 73.29 (17)	0.010	0.557	0.000	0.032	0.000	0.569	1.050	4.8.2
L18	73.29 - 68.29 (18)	0.011	0.612	0.000	0.032	0.000	0.624	1.050	4.8.2
L19	68.29 - 63.29 (19)	0.012	0.668	0.000	0.033	0.000	0.681	1.050	4.8.2
L20	63.29 - 60 (20)	0.012	0.706	0.000	0.034	0.000	0.720	1.050	4.8.2
L21	60 - 59.75 (21)	0.010	0.456	0.000	0.029	0.000	0.466	1.050	4.8.2
L22	59.75 - 54.75 (22)	0.011	0.499	0.000	0.030	0.000	0.510	1.050	4.8.2
L23	54.75 - 49.75 (23)	0.011	0.543	0.000	0.030	0.000	0.555	1.050	4.8.2
L24	49.75 - 44.75 (24)	0.012	0.588	0.000	0.031	0.000	0.601	1.050	4.8.2
L25	44.75 - 39.75 (25)	0.012	0.635	0.000	0.032	0.000	0.648	1.050	4.8.2
L26	39.75 - 34.75 (26)	0.013	0.683	0.000	0.033	0.000	0.697	1.050	4.8.2
L27	34.75 - 30 (27)	0.014	0.730	0.000	0.034	0.000	0.745	1.050	4.8.2

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
L28	30 - 29.75 (28)	0.013	0.653	0.000	0.034	0.000	0.668	1.050	4.8.2
L29	29.75 - 24.75 (29)	0.014	0.702	0.000	0.034	0.000	0.717	1.050	4.8.2
L30	24.75 - 19.75 (30)	0.014	0.751	0.000	0.034	0.000	0.767	1.050	4.8.2
L31	19.75 - 14.75 (31)	0.015	0.801	0.000	0.034	0.000	0.817	1.050	4.8.2
L32	14.75 - 9.75 (32)	0.016	0.851	0.000	0.035	0.000	0.868	1.050	4.8.2
L33	9.75 - 4.75 (33)	0.016	0.902	0.000	0.036	0.000	0.920	1.050	4.8.2
L34	4.75 - 0 (34)	0.017	0.951	0.000	0.036	0.000	0.970	1.050	4.8.2

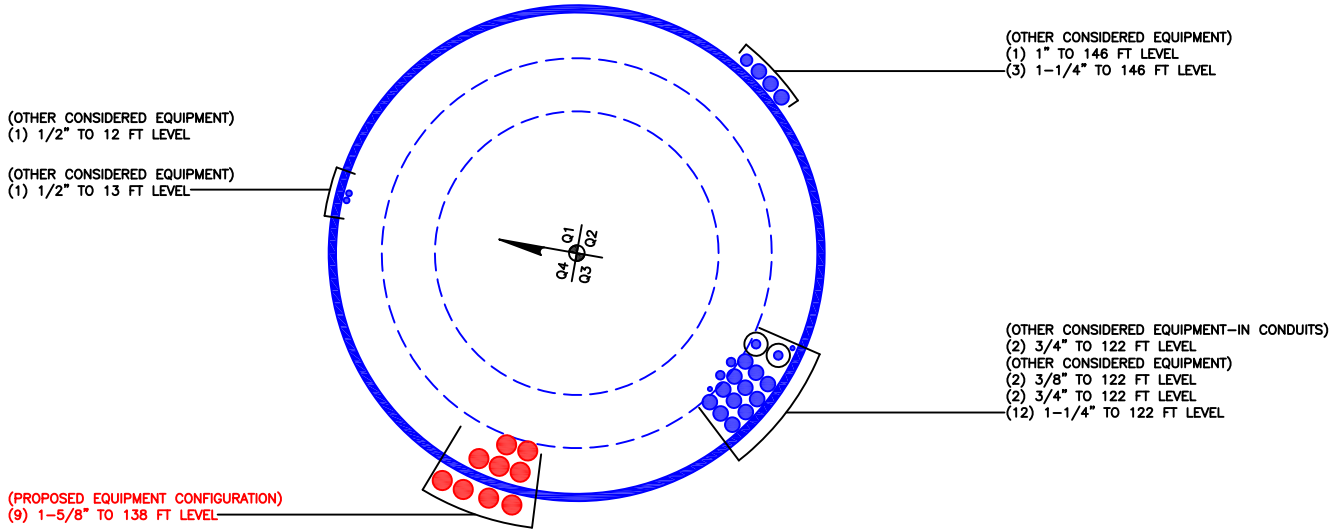
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	150 - 145	Pole	P24x0.25	1	-2.93	695.38	2.3	Pass
L2	145 - 140	Pole	P24x0.25	2	-3.31	695.38	6.6	Pass
L3	140 - 135	Pole	P24x0.25	3	-8.52	695.38	16.5	Pass
L4	135 - 130	Pole	P24x0.25	4	-8.98	695.38	28.8	Pass
L5	130 - 125	Pole	P24x0.25	5	-9.46	695.38	41.6	Pass
L6	125 - 120	Pole	P24x0.25	6	-12.06	695.38	58.3	Pass
L7	120 - 115	Pole	P30x0.375	7	-12.97	1376.61	32.3	Pass
L8	115 - 110	Pole	P30x0.375	8	-13.87	1376.61	40.3	Pass
L9	110 - 105	Pole	P30x0.375	9	-14.79	1376.61	48.5	Pass
L10	105 - 100	Pole	P30x0.375	10	-15.72	1376.61	56.9	Pass
L11	100 - 95	Pole	P30x0.375	11	-16.66	1376.61	65.6	Pass
L12	95 - 90	Pole	P30x0.375	12	-18.04	1376.61	74.6	Pass
L13	90 - 85	Pole	P36x0.375	13	-19.53	1564.60	59.9	Pass
L14	85 - 80	Pole	P36x0.375	14	-20.62	1564.60	67.0	Pass
L15	80 - 78.54	Pole	P36x0.375	15	-20.94	1564.60	69.1	Pass
L16	78.54 - 78.29	Pole	P36x0.5125	16	-21.01	2267.78	49.0	Pass
L17	78.29 - 73.29	Pole	P36x0.5125	17	-22.37	2267.78	54.1	Pass
L18	73.29 - 68.29	Pole	P36x0.5125	18	-23.73	2267.78	59.4	Pass
L19	68.29 - 63.29	Pole	P36x0.5125	19	-25.42	2267.78	64.8	Pass
L20	63.29 - 60	Pole	P36x0.5125	20	-26.67	2267.78	68.5	Pass
L21	60 - 59.75	Pole	P42x0.5875	21	-28.63	3033.68	44.4	Pass
L22	59.75 - 54.75	Pole	P42x0.5875	22	-30.35	3033.68	48.6	Pass
L23	54.75 - 49.75	Pole	P42x0.5875	23	-32.09	3033.68	52.9	Pass
L24	49.75 - 44.75	Pole	P42x0.5875	24	-33.89	3033.68	57.2	Pass
L25	44.75 - 39.75	Pole	P42x0.5875	25	-35.86	3033.68	61.7	Pass
L26	39.75 - 34.75	Pole	P42x0.5875	26	-37.84	3033.68	66.4	Pass
L27	34.75 - 30	Pole	P42x0.5875	27	-39.71	3033.68	70.9	Pass
L28	30 - 29.75	Pole	P42x0.65	28	-41.74	3351.35	63.6	Pass
L29	29.75 - 24.75	Pole	P42x0.65	29	-43.71	3351.35	68.3	Pass
L30	24.75 - 19.75	Pole	P42x0.65	30	-45.70	3351.35	73.0	Pass
L31	19.75 - 14.75	Pole	P42x0.65	31	-47.71	3351.35	77.8	Pass
L32	14.75 - 9.75	Pole	P42x0.65	32	-50.13	3351.35	82.7	Pass
L33	9.75 - 4.75	Pole	P42x0.65	33	-52.40	3351.35	87.6	Pass
L34	4.75 - 0	Pole	P42x0.65	34	-54.57	3351.35	92.4	Pass
							Summary	
						Pole (L34)	92.4	Pass
						RATING =	**92.4**	**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" TO 146 FT LEVEL
(3) 1-1/4" TO 146 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(1) 1/2" TO 12 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(1) 1/2" TO 13 FT LEVEL
Q1
Q2
Q4
Q3
(OTHER CONSIDERED EQUIPMENT-IN CONDUITS)
(2) 3/4" TO 122 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(2) 3/8" TO 122 FT LEVEL
(2) 3/4" TO 122 FT LEVEL
(12) 1-1/4" TO 122 FT LEVEL
(PROPOSED EQUIPMENT CONFIGURATION)
(9) 1-5/8" TO 138 FT LEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

CCIpole

per TIA-222- H

Site BU: 876327

Work Order: 1897667

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	30		0	24	24	0.25		A53-B-42
2	120	30		0	30.00	30	0.375		A53-B-42
3	90	30		0	36.00	36	0.375		A53-B-42
4	60	30		0	42.00	42	0.375		A53-B-42
5	30	30		0	42.00	42	0.5		A53-B-42

Reinforcement Configuration

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	0	30	plate	PL 6 x 1	2	210	330																
2	0	30	plate	PL 6 x 1	1	90																	
3	30	60	plate	PL 6.5 x 1.25	3	75	195	315															
4	60	78.54	plate	CCI-SFP-045100	3	75	195	315															
5																							
6																							
7																							
8																							
9																							
10																							

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	6	1	6	0.5	30.000	30.000	16.000	4.750	1.1875	A572-65
2	6	1	6	0.5	30.000	30.000	16.000	4.750	1.1875	A572-65
3	6.5	1.25	8.125	0.625	42.000	42.000	16.000	6.563	1.1875	A572-65
4	4.5	1	4.5	0.5	18.000	18.000	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		0	24.000	24.000	0.25	A53-B-42	1.000
2	145 - 140	5		0	24.000	24.000	0.25	A53-B-42	1.000
3	140 - 135	5		0	24.000	24.000	0.25	A53-B-42	1.000
4	135 - 130	5		0	24.000	24.000	0.25	A53-B-42	1.000
5	130 - 125	5		0	24.000	24.000	0.25	A53-B-42	1.000
6	125 - 120	5	0	0	24.000	24.000	0.25	A53-B-42	1.000
7	120 - 115	5		0	30.000	30.000	0.375	A53-B-42	1.000
8	115 - 110	5		0	30.000	30.000	0.375	A53-B-42	1.000
9	110 - 105	5		0	30.000	30.000	0.375	A53-B-42	1.000
10	105 - 100	5		0	30.000	30.000	0.375	A53-B-42	1.000
11	100 - 95	5		0	30.000	30.000	0.375	A53-B-42	1.000
12	95 - 90	5	0	0	30.000	30.000	0.375	A53-B-42	1.000
13	90 - 85	5		0	36.000	36.000	0.375	A53-B-42	1.000
14	85 - 80	5		0	36.000	36.000	0.375	A53-B-42	1.000
15	80 - 78.54	1.46		0	36.000	36.000	0.375	A53-B-42	1.000
16	78.54 - 78.29	0.25		0	36.000	36.000	0.5125	A53-B-42	0.971
17	78.29 - 73.29	5		0	36.000	36.000	0.5125	A53-B-42	0.971
18	73.29 - 68.29	5		0	36.000	36.000	0.5125	A53-B-42	0.971
19	68.29 - 63.29	5		0	36.000	36.000	0.5125	A53-B-42	0.971
20	63.29 - 60	3.29	0	0	36.000	36.000	0.5125	A53-B-42	0.971
21	60 - 59.75	0.25		0	42.000	42.000	0.5875	A53-B-42	0.960
22	59.75 - 54.75	5		0	42.000	42.000	0.5875	A53-B-42	0.960
23	54.75 - 49.75	5		0	42.000	42.000	0.5875	A53-B-42	0.960
24	49.75 - 44.75	5		0	42.000	42.000	0.5875	A53-B-42	0.960
25	44.75 - 39.75	5		0	42.000	42.000	0.5875	A53-B-42	0.960
26	39.75 - 34.75	5		0	42.000	42.000	0.5875	A53-B-42	0.960
27	34.75 - 30	4.75	0	0	42.000	42.000	0.5875	A53-B-42	0.960
28	30 - 29.75	0.25		0	42.000	42.000	0.65	A53-B-42	0.985
29	29.75 - 24.75	5		0	42.000	42.000	0.65	A53-B-42	0.985
30	24.75 - 19.75	5		0	42.000	42.000	0.65	A53-B-42	0.985
31	19.75 - 14.75	5		0	42.000	42.000	0.65	A53-B-42	0.985
32	14.75 - 9.75	5		0	42.000	42.000	0.65	A53-B-42	0.985
33	9.75 - 4.75	5		0	42.000	42.000	0.65	A53-B-42	0.985
34	4.75 - 0	4.75		0	42.000	42.000	0.65	A53-B-42	0.985

