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

January 6, 2021

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

RE: **Notice of Exempt Modification for T-Mobile:**
841301 - T-Mobile Site ID: CT11261C
426 River Road, Willington, CT 06279
Latitude: 41° 53′ 26.72″ / Longitude: -72° 17′ 21.77″

Dear Ms. Bachman:

T-Mobile currently maintains two (2) antennas at the 100-foot mount on the existing 110-foot Monopole Tower, located at 426 River Road, Willington, CT. The tower is owned by Crown Castle and the property is owned by the Willington Fire Department. T-Mobile now intends to add two (2) new antennas 1900/2100/600/700 MHz antennas. The new antennas will be installed at the 100-ft level of the tower and will be capable of providing 5G services.

Planned Modifications:
Tower:

Install New:
(2) RFS-APXVAARR24_43-U-NA20 Antenna 1900/2100/600/700 MHz
(2) Radio 4449 B71/B12
(2) TMAs
(4) 1 ¼" Coax
(1) Hybrid

Existing to Remain:
(2) EMS RR90-17-XXDP Antenna (Dormant)
(2) TMAs to be relocated

Ground:

Upgrade to existing ground cabinet. (Internally)
Upgrade existing breakers.

The facility was approved by the Town of Willington Planning and Zoning Commission on August 15, 2000 by way of a Special Permit. The Special Permit was granted with conditions which this exempt modification complies with.

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 the Honorable Erika Wiecenski, First Selectwoman for the Town of Willington, Michael D'Amato, Zoning Agent, Crown Castle as the tower owner, and the Willington Fire Department as 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:

Erika Wiecenski, First Selectwoman (*via email only to ewiecenski@willingtonct.org*)
Town of Willington
40 Old Farms Road
Willington, CT 06279
860-487-3100

Michael D'Amato, Zoning Agent (*via email only to zoningagent@willingtonct.org*)

Town of Willington
40 Old Farms Road
Willington, CT 06279
860-487-3123

Willington Fire Department, Property Owner (*via email only to president@willingtonfire.org*)
PO Box 161
Willington, CT 06279

Crown Castle, Tower Owner

From:	Zsamba, Anne Marie
To:	president@willingtonfire.org
Subject:	Notice of Exempt Modification - T-Mobile - 426 River Road, Willington - 841301
Date:	Wednesday, January 6, 2021 11:51:00 AM
Attachments:	EM-T-MOBILE-426 RIVER ROAD WILLINGTON-841301-CT11261C-NOTICE.pdf

Dear Willington Fire Department:

Attached please find T-Mobile's exempt modification application that is being submitted to the Connecticut Siting Council today, January 6, 2021.

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

Best,
Anne Marie Zsamba

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

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

From:	Zsamba, Anne Marie
To:	"ewiecenski@willingtonct.org"
Subject:	Notice of Exempt Modification - T-Mobile - 426 River Road, Willington - 841301
Date:	Wednesday, January 6, 2021 11:51:00 AM
Attachments:	EM-T-MOBILE-426 RIVER ROAD WILLINGTON-841301-CT11261C-NOTICE.pdf

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Dear First Selectwoman Wiecenski:

Attached please find T-Mobile's exempt modification application that is being submitted to the Connecticut Siting Council today, January 6, 2021.

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

Best,
Anne Marie Zsamba

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

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

From:	Zsamba, Anne Marie
To:	"zoningagent@willingtonct.org"
Subject:	Notice of Exempt Modification - T-Mobile - 426 River Road, Willington - 841301
Date:	Wednesday, January 6, 2021 11:51:00 AM
Attachments:	EM-T-MOBILE-426 RIVER ROAD WILLINGTON-841301-CT11261C-NOTICE.pdf

Dear Zoning Agent D'Amato:

Attached please find T-Mobile's exempt modification application that is being submitted to the Connecticut Siting Council today, January 6, 2021.

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

Best,
Anne Marie Zsamba

ANNE MARIE ZSAMBA
Site Acquisition Specialist
T: (201) 236-9224
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CROWN CASTLE
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Clifton Park, NY 12065
CrownCastle.com

Exhibit A

Original Facility Approval

TOWN OF WILLINGTON
PLANNING AND ZONING COMMISSION

SPECIAL PERMIT

Date: 9/26/2000

This is to certify that the use: **Monopole Antenna Tower and Support Building for Wireless Communications Facility** located on **426 River Road** Assessors Map **34**, lot **10**, Zone **R80** has been approved **with conditions** by the Willington Planning and Zoning Commission on **8/15/2000** pursuant to **Section 13** of the Town of Willington Zoning Regulations, which findings are on file with the Commission.

Owner of Record: Willington Fire Department #1

S. Yorgensen
Agent

Conditions:

1) Prior to the start of construction, any FCC and FAA approvals shall be provided to the zoning agent.
2) As stated at the public hearing, the applicant shall agree to comply with any technical revisions suggested by the town engineer and/or the zoning agent, and updated drawings to reflect those revisions shall be provided.
3) The driveway shall meet zoning regulations, as they may be waived by the zoning agent.
4) The elevation of the top of any antenna shall not exceed 642 feet above sea level.
5) The exterior lighting switch shall be arranged so any exterior lighting is not on all the time, but rather only when required by workers.
6) All easements shall be depicted on the final site plan
7) A gate shall be provided on the northeast access road at the location of the barbed wire fence.

Received for record October 25, 00
At Lic 0for Donna J Hardie TC

Applicant should obtain a copy of the Zoning Regulations which detail specific requirements.

TOWN OF WILLINGTON
Planning and Zoning Commission
40 Old Farms Road, Willington, CT 06279

Application for: *Special Permit* X *Amendment*___ *Site Plan Approval*___ *Modification*___

Location of property: 426 River Road, Willington, Connecticut 06279

Assessors Map #: 34 Assessors Lot #: 10 Existing Zone: R-80 Area of property: 12.6 acres

Historical District Certificate of Appropriateness is attached to this application (if applicable): N/A

Special Permit Requested: Construction of monopole and support building

Names, addresses and telephone numbers of owner/owners:

Willington Fire Department, Inc. #1 c/o Chief Tyler Millix, P.O. Box 161
426 River Road, Willington, Connecticut 06279 (860-429-0288)

Name, address and telephone number of petitioner if other than owner:

N/A

Description of existing and proposed use of land and buildings:

Existing use: Willington Fire Department, Inc. facility

Proposed use: Construction of a monopole and support building for a wireless communications facility and improvements to existing access driveway pursuant to Sections 7.06.04 and 7.06.04.06 of the zoning regulations.

Please submit with this application form all data and maps required in Section 13 of the Zoning Regulations. The undersigned owner(s) of the property hereby authorizes the Planning and Zoning Commission or their agent to enter and inspect premises at any reasonable hour.

Signature of owner(s): [signature] Date: May 12, 2000
Tyler Millix, Chief
Willington Fire Dept., Inc. #1 Date:

I(we) the undersigned petitioner(s) understand that the submission of inaccurate or incomplete information shall be grounds for denial of this application by the P.Z.C.

Signature(s): [signature] Date: May 12, 2000
Tyler Millix, Chief
Willington Fire Dept., Inc. #1 Date:

*List of property owners within five hundred (500) feet of subject property attached hereto as Exhibit A.

A:SPECIAL

Exhibit B

Property Card

426 RIVER RD

Location	426 RIVER RD	**Mblu**	34/ / 010-00/ /
Acct#	00242700	**Owner**	WILLINGTON FIRE DEPT INC
Assessment	$383,350	**Appraisal**	$547,630
PID	4891	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2018	$453,400	$94,230	$547,630

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2018	$317,390	$65,960	$383,350

Owner of Record

Owner	WILLINGTON FIRE DEPT INC	**Sale Price**	$0
Co-Owner		**Certificate**	1
Address	P O BOX 161 WILLINGTON, CT 06279	**Book & Page**	80/355
		Sale Date	06/25/1980

Building Information

Building 1 : Section 1

Year Built: 1985
Living Area: 4,266
Replacement Cost: $661,759
Building Percent Good: 65
Replacement Cost Less Depreciation: $430,140

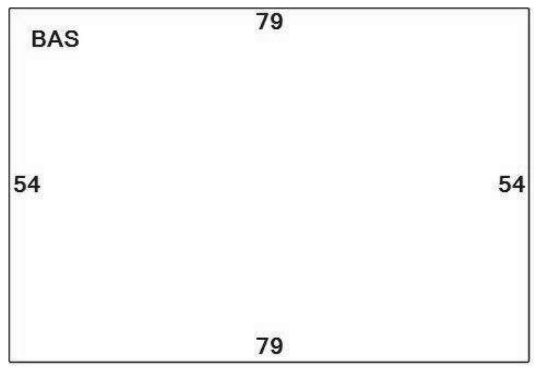
Building Attributes	
Field	**Description**
STYLE	Fire Station
MODEL	Industrial
Grade	A
Stories:	1
Occupancy	1.00

Exterior Wall 1	Typical
Exterior Wall 2	
Roof Structure	Typical
Roof Cover	Typical
Interior Wall 1	Typical
Interior Wall 2	
Interior Floor 1	Typical
Interior Floor 2	
Heating Fuel	Typical
Heating Type	Floor Furnace
AC Type	Unit/AC
Bldg Use	MUN FIRE
Total Rooms	
Total Bedrms	
Total Baths	
1st Floor Use:	
Heat/AC	None
Frame Type	Fireprf Steel
Baths/Plumbing	Average
Ceiling/Wall	-DESCRIPTION-
Rooms/Prtns	Average
Wall Height	14.00
% Comn Wall	

Building Photo

(http://images.vgsi.com/photos/WillingtonCTPhotos//00\00\18\23.jpg)

Building Layout



(ParcelSketch.ashx?pid=4891&bid=4891)

Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	4,266	4,266
		4,266	4,266

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code 9032
Description MUN FIRE
Zone R80
Neighborhood 301

Land Line Valuation

Size (Acres) 13.16
Frontage
Depth
Assessed Value $65,960

Alt Land Appr Category No

Appraised Value $94,230

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
LT1	LIGHTS-IN W/PL			1.00 UNITS	$480	1
LT5	MERC VAP/FLU			1.00 UNITS	$770	1
PAV1	PAVING-ASPHALT			15000.00 S.F.	$21,000	1
SHD1	SHED FRAME			168.00 S.F.	$1,010	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2019	$453,400	$94,230	$547,630

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2019	$317,390	$65,960	$383,350

Exhibit C

Construction Drawings

T-Mobile

L600 PROJECT

SITE NUMBER: CT11261C

SITE NAME: TOLLAND/I-84/FILL-IN

CROWN SITE NAME: WILLINGTON-RIVER RD

BU#: 841301

T-MOBILE RAN TEMPLATE: CUSTOM

NOTE:

ALL CONSTRUCTION ACTIVITIES ARE TO BE COMPLETED DIRECTLY THROUGH CROWN. CONTRACTOR MUST HAVE CONSTRUCTION PO AND NTP FROM CROWN DIRECT IN ORDER TO BEGIN. PRE-APPROVAL TO ENTER THE PROPERTY MUST BE OBTAINED. FOR ACCESS AUTHORIZATION, PLEASE CONTACT CROWN.

SCOPE OF WORK

ITEMS TO BE INSTALLED ON & REMOVED FROM EXISTING TOWER :

- INSTALL T-MOBILE ANTENNA (APXVAARR24_43-U-NA20) (TYP. OF 1 PER SECTOR, TOTAL OF 2).
- INSTALL T-MOBILE RADIO (4449 B71+B12) (TYP. OF 1 PER SECTOR, TOTAL OF 2).
- INSTALL T-MOBILE TMAS (AWS) (TYP. OF 1 PER SECTOR, TOTAL OF 2).
- INSTALL T-MOBILE COAX CABLES (TYP. OF 2 PER SECTOR, TOTAL OF 4).
- INSTALL T-MOBILE COAX JUMPER CABLES (TYP. OF 4 PER SECTOR, TOTAL OF 8).
- INSTALL T-MOBILE FIBER JUMPER CABLES (TYP. OF 1 PER SECTOR, TOTAL OF 2).
- INSTALL T-MOBILE 6x12 HCS HYBRID CABLE (TOTAL OF 1).

ITEMS TO BE INSTALLED ON EXISTING EQUIPMENT PAD:

- REMOVE (1) DUS41
- INSTALL (2) ERICSSON BASEBAND 6630 UNITS
- INSTALL (6) RUS01 B4
- RELOCATE T-MOBILE TMAS (PCS) (TYP. OF 1 PER SECTOR, TOTAL OF 2).

ITEMS TO REMAIN:

- (2) ANTENNAS, (2) TMAS, (4) COAX CABLES, (6) RUS01 B2

SITE ADDRESS:	426 RIVER ROAD WILLINGTON, CT 06279
LATITUDE (NAD 83):	N 41° 53' 26.72"
LONGITUDE (NAD 83):	W 72° 17' 21.77"
COUNTY:	TOLLAND
JURISDICTION:	-
LANDLORD:	CROWN CASTLE INTERNATIONAL 500 W. CUMMINGS PARK, STE 3600 WOBURN, MA 01801
STRUCTURE TYPE:	MONOPOLE
STRUCTURE HEIGHT:	110'
RAD CENTER:	100'
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY

DRAWING INDEX

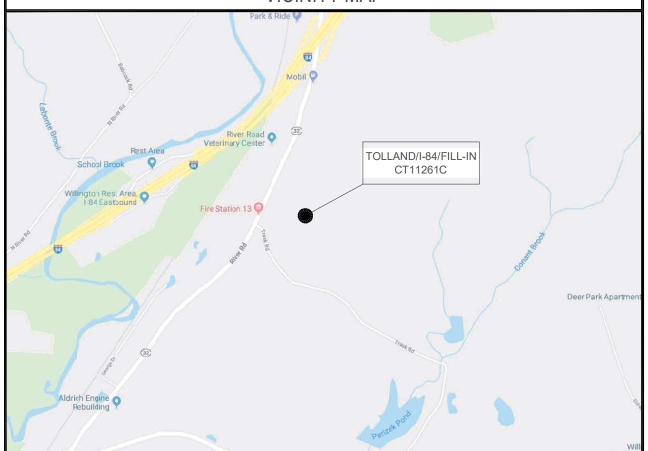
SHEET NO:	SHEET TITLE
T-1	TITLE SHEET
GN-1	GENERAL NOTES
C-1	SITE PLAN
S-1	PROPOSED TOWER ELEVATION & ANTENNA LAYOUT PLAN
S-2	EQUIPMENT DETAILS
RF-1	ANTENNA INFORMATION CHART
E-1	ONE LINE DIAGRAM
G-1	GROUNDING RISER DIAGRAM

CROWN CASTLE SITE ID #: 841301
CROWN CASTLE SITE NAME: WILLINGTON-RIVER RD

ENGINEERING

2018 CONNECTICUT STATE BUILDING CODE
2018 AMENDMENT WITH 2015 INTERNATIONAL BUILDING CODE
2009 ICC/ANSI A117.1 ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES
2015 INTERNATIONAL MECHANICAL CODE
2015 INTERNATIONAL ENERGY CONSERVATION CODE
2017 NATIONAL ELECTRICAL CODE (NFPA 70 2017)
ANSI/TIA-222-G

VICINITY MAP



WILLINGTON RT 84 EAST TAKE EXIT 70 TURN RIGHT GO 5 MILE TO FIRE STATION ON LEFT TURN INTO THE RIGHT SIDE OF THE PARKING LOT TRASK RD AND FOLLOW, ACCESS RD ON LEFT 41.53'19.2480", -072.17'14.0820"

GENERAL NOTES

1. THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
2. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE T-MOBILE REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.
3. HANDICAP REQUIREMENTS ARE NOT REQUIRED.
4. THIS FACILITY SHALL MEET OR EXCEED ALL FAA AND FCC REGULATORY REQUIREMENTS.
5. ALL NEW MATERIAL SHALL BE FURNISHED AND INSTALLED BY CONTRACTOR UNLESS NOTED OTHERWISE. EQUIPMENT, ANTENNAS/RADIOS AND CABLES FURNISHED BY OWNER AND INSTALLED BY CONTRACTOR.
6. NO COMMERCIAL SIGNAGE IS PROPOSED.

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

811

T-Mobile
T-MOBILE NORTHEAST LLC
103 MONARCH DRIVE
LIVERPOOL, NY 13088

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

JACOBS
JACOBS ENGINEERING GROUP, INC.
120 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116

STATE OF CONNECTICUT
CRAIG A. THOMAS
No. 0029052
PROFESSIONAL ENGINEER LICENSED
Craig Thomas
07/17/2019
16:44:31-04:00

PROJECT NO:	ERCC0004
DRAWN BY:	AJM
CHECKED BY:	CAT

SUBMITTALS

0	07/17/19	ISSUED FOR PERMITTING

TOLLAND/I-84/FILL-IN
CT11261C
WILLINGTON-RIVER RD
841301
426 RIVER ROAD
WILLINGTON, CT 06279

TITLE SHEET

T-1

CROWN CASTLE USA INC. SITE ACTIVITY REQUIREMENTS:

1. NOTICE TO PROCEED- NO WORK SHALL COMMENCE PRIOR TO CROWN CASTLE USA INC. WRITTEN NOTICE TO PROCEED (NTP) AND THE ISSUANCE OF A PURCHASE ORDER. PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE CROWN CASTLE USA INC. NOC AT 800-788-7011 & THE CROWN CASTLE USA INC. CONSTRUCTION MANAGER.
2. "LOOK UP" - CROWN CASTLE USA INC. SAFETY CLIMB REQUIREMENT:
THE INTEGRITY OF THE SAFETY CLIMB AND ALL COMPONENTS OF THE CLIMBING FACILITY SHALL BE CONSIDERED DURING ALL STAGES OF DESIGN, INSTALLATION, AND INSPECTION. TOWER MODIFICATION, MOUNT REINFORCEMENTS, AND/OR EQUIPMENT INSTALLATIONS SHALL NOT COMPROMISE THE INTEGRITY OR FUNCTIONAL USE OF THE SAFETY CLIMB OR ANY COMPONENTS OF THE CLIMBING FACILITY ON THE STRUCTURE. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO: PINCHING OF THE WIRE ROPE, BENDING OF THE WIRE ROPE FROM ITS SUPPORTS, DIRECT CONTACT OR CLOSE PROXIMITY TO THE WIRE ROPE WHICH MAY CAUSE FRICTIONAL WEAR, IMPACT TO THE ANCHORAGE POINTS IN ANY WAY, OR TO IMPEDE/BLOCK ITS INTENDED USE. ANY COMPROMISED SAFETY CLIMB, INCLUDING EXISTING CONDITIONS MUST BE TAGGED OUT AND REPORTED TO YOUR CROWN CASTLE USA INC. POC OR CALL THE NOC TO GENERATE A SAFETY CLIMB MAINTENANCE AND CONTRACTOR NOTICE TICKET.
3. PRIOR TO THE START OF CONSTRUCTION, ALL REQUIRED JURISDICTIONAL PERMITS SHALL BE OBTAINED. THIS INCLUDES, BUT IS NOT LIMITED TO, BUILDING, ELECTRICAL, MECHANICAL, FIRE, FLOOD ZONE, ENVIRONMENTAL, AND ZONING. AFTER ONSITE ACTIVITIES AND CONSTRUCTION ARE COMPLETED, ALL REQUIRED PERMITS SHALL BE SATISFIED AND CLOSED OUT ACCORDING TO LOCAL JURISDICTIONAL REQUIREMENTS.
4. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN, AND SHALL MEET ANSI/ASSE A10.48 (LATEST EDITION); FEDERAL, STATE, AND LOCAL REGULATIONS; AND ANY APPLICABLE INDUSTRY CONSENSUS STANDARDS RELATED TO THE CONSTRUCTION ACTIVITIES BEING PERFORMED. ALL RIGGING PLANS SHALL ADHERE TO ANSI/ASSE A10.48 (LATEST EDITION) AND CROWN CASTLE USA INC. STANDARD CED-STD-10253, INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION, TO CERTIFY THE SUPPORTING STRUCTURE(S) IN ACCORDANCE WITH ANSI/TIA-322 (LATEST EDITION).
5. ALL SITE WORK TO COMPLY WITH QAS-STD-10068 "INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON CROWN CASTLE USA INC. TOWER SITE" 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.

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, 20,000 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 "CT11261C".
30. ALL EMPTY/SPARE CONDUITS THAT ARE INSTALLED ARE TO HAVE A METERED MULE TAPE PULL CORD INSTALLED.

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).

CONDUCTOR COLOR CODE

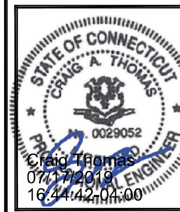
SYSTEM	CONDUCTOR	COLOR
120/240V, 1Ø	A PHASE	BLACK
	B PHASE	RED
	NEUTRAL	WHITE
	GROUND	GREEN
120/208V, 3Ø	A PHASE	BLACK
	B PHASE	RED
	C PHASE	BLUE
	NEUTRAL	WHITE
	GROUND	GREEN
277/480V, 3Ø	A PHASE	BROWN
	B PHASE	ORANGE OR PURPLE
	C PHASE	YELLOW
	NEUTRAL	GREY
	GROUND	GREEN
DC VOLTAGE	POS (+)	RED**
	NEG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

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

T-Mobile
T-MOBILE NORTHEAST LLC
103 MONARCH DRIVE
LIVERPOOL, NY 13088

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

JACOBS
JACOBS ENGINEERING GROUP, INC.
120 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116



PROJECT NO: ERCC0004

DRAWN BY: AJM

CHECKED BY: CAT

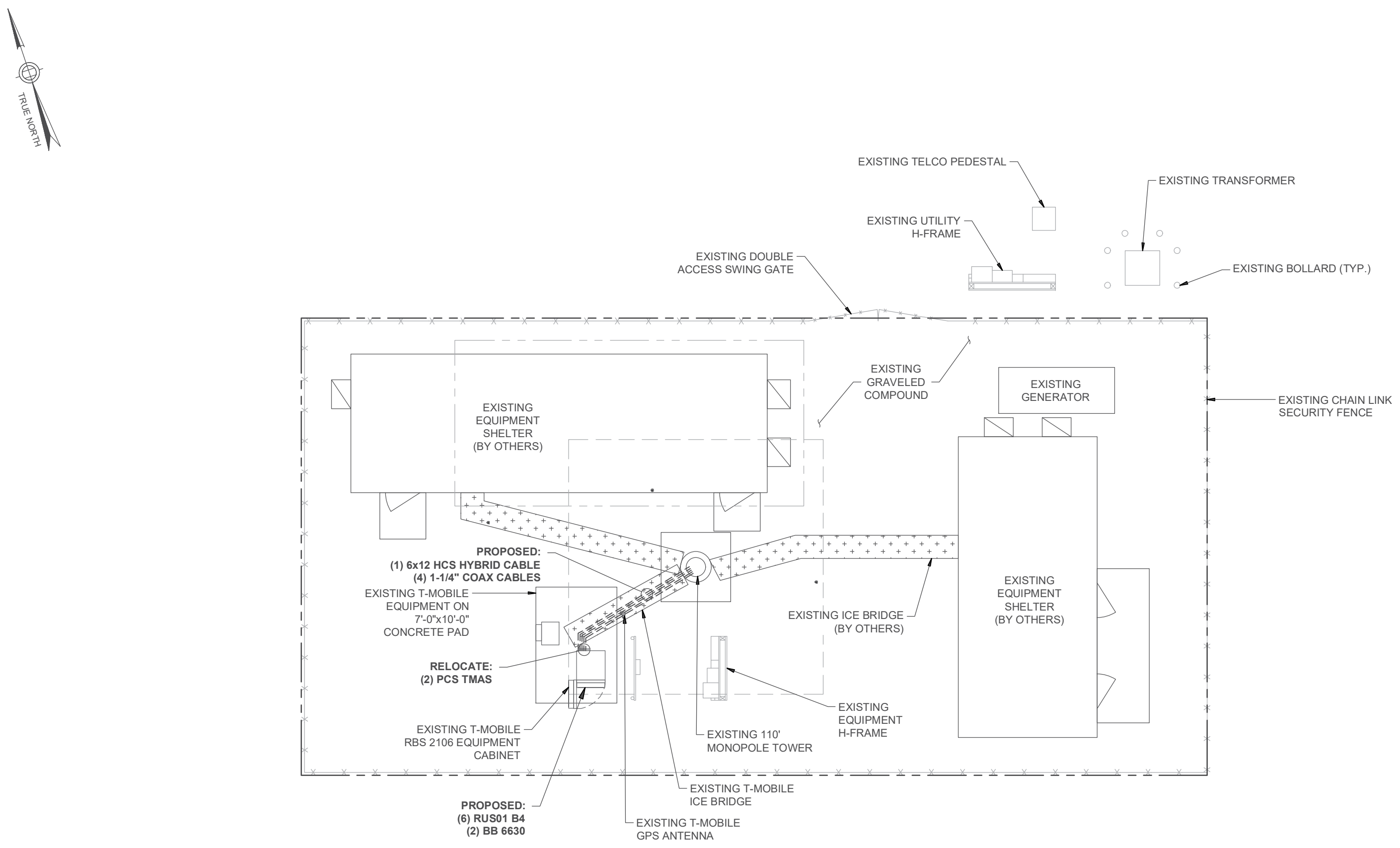
SUBMITTALS

0	07/17/19	ISSUED FOR PERMITTING

TOLLAND/I-84/FILL-IN
CT11261C
WILLINGTON-RIVER RD
841301
426 RIVER ROAD
WILLINGTON, CT 06279

GENERAL NOTES

GN-1



NOTES:

1. PLAN BASED ON AUTOCAD DRAWINGS ISSUED BY CROWN CASTLE ON 05/03/2017. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS AND LOCATION/ORIENTATION OF EXISTING EQUIPMENT.

1 SITE PLAN

SCALE: 3/16" = 1'-0"

T-Mobile

T-MOBILE NORTHEAST LLC
103 MONARCH DRIVE
LIVERPOOL, NY 13088

CROWN CASTLE

3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065

JACOBS
JACOBS ENGINEERING GROUP, INC.

120 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116

STATE OF CONNECTICUT
CRAIG A. THOMAS
No. 0029052
PROFESSIONAL ENGINEER
LICENSED

Craig Thomas
07/17/2019
16:44:51-04:00

PROJECT NO: ERCC0004

DRAWN BY: AJM

CHECKED BY: CAT

SUBMITTALS

0	07/17/19	ISSUED FOR PERMITTING

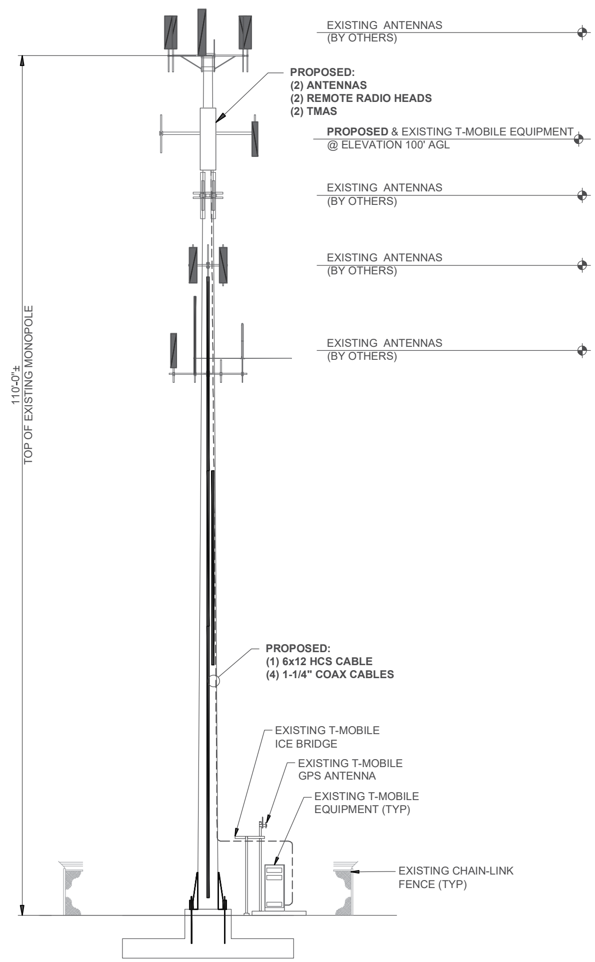
TOLLAND/I-84/FILL-IN
CT11261C
WILLINGTON-RIVER RD
841301
426 RIVER ROAD
WILLINGTON, CT 06279

SITE PLAN

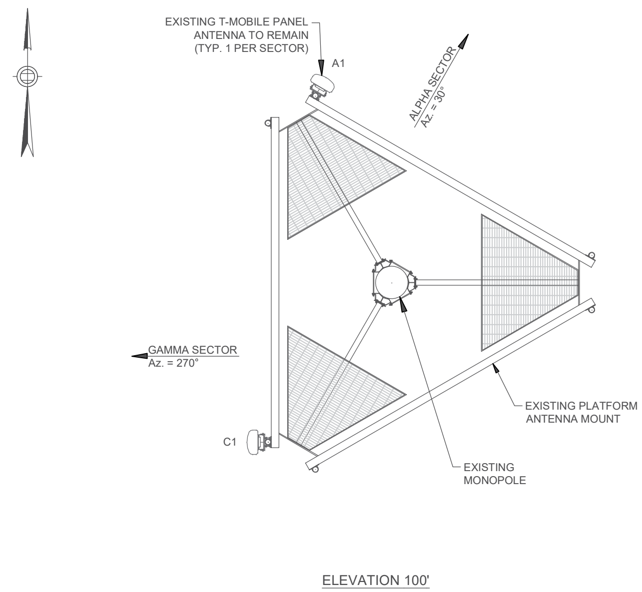
C-1

NOTES:

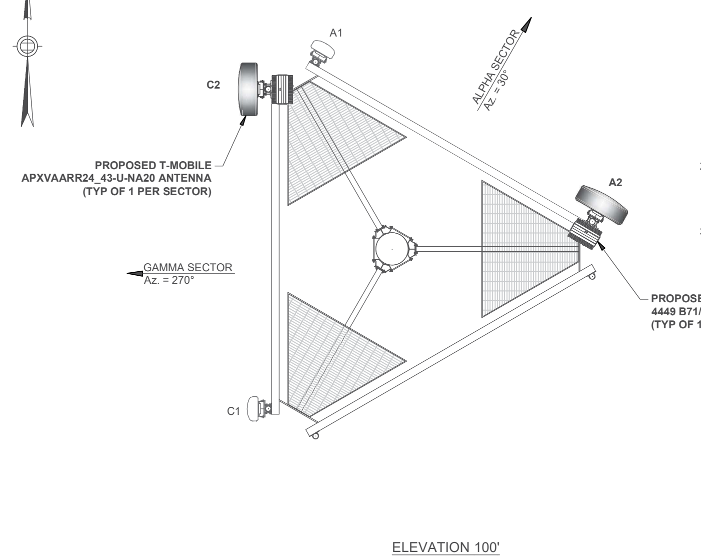
1. CONTRACTOR SHALL REFER TO THE STRUCTURAL ANALYSIS REPORT; SITE NUMBER: CT11261C; SITE NAME: TOLLAND/I-84/FILL-IN; CROWN BU NUMBER: 841301; CROWN SITE NAME: WILLINGTON-RIVER RD; CROWN ORDER NUMBER: 479824; ISSUED BY BLACK & VEATCH CORP.. DATED ON 06/19/19. PER THIS ANALYSIS NO MODIFICATIONS ARE REQUIRED. THE CONTRACTOR SHALL VERIFY ALL EXISTING MEMBERS AND HARDWARE ARE INSTALLED PROPERLY AS DESCRIBED IN THIS REPORT.



1 TOWER ELEVATION SCALE: 1/8" = 1'-0"



2 EXISTING ANTENNA LAYOUT SCALE: N.T.S.



NOTES:

1. CONTRACTOR SHALL REFER TO THE MOUNT ANALYSIS REPORT; SITE NUMBER: CT11261C; SITE NAME: TOLLAND/I-84/FILL-IN; CROWN BU NUMBER: 841301; CROWN SITE NAME: WILLINGTON-RIVER RD; CROWN ORDER NUMBER: 479824; ISSUED BY B + T GROUP, DATED ON 06/05/2019. PER THIS ANALYSIS NO MODIFICATIONS ARE REQUIRED FOR THE PROPOSED EQUIPMENT. CONTRACTOR SHALL CONFIRM ALL T-MOBILE EXISTING AND PROPOSED EQUIPMENT ARE INSTALLED IN ACCORDANCE WITH THIS REPORT.
2. CONTRACTOR TO VERIFY FINAL RF CONFIGURATION AND NOTIFY CARRIER AND ENGINEER W/ ANY DISCREPANCIES PRIOR TO THE INSTALLATION.
3. CONTRACTOR SHALL NOT EXCEED MOUNTING MORE THAN (2) RRHS PER ANTENNA MOUNTING PIPE - RELOCATE TO AN ADJACENT ANTENNA MOUNTING PIPE AS NEEDED.

3 PROPOSED ANTENNA LAYOUT SCALE: N.T.S.

T-Mobile
T-MOBILE NORTHEAST LLC
103 MONARCH DRIVE
LIVERPOOL, NY 13088

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

JACOBS
JACOBS ENGINEERING GROUP, INC.
120 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116

STATE OF CONNECTICUT CRAIG A. THOMAS No. 0029052 PROFESSIONAL ENGINEER LICENSED
Craig Thomas
07/17/2019
16:45:11-04:00

PROJECT NO: ERCC0004

DRAWN BY: AJM

CHECKED BY: CAT

SUBMITTALS

0	07/17/19	ISSUED FOR PERMITTING

TOLLAND/I-84/FILL-IN
CT11261C
WILLINGTON-RIVER RD
841301
426 RIVER ROAD
WILLINGTON, CT 06279

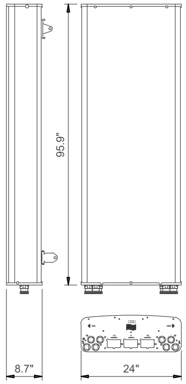
PROPOSED TOWER ELEVATION & ANTENNA LAYOUT PLAN

S-1

MANUFACTURER: RFS
MODEL NO.: APXVAARR24_43-U-NA20

COLOR: LIGHT GRAY
DIMENSIONS (LxWxD): 95.9" x 24" x 8.7"
2436mm x 609mm x 222mm
WEIGHT (lbs): 58

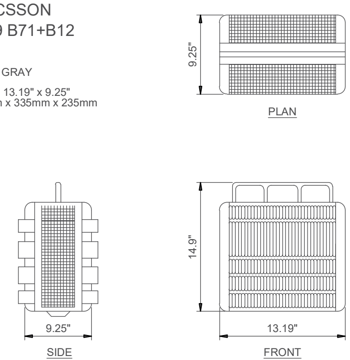
CONNECTOR: 8 x 4.3-10 FEMALE AT BOTTOM +
6 AISG CONNECTORS (3 MALE/3 FEMALE)
SURVIVAL/RATED WIND VELOCITY (KM/H): 241 (150)



1 ANTENNA SPECIFICATIONS SCALE: N.T.S.

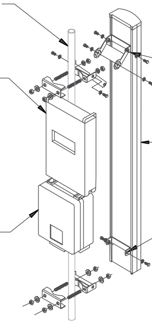
MANUFACTURER: ERICSSON
MODEL NO.: 4449 B71+B12

COLOR: LIGHT GRAY
DIMENSIONS (LxWxD): 14.9" x 13.19" x 9.25"
378mm x 335mm x 235mm
WEIGHT (lbs): 74



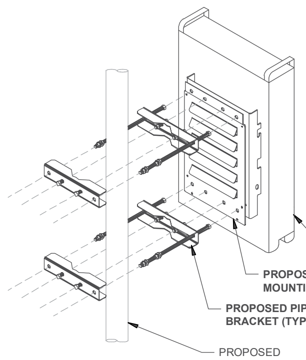
2 RRUS SPECIFICATIONS SCALE: N.T.S.

NOTE
MOUNTING OPTIONS ARE INCLUDED PRODUCTS WITH ANTENNA PURCHASE



3 RRU MOUNTING DETAIL W/ANTENNA SCALE: N.T.S.

NOTE
ANTENNA NOT SHOWN FOR CLARITY.



4 RRU MOUNTING DETAIL SCALE: N.T.S.

MANUFACTURER: ERICSSON
MODEL NO.: KRY 112 14
DIMENSIONS (LxWxD): 12.1" x 4.9" x 4.3"
308mm x 124mm x 109mm
WEIGHT (lbs): 12.1

5 TMA SPECIFICATIONS SCALE: N.T.S.

6 DETAIL NOT USED SCALE: N.T.S.

7 DETAIL NOT USED SCALE: N.T.S.

8 DETAIL NOT USED SCALE: N.T.S.

9 DETAIL NOT USED SCALE: N.T.S.

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SUITE 101
CLIFTON PARK, NY 12065

JACOBS
JACOBS ENGINEERING GROUP, INC.
120 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116

STATE OF CONNECTICUT
CRAIG A. THOMAS
No. 0029052
PROFESSIONAL LICENSED ENGINEER
Craig Thomas
07/17/2019
16:45:21-04:00

PROJECT NO:	ERCC0004
DRAWN BY:	AJM
CHECKED BY:	CAT

SUBMITTALS

0	07/17/19	ISSUED FOR PERMITTING

TOLLAND/I-84/FILL-IN
CT11261C
WILLINGTON-RIVER RD
841301
426 RIVER ROAD
WILLINGTON, CT 06279

EQUIPMENT DETAILS

S-2

CUSTOM - TOWER TOP EQUIPMENT SCHEDULE (RE: 841301_CT11261C_L600_3.1_DRAFT_2019-05-13)													
ANTENNA NUMBER (FROM L TO R)	ANTENNA MODEL	ANTENNA AZIMUTH	MECH. TILT	ELEC. TILT	ANTENNA CENTERLINE FROM GROUND	TMA/RRUS MODEL	TMA/RRUS QUANTITY	COAX/HYBRID CABLE			JUMPERS		
								SIZE/TYPE	QUANTITY	LENGTH	TYPE	QTY	LENGTH
A1	EMS - RR90-17-XXDP	30°	0°	2°	100'	-	-	-	-	-	-	-	-
A2	**APXVAARR24_43-U-NA20**	**30°**	**0°**	**2°**	**100'**	TWIN STYLE 1A-PCS TMA **RADIO 4449 B71+B12** **TWIN STYLE 1B-AWS TMA**	1 **1** **1**	1-1/4" COAX **6/12 HCS** **1-1/4" COAX**	2 **1** **2**	160' **160'** **160'**	**COAX** **FIBER**	**4** **1**	**10'** **10'**
C1	EMS - RR90-17-XXDP	270°	0°	2°	100'	-	-	-	-	-	-	-	-
C2	**APXVAARR24_43-U-NA20**	**270°**	**0°**	**2°**	**100'**	TWIN STYLE 1A-PCS TMA **RADIO 4449 B71+B12** **TWIN STYLE 1B-AWS TMA**	1 **1** **1**	1-1/4" COAX - **1-1/4" COAX**	2 - **2**	160' - **160'**	**COAX** **FIBER**	**4** **1**	**10'** **10'**

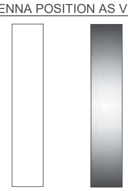
NOTES:

1. EQUIPMENT LISTED IN **BOLD**, DELINEATES THAT THE EQUIPMENT IS PROPOSED.

1 EQUIPMENT INFORMATION CHART

SCALE: NONE

KEY
EXISTING
PROPOSED
KEY
ANTENNA POSITION AS VIEW FROM BEHIND



EQUIPMENT NOTES:

1. THE HYBRID CABLE LENGTH SHOW IS ONLY AN ESTIMATE AND SHOULD NOT BE USED FOR ORDERING MATERIALS. CONFIRM THE REQUIRED HYBRID CABLE LENGTH WITH T-MOBILE PRIOR TO ORDERING OR INSTALLATION.
2. THE CONTRACTOR SHALL TEST THE OPTICAL FIBER AFTER INSTALLATION IN ACCORDANCE WITH T-MOBILE STANDARDS AND SUPPLY THE RESULTS TO T-MOBILE.
3. THE CONTRACTOR SHALL CONFIRM THE TOWER TOP EQUIPMENT LIST ABOVE WITH THE FINAL T-MOBILE RFDS PRIOR TO INSTALLATION.
4. ALL EXISTING AND PROPOSED ANTENNA CABLES SHALL BE COLOR CODED PER T-MOBILE STANDARDS.
5. REFER TO EQUIPMENT INSTALLATION STANDARDS FOR ADDITIONAL INFORMATION.
6. REFER TO EQUIPMENT MANUFACTURER'S SPECIFICATION SHEETS FOR ADDITIONAL INFORMATION NOT LISTED ABOVE.

2 ANTENNA KEY

SCALE: NONE

CUSTOM - TOWER LOADING SUMMARY				
EQUIPMENT TYPE	EXISTING QUANTITY	QUANTITY REMOVED	QUANTITY ADDED	TOTAL QUANTITY
PANEL ANTENNA	2	0	2	4
COAX CABLE	4	0	4	8
HYBRID CABLE	0	0	1	1
FIBER JUMPER	0	0	2	2
COAX JUMPER	0	0	8	8
TMA	2	0	2	4
RADIO	0	0	2	2

3 ANTENNA & CABLE SCHEDULE

SCALE: NONE

T-Mobile

T-MOBILE NORTHEAST LLC
103 MONARCH DRIVE
LIVERPOOL, NY 13088

CROWN CASTLE

3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065

JACOBS
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120 ST. JAMES AVENUE, 5TH FLOOR
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841301

426 RIVER ROAD
WILLINGTON, CT 06279

ANTENNA
INFORMATION CHART

RF-1

ONE LINE DIAGRAM NOTES:

1. ELECTRICAL SERVICE SHALL BE 200A, 240/120V, 1Ø, 3W

2. FOR COMPLETE INTERNAL WIRING AND ARRANGEMENT, REFER TO VENDOR PRINTS PROVIDED BY EQUIPMENT MANUFACTURER.

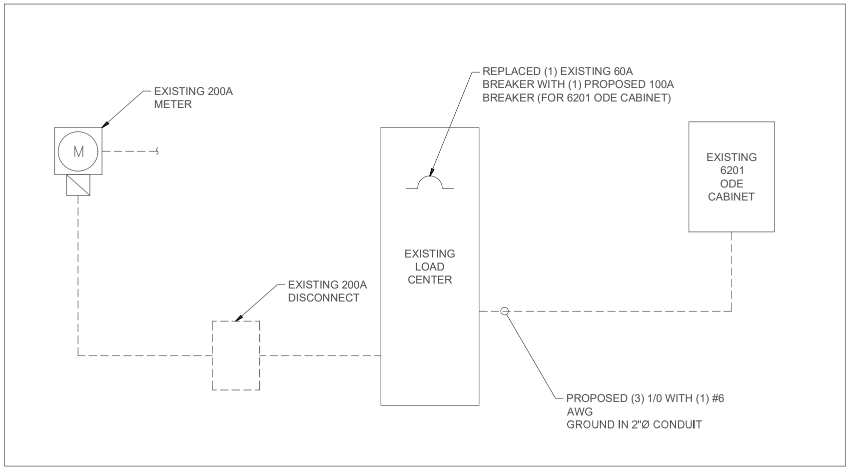
NOTES:

1. CONTRACTOR SHALL VERIFY AVAILABLE FAULT CURRENT WITH POWER COMPANY AND ENSURE ALL ELECTRICAL EQUIPMENT IS SUITABLE FOR AVAILABLE FAULT CURRENT.

2. CONTRACTOR SHALL COORDINATE UTILITY SERVICES WITH LOCAL UTILITY COMPANIES. VERIFY ALL REQUIREMENTS WITH UTILITY COMPANY STANDARDS.

3. ONE-LINE DIAGRAM IS SCHEMATIC ONLY AND NOT INDICATIVE OF ACTUAL EQUIPMENT LAYOUT.

4. CONTRACTOR SHALL LABEL METER SOCKET WITH SERVICE OWNER NAMEPLATE W/ 1/2" MINIMUM LETTERS.



1 ONE LINE DIAGRAM

SCALE: NONE

T-Mobile

T-MOBILE NORTHEAST LLC
103 MONARCH DRIVE
LIVERPOOL, NY 13088

CROWN CASTLE

3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065

JACOBS
JACOBS ENGINEERING GROUP, INC.

120 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116

STATE OF CONNECTICUT
CRAIG A. THOMAS
No. 0029052
PROFESSIONAL ENGINEER LICENSED

Craig Thomas
07/17/2019
16:45:41-04:00

PROJECT NO: ERCC0004

DRAWN BY: AJM

CHECKED BY: CAT

SUBMITTALS

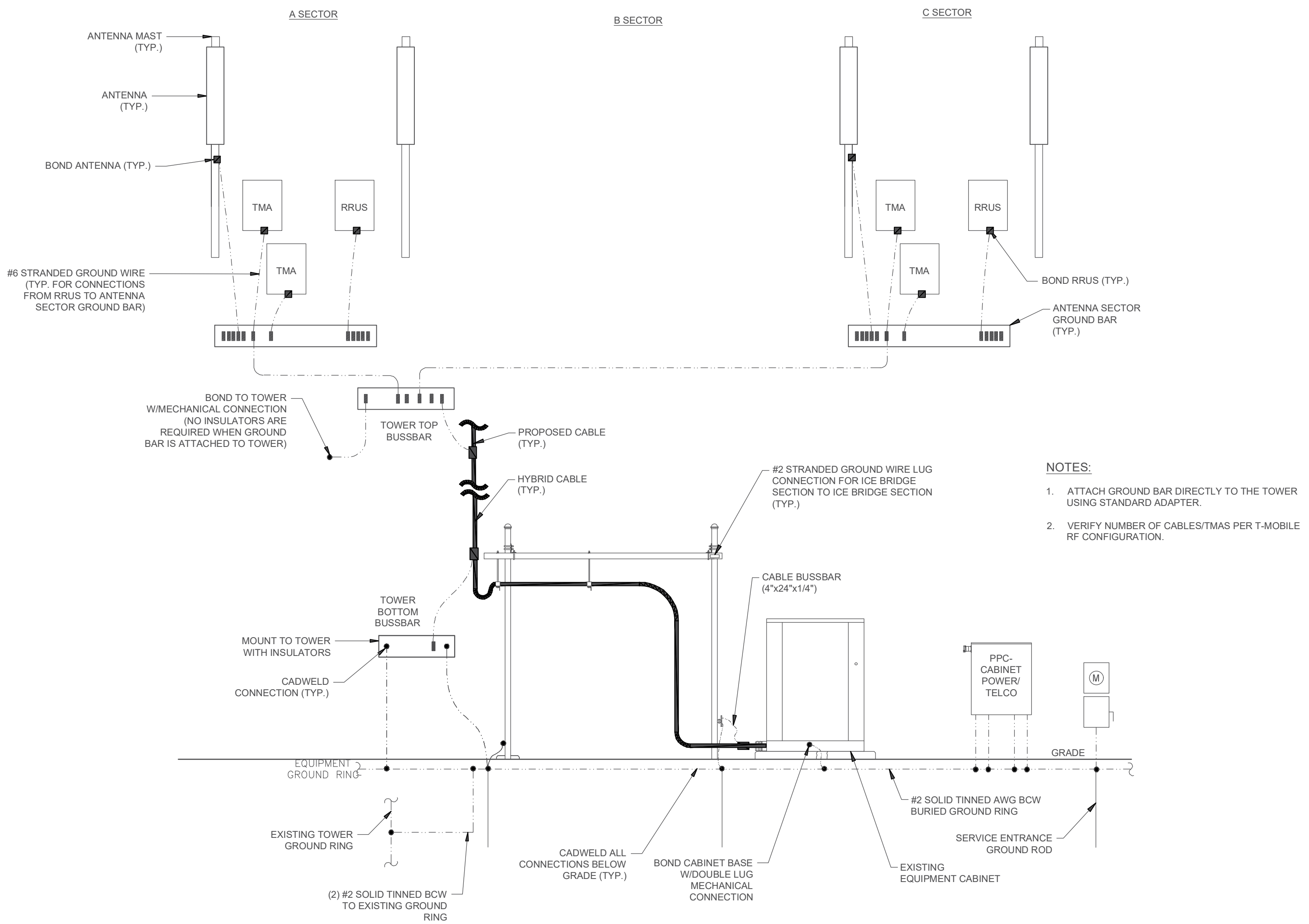
0	07/17/19	ISSUED FOR PERMITTING

TOLLAND/I-84/FILL-IN
CT11261C
WILLINGTON-RIVER RD
841301

426 RIVER ROAD
WILLINGTON, CT 06279

ONE LINE DIAGRAM

E-1



NOTES:

1. ATTACH GROUND BAR DIRECTLY TO THE TOWER USING STANDARD ADAPTER.
2. VERIFY NUMBER OF CABLES/TMAS PER T-MOBILE RF CONFIGURATION.

GROUNDING NOTES:

1. BELOW GROUND ALL GROUNDING CONDUCTORS TO BE #2 AWG SOLID TINNED BARE COPPER WIRE (BCW) U.O.N.
2. ABOVE GROUND ALL GROUNDING CONDUCTORS TO BE #2 AWG STRANDED INSULATED COPPER WIRE U.O.N.
3. PROVIDE BONDING AND GROUNDING CONDUCTORS WITH GREEN TYPE THWN INSULATION, U.O.N.
4. LEAVE 4' EXCESS GROUND WIRE COILED UP ABOVE GRADE. SEAL/WEATHERPROOF CONDUIT.

1 GROUNDING RISER DIAGRAM

SCALE: N.T.S.

T-Mobile
T-MOBILE NORTHEAST LLC
103 MONARCH DRIVE
LIVERPOOL, NY 13088

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

JACOBS
JACOBS ENGINEERING GROUP, INC.
120 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116

STATE OF CONNECTICUT
CRAIG A. THOMAS
No. 0029052
PROFESSIONAL ENGINEER
Craig Thomas
07/17/2019
16:45:51-04:00

PROJECT NO:	ERCC0004
DRAWN BY:	AJM
CHECKED BY:	CAT

SUBMITTALS

0	07/17/19	ISSUED FOR PERMITTING

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CT11261C
WILLINGTON-RIVER RD
841301
426 RIVER ROAD
WILLINGTON, CT 06279

GROUNDING RISER DIAGRAM

G-1

Exhibit D

Structural Analysis Report

Date: **June 19, 2019**

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

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corp.
6800 W. 115th St., Suite 2292
Overland Park, KS 66211
(913) 458-6909

Subject:	**Structural Analysis Report**	
Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CT11261C
	Carrier Site Name:	Tolland/I-84/Fill-In
Crown Castle Designation:	**Crown Castle BU Number:**	841301
	Crown Castle Site Name:	WILLINGTON-RIVER RD
	Crown Castle JDE Job Number:	559267
	Crown Castle Work Order Number:	1749500
	Crown Castle Order Number:	479824 Rev. 0
Engineering Firm Designation:	**Black & Veatch Corp. Project Number:**	400087
Site Data:	**426 River Road, Willington, Tolland County, CT** **Latitude *41° 53' 26.72"*, Longitude *-72° 17' 21.77"*** **110 Foot - Monopole Tower**	

Dear Denice Nicholson,

Black & Veatch Corp. is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower.

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

LC7: Proposed Equipment Configuration **Sufficient Capacity - 80%**

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

Structural analysis prepared by: Purich Sangpairoj / Akarapan Tongjunta

Respectfully submitted by:

Joshua J. Riley, P.E.
Professional Engineer

STATE OF CONNECTICUT
JOSHUA J. RILEY
33208
LICENSED
PROFESSIONAL ENGINEER
06/19/2019

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 110 ft Monopole tower mapped by ADP Structural & Welding.

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

The tower has been modified per reinforcement drawings prepared by GPD Group, Inc., in June of 2012. Reinforcement consists of Reinforcement consists of addition of reinforcement plates at elevation 45.5' to 65.5' and addition of base plate stiffeners at elevation 0'. Refer to Legacy Modification Inspection Report by FDH Velocitel, Inc., in August of 2015. This modification has been considered effective in this analysis.

The tower has been modified per reinforcement drawings prepared by Aero Solutions, LLC. in January of 2015. Reinforcement consists of addition of reinforcement plates at elevation 1.5' to 86.5', addition of transition stiffeners at elevation 0' and (4) additional anchor rods with brackets. Refer to Modification Inspection Report by FDH Velocitel, Inc., in August of 2015. This modification has been considered effective in this analysis.

2) ANALYSIS CRITERIA

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

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
100.0	100.0	1	cci tower mounts	Platform Mount [10.75' LP 712-1]	9	1-1/4
		2	ems wireless	RR90-17-00DP w/ Mount Pipe		
		2	ericsson	KRY 112 144/1		
		2	ericsson	KRY 112 489/2		
		2	ericsson	RADIO 4449 B12/B71		
		2	rfs celwave	APXVAARR24_43-U-NA20_TIA w/ Mount Pipe		

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)
110.0	113.0	3	ericsson	RRUS 11	2 4 12 1	3/8 3/4 7/8 conduit
		3	ericsson	RRUS 32		
		3	ericsson	RRUS 32 B2		
		3	kmw communications	AM-X-CD-16-65-00T-RET_TIA w/ Mount Pipe		
		6	powerwave technologies	7020.00		
		3	powerwave technologies	P65-15-XLH-RR w/ Mount Pipe		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
110.0	113.0	6	powerwave technologies	TT19-08BP111-001		
		3	quintel technology	QS66512-2 w/ Mount Pipe		
		2	raycap	DC6-48-60-18-8F		
	110.0	1	cci tower mounts	Platform Mount [10.75' LP 712-1]		
		2	cci tower mounts	T-Arm Mount [TA 702-3]		
83.0	83.0	2	alcatel lucent	B13 RRH4X30-4R	2	1-5/8
		2	alcatel lucent	B66A RRH4X45		
		2	alcatel lucent	RRH2X60-PCS		
		4	andrew	SBNHH-1D65A_TIA w/ Mount Pipe		
		2	cci tower mounts	Side Arm Mount [SO 101-1]		
		2	cci tower mounts	Side Arm Mount [SO 104-1]		
		2	rfs celwave	DB-T1-6Z-8AB-0Z		
69.0	74.0	1	decibel	DB810M-XC	3	1/2
	72.0	1	dapa	48212S w/ Mount Pipe		
	71.0	1	decibel	DB201-F		
	69.0	1	-	12' HSS 3x3x1/4		
		1	cci tower mounts	Side Arm Mount [SO 201-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Wilkinson Engineering	4710168	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Wilkinson Engineering (Mapped)	4710170	CCISITES
4-TOWER MANUFACTURER DRAWINGS	ADP Structural & Welding (Mapped)	5113552	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	GPD Group, Inc.	4945191	CCISITES
4-POST-MODIFICATION INSPECTION	FDH Velocitel, Inc.	5864402	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Aero Solutions, LLC.	5537030	CCISITES
4-POST-MODIFICATION INSPECTION	FDH Velocitel, Inc.	5822398	CCISITES

3.1) Analysis Method

tnxTower (version 8.0.5.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

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 built and maintained in accordance with the manufacturer's specifications.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
3) The wind loading Exposure Category and Topographic Category for this site have been analyzed and determined by the tower owner. Black & Veatch does not assume any responsibility for its accuracy.
4) This analysis was performed under the assumption that all information provided to Black & Veatch is current and correct. This is to include site data, appurtenance loading, tower/foundation details, and geotechnical data. The loading on the structure is based on CAD level drawings and carrier orders provided by the owner. If any of this information is not current and correct, this report should be considered obsolete and further analysis will be required.

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary) (Monopole Tower)

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
110 - 105	Pole	TP13.901x13.051x0.1875	Pole	22.6%	Pass
105 - 100	Pole	TP14.751x13.901x0.1875	Pole	35.0%	Pass
100 - 95	Pole	TP15.941x14.751x0.1875	Pole	52.0%	Pass
95 - 90	Pole	TP16.114x15.226x0.25	Pole	51.7%	Pass
90 - 85	Pole	TP17.002x16.114x0.25	Pole	59.9%	Pass
85 - 80	Pole	TP17.89x17.002x0.25	Pole	67.9%	Pass
80 - 79.75	Pole + Reinf.	TP17.934x17.89x0.5625	Reinf. 6 Tension Rupture	57.5%	Pass
79.75 - 74.75	Pole + Reinf.	TP18.822x17.934x0.5375	Reinf. 6 Tension Rupture	65.3%	Pass
74.75 - 69.75	Pole + Reinf.	TP19.71x18.822x0.525	Reinf. 6 Tension Rupture	72.3%	Pass
69.75 - 64.75	Pole + Reinf.	TP20.598x19.71x0.5	Reinf. 6 Tension Rupture	79.3%	Pass
64.75 - 64.25	Pole + Reinf.	TP20.686x20.598x0.5	Reinf. 6 Tension Rupture	80.0%	Pass
64.25 - 64	Pole + Reinf.	TP20.731x20.686x0.775	Reinf. 1 Tension Rupture	61.6%	Pass
64 - 59	Pole + Reinf.	TP21.619x20.731x0.75	Reinf. 1 Tension Rupture	66.8%	Pass
59 - 56.5	Pole + Reinf.	TP22.063x21.619x0.725	Reinf. 1 Tension Rupture	69.2%	Pass
56.5 - 56.25	Pole + Reinf.	TP22.107x22.063x0.975	Reinf. 1 Tension Rupture	54.3%	Pass
56.25 - 51.25	Pole + Reinf.	TP22.995x22.107x0.925	Reinf. 1 Tension Rupture	58.2%	Pass
51.25 - 49.5	Pole + Reinf.	TP24.016x22.995x0.9125	Reinf. 1 Tension Rupture	59.4%	Pass
49.5 - 44.5	Pole + Reinf.	TP23.709x22.806x0.725	Reinf. 4 Tension Rupture	61.9%	Pass
44.5 - 39.5	Pole + Reinf.	TP24.613x23.709x0.7125	Reinf. 4 Tension Rupture	64.6%	Pass
39.5 - 37.25	Pole + Reinf.	TP25.019x24.613x0.7	Reinf. 4 Tension Rupture	65.8%	Pass

37.25 - 37	Pole + Reinf.	TP25.065x25.019x0.7	Reinf. 5 Tension Rupture	64.4%	Pass
37 - 36.5	Pole + Reinf.	TP25.155x25.065x0.7	Reinf. 5 Tension Rupture	64.7%	Pass
36.5 - 36.25	Pole + Reinf.	TP25.2x25.155x0.9125	Reinf. 2 Tension Rupture	56.6%	Pass
36.25 - 34.25	Pole + Reinf.	TP25.562x25.2x0.8875	Reinf. 2 Tension Rupture	57.5%	Pass
34.25 - 34	Pole + Reinf.	TP25.607x25.562x0.725	Reinf. 3 Tension Rupture	61.0%	Pass
34 - 29	Pole + Reinf.	TP26.51x25.607x0.7	Reinf. 3 Tension Rupture	63.2%	Pass
29 - 24	Pole + Reinf.	TP27.414x26.51x0.6875	Reinf. 3 Tension Rupture	65.3%	Pass
24 - 19	Pole + Reinf.	TP28.317x27.414x0.675	Reinf. 3 Tension Rupture	67.3%	Pass
19 - 14	Pole + Reinf.	TP29.221x28.317x0.6625	Reinf. 3 Tension Rupture	69.1%	Pass
14 - 9	Pole + Reinf.	TP30.125x29.221x0.6375	Reinf. 3 Tension Rupture	70.7%	Pass
9 - 4	Pole + Reinf.	TP31.028x30.125x0.6375	Reinf. 3 Tension Rupture	72.3%	Pass
4 - 1.17	Pole + Reinf.	TP31.54x31.028x0.625	Reinf. 3 Tension Rupture	73.1%	Pass
1.17 - 0.92	Pole + Reinf.	TP31.585x31.54x0.9375	Reinf. 7 Tension Yield	54.8%	Pass
0.92 - 0	Pole + Reinf.	TP31.751x31.585x0.9375	Reinf. 7 Tension Yield	55.1%	Pass
				Summary	
			Pole	67.9%	Pass
			Reinforcement	80.0%	Pass
			Overall	80.0%	Pass

Table 5 - Tower Component Stresses vs. Capacity (Monopole Tower) - LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods (Original)	0	49.5	Pass
	Anchor Rods (Existing MODs)		45.3	Pass
1	Base Plate	0	54.9	Pass
	Stiffeners		43.4	Pass
	Pole Punching Shear		6.0	Pass
1	Base Foundation	0	44.3	Pass
	Base Foundation Soil Interaction		44.5	Pass

Structure Rating (max from all components) =	**80%**

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

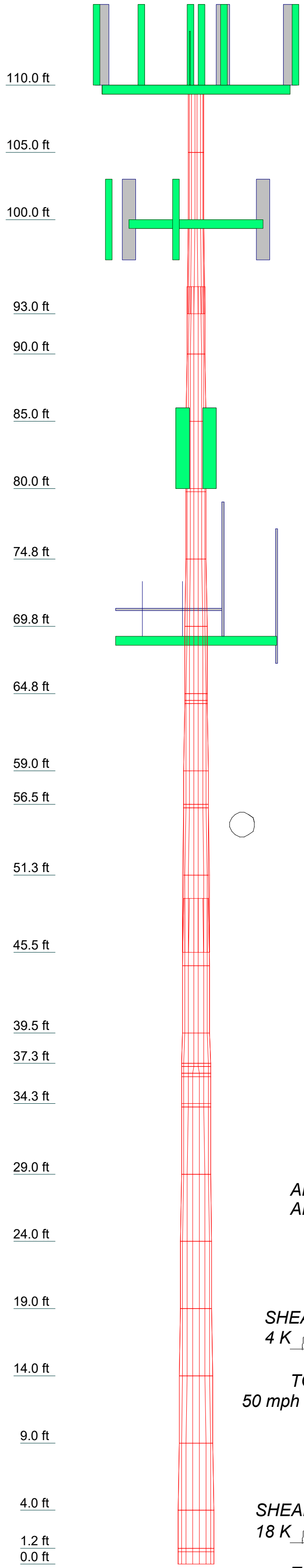
4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	5.00	18	0.1875		13.0510	13.9010	A572-65	0.1
2	5.00	18	0.1875		13.9010	14.7510		0.1
3	7.00	18	0.1875	2.00	14.7510	15.9410		0.2
4	5.00	18	0.2500		15.2260	16.1139		0.2
5	5.00	18	0.2500		16.1139	17.0018		0.2
6	5.00	18	0.2500		17.0018	17.8896		0.2
7	0.25	18	0.5625		[illegible]	[illegible]		0.0
8	5.00	18	0.5375		17.9340	18.8219		0.5
9	5.00	18	0.5250		18.8219	19.7098		0.5
10	5.00	18	0.5000		19.7098	20.5977		0.5
11	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]
12	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]
13	5.00	18	0.7500		[illegible]	[illegible]		0.7
14	[illegible]	18	[illegible]		[illegible]	[illegible]		0.4
15	[illegible]	18	[illegible]		[illegible]	[illegible]		0.0
16	5.00	18	0.9250		[illegible]	[illegible]		0.9
17	[illegible]	18	0.9125	4.00	22.9949	24.0160		1.1
18	[illegible]	18	[illegible]		[illegible]	[illegible]		0.8
19	5.00	18	0.7125		[illegible]	[illegible]		0.8
20	[illegible]	18	[illegible]		[illegible]	[illegible]		0.4
21	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]
22	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]
23	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]
24	[illegible]	18	[illegible]		[illegible]	[illegible]		[illegible]
25	[illegible]	18	[illegible]		[illegible]	[illegible]		0.0
26	5.00	18	0.7000		[illegible]	[illegible]		1.0
27	5.00	18	0.6875		26.5103	27.4139		1.0
28	5.00	18	0.6750		27.4139	28.3174		1.0
29	5.00	18	0.6625		28.3174	29.2210		1.0
30	5.00	18	0.6375		29.2210	30.1246		1.0
31	5.00	18	0.6375		30.1246	31.0281		1.1
32	2.83	18	[illegible]		[illegible]	[illegible]		0.6
33	[illegible]	18	[illegible]		[illegible]	[illegible]		[illegible]
34	[illegible]	18	[illegible]		[illegible]	[illegible]		[illegible]
								15.5

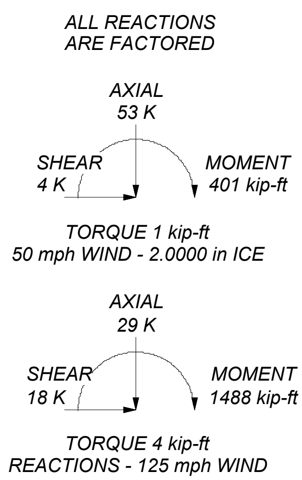


MATERIAL STRENGTH

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

TOWER DESIGN NOTES

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



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Job: WILLINGTON-RIVER RD (BU #841301)		
Project: 400087 (841301.1749500)		
Client: Crown Castle	Drawn by: Josh Riley	App'd:
Code: TIA-222-H	Date: 06/19/19	Scale: NTS
Path: C:\Users\rl68982\OneDrive - Black & Veatch\Desktop\841301\MOD.eri		Dwg No. E-1

Tower Input Data

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

1) Tower is located in Tolland County, Connecticut.
2) Tower base elevation above sea level: 42.00 ft.
3) Basic wind speed of 125 mph.
4) Risk Category II.
5) Exposure Category B.
6) Simplified Topographic Factor Procedure for wind speed-up calculations is used.
7) Topographic Category: 1.
8) Crest Height: 0.00 ft.
9) Nominal ice thickness of 2.0000 in.
10) Ice thickness is considered to increase with height.
11) Ice density of 56 pcf.
12) A wind speed of 50 mph is used in combination with ice.
13) Temperature drop of 50 °F.
14) Deflections calculated using a wind speed of 60 mph.
15) TIA-222-H Annex S.
16) A non-linear (P-delta) analysis was used.
17) Pressures are calculated at each section.
18) Stress ratio used in pole design is 1.05.
19) Tower analysis based on target reliabilities in accordance with Annex S.
20) Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
21) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs
Consider Moments - Horizontals
Consider Moments - Diagonals
Use Moment Magnification
Use Code Stress Ratios
√ Use Code Safety Factors - Guys
Escalate Ice
Always Use Max Kz
Use Special Wind Profile

Include Bolts In Member Capacity

Leg Bolts Are At Top Of Section
Secondary Horizontal Braces Leg
Use Diamond Inner Bracing (4 Sided)
SR Members Have Cut Ends
SR Members Are Concentric

Distribute Leg Loads As Uniform
Assume Legs Pinned
√ Assume Rigid Index Plate
√ Use Clear Spans For Wind Area
Use Clear Spans For KL/r
Retension Guys To Initial Tension
√ Bypass Mast Stability Checks
√ Use Azimuth Dish Coefficients
√ Project Wind Area of Appurt.