TNX Section Forces

Increment (ft): 5

	Section Height (ft)	TNX Output P_u (K)	M_{ux} (kip-ft)	V_u (K)
1	150 - 145	2.93	7.60	3.34
2	145 - 140	3.31	25.20	3.69
3	140 - 135	8.52	62.49	10.03
4	135 - 130	8.98	113.48	10.40
5	130 - 125	9.46	166.36	10.75
6	125 - 120	12.06	233.33	15.16
7	120 - 115	12.97	310.23	15.59
8	115 - 110	13.87	389.26	16.01
9	110 - 105	14.79	470.36	16.42
10	105 - 100	15.72	553.61	16.85
11	100 - 95	16.66	638.81	17.22
12	95 - 90	18.04	727.55	18.26
13	90 - 85	19.53	821.89	19.46
14	85 - 80	20.62	920.27	19.88
15	80 - 78.54	20.94	949.39	20.00
16	78.54 - 78.29	21.01	954.39	20.02
17	78.29 - 73.29	22.37	1055.60	20.45
18	73.29 - 68.29	23.73	1158.91	20.86
19	68.29 - 63.29	25.42	1265.31	21.69
20	63.29 - 60	26.67	1337.61	22.25
21	60 - 59.75	28.63	1343.93	25.29
22	59.75 - 54.75	30.35	1471.58	25.75
23	54.75 - 49.75	32.09	1601.51	26.20
24	49.75 - 44.75	33.89	1734.73	27.07
25	44.75 - 39.75	35.86	1872.28	27.93
26	39.75 - 34.75	37.84	2014.04	28.75
27	34.75 - 30	39.71	2152.38	29.49
28	30 - 29.75	41.74	2160.40	32.09
29	29.75 - 24.75	43.71	2321.67	32.40
30	24.75 - 19.75	45.70	2484.37	32.67
31	19.75 - 14.75	47.71	2648.30	32.90
32	14.75 - 9.75	50.13	2814.47	33.57
33	9.75 - 4.75	52.40	2983.61	34.09
34	4.75 - 0	54.57	3145.82	34.22

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
150 - 145	Pole	TP24x24x0.25	Pole	2.3%	Pass
145 - 140	Pole	TP24x24x0.25	Pole	6.5%	Pass
140 - 135	Pole	TP24x24x0.25	Pole	16.3%	Pass
135 - 130	Pole	TP24x24x0.25	Pole	28.6%	Pass
130 - 125	Pole	TP24x24x0.25	Pole	41.4%	Pass
125 - 120	Pole	TP24x24x0.25	Pole	58.0%	Pass
120 - 115	Pole	TP30x30x0.375	Pole	32.2%	Pass
115 - 110	Pole	TP30x30x0.375	Pole	40.2%	Pass
110 - 105	Pole	TP30x30x0.375	Pole	48.4%	Pass
105 - 100	Pole	TP30x30x0.375	Pole	56.8%	Pass
100 - 95	Pole	TP30x30x0.375	Pole	65.5%	Pass
95 - 90	Pole	TP30x30x0.375	Pole	74.5%	Pass
90 - 85	Pole	TP36x36x0.375	Pole	59.8%	Pass
85 - 80	Pole	TP36x36x0.375	Pole	66.9%	Pass
80 - 78.54	Pole	TP36x36x0.375	Pole	68.9%	Pass
78.54 - 78.29	Pole + Reinf.	TP36x36x0.5125	Reinf. 4 Tension Rupture	52.8%	Pass
78.29 - 73.29	Pole + Reinf.	TP36x36x0.5125	Reinf. 4 Tension Rupture	58.4%	Pass
73.29 - 68.29	Pole + Reinf.	TP36x36x0.5125	Reinf. 4 Tension Rupture	64.1%	Pass
68.29 - 63.29	Pole + Reinf.	TP36x36x0.5125	Reinf. 4 Tension Rupture	69.9%	Pass
63.29 - 60	Pole + Reinf.	TP36x36x0.5125	Reinf. 4 Tension Rupture	73.9%	Pass
60 - 59.75	Pole + Reinf.	TP42x42x0.5875	Pole	47.2%	Pass
59.75 - 54.75	Pole + Reinf.	TP42x42x0.5875	Pole	51.6%	Pass
54.75 - 49.75	Pole + Reinf.	TP42x42x0.5875	Pole	56.2%	Pass
49.75 - 44.75	Pole + Reinf.	TP42x42x0.5875	Pole	60.8%	Pass
44.75 - 39.75	Pole + Reinf.	TP42x42x0.5875	Pole	65.6%	Pass
39.75 - 34.75	Pole + Reinf.	TP42x42x0.5875	Pole	70.6%	Pass
34.75 - 30	Pole + Reinf.	TP42x42x0.5875	Pole	75.4%	Pass
30 - 29.75	Pole + Reinf.	TP42x42x0.65	Pole	65.6%	Pass
29.75 - 24.75	Pole + Reinf.	TP42x42x0.65	Pole	70.4%	Pass
24.75 - 19.75	Pole + Reinf.	TP42x42x0.65	Pole	75.3%	Pass
19.75 - 14.75	Pole + Reinf.	TP42x42x0.65	Pole	80.3%	Pass
14.75 - 9.75	Pole + Reinf.	TP42x42x0.65	Pole	85.3%	Pass
9.75 - 4.75	Pole + Reinf.	TP42x42x0.65	Pole	90.4%	Pass
4.75 - 0	Pole + Reinf.	TP42x42x0.65	Pole	95.3%	Pass
				Summary	
			Pole	95.3%	Pass
			Reinforcement	90.9%	Pass
			Overall	95.3%	Pass

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in^4)			Area (in^2)			% Capacity*				
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3	R4
150 - 145	1315	n/a	1315	18.65	n/a	18.65	2.3%				
145 - 140	1315	n/a	1315	18.65	n/a	18.65	6.5%				
140 - 135	1315	n/a	1315	18.65	n/a	18.65	16.3%				
135 - 130	1315	n/a	1315	18.65	n/a	18.65	28.6%				
130 - 125	1315	n/a	1315	18.65	n/a	18.65	41.4%				
125 - 120	1315	n/a	1315	18.65	n/a	18.65	58.0%				
120 - 115	3829	n/a	3829	34.90	n/a	34.90	32.2%				
115 - 110	3829	n/a	3829	34.90	n/a	34.90	40.2%				
110 - 105	3829	n/a	3829	34.90	n/a	34.90	48.4%				
105 - 100	3829	n/a	3829	34.90	n/a	34.90	56.8%				
100 - 95	3829	n/a	3829	34.90	n/a	34.90	65.5%				
95 - 90	3829	n/a	3829	34.90	n/a	34.90	74.5%				
90 - 85	6659	n/a	6659	41.97	n/a	41.97	59.8%				
85 - 80	6659	n/a	6659	41.97	n/a	41.97	66.9%				
80 - 78.54	6659	n/a	6659	41.97	n/a	41.97	68.9%				
78.54 - 78.29	6659	2322	8981	41.97	13.50	55.47	51.3%				52.8%
78.29 - 73.29	6659	2322	8981	41.97	13.50	55.47	56.7%				58.4%
73.29 - 68.29	6659	2322	8981	41.97	13.50	55.47	62.2%				64.1%
68.29 - 63.29	6659	2322	8981	41.97	13.50	55.47	67.9%				69.9%
63.29 - 60	6659	2322	8981	41.97	13.50	55.47	71.8%				73.9%
60 - 59.75	10622	5744	16365	49.04	24.38	73.41	47.2%			42.8%	
59.75 - 54.75	10622	5744	16365	49.04	24.38	73.41	51.6%			46.9%	
54.75 - 49.75	10622	5744	16365	49.04	24.38	73.41	56.2%			51.0%	
49.75 - 44.75	10622	5744	16365	49.04	24.38	73.41	60.8%			55.2%	
44.75 - 39.75	10622	5744	16365	49.04	24.38	73.41	65.6%			59.5%	
39.75 - 34.75	10622	5744	16365	49.04	24.38	73.41	70.6%			64.0%	
34.75 - 30	10622	5744	16365	49.04	24.38	73.41	75.4%			68.4%	
30 - 29.75	14036	4188	18224	65.19	18.00	83.19	65.6%	62.6%	62.6%		
29.75 - 24.75	14036	4188	18224	65.19	18.00	83.19	70.4%	67.2%	67.2%		
24.75 - 19.75	14036	4188	18224	65.19	18.00	83.19	75.3%	71.9%	71.9%		
19.75 - 14.75	14036	4188	18224	65.19	18.00	83.19	80.3%	76.6%	76.6%		
14.75 - 9.75	14036	4188	18224	65.19	18.00	83.19	85.3%	81.4%	81.4%		
9.75 - 4.75	14036	4188	18224	65.19	18.00	83.19	90.4%	86.2%	86.2%		
4.75 - 0	14036	4188	18224	65.19	18.00	83.19	95.3%	90.9%	90.9%		

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

Monopole Flange Plate Connection

Elevation = 120 ft.

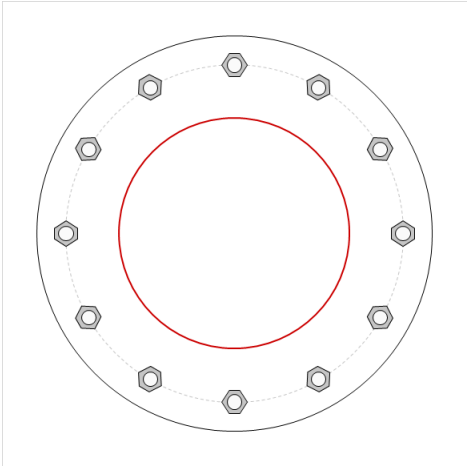
BU #	876327
Site Name	KINGS LOT
Order #	495800 Rev. 3

TIA-222 Revision	H

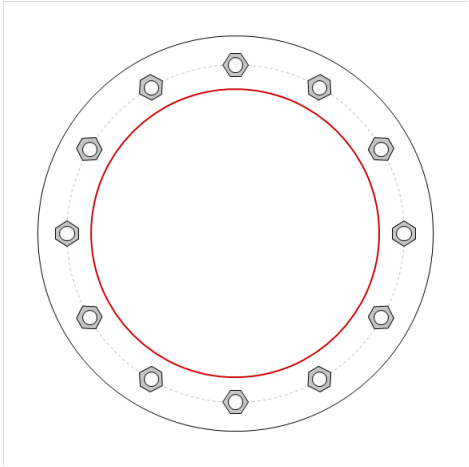
Applied Loads	
Moment (kip-ft)	233.33
Axial Force (kips)	12.06
Shear Force (kips)	15.16

**TIA-222-H Section 15.5 Applied*

Top Plate - External



Bottom Plate - External



Connection Properties

Bolt Data

(12) 1-1/2" ø bolts (A325 X; Fy=81 ksi, Fu=105 ksi) on 35" BC

Top Plate Data

41" OD x 2" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

41" OD x 2" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

24" x 0.25" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Pole Data

30" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	25.64	
Allowable (kips)	111.03	
Stress Rating:	**22.0%**	Pass

Top Plate Capacity

Max Stress (ksi):	11.94	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**35.1%**	Pass
Tension Side Stress Rating:	**20.2%**	Pass

Bottom Plate Capacity

Max Stress (ksi):	5.65	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**16.6%**	Pass
Tension Side Stress Rating:	**5.8%**	Pass

Monopole Flange Plate Connection

Elevation = 90 ft.

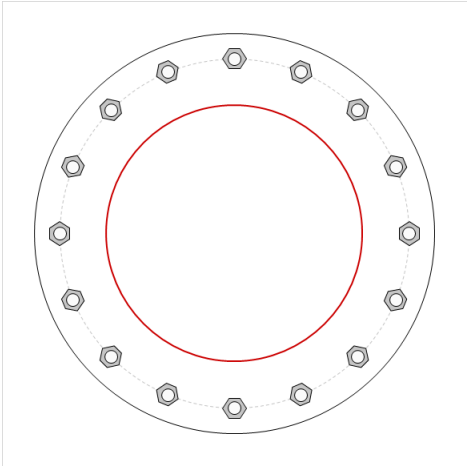
BU #	876327
Site Name	KINGS LOT
Order #	495800 Rev. 3

TIA-222 Revision	H

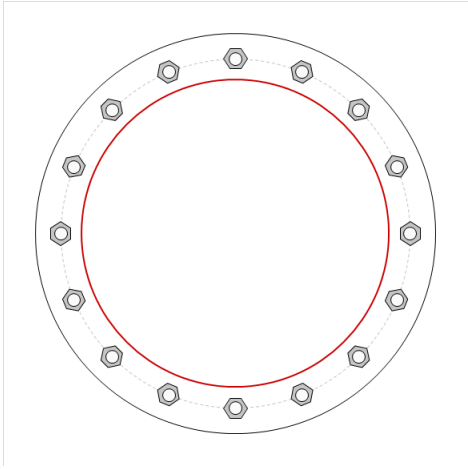
Applied Loads	
Moment (kip-ft)	727.55
Axial Force (kips)	18.04
Shear Force (kips)	18.26

**TIA-222-H Section 15.5 Applied*

Top Plate - External



Bottom Plate - External



Connection Properties

Bolt Data

(16) 1-1/2" ø bolts (A325 X; Fy=81 ksi, Fu=105 ksi) on 41" BC

Top Plate Data

47" OD x 2" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

47" OD x 2" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

30" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Pole Data

36" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	52.08	
Allowable (kips)	111.03	
Stress Rating:	**44.7%**	Pass

Top Plate Capacity

Max Stress (ksi):	26.12	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**76.8%**	Pass
Tension Side Stress Rating:	**44.1%**	Pass

Bottom Plate Capacity

Max Stress (ksi):	11.74	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**34.5%**	Pass
Tension Side Stress Rating:	**13.2%**	Pass

Welded-Plate Monopole Bridge Stiffeners
per TIA-222-H

Site Data

BU#: *876327*
Site Name: *KINGS LOT*
Order #: *495800 - Rev. 3*

Factored Loads at Splice Elevation		
Moment:	1337.61	ft-kips
Axial:	26.67	kips
Shear:	22.25	kips

Elevation:	60	ft

Splice Bolt Data		
Quantity:	18	
Bolt Diameter:	1.5	in
Bolt Circle:	47.5	in

Pole Data		
Upper Diam:	36	in
Upper Thickness	0.375	in
Lower Diam:	42	in
Lower Thickness	0.375	in
Pipe Steel (Fy):	42	ksi

Bridge Stiffener Data		
Quantity:	3	
Total Length:	139.0	in
Plate Thickness:	1.250	in
Steel Grade (Fy):	65.0	ksi
Steel Ultimate (Fu):	80.0	ksi
Weld Type:	Fillet (both sides)	
Weld Size:	0.375	in
Weld Strength:	80	ksi
Upper Weld Length:	66.25	in
Upper Weld, C:	3.52	Table 8-4
Upper Plate Width:	16	in
Lower Weld Length:	67.13	in
Lower Weld, C:	3.67	Table 8-4
Lower Plate Width:	13	in
Gap PL Length:	5.6	in
Gap PL Width:	6	in

Stress Increase Factor		
ASIF:	1.000	

Stiffener Results	44.0%	
Maximum Compression:	188.7	kips
Allowable Compression:	428.7	kips
Compression Stress Ratio:	44.0%	
Maximum Tension:	188.7	kips
Allowable Tension:	438.8	kips
Tension Stress Ratio:	43.0%	
Maximum Flexure:	2452.5	in.kips
Allowable Flexure:	53491.7	in.kips
Bending&Shear Stress Ratio:	4.6%	

Weld Results	18.0%	
Upper Weld Eccentric Load:	188.65	kip
Allowable Weld Strength:	1049.40	kip
Upper Weld Strength Ratio:	18.0%	
Upper Weld Eccentric Load:	188.65	kip
Allowable Weld Strength:	1108.65	kip
Lower Weld Strength Ratio:	17.0%	

Pole Results	11.8%	
Punching Shear Stress:	3.35	kip/in
Allowable Punching Stress:	28.35	kip/in
Punching Shear Stress Ratio:	11.8%	

Loads to Use to Check Flange and Bolts w / CCIPlate		
Moment:	607	ft.kips
Axial:	26.7	kips
Shear:	22.3	kips

Analysis Date: 11/9/2020

Monopole Flange Plate Connection

Elevation = 60 ft.

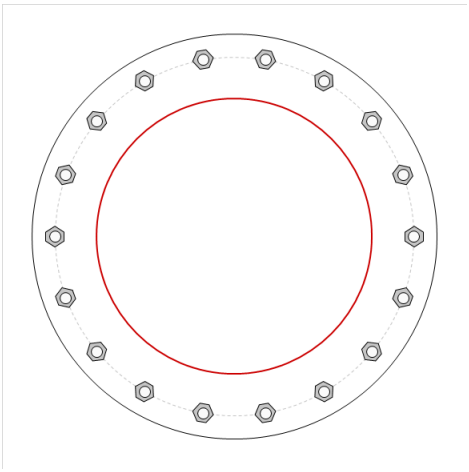
BU #	876327
Site Name	KINGS LOT
Order #	495800 Rev. 3

TIA-222 Revision	H

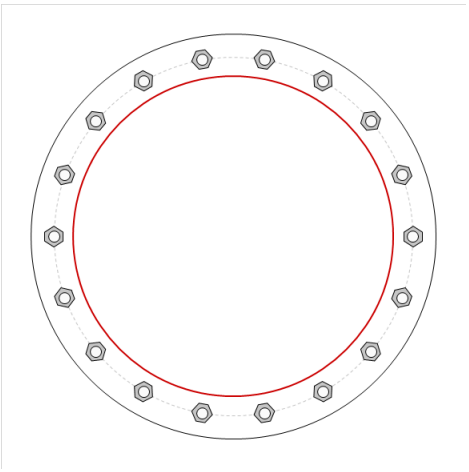
Applied Loads	
Moment (kip-ft)	607.00
Axial Force (kips)	26.67
Shear Force (kips)	22.25

**TIA-222-H Section 15.5 Applied*

Top Plate - External



Bottom Plate - External



Connection Properties

Bolt Data

(18) 1-1/2" ø bolts (A325 X; Fy=81 ksi, Fu=105 ksi) on 47" BC

Top Plate Data

53" OD x 2" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

53" OD x 2" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

36" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Pole Data

42" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	32.94	
Allowable (kips)	111.03	
Stress Rating:	**28.3%**	Pass

Top Plate Capacity

Max Stress (ksi):	16.92	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**49.7%**	Pass
Tension Side Stress Rating:	**25.9%**	Pass

Bottom Plate Capacity

Max Stress (ksi):	7.73	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**22.7%**	Pass
Tension Side Stress Rating:	**8.0%**	Pass

Welded-Plate Monopole Bridge Stiffeners
per TIA-222-H

Site Data

BU#: *876327*
Site Name: *KINGS LOT*
Order #: *495800 - Rev. 3*

Factored Loads at Splice Elevation		
Moment:	2152.38	ft-kips
Axial:	39.71	kips
Shear:	29.49	kips

Elevation:	30	ft

Splice Bolt Data		
Quantity:	18	
Bolt Diameter:	1.5	in
Bolt Circle:	47.5	in

Pole Data		
Upper Diam:	42	in
Upper Thickness	0.375	in
Lower Diam:	42	in
Lower Thickness	0.5	in
Pipe Steel (Fy):	42	ksi

Bridge Stiffener Data		
Quantity:	3	
Total Length:	139.0	in
Plate Thickness:	1.250	in
Steel Grade (Fy):	65.0	ksi
Steel Ultimate (Fu):	80.0	ksi
Weld Type:	Fillet (both sides)	
Weld Size:	0.375	in
Weld Strength:	80	ksi
Upper Weld Length:	66.25	in
Upper Weld, C:	3.57	Table 8-4
Upper Plate Width:	15	in
Lower Weld Length:	67.13	in
Lower Weld, C:	3.58	Table 8-4
Lower Plate Width:	15	in
Gap PL Length:	5.6	in
Gap PL Width:	6	in

Stress Increase Factor		
ASIF:	1.000	

Stiffener Results	70.3%	
Maximum Compression:	301.2	kips
Allowable Compression:	428.7	kips
Compression Stress Ratio:	70.3%	
Maximum Tension:	301.2	kips
Allowable Tension:	438.8	kips
Tension Stress Ratio:	68.7%	
Maximum Flexure:	3614.6	in.kips
Allowable Flexure:	54922.2	in.kips
Bending&Shear Stress Ratio:	7.0%	

Weld Results	28.3%	
Upper Weld Eccentric Load:	301.22	kip
Allowable Weld Strength:	1064.31	kip
Upper Weld Strength Ratio:	28.3%	
Upper Weld Eccentric Load:	301.22	kip
Allowable Weld Strength:	1081.46	kip
Lower Weld Strength Ratio:	27.9%	

Pole Results	17.4%	
Punching Shear Stress:	4.94	kip/in
Allowable Punching Stress:	28.35	kip/in
Punching Shear Stress Ratio:	17.4%	

Loads to Use to Check Flange and Bolts w / CCIPlate		
Moment:	910	ft.kips
Axial:	39.7	kips
Shear:	29.5	kips

Analysis Date: 11/9/2020

Monopole Flange Plate Connection

Elevation = 30 ft.

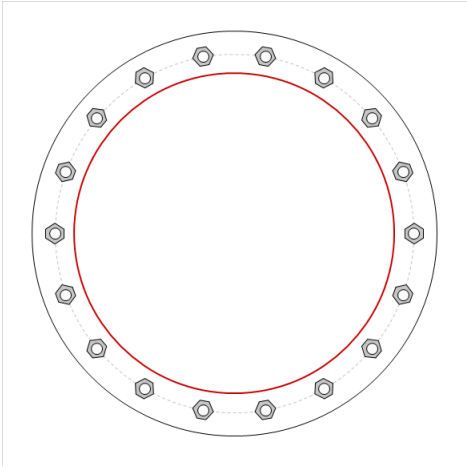
BU #	876327
Site Name	KINGS LOT
Order #	495800 Rev. 3

TIA-222 Revision	H

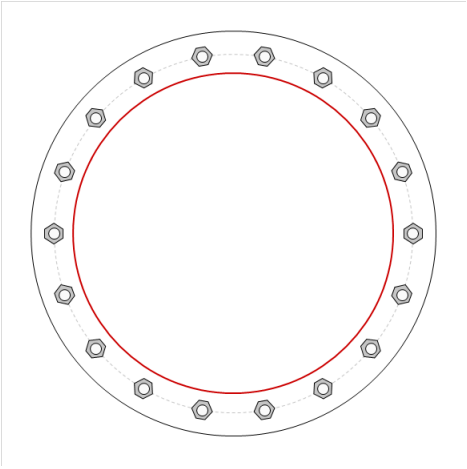
Applied Loads	
Moment (kip-ft)	910.00
Axial Force (kips)	39.71
Shear Force (kips)	29.49

**TIA-222-H Section 15.5 Applied*

Top Plate - External



Bottom Plate - External



Connection Properties

Bolt Data

(18) 1-1/2" ø bolts (A325 X; Fy=81 ksi, Fu=105 ksi) on 47" BC

Top Plate Data

53" OD x 2" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

53" OD x 2" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

42" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Pole Data

42" x 0.5" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	49.40	
Allowable (kips)	111.02	
Stress Rating:	**42.4%**	Pass

Top Plate Capacity

Max Stress (ksi):	11.58	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**34.0%**	Pass
Tension Side Stress Rating:	**12.0%**	Pass

Bottom Plate Capacity

Max Stress (ksi):	11.58	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**34.0%**	Pass
Tension Side Stress Rating:	**12.0%**	Pass

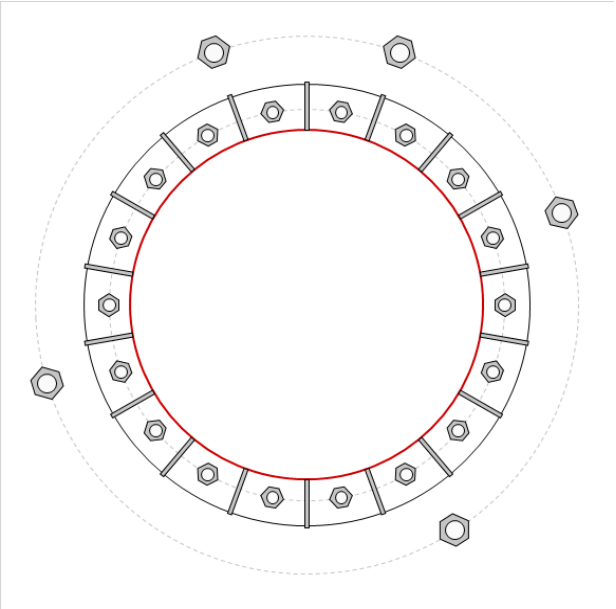
Monopole Base Plate Connection

Site Info	
BU #	876327
Site Name	KINGS LOT
Order #	495800 Rev. 3

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	Yes
l_{ar} (in)	0

Applied Loads	
Moment (kip-ft)	3145.82
Axial Force (kips)	54.57
Shear Force (kips)	34.22

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

GROUP 1: (18) 1-1/2" ø bolts (A354-BC N; Fy=109 ksi, Fu=125 ksi) on 47" BC

GROUP 2: (5) 2-1/4" ø bolts (A193 Gr. B7 N; Fy=105 ksi, Fu=125 ksi) on 64.5" BC

pos. (deg): 70, 110, 20, 197, 303

Base Plate Data

53" OD x 2" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Stiffener Data

(18) 14.25"H x 5.75"W x 0.5"T, Notch: 0.75"

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

horiz. weld: 0.25" groove, 45° dbl bevel, 0.25" fillet

vert. weld: 0.25" fillet

Pole Data

42" x 0.5" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

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

GROUP 1:		
Pu_c = 93.38	ϕPn_c = 173.36	**Stress Rating**
Vu = 1.9	ϕVn = 78.01	**51.4%**
Mu = n/a	ϕMn = n/a	**Pass**
GROUP 2:		
Pu_t = 279.17	ϕPn_t = 304.69	**Stress Rating**
Vu = 0	ϕVn = 186.38	**80.0%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary

Max Stress (ksi):	19.14	(Roark's Flexural)
Allowable Stress (ksi):	32.4	
Stress Rating:	**56.3%**	**Pass**

Stiffener Summary

Horizontal Weld:	**38.5%**	**Pass**
Vertical Weld:	**29.8%**	**Pass**
Plate Flexure+Shear:	**11.5%**	**Pass**
Plate Tension+Shear:	**38.8%**	**Pass**
Plate Compression:	**42.4%**	**Pass**

Pole Summary

Punching Shear:	**7.0%**	**Pass**

Pier and Pad Foundation

BU # :	876327
Site Name:	KINGS LOT
App. Number:	495800 - Rev. 3

TIA-222 Revision:	H
Tower Type:	Monopole

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

Superstructure Analysis Reactions		
Compression, P_{comp}:	54.59	kips
Base Shear, Vu_comp:	34.19	kips
Moment, M_u:	3145.82	ft-kips
Tower Height, **H**:	150	ft
BP Dist. Above Fdn, bp_{dist}:	5.5	in
Bolt Circle / Bearing Plate Width, **BC**:	47	in

Foundation Analysis Checks	Capacity	Demand	Rating*	Check
Lateral (Sliding) (kips)	146.06	34.19	**22.3%**	**Pass**
Bearing Pressure (ksf)	18.00	4.77	**26.5%**	**Pass**
*Overturning (kip*ft)*	3996.45	3366.63	**84.2%**	**Pass**
*Pad Flexure (kip*ft)*	5215.72	1966.39	**35.9%**	**Pass**
Pad Shear - 1-way (kips)	1397.51	239.03	**16.3%**	**Pass**
Pad Shear - 2-way (Comp) (ksi)	0.164	0.000	**0.0%**	**Pass**
*Flexural 2-way (Comp) (kip*ft)*	8780.60	0.00	**0.0%**	**Pass**