Autocalc Torque Arm Areas

Add IBC .6D+W Combination
Sort Capacity Reports By Component
Triangulate Diamond Inner Bracing
Treat Feed Line Bundles As Cylinder
Ignore KL/ry For 60 Deg. Angle Legs

Use ASCE 10 X-Brace Ly Rules
Calculate Redundant Bracing Forces
Ignore Redundant Members in FEA
SR Leg Bolts Resist Compression
All Leg Panels Have Same Allowable
Offset Girt At Foundation
√ Consider Feed Line Torque
Include Angle Block Shear Check
Use TIA-222-H Bracing Resist. Exemption
Use TIA-222-H Tension Splice Exemption

Poles

Include Shear-Torsion Interaction
Always Use Sub-Critical Flow
Use Top Mounted Sockets
Pole Without Linear Attachments
Pole With Shroud Or No Appurtenances
Outside and Inside Corner Radii Are Known

Tapered Pole Section Geometry

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

Section	*Elevation* *ft*	*Section Length* *ft*	*Splice Length* *ft*	*Number of Sides*	*Top Diameter* *in*	*Bottom Diameter* *in*	*Wall Thickness* *in*	*Bend Radius* *in*	*Pole Grade*
L1	110.00-105.00	5.00	0.00	18	13.0510	13.9010	0.1875	0.7500	A572-65 (65 ksi)
L2	105.00-100.00	5.00	0.00	18	13.9010	14.7510	0.1875	0.7500	A572-65 (65 ksi)
L3	100.00-93.00	7.00	2.00	18	14.7510	15.9410	0.1875	0.7500	A572-65 (65 ksi)
L4	93.00-90.00	5.00	0.00	18	15.2260	16.1139	0.2500	1.0000	A572-65 (65 ksi)
L5	90.00-85.00	5.00	0.00	18	16.1139	17.0018	0.2500	1.0000	A572-65 (65 ksi)
L6	85.00-80.00	5.00	0.00	18	17.0018	17.8896	0.2500	1.0000	A572-65 (65 ksi)
L7	80.00-79.75	0.25	0.00	18	17.8896	17.9340	0.5625	2.2500	A572-65 (65 ksi)
L8	79.75-74.75	5.00	0.00	18	17.9340	18.8219	0.5375	2.1500	A572-65 (65 ksi)
L9	74.75-69.75	5.00	0.00	18	18.8219	19.7098	0.5250	2.1000	A572-65 (65 ksi)
L10	69.75-64.75	5.00	0.00	18	19.7098	20.5977	0.5000	2.0000	A572-65 (65 ksi)
L11	64.75-64.25	0.50	0.00	18	20.5977	20.6865	0.5000	2.0000	A572-65 (65 ksi)
L12	64.25-64.00	0.25	0.00	18	20.6865	20.7308	0.7750	3.1000	A572-65 (65 ksi)
L13	64.00-59.00	5.00	0.00	18	20.7308	21.6187	0.7500	3.0000	A572-65 (65 ksi)
L14	59.00-56.50	2.50	0.00	18	21.6187	22.0627	0.7250	2.9000	A572-65 (65 ksi)
L15	56.50-56.25	0.25	0.00	18	22.0627	22.1071	0.9750	3.9000	A572-65 (65 ksi)
L16	56.25-51.25	5.00	0.00	18	22.1071	22.9949	0.9250	3.7000	A572-65 (65 ksi)
L17	51.25-45.50	5.75	4.00	18	22.9949	24.0160	0.9125	3.6500	A572-65 (65 ksi)
L18	45.50-44.50	5.00	0.00	18	22.8057	23.7093	0.7250	2.9000	A572-65 (65 ksi)
L19	44.50-39.50	5.00	0.00	18	23.7093	24.6128	0.7125	2.8500	A572-65 (65 ksi)
L20	39.50-37.25	2.25	0.00	18	24.6128	25.0194	0.7000	2.8000	A572-65 (65 ksi)
L21	37.25-37.00	0.25	0.00	18	25.0194	25.0646	0.7000	2.8000	A572-65 (65 ksi)
L22	37.00-36.50	0.50	0.00	18	25.0646	25.1550	0.7000	2.8000	A572-65 (65 ksi)
L23	36.50-36.25	0.25	0.00	18	25.1550	25.2001	0.9125	3.6500	A572-65 (65 ksi)
L24	36.25-34.25	2.00	0.00	18	25.2001	25.5616	0.8875	3.5500	A572-65 (65 ksi)
L25	34.25-34.00	0.25	0.00	18	25.5616	25.6068	0.7250	2.9000	A572-65 (65 ksi)
L26	34.00-29.00	5.00	0.00	18	25.6068	26.5103	0.7000	2.8000	A572-65 (65 ksi)
L27	29.00-24.00	5.00	0.00	18	26.5103	27.4139	0.6875	2.7500	A572-65 (65 ksi)
L28	24.00-19.00	5.00	0.00	18	27.4139	28.3174	0.6750	2.7000	A572-65 (65 ksi)
L29	19.00-14.00	5.00	0.00	18	28.3174	29.2210	0.6625	2.6500	A572-65 (65 ksi)
L30	14.00-9.00	5.00	0.00	18	29.2210	30.1246	0.6375	2.5500	A572-65 (65 ksi)
L31	9.00-4.00	5.00	0.00	18	30.1246	31.0281	0.6375	2.5500	A572-65 (65 ksi)
L32	4.00-1.17	2.83	0.00	18	31.0281	31.5396	0.6250	2.5000	A572-65 (65 ksi)
L33	1.17-0.92	0.25	0.00	18	31.5396	31.5847	0.9375	3.7500	A572-65 (65 ksi)
L34	0.92-0.00	0.92		18	31.5847	31.7510	0.9375	3.7500	A572-65 (65 ksi)

Tapered Pole Properties

Section	*Tip Dia.*	*Area*	*I*	*r*	*C*	*I/C*	*J*	*It/Q*	*w*	*w/t*
	in	*in^2*	*in^4*	*in*	*in*	*in^3*	*in^4*	*in^2*	*in*	
L1	13.2234	7.6554	160.0380	4.5665	6.6299	24.1388	320.2866	3.8284	1.9670	10.491
	14.0865	8.1612	193.9057	4.8683	7.0617	27.4588	388.0665	4.0814	2.1166	11.288
L2	14.0865	8.1612	193.9057	4.8683	7.0617	27.4588	388.0665	4.0814	2.1166	11.288
	14.9496	8.6671	232.2432	5.1700	7.4935	30.9926	464.7919	4.3344	2.2662	12.086
L3	14.9496	8.6671	232.2432	5.1700	7.4935	30.9926	464.7919	4.3344	2.2662	12.086
	16.1580	9.3753	293.9523	5.5925	8.0980	36.2992	588.2913	4.6885	2.4756	13.203
L4	15.7829	11.8835	336.7223	5.3165	7.7348	43.5334	673.8877	5.9429	2.2398	8.959
	16.3239	12.5880	400.2327	5.6317	8.1859	48.8932	800.9920	6.2952	2.3960	9.584
L5	16.3239	12.5880	400.2327	5.6317	8.1859	48.8932	800.9920	6.2952	2.3960	9.584
	17.2255	13.2925	471.2654	5.9469	8.6369	54.5642	943.1509	6.6475	2.5523	10.209
L6	17.2255	13.2925	471.2654	5.9469	8.6369	54.5642	943.1509	6.6475	2.5523	10.209
	18.1270	13.9971	550.2414	6.2621	9.0879	60.5464	1101.2068	6.9999	2.7086	10.834
L7	18.0788	30.9354	1173.4032	6.1511	9.0879	129.1166	2348.3503	15.4707	2.1586	3.837
	18.1239	31.0147	1182.4454	6.1669	9.1105	129.7895	2366.4468	15.5103	2.1664	3.851
L8	18.1278	29.6789	1134.7775	6.1758	9.1105	124.5573	2271.0483	14.8423	2.2104	4.112
	19.0293	31.1937	1317.5455	6.4910	9.5615	137.7965	2636.8247	15.5998	2.3667	4.403
L9	19.0313	30.4891	1289.5461	6.4954	9.5615	134.8682	2580.7889	15.2474	2.3887	4.55
	19.9329	31.9686	1486.5335	6.8106	10.0126	148.4667	2975.0229	15.9873	2.5449	4.847
L10	19.9367	30.4859	1421.2880	6.8195	10.0126	141.9503	2844.4462	15.2459	2.5889	5.178
	20.8383	31.8950	1627.6136	7.1347	10.4636	155.5498	3257.3689	15.9505	2.7452	5.49
L11	20.8383	31.8950	1627.6136	7.1347	10.4636	155.5498	3257.3689	15.9505	2.7452	5.49
	20.9284	32.0359	1649.2806	7.1662	10.5087	156.9440	3300.7314	16.0210	2.7608	5.522
L12	20.8860	48.9792	2453.3249	7.0686	10.5087	233.4561	4909.8779	24.4943	2.2768	2.938
	20.9311	49.0884	2469.7707	7.0843	10.5313	234.5178	4942.7912	24.5489	2.2846	2.948
L13	20.9350	47.5644	2399.0947	7.0932	10.5313	227.8068	4801.3461	23.7867	2.3286	3.105
	21.8365	49.6780	2733.3391	7.4084	10.9823	248.8855	5470.2747	24.8437	2.4849	3.313
L14	21.8404	48.0796	2651.7350	7.4173	10.9823	241.4551	5306.9593	24.0444	2.5289	3.488
	22.2912	49.1012	2824.3803	7.5749	11.2078	252.0005	5652.4771	24.5553	2.6070	3.596
L15	22.2526	65.2589	3666.3557	7.4861	11.2078	327.1243	7337.5356	32.6357	2.1670	2.223
	22.2977	65.3963	3689.5598	7.5019	11.2304	328.5336	7383.9744	32.7044	2.1748	2.231
L16	22.3054	62.1895	3525.2567	7.5196	11.2304	313.9034	7055.1521	31.1006	2.2628	2.446
	23.2070	64.7962	3987.3972	7.8348	11.6814	341.3450	7980.0412	32.4043	2.4191	2.615
L17	23.2089	63.9568	3940.2009	7.8393	11.6814	337.3047	7885.5864	31.9845	2.4411	2.675
	24.2457	66.9141	4512.4310	8.2017	12.2001	369.8675	9030.7996	33.4634	2.6208	2.872
L18	23.7797	50.8110	3129.8297	7.8386	11.5853	270.1554	6263.7778	25.4103	2.7378	3.776
	23.9632	52.8902	3529.9953	8.1594	12.0443	293.0842	7064.6355	26.4501	2.8968	3.996
L19	23.9651	52.0066	3474.7965	8.1639	12.0443	288.5012	6954.1651	26.0082	2.9188	4.097
	24.8826	54.0500	3900.6850	8.4846	12.5033	311.9720	7806.5026	27.0301	3.0779	4.32
L20	24.8845	53.1295	3838.2679	8.4891	12.5033	306.9800	7681.5864	26.5698	3.0999	4.428
	25.2974	54.0329	4037.4095	8.6334	12.7099	317.6593	8080.1316	27.0216	3.1714	4.531
L21	25.2974	54.0329	4037.4095	8.6334	12.7099	317.6593	8080.1316	27.0216	3.1714	4.531
	25.3433	54.1333	4059.9521	8.6494	12.7328	318.8572	8125.2464	27.0718	3.1794	4.542
L22	25.3433	54.1333	4059.9521	8.6494	12.7328	318.8572	8125.2464	27.0718	3.1794	4.542
	25.4350	54.3340	4105.2888	8.6815	12.7787	321.2597	8215.9793	27.1722	3.1953	4.565
L23	25.4023	70.2129	5213.2402	8.6061	12.7787	407.9625	10433.3402	35.1131	2.8213	3.092
	25.4481	70.3437	5242.4413	8.6221	12.8017	409.5121	10491.7806	35.1785	2.8292	3.101
L24	25.4520	68.4869	5114.5740	8.6310	12.8017	399.5238	10235.8779	34.2500	2.8732	3.237
	25.8190	69.5050	5346.0777	8.7593	12.9853	411.7030	10699.1900	34.7591	2.9368	3.309
L25	25.8441	57.1527	4454.0736	8.8170	12.9853	343.0095	8914.0080	28.5818	3.2228	4.445
	25.8899	57.2566	4478.4239	8.8330	13.0082	344.2762	8962.7406	28.6338	3.2308	4.456
L26	25.8938	55.3378	4337.0422	8.8419	13.0082	333.4076	8679.7912	27.6742	3.2748	4.678
	26.8113	57.3454	4826.3902	9.1627	13.4672	358.3800	9659.1310	28.6781	3.4338	4.905
L27	26.8132	56.3486	4747.0951	9.1671	13.4672	352.4920	9500.4365	28.1797	3.4558	5.027
	27.7307	58.3203	5263.0517	9.4879	13.9263	377.9230	10533.0287	29.1657	3.6148	5.258
L28	27.7327	57.2867	5174.6136	9.4923	13.9263	371.5726	10356.0362	28.6488	3.6368	5.388
	28.6502	59.2226	5717.1251	9.8131	14.3853	397.4293	11441.7730	29.6169	3.7959	5.624

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L29	28.6521	58.1521	5618.8681	9.8175	14.3853	390.5989	11245.1297	29.0816	3.8179	5.763
	29.5696	60.0521	6187.8121	10.1383	14.8443	416.8484	12383.7663	30.0318	3.9769	6.003
L30	29.5735	57.8366	5969.9606	10.1471	14.8443	402.1726	11947.7766	28.9238	4.0209	6.307
	30.4910	59.6649	6554.2033	10.4679	15.3033	428.2873	13117.0308	29.8381	4.1799	6.557
L31	30.4910	59.6649	6554.2033	10.4679	15.3033	428.2873	13117.0308	29.8381	4.1799	6.557
	31.4085	61.4932	7175.3716	10.7887	15.7623	455.2237	14360.1848	30.7524	4.3390	6.806
L32	31.4104	60.3122	7043.3620	10.7931	15.7623	446.8487	14095.9918	30.1619	4.3610	6.978
	31.9297	61.3268	7404.8088	10.9747	16.0221	462.1622	14819.3611	30.6692	4.4510	7.122
L33	31.8815	91.0603	10773.7748	10.8637	16.0221	672.4321	21561.7259	45.5388	3.9010	4.161
	31.9274	91.1947	10821.5614	10.8798	16.0450	674.4486	21657.3620	45.6060	3.9089	4.17
L34	31.9274	91.1947	10821.5614	10.8798	16.0450	674.4486	21657.3620	45.6060	3.9089	4.17
	32.0962	91.6894	10998.6338	10.9388	16.1295	681.8952	22011.7399	45.8534	3.9382	4.201

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 110.00-105.00				1	1	1			
L2 105.00-100.00				1	1	1			
L3 100.00-93.00				1	1	1			
L4 93.00-90.00				1	1	1			
L5 90.00-85.00				1	1	1			
L6 85.00-80.00				1	1	1			
L7 80.00-79.75				1	1	0.887733			
L8 79.75-74.75				1	1	0.905226			
L9 74.75-69.75				1	1	0.905321			
L10 69.75-64.75				1	1	0.929499			
L11 64.75-64.25				1	1	0.92761			
L12 64.25-64.00				1	1	0.873476			
L13 64.00-59.00				1	1	0.877291			
L14 59.00-56.50				1	1	0.894771			
L15 56.50-56.25				1	1	0.838655			
L16 56.25-51.25				1	1	0.857295			
L17 51.25-45.50				1	1	0.860295			
L18 45.50-44.50				1	1	0.899647			
L19 44.50-39.50				1	1	0.896925			
L20 39.50-				1	1	0.904672			

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
37.25									
L21 37.25-37.00				1	1	1.05392			
L22 37.00-36.50				1	1	1.05168			
L23 36.50-36.25				1	1	0.928468			
L24 36.25-34.25				1	1	0.94483			
L25 34.25-34.00				1	1	1.00582			
L26 34.00-29.00				1	1	1.01989			
L27 29.00-24.00				1	1	1.01821			
L28 24.00-19.00				1	1	1.01783			
L29 19.00-14.00				1	1	1.01869			
L30 14.00-9.00				1	1	1.04033			
L31 9.00-4.00				1	1	1.02397			
L32 4.00-1.17				1	1	1.03502			
L33 1.17-0.92				1	1	0.737647			
L34 0.92-0.00				1	1	0.735465			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
Safety Line 3/8	A	No	Surface Ar (CaAa)	110.00 - 0.00	1	1	0.400 0.410	0.3750		0.22
***										
PL1.25x3.5-12	A	No	Surface Af (CaAa)	65.50 - 45.50	1	1	0.000 0.000	3.5000	9.5000	0.00
PL1.25x3.5-12	B	No	Surface Af (CaAa)	65.50 - 45.50	1	1	0.000 0.000	3.5000	9.5000	0.00
PL1.25x3.5-12	C	No	Surface Af (CaAa)	65.50 - 45.50	1	1	0.000 0.000	3.5000	9.5000	0.00
***										
CCI-SFP-06512535	A	No	Surface Af (CaAa)	36.50 - 1.50	1	1	0.000 0.000	6.5000	15.5000	0.00
CCI-SFP-06512535	B	No	Surface Af (CaAa)	36.50 - 1.50	1	1	0.000 0.000	6.5000	15.5000	0.00
CCI-SFP-06512535	B	No	Surface Af (CaAa)	36.50 - 1.50	1	1	0.000 0.000	6.5000	15.5000	0.00
CCI-SFP-06512535	C	No	Surface Af (CaAa)	36.50 - 1.50	1	1	0.000 0.000	6.5000	15.5000	0.00
CCI-SFP-06512525	A	No	Surface Af (CaAa)	56.50 - 31.50	1	1	0.000 0.000	6.5000	15.5000	0.00
CCI-SFP-06512520	B	No	Surface Af (CaAa)	56.50 - 36.50	1	1	0.000 0.000	6.5000	15.5000	0.00
CCI-SFP-06512520	C	No	Surface Af (CaAa)	56.50 - 36.50	1	1	0.000 0.000	6.5000	15.5000	0.00
CCI-SFP-04510025	A	No	Surface Af (CaAa)	81.50 - 56.50	1	1	0.000 0.000	4.5000	11.0000	0.00
CCI-SFP-04510025	B	No	Surface Af (CaAa)	81.50 - 56.50	1	1	0.000 0.000	4.5000	11.0000	0.00
CCI-SFP-04510025	C	No	Surface Af (CaAa)	81.50 - 56.50	1	1	0.000 0.000	4.5000	11.0000	0.00
***										

Feed Line/Linear Appurtenances - Entered As Area

Description	*Face or Leg*	*Allow Shield*	*Exclude From Torque Calculation*	*Component Type*	*Placement ft*	*Total Number*		*C_AA_A ft²/ft*	*Weight plf*
***									
FB-L98-002-XXX(3/8)	C	No	No	Inside Pole	110.00 - 0.00	1	No Ice	0.00	0.06
							1/2" Ice	0.00	0.06
							1" Ice	0.00	0.06
							2" Ice	0.00	0.06
WR-VG86ST-BRD(3/4)	C	No	No	Inside Pole	110.00 - 0.00	2	No Ice	0.00	0.58
							1/2" Ice	0.00	0.58
							1" Ice	0.00	0.58
							2" Ice	0.00	0.58
LDF5-50A(7/8)	C	No	No	Inside Pole	110.00 - 0.00	12	No Ice	0.00	0.33
							1/2" Ice	0.00	0.33
							1" Ice	0.00	0.33
							2" Ice	0.00	0.33
FB-L98-002-XXX(3/8)	C	No	No	Inside Pole	110.00 - 0.00	1	No Ice	0.00	0.06
							1/2" Ice	0.00	0.06
							1" Ice	0.00	0.06
							2" Ice	0.00	0.06
WR-VG86ST-BRD(3/4)	C	No	No	Inside Pole	110.00 - 0.00	2	No Ice	0.00	0.58
							1/2" Ice	0.00	0.58
							1" Ice	0.00	0.58
							2" Ice	0.00	0.58
2" innerduct conduit	C	No	No	Inside Pole	110.00 - 0.00	1	No Ice	0.00	0.20
							1/2" Ice	0.00	0.20
							1" Ice	0.00	0.20
							2" Ice	0.00	0.20
***									
HB114-U6S12-XXX-LI(1-1/4)	C	No	No	Inside Pole	100.00 - 0.00	1	No Ice	0.00	1.70
							1/2" Ice	0.00	1.70
							1" Ice	0.00	1.70
							2" Ice	0.00	1.70
LDF6-50A(1-1/4)	C	No	No	Inside Pole	100.00 - 0.00	8	No Ice	0.00	0.60
							1/2" Ice	0.00	0.60
							1" Ice	0.00	0.60
							2" Ice	0.00	0.60
***									
HB158-1-08U8-S8J18(1-5/8)	B	No	No	Inside Pole	83.00 - 0.00	2	No Ice	0.00	1.30
							1/2" Ice	0.00	1.30
							1" Ice	0.00	1.30
							2" Ice	0.00	1.30
***									
LDF4-50A(1/2)	A	No	No	Inside Pole	69.00 - 0.00	3	No Ice	0.00	0.15
							1/2" Ice	0.00	0.15
							1" Ice	0.00	0.15
							2" Ice	0.00	0.15
***									

Feed Line/Linear Appurtenances Section Areas

Tower Section	*Tower Elevation ft*	*Face*	*A_R ft²*	*A_F ft²*	*C_AA_A In Face ft²*	*C_AA_A Out Face ft²*	*Weight K*
L1	110.00-105.00	A	0.000	0.000	0.188	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.03
L2	105.00-100.00	A	0.000	0.000	0.188	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.03

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
L3	100.00-93.00	A	0.000	0.000	0.263	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.09
L4	93.00-90.00	A	0.000	0.000	0.112	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.04
L5	90.00-85.00	A	0.000	0.000	0.188	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.07
L6	85.00-80.00	A	0.000	0.000	1.313	0.000	0.00
		B	0.000	0.000	1.125	0.000	0.01
		C	0.000	0.000	1.125	0.000	0.07
L7	80.00-79.75	A	0.000	0.000	0.197	0.000	0.00
		B	0.000	0.000	0.188	0.000	0.00
		C	0.000	0.000	0.188	0.000	0.00
L8	79.75-74.75	A	0.000	0.000	3.938	0.000	0.00
		B	0.000	0.000	3.750	0.000	0.01
		C	0.000	0.000	3.750	0.000	0.07
L9	74.75-69.75	A	0.000	0.000	3.938	0.000	0.00
		B	0.000	0.000	3.750	0.000	0.01
		C	0.000	0.000	3.750	0.000	0.07
L10	69.75-64.75	A	0.000	0.000	4.375	0.000	0.00
		B	0.000	0.000	4.188	0.000	0.01
		C	0.000	0.000	4.188	0.000	0.07
L11	64.75-64.25	A	0.000	0.000	0.685	0.000	0.00
		B	0.000	0.000	0.667	0.000	0.00
		C	0.000	0.000	0.667	0.000	0.01
L12	64.25-64.00	A	0.000	0.000	0.343	0.000	0.00
		B	0.000	0.000	0.333	0.000	0.00
		C	0.000	0.000	0.333	0.000	0.00
L13	64.00-59.00	A	0.000	0.000	6.854	0.000	0.00
		B	0.000	0.000	6.667	0.000	0.01
		C	0.000	0.000	6.667	0.000	0.07
L14	59.00-56.50	A	0.000	0.000	3.427	0.000	0.00
		B	0.000	0.000	3.333	0.000	0.01
		C	0.000	0.000	3.333	0.000	0.03
L15	56.50-56.25	A	0.000	0.000	0.426	0.000	0.00
		B	0.000	0.000	0.417	0.000	0.00
		C	0.000	0.000	0.417	0.000	0.00
L16	56.25-51.25	A	0.000	0.000	8.521	0.000	0.00
		B	0.000	0.000	8.333	0.000	0.01
		C	0.000	0.000	8.333	0.000	0.07
L17	51.25-45.50	A	0.000	0.000	9.799	0.000	0.00
		B	0.000	0.000	9.583	0.000	0.01
		C	0.000	0.000	9.583	0.000	0.08
L18	45.50-44.50	A	0.000	0.000	1.121	0.000	0.00
		B	0.000	0.000	1.083	0.000	0.00
		C	0.000	0.000	1.083	0.000	0.01
L19	44.50-39.50	A	0.000	0.000	5.604	0.000	0.00
		B	0.000	0.000	5.417	0.000	0.01
		C	0.000	0.000	5.417	0.000	0.07
L20	39.50-37.25	A	0.000	0.000	2.522	0.000	0.00
		B	0.000	0.000	2.438	0.000	0.01
		C	0.000	0.000	2.438	0.000	0.03
L21	37.25-37.00	A	0.000	0.000	0.280	0.000	0.00
		B	0.000	0.000	0.271	0.000	0.00
		C	0.000	0.000	0.271	0.000	0.00
L22	37.00-36.50	A	0.000	0.000	0.560	0.000	0.00
		B	0.000	0.000	0.542	0.000	0.00
		C	0.000	0.000	0.542	0.000	0.01
L23	36.50-36.25	A	0.000	0.000	0.551	0.000	0.00
		B	0.000	0.000	0.542	0.000	0.00
		C	0.000	0.000	0.271	0.000	0.00
L24	36.25-34.25	A	0.000	0.000	4.408	0.000	0.00
		B	0.000	0.000	4.333	0.000	0.01
		C	0.000	0.000	2.167	0.000	0.03
L25	34.25-34.00	A	0.000	0.000	0.551	0.000	0.00
		B	0.000	0.000	0.542	0.000	0.00
		C	0.000	0.000	0.271	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
L26	34.00-29.00	A	0.000	0.000	8.313	0.000	0.00
		B	0.000	0.000	10.833	0.000	0.01
		C	0.000	0.000	5.417	0.000	0.07
L27	29.00-24.00	A	0.000	0.000	5.604	0.000	0.00
		B	0.000	0.000	10.833	0.000	0.01
		C	0.000	0.000	5.417	0.000	0.07
L28	24.00-19.00	A	0.000	0.000	5.604	0.000	0.00
		B	0.000	0.000	10.833	0.000	0.01
		C	0.000	0.000	5.417	0.000	0.07
L29	19.00-14.00	A	0.000	0.000	5.604	0.000	0.00
		B	0.000	0.000	10.833	0.000	0.01
		C	0.000	0.000	5.417	0.000	0.07
L30	14.00-9.00	A	0.000	0.000	5.604	0.000	0.00
		B	0.000	0.000	10.833	0.000	0.01
		C	0.000	0.000	5.417	0.000	0.07
L31	9.00-4.00	A	0.000	0.000	5.604	0.000	0.00
		B	0.000	0.000	10.833	0.000	0.01
		C	0.000	0.000	5.417	0.000	0.07
L32	4.00-1.17	A	0.000	0.000	2.814	0.000	0.00
		B	0.000	0.000	5.417	0.000	0.01
		C	0.000	0.000	2.708	0.000	0.04
L33	1.17-0.92	A	0.000	0.000	0.009	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L34	0.92-0.00	A	0.000	0.000	0.035	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.01

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	110.00-105.00	A	1.913	0.000	0.000	2.101	0.000	0.03
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.03
L2	105.00-100.00	A	1.904	0.000	0.000	2.091	0.000	0.03
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.03
L3	100.00-93.00	A	1.892	0.000	0.000	2.912	0.000	0.04
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.09
L4	93.00-90.00	A	1.883	0.000	0.000	1.248	0.000	0.02
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.04
L5	90.00-85.00	A	1.874	0.000	0.000	2.062	0.000	0.03
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.07
L6	85.00-80.00	A	1.863	0.000	0.000	3.735	0.000	0.05
		B		0.000	0.000	1.684	0.000	0.03
		C		0.000	0.000	1.684	0.000	0.09
L7	80.00-79.75	A	1.857	0.000	0.000	0.383	0.000	0.00
		B		0.000	0.000	0.280	0.000	0.00
		C		0.000	0.000	0.280	0.000	0.01
L8	79.75-74.75	A	1.851	0.000	0.000	7.639	0.000	0.09
		B		0.000	0.000	5.601	0.000	0.08
		C		0.000	0.000	5.601	0.000	0.13
L9	74.75-69.75	A	1.839	0.000	0.000	7.615	0.000	0.09
		B		0.000	0.000	5.589	0.000	0.08
		C		0.000	0.000	5.589	0.000	0.13
L10	69.75-64.75	A	1.825	0.000	0.000	8.300	0.000	0.10
		B		0.000	0.000	6.287	0.000	0.09
		C		0.000	0.000	6.287	0.000	0.14
L11	64.75-64.25	A	1.818	0.000	0.000	1.231	0.000	0.01
		B		0.000	0.000	1.030	0.000	0.01
		C		0.000	0.000	1.030	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
L12	64.25-64.00	A	1.817	0.000	0.000	0.615	0.000	0.01
		B		0.000	0.000	0.515	0.000	0.01
		C		0.000	0.000	0.515	0.000	0.01
L13	64.00-59.00	A	1.809	0.000	0.000	12.282	0.000	0.15
		B		0.000	0.000	10.285	0.000	0.13
		C		0.000	0.000	10.285	0.000	0.19
L14	59.00-56.50	A	1.798	0.000	0.000	6.124	0.000	0.07
		B		0.000	0.000	5.131	0.000	0.07
		C		0.000	0.000	5.131	0.000	0.09
L15	56.50-56.25	A	1.794	0.000	0.000	0.695	0.000	0.01
		B		0.000	0.000	0.594	0.000	0.01
		C		0.000	0.000	0.594	0.000	0.01
L16	56.25-51.25	A	1.785	0.000	0.000	13.876	0.000	0.16
		B		0.000	0.000	11.867	0.000	0.15
		C		0.000	0.000	11.867	0.000	0.20
L17	51.25-45.50	A	1.766	0.000	0.000	15.892	0.000	0.18
		B		0.000	0.000	13.608	0.000	0.17
		C		0.000	0.000	13.608	0.000	0.23
L18	45.50-44.50	A	1.754	0.000	0.000	1.827	0.000	0.02
		B		0.000	0.000	1.430	0.000	0.02
		C		0.000	0.000	1.430	0.000	0.03
L19	44.50-39.50	A	1.741	0.000	0.000	9.087	0.000	0.10
		B		0.000	0.000	7.129	0.000	0.09
		C		0.000	0.000	7.129	0.000	0.14
L20	39.50-37.25	A	1.726	0.000	0.000	4.075	0.000	0.04
		B		0.000	0.000	3.202	0.000	0.04
		C		0.000	0.000	3.202	0.000	0.06
L21	37.25-37.00	A	1.720	0.000	0.000	0.452	0.000	0.00
		B		0.000	0.000	0.356	0.000	0.00
		C		0.000	0.000	0.356	0.000	0.01
L22	37.00-36.50	A	1.718	0.000	0.000	0.904	0.000	0.01
		B		0.000	0.000	0.711	0.000	0.01
		C		0.000	0.000	0.711	0.000	0.01
L23	36.50-36.25	A	1.717	0.000	0.000	0.809	0.000	0.01
		B		0.000	0.000	0.713	0.000	0.01
		C		0.000	0.000	0.357	0.000	0.01
L24	36.25-34.25	A	1.711	0.000	0.000	6.462	0.000	0.07
		B		0.000	0.000	5.702	0.000	0.06
		C		0.000	0.000	2.851	0.000	0.06
L25	34.25-34.00	A	1.706	0.000	0.000	0.807	0.000	0.01
		B		0.000	0.000	0.712	0.000	0.01
		C		0.000	0.000	0.356	0.000	0.01
L26	34.00-29.00	A	1.692	0.000	0.000	12.543	0.000	0.13
		B		0.000	0.000	14.217	0.000	0.16
		C		0.000	0.000	7.109	0.000	0.14
L27	29.00-24.00	A	1.663	0.000	0.000	8.930	0.000	0.09
		B		0.000	0.000	14.159	0.000	0.15
		C		0.000	0.000	7.080	0.000	0.14
L28	24.00-19.00	A	1.629	0.000	0.000	8.861	0.000	0.09
		B		0.000	0.000	14.091	0.000	0.15
		C		0.000	0.000	7.045	0.000	0.13
L29	19.00-14.00	A	1.586	0.000	0.000	8.776	0.000	0.09
		B		0.000	0.000	14.005	0.000	0.15
		C		0.000	0.000	7.003	0.000	0.13
L30	14.00-9.00	A	1.530	0.000	0.000	8.664	0.000	0.08
		B		0.000	0.000	13.893	0.000	0.14
		C		0.000	0.000	6.946	0.000	0.13
L31	9.00-4.00	A	1.445	0.000	0.000	8.494	0.000	0.08
		B		0.000	0.000	13.723	0.000	0.13
		C		0.000	0.000	6.861	0.000	0.12
L32	4.00-1.17	A	1.318	0.000	0.000	4.219	0.000	0.04
		B		0.000	0.000	6.734	0.000	0.06
		C		0.000	0.000	3.367	0.000	0.06
L33	1.17-0.92	A	1.204	0.000	0.000	0.070	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L34	0.92-0.00	A	1.109	0.000	0.000	0.239	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.01

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	110.00-105.00	-0.0591	-0.2932	-0.2652	-1.3154
L2	105.00-100.00	-0.0592	-0.2935	-0.2700	-1.3390
L3	100.00-93.00	-0.0592	-0.2937	-0.2750	-1.3641
L4	93.00-90.00	-0.0593	-0.2940	-0.2779	-1.3783
L5	90.00-85.00	-0.0593	-0.2942	-0.2800	-1.3884
L6	85.00-80.00	-0.0369	-0.1832	-0.2029	-1.0060
L7	80.00-79.75	-0.0164	-0.0815	-0.1234	-0.6121
L8	79.75-74.75	-0.0167	-0.0827	-0.1254	-0.6219
L9	74.75-69.75	-0.0171	-0.0849	-0.1290	-0.6398
L10	69.75-64.75	-0.0165	-0.0817	-0.1235	-0.6125
L11	64.75-64.25	-0.0125	-0.0619	-0.0908	-0.4503
L12	64.25-64.00	-0.0125	-0.0620	-0.0910	-0.4515
L13	64.00-59.00	-0.0127	-0.0629	-0.0924	-0.4581
L14	59.00-56.50	-0.0130	-0.0642	-0.0942	-0.4674
L15	56.50-56.25	-0.0112	-0.0555	-0.0926	-0.4269
L16	56.25-51.25	-0.0114	-0.0563	-0.0936	-0.4324
L17	51.25-45.50	-0.0117	-0.0579	-0.0954	-0.4432
L18	45.50-44.50	-0.0155	-0.0770	-0.1327	-0.6187
L19	44.50-39.50	-0.0157	-0.0780	-0.1329	-0.6221
L20	39.50-37.25	-0.0160	-0.0792	-0.1338	-0.6291
L21	37.25-37.00	-0.0161	-0.0797	-0.1341	-0.6314
L22	37.00-36.50	-0.0161	-0.0798	-0.1342	-0.6321
L23	36.50-36.25	-0.0118	-1.8387	-0.0920	-2.2604
L24	36.25-34.25	-0.0118	-1.8483	-0.0924	-2.2726
L25	34.25-34.00	-0.0119	-1.8574	-0.0927	-2.2843
L26	34.00-29.00	0.8384	-1.5224	0.7654	-1.9804
L27	29.00-24.00	1.8417	-1.1420	1.7850	-1.6369
L28	24.00-19.00	1.8780	-1.1646	1.8258	-1.6659
L29	19.00-14.00	1.9134	-1.1866	1.8660	-1.6916
L30	14.00-9.00	1.9480	-1.2081	1.9056	-1.7122
L31	9.00-4.00	1.9818	-1.2292	1.9449	-1.7232
L32	4.00-1.17	2.3052	-1.4431	1.8613	-1.6888
L33	1.17-0.92	-0.0598	-0.2967	-0.2367	-1.1741
L34	0.92-0.00	-0.0598	-0.2967	-0.2230	-1.1058

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	1	Safety Line 3/8	105.00 - 110.00	1.0000	1.0000
L2	1	Safety Line 3/8	100.00 - 105.00	1.0000	1.0000
L3	1	Safety Line 3/8	93.00 - 100.00	1.0000	1.0000
L5	1	Safety Line 3/8	85.00 - 90.00	1.0000	1.0000
L6	1	Safety Line 3/8	80.00 - 85.00	1.0000	1.0000
L6	29	CCI-SFP-04510025	80.00 - 81.50	1.0000	1.0000
L6	30	CCI-SFP-04510025	80.00 -	1.0000	1.0000