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

Soil Rating*:	**84.2%**
Structural Rating*:	**35.9%**

Pad Properties		
Depth, **D**:	5.5	ft
Pad Width, **W**:	21	ft
Pad Thickness, **T**:	6	ft
Pad Rebar Size (Bottom), **Sp**:	8	
Pad Rebar Quantity (Bottom), **mp**:	22	
Pad Clear Cover, cc_{pad}:	3	in

Material Properties		
Rebar Grade, **Fy**:	60	ksi
Concrete Compressive Strength, **F'c**:	3	ksi
Dry Concrete Density, δ**c**:	150	pcf

Soil Properties		
Total Soil Unit Weight, γ:	115	pcf
Ultimate Gross Bearing, Qult:	24.000	ksf
Cohesion, **Cu**:	0.000	ksf
Friction Angle, φ:	32	degrees
SPT Blow Count, N_{blows}:	18	
Base Friction, μ:	0.3	
Neglected Depth, **N**:	3.33	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, **gw**:	N/A	ft

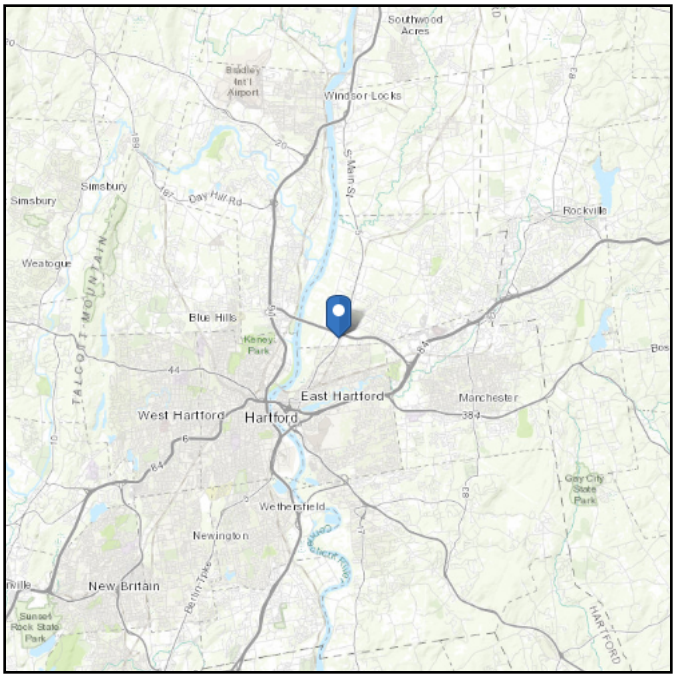
<--Toggle between Gross and Net

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 57.95 ft (NAVD 88)
Latitude: 41.802992
Longitude: -72.617211



Wind

Results:

Wind Speed:	~~122 Vmph~~ ← 125mph per jurisdiction
10-year MRI	77 Vmph
25-year MRI	86 Vmph
50-year MRI	93 Vmph
100-year MRI	100 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: Tue Oct 20 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.

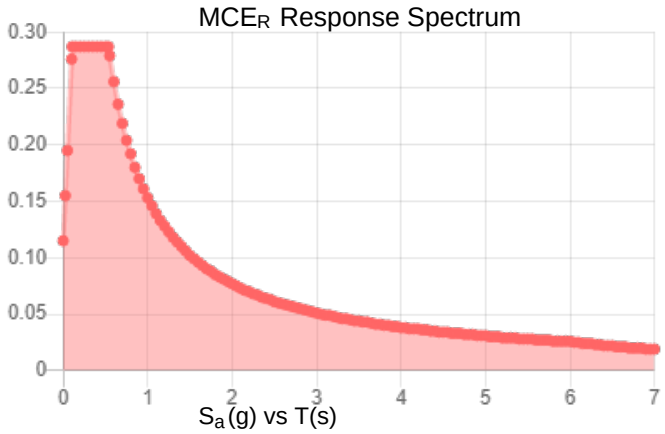
Seismic

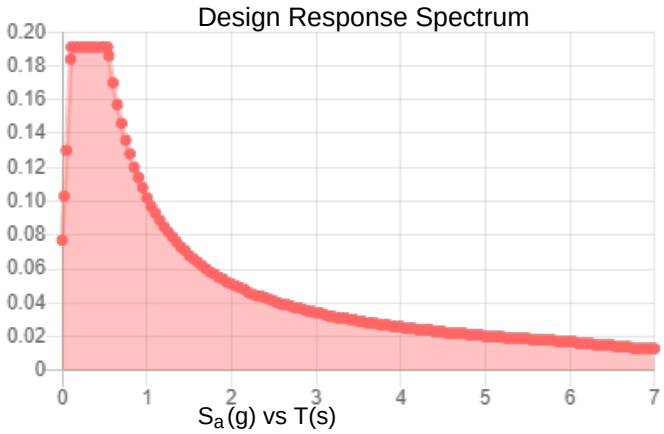
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.179	S_{DS} :	0.191
S_1 :	0.064	S_{D1} :	0.102
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.09
S_{MS} :	0.287	PGA_M :	0.144
S_{M1} :	0.153	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B





Data Accessed: Tue Oct 20 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:	1.00 in.
Concurrent Temperature:	5 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Tue Oct 20 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

Date: **November 6, 2020**

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

Infinigy Engineering, PLLC
1033 Watervliet Shaker Road
Albany, NY 12205
518-690-0790
structural@infinigy.com

Subject:	**Mount Analysis Report**	
Carrier Designation:	**T-Mobile Equipment Change-Out**	
	Carrier Site Number:	CT11883C
	Carrier Site Name:	CT883/Sprint S. Windsor
Crown Castle Designation:	**Crown Castle BU Number:**	876327
	Crown Castle Site Name:	KINGS LOT
	Crown Castle JDE Job Number:	578442
	Crown Castle Order Number:	495800 Rev. 3
Engineering Firm Designation:	**Infinigy Engineering, PLLC Report Designation:** 1039-Z0001-B	
Site Data:	**59 McGuire Road, South Windsor, Hartford County, CT, 06074** **Latitude 41°48'10.77" Longitude -72°37'1.96"**	
Structure Information:	**Tower Height & Type:**	**150.0 ft Monopole**
	Mount Elevation:	**138.0 ft**
	Mount Type:	**14.0 ft Platform**

Dear Darcy Tarr,

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

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

Platform **Sufficient**
***Sufficient upon completion of the changes listed in the 'Recommendations' section of this report.**

This analysis utilizes an ultimate 3-second gust wind speed of 125 mph as required by the 2018 Connecticut State Building Code based on the 2015 International Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Mount analysis prepared by: Alex Mercado, E.I.T.

Respectfully Submitted by:
John S. Stevens, P.E.
518-690-0790
structural@infinigy.com
CT PE License No. PEN.0024705

11-6-2020

TABLE OF CONTENTS

1) INTRODUCTION

This is an existing 3 sector 14.0 ft Platform, mapped by Infinigy Engineering.

2) ANALYSIS CRITERIA

Building Code:	2015 IBC / 2018 Connecticut State Building Code
TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	125 mph
Exposure Category:	C
Topographic Factor at Base:	1.0
Topographic Factor at Mount:	1.0
Ice Thickness:	2.0 in
Wind Speed with Ice:	50 mph
Seismic S_s:	0.178
Seismic S_1:	0.064
Live Loading Wind Speed:	30 mph
Man Live Load at Mid/End-Points:	250 lb
Man Live Load at Mount Pipes:	500 lb

Table 1 - Proposed Equipment Configuration

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount / Modification Details
138.0	138.0	3	ERICSSON	AIR 32 B2A/B66AA	14.0 ft Platform
		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 B85_ T-MOBILE	
		3	ERICSSON	RRUS 4415 B25_CCIV2	

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
Crown Application	T-Mobile Application	495800 Rev. 3	CCI Sites
Mount Mapping Documents	Infinigy Engineering	8513686	CCI Sites
Loading Documents	T-Mobile	RFDS Version 6	TSA

3.1) Analysis Method

RISA-3D (Version 17.0.4), a commercially available analysis software package, was used to create a three-dimensional model of the antenna mounting system and calculate member stresses for various loading cases.

Infinigy Mount Analysis Tool V2.1.4, a tool internally developed by Infinigy, was used to calculate wind loading on all appurtenances, dishes and mount members for various loading cases. Selected output from the analysis is included in Appendix B “Software Input Calculations”.

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

3.2) Assumptions

1) The antenna mounting system was properly fabricated, installed and maintained in good condition in accordance with its original design and manufacturer's specifications.
2) The configuration of antennas, mounts, and other appurtenances are as specified in Table 1 and the referenced drawings.
3) All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
4) The analysis will be required to be revised if the existing conditions in the field differ from those shown in the above-referenced documents or assumed in this analysis. No allowance was made for any damaged, missing, or rusted members.
5) Prior structural modifications to the tower mounting system are assumed to be installed as shown per available data.
6) Steel grades have been assumed as follows, unless noted otherwise:

Channel, Solid Round, Angle, Plate	ASTM A36 (GR 36)
HSS (Rectangular)	ASTM A500 (GR B-46)
Pipe	ASTM A53 (GR 35)
Connection Bolts	ASTM A325

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

4) ANALYSIS RESULTS

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

Notes	Component	Critical Member	Centerline (ft)	% Capacity	Pass / Fail
1,2,3,4	Mount Pipe(s)	MP2	138.0	62.8	Pass
	Horizontal(s)	M14		97.4	Pass
	Standoff(s)	M15		50.1	Pass
	Corner Horizontal(s)	M26		21.2	Pass
	Mount Connection(s)	--		75.2	Pass

Structure Rating (max from all components) =	97.4%

Notes:
1) See additional documentation in "Appendix C - Software Analysis Output" for calculations supporting the % capacity consumed.
2) See additional documentation in “Appendix D – Additional Calculations” for detailed mount connection calculations.
3) All sectors are typical
4) Rating per TIA-222-H, Section 15.5

4.1) Recommendations

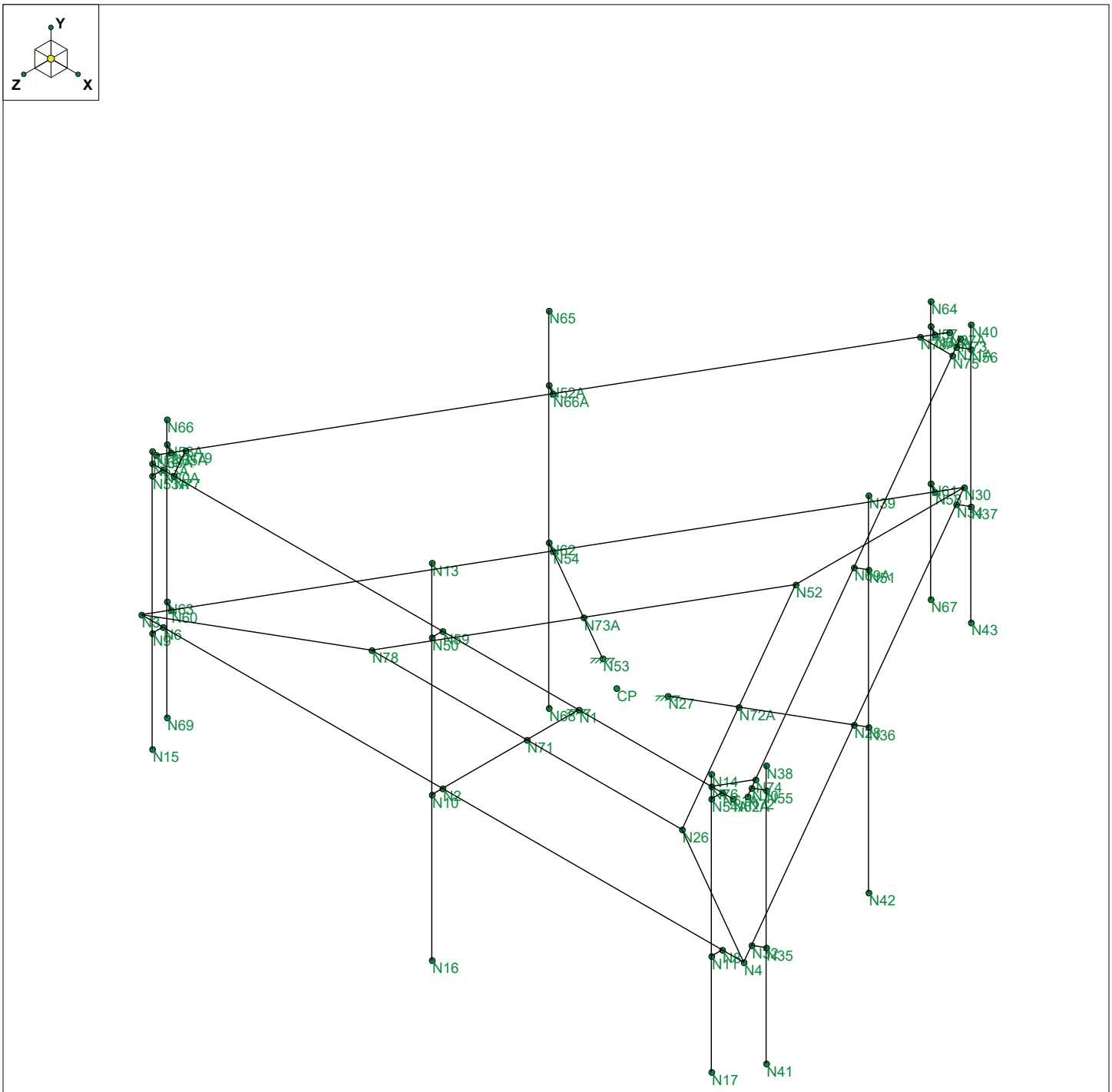
The mount has sufficient capacity to carry the proposed loading configuration. In order for the results of the analysis to be considered valid, the structural modifications listed below must be completed.

1. Installation of Handrail Kit Site Pro 1 HRK14. Cut off approximately 1ft of the proposed handrail pipes to fit on the antenna mount pipes layout.

No structural modifications are required at this time, provided that the above-listed changes are implemented.

APPENDIX A

WIRE FRAME AND RENDERED MODELS



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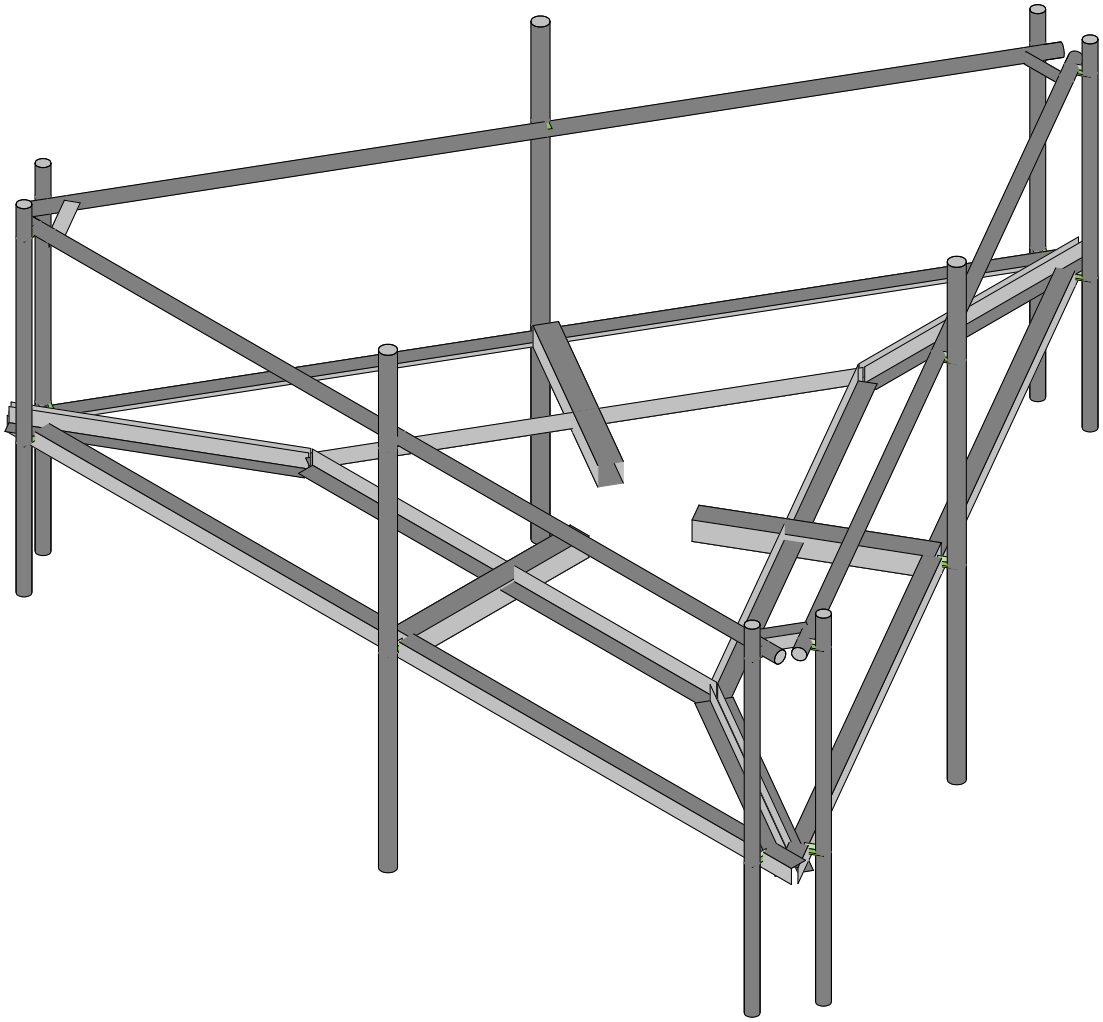

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APPENDIX B

SOFTWARE INPUT CALCULATIONS

Program Inputs

PROJECT INFORMATION	
Client:	Crown Castle
Carrier:	T-Mobile
Engineer:	Alex Mercado

SITE INFORMATION		
Risk Category:	II	
Exposure Category:	C	
Topo Factor Procedure:	Method 1, Category 1	
Site Class:	D - Stiff Soil	
Ground Elevation:	57.95	ft *Rev H

MOUNT INFORMATION		
Mount Type:	Platform	
Num Sectors:	3	
Centerline AGL:	138.0	ft
Tower Height AGL:	150.0	ft

TOPOGRAPHIC DATA		
Topo Feature:	N/A	
Slope Distance:	N/A	ft
Crest Distance:	N/A	ft
Crest Height:	N/A	ft

FACTORS		
Directionality Fact. (K_d):	0.95	
Ground Ele. Factor (K_e):	1.00	*Rev H Only
Rooftop Speed-Up (K_s):	1.00	*Rev H Only
Topographic Factor (K_{zt}):	1.00	
Gust Effect Factor (G_h):	1.0	

CODE STANDARDS		
Building Code:	2015 IBC	
TIA Standard:	TIA-222-H	
ASCE Standard:	ASCE 7-10	

WIND AND ICE DATA		
Ultimate Wind (V_{ult}):	125	mph
Design Wind (V):	N/A	mph
Ice Wind (V_{ice}):	50	mph
Base Ice Thickness (t_i):	2	in
Flat Pressure:	102.72	psf
Round Pressure:	61.63	psf
Ice Wind Pressure:	9.86	psf

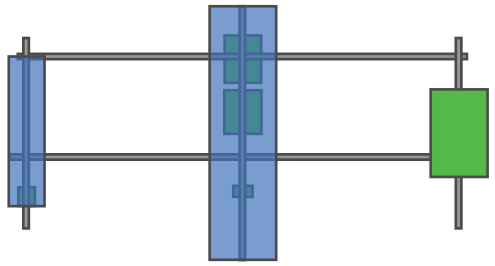
SEISMIC DATA		
Short-Period Accel. (S_s):	0.18	g
1-Second Accel. (S_1):	0.06	g
Short-Period Design (S_{DS}):	0.19	
1-Second Design (S_{D1}):	0.10	
Short-Period Coeff. (F_a):	1.60	
1-Second Coeff. (F_v):	2.40	
Amplification Factor (a_p):	1.00	
Response Mod. (R_p):	2.50	
Overstrength (Ω_o):	1.00	

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless

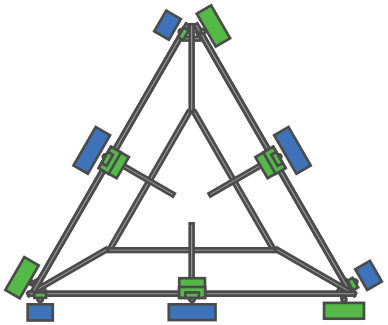
Infinigy Load Calculator V2.1.4

Program Inputs

ELEVATION VIEW



PLAN VIEW



INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless

Infinigy Load Calculator V2.1.4

APPURTENANCE INFORMATION

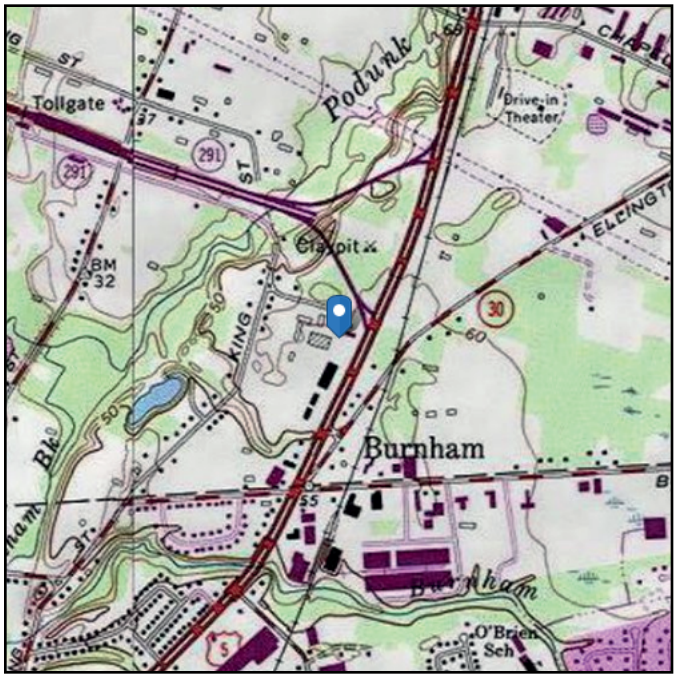
Appurtenance Name	Elevation	Qty.	K_a	q_z (psf)	EPA_N (ft^2)	EPA_T (ft^2)	Wind F_z (lbs)	Wind F_x (lbs)	Weight (lbs)	Seismic F (lbs)	Member (α sector)
ERICSSON AIR 32 B2A/B66AA	138.0	3	0.90	51.36	6.51	4.71	300.91	217.82	132.20	12.55	MP3
ERICSSON AIR6449 B41_T-MOBILE	138.0	3	0.90	51.36	5.66	2.48	261.58	114.47	114.63	10.88	MP1
ERICSSON TME-KRY 112 144/1	138.0	3	0.90	51.36	0.35	0.18	16.18	8.09	11.00	1.04	MP3
ICSSON RADIO 4449 B71 B85A_T-MOBI	138.0	3	0.90	51.36	1.97	1.59	91.07	73.34	73.21	6.95	MP2
ERICSSON TME-RRUS 4415 B25_CCIV2	138.0	3	0.90	51.36	1.84	0.82	85.17	37.91	46.00	4.37	MP2
/CELWAVE APXVAALL24_43-U-NA20_TI	138.0	3	0.90	51.36	20.24	8.73	935.69	403.68	149.90	14.23	MP2
COMMSCOPE SDX1926Q-43	138.0	3	0.90	51.36	0.24	0.10	11.13	4.67	6.17	0.59	MP2

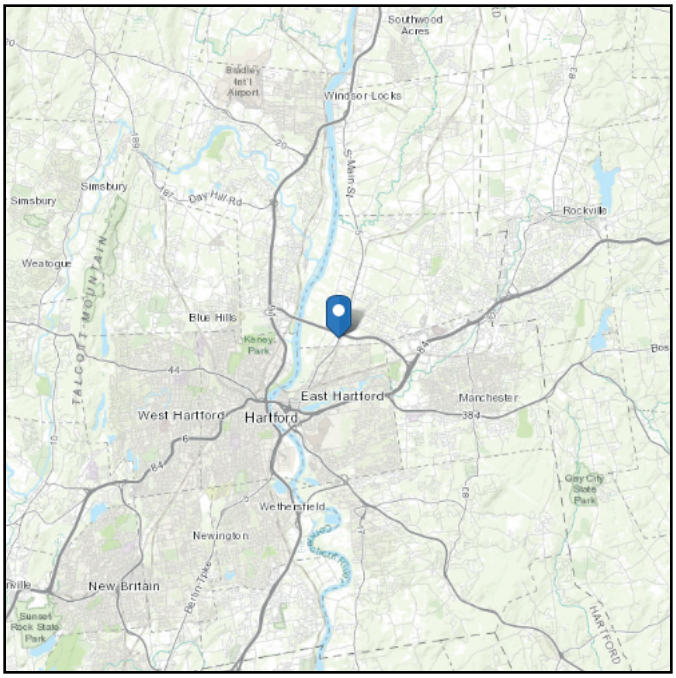
ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 57.95 ft (NAVD 88)
Latitude: 41.80299
Longitude: -72.61721





Wind

Results:

Wind Speed:	122 Vmph
10-year MRI	77 Vmph
25-year MRI	86 Vmph
50-year MRI	93 Vmph
100-year MRI	100 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: Thu Nov 05 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.