Tower Section	*Feed Line Record No.*	*Description*	*Feed Line Segment Elev.*	*K_a No Ice*	*K_a Ice*
			81.50		
L6	31	CCI-SFP-04510025	80.00 - 81.50	1.0000	1.0000
L7	1	Safety Line 3/8	79.75 - 80.00	1.0000	1.0000
L7	29	CCI-SFP-04510025	79.75 - 80.00	1.0000	1.0000
L7	30	CCI-SFP-04510025	79.75 - 80.00	1.0000	1.0000
L7	31	CCI-SFP-04510025	79.75 - 80.00	1.0000	1.0000
L8	1	Safety Line 3/8	74.75 - 79.75	1.0000	1.0000
L8	29	CCI-SFP-04510025	74.75 - 79.75	1.0000	1.0000
L8	30	CCI-SFP-04510025	74.75 - 79.75	1.0000	1.0000
L8	31	CCI-SFP-04510025	74.75 - 79.75	1.0000	1.0000
L9	1	Safety Line 3/8	69.75 - 74.75	1.0000	1.0000
L9	29	CCI-SFP-04510025	69.75 - 74.75	1.0000	1.0000
L9	30	CCI-SFP-04510025	69.75 - 74.75	1.0000	1.0000
L9	31	CCI-SFP-04510025	69.75 - 74.75	1.0000	1.0000
L10	1	Safety Line 3/8	64.75 - 69.75	1.0000	1.0000
L10	18	PL1.25x3.5-12	64.75 - 65.50	1.0000	1.0000
L10	19	PL1.25x3.5-12	64.75 - 65.50	1.0000	1.0000
L10	20	PL1.25x3.5-12	64.75 - 65.50	1.0000	1.0000
L10	29	CCI-SFP-04510025	64.75 - 69.75	1.0000	1.0000
L10	30	CCI-SFP-04510025	64.75 - 69.75	1.0000	1.0000
L10	31	CCI-SFP-04510025	64.75 - 69.75	1.0000	1.0000
L11	1	Safety Line 3/8	64.25 - 64.75	1.0000	1.0000
L11	18	PL1.25x3.5-12	64.25 - 64.75	1.0000	1.0000
L11	19	PL1.25x3.5-12	64.25 - 64.75	1.0000	1.0000
L11	20	PL1.25x3.5-12	64.25 - 64.75	1.0000	1.0000
L11	29	CCI-SFP-04510025	64.25 - 64.75	1.0000	1.0000
L11	30	CCI-SFP-04510025	64.25 - 64.75	1.0000	1.0000
L11	31	CCI-SFP-04510025	64.25 - 64.75	1.0000	1.0000
L12	1	Safety Line 3/8	64.00 - 64.25	1.0000	1.0000
L12	18	PL1.25x3.5-12	64.00 - 64.25	1.0000	1.0000
L12	19	PL1.25x3.5-12	64.00 - 64.25	1.0000	1.0000
L12	20	PL1.25x3.5-12	64.00 - 64.25	1.0000	1.0000
L12	29	CCI-SFP-04510025	64.00 - 64.25	1.0000	1.0000
L12	30	CCI-SFP-04510025	64.00 - 64.25	1.0000	1.0000
L12	31	CCI-SFP-04510025	64.00 - 64.25	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L13	1	Safety Line 3/8	59.00 - 64.00	1.0000	1.0000
L13	18	PL1.25x3.5-12	59.00 - 64.00	1.0000	1.0000
L13	19	PL1.25x3.5-12	59.00 - 64.00	1.0000	1.0000
L13	20	PL1.25x3.5-12	59.00 - 64.00	1.0000	1.0000
L13	29	CCI-SFP-04510025	59.00 - 64.00	1.0000	1.0000
L13	30	CCI-SFP-04510025	59.00 - 64.00	1.0000	1.0000
L13	31	CCI-SFP-04510025	59.00 - 64.00	1.0000	1.0000
L14	1	Safety Line 3/8	56.50 - 59.00	1.0000	1.0000
L14	18	PL1.25x3.5-12	56.50 - 59.00	1.0000	1.0000
L14	19	PL1.25x3.5-12	56.50 - 59.00	1.0000	1.0000
L14	20	PL1.25x3.5-12	56.50 - 59.00	1.0000	1.0000
L14	29	CCI-SFP-04510025	56.50 - 59.00	1.0000	1.0000
L14	30	CCI-SFP-04510025	56.50 - 59.00	1.0000	1.0000
L14	31	CCI-SFP-04510025	56.50 - 59.00	1.0000	1.0000
L15	1	Safety Line 3/8	56.25 - 56.50	1.0000	1.0000
L15	18	PL1.25x3.5-12	56.25 - 56.50	1.0000	1.0000
L15	19	PL1.25x3.5-12	56.25 - 56.50	1.0000	1.0000
L15	20	PL1.25x3.5-12	56.25 - 56.50	1.0000	1.0000
L15	26	CCI-SFP-06512525	56.25 - 56.50	1.0000	1.0000
L15	27	CCI-SFP-06512520	56.25 - 56.50	1.0000	1.0000
L15	28	CCI-SFP-06512520	56.25 - 56.50	1.0000	1.0000
L16	1	Safety Line 3/8	51.25 - 56.25	1.0000	1.0000
L16	18	PL1.25x3.5-12	51.25 - 56.25	1.0000	1.0000
L16	19	PL1.25x3.5-12	51.25 - 56.25	1.0000	1.0000
L16	20	PL1.25x3.5-12	51.25 - 56.25	1.0000	1.0000
L16	26	CCI-SFP-06512525	51.25 - 56.25	1.0000	1.0000
L16	27	CCI-SFP-06512520	51.25 - 56.25	1.0000	1.0000
L16	28	CCI-SFP-06512520	51.25 - 56.25	1.0000	1.0000
L17	1	Safety Line 3/8	45.50 - 51.25	1.0000	1.0000
L17	18	PL1.25x3.5-12	45.50 - 51.25	1.0000	1.0000
L17	19	PL1.25x3.5-12	45.50 - 51.25	1.0000	1.0000
L17	20	PL1.25x3.5-12	45.50 - 51.25	1.0000	1.0000
L17	26	CCI-SFP-06512525	45.50 - 51.25	1.0000	1.0000
L17	27	CCI-SFP-06512520	45.50 - 51.25	1.0000	1.0000
L17	28	CCI-SFP-06512520	45.50 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			51.25		
L19	1	Safety Line 3/8	39.50 - 44.50	1.0000	1.0000
L19	26	CCI-SFP-06512525	39.50 - 44.50	1.0000	1.0000
L19	27	CCI-SFP-06512520	39.50 - 44.50	1.0000	1.0000
L19	28	CCI-SFP-06512520	39.50 - 44.50	1.0000	1.0000
L20	1	Safety Line 3/8	37.25 - 39.50	1.0000	1.0000
L20	26	CCI-SFP-06512525	37.25 - 39.50	1.0000	1.0000
L20	27	CCI-SFP-06512520	37.25 - 39.50	1.0000	1.0000
L20	28	CCI-SFP-06512520	37.25 - 39.50	1.0000	1.0000
L21	1	Safety Line 3/8	37.00 - 37.25	1.0000	1.0000
L21	26	CCI-SFP-06512525	37.00 - 37.25	1.0000	1.0000
L21	27	CCI-SFP-06512520	37.00 - 37.25	1.0000	1.0000
L21	28	CCI-SFP-06512520	37.00 - 37.25	1.0000	1.0000
L22	1	Safety Line 3/8	36.50 - 37.00	1.0000	1.0000
L22	26	CCI-SFP-06512525	36.50 - 37.00	1.0000	1.0000
L22	27	CCI-SFP-06512520	36.50 - 37.00	1.0000	1.0000
L22	28	CCI-SFP-06512520	36.50 - 37.00	1.0000	1.0000
L23	1	Safety Line 3/8	36.25 - 36.50	1.0000	1.0000
L23	22	CCI-SFP-06512535	36.25 - 36.50	1.0000	1.0000
L23	23	CCI-SFP-06512535	36.25 - 36.50	1.0000	1.0000
L23	24	CCI-SFP-06512535	36.25 - 36.50	1.0000	1.0000
L23	25	CCI-SFP-06512535	36.25 - 36.50	1.0000	1.0000
L23	26	CCI-SFP-06512525	36.25 - 36.50	1.0000	1.0000
L24	1	Safety Line 3/8	34.25 - 36.25	1.0000	1.0000
L24	22	CCI-SFP-06512535	34.25 - 36.25	1.0000	1.0000
L24	23	CCI-SFP-06512535	34.25 - 36.25	1.0000	1.0000
L24	24	CCI-SFP-06512535	34.25 - 36.25	1.0000	1.0000
L24	25	CCI-SFP-06512535	34.25 - 36.25	1.0000	1.0000
L24	26	CCI-SFP-06512525	34.25 - 36.25	1.0000	1.0000
L25	1	Safety Line 3/8	34.00 - 34.25	1.0000	1.0000
L25	22	CCI-SFP-06512535	34.00 - 34.25	1.0000	1.0000
L25	23	CCI-SFP-06512535	34.00 - 34.25	1.0000	1.0000
L25	24	CCI-SFP-06512535	34.00 - 34.25	1.0000	1.0000
L25	25	CCI-SFP-06512535	34.00 - 34.25	1.0000	1.0000
L25	26	CCI-SFP-06512525	34.00 - 34.25	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L26	1	Safety Line 3/8	29.00 - 34.00	1.0000	1.0000
L26	22	CCI-SFP-06512535	29.00 - 34.00	1.0000	1.0000
L26	23	CCI-SFP-06512535	29.00 - 34.00	1.0000	1.0000
L26	24	CCI-SFP-06512535	29.00 - 34.00	1.0000	1.0000
L26	25	CCI-SFP-06512535	29.00 - 34.00	1.0000	1.0000
L26	26	CCI-SFP-06512525	31.50 - 34.00	1.0000	1.0000
L27	1	Safety Line 3/8	24.00 - 29.00	1.0000	1.0000
L27	22	CCI-SFP-06512535	24.00 - 29.00	1.0000	1.0000
L27	23	CCI-SFP-06512535	24.00 - 29.00	1.0000	1.0000
L27	24	CCI-SFP-06512535	24.00 - 29.00	1.0000	1.0000
L27	25	CCI-SFP-06512535	24.00 - 29.00	1.0000	1.0000
L28	1	Safety Line 3/8	19.00 - 24.00	1.0000	1.0000
L28	22	CCI-SFP-06512535	19.00 - 24.00	1.0000	1.0000
L28	23	CCI-SFP-06512535	19.00 - 24.00	1.0000	1.0000
L28	24	CCI-SFP-06512535	19.00 - 24.00	1.0000	1.0000
L28	25	CCI-SFP-06512535	19.00 - 24.00	1.0000	1.0000
L29	1	Safety Line 3/8	14.00 - 19.00	1.0000	1.0000
L29	22	CCI-SFP-06512535	14.00 - 19.00	1.0000	1.0000
L29	23	CCI-SFP-06512535	14.00 - 19.00	1.0000	1.0000
L29	24	CCI-SFP-06512535	14.00 - 19.00	1.0000	1.0000
L29	25	CCI-SFP-06512535	14.00 - 19.00	1.0000	1.0000
L30	1	Safety Line 3/8	9.00 - 14.00	1.0000	1.0000
L30	22	CCI-SFP-06512535	9.00 - 14.00	1.0000	1.0000
L30	23	CCI-SFP-06512535	9.00 - 14.00	1.0000	1.0000
L30	24	CCI-SFP-06512535	9.00 - 14.00	1.0000	1.0000
L30	25	CCI-SFP-06512535	9.00 - 14.00	1.0000	1.0000
L31	1	Safety Line 3/8	4.00 - 9.00	1.0000	1.0000
L31	22	CCI-SFP-06512535	4.00 - 9.00	1.0000	1.0000
L31	23	CCI-SFP-06512535	4.00 - 9.00	1.0000	1.0000
L31	24	CCI-SFP-06512535	4.00 - 9.00	1.0000	1.0000
L31	25	CCI-SFP-06512535	4.00 - 9.00	1.0000	1.0000
L32	1	Safety Line 3/8	1.17 - 4.00	1.0000	1.0000
L32	22	CCI-SFP-06512535	1.50 - 4.00	1.0000	1.0000
L32	23	CCI-SFP-06512535	1.50 - 4.00	1.0000	1.0000
L32	24	CCI-SFP-06512535	1.50 - 4.00	1.0000	1.0000
L32	25	CCI-SFP-06512535	1.50 - 4.00	1.0000	1.0000
L33	1	Safety Line 3/8	0.92 - 1.17	1.0000	1.0000
L34	1	Safety Line 3/8	0.00 - 0.92	1.0000	1.0000

Discrete Tower Loads

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert*	*Azimuth Adjustment*	*Placement*		C_AA_A *Front*	C_AA_A *Side*	*Weight*
			ft *ft* *ft*	*°*	*ft*		*ft²*	*ft²*	*K*
Lightning Rod 5/8"x4'	C	From Leg	0.00	0.0000	110.00	No Ice	0.25	0.25	0.00
			0.00			1/2"	0.66	0.66	0.01
			2.00			Ice	0.97	0.97	0.01
						1" Ice	1.49	1.49	0.03
						2" Ice			
***									
Platform Mount [10.75' LP 712-1]	C	None		0.0000	110.00	No Ice	21.97	21.97	1.20
						1/2"	26.82	26.82	1.47
						Ice	31.67	31.67	1.75
						1" Ice	41.36	41.36	2.31
						2" Ice			
(2) T-Arm Mount [TA 702-3]	C	None		0.0000	110.00	No Ice	5.64	5.64	0.34
						1/2"	6.55	6.55	0.43
						Ice	7.46	7.46	0.52
						1" Ice	9.28	9.28	0.70
						2" Ice			
Transition Ladder	C	From Leg	2.00	0.0000	110.00	No Ice	6.00	6.00	0.16
			0.00			1/2"	8.00	8.00	0.24
			-3.00			Ice	10.00	10.00	0.32
						1" Ice	14.00	14.00	0.48
						2" Ice			
8'x2" Mount Pipe	A	From Leg	3.00	0.0000	110.00	No Ice	1.90	1.90	0.03
			-2.00			1/2"	2.73	2.73	0.04
			0.00			Ice	3.40	3.40	0.06
						1" Ice	4.40	4.40	0.12
						2" Ice			
8'x2" Mount Pipe	B	From Leg	3.00	0.0000	110.00	No Ice	1.90	1.90	0.03
			-2.00			1/2"	2.73	2.73	0.04
			0.00			Ice	3.40	3.40	0.06
						1" Ice	4.40	4.40	0.12
						2" Ice			
8'x2" Mount Pipe	C	From Leg	3.00	0.0000	110.00	No Ice	1.90	1.90	0.03
			-2.00			1/2"	2.73	2.73	0.04
			0.00			Ice	3.40	3.40	0.06
						1" Ice	4.40	4.40	0.12
						2" Ice			
QS66512-2 w/ Mount Pipe	A	From Leg	4.00	0.0000	110.00	No Ice	8.64	6.66	0.14
			7.00			1/2"	9.29	9.66	0.21
			3.00			Ice	9.91	10.62	0.30
						1" Ice	11.18	12.61	0.49
						2" Ice			
QS66512-2 w/ Mount Pipe	B	From Leg	4.00	0.0000	110.00	No Ice	8.64	6.66	0.14
			7.00			1/2"	9.29	9.66	0.21
			3.00			Ice	9.91	10.62	0.30
						1" Ice	11.18	12.61	0.49
						2" Ice			
QS66512-2 w/ Mount Pipe	C	From Leg	4.00	0.0000	110.00	No Ice	8.64	6.66	0.14
			7.00			1/2"	9.29	9.66	0.21
			3.00			Ice	9.91	10.62	0.30
						1" Ice	11.18	12.61	0.49
						2" Ice			
AM-X-CD-16-65-00T-RET_TIA w/ Mount Pipe	A	From Leg	3.00	0.0000	110.00	No Ice	8.26	6.36	0.07
			2.00			1/2"	8.82	7.54	0.14
			3.00			Ice	9.35	8.43	0.21
						1" Ice	10.42	10.24	0.39
						2" Ice			
AM-X-CD-16-65-00T-RET_TIA w/ Mount Pipe	B	From Leg	3.00	0.0000	110.00	No Ice	8.26	6.36	0.07
			2.00			1/2"	8.82	7.54	0.14
			3.00			Ice	9.35	8.43	0.21
						1" Ice	10.42	10.24	0.39
						2" Ice			
AM-X-CD-16-65-00T-RET_TIA w/ Mount Pipe	C	From Leg	3.00	0.0000	110.00	No Ice	8.26	6.36	0.07
			2.00			1/2"	8.82	7.54	0.14
			3.00			Ice	9.35	8.43	0.21
						1" Ice	10.42	10.24	0.39

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert ft ft ft*	*Azimuth Adjustment °*	*Placement ft*		*C_AA_A Front ft²*	*C_AA_A Side ft²*	*Weight K*
						2" Ice			
P65-15-XLH-RR w/ Mount	A	From Leg	4.00	0.0000	110.00	No Ice	5.67	4.33	0.06
Pipe			-7.00			1/2"	6.08	5.01	0.11
			3.00			Ice	6.49	5.67	0.16
						1" Ice	7.34	7.01	0.29
						2" Ice			
P65-15-XLH-RR w/ Mount	B	From Leg	4.00	0.0000	110.00	No Ice	5.67	4.33	0.06
Pipe			-7.00			1/2"	6.08	5.01	0.11
			3.00			Ice	6.49	5.67	0.16
						1" Ice	7.34	7.01	0.29
						2" Ice			
P65-15-XLH-RR w/ Mount	C	From Leg	4.00	0.0000	110.00	No Ice	5.67	4.33	0.06
Pipe			-7.00			1/2"	6.08	5.01	0.11
			3.00			Ice	6.49	5.67	0.16
						1" Ice	7.34	7.01	0.29
						2" Ice			
(2) 7020.00	A	From Leg	4.00	0.0000	110.00	No Ice	0.10	0.17	0.00
			0.00			1/2"	0.15	0.24	0.01
			3.00			Ice	0.20	0.31	0.01
						1" Ice	0.33	0.48	0.02
						2" Ice			
(2) 7020.00	B	From Leg	4.00	0.0000	110.00	No Ice	0.10	0.17	0.00
			0.00			1/2"	0.15	0.24	0.01
			3.00			Ice	0.20	0.31	0.01
						1" Ice	0.33	0.48	0.02
						2" Ice			
(2) 7020.00	C	From Leg	4.00	0.0000	110.00	No Ice	0.10	0.17	0.00
			0.00			1/2"	0.15	0.24	0.01
			3.00			Ice	0.20	0.31	0.01
						1" Ice	0.33	0.48	0.02
						2" Ice			
RRUS 32	A	From Leg	4.00	0.0000	110.00	No Ice	2.86	1.78	0.06
			0.00			1/2"	3.08	1.97	0.08
			3.00			Ice	3.32	2.17	0.10
						1" Ice	3.81	2.58	0.16
						2" Ice			
RRUS 32	B	From Leg	4.00	0.0000	110.00	No Ice	2.86	1.78	0.06
			0.00			1/2"	3.08	1.97	0.08
			3.00			Ice	3.32	2.17	0.10
						1" Ice	3.81	2.58	0.16
						2" Ice			
RRUS 32	C	From Leg	4.00	0.0000	110.00	No Ice	2.86	1.78	0.06
			0.00			1/2"	3.08	1.97	0.08
			3.00			Ice	3.32	2.17	0.10
						1" Ice	3.81	2.58	0.16
						2" Ice			
RRUS 32 B2	A	From Leg	4.00	0.0000	110.00	No Ice	2.73	1.67	0.05
			0.00			1/2"	2.95	1.86	0.07
			3.00			Ice	3.18	2.05	0.10
						1" Ice	3.66	2.46	0.16
						2" Ice			
RRUS 32 B2	B	From Leg	4.00	0.0000	110.00	No Ice	2.73	1.67	0.05
			0.00			1/2"	2.95	1.86	0.07
			3.00			Ice	3.18	2.05	0.10
						1" Ice	3.66	2.46	0.16
						2" Ice			
RRUS 32 B2	C	From Leg	4.00	0.0000	110.00	No Ice	2.73	1.67	0.05
			0.00			1/2"	2.95	1.86	0.07
			3.00			Ice	3.18	2.05	0.10
						1" Ice	3.66	2.46	0.16
						2" Ice			
DC6-48-60-18-8F	A	From Leg	1.00	0.0000	110.00	No Ice	0.92	0.92	0.02
			0.00			1/2"	1.46	1.46	0.04
			3.00			Ice	1.64	1.64	0.06
						1" Ice	2.04	2.04	0.11

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft ft ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		*C_AA_A Front* *ft^2*	*C_AA_A Side* *ft^2*	*Weight* *K*
						2" Ice			
DC6-48-60-18-8F	A	From Leg	1.00	0.0000	110.00	No Ice	0.92	0.92	0.02
			0.00			1/2" Ice	1.46	1.46	0.04
			3.00			1" Ice	1.64	1.64	0.06
						2" Ice	2.04	2.04	0.11
(2) TT19-08BP111-001	A	From Leg	4.00	0.0000	110.00	No Ice	0.55	0.45	0.02
			0.00			1/2" Ice	0.65	0.53	0.02
			3.00			1" Ice	0.75	0.63	0.03
						2" Ice	0.98	0.84	0.05
(2) TT19-08BP111-001	B	From Leg	4.00	0.0000	110.00	No Ice	0.55	0.45	0.02
			0.00			1/2" Ice	0.65	0.53	0.02
			3.00			1" Ice	0.75	0.63	0.03
						2" Ice	0.98	0.84	0.05
(2) TT19-08BP111-001	C	From Leg	4.00	0.0000	110.00	No Ice	0.55	0.45	0.02
			0.00			1/2" Ice	0.65	0.53	0.02
			3.00			1" Ice	0.75	0.63	0.03
						2" Ice	0.98	0.84	0.05
RRUS 11	A	From Leg	3.00	0.0000	110.00	No Ice	2.78	1.19	0.05
			0.00			1/2" Ice	2.99	1.33	0.07
			3.00			1" Ice	3.21	1.49	0.10
						2" Ice	3.66	1.83	0.15
RRUS 11	B	From Leg	3.00	0.0000	110.00	No Ice	2.78	1.19	0.05
			0.00			1/2" Ice	2.99	1.33	0.07
			3.00			1" Ice	3.21	1.49	0.10
						2" Ice	3.66	1.83	0.15
RRUS 11	C	From Leg	3.00	0.0000	110.00	No Ice	2.78	1.19	0.05
			0.00			1/2" Ice	2.99	1.33	0.07
			3.00			1" Ice	3.21	1.49	0.10
						2" Ice	3.66	1.83	0.15
***									
Platform Mount [10.75' LP 712-1]	C	None		0.0000	100.00	No Ice	21.97	21.97	1.20
						1/2" Ice	26.82	26.82	1.47
						1" Ice	31.67	31.67	1.75
						2" Ice	41.36	41.36	2.31
Transition Ladder	C	From Leg	2.00	0.0000	100.00	No Ice	6.00	6.00	0.16
			0.00			1/2" Ice	8.00	8.00	0.24
			-3.00			1" Ice	10.00	10.00	0.32
						2" Ice	14.00	14.00	0.48
(2) 8'x2" Mount Pipe	B	From Leg	4.00	0.0000	100.00	No Ice	1.90	1.90	0.03
			0.00			1/2" Ice	2.73	2.73	0.04
			0.00			1" Ice	3.40	3.40	0.06
						2" Ice	4.40	4.40	0.12
APXVAARR24_43-U-NA20_TIA w/ Mount Pipe	A	From Leg	4.00	0.0000	100.00	No Ice	20.48	11.02	0.19
			5.00			1/2" Ice	21.23	12.55	0.32
			0.00			1" Ice	21.99	14.10	0.47
						2" Ice	23.44	16.45	0.80
APXVAARR24_43-U-NA20_TIA w/ Mount Pipe	C	From Leg	4.00	0.0000	100.00	No Ice	20.48	11.02	0.19
			5.00			1/2" Ice	21.23	12.55	0.32
			0.00			1" Ice	21.99	14.10	0.47
						2" Ice	23.44	16.45	0.80
RR90-17-00DP w/ Mount Pipe	A	From Leg	4.00	0.0000	100.00	No Ice	4.59	3.32	0.03
			-5.00			1/2" Ice	5.02	4.09	0.07
			0.00			1" Ice	5.44	4.78	0.12

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	6.30	6.23	0.22
RR90-17-00DP w/ Mount Pipe	C	From Leg	4.00	0.0000	100.00	No Ice	4.59	3.32	0.03
			-5.00			1/2" Ice	5.02	4.09	0.07
			0.00			1" Ice	5.44	4.78	0.12
						2" Ice	6.30	6.23	0.22
KRY 112 489/2	A	From Leg	4.00	0.0000	100.00	No Ice	0.56	0.37	0.02
			0.00			1/2" Ice	0.66	0.45	0.02
			0.00			1" Ice	0.76	0.54	0.03
						2" Ice	1.00	0.75	0.05
KRY 112 489/2	C	From Leg	4.00	0.0000	100.00	No Ice	0.56	0.37	0.02
			0.00			1/2" Ice	0.66	0.45	0.02
			0.00			1" Ice	0.76	0.54	0.03
						2" Ice	1.00	0.75	0.05
RADIO 4449 B12/B71	A	From Leg	4.00	0.0000	100.00	No Ice	1.65	1.30	0.08
			0.00			1/2" Ice	1.81	1.44	0.09
			0.00			1" Ice	1.98	1.60	0.11
						2" Ice	2.34	1.92	0.16
RADIO 4449 B12/B71	C	From Leg	4.00	0.0000	100.00	No Ice	1.65	1.30	0.08
			0.00			1/2" Ice	1.81	1.44	0.09
			0.00			1" Ice	1.98	1.60	0.11
						2" Ice	2.34	1.92	0.16
KRY 112 144/1	A	From Leg	4.00	0.0000	100.00	No Ice	0.35	0.17	0.01
			0.00			1/2" Ice	0.43	0.23	0.01
			0.00			1" Ice	0.51	0.30	0.02
						2" Ice	0.70	0.46	0.03
KRY 112 144/1	A	From Leg	4.00	0.0000	100.00	No Ice	0.35	0.17	0.01
			0.00			1/2" Ice	0.43	0.23	0.01
			0.00			1" Ice	0.51	0.30	0.02
						2" Ice	0.70	0.46	0.03
***									
Side Arm Mount [SO 101-1]	A	From Leg	0.00	0.0000	83.00	No Ice	3.75	1.28	0.08
			0.00			1/2" Ice	4.45	1.39	0.11
			0.00			1" Ice	5.15	1.50	0.14
						2" Ice	6.55	1.72	0.19
Side Arm Mount [SO 101-1]	C	From Leg	0.00	0.0000	83.00	No Ice	3.75	1.28	0.08
			0.00			1/2" Ice	4.45	1.39	0.11
			0.00			1" Ice	5.15	1.50	0.14
						2" Ice	6.55	1.72	0.19
Side Arm Mount [SO 104-1]	A	From Face	0.00	0.0000	83.00	No Ice	1.51	0.67	0.10
			0.00			1/2" Ice	1.82	0.93	0.14
			0.00			1" Ice	2.13	1.19	0.18
						2" Ice	2.75	1.71	0.26
Side Arm Mount [SO 104-1]	B	From Face	0.00	0.0000	83.00	No Ice	1.51	0.67	0.10
			0.00			1/2" Ice	1.82	0.93	0.14
			0.00			1" Ice	2.13	1.19	0.18
						2" Ice	2.75	1.71	0.26
6'x2" Mount Pipe	A	From Face	1.00	0.0000	83.00	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.92	1.92	0.03
			0.00			1" Ice	2.29	2.29	0.05
						2" Ice	3.06	3.06	0.09
6'x2" Mount Pipe	B	From Face	1.00	0.0000	83.00	No Ice	1.43	1.43	0.02
			0.00			1/2"	1.92	1.92	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement		C_AA_A Front	C_AA_A Side	Weight
			ft ft ft	°	ft		ft²	ft²	K
			0.00			Ice	2.29	2.29	0.05
						1" Ice	3.06	3.06	0.09
						2" Ice			
SBNHH-1D65A_TIA w/	A	From Leg	1.00	0.0000	83.00	No Ice	6.19	5.25	0.05
Mount Pipe			1.00			1/2"	6.64	6.04	0.11
			0.00			Ice	7.07	6.74	0.17
						1" Ice	7.97	8.18	0.31
						2" Ice			
SBNHH-1D65A_TIA w/	A	From Leg	1.00	0.0000	83.00	No Ice	6.19	5.25	0.05
Mount Pipe			-1.00			1/2"	6.64	6.04	0.11
			0.00			Ice	7.07	6.74	0.17
						1" Ice	7.97	8.18	0.31
						2" Ice			
SBNHH-1D65A_TIA w/	C	From Face	1.00	0.0000	83.00	No Ice	6.19	5.25	0.05
Mount Pipe			1.00			1/2"	6.64	6.04	0.11
			0.00			Ice	7.07	6.74	0.17
						1" Ice	7.97	8.18	0.31
						2" Ice			
SBNHH-1D65A_TIA w/	C	From Face	1.00	0.0000	83.00	No Ice	6.19	5.25	0.05
Mount Pipe			-1.00			1/2"	6.64	6.04	0.11
			0.00			Ice	7.07	6.74	0.17
						1" Ice	7.97	8.18	0.31
						2" Ice			
B13 RRH4X30-4R	C	From Leg	1.00	0.0000	83.00	No Ice	2.16	1.62	0.06
			0.00			1/2"	2.35	1.79	0.08
			0.00			Ice	2.55	1.97	0.10
						1" Ice	2.97	2.36	0.15
						2" Ice			
B13 RRH4X30-4R	A	From Face	1.00	0.0000	83.00	No Ice	2.16	1.62	0.06
			0.00			1/2"	2.35	1.79	0.08
			0.00			Ice	2.55	1.97	0.10
						1" Ice	2.97	2.36	0.15
						2" Ice			
DB-T1-6Z-8AB-0Z	B	From Leg	1.00	0.0000	83.00	No Ice	4.80	2.00	0.04
			0.00			1/2"	5.07	2.19	0.08
			0.00			Ice	5.35	2.39	0.12
						1" Ice	5.93	2.81	0.21
						2" Ice			
DB-T1-6Z-8AB-0Z	A	From Leg	1.00	0.0000	83.00	No Ice	4.80	2.00	0.04
			0.00			1/2"	5.07	2.19	0.08
			0.00			Ice	5.35	2.39	0.12
						1" Ice	5.93	2.81	0.21
						2" Ice			
B66A RRH4X45	A	From Face	1.00	0.0000	83.00	No Ice	2.58	1.63	0.06
			0.00			1/2"	2.79	1.81	0.08
			0.00			Ice	3.01	2.00	0.10
						1" Ice	3.48	2.40	0.16
						2" Ice			
B66A RRH4X45	C	From Leg	1.00	0.0000	83.00	No Ice	2.58	1.63	0.06
			0.00			1/2"	2.79	1.81	0.08
			0.00			Ice	3.01	2.00	0.10
						1" Ice	3.48	2.40	0.16
						2" Ice			
RRH2X60-PCS	C	From Leg	1.00	0.0000	83.00	No Ice	2.20	1.72	0.06
			0.00			1/2"	2.39	1.90	0.08
			0.00			Ice	2.59	2.09	0.10
						1" Ice	3.01	2.48	0.16
						2" Ice			
RRH2X60-PCS	A	From Face	1.00	0.0000	83.00	No Ice	2.20	1.72	0.06
			0.00			1/2"	2.39	1.90	0.08
			0.00			Ice	2.59	2.09	0.10
						1" Ice	3.01	2.48	0.16
						2" Ice			
***									
Side Arm Mount [SO 201-	A	From Leg	1.00	0.0000	69.00	No Ice	2.96	2.11	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
1]			0.00 0.00			1/2" Ice 1" Ice 2" Ice	4.10 5.24 7.52	2.93 3.75 5.39	0.12 0.14 0.18
12' HSS 3x3x1/4	A	From Leg	2.00 0.00 0.00	0.0000	69.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.96 4.88 5.80 7.64	0.15 0.22 0.30 0.45	0.12 0.15 0.18 0.24
7'x2" Mount Pipe	A	From Leg	2.00 -6.00 -2.00	0.0000	69.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.66 2.39 2.83 3.71	1.66 2.39 2.83 3.71	0.03 0.04 0.06 0.10
7'x2" Mount Pipe	A	From Leg	2.00 -2.00 -2.00	0.0000	69.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.66 2.39 2.83 3.71	1.66 2.39 2.83 3.71	0.03 0.04 0.06 0.10
7'x2" Mount Pipe	A	From Leg	2.00 2.00 -2.00	0.0000	69.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.66 2.39 2.83 3.71	1.66 2.39 2.83 3.71	0.03 0.04 0.06 0.10
DB201-F	A	From Leg	2.00 -6.00 2.00	0.0000	69.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.40 0.72 1.04 1.68	0.40 0.72 1.04 1.68	0.01 0.01 0.02 0.02
DB810M-XC	A	From Leg	2.00 2.00 5.00	0.0000	69.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.12 3.14 4.18 5.77	2.12 3.14 4.18 5.77	0.03 0.05 0.07 0.13
48212S w/ Mount Pipe	A	From Leg	2.00 6.00 3.00	0.0000	69.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.62 5.03 5.44 6.28	3.12 3.83 4.49 5.88	0.04 0.08 0.12 0.23
***									

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

Comb. No.	*Description*
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	*Elevation ft*	*Component Type*	*Condition*	*Gov. Load Comb.*	*Axial K*	*Major Axis Moment kip-ft*	*Minor Axis Moment kip-ft*
L1	110 - 105	Pole	Max Tension	26	0.00	-0.00	-0.00
			Max. Compression	26	-10.99	1.26	-0.19
			Max. Mx	20	-3.80	39.25	-0.11
			Max. My	14	-3.79	0.43	-39.03
			Max. Vy	20	-5.92	39.25	-0.11
			Max. Vx	2	-5.93	0.37	38.70
			Max. Torque	24			0.62
L2	105 - 100	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-11.42	1.41	-0.05
			Max. Mx	20	-4.03	69.30	-0.09
			Max. My	14	-4.02	0.49	-69.12
			Max. Vy	20	-6.10	69.30	-0.09
			Max. Vx	2	-6.11	0.38	68.80
			Max. Torque	24			0.62
L3	100 - 93	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-17.69	5.28	4.65
			Max. Mx	20	-6.53	114.65	0.25
			Max. My	2	-6.48	0.73	115.37
			Max. Vy	20	-9.05	114.65	0.25
			Max. Vx	2	-9.25	0.73	115.37
			Max. Torque	18			-3.01
L4	93 - 90	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-18.41	5.44	4.82
			Max. Mx	20	-6.98	160.35	-0.50
			Max. My	2	-6.94	-0.05	162.08

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	20	-9.23	160.35	-0.50
			Max. Vx	2	-9.43	-0.05	162.08
			Max. Torque	18			-3.01
L5	90 - 85	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-18.99	5.58	4.96
			Max. Mx	20	-7.40	206.82	-1.27
			Max. My	2	-7.36	-0.82	209.58
			Max. Vy	20	-9.38	206.82	-1.27
			Max. Vx	2	-9.58	-0.82	209.58
			Max. Torque	18			-3.00
L6	85 - 80	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-23.37	6.96	5.70
			Max. Mx	20	-8.97	260.04	-1.85
			Max. My	2	-8.92	-1.01	263.75
			Max. Vy	20	-11.31	260.04	-1.85
			Max. Vx	2	-11.64	-1.01	263.75
			Max. Torque	18			-3.40
L7	80 - 79.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-23.43	6.97	5.70
			Max. Mx	20	-9.01	262.86	-1.89
			Max. My	2	-8.96	-1.05	266.66
			Max. Vy	20	-11.32	262.86	-1.89
			Max. Vx	14	11.65	5.62	-263.70
			Max. Torque	18			-3.40
L8	79.75 - 74.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-24.54	7.08	5.83
			Max. Mx	20	-9.71	320.28	-2.66
			Max. My	2	-9.66	-1.83	325.71
			Max. Vy	20	-11.66	320.28	-2.66
			Max. Vx	14	12.01	6.45	-322.83
			Max. Torque	18			-3.40
L9	74.75 - 69.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-25.67	7.18	5.95
			Max. Mx	20	-10.43	379.36	-3.43
			Max. My	2	-10.38	-2.62	386.44
			Max. Vy	20	-11.99	379.36	-3.43
			Max. Vx	14	12.37	7.27	-383.75
			Max. Torque	18			-3.40
L10	69.75 - 64.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-27.97	6.47	9.05
			Max. Mx	20	-11.61	442.28	-3.08
			Max. My	2	-11.55	-3.44	453.32
			Max. Vy	20	-12.77	442.28	-3.08
			Max. Vx	14	13.39	8.06	-448.59
			Max. Torque	18			-4.03
L11	64.75 - 64.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-28.11	6.48	9.06
			Max. Mx	20	-11.69	448.67	-3.16
			Max. My	2	-11.64	-3.52	459.98
			Max. Vy	20	-12.80	448.67	-3.16
			Max. Vx	14	13.43	8.15	-455.29
			Max. Torque	18			-4.02
L12	64.25 - 64	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-28.19	6.48	9.07
			Max. Mx	20	-11.74	451.87	-3.20
			Max. My	2	-11.69	-3.55	463.32
			Max. Vy	20	-12.82	451.87	-3.20
			Max. Vx	14	13.45	8.19	-458.65
			Max. Torque	18			-4.02
L13	64 - 59	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-29.80	6.56	9.17
			Max. Mx	20	-12.75	516.89	-3.97
			Max. My	2	-12.70	-4.34	531.04
			Max. Vy	20	-13.20	516.89	-3.97
			Max. Vx	14	13.87	9.01	-526.92

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Torque	18			-4.02
L14	59 - 56.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-30.61	6.60	9.22
			Max. Mx	20	-13.26	550.11	-4.36
			Max. My	2	-13.21	-4.74	565.62
			Max. Vy	20	-13.39	550.11	-4.36
			Max. Vx	14	14.09	9.41	-561.85
			Max. Torque	18			-4.02
L15	56.5 - 56.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-30.71	6.61	9.22
			Max. Mx	20	-13.33	553.46	-4.40
			Max. My	2	-13.28	-4.78	569.10
			Max. Vy	20	-13.40	553.46	-4.40
			Max. Vx	14	14.10	9.46	-565.37
			Max. Torque	18			-4.02
L16	56.25 - 51.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-32.61	6.68	9.31
			Max. Mx	20	-14.57	621.49	-5.18
			Max. My	2	-14.52	-5.57	639.84
			Max. Vy	20	-13.81	621.49	-5.18
			Max. Vx	14	14.56	10.27	-637.01
			Max. Torque	18			-4.02
L17	51.25 - 45.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-33.28	6.71	9.35
			Max. Mx	20	-15.00	645.77	-5.46
			Max. My	2	-14.96	-5.84	665.08
			Max. Vy	20	-13.96	645.77	-5.46
			Max. Vx	14	14.72	10.56	-662.63
			Max. Torque	18			-4.02
L18	45.5 - 44.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-36.14	6.78	9.43
			Max. Mx	20	-17.00	716.67	-6.24
			Max. My	2	-16.96	-6.63	738.69
			Max. Vy	20	-14.40	716.67	-6.24
			Max. Vx	14	15.22	11.38	-737.49
			Max. Torque	18			-4.02
L19	44.5 - 39.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-37.73	6.85	9.52
			Max. Mx	20	-18.13	789.46	-7.02
			Max. My	14	-18.07	12.19	-814.43
			Max. Vy	20	-14.73	789.46	-7.02
			Max. Vx	14	15.58	12.19	-814.43
			Max. Torque	18			-4.02
L20	39.5 - 37.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-38.46	6.88	9.55
			Max. Mx	20	-18.65	822.76	-7.38
			Max. My	14	-18.59	12.56	-849.65
			Max. Vy	20	-14.88	822.76	-7.38
			Max. Vx	14	15.74	12.56	-849.65
			Max. Torque	18			-4.02
L21	37.25 - 37	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-38.55	6.89	9.55
			Max. Mx	20	-18.72	826.48	-7.42
			Max. My	14	-18.67	12.60	-853.58
			Max. Vy	20	-14.89	826.48	-7.42
			Max. Vx	14	15.75	12.60	-853.58
			Max. Torque	18			-4.02
L22	37 - 36.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-38.73	6.89	9.56
			Max. Mx	20	-18.85	833.94	-7.50
			Max. My	14	-18.80	12.68	-861.47
			Max. Vy	20	-14.93	833.94	-7.50
			Max. Vx	14	15.79	12.68	-861.47
			Max. Torque	18			-4.02
L23	36.5 - 36.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-38.83	6.90	9.57
			Max. Mx	20	-18.92	837.67	-7.53
			Max. My	14	-18.87	12.72	-865.42

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	20	-14.94	837.67	-7.53
			Max. Vx	14	15.81	12.72	-865.42
			Max. Torque	18			-4.02
L24	36.25 - 34.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-39.68	6.92	9.63
			Max. Mx	20	-19.51	867.70	-7.85
			Max. My	14	-19.46	13.04	-897.21
			Max. Vy	20	-15.10	867.70	-7.85
			Max. Vx	14	15.99	13.04	-897.21
			Max. Torque	18			-4.02
L25	34.25 - 34	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-39.77	6.92	9.64
			Max. Mx	20	-19.58	871.48	-7.89
			Max. My	14	-19.53	13.08	-901.20
			Max. Vy	20	-15.11	871.48	-7.89
			Max. Vx	14	16.00	13.08	-901.20
			Max. Torque	18			-4.02
L26	34 - 29	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-41.68	6.95	9.76
			Max. Mx	20	-20.91	947.89	-8.67
			Max. My	14	-20.86	13.89	-982.17
			Max. Vy	20	-15.46	947.89	-8.67
			Max. Vx	14	16.40	13.89	-982.17
			Max. Torque	18			-4.02
L27	29 - 24	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43.57	6.93	9.86
			Max. Mx	20	-22.27	1026.00	-9.46
			Max. My	14	-22.23	14.69	-1065.02
			Max. Vy	20	-15.80	1026.00	-9.46
			Max. Vx	14	16.76	14.69	-1065.02
			Max. Torque	18			-4.01
L28	24 - 19	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-45.47	6.90	9.96
			Max. Mx	20	-23.64	1105.81	-10.24
			Max. My	14	-23.61	15.49	-1149.67
			Max. Vy	20	-16.14	1105.81	-10.24
			Max. Vx	14	17.13	15.49	-1149.67
			Max. Torque	18			-4.01
L29	19 - 14	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-47.38	6.87	10.04
			Max. Mx	20	-25.04	1187.30	-11.02
			Max. My	14	-25.02	16.27	-1236.14
			Max. Vy	20	-16.48	1187.30	-11.02
			Max. Vx	14	17.49	16.27	-1236.14
			Max. Torque	18			-4.01
L30	14 - 9	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-49.29	6.83	10.10
			Max. Mx	20	-26.46	1270.48	-11.79
			Max. My	14	-26.45	17.05	-1324.42
			Max. Vy	20	-16.82	1270.48	-11.79
			Max. Vx	14	17.85	17.05	-1324.42
			Max. Torque	18			-4.01
L31	9 - 4	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-51.19	6.78	10.15
			Max. Mx	20	-27.91	1355.34	-12.56
			Max. My	14	-27.90	17.83	-1414.50
			Max. Vy	20	-17.15	1355.34	-12.56
			Max. Vx	14	18.21	17.83	-1414.50
			Max. Torque	18			-4.01
L32	4 - 1.17	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-52.24	6.76	10.17
			Max. Mx	20	-28.73	1404.12	-13.00
			Max. My	14	-28.73	18.26	-1466.27
			Max. Vy	20	-17.35	1404.12	-13.00
			Max. Vx	14	18.41	18.26	-1466.27
			Max. Torque	18			-4.01
L33	1.17 - 0.92	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-52.32	6.76	10.17

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	-28.82	1408.45	-13.04
			Max. My	14	-28.82	18.30	-1470.87
			Max. Vy	20	-17.34	1408.45	-13.04
			Max. Vx	14	18.41	18.30	-1470.87
			Max. Torque	18			-4.01
L34	0.92 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-52.64	6.76	10.17
			Max. Mx	20	-29.10	1424.42	-13.18
			Max. My	14	-29.10	18.44	-1487.82
			Max. Vy	20	-17.38	1424.42	-13.18
			Max. Vx	14	18.44	18.44	-1487.82
			Max. Torque	18			-4.01

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	52.64	0.00	0.00
	Max. H_x	21	21.83	17.37	-0.15
	Max. H_z	2	29.10	-0.15	17.60
	Max. M_x	2	1466.23	-0.15	17.60
	Max. M_z	8	1416.47	-17.10	0.15
	Max. Torsion	6	3.98	-15.42	9.25
	Min. Vert	11	21.83	-14.74	-8.68
	Min. H_x	8	29.10	-17.10	0.15
	Min. H_z	15	21.83	0.15	-18.43
	Min. M_x	14	-1487.82	0.15	-18.43
	Min. M_z	20	-1424.42	17.37	-0.15
	Min. Torsion	18	-4.01	15.12	-9.08

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	24.25	-0.00	-0.00	-2.35	1.99	-0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	29.10	0.15	-17.60	-1466.23	-13.58	-1.25
0.9 Dead+1.0 Wind 0 deg - No Ice	21.83	0.15	-17.60	-1447.52	-14.02	-1.19
1.2 Dead+1.0 Wind 30 deg - No Ice	29.10	8.67	-15.32	-1278.16	-720.33	-3.01
0.9 Dead+1.0 Wind 30 deg - No Ice	21.83	8.67	-15.32	-1261.75	-712.08	-2.94
1.2 Dead+1.0 Wind 60 deg - No Ice	29.10	15.42	-9.25	-760.17	-1253.83	-3.98
0.9 Dead+1.0 Wind 60 deg - No Ice	21.83	15.42	-9.25	-750.18	-1239.13	-3.91
1.2 Dead+1.0 Wind 90 deg - No Ice	29.10	17.10	-0.15	-18.84	-1416.47	-3.89
0.9 Dead+1.0 Wind 90 deg - No Ice	21.83	17.10	-0.15	-17.88	-1399.67	-3.85
1.2 Dead+1.0 Wind 120 deg - No Ice	29.10	14.74	8.68	715.55	-1218.37	-2.76
0.9 Dead+1.0 Wind 120 deg - No Ice	21.83	14.74	8.68	707.50	-1204.02	-2.76
1.2 Dead+1.0 Wind 150 deg - No Ice	29.10	8.42	15.19	1257.38	-693.12	-0.89
0.9 Dead+1.0 Wind 150 deg - No Ice	21.83	8.42	15.19	1242.70	-685.23	-0.93

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
1.2 Dead+1.0 Wind 180 deg - No Ice	29.10	-0.15	18.43	1487.82	18.44	1.23
0.9 Dead+1.0 Wind 180 deg - No Ice	21.83	-0.15	18.43	1470.46	17.57	1.16
1.2 Dead+1.0 Wind 210 deg - No Ice	29.10	-8.82	15.57	1275.98	727.20	3.02
0.9 Dead+1.0 Wind 210 deg - No Ice	21.83	-8.82	15.57	1261.08	717.64	2.95
1.2 Dead+1.0 Wind 240 deg - No Ice	29.10	-15.12	9.08	744.77	1241.83	4.01
0.9 Dead+1.0 Wind 240 deg - No Ice	21.83	-15.12	9.08	736.36	1225.96	3.95
1.2 Dead+1.0 Wind 270 deg - No Ice	29.10	-17.37	0.15	13.18	1424.42	3.91
0.9 Dead+1.0 Wind 270 deg - No Ice	21.83	-17.37	0.15	13.72	1406.31	3.87
1.2 Dead+1.0 Wind 300 deg - No Ice	29.10	-15.41	-9.07	-733.92	1245.23	2.75
0.9 Dead+1.0 Wind 300 deg - No Ice	21.83	-15.41	-9.07	-724.28	1229.42	2.75
1.2 Dead+1.0 Wind 330 deg - No Ice	29.10	-8.41	-15.16	-1262.24	697.51	0.86
0.9 Dead+1.0 Wind 330 deg - No Ice	21.83	-8.41	-15.16	-1246.04	688.31	0.90
1.2 Dead+1.0 Ice+1.0 Temp	52.64	-0.00	-0.00	-10.17	6.76	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	52.64	0.02	-4.17	-401.36	4.40	-0.66
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	52.64	2.07	-3.62	-350.14	-187.59	-1.05
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	52.64	3.64	-2.15	-210.06	-331.37	-1.17
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	52.64	4.10	-0.02	-12.56	-378.02	-0.97
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	52.64	3.54	2.07	183.43	-325.28	-0.51
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	52.64	2.03	3.61	327.55	-183.57	0.09
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	52.64	-0.02	4.31	386.14	9.14	0.66
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	52.64	-2.08	3.65	330.36	201.47	1.05
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	52.64	-3.59	2.12	187.80	341.64	1.16
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	52.64	-4.13	0.02	-7.82	392.08	0.96
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	52.64	-3.65	-2.13	-206.22	342.99	0.50
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	52.64	-2.03	-3.60	-347.77	197.02	-0.09
Dead+Wind 0 deg - Service	24.25	0.03	-3.82	-318.50	-1.44	-0.27
Dead+Wind 30 deg - Service	24.25	1.88	-3.33	-277.87	-154.13	-0.65
Dead+Wind 60 deg - Service	24.25	3.35	-2.01	-165.97	-269.39	-0.87
Dead+Wind 90 deg - Service	24.25	3.72	-0.03	-5.82	-304.51	-0.85
Dead+Wind 120 deg - Service	24.25	3.20	1.89	152.82	-261.72	-0.61
Dead+Wind 150 deg - Service	24.25	1.83	3.30	269.87	-148.26	-0.20
Dead+Wind 180 deg - Service	24.25	-0.03	4.01	319.67	5.46	0.26
Dead+Wind 210 deg - Service	24.25	-1.92	3.38	273.90	158.59	0.65
Dead+Wind 240 deg - Service	24.25	-3.29	1.97	159.13	269.76	0.87
Dead+Wind 270 deg - Service	24.25	-3.78	0.03	1.08	309.19	0.85
Dead+Wind 300 deg - Service	24.25	-3.35	-1.97	-160.30	270.49	0.60
Dead+Wind 330 deg - Service	24.25	-1.83	-3.30	-274.43	152.17	0.20

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.00	-24.25	0.00	0.00	24.25	0.00	0.000%
2	0.15	-29.10	-17.60	-0.15	29.10	17.60	0.000%
3	0.15	-21.83	-17.60	-0.15	21.83	17.60	0.000%
4	8.67	-29.10	-15.32	-8.67	29.10	15.32	0.000%
5	8.67	-21.83	-15.32	-8.67	21.83	15.32	0.000%
6	15.42	-29.10	-9.25	-15.42	29.10	9.25	0.000%
7	15.42	-21.83	-9.25	-15.42	21.83	9.25	0.000%
8	17.10	-29.10	-0.15	-17.10	29.10	0.15	0.000%
9	17.10	-21.83	-0.15	-17.10	21.83	0.15	0.000%
10	14.74	-29.10	8.68	-14.74	29.10	-8.68	0.000%
11	14.74	-21.83	8.68	-14.74	21.83	-8.68	0.000%
12	8.42	-29.10	15.19	-8.42	29.10	-15.19	0.000%
13	8.42	-21.83	15.19	-8.42	21.83	-15.19	0.000%
14	-0.15	-29.10	18.43	0.15	29.10	-18.43	0.000%
15	-0.15	-21.83	18.43	0.15	21.83	-18.43	0.000%
16	-8.82	-29.10	15.57	8.82	29.10	-15.57	0.000%
17	-8.82	-21.83	15.57	8.82	21.83	-15.57	0.000%
18	-15.12	-29.10	9.08	15.12	29.10	-9.08	0.000%
19	-15.12	-21.83	9.08	15.12	21.83	-9.08	0.000%
20	-17.37	-29.10	0.15	17.37	29.10	-0.15	0.000%
21	-17.37	-21.83	0.15	17.37	21.83	-0.15	0.000%
22	-15.41	-29.10	-9.07	15.41	29.10	9.07	0.000%
23	-15.41	-21.83	-9.07	15.41	21.83	9.07	0.000%
24	-8.41	-29.10	-15.16	8.41	29.10	15.16	0.000%
25	-8.41	-21.83	-15.16	8.41	21.83	15.16	0.000%
26	0.00	-52.64	0.00	0.00	52.64	0.00	0.000%
27	0.02	-52.64	-4.17	-0.02	52.64	4.17	0.000%
28	2.07	-52.64	-3.62	-2.07	52.64	3.62	0.000%
29	3.64	-52.64	-2.15	-3.64	52.64	2.15	0.000%
30	4.10	-52.64	-0.02	-4.10	52.64	0.02	0.000%
31	3.54	-52.64	2.07	-3.54	52.64	-2.07	0.000%
32	2.03	-52.64	3.61	-2.03	52.64	-3.61	0.000%
33	-0.02	-52.64	4.31	0.02	52.64	-4.31	0.000%
34	-2.08	-52.64	3.65	2.08	52.64	-3.65	0.000%
35	-3.59	-52.64	2.12	3.59	52.64	-2.12	0.000%
36	-4.13	-52.64	0.02	4.13	52.64	-0.02	0.000%
37	-3.65	-52.64	-2.13	3.65	52.64	2.13	0.000%
38	-2.03	-52.64	-3.60	2.03	52.64	3.60	0.000%
39	0.03	-24.25	-3.82	-0.03	24.25	3.82	0.000%
40	1.88	-24.25	-3.33	-1.88	24.25	3.33	0.000%
41	3.35	-24.25	-2.01	-3.35	24.25	2.01	0.000%
42	3.72	-24.25	-0.03	-3.72	24.25	0.03	0.000%
43	3.20	-24.25	1.89	-3.20	24.25	-1.89	0.000%
44	1.83	-24.25	3.30	-1.83	24.25	-3.30	0.000%
45	-0.03	-24.25	4.01	0.03	24.25	-4.01	0.000%
46	-1.92	-24.25	3.38	1.92	24.25	-3.38	0.000%
47	-3.29	-24.25	1.97	3.29	24.25	-1.97	0.000%
48	-3.78	-24.25	0.03	3.78	24.25	-0.03	0.000%
49	-3.35	-24.25	-1.97	3.35	24.25	1.97	0.000%
50	-1.83	-24.25	-3.30	1.83	24.25	3.30	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00001013
2	Yes	5	0.00000001	0.00088295
3	Yes	5	0.00000001	0.00038381
4	Yes	6	0.00000001	0.00068034

5	Yes	6	0.00000001	0.00021377
6	Yes	6	0.00000001	0.00089156
7	Yes	6	0.00000001	0.00028823
8	Yes	6	0.00000001	0.00021979
9	Yes	6	0.00000001	0.00007463
10	Yes	6	0.00000001	0.00064786
11	Yes	6	0.00000001	0.00020693
12	Yes	6	0.00000001	0.00073410
13	Yes	6	0.00000001	0.00023760
14	Yes	6	0.00000001	0.00009504
15	Yes	5	0.00000001	0.00071564
16	Yes	6	0.00000001	0.00085626
17	Yes	6	0.00000001	0.00027555
18	Yes	6	0.00000001	0.00067320
19	Yes	6	0.00000001	0.00021196
20	Yes	6	0.00000001	0.00017851
21	Yes	6	0.00000001	0.00006069
22	Yes	6	0.00000001	0.00082098
23	Yes	6	0.00000001	0.00026568
24	Yes	6	0.00000001	0.00070611
25	Yes	6	0.00000001	0.00022427
26	Yes	5	0.00000001	0.00057919
27	Yes	7	0.00000001	0.00020502
28	Yes	7	0.00000001	0.00023518
29	Yes	7	0.00000001	0.00024568
30	Yes	7	0.00000001	0.00018670
31	Yes	7	0.00000001	0.00020892
32	Yes	7	0.00000001	0.00021086
33	Yes	7	0.00000001	0.00018694
34	Yes	7	0.00000001	0.00024109
35	Yes	7	0.00000001	0.00023198
36	Yes	7	0.00000001	0.00020418
37	Yes	7	0.00000001	0.00025658
38	Yes	7	0.00000001	0.00025300
39	Yes	5	0.00000001	0.00006107
40	Yes	5	0.00000001	0.00015343
41	Yes	5	0.00000001	0.00028293
42	Yes	5	0.00000001	0.00016584
43	Yes	5	0.00000001	0.00013781
44	Yes	5	0.00000001	0.00016567
45	Yes	5	0.00000001	0.00006705
46	Yes	5	0.00000001	0.00025329
47	Yes	5	0.00000001	0.00017480
48	Yes	5	0.00000001	0.00016398
49	Yes	5	0.00000001	0.00024078
50	Yes	5	0.00000001	0.00015294

Maximum Tower Deflections - Service Wind

Section No.	*Elevation* *ft*	*Horz. Deflection* *in*	*Gov. Load Comb.*	*Tilt* °	*Twist* °
L1	110 - 105	16.650	39	1.6107	0.0204
L2	105 - 100	14.981	39	1.5703	0.0201
L3	100 - 93	13.374	39	1.4939	0.0199
L4	95 - 90	11.868	39	1.3781	0.0154
L5	90 - 85	10.468	39	1.2799	0.0128
L6	85 - 80	9.197	39	1.1465	0.0102
L7	80 - 79.75	8.070	39	1.0026	0.0077
L8	79.75 - 74.75	8.018	39	0.9991	0.0076
L9	74.75 - 69.75	7.011	39	0.9239	0.0065
L10	69.75 - 64.75	6.085	39	0.8442	0.0056
L11	64.75 - 64.25	5.246	39	0.7581	0.0046
L12	64.25 - 64	5.167	39	0.7495	0.0045
L13	64 - 59	5.128	39	0.7466	0.0045
L14	59 - 56.5	4.377	39	0.6862	0.0038
L15	56.5 - 56.25	4.026	39	0.6550	0.0036
L16	56.25 - 51.25	3.992	39	0.6526	0.0035

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L17	51.25 - 45.5	3.335	39	0.6026	0.0031
L18	49.5 - 44.5	3.117	39	0.5850	0.0030
L19	44.5 - 39.5	2.520	39	0.5493	0.0027
L20	39.5 - 37.25	1.979	39	0.4840	0.0023
L21	37.25 - 37	1.758	39	0.4545	0.0021
L22	37 - 36.5	1.734	39	0.4513	0.0021
L23	36.5 - 36.25	1.687	39	0.4448	0.0020
L24	36.25 - 34.25	1.664	39	0.4423	0.0020
L25	34.25 - 34	1.483	39	0.4214	0.0019
L26	34 - 29	1.461	39	0.4183	0.0019
L27	29 - 24	1.057	39	0.3549	0.0015
L28	24 - 19	0.718	39	0.2919	0.0012
L29	19 - 14	0.445	45	0.2294	0.0009
L30	14 - 9	0.238	45	0.1675	0.0006
L31	9 - 4	0.095	45	0.1051	0.0004
L32	4 - 1.17	0.017	45	0.0441	0.0002
L33	1.17 - 0.92	0.001	45	0.0096	0.0000
L34	0.92 - 0	0.001	45	0.0076	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
110.00	Lightning Rod 5/8"x4'	39	16.650	1.6107	0.0205	4538
100.00	Platform Mount [10.75' LP 712-1]	39	13.374	1.4939	0.0200	2918
83.00	Side Arm Mount [SO 101-1]	39	8.728	1.0794	0.0090	2097
69.00	Side Arm Mount [SO 201-1]	39	5.953	0.8320	0.0054	3428

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	110 - 105	76.283	14	7.3680	0.0920
L2	105 - 100	68.706	14	7.1778	0.0910
L3	100 - 93	61.420	14	6.8221	0.0904
L4	95 - 90	54.580	14	6.3101	0.0700
L5	90 - 85	48.207	14	5.8674	0.0585
L6	85 - 80	42.403	14	5.2605	0.0463
L7	80 - 79.75	37.250	14	4.6036	0.0352
L8	79.75 - 74.75	37.010	14	4.5877	0.0349
L9	74.75 - 69.75	32.393	14	4.2435	0.0300
L10	69.75 - 64.75	28.142	14	3.8799	0.0256
L11	64.75 - 64.25	24.284	14	3.4918	0.0211
L12	64.25 - 64	23.921	14	3.4528	0.0206
L13	64 - 59	23.741	14	3.4396	0.0205
L14	59 - 56.5	20.283	14	3.1663	0.0177
L15	56.5 - 56.25	18.663	14	3.0249	0.0163
L16	56.25 - 51.25	18.505	14	3.0140	0.0162
L17	51.25 - 45.5	15.470	14	2.7862	0.0143
L18	49.5 - 44.5	14.463	14	2.7058	0.0137
L19	44.5 - 39.5	11.702	14	2.5425	0.0125
L20	39.5 - 37.25	9.197	14	2.2430	0.0105
L21	37.25 - 37	8.172	14	2.1077	0.0097
L22	37 - 36.5	8.062	14	2.0928	0.0096
L23	36.5 - 36.25	7.845	14	2.0631	0.0094
L24	36.25 - 34.25	7.737	14	2.0513	0.0093
L25	34.25 - 34	6.898	14	1.9555	0.0088
L26	34 - 29	6.796	14	1.9412	0.0087
L27	29 - 24	4.917	14	1.6486	0.0071

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L28	24 - 19	3.344	14	1.3575	0.0056
L29	19 - 14	2.074	14	1.0680	0.0042
L30	14 - 9	1.107	14	0.7804	0.0030
L31	9 - 4	0.443	14	0.4894	0.0018
L32	4 - 1.17	0.080	14	0.2054	0.0007
L33	1.17 - 0.92	0.005	14	0.0449	0.0002
L34	0.92 - 0	0.003	14	0.0352	0.0001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
110.00	Lightning Rod 5/8"x4'	14	76.283	7.3680	0.0958	1043
100.00	Platform Mount [10.75' LP 712-1]	14	61.420	6.8221	0.0930	676
83.00	Side Arm Mount [SO 101-1]	14	40.262	4.9546	0.0414	467
69.00	Side Arm Mount [SO 201-1]	14	27.538	3.8249	0.0250	756

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	110 - 105 (1)	TP13.901x13.051x0.1875	5.00	0.00	0.0	8.1613	-3.79	477.43	0.008
L2	105 - 100 (2)	TP14.751x13.901x0.1875	5.00	0.00	0.0	8.6671	-4.02	507.03	0.008
L3	100 - 93 (3)	TP15.941x14.751x0.1875	7.00	0.00	0.0	9.1730	-6.48	536.62	0.012
L4	93 - 90 (4)	TP16.1139x15.226x0.25	5.00	0.00	0.0	12.5880	-6.93	736.40	0.009
L5	90 - 85 (5)	TP17.0018x16.1139x0.25	5.00	0.00	0.0	13.2925	-7.35	777.61	0.009
L6	85 - 80 (6)	TP17.8896x17.0018x0.25	5.00	0.00	0.0	13.9971	-8.91	818.83	0.011
L7	80 - 79.75 (7)	TP17.934x17.8896x0.5625	0.25	0.00	0.0	31.0147	-8.96	1814.36	0.005
L8	79.75 - 74.75 (8)	TP18.8219x17.934x0.5375	5.00	0.00	0.0	31.1937	-9.65	1824.83	0.005
L9	74.75 - 69.75 (9)	TP19.7098x18.8219x0.525	5.00	0.00	0.0	31.9686	-10.38	1870.16	0.006
L10	69.75 - 64.75 (10)	TP20.5977x19.7098x0.5	5.00	0.00	0.0	31.8950	-11.55	1865.86	0.006
L11	64.75 - 64.25 (11)	TP20.6865x20.5977x0.5	0.50	0.00	0.0	32.0359	-11.64	1874.10	0.006
L12	64.25 - 64 (12)	TP20.7308x20.6865x0.775	0.25	0.00	0.0	49.0884	-11.69	2871.67	0.004
L13	64 - 59 (13)	TP21.6187x20.7308x0.75	5.00	0.00	0.0	49.6780	-12.69	2906.16	0.004
L14	59 - 56.5 (14)	TP22.0627x21.6187x0.725	2.50	0.00	0.0	49.1012	-13.21	2872.42	0.005
L15	56.5 - 56.25 (15)	TP22.1071x22.0627x0.975	0.25	0.00	0.0	65.3963	-13.28	3825.69	0.003
L16	56.25 - 51.25 (16)	TP22.9949x22.1071x0.925	5.00	0.00	0.0	64.7962	-14.52	3790.58	0.004
L17	51.25 - 45.5 (17)	TP24.016x22.9949x0.9125	5.75	0.00	0.0	64.8569	-14.96	3794.13	0.004
L18	45.5 - 44.5 (18)	TP23.7093x22.8057x0.725	5.00	0.00	0.0	52.8902	-16.96	3094.08	0.005

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L19	44.5 - 39.5 (19)	TP24.6128x23.7093x0.7125	5.00	0.00	0.0	54.0500	-18.09	3161.92	0.006
L20	39.5 - 37.25 (20)	TP25.0194x24.6128x0.7	2.25	0.00	0.0	54.0329	-18.59	3160.93	0.006
L21	37.25 - 37 (21)	TP25.0646x25.0194x0.7	0.25	0.00	0.0	54.1333	-18.67	3166.80	0.006
L22	37 - 36.5 (22)	TP25.155x25.0646x0.7	0.50	0.00	0.0	54.3340	-18.80	3178.54	0.006
L23	36.5 - 36.25 (23)	TP25.2001x25.155x0.9125	0.25	0.00	0.0	70.3437	-18.87	4115.11	0.005
L24	36.25 - 34.25 (24)	TP25.5616x25.2001x0.8875	2.00	0.00	0.0	69.5050	-19.46	4066.04	0.005
L25	34.25 - 34 (25)	TP25.6068x25.5616x0.725	0.25	0.00	0.0	57.2566	-19.53	3349.51	0.006
L26	34 - 29 (26)	TP26.5103x25.6068x0.7	5.00	0.00	0.0	57.3454	-20.86	3354.70	0.006
L27	29 - 24 (27)	TP27.4139x26.5103x0.6875	5.00	0.00	0.0	58.3203	-22.23	3411.74	0.007
L28	24 - 19 (28)	TP28.3174x27.4139x0.675	5.00	0.00	0.0	59.2226	-23.61	3464.52	0.007
L29	19 - 14 (29)	TP29.221x28.3174x0.6625	5.00	0.00	0.0	60.0521	-25.02	3513.05	0.007
L30	14 - 9 (30)	TP30.1246x29.221x0.6375	5.00	0.00	0.0	59.6649	-26.45	3490.40	0.008
L31	9 - 4 (31)	TP31.0281x30.1246x0.6375	5.00	0.00	0.0	61.4932	-27.90	3597.35	0.008
L32	4 - 1.17 (32)	TP31.5396x31.0281x0.625	2.83	0.00	0.0	61.3268	-28.73	3587.62	0.008
L33	1.17 - 0.92 (33)	TP31.5847x31.5396x0.9375	0.25	0.00	0.0	91.1947	-28.82	5334.89	0.005
L34	0.92 - 0 (34)	TP31.751x31.5847x0.9375	0.92	0.00	0.0	91.6894	-29.10	5363.83	0.005

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	110 - 105 (1)	TP13.901x13.051x0.1875	39.31	170.00	0.231	0.00	170.00	0.000
L2	105 - 100 (2)	TP14.751x13.901x0.1875	69.38	191.88	0.362	0.00	191.88	0.000
L3	100 - 93 (3)	TP15.941x14.751x0.1875	115.37	215.09	0.536	0.00	215.09	0.000
L4	93 - 90 (4)	TP16.1139x15.226x0.25	161.97	302.71	0.535	0.00	302.71	0.000
L5	90 - 85 (5)	TP17.0018x16.1139x0.25	209.90	337.82	0.621	0.00	337.82	0.000
L6	85 - 80 (6)	TP17.8896x17.0018x0.25	264.06	374.86	0.704	0.00	374.86	0.000
L7	80 - 79.75 (7)	TP17.934x17.8896x0.5625	266.99	803.56	0.332	0.00	803.56	0.000
L8	79.75 - 74.75 (8)	TP18.8219x17.934x0.5375	326.31	853.13	0.382	0.00	853.13	0.000
L9	74.75 - 69.75 (9)	TP19.7098x18.8219x0.525	387.32	919.19	0.421	0.00	919.19	0.000
L10	69.75 - 64.75 (10)	TP20.5977x19.7098x0.5	454.10	963.05	0.472	0.00	963.05	0.000
L11	64.75 - 64.25 (11)	TP20.6865x20.5977x0.5	460.76	971.68	0.474	0.00	971.68	0.000
L12	64.25 - 64 (12)	TP20.7308x20.6865x0.775	464.10	1451.96	0.320	0.00	1451.96	0.000
L13	64 - 59 (13)	TP21.6187x20.7308x0.75	531.84	1540.92	0.345	0.00	1540.92	0.000
L14	59 - 56.5 (14)	TP22.0627x21.6187x0.725	566.42	1560.20	0.363	0.00	1560.20	0.000
L15	56.5 - 56.25 (15)	TP22.1071x22.0627x0.975	569.90	2034.03	0.280	0.00	2034.03	0.000
L16	56.25 - 51.25 (16)	TP22.9949x22.1071x0.925	640.66	2113.35	0.303	0.00	2113.35	0.000
L17	51.25 - 45.5 (17)	TP24.016x22.9949x0.9125	665.90	2148.71	0.310	0.00	2148.71	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L18	45.5 - 44.5 (18)	TP23.7093x22.8057x0.725	739.53	1814.56	0.408	0.00	1814.56	0.000
L19	44.5 - 39.5 (19)	TP24.6128x23.7093x0.7125	815.05	1931.50	0.422	0.00	1931.50	0.000
L20	39.5 - 37.25 (20)	TP25.0194x24.6128x0.7	849.74	1966.71	0.432	0.00	1966.71	0.000
L21	37.25 - 37 (21)	TP25.0646x25.0194x0.7	853.67	1974.13	0.432	0.00	1974.13	0.000
L22	37 - 36.5 (22)	TP25.155x25.0646x0.7	861.56	1989.00	0.433	0.00	1989.00	0.000
L23	36.5 - 36.25 (23)	TP25.2001x25.155x0.9125	865.51	2535.39	0.341	0.00	2535.39	0.000
L24	36.25 - 34.25 (24)	TP25.5616x25.2001x0.8875	897.30	2548.96	0.352	0.00	2548.96	0.000
L25	34.25 - 34 (25)	TP25.6068x25.5616x0.725	901.30	2131.50	0.423	0.00	2131.50	0.000
L26	34 - 29 (26)	TP26.5103x25.6068x0.7	982.27	2218.82	0.443	0.00	2218.82	0.000
L27	29 - 24 (27)	TP27.4139x26.5103x0.6875	1065.12	2339.82	0.455	0.00	2339.82	0.000
L28	24 - 19 (28)	TP28.3174x27.4139x0.675	1149.78	2460.58	0.467	0.00	2460.58	0.000
L29	19 - 14 (29)	TP29.221x28.3174x0.6625	1236.25	2580.82	0.479	0.00	2580.82	0.000
L30	14 - 9 (30)	TP30.1246x29.221x0.6375	1324.53	2651.63	0.500	0.00	2651.63	0.000
L31	9 - 4 (31)	TP31.0281x30.1246x0.6375	1414.61	2818.40	0.502	0.00	2818.40	0.000
L32	4 - 1.17 (32)	TP31.5396x31.0281x0.625	1466.39	2861.36	0.512	0.00	2861.36	0.000
L33	1.17 - 0.92 (33)	TP31.5847x31.5396x0.9375	1470.99	4175.68	0.352	0.00	4175.68	0.000
L34	0.92 - 0 (34)	TP31.751x31.5847x0.9375	1487.93	4221.78	0.352	0.00	4221.78	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	110 - 105 (1)	TP13.901x13.051x0.1875	5.93	143.23	0.041	0.12	172.01	0.001
L2	105 - 100 (2)	TP14.751x13.901x0.1875	6.11	152.11	0.040	0.12	194.00	0.001
L3	100 - 93 (3)	TP15.941x14.751x0.1875	9.26	160.99	0.057	1.42	217.30	0.007
L4	93 - 90 (4)	TP16.1139x15.226x0.25	9.52	220.92	0.043	2.53	306.92	0.008
L5	90 - 85 (5)	TP17.0018x16.1139x0.25	9.67	233.28	0.041	2.53	342.24	0.007
L6	85 - 80 (6)	TP17.8896x17.0018x0.25	11.69	245.65	0.048	3.04	379.48	0.008
L7	80 - 79.75 (7)	TP17.934x17.8896x0.5625	11.70	544.31	0.022	3.04	828.06	0.004
L8	79.75 - 74.75 (8)	TP18.8219x17.934x0.5375	12.04	547.45	0.022	3.03	876.61	0.003
L9	74.75 - 69.75 (9)	TP19.7098x18.8219x0.525	12.38	561.05	0.022	3.03	942.63	0.003
L10	69.75 - 64.75 (10)	TP20.5977x19.7098x0.5	13.31	559.76	0.024	3.03	985.20	0.003
L11	64.75 - 64.25 (11)	TP20.6865x20.5977x0.5	13.34	562.23	0.024	3.03	993.92	0.003
L12	64.25 - 64 (12)	TP20.7308x20.6865x0.775	13.36	861.50	0.016	3.03	1505.59	0.002
L13	64 - 59 (13)	TP21.6187x20.7308x0.75	13.75	871.85	0.016	3.02	1593.38	0.002
L14	59 - 56.5 (14)	TP22.0627x21.6187x0.725	13.94	861.73	0.016	3.02	1610.26	0.002
L15	56.5 - 56.25 (15)	TP22.1071x22.0627x0.975	13.95	1147.71	0.012	3.02	2123.99	0.001
L16	56.25 - 51.25 (16)	TP22.9949x22.1071x0.925	14.36	1137.17	0.013	3.02	2197.90	0.001
L17	51.25 - 45.5 (17)	TP24.016x22.9949x0.9125	14.50	1138.24	0.013	3.02	2232.18	0.001