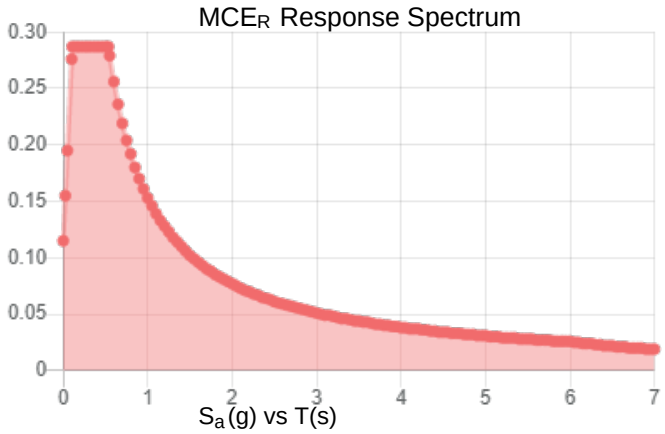
Seismic

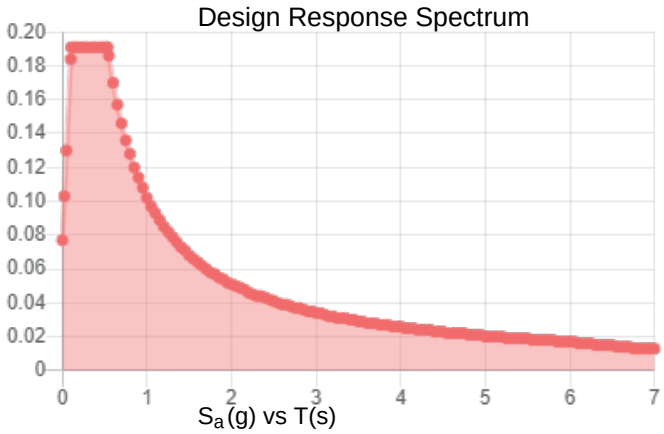
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.179	S_{DS} :	0.191
S_1 :	0.064	S_{D1} :	0.102
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.09
S_{MS} :	0.287	PGA_M :	0.144
S_{M1} :	0.153	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B





Data Accessed: Thu Nov 05 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:	1.00 in.
Concurrent Temperature:	5 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Thu Nov 05 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 C

SOFTWARE ANALYSIS OUTPUT

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N3	N4		180	Horizontals	Beam	Single Angle	A36 Gr.36	Typical
2	M2	N1	N2			Standoffs	Beam	Tube	A500 Gr.B...	Typical
3	M3	N6	N9			RIGID	None	None	RIGID	Typical
4	M4	N2	N10			RIGID	None	None	RIGID	Typical
5	M5	N8	N11			RIGID	None	None	RIGID	Typical
6	MP1	N14	N17			STD 2.0 Pipe ...	Column	Pipe	A53 Gr.B	Typical
7	MP2	N13	N16			STD 2.5 Pipe ...	Column	Pipe	A53 Gr.B	Typical
8	MP3	N12	N15			STD 2.0 Pipe ...	Column	Pipe	A53 Gr.B	Typical
9	M13	N26	N4		180	Corner Horizo...	Column	Double Angle (...	A36 Gr.36	Typical
10	M14	N4	N30		180	Horizontals	Beam	Single Angle	A36 Gr.36	Typical
11	M15	N27	N28			Standoffs	Beam	Tube	A500 Gr.B...	Typical
12	M16	N32	N35			RIGID	None	None	RIGID	Typical
13	M17	N28	N36			RIGID	None	None	RIGID	Typical
14	M18	N34	N37			RIGID	None	None	RIGID	Typical
15	MP7	N40	N43			STD 2.0 Pipe ...	Column	Pipe	A53 Gr.B	Typical
16	MP8	N39	N42			STD 2.5 Pipe ...	Column	Pipe	A53 Gr.B	Typical
17	MP9	N38	N41			STD 2.0 Pipe ...	Column	Pipe	A53 Gr.B	Typical
18	M26	N52	N30		180	Corner Horizo...	Column	Double Angle (...	A36 Gr.36	Typical
19	M27	N30	N3		180	Horizontals	Beam	Single Angle	A36 Gr.36	Typical
20	M28	N53	N54			Standoffs	Beam	Tube	A500 Gr.B...	Typical
21	M29	N58	N61			RIGID	None	None	RIGID	Typical
22	M30	N54	N62			RIGID	None	None	RIGID	Typical
23	M31	N60	N63			RIGID	None	None	RIGID	Typical
24	MP4	N66	N69			STD 2.0 Pipe ...	Column	Pipe	A53 Gr.B	Typical
25	MP5	N65	N68			STD 2.5 Pipe ...	Column	Pipe	A53 Gr.B	Typical
26	MP6	N64	N67			STD 2.0 Pipe ...	Column	Pipe	A53 Gr.B	Typical
27	M39	N78	N3		180	Corner Horizo...	Column	Double Angle (...	A36 Gr.36	Typical
28	M53	N78	N26			Horizontals	Beam	Single Angle	A36 Gr.36	Typical
29	M54	N26	N52			Horizontals	Beam	Single Angle	A36 Gr.36	Typical
30	M55	N52	N78			Horizontals	Beam	Single Angle	A36 Gr.36	Typical
31	M31A	N68A	N67A			Handrail	Beam	Pipe	A53 Gr.B	Typical
32	M32	N64A	N57			RIGID	None	None	RIGID	Typical
33	M33	N66A	N52A			RIGID	None	None	RIGID	Typical
34	M34	N65A	N58A			RIGID	None	None	RIGID	Typical
35	M35	N70	N55			RIGID	None	None	RIGID	Typical
36	M36	N69A	N51			RIGID	None	None	RIGID	Typical
37	M37	N71A	N56			RIGID	None	None	RIGID	Typical
38	M38	N72	N73			Handrail	Beam	Pipe	A53 Gr.B	Typical
39	M39A	N63A	N62A			Handrail	Beam	Pipe	A53 Gr.B	Typical
40	M40	N61A	N54A			RIGID	None	None	RIGID	Typical
41	M41	N59	N50			RIGID	None	None	RIGID	Typical
42	M42	N60A	N53A			RIGID	None	None	RIGID	Typical
43	M43	N76	N74		180	Connection Pl...	HBrace	Single Angle	A36 Gr.36	Typical
44	M44	N75	N78A		180	Connection Pl...	HBrace	Single Angle	A36 Gr.36	Typical
45	M45	N77	N79		90	Connection Pl...	HBrace	Single Angle	A36 Gr.36	Typical

Material Takeoff

	Material	Size	Pieces	Length[in]	Weight[LB]
1	General				
2	RIGID		18	54	0
3	Total General		18	54	0
4					
5	Hot Rolled Steel				
6	A36 Gr.36	L2.5x2.5x4	3	27	9.115

Material Takeoff (Continued)

	Material	Size	Pieces	Length[in]	Weight[LB]
7	A36 Gr.36	L3X3X4	6	763.8	311.883
8	A36 Gr.36	LL3x3x4x0	3	141	115.15
9	A500 Gr.B Rect	HSS4X4X4	3	114	117.158
10	A53 Gr.B	PIPE_2.0	9	918	265.519
11	A53 Gr.B	PIPE_2.5	3	288	131.483
12	Total HR Steel		27	2251.8	950.309

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(Me...	Surface(Plate/Wall)
1	Self Weight	DL		-1			27		3	
2	Wind Load AZI 0	WLZ					54			
3	Wind Load AZI 30	None					54			
4	Wind Load AZI 60	None					54			
5	Wind Load AZI 90	WLX					54			
6	Wind Load AZI 120	None					54			
7	Wind Load AZI 150	None					54			
8	Wind Load AZI 180	None					54			
9	Wind Load AZI 210	None					54			
10	Wind Load AZI 240	None					54			
11	Wind Load AZI 270	None					54			
12	Wind Load AZI 300	None					54			
13	Wind Load AZI 330	None					54			
14	Distr. Wind Load Z	WLZ						30		
15	Distr. Wind Load X	WLX						30		
16	Ice Weight	OL1					27	30	3	
17	Ice Wind Load AZI ...	OL2					54			
18	Ice Wind Load AZI ...	None					54			
19	Ice Wind Load AZI ...	None					54			
20	Ice Wind Load AZI ...	OL3					54			
21	Ice Wind Load AZI ...	None					54			
22	Ice Wind Load AZI ...	None					54			
23	Ice Wind Load AZI ...	None					54			
24	Ice Wind Load AZI ...	None					54			
25	Ice Wind Load AZI ...	None					54			
26	Ice Wind Load AZI ...	None					54			
27	Ice Wind Load AZI ...	None					54			
28	Ice Wind Load AZI ...	None					54			
29	Distr. Ice Wind Loa...	OL2						30		
30	Distr. Ice Wind Loa...	OL3						30		
31	Seismic Load Z	ELZ			-.095		27			
32	Seismic Load X	ELX	-.095				27			
33	Service Live Loads	LL				1				
34	Maintenance Load 1	LL				1				
35	Maintenance Load 2	LL				1				
36	Maintenance Load 3	LL				1				
37	Maintenance Load 4	LL				1				
38	Maintenance Load 5	LL				1				
39	Maintenance Load 6	LL				1				
40	Maintenance Load 7	LL				1				
41	Maintenance Load 8	LL				1				
42	Maintenance Load 9	LL				1				
43	BLC 1 Transient Ar...	None						30		
44	BLC 16 Transient ...	None						30		

Load Combinations

	Description	Solve	PDelta	SRSS	BLC	Factor	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.4DL	Yes	Y		1	1.4																		
2	1.2DL + 1WL AZI 0	Yes	Y		1	1.2	2	1	14	1	15													
3	1.2DL + 1WL AZI 30	Yes	Y		1	1.2	3	1	14	.866	15	.5												
4	1.2DL + 1WL AZI 60	Yes	Y		1	1.2	4	1	14	.5	15	.866												
5	1.2DL + 1WL AZI 90	Yes	Y		1	1.2	5	1	14		15	1												
6	1.2DL + 1WL AZI 120	Yes	Y		1	1.2	6	1	14	-.5	15	.866												
7	1.2DL + 1WL AZI 150	Yes	Y		1	1.2	7	1	14	-.8...	15	.5												
8	1.2DL + 1WL AZI 180	Yes	Y		1	1.2	8	1	14	-1	15													
9	1.2DL + 1WL AZI 210	Yes	Y		1	1.2	9	1	14	-.8...	15	-.5												
10	1.2DL + 1WL AZI 240	Yes	Y		1	1.2	10	1	14	-.5	15	-.8...												
11	1.2DL + 1WL AZI 270	Yes	Y		1	1.2	11	1	14		15	-1												
12	1.2DL + 1WL AZI 300	Yes	Y		1	1.2	12	1	14	.5	15	-.8...												
13	1.2DL + 1WL AZI 330	Yes	Y		1	1.2	13	1	14	.866	15	-.5												
14	0.9DL + 1WL AZI 0	Yes	Y		1	.9	2	1	14	1	15													
15	0.9DL + 1WL AZI 30	Yes	Y		1	.9	3	1	14	.866	15	.5												
16	0.9DL + 1WL AZI 60	Yes	Y		1	.9	4	1	14	.5	15	.866												
17	0.9DL + 1WL AZI 90	Yes	Y		1	.9	5	1	14		15	1												
18	0.9DL + 1WL AZI 120	Yes	Y		1	.9	6	1	14	-.5	15	.866												
19	0.9DL + 1WL AZI 150	Yes	Y		1	.9	7	1	14	-.8...	15	.5												
20	0.9DL + 1WL AZI 180	Yes	Y		1	.9	8	1	14	-1	15													
21	0.9DL + 1WL AZI 210	Yes	Y		1	.9	9	1	14	-.8...	15	-.5												
22	0.9DL + 1WL AZI 240	Yes	Y		1	.9	10	1	14	-.5	15	-.8...												
23	0.9DL + 1WL AZI 270	Yes	Y		1	.9	11	1	14		15	-1												
24	0.9DL + 1WL AZI 300	Yes	Y		1	.9	12	1	14	.5	15	-.8...												
25	0.9DL + 1WL AZI 330	Yes	Y		1	.9	13	1	14	.866	15	-.5												
26	1.2D + 1.0Di	Yes	Y		1	1.2	16	1																
27	1.2D + 1.0Di +1.0Wi A...	Yes	Y		1	1.2	16	1	17	1	29	1	30											
28	1.2D + 1.0Di +1.0Wi A...	Yes	Y		1	1.2	16	1	18	1	29	.866	30	.5										
29	1.2D + 1.0Di +1.0Wi A...	Yes	Y		1	1.2	16	1	19	1	29	.5	30	.866										
30	1.2D + 1.0Di +1.0Wi A...	Yes	Y		1	1.2	16	1	20	1	29		30	1										
31	1.2D + 1.0Di +1.0Wi A...	Yes	Y		1	1.2	16	1	21	1	29	-.5	30	.866										
32	1.2D + 1.0Di +1.0Wi A...	Yes	Y		1	1.2	16	1	22	1	29	-.8...	30	.5										
33	1.2D + 1.0Di +1.0Wi A...	Yes	Y		1	1.2	16	1	23	1	29	-1	30											
34	1.2D + 1.0Di +1.0Wi A...	Yes	Y		1	1.2	16	1	24	1	29	-.8...	30	-.5										
35	1.2D + 1.0Di +1.0Wi A...	Yes	Y		1	1.2	16	1	25	1	29	-.5	30	-.8...										
36	1.2D + 1.0Di +1.0Wi A...	Yes	Y		1	1.2	16	1	26	1	29		30	-1										
37	1.2D + 1.0Di +1.0Wi A...	Yes	Y		1	1.2	16	1	27	1	29	.5	30	-.8...										
38	1.2D + 1.0Di +1.0Wi A...	Yes	Y		1	1.2	16	1	28	1	29	.866	30	-.5										
39	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.238	31	1	32															
40	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.238	31	.866	32	.5														
41	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.238	31	.5	32	.866														
42	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.238	31		32	1														
43	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.238	31	-.5	32	.866														
44	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.238	31	-.8...	32	.5														
45	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.238	31	-1	32															
46	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.238	31	-.8...	32	-.5														
47	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.238	31	-.5	32	-.8...														
48	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.238	31		32	-1														
49	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.238	31	.5	32	-.8...														
50	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.238	31	.866	32	-.5														
51	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	.862	31	1	32															
52	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	.862	31	.866	32	.5														
53	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	.862	31	.5	32	.866														
54	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	.862	31		32	1														
55	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	.862	31	-.5	32	.866														
56	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	.862	31	-.8...	32	.5														

Load Combinations (Continued)