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 $\frac{T_u}{\phi T_n}$
L18	45.5 - 44.5 (18)	TP23.7093x22.8057x0.725	14.95	928.22	0.016	3.02	1868.38	0.002
L19	44.5 - 39.5 (19)	TP24.6128x23.7093x0.7125	15.28	948.58	0.016	3.02	1985.44	0.002
L20	39.5 - 37.25 (20)	TP25.0194x24.6128x0.7	15.74	948.28	0.017	1.23	2019.62	0.001
L21	37.25 - 37 (21)	TP25.0646x25.0194x0.7	15.75	950.04	0.017	1.23	2027.13	0.001
L22	37 - 36.5 (22)	TP25.155x25.0646x0.7	15.79	953.56	0.017	1.23	2042.19	0.001
L23	36.5 - 36.25 (23)	TP25.2001x25.155x0.9125	15.81	1234.53	0.013	1.23	2625.83	0.000
L24	36.25 - 34.25 (24)	TP25.5616x25.2001x0.8875	15.99	1219.81	0.013	1.23	2635.81	0.000
L25	34.25 - 34 (25)	TP25.6068x25.5616x0.725	16.01	1004.85	0.016	1.23	2189.60	0.001
L26	34 - 29 (26)	TP26.5103x25.6068x0.7	16.40	1006.41	0.016	1.23	2274.83	0.001
L27	29 - 24 (27)	TP27.4139x26.5103x0.6875	16.76	1023.52	0.016	1.23	2395.62	0.001
L28	24 - 19 (28)	TP28.3174x27.4139x0.675	17.13	1039.36	0.016	1.23	2516.06	0.000
L29	19 - 14 (29)	TP29.221x28.3174x0.6625	17.49	1053.91	0.017	1.23	2635.85	0.000
L30	14 - 9 (30)	TP30.1246x29.221x0.6375	17.85	1047.12	0.017	1.23	2704.01	0.000
L31	9 - 4 (31)	TP31.0281x30.1246x0.6375	18.21	1079.21	0.017	1.23	2872.27	0.000
L32	4 - 1.17 (32)	TP31.5396x31.0281x0.625	18.41	1076.28	0.017	1.23	2913.88	0.000
L33	1.17 - 0.92 (33)	TP31.5847x31.5396x0.9375	18.41	1600.47	0.012	1.23	4295.54	0.000
L34	0.92 - 0 (34)	TP31.751x31.5847x0.9375	18.44	1609.15	0.011	1.23	4342.27	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	110 - 105 (1)	0.008	0.231	0.000	0.041	0.001	0.241	1.050	4.8.2
L2	105 - 100 (2)	0.008	0.362	0.000	0.040	0.001	0.371	1.050	4.8.2
L3	100 - 93 (3)	0.012	0.536	0.000	0.057	0.007	0.553	1.050	4.8.2
L4	93 - 90 (4)	0.009	0.535	0.000	0.043	0.008	0.547	1.050	4.8.2
L5	90 - 85 (5)	0.009	0.621	0.000	0.041	0.007	0.633	1.050	4.8.2
L6	85 - 80 (6)	0.011	0.704	0.000	0.048	0.008	0.718	1.050	4.8.2
L7	80 - 79.75 (7)	0.005	0.332	0.000	0.022	0.004	0.338	1.050	4.8.2
L8	79.75 - 74.75 (8)	0.005	0.382	0.000	0.022	0.003	0.388	1.050	4.8.2
L9	74.75 - 69.75 (9)	0.006	0.421	0.000	0.022	0.003	0.428	1.050	4.8.2
L10	69.75 - 64.75 (10)	0.006	0.472	0.000	0.024	0.003	0.478	1.050	4.8.2
L11	64.75 - 64.25 (11)	0.006	0.474	0.000	0.024	0.003	0.481	1.050	4.8.2
L12	64.25 - 64 (12)	0.004	0.320	0.000	0.016	0.002	0.324	1.050	4.8.2
L13	64 - 59 (13)	0.004	0.345	0.000	0.016	0.002	0.350	1.050	4.8.2
L14	59 - 56.5 (14)	0.005	0.363	0.000	0.016	0.002	0.368	1.050	4.8.2
L15	56.5 - 56.25 (15)	0.003	0.280	0.000	0.012	0.001	0.284	1.050	4.8.2
L16	56.25 - 51.25 (16)	0.004	0.303	0.000	0.013	0.001	0.307	1.050	4.8.2
L17	51.25 - 45.5 (17)	0.004	0.310	0.000	0.013	0.001	0.314	1.050	4.8.2

Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L18	45.5 - 44.5 (18)	0.005	0.408	0.000	0.016	0.002	0.413	1.050	4.8.2
L19	44.5 - 39.5 (19)	0.006	0.422	0.000	0.016	0.002	0.428	1.050	4.8.2
L20	39.5 - 37.25 (20)	0.006	0.432	0.000	0.017	0.001	0.438	1.050	4.8.2
L21	37.25 - 37 (21)	0.006	0.432	0.000	0.017	0.001	0.439	1.050	4.8.2
L22	37 - 36.5 (22)	0.006	0.433	0.000	0.017	0.001	0.439	1.050	4.8.2
L23	36.5 - 36.25 (23)	0.005	0.341	0.000	0.013	0.000	0.346	1.050	4.8.2
L24	36.25 - 34.25 (24)	0.005	0.352	0.000	0.013	0.000	0.357	1.050	4.8.2
L25	34.25 - 34 (25)	0.006	0.423	0.000	0.016	0.001	0.429	1.050	4.8.2
L26	34 - 29 (26)	0.006	0.443	0.000	0.016	0.001	0.449	1.050	4.8.2
L27	29 - 24 (27)	0.007	0.455	0.000	0.016	0.001	0.462	1.050	4.8.2
L28	24 - 19 (28)	0.007	0.467	0.000	0.016	0.000	0.474	1.050	4.8.2
L29	19 - 14 (29)	0.007	0.479	0.000	0.017	0.000	0.486	1.050	4.8.2
L30	14 - 9 (30)	0.008	0.500	0.000	0.017	0.000	0.507	1.050	4.8.2
L31	9 - 4 (31)	0.008	0.502	0.000	0.017	0.000	0.510	1.050	4.8.2
L32	4 - 1.17 (32)	0.008	0.512	0.000	0.017	0.000	0.521	1.050	4.8.2
L33	1.17 - 0.92 (33)	0.005	0.352	0.000	0.012	0.000	0.358	1.050	4.8.2
L34	0.92 - 0 (34)	0.005	0.352	0.000	0.011	0.000	0.358	1.050	4.8.2

Section Capacity Table

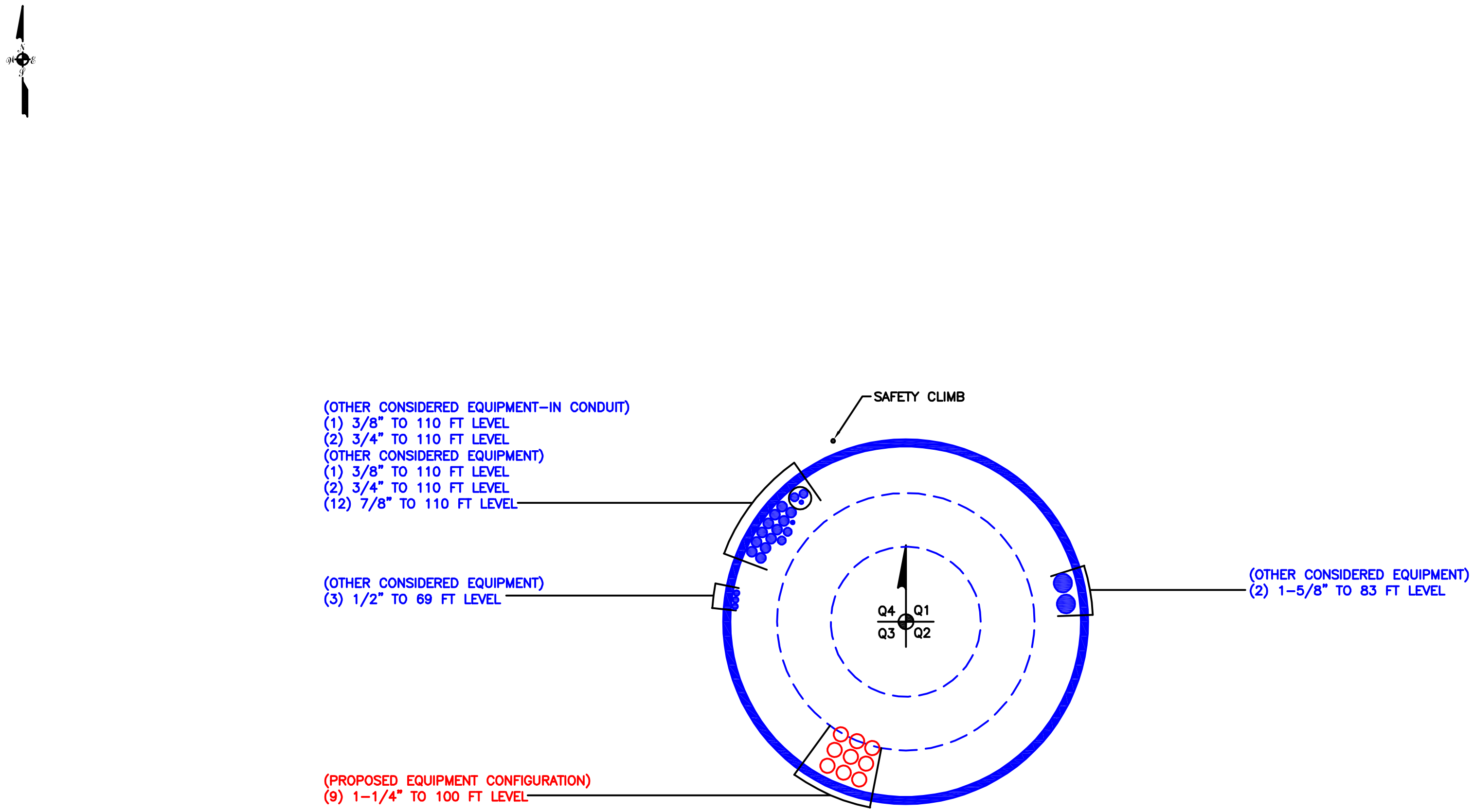
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$øP_{allow}$ K	% Capacity	Pass Fail
L1	110 - 105	Pole	TP13.901x13.051x0.1875	1	-3.79	501.30	22.9	Pass
L2	105 - 100	Pole	TP14.751x13.901x0.1875	2	-4.02	532.38	35.4	Pass
L3	100 - 93	Pole	TP15.941x14.751x0.1875	3	-6.48	563.45	52.6	Pass
L4	93 - 90	Pole	TP16.1139x15.226x0.25	4	-6.93	773.22	52.1	Pass
L5	90 - 85	Pole	TP17.0018x16.1139x0.25	5	-7.35	816.49	60.3	Pass
L6	85 - 80	Pole	TP17.8896x17.0018x0.25	6	-8.91	859.77	68.4	Pass
L7	80 - 79.75	Pole	TP17.934x17.8896x0.5625	7	-8.96	1905.08	32.2	Pass
L8	79.75 - 74.75	Pole	TP18.8219x17.934x0.5375	8	-9.65	1916.07	37.0	Pass
L9	74.75 - 69.75	Pole	TP19.7098x18.8219x0.525	9	-10.38	1963.67	40.7	Pass
L10	69.75 - 64.75	Pole	TP20.5977x19.7098x0.5	10	-11.55	1959.15	45.6	Pass
L11	64.75 - 64.25	Pole	TP20.6865x20.5977x0.5	11	-11.64	1967.80	45.8	Pass
L12	64.25 - 64	Pole	TP20.7308x20.6865x0.775	12	-11.69	3015.25	30.9	Pass
L13	64 - 59	Pole	TP21.6187x20.7308x0.75	13	-12.69	3051.47	33.3	Pass
L14	59 - 56.5	Pole	TP22.0627x21.6187x0.725	14	-13.21	3016.04	35.0	Pass
L15	56.5 - 56.25	Pole	TP22.1071x22.0627x0.975	15	-13.28	4016.97	27.0	Pass
L16	56.25 - 51.25	Pole	TP22.9949x22.1071x0.925	16	-14.52	3980.11	29.3	Pass
L17	51.25 - 45.5	Pole	TP24.016x22.9949x0.9125	17	-14.96	3983.84	29.9	Pass
L18	45.5 - 44.5	Pole	TP23.7093x22.8057x0.725	18	-16.96	3248.78	39.4	Pass
L19	44.5 - 39.5	Pole	TP24.6128x23.7093x0.7125	19	-18.09	3320.02	40.8	Pass
L20	39.5 - 37.25	Pole	TP25.0194x24.6128x0.7	20	-18.59	3318.98	41.7	Pass
L21	37.25 - 37	Pole	TP25.0646x25.0194x0.7	21	-18.67	3325.14	41.8	Pass
L22	37 - 36.5	Pole	TP25.155x25.0646x0.7	22	-18.80	3337.47	41.8	Pass
L23	36.5 - 36.25	Pole	TP25.2001x25.155x0.9125	23	-18.87	4320.87	33.0	Pass
L24	36.25 - 34.25	Pole	TP25.5616x25.2001x0.8875	24	-19.46	4269.34	34.0	Pass
L25	34.25 - 34	Pole	TP25.6068x25.5616x0.725	25	-19.53	3516.99	40.9	Pass
L26	34 - 29	Pole	TP26.5103x25.6068x0.7	26	-20.86	3522.43	42.8	Pass
L27	29 - 24	Pole	TP27.4139x26.5103x0.6875	27	-22.23	3582.33	44.0	Pass
L28	24 - 19	Pole	TP28.3174x27.4139x0.675	28	-23.61	3637.75	45.2	Pass
L29	19 - 14	Pole	TP29.221x28.3174x0.6625	29	-25.02	3688.70	46.3	Pass
L30	14 - 9	Pole	TP30.1246x29.221x0.6375	30	-26.45	3664.92	48.3	Pass
L31	9 - 4	Pole	TP31.0281x30.1246x0.6375	31	-27.90	3777.22	48.6	Pass
L32	4 - 1.17	Pole	TP31.5396x31.0281x0.625	32	-28.73	3767.00	49.6	Pass

Section No.	*Elevation ft*	*Component Type*	*Size*	*Critical Element*	*P K*	*$øP_{allow}$ K*	*% Capacity*	*Pass Fail*
L33	1.17 - 0.92	Pole	TP31.5847x31.5396x0.9375	33	-28.82	5601.63	34.1	Pass
L34	0.92 - 0	Pole	TP31.751x31.5847x0.9375	34	-29.10	5632.02	34.1	Pass
							Summary	
						Pole (L6)	68.4	Pass
						RATING =	**68.4**	**Pass**

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

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 841301 TOWER ID:C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

CCIpole

per TIA-222- H

Site BU: 841301

Work Order: 1749500

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	110	17	2	18	13.051	15.941	0.1875	Auto	A572-65
2	95	49.5	4	18	15.23	24.016	0.25	Auto	A572-65
3	49.5	49.5	0	18	22.81	31.751	0.3125	Auto	A572-65

Reinforcement Configuration

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	46.75	64.25	plate	PL 3.5" x 1.25"	3		E1						E1						E1				
2	1.17	36.5	plate	CCI-SFP-065125	3						E2									E2			E2
3	1.17	37.25	plate	CCI-SFP-065125	1										E2								
4	34.25	56.5	plate	CCI-SFP-065125	1												E2						
5	36.5	56.5	plate	CCI-SFP-065125	2						E2												E2
6	56.5	80	plate	CCI-SFP-045100	3						E2						E2						E2
7	0	1.17	plate	ARB2 (7.25" x 1.25")	3			E2				E2									E2		
8	0	1.17	plate	ARB1 (7.25" x 1.25")	1											E2							
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	3.5	1.25	4.375	0.625	15.000	15.000	12.000	2.813	1.1875	A572-65
2	6.5	1.25	8.125	0.625	33.000	33.000	19.000	6.563	1.1875	A572-65
3	6.5	1.25	8.125	0.625	33.000	33.000	19.000	6.563	1.1875	A572-65
4	6.5	1.25	8.125	0.625	33.000	33.000	19.000	6.563	1.1875	A572-65
5	6.5	1.25	8.125	0.625	33.000	33.000	19.000	6.563	1.1875	A572-65
6	4.5	1	4.5	0.5	18.000	18.000	20.000	3.250	1.1875	A572-65
7	1.25	7.25	9.0625	3.625	n/a	n/a	0.000	9.063	0.0000	A572-65
8	1.25	7.25	9.0625	3.625	n/a	n/a	0.000	9.063	0.0000	A572-65

TNX Geometry Input

Increment (ft): 5

	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	110 - 105	5		18	13.051	13.901	0.1875	A572-65	1.000
2	105 - 100	5		18	13.901	14.751	0.1875	A572-65	1.000
3	100 - 95	7	2	18	14.751	15.941	0.1875	A572-65	1.000
4	95 - 90	5		18	15.226	16.114	0.25	A572-65	1.000
5	90 - 85	5		18	16.114	17.002	0.25	A572-65	1.000
6	85 - 80	5		18	17.002	17.890	0.25	A572-65	1.000
7	80 - 79.75	0.25		18	17.890	17.934	0.5625	A572-65	0.888
8	79.75 - 74.75	5		18	17.934	18.822	0.5375	A572-65	0.905
9	74.75 - 69.75	5		18	18.822	19.710	0.525	A572-65	0.905
10	69.75 - 64.75	5		18	19.710	20.598	0.5	A572-65	0.929
11	64.75 - 64.25	0.5		18	20.598	20.686	0.5	A572-65	0.928
12	64.25 - 64	0.25		18	20.686	20.731	0.775	A572-65	0.873
13	64 - 59	5		18	20.731	21.619	0.75	A572-65	0.877
14	59 - 56.5	2.5		18	21.619	22.063	0.725	A572-65	0.895
15	56.5 - 56.25	0.25		18	22.063	22.107	0.975	A572-65	0.839
16	56.25 - 51.25	5		18	22.107	22.995	0.925	A572-65	0.857
17	51.25 - 49.5	5.75	4	18	22.995	24.016	0.9125	A572-65	0.860
18	49.5 - 44.5	5		18	22.806	23.709	0.725	A572-65	0.900
19	44.5 - 39.5	5		18	23.709	24.613	0.7125	A572-65	0.897
20	39.5 - 37.25	2.25		18	24.613	25.019	0.7	A572-65	0.905
21	37.25 - 37	0.25		18	25.019	25.065	0.7	A572-65	1.054
22	37 - 36.5	0.5		18	25.065	25.155	0.7	A572-65	1.052
23	36.5 - 36.25	0.25		18	25.155	25.200	0.9125	A572-65	0.928
24	36.25 - 34.25	2		18	25.200	25.562	0.8875	A572-65	0.945
25	34.25 - 34	0.25		18	25.562	25.607	0.725	A572-65	1.006
26	34 - 29	5		18	25.607	26.510	0.7	A572-65	1.020
27	29 - 24	5		18	26.510	27.414	0.6875	A572-65	1.018
28	24 - 19	5		18	27.414	28.317	0.675	A572-65	1.018
29	19 - 14	5		18	28.317	29.221	0.6625	A572-65	1.019
30	14 - 9	5		18	29.221	30.125	0.6375	A572-65	1.040
31	9 - 4	5		18	30.125	31.028	0.6375	A572-65	1.024
32	4 - 1.17	2.83		18	31.028	31.540	0.625	A572-65	1.035
33	1.17 - 0.92	0.25		18	31.540	31.585	0.9375	A572-65	0.738
34	0.92 - 0	0.92		18	31.585	31.751	0.9375	A572-65	0.735

TNX Section Forces

Increment (ft): 5

	Section Height (ft)			TNX Output: P_u (K)	TNX Output: M_{ux} (kip-ft)	TNX Output: V_u (K)
1	110	-	105	3.79	39.31	5.93
2	105	-	100	4.02	69.38	6.11
3	100	-	95	6.48	115.37	9.26
4	95	-	90	6.94	162.08	9.43
5	90	-	85	7.35	209.89	9.67
6	85	-	80	8.91	264.06	11.69
7	80	-	79.75	8.96	266.99	11.70
8	79.75	-	74.75	9.65	326.31	12.04
9	74.75	-	69.75	10.38	387.32	12.38
10	69.75	-	64.75	11.55	454.10	13.31
11	64.75	-	64.25	11.64	460.76	13.34
12	64.25	-	64	11.69	464.10	13.36
13	64	-	59	12.69	531.84	13.75
14	59	-	56.5	13.21	566.42	13.94
15	56.5	-	56.25	13.28	569.91	13.95
16	56.25	-	51.25	14.52	640.66	14.36
17	51.25	-	49.5	14.96	665.90	14.50
18	49.5	-	44.5	16.96	739.53	14.95
19	44.5	-	39.5	18.09	815.05	15.28
20	39.5	-	37.25	18.59	849.74	15.74
21	37.25	-	37	18.67	853.68	15.75
22	37	-	36.5	18.80	861.56	15.79
23	36.5	-	36.25	18.87	865.51	15.81
24	36.25	-	34.25	19.46	897.30	15.99
25	34.25	-	34	19.53	901.30	16.01
26	34	-	29	20.86	982.27	16.40
27	29	-	24	22.23	1065.12	16.76
28	24	-	19	23.61	1149.78	17.13
29	19	-	14	25.02	1236.25	17.49
30	14	-	9	26.45	1324.53	17.85
31	9	-	4	27.90	1414.61	18.21
32	4	-	1.17	28.73	1466.39	18.41
33	1.17	-	0.92	28.82	1470.99	18.41
34	0.92	-	0	29.10	1487.93	18.44

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
110 - 105	Pole	TP13.901x13.051x0.1875	Pole	22.6%	Pass
105 - 100	Pole	TP14.751x13.901x0.1875	Pole	35.0%	Pass
100 - 95	Pole	TP15.941x14.751x0.1875	Pole	52.0%	Pass
95 - 90	Pole	TP16.114x15.226x0.25	Pole	51.7%	Pass
90 - 85	Pole	TP17.002x16.114x0.25	Pole	59.9%	Pass
85 - 80	Pole	TP17.89x17.002x0.25	Pole	67.9%	Pass
80 - 79.75	Pole + Reinf.	TP17.934x17.89x0.5625	Reinf. 6 Tension Rupture	57.5%	Pass
79.75 - 74.75	Pole + Reinf.	TP18.822x17.934x0.5375	Reinf. 6 Tension Rupture	65.3%	Pass
74.75 - 69.75	Pole + Reinf.	TP19.71x18.822x0.525	Reinf. 6 Tension Rupture	72.3%	Pass
69.75 - 64.75	Pole + Reinf.	TP20.598x19.71x0.5	Reinf. 6 Tension Rupture	79.3%	Pass
64.75 - 64.25	Pole + Reinf.	TP20.686x20.598x0.5	Reinf. 6 Tension Rupture	80.0%	Pass
64.25 - 64	Pole + Reinf.	TP20.731x20.686x0.775	Reinf. 1 Tension Rupture	61.6%	Pass
64 - 59	Pole + Reinf.	TP21.619x20.731x0.75	Reinf. 1 Tension Rupture	66.8%	Pass
59 - 56.5	Pole + Reinf.	TP22.063x21.619x0.725	Reinf. 1 Tension Rupture	69.2%	Pass
56.5 - 56.25	Pole + Reinf.	TP22.107x22.063x0.975	Reinf. 1 Tension Rupture	54.3%	Pass
56.25 - 51.25	Pole + Reinf.	TP22.995x22.107x0.925	Reinf. 1 Tension Rupture	58.2%	Pass
51.25 - 49.5	Pole + Reinf.	TP24.016x22.995x0.9125	Reinf. 1 Tension Rupture	59.4%	Pass
49.5 - 44.5	Pole + Reinf.	TP23.709x22.806x0.725	Reinf. 4 Tension Rupture	61.9%	Pass
44.5 - 39.5	Pole + Reinf.	TP24.613x23.709x0.7125	Reinf. 4 Tension Rupture	64.6%	Pass
39.5 - 37.25	Pole + Reinf.	TP25.019x24.613x0.7	Reinf. 4 Tension Rupture	65.8%	Pass
37.25 - 37	Pole + Reinf.	TP25.065x25.019x0.7	Reinf. 5 Tension Rupture	64.4%	Pass
37 - 36.5	Pole + Reinf.	TP25.155x25.065x0.7	Reinf. 5 Tension Rupture	64.7%	Pass
36.5 - 36.25	Pole + Reinf.	TP25.2x25.155x0.9125	Reinf. 2 Tension Rupture	56.6%	Pass
36.25 - 34.25	Pole + Reinf.	TP25.562x25.2x0.8875	Reinf. 2 Tension Rupture	57.5%	Pass
34.25 - 34	Pole + Reinf.	TP25.607x25.562x0.725	Reinf. 3 Tension Rupture	61.0%	Pass
34 - 29	Pole + Reinf.	TP26.51x25.607x0.7	Reinf. 3 Tension Rupture	63.2%	Pass
29 - 24	Pole + Reinf.	TP27.414x26.51x0.6875	Reinf. 3 Tension Rupture	65.3%	Pass
24 - 19	Pole + Reinf.	TP28.317x27.414x0.675	Reinf. 3 Tension Rupture	67.3%	Pass
19 - 14	Pole + Reinf.	TP29.221x28.317x0.6625	Reinf. 3 Tension Rupture	69.1%	Pass
14 - 9	Pole + Reinf.	TP30.125x29.221x0.6375	Reinf. 3 Tension Rupture	70.7%	Pass
9 - 4	Pole + Reinf.	TP31.028x30.125x0.6375	Reinf. 3 Tension Rupture	72.3%	Pass
4 - 1.17	Pole + Reinf.	TP31.54x31.028x0.625	Reinf. 3 Tension Rupture	73.1%	Pass
1.17 - 0.92	Pole + Reinf.	TP31.585x31.54x0.9375	Reinf. 7 Tension Yield	54.8%	Pass
0.92 - 0	Pole + Reinf.	TP31.751x31.585x0.9375	Reinf. 7 Tension Yield	55.1%	Pass
				Summary	
			Pole	67.9%	Pass
			Reinforcement	80.0%	Pass
			Overall	80.0%	Pass

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in^4)			Area (in^2)			% Capacity*								
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3	R4	R5	R6	R7	R8
110 - 105	194	n/a	194	8.16	n/a	8.16	22.6%								
105 - 100	232	n/a	232	8.67	n/a	8.67	35.0%								
100 - 95	275	n/a	275	9.17	n/a	9.17	52.0%								
95 - 90	400	n/a	400	12.59	n/a	12.59	51.7%								
90 - 85	471	n/a	471	13.29	n/a	13.29	59.9%								
85 - 80	550	n/a	550	14.00	n/a	14.00	67.9%								
80 - 79.75	554	617	1171	14.03	13.50	27.53	32.0%						57.5%		
79.75 - 74.75	642	675	1317	14.74	13.50	28.24	36.4%						65.3%		
74.75 - 69.75	739	736	1474	15.44	13.50	28.94	40.4%						72.3%		
69.75 - 64.75	844	799	1643	16.15	13.50	29.65	44.4%						79.3%		
64.75 - 64.25	855	806	1661	16.22	13.50	29.72	44.8%						80.0%		
64.25 - 64	861	1609	2470	16.25	26.63	42.88	30.4%	61.6%					54.3%		
64 - 59	978	1741	2719	16.96	26.63	43.58	33.0%	66.8%					58.8%		
59 - 56.5	1040	1809	2849	17.31	26.63	43.93	34.2%	69.2%					61.0%		
56.5 - 56.25	1046	2609	3656	17.34	37.50	54.84	26.9%	54.3%			43.3%	43.3%			
56.25 - 51.25	1179	2807	3987	18.05	37.50	55.55	28.9%	58.2%			46.4%	46.4%			
51.25 - 49.5	1228	2879	4107	18.29	37.50	55.79	29.5%	59.4%			47.4%	47.4%			
49.5 - 44.5	1604	1943	3547	23.21	24.38	47.58	38.6%				61.9%	61.9%			
44.5 - 39.5	1798	2083	3880	24.10	24.38	48.48	40.3%				64.6%	64.6%			
39.5 - 37.25	1889	2147	4036	24.51	24.38	48.88	41.1%				65.8%	65.8%			
37.25 - 37	1900	2183	4083	24.55	32.50	57.05	41.4%			43.7%	53.1%	64.4%			
37 - 36.5	1921	2197	4118	24.64	32.50	57.14	41.6%			43.9%	53.3%	64.7%			
36.5 - 36.25	2005	3274	5279	24.68	40.63	65.31	37.0%		56.6%	44.7%	45.5%				
36.25 - 34.25	2093	3363	5456	25.04	40.63	65.67	37.6%		57.5%	45.5%	46.3%				
34.25 - 34	2029	2436	4465	25.09	32.50	57.59	41.6%		60.0%	61.0%					
34 - 29	2254	2598	4852	25.98	32.50	58.48	43.2%		62.3%	63.2%					
29 - 24	2496	2765	5261	26.88	32.50	59.38	44.7%		64.3%	65.3%					
24 - 19	2754	2938	5691	27.78	32.50	60.28	46.0%		66.2%	67.3%					
19 - 14	3029	3116	6145	28.67	32.50	61.17	47.3%		68.0%	69.1%					
14 - 9	3322	3299	6621	29.57	32.50	62.07	48.5%		69.6%	70.7%					
9 - 4	3633	3488	7121	30.46	32.50	62.96	50.0%		71.1%	72.3%					
4 - 1.17	3817	3597	7415	30.97	32.50	63.47	50.8%		71.9%	73.1%					
1.17 - 0.92	3857	7043	10899	31.02	36.25	67.27	36.3%							54.8%	53.7%
0.92 - 0	3918	7103	11021	31.18	36.25	67.43	36.6%							55.1%	54.0%

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

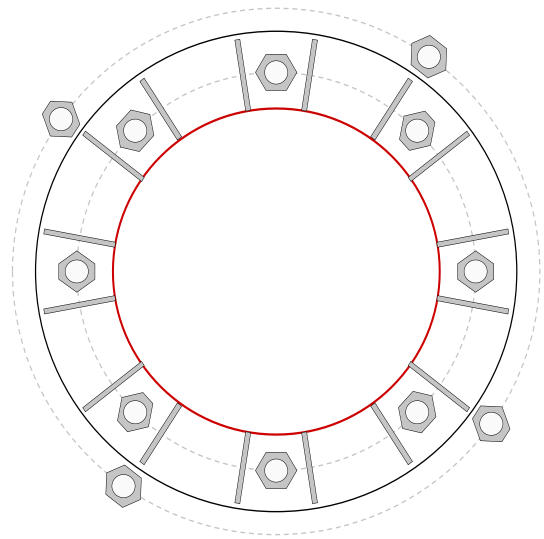
Monopole Base Plate Connection

Site Info	
BU #	841301
Site Name	WILLINGTON-RIVER RD
Order #	479824 Rev.0

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
I_{ar} (in)	0.9375

Applied Loads	
Moment (kip-ft)	1487.93
Axial Force (kips)	29.10
Shear Force (kips)	18.44

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

GROUP 1: (8) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 38.75" BC
GROUP 2: (4) 2-1/4" ø bolts (A193 Gr. B7 N; Fy=105 ksi, Fu=125 ksi) on 51.25" BC

Base Plate Data

46.75" OD x 1.5" Plate (A572-60; Fy=60 ksi, Fu=75 ksi)

Stiffener Data

(16) 18"H x 7"W x 0.5"T, Notch: 0.5"
plate: Fy= 70 ksi ; weld: Fy= 70 ksi
horiz. weld: 0.5" groove, 45° dbl bevel, 0.375" fillet
vert. weld: 0.375" fillet

Pole Data

31.751" x 0.3125" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

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

GROUP 1:			
	Pu_c = 126.4	ϕPn_c = 243.75	**Stress Rating**
	Vu = 2.31	ϕVn = 73.13	**49.5%**
	Mu = n/a	ϕMn = n/a	Pass
GROUP 2:			
	Pu_c = 162.36	ϕPn_c = 341.25	**Stress Rating**
	Vu = 0	ϕVn = 102.38	**45.3%**
	Mu = n/a	ϕMn = n/a	Pass

Base Plate Summary

Max Stress (ksi):	31.11	(Roark's Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	**54.9%**	Pass

Stiffener Summary

Horizontal Weld:	**43.4%**	Pass
Vertical Weld:	**17.0%**	Pass
Plate Flexure+Shear:	**6.1%**	Pass
Plate Tension+Shear:	**21.7%**	Pass
Plate Compression:	**27.0%**	Pass

Pole Summary

Punching Shear:	**6.0%**	Pass

CCIplate - version 3.6.0 Analysis Date: 6/19/2019

Additional Anchor Rod Calculations:

Base Reactions from tnxTower:

$Moment := 1494.71 \cdot kip \cdot ft$

$Axial := 18.58 \cdot kip$

$Shear := 18.44 \cdot kip$

Apply TIA-222-H Section 15.5?

No
Yes

Original Anchor Rod Group:

$N_{existing} := 8$

$BC_{existing} := 38.75 \cdot in$

$D_{existing} := 2.25 \cdot in$

$A_{existing} := 3.25 in^2$

$Fu_{exisitng} := 100 ksi$

$Fy_{existing} := 75 ksi$

Existing Anchor Rod Group:

$N_{new} := 4$

$BC_{new} := 51.25 \cdot in$

$D_{new} := 2.25 \cdot in$

$A_{new} := 3.25 \cdot in^2$

$Fu_{rod} := 125 ksi$

$Fy_{rod} := 105 ksi$

--See attached CCIplate output for additional anchor rod group capacity and structural rating values--

Anchor Rod Bracket Calculations

Analyze the anchor rod bracket and all components to resist the full demand loading of the additional anchors.