	Description	Solve	PDelta	SRSS	BLC	Factor	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
57	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	.862	31	-1	32																	
58	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	.862	31	-.8...	32	-.5																
59	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	.862	31	-.5	32	-.8...																
60	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	.862	31		32	-1																
61	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	.862	31	.5	32	-.8...																
62	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	.862	31	.866	32	-.5																
63	1.0DL + 1.5LL + 1.0SW...	Yes	Y		1	1	2	.23	14	.23	15		33	1.5												
64	1.0DL + 1.5LL + 1.0SW...	Yes	Y		1	1	3	.23	14	.2	15	.115	33	1.5												
65	1.0DL + 1.5LL + 1.0SW...	Yes	Y		1	1	4	.23	14	.115	15	.2	33	1.5												
66	1.0DL + 1.5LL + 1.0SW...	Yes	Y		1	1	5	.23	14		15	.23	33	1.5												
67	1.0DL + 1.5LL + 1.0SW...	Yes	Y		1	1	6	.23	14	-.1...	15	.2	33	1.5												
68	1.0DL + 1.5LL + 1.0SW...	Yes	Y		1	1	7	.23	14	-.2	15	.115	33	1.5												
69	1.0DL + 1.5LL + 1.0SW...	Yes	Y		1	1	8	.23	14	-.23	15		33	1.5												
70	1.0DL + 1.5LL + 1.0SW...	Yes	Y		1	1	9	.23	14	-.2	15	-.1...	33	1.5												
71	1.0DL + 1.5LL + 1.0SW...	Yes	Y		1	1	10	.23	14	-.1...	15	-.2	33	1.5												
72	1.0DL + 1.5LL + 1.0SW...	Yes	Y		1	1	11	.23	14		15	-.23	33	1.5												
73	1.0DL + 1.5LL + 1.0SW...	Yes	Y		1	1	12	.23	14	.115	15	-.2	33	1.5												
74	1.0DL + 1.5LL + 1.0SW...	Yes	Y		1	1	13	.23	14	.2	15	-.1...	33	1.5												
75	1.2DL + 1.5LL	Yes	Y		1	1.2	33	1.5																		
76	1.2DL + 1.5LM-MP1 + ...	Yes	Y		1	1.2	34	1.5	2	.058	14	.058	15													
77	1.2DL + 1.5LM-MP1 + ...	Yes	Y		1	1.2	34	1.5	3	.058	14	.05	15	.029												
78	1.2DL + 1.5LM-MP1 + ...	Yes	Y		1	1.2	34	1.5	4	.058	14	.029	15	.05												
79	1.2DL + 1.5LM-MP1 + ...	Yes	Y		1	1.2	34	1.5	5	.058	14		15	.058												
80	1.2DL + 1.5LM-MP1 + ...	Yes	Y		1	1.2	34	1.5	6	.058	14	-.0...	15	.05												
81	1.2DL + 1.5LM-MP1 + ...	Yes	Y		1	1.2	34	1.5	7	.058	14	-.05	15	.029												
82	1.2DL + 1.5LM-MP1 + ...	Yes	Y		1	1.2	34	1.5	8	.058	14	-.0...	15													
83	1.2DL + 1.5LM-MP1 + ...	Yes	Y		1	1.2	34	1.5	9	.058	14	-.05	15	-.0...												
84	1.2DL + 1.5LM-MP1 + ...	Yes	Y		1	1.2	34	1.5	10	.058	14	-.0...	15	-.05												
85	1.2DL + 1.5LM-MP1 + ...	Yes	Y		1	1.2	34	1.5	11	.058	14		15	-.0...												
86	1.2DL + 1.5LM-MP1 + ...	Yes	Y		1	1.2	34	1.5	12	.058	14	.029	15	-.05												
87	1.2DL + 1.5LM-MP1 + ...	Yes	Y		1	1.2	34	1.5	13	.058	14	.05	15	-.0...												
88	1.2DL + 1.5LM-MP2 + ...	Yes	Y		1	1.2	35	1.5	2	.058	14	.058	15													
89	1.2DL + 1.5LM-MP2 + ...	Yes	Y		1	1.2	35	1.5	3	.058	14	.05	15	.029												
90	1.2DL + 1.5LM-MP2 + ...	Yes	Y		1	1.2	35	1.5	4	.058	14	.029	15	.05												
91	1.2DL + 1.5LM-MP2 + ...	Yes	Y		1	1.2	35	1.5	5	.058	14		15	.058												
92	1.2DL + 1.5LM-MP2 + ...	Yes	Y		1	1.2	35	1.5	6	.058	14	-.0...	15	.05												
93	1.2DL + 1.5LM-MP2 + ...	Yes	Y		1	1.2	35	1.5	7	.058	14	-.05	15	.029												
94	1.2DL + 1.5LM-MP2 + ...	Yes	Y		1	1.2	35	1.5	8	.058	14	-.0...	15													
95	1.2DL + 1.5LM-MP2 + ...	Yes	Y		1	1.2	35	1.5	9	.058	14	-.05	15	-.0...												
96	1.2DL + 1.5LM-MP2 + ...	Yes	Y		1	1.2	35	1.5	10	.058	14	-.0...	15	-.05												
97	1.2DL + 1.5LM-MP2 + ...	Yes	Y		1	1.2	35	1.5	11	.058	14		15	-.0...												
98	1.2DL + 1.5LM-MP2 + ...	Yes	Y		1	1.2	35	1.5	12	.058	14	.029	15	-.05												
99	1.2DL + 1.5LM-MP2 + ...	Yes	Y		1	1.2	35	1.5	13	.058	14	.05	15	-.0...												
100	1.2DL + 1.5LM-MP3 + ...	Yes	Y		1	1.2	36	1.5	2	.058	14	.058	15													
101	1.2DL + 1.5LM-MP3 + ...	Yes	Y		1	1.2	36	1.5	3	.058	14	.05	15	.029												
102	1.2DL + 1.5LM-MP3 + ...	Yes	Y		1	1.2	36	1.5	4	.058	14	.029	15	.05												
103	1.2DL + 1.5LM-MP3 + ...	Yes	Y		1	1.2	36	1.5	5	.058	14		15	.058												
104	1.2DL + 1.5LM-MP3 + ...	Yes	Y		1	1.2	36	1.5	6	.058	14	-.0...	15	.05												
105	1.2DL + 1.5LM-MP3 + ...	Yes	Y		1	1.2	36	1.5	7	.058	14	-.05	15	.029												
106	1.2DL + 1.5LM-MP3 + ...	Yes	Y		1	1.2	36	1.5	8	.058	14	-.0...	15													
107	1.2DL + 1.5LM-MP3 + ...	Yes	Y		1	1.2	36	1.5	9	.058	14	-.05	15	-.0...												
108	1.2DL + 1.5LM-MP3 + ...	Yes	Y		1	1.2	36	1.5	10	.058	14	-.0...	15	-.05												
109	1.2DL + 1.5LM-MP3 + ...	Yes	Y		1	1.2	36	1.5	11	.058	14		15	-.0...												
110	1.2DL + 1.5LM-MP3 + ...	Yes	Y		1	1.2	36	1.5	12	.058	14	.029	15	-.05												
111	1.2DL + 1.5LM-MP3 + ...	Yes	Y		1	1.2	36	1.5	13	.058	14	.05	15	-.0...												
112	1.2DL + 1.5LM-MP4 + ...	Yes	Y		1	1.2	37	1.5	2	.058	14	.058	15													
113	1.2DL + 1.5LM-MP4 + ...	Yes	Y		1	1.2	37	1.5	3	.058	14	.05	15	.029												

Load Combinations (Continued)

	Description	Solve	PDelta	SRSS	BLC	Factor	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
114	1.2DL + 1.5LM-MP4 + ...	Yes	Y		1	1.2	37	1.5	4	.058	14	.029	15	.05										
115	1.2DL + 1.5LM-MP4 + ...	Yes	Y		1	1.2	37	1.5	5	.058	14		15	.058										
116	1.2DL + 1.5LM-MP4 + ...	Yes	Y		1	1.2	37	1.5	6	.058	14	-.0...	15	.05										
117	1.2DL + 1.5LM-MP4 + ...	Yes	Y		1	1.2	37	1.5	7	.058	14	-.05	15	.029										
118	1.2DL + 1.5LM-MP4 + ...	Yes	Y		1	1.2	37	1.5	8	.058	14	-.0...	15											
119	1.2DL + 1.5LM-MP4 + ...	Yes	Y		1	1.2	37	1.5	9	.058	14	-.05	15	-.0...										
120	1.2DL + 1.5LM-MP4 + ...	Yes	Y		1	1.2	37	1.5	10	.058	14	-.0...	15	-.05										
121	1.2DL + 1.5LM-MP4 + ...	Yes	Y		1	1.2	37	1.5	11	.058	14		15	-.0...										
122	1.2DL + 1.5LM-MP4 + ...	Yes	Y		1	1.2	37	1.5	12	.058	14	.029	15	-.05										
123	1.2DL + 1.5LM-MP4 + ...	Yes	Y		1	1.2	37	1.5	13	.058	14	.05	15	-.0...										
124	1.2DL + 1.5LM-MP5 + ...	Yes	Y		1	1.2	38	1.5	2	.058	14	.058	15											
125	1.2DL + 1.5LM-MP5 + ...	Yes	Y		1	1.2	38	1.5	3	.058	14	.05	15	.029										
126	1.2DL + 1.5LM-MP5 + ...	Yes	Y		1	1.2	38	1.5	4	.058	14	.029	15	.05										
127	1.2DL + 1.5LM-MP5 + ...	Yes	Y		1	1.2	38	1.5	5	.058	14		15	.058										
128	1.2DL + 1.5LM-MP5 + ...	Yes	Y		1	1.2	38	1.5	6	.058	14	-.0...	15	.05										
129	1.2DL + 1.5LM-MP5 + ...	Yes	Y		1	1.2	38	1.5	7	.058	14	-.05	15	.029										
130	1.2DL + 1.5LM-MP5 + ...	Yes	Y		1	1.2	38	1.5	8	.058	14	-.0...	15											
131	1.2DL + 1.5LM-MP5 + ...	Yes	Y		1	1.2	38	1.5	9	.058	14	-.05	15	-.0...										
132	1.2DL + 1.5LM-MP5 + ...	Yes	Y		1	1.2	38	1.5	10	.058	14	-.0...	15	-.05										
133	1.2DL + 1.5LM-MP5 + ...	Yes	Y		1	1.2	38	1.5	11	.058	14		15	-.0...										
134	1.2DL + 1.5LM-MP5 + ...	Yes	Y		1	1.2	38	1.5	12	.058	14	.029	15	-.05										
135	1.2DL + 1.5LM-MP5 + ...	Yes	Y		1	1.2	38	1.5	13	.058	14	.05	15	-.0...										
136	1.2DL + 1.5LM-MP6 + ...	Yes	Y		1	1.2	39	1.5	2	.058	14	.058	15											
137	1.2DL + 1.5LM-MP6 + ...	Yes	Y		1	1.2	39	1.5	3	.058	14	.05	15	.029										
138	1.2DL + 1.5LM-MP6 + ...	Yes	Y		1	1.2	39	1.5	4	.058	14	.029	15	.05										
139	1.2DL + 1.5LM-MP6 + ...	Yes	Y		1	1.2	39	1.5	5	.058	14		15	.058										
140	1.2DL + 1.5LM-MP6 + ...	Yes	Y		1	1.2	39	1.5	6	.058	14	-.0...	15	.05										
141	1.2DL + 1.5LM-MP6 + ...	Yes	Y		1	1.2	39	1.5	7	.058	14	-.05	15	.029										
142	1.2DL + 1.5LM-MP6 + ...	Yes	Y		1	1.2	39	1.5	8	.058	14	-.0...	15											
143	1.2DL + 1.5LM-MP6 + ...	Yes	Y		1	1.2	39	1.5	9	.058	14	-.05	15	-.0...										
144	1.2DL + 1.5LM-MP6 + ...	Yes	Y		1	1.2	39	1.5	10	.058	14	-.0...	15	-.05										
145	1.2DL + 1.5LM-MP6 + ...	Yes	Y		1	1.2	39	1.5	11	.058	14		15	-.0...										
146	1.2DL + 1.5LM-MP6 + ...	Yes	Y		1	1.2	39	1.5	12	.058	14	.029	15	-.05										
147	1.2DL + 1.5LM-MP6 + ...	Yes	Y		1	1.2	39	1.5	13	.058	14	.05	15	-.0...										
148	1.2DL + 1.5LM-MP7 + ...	Yes	Y		1	1.2	40	1.5	2	.058	14	.058	15											
149	1.2DL + 1.5LM-MP7 + ...	Yes	Y		1	1.2	40	1.5	3	.058	14	.05	15	.029										
150	1.2DL + 1.5LM-MP7 + ...	Yes	Y		1	1.2	40	1.5	4	.058	14	.029	15	.05										
151	1.2DL + 1.5LM-MP7 + ...	Yes	Y		1	1.2	40	1.5	5	.058	14		15	.058										
152	1.2DL + 1.5LM-MP7 + ...	Yes	Y		1	1.2	40	1.5	6	.058	14	-.0...	15	.05										
153	1.2DL + 1.5LM-MP7 + ...	Yes	Y		1	1.2	40	1.5	7	.058	14	-.05	15	.029										
154	1.2DL + 1.5LM-MP7 + ...	Yes	Y		1	1.2	40	1.5	8	.058	14	-.0...	15											
155	1.2DL + 1.5LM-MP7 + ...	Yes	Y		1	1.2	40	1.5	9	.058	14	-.05	15	-.0...										
156	1.2DL + 1.5LM-MP7 + ...	Yes	Y		1	1.2	40	1.5	10	.058	14	-.0...	15	-.05										
157	1.2DL + 1.5LM-MP7 + ...	Yes	Y		1	1.2	40	1.5	11	.058	14		15	-.0...										
158	1.2DL + 1.5LM-MP7 + ...	Yes	Y		1	1.2	40	1.5	12	.058	14	.029	15	-.05										
159	1.2DL + 1.5LM-MP7 + ...	Yes	Y		1	1.2	40	1.5	13	.058	14	.05	15	-.0...										
160	1.2DL + 1.5LM-MP8 + ...	Yes	Y		1	1.2	41	1.5	2	.058	14	.058	15											
161	1.2DL + 1.5LM-MP8 + ...	Yes	Y		1	1.2	41	1.5	3	.058	14	.05	15	.029										
162	1.2DL + 1.5LM-MP8 + ...	Yes	Y		1	1.2	41	1.5	4	.058	14	.029	15	.05										
163	1.2DL + 1.5LM-MP8 + ...	Yes	Y		1	1.2	41	1.5	5	.058	14		15	.058										
164	1.2DL + 1.5LM-MP8 + ...	Yes	Y		1	1.2	41	1.5	6	.058	14	-.0...	15	.05										
165	1.2DL + 1.5LM-MP8 + ...	Yes	Y		1	1.2	41	1.5	7	.058	14	-.05	15	.029										
166	1.2DL + 1.5LM-MP8 + ...	Yes	Y		1	1.2	41	1.5	8	.058	14	-.0...	15											
167	1.2DL + 1.5LM-MP8 + ...	Yes	Y		1	1.2	41	1.5	9	.058	14	-.05	15	-.0...										
168	1.2DL + 1.5LM-MP8 + ...	Yes	Y		1	1.2	41	1.5	10	.058	14	-.0...	15	-.05										
169	1.2DL + 1.5LM-MP8 + ...	Yes	Y		1	1.2	41	1.5	11	.058	14		15	-.0...										
170	1.2DL + 1.5LM-MP8 + ...	Yes	Y		1	1.2	41	1.5	12	.058	14	.029	15	-.05										

Load Combinations (Continued)

	Description	Solve	PDelta	SRSS	BLC	Factor	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
171	1.2DL + 1.5LM-MP8 + ...	Yes	Y		1	1.2	41	1.5	13	.058	14	.05	15	-.0...										
172	1.2DL + 1.5LM-MP9 + ...	Yes	Y		1	1.2	42	1.5	2	.058	14	.058	15											
173	1.2DL + 1.5LM-MP9 + ...	Yes	Y		1	1.2	42	1.5	3	.058	14	.05	15	.029										
174	1.2DL + 1.5LM-MP9 + ...	Yes	Y		1	1.2	42	1.5	4	.058	14	.029	15	.05										
175	1.2DL + 1.5LM-MP9 + ...	Yes	Y		1	1.2	42	1.5	5	.058	14		15	.058										
176	1.2DL + 1.5LM-MP9 + ...	Yes	Y		1	1.2	42	1.5	6	.058	14	-.0...	15	.05										
177	1.2DL + 1.5LM-MP9 + ...	Yes	Y		1	1.2	42	1.5	7	.058	14	-.05	15	.029										
178	1.2DL + 1.5LM-MP9 + ...	Yes	Y		1	1.2	42	1.5	8	.058	14	-.0...	15											
179	1.2DL + 1.5LM-MP9 + ...	Yes	Y		1	1.2	42	1.5	9	.058	14	-.05	15	-.0...										
180	1.2DL + 1.5LM-MP9 + ...	Yes	Y		1	1.2	42	1.5	10	.058	14	-.0...	15	-.05										
181	1.2DL + 1.5LM-MP9 + ...	Yes	Y		1	1.2	42	1.5	11	.058	14		15	-.0...										
182	1.2DL + 1.5LM-MP9 + ...	Yes	Y		1	1.2	42	1.5	12	.058	14	.029	15	-.05										

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N1	max	1975.34	18	3689.735	33	1526.317	14	-751.588	14	1548.282	6	1569.862	145
2		min	-1978.032	12	487.836	14	-1756.705	8	-9690.577	33	-1548.418	24	-1571.818	151
3	N27	max	1959.896	17	3689.772	37	2269.758	2	4898.069	27	2232.24	10	8404.253	36
4		min	-2158.421	11	487.685	18	-2152.586	20	39.493	20	-2232.591	16	607.946	17
5	N53	max	2174.113	5	3689.759	29	2324.773	2	4897.194	27	2103.686	12	-547.706	23
6		min	-1973.64	23	487.732	22	-2210.857	20	92.101	20	-2100.062	18	-8408.036	30
7	Totals:	max	5997.785	5	10942.99	32	6087.76	2						
8		min	-5997.785	23	2291.854	62	-6087.747	20						

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

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*...	phi*...	phi*...	phi*...	...	Eqn
1	M14	L3X3X4	1.023	84.001	38	.141	0	z	6	1577..	46656	1688..	2160..	1	H2-1
2	M27	L3X3X4	1.022	84.002	29	.140	0	z	10	1577..	46656	1688..	2160..	1	H2-1
3	M1	L3X3X4	1.022	84	34	.142	0	z	2	1577..	46656	1688..	2160..	1	H2-1
4	M54	L3X3X4	.761	43.298	35	.028	43.298	y	27	1484..	46656	1688..	3135..	....	H2-1
5	M55	L3X3X4	.761	43.298	38	.028	43.298	y	27	1484..	46656	1688..	3134..	....	H2-1
6	M53	L3X3X4	.752	43.298	30	.029	43.298	y	35	1484..	46656	1688..	3133..	....	H2-1
7	MP2	PIPE_...	.659	56	2	.048	56		3	3003..	50715	3596..	3596..	....	H1-...
8	MP5	PIPE_...	.659	56	10	.047	56		9	3003..	50715	3596..	3596..	....	H1-...
9	MP8	PIPE_...	.659	56	6	.048	56		7	3003..	50715	3596..	3596..	....	H1-...
10	M15	HSS4X...	.620	0	35	.156	0	y	83	1337..	1395..	1618..	1618..	....	H1-...
11	M28	HSS4X...	.620	0	31	.156	0	y	123	1337..	1395..	1618..	1618..	....	H1-...
12	M2	HSS4X...	.612	0	31	.156	0	y	151	1337..	1395..	1618..	1618..	....	H1-...
13	MP1	PIPE_...	.559	43.5	31	.132	43.5		31	2086..	32130	1871..	1871..	....	H1-...
14	MP7	PIPE_...	.559	43.5	35	.132	43.5		35	2086..	32130	1871..	1871..	....	H1-...
15	MP3	PIPE_...	.559	43.5	35	.133	43.5		35	2086..	32130	1871..	1871..	....	H1-...
16	MP6	PIPE_...	.559	43.5	31	.133	43.5		31	2086..	32130	1871..	1871..	....	H1-...
17	MP4	PIPE_...	.559	43.5	27	.132	43.5		27	2086..	32130	1871..	1871..	....	H1-...
18	MP9	PIPE_...	.559	43.5	27	.133	43.5		27	2086..	32130	1871..	1871..	....	H1-...
19	M31A	PIPE_...	.502	81	27	.135	81		4	5397..	32130	1871..	1871..	....	H1-...
20	M38	PIPE_...	.502	81	35	.136	81		12	5397..	32130	1871..	1871..	....	H1-...
21	M39A	PIPE_...	.502	81	31	.135	81		8	5397..	32130	1871..	1871..	....	H1-...
22	M45	L2.5x2...	.257	9.004	33	.084	9.004	z	3	3785..	38556	1113..	2537..	....	H2-1
23	M43	L2.5x2...	.257	0	37	.084	0	y	7	3785..	38556	1113..	2537..	....	H2-1
24	M44	L2.5x2...	.257	0	29	.084	0	y	11	3785..	38556	1113..	2537..	....	H2-1
25	M26	LL3x3x...	.223	47	32	.018	0	y	11	7637..	93312	6480	4360..	....	H1-...
26	M13	LL3x3x...	.223	47	29	.018	0	y	7	7637..	93312	6480	4360..	....	H1-...
27	M39	LL3x3x...	.221	47	36	.018	0	y	3	7637..	93312	6480	4360..	....	H1-...

APPENDIX D

ADDITIONAL CALCUATIONS

INFINIGY

FROM ZERO TO INFINIGY

the solutions are endless

Welded Calculation Tool, V1.0

PROJECT DATA	
Site Name:	KINGS LOT
Site Number:	876327
Job Code:	1039-Z0001-B
Date:	11/6/2020

WELD INFORMATION		
Design:	LRFD	-
Weld Strength (F_EXX):	70	ksi
Weld Thickness:	0.25	in

MAIN SHAPE INFORMATION		
Main Shape:	Rectangle	-
Main Shape Material:	A 500 Gr. B Rect.	-
Main Shape Thickness:	0.250	in
Main Shape Size:	4X4	in

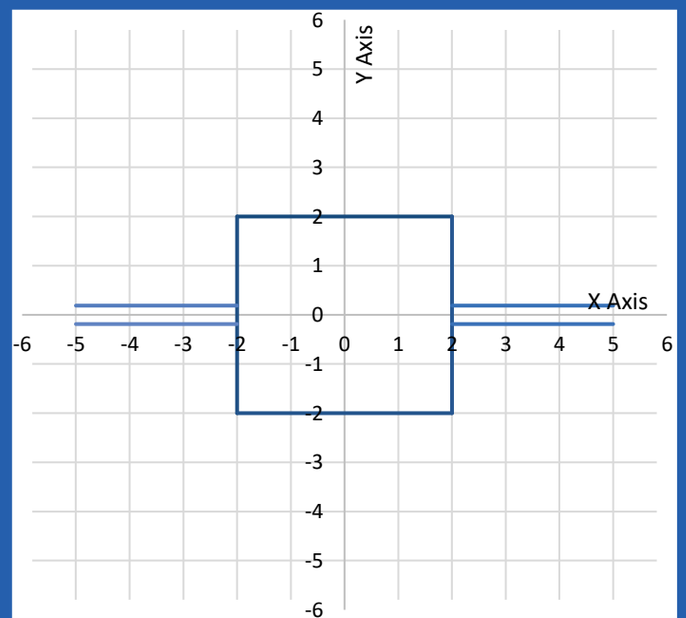
TOTAL SUM OF LINES PROPERTIES		
Polar Moment of Inertia:	241.755	in^3
Section Modulus X-X dir.:	21.544	in^2
Section Modulus Y-Y dir.:	39.733	in^2
Critical Usage Mode*:	Base Yielding	-
Critical Thickness Used**:	0.182	in

SECONDARY SHAPE INFORMATION		
Secondary Shape:	Custom	-
Secondary Shape Material:	A36	-
Secondary Shape Thickness:	0.188	in
Secondary Shape Size:	N/A	in

WELD DESCRIPTION
Platform to Tower

RESULTS		
Critical Risa Combination:	LC 37	-
Critical Member Label:	M15	-
Member End:	i	-
Weld Strength (Phi*Rn):	4060.800	lb/in
Weld Demand (Ru):	3052.406	lb/in
Usage ratio:	**75.2%**	OK

WELD DIAGRAM (NOT TO SCALE)



NOTES

*Base Yielding governs when the welded object has a lesser effective strength than the weld itself.

**For base shapes with double sided weldments half the thickness is used to calculate the effective strength.

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: CT11883C

CT883/Sprint S. Windsor
59 McGuire Road
South Windsor, Connecticut 06074

November 18, 2020

EBI Project Number: 6220005940

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**19.47%**

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

November 18, 2020

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

Emissions Analysis for Site: CT11883C - CT883/Sprint S. Windsor

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **59 McGuire Road** in **South Windsor, 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 59 McGuire Road in South Windsor, 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 138 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):	138 feet	Height (AGL):	138 feet	Height (AGL):	138 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 %:	**2.42%**	Antenna B1 MPE %:	**2.42%**	Antenna C1 MPE %:	**2.42%**
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):	138 feet	Height (AGL):	138 feet	Height (AGL):	138 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 %:	**3.16%**	Antenna B2 MPE %:	**3.16%**	Antenna C2 MPE %:	**3.16%**
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):	138 feet	Height (AGL):	138 feet	Height (AGL):	138 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 %:	**7.26%**	Antenna B3 MPE %:	**7.26%**	Antenna C3 MPE %:	**7.26%**

Site Composite MPE %	
Carrier	MPE %
T-Mobile (Max at Sector A):	12.85%
Sprint	2.63%
AT&T	3.99%
Site Total MPE % :	19.47%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	12.85%
T-Mobile Sector B Total:	12.85%
T-Mobile Sector C Total:	12.85%
Site Total MPE % :	19.47%

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	138.0	7.76	1900 MHz GSM	1000	0.78%
T-Mobile 1900 MHz LTE	2	2056.61	138.0	7.76	1900 MHz LTE	1000	0.78%
T-Mobile 2100 MHz LTE	2	2307.55	138.0	8.71	2100 MHz LTE	1000	0.87%
T-Mobile 600 MHz LTE	2	591.73	138.0	2.23	600 MHz LTE	400	0.56%
T-Mobile 600 MHz NR	1	1577.94	138.0	2.98	600 MHz NR	400	0.74%
T-Mobile 700 MHz LTE	2	695.22	138.0	2.62	700 MHz LTE	467	0.56%
T-Mobile 1900 MHz LTE	2	2104.51	138.0	7.95	1900 MHz LTE	1000	0.79%
T-Mobile 2100 MHz UMTS	2	1324.71	138.0	5.00	2100 MHz UMTS	1000	0.50%
T-Mobile 2500 MHz LTE	1	19238.94	138.0	36.32	2500 MHz LTE	1000	3.63%
T-Mobile 2500 MHz NR	1	19238.94	138.0	36.32	2500 MHz NR	1000	3.63%
						Total:	**12.85%**

• 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:	12.85%
Sector B:	12.85%
Sector C:	12.85%
T-Mobile Maximum MPE % (Sector A):	12.85%
Site Total:	19.47%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **19.47%** 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.