Bracket Demand Load:
From CCI Plate

$Pu := 163.1 \cdot kip$

Tube Design (Square HSS)

Member Size: HSS 5" x 5" x 1/2"

Member Properties
(AISC 15th Ed., Table 1-12):

Outside Diameter: $OD_{HSS} := 5 \cdot in$

Area: $A_{HSS} := 7.88 \cdot in^2$ $\quad A_{e\_HSS} := 0.75 \cdot A_{HSS} = 5.91 \cdot in^2$

Thickness: $t_{HSS} := 0.465 \cdot in$

Yield Strength: $F_{y\_HSS} := 46 \cdot ksi$ $\quad F_{u\_HSS} := 62 \cdot ksi$

Length: $L_{HSS} := 14 \cdot in$

Moment of Inertia: $I_{HSS} := 26.0 \cdot in^4$

Radius of Gyration: $r_{HSS} := 1.82 \cdot in$

Inside Dimension: $ID_{HSS} := OD_{HSS} - 2 \cdot t_{HSS} = 4.07 \cdot in$

Bearing Check
(AISC 15th Ed., Equation J7-1):

$\phi_b := 0.75$

$Pu\_c = \phi_b \cdot R_n = \phi_b \cdot 1.8 \cdot F_{y\_HSS} \cdot A_{pb}$

$$A_{pb} := \frac{Pu}{\phi_b \cdot 1.8 \cdot F_{y\_HSS}} = 2.63 \cdot in^2$$

$$Check_{bear} := \begin{cases} \text{"OK"} & \text{if } A_{HSS} \geq A_{pb} \\ \text{"N/G"} & \text{otherwise} \end{cases}$$

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

Compression Check
(AISC 15th Ed., Eqs. E3-1 to E3-4):

$\phi_c := 0.9$

$K := 1$

$\phi P_{u\_comp} = \phi_c \cdot F_{cr} \cdot A_g$

$L_c := K \cdot L_{HSS} = 14 \cdot in$

$$F_e := \frac{\pi^2 \cdot 29000ksi}{\left(\frac{L_c}{r_{HSS}}\right)^2} = 4837.09 \cdot ksi$$

$$\frac{L_c}{r_{HSS}} = 7.69 \quad < \quad 4.71 \cdot \sqrt{\frac{29000 \cdot ksi}{F_{y\_HSS}}} = 118.26$$

$$\therefore \quad F_{cr} := 0.658^{\frac{F_{y\_HSS}}{F_e}} \cdot F_{y\_HSS} = 45.82 \cdot ksi$$

(AISC 15th Ed., Equation J4-6):

$$\phi P_{u\_comp} := \begin{cases} \phi_c \cdot F_{y\_HSS} \cdot A_{HSS} & \text{if } \frac{L_c}{r_{HSS}} \le 25 \\ \phi_c \cdot F_{cr} \cdot A_{HSS} & \text{otherwise} \end{cases}$$

$\phi P_{u\_comp} = 326.23 \cdot kip$

$$Check_{comp} := \begin{cases} \text{"OK"} & \text{if } Rating_{comp} < 100\% \\ \text{"N/G"} & \text{otherwise} \end{cases}$$

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

Gusset Plate Design

Gusset Plate width: $w_{plate} := 7.25 \cdot in$

Gusset Plate thickness: $t_{plate} := 1.25in$

$L_{plate1} := 57in$

$L_{plate2} := 14in$

Gusset Plate Strength: $Fy_{plate} := 65ksi$

$Fu_{plate} := 80ksi$

Pole thickness: $t_{pole} := 0.3125in$

Shear Check
(AISC 15th Ed., Eqs. J4-3 and J4-4):

$A_g := t_{plate} \cdot L_{plate2} = 17.5 \cdot in^2$

$A_{nv} := A_g = 17.5 \cdot in^2$

Shear Yielding

$\phi_v := 1$

$\phi V_{plate} := \phi_v \cdot 0.6 \cdot A_g \cdot Fy_{plate} = 682.5 \cdot kip$

$Check_{shear} := \begin{cases} \text{"OK"} & \text{if } Rating_{shear} < 100\% \\ \text{"N/G"} & \text{otherwise} \end{cases}$

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

Shear Rupture

$\phi_v := 0.75$

$\phi V_{plate} := \phi_v \cdot 0.6 \cdot A_{nv} \cdot Fu_{plate} = 630 \cdot kip$

$Check_{shear} := \begin{cases} \text{"OK"} & \text{if } Rating_{shear} < 100\% \\ \text{"N/G"} & \text{otherwise} \end{cases}$

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

Gusset Plate to Pole and Base Plate Weld Design (Horizontal and Vertical Weld):
(AISC 15th Ed., Part 8)

Gusset plate thickness: $t_{plate} = 1.25 \cdot in$

Pole Grade: $Fy_{pole} := 65ksi$ $Fu_{pole} := 80ksi$

Base Plate Grade: $Fy_{base} := 60ksi$ $Fu_{base} := 75ksi$

Gussett Plate Grade: $Fy_{plate} = 65 \cdot ksi$ $Fu_{plate} = 80 \cdot ksi$

Height of vertical weld from base plate: $H := L_{plate1} = 57 \cdot in$

$Notch_{horiz} := 0.75 \cdot in$

$Notch_{vert} := 0.75 \cdot in$

Gap between Base Plate and HSS: $Gap := 0in$

Vertical fillet weld size to pole:
(in sixteenths of an inch) $D_{vpole} := 6$

$weldsize_{pole} := \frac{D_{vpole}}{16} = \frac{3}{8}$

Weld Material Grade: $F_{EXX} := 70ksi$

$$Check := \begin{cases} \text{"OK"} & \text{if } Rating < 100\% \\ \text{"INSUFFICIENT"} & \text{otherwise} \end{cases}$$

$Check = \text{"OK"}$

Gusset Plate to HSS Weld Design
(AISC 15th Ed., Table 8-4)

Electrode Strength: $F_{EXX} := 70ksi$

Weld Size (in sixteenths of an inch): $D_1 := 6$ $\quad weldsize_1 := \frac{D_1}{16} = \frac{3}{8}$

Assume the worst-case installation scenario where the rod is positioned directly against the far side of the HSS.

$$ecc_2 := OD_{HSS} - t_{HSS} - \frac{D_{new}}{2} = 3.41 \cdot in$$

Load not in plane with weld group: $k := 0$

$$a := \frac{ecc_2}{L_{plate2}} = 0.24$$

$C_1 = 1$

$Coeff_1 := 3.35$

$\phi_w := 0.75$

$$D_{min1} := ceil\left(\frac{Pu \cdot in}{\phi_w \cdot Coeff_1 C_1 \cdot L_{plate2} \cdot kip}\right) = 5$$

$$minweldsize := \frac{D_{min1}}{16} = \frac{5}{16}$$

$Check_{weld} :=$ | "OK" if $D_1 \geq D_{min1} \wedge D_1 \geq Min_{weldsize}$
"N/G" otherwise

$Check_{weld} =$ "OK"

$$\phi Rn_{weld1} := \phi_w \cdot Coeff_1 \, ksi \cdot in \cdot C_1 \cdot D_1 \cdot L_{plate2} = 211.05 \cdot kip$$

$Check_{weld1} :=$ | "OK" if $Rating_{weld1} < 100\%$
"N/G" otherwise

$Check_{weld1} =$ "OK"

Gusset Plate to Pole Punching Shear Check (max per unit length): (AISC 15th Ed., Section J4.2)

Assume the worst-case installation scenario where the rod is positioned directly against the far side of the HSS.

$\phi_{sy} := 1.0$

$\phi_{sr} := 0.75$

$ecc_1 := w_{plate} + OD_{HSS} - t_{HSS} - \frac{D_{new}}{2} = 10.66 \cdot in$

$M_1 := Pu \cdot ecc_1 = 1738.65 \cdot kip \cdot in$

$S_1 := \frac{t_{plate} \cdot L_{plate1}^2}{6} = 676.87 \cdot in^3$

$f_v := \frac{M_1}{S_1} \cdot t_{plate} \cdot 1in = 3.21 \cdot kip$

AISC 15th Ed., Equation J4-3: $\phi F_{sy} := \phi_{sy} \cdot 0.6 \cdot Fy_{pole} \cdot 2 \cdot t_{pole} \cdot 1in = 24.37 \cdot kip$

AISC 15th Ed., Equation J4-4: $\phi F_{sr} := \phi_{sr} \cdot 0.6 \cdot Fu_{pole} \cdot 2 \cdot t_{pole} \cdot 1in = 22.5 \cdot kip$

$\phi F_v := \min(\phi F_{sy}, \phi F_{sr}) = 22.5 \cdot kip$

$Check_{PS1} :=$ | "OK" if $Rating_{PS1} < 100\%$ | "N/G" otherwise

$Check_{PS1} = \text{"OK"}$

Gusset Plate to HSS Punching Shear Check (max per unit length): (AISC 15th Ed., Section J4.2)

Assume the worst-case installation scenario where the rod is positioned directly against the far side of the HSS.

$ecc_2 := OD_{HSS} - t_{HSS} - \frac{D_{new}}{2} = 3.41 \cdot in$

$M_2 := Pu \cdot ecc_2 = 556.17 \cdot kip \cdot in$

$S_2 := \frac{t_{plate} \cdot L_{plate2}^2}{6} = 40.83 \cdot in^3$

$f_v := \frac{M_2}{S_2} \cdot t_{plate} \cdot 1in = 17.03 \cdot kip$

AISC 15th Ed., Equation J4-3: $\phi F_{sy} := \phi_{sy} \cdot 0.6 \cdot F_{y\_HSS} \cdot 2 \cdot t_{HSS} \cdot 1in = 25.67 \cdot kip$

AISC 15th Ed., Equation J4-4: $\phi F_{sr} := \phi_{sr} \cdot 0.6 \cdot F_{u\_HSS} \cdot 2 \cdot t_{HSS} \cdot 1in = 25.95 \cdot kip$

$\phi F_v := \min(\phi F_{sy}, \phi F_{sr}) = 25.67 \cdot kip$

$Check_{PS2} :=$ | "OK" if $Rating_{PS2} < 100\%$ | "N/G" otherwise

$Check_{PS2} = \text{"OK"}$

Embedment Depth Calculations

Projected Embedment Depth: $L_{em} := 5.75 \cdot ft$

Yield Strength of Rebar: $f_y := 60ksi$

Concrete Strength: $f'_c := 3000psi$

Transverse Reinforcement Index: $k_{tr} := 0$ Can be taken as 0 for design per ACI 318-14

Epoxy Factor: $\psi_e := 1$

Rebar Size Factor: $\psi_s := 1$

Casting Position Factor: $\psi_t := 1$

Concrete Weight Factor: $\lambda := 1 \cdot \sqrt{psi}$

Pier Diameter: $D_{pier} := 6ft$

Cover $c_c := 3in$

Rebar Size: $d_s := 10$ $d_b := vlookup(d_s, Rebar, 2) \cdot in = 1.27 \cdot in$

Tie Size: $Tie := 3$

Number of Vertical Rebar: $n := 32$

The embedment depth shall be analyzed based on the design tension capacity of the anchor rods.

Design Load: $\phi P_{nt} := 0.75 \cdot Fu_{rod} \cdot A_{new} = 304.69 \cdot kip$

Development Length (ACI 318-14 Chapter 25):

$$BC_{rebar} := D_{pier} - 2 \cdot c_c - \frac{Tie \cdot in}{4} - d_b = 63.98 \cdot in$$

$$S_{rebar} := \frac{\pi \cdot BC_{rebar}}{n} = 6.281 \cdot in$$

$$c_b := \min\left(c_c + \frac{Tie}{8} in + \frac{d_b}{2}, S_{rebar} \cdot 0.5\right) = 3.14 \cdot in$$

ACI 318-14, Equation 25.4.2.3a:

$$l_d := \left[\frac{3}{40} \cdot \frac{f_y}{\lambda \cdot \sqrt{f'_c}} \cdot \frac{\psi_t \cdot \psi_e \cdot \psi_s}{\min\left[\left(\frac{c_b + k_{tr}}{d_b}\right), 2.5\right]}\right] \cdot d_b = 42.19 \cdot in$$

Calculate Max Distance Between Rebar and New Anchor Rods:

$$A := \frac{1}{2} \cdot S_{rebar} = 3.141 \cdot in$$

$$B := \frac{BC_{rebar}}{2} - \frac{BC_{new}}{2} = 6.365 \cdot in$$

$$G := \sqrt{A^2 + B^2} = 7.098 \cdot in$$

$$l'_d := l_d + \frac{G}{1.5} + 3in = 4.16\,ft$$

Epoxy Development Length:

Bond Strength:

Epoxy := Hilti Hit Re 500

$$\phi_{bond} := 0.65$$

$$S_b := \begin{cases} S_{bh} & \text{if } Epoxy = 0 \\ S_{bA} & \text{otherwise} \end{cases}$$

$$S_b = 1073\,psi$$

$$L_{be} := \frac{\phi P_{nt}}{\pi \cdot D_{new} \cdot S_b \cdot \phi_{bond}} = 61.8 \cdot in$$

Required Embedment Length:

Length of Breaker Tape: $L_{BT} := 6 \cdot in$

$$L_{min} := \max\left(L_{be} + L_{BT}, l'_d + 0.25 \cdot L_{be}\right) = 5.65\,ft$$

$$Check := \begin{cases} \text{"OK"} & \text{if } L_{min} \le L_{em} \\ \text{"N/G"} & \text{otherwise} \end{cases}$$

Check = "OK"

Anchor Rod Pullout Test:

$$\phi_p := 0.75$$

Is this a CA **DSA** site? ○ Yes ◉ No

$$\text{Pullout} := \begin{cases} \dfrac{\phi_p \cdot Fu_{rod} \cdot A_{new}}{1.6} & \text{if } CA = 0 \\ \left(0.8 \cdot Fy_{rod} \cdot A_{new}\right) & \text{otherwise} \end{cases} = 190 \cdot kip$$

Pier and Pad Foundation

BU # :	841301
Site Name:	WILLINGTON-RIVI
App. Number:	479824 Rev.0

TIA-222 Revision:	H
Tower Type:	Monopole

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

Superstructure Analysis Reactions		
Compression, P_{comp}:	29.1	kips
Base Shear, Vu_comp:	18.44	kips
Moment, M_u:	1487.93	ft-kips
Tower Height, **H**:	110	ft
BP Dist. Above Fdn, bp_{dist}:	4.625	in

Foundation Analysis Checks	Capacity	Demand	Rating*	Check
Lateral (Sliding) (kips)	160.63	18.44	**10.9%**	**Pass**
Bearing Pressure (ksf)	15.00	2.16	**13.7%**	**Pass**
*Overturning (kip*ft)*	3608.91	1605.68	**44.5%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	5182.08	1552.47	**28.5%**	**Pass**
Pier Compression (kip)	17184.96	51.78	**0.3%**	**Pass**
*Pad Flexure (kip*ft)*	1677.22	543.92	**30.9%**	**Pass**
Pad Shear - 1-way (kips)	553.09	96.75	**16.7%**	**Pass**
Pad Shear - 2-way (Comp) (ksi)	0.164	0.027	**15.7%**	**Pass**
*Flexural 2-way (Comp) (kip*ft)*	2004.63	931.48	**44.3%**	**Pass**

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

Soil Rating*:	**44.5%**
Structural Rating*:	**44.3%**

Pier Properties		
Pier Shape:	Square	
Pier Diameter, **dpier**:	6	ft
Ext. Above Grade, **E**:	1	ft
Pier Rebar Size, **Sc**:	10	
Pier Rebar Quantity, **mc**:	32	
Pier Tie/Spiral Size, **St**:	3	
Pier Tie/Spiral Quantity, **mt**:	3	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier}:	3	in

Pad Properties		
Depth, **D**:	5	ft
Pad Width, **W**:	22	ft
Pad Thickness, **T**:	2.5	ft
Pad Rebar Size (Bottom), **Sp**:	8	
Pad Rebar Quantity (Bottom), **mp**:	19	
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:	125	pcf
Ultimate Gross Bearing, Qult:	20.000	ksf
Cohesion, **Cu**:	0.000	ksf
Friction Angle, φ:	36	degrees
SPT Blow Count, N_{blows}:		
Base Friction, μ:	0.35	
Neglected Depth, **N**:	2.50	ft
Foundation Bearing on Rock?	Yes	
Groundwater Depth, **gw**:	n/a	ft

<--Toggle between Gross and Net

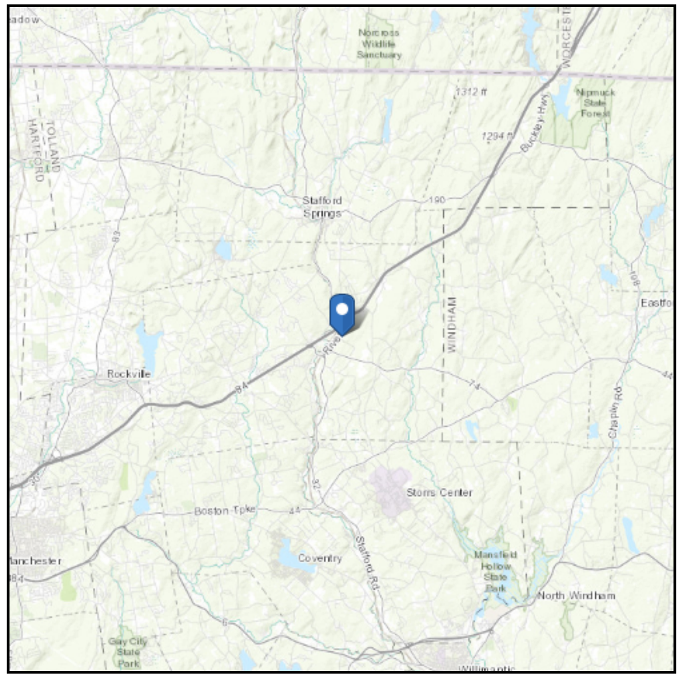
Version 3.2.0

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 515.88 ft (NAVD 88)
Latitude: 41.890756
Longitude: -72.289381



ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

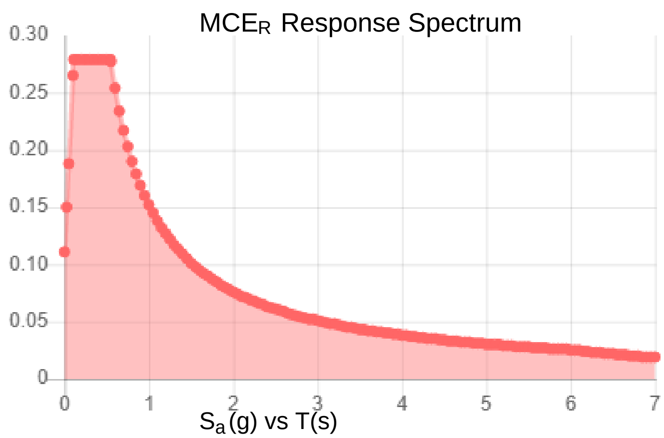
Seismic

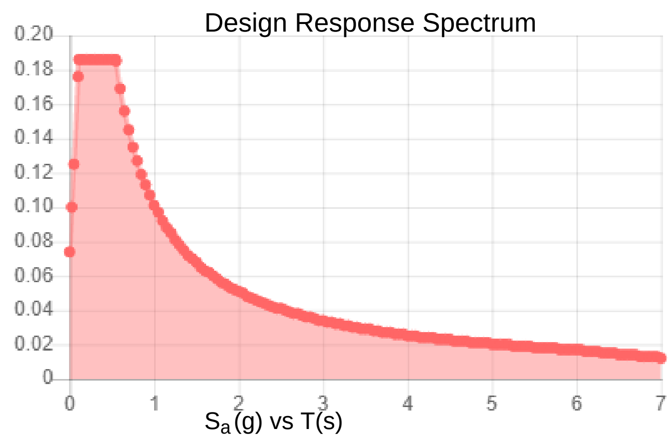
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.174	S_{DS} :	0.186
S_1 :	0.063	S_{D1} :	0.101
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.086
S_{MS} :	0.279	PGA_M :	0.138
S_{M1} :	0.152	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B





Data Accessed: Mon Jun 17 2019

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:	Mon Jun 17 2019

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: June 5, 2019

Charles McGuirt
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
(704) 405-6607

B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630
btwo@btgrp.com

Subject:	**Mount Analysis Report**	
Carrier Designation:	**T-Mobile Equipment Change-Out**	
	Carrier Site Number:	CT11261C
	Carrier Site Name:	Tolland/I-84/Fill-In
Crown Castle Designation:	**Crown Castle BU Number:**	841301
	Crown Castle Site Name:	Willington-River Rd
	Crown Castle JDE Job Number:	559267
	Crown Castle Order Number:	479824, Rev.0
Engineering Firm Designation:	**B+T Group Report Designation:**	135909.001.01.R1
Site Data:	**426 River Road, Willington, CT, Tolland County, 06279**	
	Latitude 41° 53' 26.72" Longitude -72° 17' 21.77"	
Structure Information:	**Tower Height & Type:**	**110 ft. Monopole**
	Mount Elevation:	**100 ft.**
	Mount Type:	**10.75 ft. Platform Mount**

Dear Mr. McGuirt,

B+T Group 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 above mentioned supporting tower structure. Analysis of the existing supporting tower structure is to be completed by others and therefore is not part of this analysis. Analysis of the antenna mounting system as a tie-off point for fall protection or rigging is not part of this document.

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

Platform Mount	**Sufficient**

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.

Mount structural analysis prepared by: Phanindra Kosaraju, E.I.T.

Respectfully submitted by: B&T Engineering, Inc.
COA: PEC.0001564 Expires: 02/10/2020

STATE OF CONNECTICUT
SCOTT S. VANCE
31627
LICENSED
PROFESSIONAL ENGINEER

6/5/19

Scott S. Vance, P.E.
Engineer of Record

TABLE OF CONTENTS

1) INTRODUCTION

This is a 10.75' Platform Mount, mapped by Paul J. Ford & Company & RKS.

2) ANALYSIS CRITERIA

Building Code: 2015 IBC
TIA-222 Revision: TIA-222-H
Risk Category: II
Ultimate Wind Speed: 125 mph
Exposure Category: B
Topographic Factor at Base: 1
Topographic Factor at Mount: 1
Ice Thickness: 2 in
Wind Speed with Ice: 50 mph
Seismic S_s: 0.174
Seismic S_1: 0.063
Live Loading Wind Speed: 30 mph
Man Live Load at Mid/End-Points: 250 lb.
Man Live Load at Mount Pipes: 500 lb.

Table 1 - Proposed Equipment Configuration

Mount Centerline	Antenna Centerline	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount Details
100 ft	100 ft	2	EMS Wireless	RR90-17-00DP	10.75' Platform Mount
		2	RFS	APXVAARR24_43-U-NA20	
		2	Ericsson	KRY 112 144/1	
		2	Ericsson	KRY 112 489/2	
		2	Ericsson	RADIO 4449 B12/B71	

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
CCI Order	Existing Loading Proposed Loading	Date: 05/28/2019	Crown Castle
Mount Mapping	Paul J. Ford & Company & RKS	Date: 04/06/2019	On File

3.1) Analysis Method

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

A tool internally developed by B+T Group, 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 C).

3.2) Assumptions

1. The mount was properly fabricated and installed in accordance with its original design and manufacturer's specifications.
2. The mount has been maintained in accordance with the manufacturer's specifications and is free of damage.
3. The configuration of antennas, mounts, and other appurtenances are as specified in Table-1.
4. All mount components have been assumed to be in sufficient condition to carry their full design capacity for the analysis.
5. Mount areas and weights are determined from field measurements, standard material properties, and/or manufacturer product data.
6. Serviceability with respect to antenna twist, tilt, roll or lateral translation is not checked and is left to the carrier or tower owner to ensure conformance.
7. All prior structural modifications, if any are assumed to be correctly installed and fully effective.
8. 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.
9. 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.
10. The following material grades were assumed (Unless Noted Otherwise):
    (a) Connection Bolts : ASTM A325
    (b) Steel Pipe : ASTM A53 (GR. 35)
    (c) HSS (Round) : ASTM 500 (GR. B-42)
    (d) HSS (Rectangular) : ASTM 500 (GR. B-46)
    (e) Channel : ASTM A36 (GR. 36)
    (f) Steel Solid Rod : ASTM A36 (GR. 36)
    (g) Steel Plate : ASTM A36 (GR. 36)
    (h) Steel Angle : ASTM A36 (GR. 36)
    (i) UNISTRUT : ASTM A570 (GR. 33)

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

4) ANALYSIS RESULTS

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

Notes	Component	Critical Member	Centerline (ft.)	% Capacity	Pass / Fail
1,2	Main Horizontals	M1	100	48.9	Pass
	Support Channels	M8	100	37.2	Pass
	Support Angle	M109	100	16.5	Pass
	Mount Pipes	M90	100	68.3	Pass

Structure Rating (max from all components) =	**68.3%**

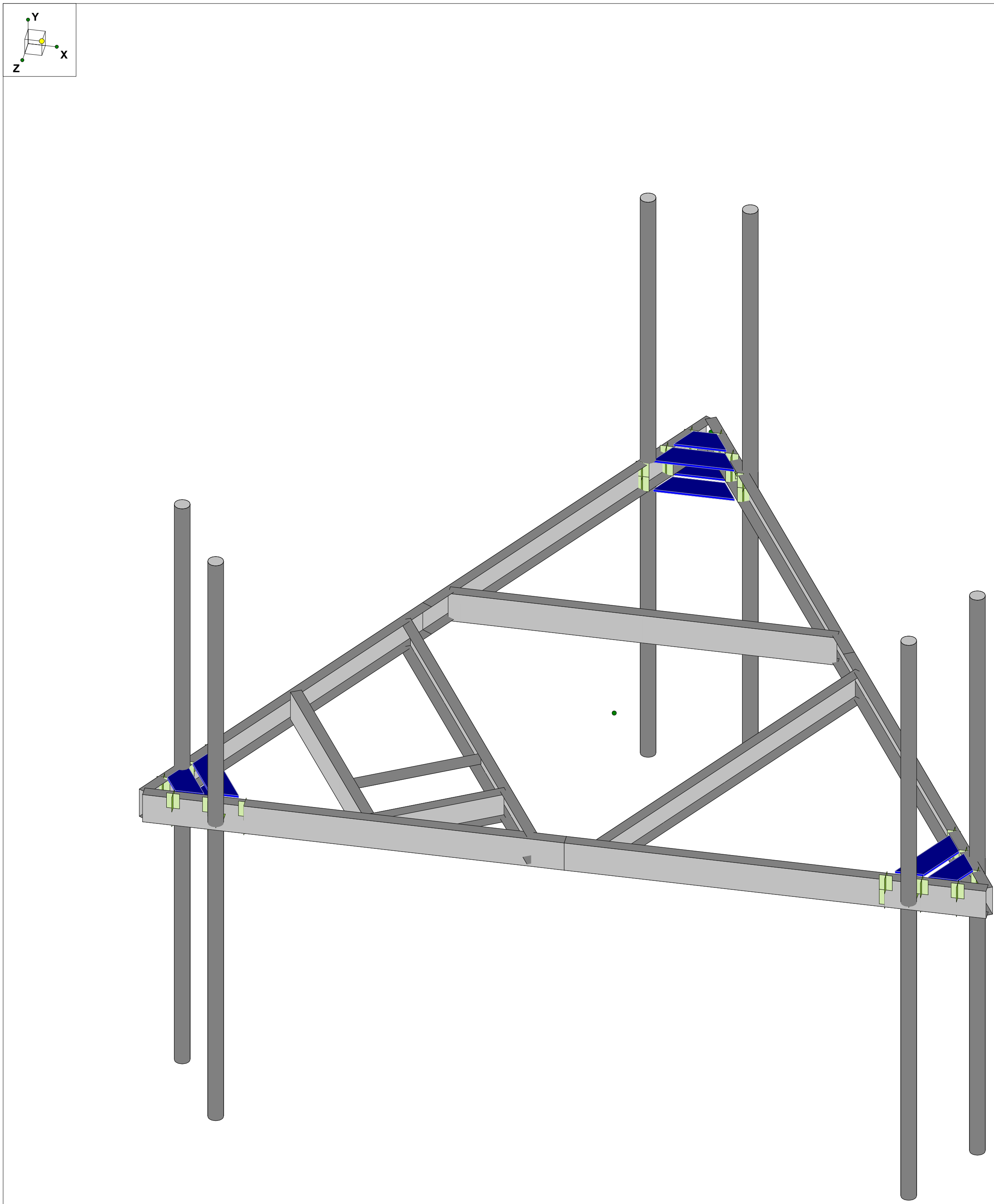
Notes:
1) See additional documentation in "Appendix C - Software Analysis Output" for calculations supporting the % capacity consumed.
2) All sectors are typical

4.1) Recommendations

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

APPENDIX A

WIRE FRAME AND RENDERED MODELS



Envelope Only Solution

B+T Group	841301 - Willington-River Rd	SK - 1
PKK		June 5, 2019 at 11:19 AM
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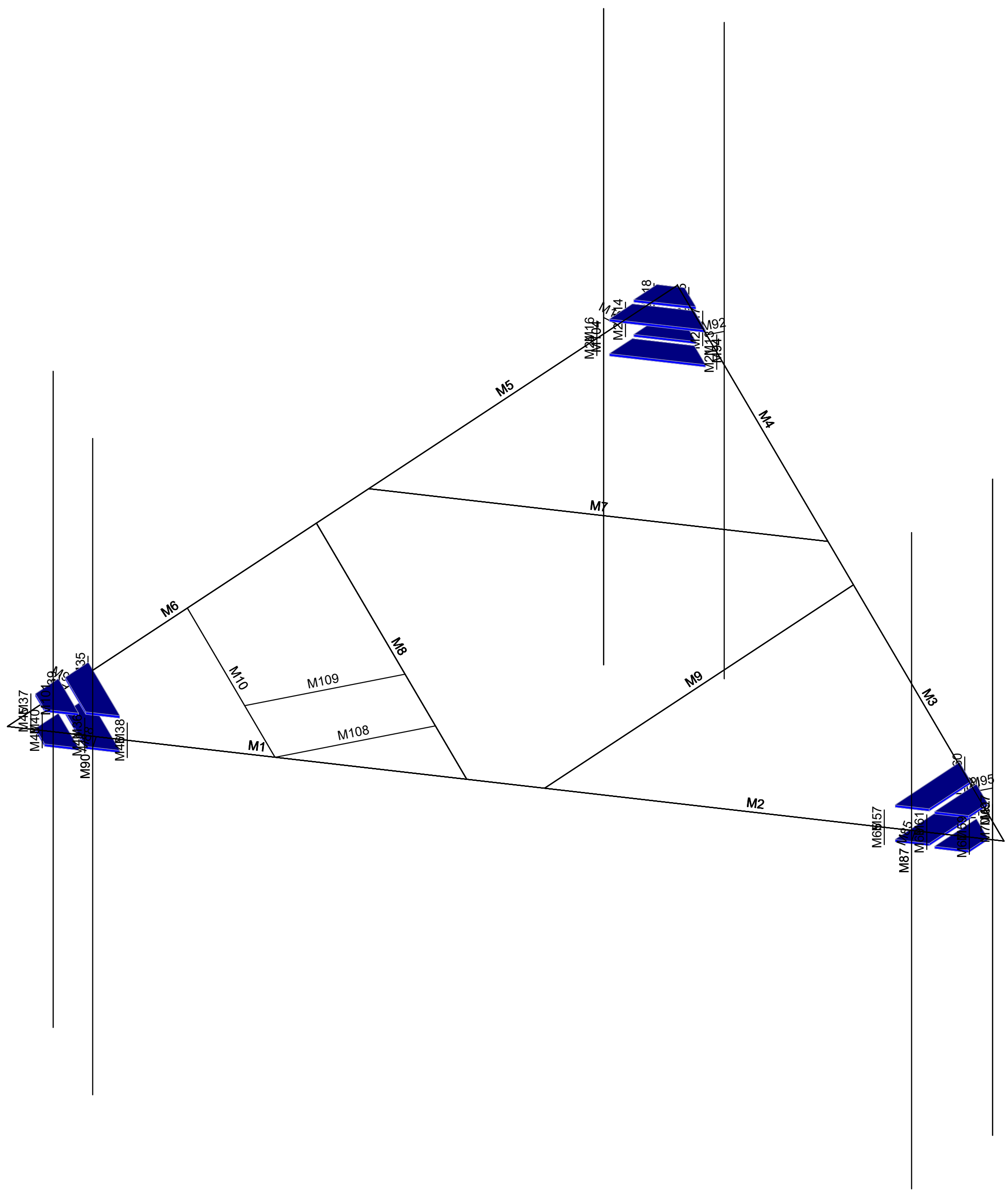

Envelope Only Solution

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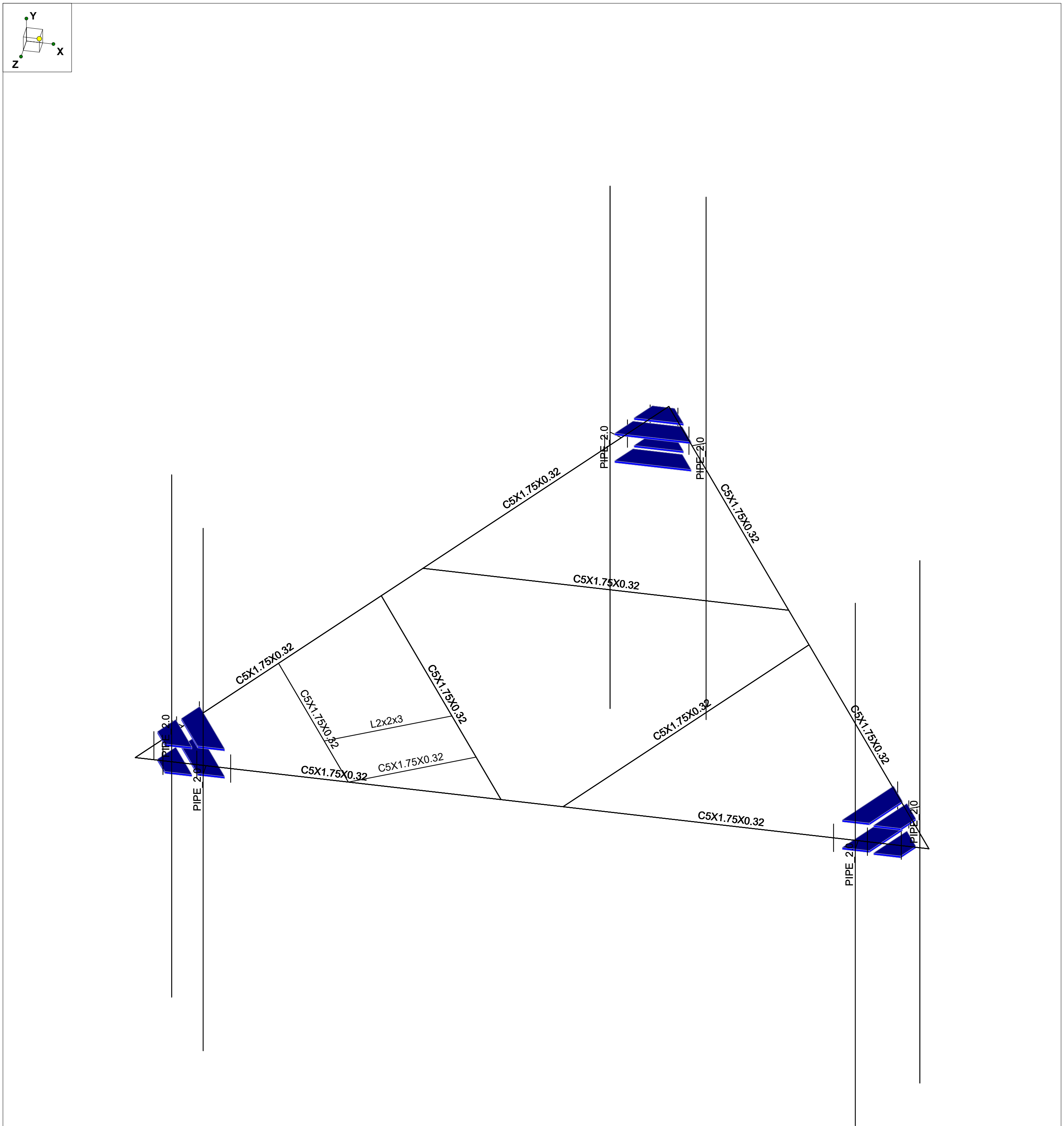

Envelope Only Solution

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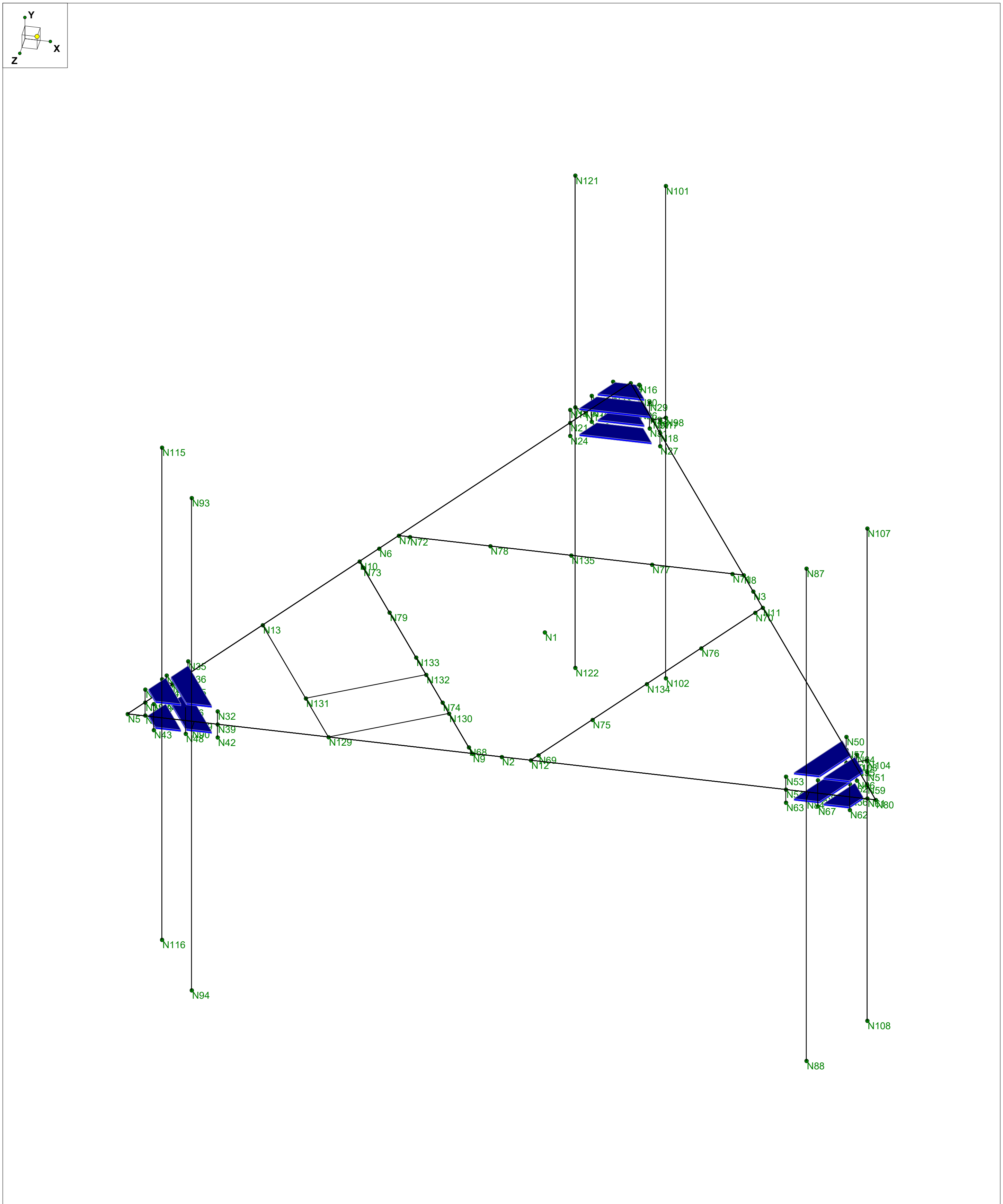

Envelope Only Solution

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APPENDIX B

SOFTWARE INPUT CALCULATIONS

PROJECT	**135909.001.01 - Willington-River Rd, (PKK**		
SUBJECT	**Platform Mount Mount Analysis**		
DATE	**06/04/19**	PAGE 1	OF 1

B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

INPUT

[REF: ANSI/TIA-222-H]

Tower Type		:	MP		
Tower Height		:	110	ft	
Mount Elevation		:	100	ft	
Antenna Elevation		:	100	ft	
Crest Height		:	0	ft	
Risk Category		:	II		[Table 2-1]
Exposure Category		:	B		[Sec. 2.6.5.1.2]
Topography Category		:	1		[Sec. 2.6.6.2]
Wind Velocity	V	:	125	mph	[Annex B]
Ice wind Velocity	V_i	:	50	mph	[Annex B]
Service Velocity	V_s	:	30	mph	[Annex B]
Base Ice thickness	t_i	:	2	in	[Annex B]
Ground Elevation	z_s	:	515.88	ft	[Sec. 2.6.8]

ANTENNAS

	Manufacturer	Model	Height (in)	Front Width (in)	Side Width (in)	Weight (lbs)	Shape	Quantity	Location (%)
Mount Pipe **M87**									
	EMS Wireless	RR90-17-00DP	56.00	8.00	2.75	13.50	Flat	0.5	5
	EMS Wireless	RR90-17-00DP	56.00	8.00	2.75	13.50	Flat	0.5	45
	Ericsson	KRY 112 489/2	11.00	6.10	3.94	15.40	Flat	2	30
Mount Pipe **M90**									
	RFS	APXVAARR24_43-U-NA20	95.90	24.00	8.70	128.00	Flat	0.5	10
	RFS	APXVAARR24_43-U-NA20	95.90	24.00	8.70	128.00	Flat	0.5	90
	Ericsson	RADIO 4449 B12/B71	14.95	13.19	9.25	75.00	Flat	1	30
Mount Pipe **M101**									
	Ericsson	KRY 112 144/1	7.00	6.00	3.00	11.00	Flat	2	30
Mount Pipe **M104**									
	Ericsson	RADIO 4449 B12/B71	14.95	13.19	9.25	75.00	Flat	1	30
Mount Pipe **M94**									
	EMS Wireless	RR90-17-00DP	56.00	8.00	2.75	13.50	Flat	0.5	5
	EMS Wireless	RR90-17-00DP	56.00	8.00	2.75	13.50	Flat	0.5	45
Mount Pipe **M97**									
	RFS	APXVAARR24_43-U-NA20	95.90	24.00	8.70	128.00	Flat	0.5	10
	RFS	APXVAARR24_43-U-NA20	95.90	24.00	8.70	128.00	Flat	0.5	90

PROJECT	**135909.001.01 - Willington-River Rd, (PKK**
SUBJECT	**Platform Mount Mount Analysis**
DATE	**06/05/19**

B+T GRP

B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

INPUT

[REF: ANSI/TIA-222-G2005]

	Member Number	Section Set	Wind Projection (in)	Length (in)	Perimeter (in)	Shape	D_c (in)
	M1	MF-H1	5.00	64.50	17.00	Flat	5.30
	M2	MF-H1	5.00	64.50	17.00	Flat	5.30
	M3	MF-H1	5.00	64.50	17.00	Flat	5.30
	M4	MF-H1	5.00	64.50	17.00	Flat	5.30
	M5	MF-H1	5.00	64.50	17.00	Flat	5.30
	M6	MF-H1	5.00	64.50	17.00	Flat	5.30
	M7	F1-SA1	5.00	59.47	17.00	Flat	5.30
	M8	F1-SA1	5.00	59.47	17.00	Flat	5.30
	M9	F1-SA1	5.00	59.47	17.00	Flat	5.30
	M10	F1-SA1	5.00	34.64	17.00	Flat	5.30
	M87	MF-P1	2.38	102.00	7.48	Round	2.38
	M90	MF-P1	2.38	102.00	7.48	Round	2.38
	M94	MF-P1	2.38	102.00	7.48	Round	2.38
	M97	MF-P1	2.38	102.00	7.48	Round	2.38
	M101	MF-P1	2.38	102.00	7.48	Round	2.38
	M104	MF-P1	2.38	102.00	7.48	Round	2.38
	M108	F1-SA1	5.00	21.50	17.00	Flat	5.30
	M109	F1-SA2	2.00	21.50	8.00	Flat	2.83

PROJECT	135909.001.01 - Willington-R	PKK
SUBJECT	Platform Mount Mount Analysis	
DATE	06/04/19	PAGE OF

B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

Manufacturer	Model	Qty	Aspect Ratio	C_a flat/round	EPA_N*K_a (ft^2)	EPA_T*K_a (ft^2)	$EPA_{N-Ice}*K_a$ (ft^2)	$EPA_{T-Ice}*K_a$ (ft^2)	$F_{A\ No\ Ice\ (N)}$	$F_{A\ No\ Ice\ (T)}$	$F_{A\ Ice\ (N)}$	$F_{A\ Ice\ (T)}$
EMS Wireless	RR90-17-00DP	0.5	7.00	1.40	1.40	0.48	2.36	1.36	0.07	0.03	0.01	0.01
EMS Wireless	RR90-17-00DP	0.5	7.00	1.40	1.40	0.48	2.36	1.36	0.07	0.03	0.01	0.01
Ericsson	KRY 112 489/2	2	1.80	1.20	0.84	0.54	2.04	1.63	0.04	0.02	0.01	0.00
RFS	APXVAARR24_43-U-NA20	0.5	4.00	1.27	7.19	2.61	8.93	4.13	0.34	0.15	0.05	0.02
RFS	APXVAARR24_43-U-NA20	0.5	4.00	1.27	7.19	2.61	8.93	4.13	0.34	0.15	0.05	0.02
Ericsson	RADIO 4449 B12/B71	1	1.13	1.20	1.23	0.86	2.14	1.67	0.05	0.04	0.01	0.01
Ericsson	KRY 112 144/1	2	1.17	1.20	0.53	0.26	1.50	1.07	0.02	0.01	0.00	0.00
Ericsson	RADIO 4449 B12/B71	1	1.13	1.20	1.23	0.86	2.14	1.67	0.05	0.04	0.01	0.01
EMS Wireless	RR90-17-00DP	0.5	7.00	1.40	1.40	0.48	2.36	1.36	0.07	0.03	0.01	0.01
EMS Wireless	RR90-17-00DP	0.5	7.00	1.40	1.40	0.48	2.36	1.36	0.07	0.03	0.01	0.01
RFS	APXVAARR24_43-U-NA20	0.5	4.00	1.27	7.19	2.61	8.93	4.13	0.34	0.15	0.05	0.02
RFS	APXVAARR24_43-U-NA20	0.5	4.00	1.27	7.19	2.61	8.93	4.13	0.34	0.15	0.05	0.02

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	MF-H1	C5X1.75X0.32	Beam	Channel	A36 Gr.36	Typical	1.948	.578	7.455	.044
2	MF-P1	PIPE_2.0	Column	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
3	F1-SA1	C5X1.75X0.32	Beam	Channel	A36 Gr.36	Typical	1.948	.578	7.455	.044
4	F1-SA2	L2x2x3	Beam	Single Angle	A36 Gr.36	Typical	.722	.271	.271	.009
5	Handrails	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
6	F1-CA1	L2.5x2.5x4	Beam	Single Angle	A36 Gr.36	Typical	1.19	.692	.692	.026

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	N1	0	0	0	0	
2	N2	0.	0	3.103258	0	
3	N3	2.6875	0	-1.551629	0	
4	N4	-0.	0	-6.206515	0	
5	N5	-5.375	0	3.103258	0	
6	N6	-2.6875	0	-1.551629	0	
7	N7	-2.477795	0	-1.914849	0	
8	N8	2.477795	0	-1.914849	0	
9	N9	-0.41941	0	3.103258	0	
10	N10	-2.897205	0	-1.188409	0	
11	N11	2.897205	0	-1.188409	0	
12	N12	0.41941	0	3.103258	0	
13	N13	-3.931624	0	0.603258	0	
14	N14	-0.645833	0.224167	-5.087899	0	
15	N15	-0.1875	0.224167	-5.881756	0	
16	N16	0.1875	0.224167	-5.881756	0	
17	N17	0.645833	0.224167	-5.087899	0	
18	N18	0.645833	0	-5.087899	0	
19	N19	-0.416667	-1.8e-15	-5.484828	0	
20	N20	0.1875	-1.8e-15	-5.881756	0	
21	N21	-0.645833	0	-5.087899	0	
22	N22	0.416667	-1.8e-15	-5.484828	0	
23	N23	-0.1875	-1.8e-15	-5.881756	0	
24	N24	-0.645833	-0.224167	-5.087899	0	
25	N25	-0.1875	-0.224167	-5.881756	0	
26	N26	0.1875	-0.224167	-5.881756	0	
27	N27	0.645833	-0.224167	-5.087899	0	
28	N28	-0.416667	0.224167	-5.484828	0	
29	N29	0.416667	0.224167	-5.484828	0	
30	N30	-0.416667	-0.224167	-5.484828	0	
31	N31	0.416667	-0.224167	-5.484828	0	
32	N32	-4.083333	0.224167	3.103258	0	
33	N33	-5.	0.224167	3.103258	0	
34	N34	-5.1875	0.224167	2.778498	0	
35	N35	-4.729167	0.224167	1.984642	0	
36	N36	-4.729167	0	1.984642	0	
37	N37	-4.541667	-1.8e-15	3.103258	0	
38	N38	-5.1875	-1.8e-15	2.778498	0	
39	N39	-4.083333	0	3.103258	0	
40	N40	-4.958333	-1.8e-15	2.38157	0	
41	N41	-5.	-1.8e-15	3.103258	0	
42	N42	-4.083333	-0.224167	3.103258	0	
43	N43	-5.	-0.224167	3.103258	0	
44	N44	-5.1875	-0.224167	2.778498	0	
45	N45	-4.729167	-0.224167	1.984642	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
46	N46	-4.541667	0.224167	3.103258	0	
47	N47	-4.958333	0.224167	2.38157	0	
48	N48	-4.541667	-0.224167	3.103258	0	
49	N49	-4.958333	-0.224167	2.38157	0	
50	N50	4.729167	0.224167	1.984642	0	
51	N51	5.1875	0.224167	2.778498	0	
52	N52	5.	0.224167	3.103258	0	
53	N53	4.083333	0.224167	3.103258	0	
54	N54	4.083333	0	3.103258	0	
55	N55	4.958333	-1.8e-15	2.38157	0	
56	N56	5.	-1.8e-15	3.103258	0	
57	N57	4.729167	0	1.984642	0	
58	N58	4.541667	-1.8e-15	3.103258	0	
59	N59	5.1875	-1.8e-15	2.778498	0	
60	N60	4.729167	-0.224167	1.984642	0	
61	N61	5.1875	-0.224167	2.778498	0	
62	N62	5.	-0.224167	3.103258	0	
63	N63	4.083333	-0.224167	3.103258	0	
64	N64	4.958333	0.224167	2.38157	0	
65	N65	4.541667	0.224167	3.103258	0	
66	N66	4.958333	-0.224167	2.38157	0	
67	N67	4.541667	-0.224167	3.103258	0	
68	N68	-.5	0	2.963672	0	
69	N69	.5	0	2.963672	0	
70	N70	2.816615	0	-1.048823	0	
71	N71	2.316615	0	-1.914849	0	
72	N72	-2.316615	0	-1.914849	0	
73	N73	-2.816615	0	-1.048823	0	
74	N74	-1.07735	0	1.963672	0	
75	N75	1.07735	0	1.963672	0	
76	N76	2.239265	0	-0.048823	0	
77	N77	1.161915	0	-1.914849	0	
78	N78	-1.161915	0	-1.914849	0	
79	N79	-2.239265	0	-0.048823	0	
80	N80	5.375	0	3.103258	0	
81	N83	4.416667	0	3.103258	0	
82	N84	4.416667	0	3.301591	0	
83	N87	4.416667	4	3.301591	0	
84	N88	4.416667	-4.5	3.301591	0	
85	N89	-4.416667	0	3.103258	0	
86	N90	-4.416667	0	3.301591	0	
87	N93	-4.416667	4	3.301591	0	
88	N94	-4.416667	-4.5	3.301591	0	
89	N97	0.479167	0	-5.376574	0	
90	N98	0.650928	0	-5.475741	0	
91	N101	0.650928	4	-5.475741	0	
92	N102	0.650928	-4.5	-5.475741	0	
93	N103	4.895833	0	2.273317	0	
94	N104	5.067595	0	2.17415	0	
95	N107	5.067595	4	2.17415	0	
96	N108	5.067595	-4.5	2.17415	0	
97	N111	-4.895833	0	2.273317	0	
98	N112	-5.067595	0	2.17415	0	
99	N115	-5.067595	4	2.17415	0	
100	N116	-5.067595	-4.5	2.17415	0	
101	N117	-0.479167	0	-5.376574	0	
102	N118	-0.650928	0	-5.475741	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
103	N121	-0.650928	4	-5.475741	0	
104	N122	-0.650928	-4.5	-5.475741	0	
105	N129	-2.488249	0	3.103258	0	
106	N130	-0.93662	0	2.207424	0	
107	N131	-2.988249	0	2.237232	0	
108	N132	-1.43662	0	1.341399	0	
109	N133	-1.658308	0	0.957424	0	
110	N134	1.658308	0	0.957424	0	
111	N135	0	0	-1.914849	0	

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N5	N2		180	MF-H1	Beam	Channel	A36 Gr.36	Typical
2	M2	N80	N2			MF-H1	Beam	Channel	A36 Gr.36	Typical
3	M3	N80	N3		180	MF-H1	Beam	Channel	A36 Gr.36	Typical
4	M4	N4	N3			MF-H1	Beam	Channel	A36 Gr.36	Typical
5	M5	N4	N6		180	MF-H1	Beam	Channel	A36 Gr.36	Typical
6	M6	N5	N6			MF-H1	Beam	Channel	A36 Gr.36	Typical
7	M7	N7	N8		180	F1-SA1	Beam	Channel	A36 Gr.36	Typical
8	M8	N9	N10		180	F1-SA1	Beam	Channel	A36 Gr.36	Typical
9	M9	N11	N12		180	F1-SA1	Beam	Channel	A36 Gr.36	Typical
10	M10	N129	N13			F1-SA1	Beam	Channel	A36 Gr.36	Typical
11	M13	N18	N17			RIGID	None	None	RIGID	Typical
12	M14	N19	N28			RIGID	None	None	RIGID	Typical
13	M15	N20	N16			RIGID	None	None	RIGID	Typical
14	M16	N21	N14			RIGID	None	None	RIGID	Typical
15	M17	N22	N29			RIGID	None	None	RIGID	Typical
16	M18	N23	N15			RIGID	None	None	RIGID	Typical
17	M21	N27	N18			RIGID	None	None	RIGID	Typical
18	M22	N30	N19			RIGID	None	None	RIGID	Typical
19	M23	N26	N20			RIGID	None	None	RIGID	Typical
20	M24	N24	N21			RIGID	None	None	RIGID	Typical
21	M25	N31	N22			RIGID	None	None	RIGID	Typical
22	M26	N25	N23			RIGID	None	None	RIGID	Typical
23	M35	N36	N35			RIGID	None	None	RIGID	Typical
24	M36	N37	N46			RIGID	None	None	RIGID	Typical
25	M37	N38	N34			RIGID	None	None	RIGID	Typical
26	M38	N39	N32			RIGID	None	None	RIGID	Typical
27	M39	N40	N47			RIGID	None	None	RIGID	Typical
28	M40	N41	N33			RIGID	None	None	RIGID	Typical
29	M43	N45	N36			RIGID	None	None	RIGID	Typical
30	M44	N48	N37			RIGID	None	None	RIGID	Typical
31	M45	N44	N38			RIGID	None	None	RIGID	Typical
32	M46	N42	N39			RIGID	None	None	RIGID	Typical
33	M47	N49	N40			RIGID	None	None	RIGID	Typical
34	M48	N43	N41			RIGID	None	None	RIGID	Typical
35	M57	N54	N53			RIGID	None	None	RIGID	Typical
36	M58	N55	N64			RIGID	None	None	RIGID	Typical
37	M59	N56	N52			RIGID	None	None	RIGID	Typical
38	M60	N57	N50			RIGID	None	None	RIGID	Typical
39	M61	N58	N65			RIGID	None	None	RIGID	Typical
40	M62	N59	N51			RIGID	None	None	RIGID	Typical
41	M65	N63	N54			RIGID	None	None	RIGID	Typical
42	M66	N66	N55			RIGID	None	None	RIGID	Typical
43	M67	N62	N56			RIGID	None	None	RIGID	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
44	M68	N60	N57			RIGID	None	None	RIGID	Typical
45	M69	N67	N58			RIGID	None	None	RIGID	Typical
46	M70	N61	N59			RIGID	None	None	RIGID	Typical
47	M85	N83	N84			RIGID	None	None	RIGID	Typical
48	M87	N87	N88			MF-P1	Column	Pipe	A53 Gr.B	Typical
49	M88	N89	N90			RIGID	None	None	RIGID	Typical
50	M90	N93	N94			MF-P1	Column	Pipe	A53 Gr.B	Typical
51	M92	N97	N98			RIGID	None	None	RIGID	Typical
52	M94	N101	N102			MF-P1	Column	Pipe	A53 Gr.B	Typical
53	M95	N103	N104			RIGID	None	None	RIGID	Typical
54	M97	N107	N108			MF-P1	Column	Pipe	A53 Gr.B	Typical
55	M99	N111	N112			RIGID	None	None	RIGID	Typical
56	M101	N115	N116			MF-P1	Column	Pipe	A53 Gr.B	Typical
57	M102	N117	N118			RIGID	None	None	RIGID	Typical
58	M104	N121	N122			MF-P1	Column	Pipe	A53 Gr.B	Typical
59	M108	N129	N130			F1-SA1	Beam	Channel	A36 Gr.36	Typical
60	M109	N131	N132		270	F1-SA2	Beam	Single Angle	A36 Gr.36	Typical

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(Plate/...
1	Dead	DL		-1			30		8	
2	0 Wind - No Ice	WLZ					30	18		
3	90 Wind - No Ice	WLX					30	18		
4	0 Wind - Ice	WLZ					30	18		
5	90 Wind - Ice	WLX					30	18		
6	0 Wind - Service	WLZ					30	18		
7	90 Wind - Service	WLX					30	18		
8	Ice	OL1					30	18	8	
9	Live Load a	LL				3				
10	Live Load b	LL				3				
11	Live Load c	LL								
12	Live Load d	LL								
13	Maint LL 1	LL								
14	Maint LL 2	LL					1			
15	Maint LL 3	LL								
16	Maint LL 4	LL					1			
17	Maint LL 5	LL								
18	Maint LL 6	LL					1			
19	Maint LL 7	LL								
20	Maint LL 8	LL					1			
21	Maint LL 9	LL								
22	Maint LL 10	LL					1			
23	Maint LL 11	LL								
24	Maint LL 12	LL					1			
25	Maint LL 13	LL					1			
26	Maint LL 14	LL					1			
27	Maint LL 15	LL					1			
28	BLC 1 Transient Are...	None						33		
29	BLC 8 Transient Are...	None						34		

Load Combinations

	Description	So...	P...	S...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...
1	1.4 Dead	Yes	Y		1	1.4																		
2	1.2 D + 1.0 - 0 W	Yes	Y		1	1.2	2	1																
3	1.2 D + 1.0 - 30 W	Yes	Y		1	1.2	2	.866	3	.5														
4	1.2 D + 1.0 - 60 W	Yes	Y		1	1.2	3	.866	2	.5														
5	1.2 D + 1.0 - 90 W	Yes	Y		1	1.2	3	1																
6	1.2 D + 1.0 - 120 W	Yes	Y		1	1.2	3	.866	2	-.5														
7	1.2 D + 1.0 - 150 W	Yes	Y		1	1.2	2	-.866	3	.5														
8	1.2 D + 1.0 - 180 W	Yes	Y		1	1.2	2	-1																
9	1.2 D + 1.0 - 210 W	Yes	Y		1	1.2	2	-.866	3	-.5														
10	1.2 D + 1.0 - 240 W	Yes	Y		1	1.2	3	-.866	2	-.5														
11	1.2 D + 1.0 - 270 W	Yes	Y		1	1.2	3	-1																
12	1.2 D + 1.0 - 300 W	Yes	Y		1	1.2	3	-.866	2	.5														
13	1.2 D + 1.0 - 330 W	Yes	Y		1	1.2	2	.866	3	-.5														
14	1.2 D + 1.0 - 0 W/Ice	Yes	Y		1	1.2	4	1			8	1												
15	1.2 D + 1.0 - 30 W/Ice	Yes	Y		1	1.2	4	.866	5	.5	8	1												
16	1.2 D + 1.0 - 60 W/Ice	Yes	Y		1	1.2	5	.866	4	.5	8	1												
17	1.2 D + 1.0 - 90 W/Ice	Yes	Y		1	1.2	5	1			8	1												
18	1.2 D + 1.0 - 120 W/Ice	Yes	Y		1	1.2	5	.866	4	-.5	8	1												
19	1.2 D + 1.0 - 150 W/Ice	Yes	Y		1	1.2	4	-.866	5	.5	8	1												
20	1.2 D + 1.0 - 180 W/Ice	Yes	Y		1	1.2	4	-1			8	1												
21	1.2 D + 1.0 - 210 W/Ice	Yes	Y		1	1.2	4	-.866	5	-.5	8	1												
22	1.2 D + 1.0 - 240 W/Ice	Yes	Y		1	1.2	5	-.866	4	-.5	8	1												
23	1.2 D + 1.0 - 270 W/Ice	Yes	Y		1	1.2	5	-1			8	1												
24	1.2 D + 1.0 - 300 W/Ice	Yes	Y		1	1.2	5	-.866	4	.5	8	1												
25	1.2 D + 1.0 - 330 W/Ice	Yes	Y		1	1.2	4	.866	5	-.5	8	1												
26	1.2 D + 1.5 LL a + Service...	Yes	Y		1	1.2	6	1			9	1.5												
27	1.2 D + 1.5 LL a + Service...	Yes	Y		1	1.2	6	.866	7	.5	9	1.5												
28	1.2 D + 1.5 LL a + Service...	Yes	Y		1	1.2	7	.866	6	.5	9	1.5												
29	1.2 D + 1.5 LL a + Service...	Yes	Y		1	1.2	7	1			9	1.5												
30	1.2 D + 1.5 LL a + Service...	Yes	Y		1	1.2	7	.866	6	-.5	9	1.5												
31	1.2 D + 1.5 LL a + Service...	Yes	Y		1	1.2	6	-.866	7	.5	9	1.5												
32	1.2 D + 1.5 LL a + Service...	Yes	Y		1	1.2	6	-1			9	1.5												
33	1.2 D + 1.5 LL a + Service...	Yes	Y		1	1.2	6	-.866	7	-.5	9	1.5												
34	1.2 D + 1.5 LL a + Service...	Yes	Y		1	1.2	7	-.866	6	-.5	9	1.5												
35	1.2 D + 1.5 LL a + Service...	Yes	Y		1	1.2	7	-1			9	1.5												
36	1.2 D + 1.5 LL a + Service...	Yes	Y		1	1.2	7	-.866	6	.5	9	1.5												
37	1.2 D + 1.5 LL a + Service...	Yes	Y		1	1.2	6	.866	7	-.5	9	1.5												
38	1.2 D + 1.5 LL b + Service...	Yes	Y		1	1.2	6	1			10	1.5												
39	1.2 D + 1.5 LL b + Service...	Yes	Y		1	1.2	6	.866	7	.5	10	1.5												
40	1.2 D + 1.5 LL b + Service...	Yes	Y		1	1.2	7	.866	6	.5	10	1.5												
41	1.2 D + 1.5 LL b + Service...	Yes	Y		1	1.2	7	1			10	1.5												
42	1.2 D + 1.5 LL b + Service...	Yes	Y		1	1.2	7	.866	6	-.5	10	1.5												
43	1.2 D + 1.5 LL b + Service...	Yes	Y		1	1.2	6	-.866	7	.5	10	1.5												
44	1.2 D + 1.5 LL b + Service...	Yes	Y		1	1.2	6	-1			10	1.5												
45	1.2 D + 1.5 LL b + Service...	Yes	Y		1	1.2	6	-.866	7	-.5	10	1.5												
46	1.2 D + 1.5 LL b + Service...	Yes	Y		1	1.2	7	-.866	6	-.5	10	1.5												
47	1.2 D + 1.5 LL b + Service...	Yes	Y		1	1.2	7	-1			10	1.5												
48	1.2 D + 1.5 LL b + Service...	Yes	Y		1	1.2	7	-.866	6	.5	10	1.5												
49	1.2 D + 1.5 LL b + Service...	Yes	Y		1	1.2	6	.866	7	-.5	10	1.5												
50	1.2 D + 1.5 LL c + Service...	Yes	Y		1	1.2	6	1			11	1.5												
51	1.2 D + 1.5 LL c + Service...	Yes	Y		1	1.2	6	.866	7	.5	11	1.5												
52	1.2 D + 1.5 LL c + Service...	Yes	Y		1	1.2	7	.866	6	.5	11	1.5												
53	1.2 D + 1.5 LL c + Service...	Yes	Y		1	1.2	7	1			11	1.5												
54	1.2 D + 1.5 LL c + Service...	Yes	Y		1	1.2	7	.866	6	-.5	11	1.5												
55	1.2 D + 1.5 LL c + Service...	Yes	Y		1	1.2	6	-.866	7	.5	11	1.5												
56	1.2 D + 1.5 LL c + Service...	Yes	Y		1	1.2	6	-1			11	1.5												
57	1.2 D + 1.5 LL c + Service...	Yes	Y		1	1.2	6	-.866	7	-.5	11	1.5												

Load Combinations (Continued)

	Description	So..	P...	S...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...
58	1.2 D + 1.5 LL c + Service..	Yes	Y		1	1.2	7	-.866	6	-.5	11	1.5												
59	1.2 D + 1.5 LL c + Service..	Yes	Y		1	1.2	7	-1			11	1.5												
60	1.2 D + 1.5 LL c + Service..	Yes	Y		1	1.2	7	-.866	6	.5	11	1.5												
61	1.2 D + 1.5 LL c + Service..	Yes	Y		1	1.2	6	.866	7	-.5	11	1.5												
62	1.2 D + 1.5 LL d + Service..	Yes	Y		1	1.2	6	1			12	1.5												
63	1.2 D + 1.5 LL d + Service..	Yes	Y		1	1.2	6	.866	7	.5	12	1.5												
64	1.2 D + 1.5 LL d + Service..	Yes	Y		1	1.2	7	.866	6	.5	12	1.5												
65	1.2 D + 1.5 LL d + Service..	Yes	Y		1	1.2	7	1			12	1.5												
66	1.2 D + 1.5 LL d + Service..	Yes	Y		1	1.2	7	.866	6	-.5	12	1.5												
67	1.2 D + 1.5 LL d + Service..	Yes	Y		1	1.2	6	-.866	7	.5	12	1.5												
68	1.2 D + 1.5 LL d + Service..	Yes	Y		1	1.2	6	-1			12	1.5												
69	1.2 D + 1.5 LL d + Service..	Yes	Y		1	1.2	6	-.866	7	-.5	12	1.5												
70	1.2 D + 1.5 LL d + Service..	Yes	Y		1	1.2	7	-.866	6	-.5	12	1.5												
71	1.2 D + 1.5 LL d + Service..	Yes	Y		1	1.2	7	-1			12	1.5												
72	1.2 D + 1.5 LL d + Service..	Yes	Y		1	1.2	7	-.866	6	.5	12	1.5												
73	1.2 D + 1.5 LL d + Service..	Yes	Y		1	1.2	6	.866	7	-.5	12	1.5												
74	1.2 D + 1.5 LL Maint (1)	Yes	Y		1	1.2					13	1.5												
75	1.2 D + 1.5 LL Maint (2)	Yes	Y		1	1.2					14	1.5												
76	1.2 D + 1.5 LL Maint (3)	Yes	Y		1	1.2					15	1.5												
77	1.2 D + 1.5 LL Maint (4)	Yes	Y		1	1.2					16	1.5												
78	1.2 D + 1.5 LL Maint (5)	Yes	Y		1	1.2					17	1.5												
79	1.2 D + 1.5 LL Maint (6)	Yes	Y		1	1.2					18	1.5												
80	1.2 D + 1.5 LL Maint (7)	Yes	Y		1	1.2					19	1.5												
81	1.2 D + 1.5 LL Maint (8)	Yes	Y		1	1.2					20	1.5												
82	1.2 D + 1.5 LL Maint (9)	Yes	Y		1	1.2					21	1.5												
83	1.2 D + 1.5 LL Maint (10)	Yes	Y		1	1.2					22	1.5												
84	1.2 D + 1.5 LL Maint (11)	Yes	Y		1	1.2					23	1.5												
85	1.2 D + 1.5 LL Maint (12)	Yes	Y		1	1.2					24	1.5												
86	1.2 D + 1.5 LL Maint (13)	Yes	Y		1	1.2					25	1.5												
87	1.2 D + 1.5 LL Maint (14)	Yes	Y		1	1.2					26	1.5												
88	1.2 D + 1.5 LL Maint (15)	Yes	Y		1	1.2					27	1.5												

Joint Loads and Enforced Displacements (BLC 9 : Live Load a)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/f...
1	N89	L	Y	-.5
2	N103	L	Y	-.5
3	N117	L	Y	-.5

Joint Loads and Enforced Displacements (BLC 10 : Live Load b)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/f...
1	N83	L	Y	-.5
2	N97	L	Y	-.5
3	N111	L	Y	-.5

Member Point Loads (BLC 1 : Dead)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M87	Y	-.007	%5
2	M87	Y	-.007	%45
3	M87	Y	-.031	%30
4	M87	Y	0	0
5	M87	Y	0	0
6	M90	Y	-.064	%10
7	M90	Y	-.064	%90

Member Point Loads (BLC 1 : Dead) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
8	M90	Y	-.075	%30
9	M90	Y	0	0
10	M90	Y	0	0
11	M101	Y	-.022	%30
12	M101	Y	0	0
13	M101	Y	0	0
14	M101	Y	0	0
15	M101	Y	0	0
16	M104	Y	-.075	%30
17	M104	Y	0	0
18	M104	Y	0	0
19	M104	Y	0	0
20	M104	Y	0	0
21	M94	Y	-.007	%5
22	M94	Y	-.007	%45
23	M94	Y	0	0
24	M94	Y	0	0
25	M94	Y	0	0
26	M97	Y	-.064	%10
27	M97	Y	-.064	%90
28	M97	Y	0	0
29	M97	Y	0	0
30	M97	Y	0	0

Member Point Loads (BLC 2 : 0 Wind - No Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M87	Z	-.072	%5
2	M87	Z	-.072	%45
3	M87	Z	-.037	%30
4	M87	Z	0	0
5	M87	Z	0	0
6	M90	Z	-.336	%10
7	M90	Z	-.336	%90
8	M90	Z	-.054	%30
9	M90	Z	0	0
10	M90	Z	0	0
11	M101	Z	-.023	%30
12	M101	Z	0	0
13	M101	Z	0	0
14	M101	Z	0	0
15	M101	Z	0	0
16	M104	Z	-.054	%30
17	M104	Z	0	0
18	M104	Z	0	0
19	M104	Z	0	0
20	M104	Z	0	0
21	M94	Z	-.072	%5
22	M94	Z	-.072	%45
23	M94	Z	0	0
24	M94	Z	0	0
25	M94	Z	0	0
26	M97	Z	-.336	%10
27	M97	Z	-.336	%90
28	M97	Z	0	0
29	M97	Z	0	0
30	M97	Z	0	0

Member Point Loads (BLC 3 : 90 Wind - No Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M87	X	-.033	%5
2	M87	X	-.033	%45
3	M87	X	-.024	%30
4	M87	X	0	0
5	M87	X	0	0
6	M90	X	-.147	%10
7	M90	X	-.147	%90
8	M90	X	-.038	%30
9	M90	X	0	0
10	M90	X	0	0
11	M101	X	-.012	%30
12	M101	X	0	0
13	M101	X	0	0
14	M101	X	0	0
15	M101	X	0	0
16	M104	X	-.038	%30
17	M104	X	0	0
18	M104	X	0	0
19	M104	X	0	0
20	M104	X	0	0
21	M94	X	-.033	%5
22	M94	X	-.033	%45
23	M94	X	0	0
24	M94	X	0	0
25	M94	X	0	0
26	M97	X	-.147	%10
27	M97	X	-.147	%90
28	M97	X	0	0
29	M97	X	0	0
30	M97	X	0	0

Member Point Loads (BLC 4 : 0 Wind - Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M87	Z	-.012	%5
2	M87	Z	-.012	%45
3	M87	Z	-.006	%30
4	M87	Z	0	0
5	M87	Z	0	0
6	M90	Z	-.054	%10
7	M90	Z	-.054	%90
8	M90	Z	-.009	%30
9	M90	Z	0	0
10	M90	Z	0	0
11	M101	Z	-.004	%30
12	M101	Z	0	0
13	M101	Z	0	0
14	M101	Z	0	0
15	M101	Z	0	0
16	M104	Z	-.009	%30
17	M104	Z	0	0
18	M104	Z	0	0
19	M104	Z	0	0
20	M104	Z	0	0
21	M94	Z	-.012	%5
22	M94	Z	-.012	%45
23	M94	Z	0	0

Member Point Loads (BLC 4 : 0 Wind - Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
24	M94	Z	0	0
25	M94	Z	0	0
26	M97	Z	-.054	%10
27	M97	Z	-.054	%90
28	M97	Z	0	0
29	M97	Z	0	0
30	M97	Z	0	0

Member Point Loads (BLC 5 : 90 Wind - Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M87	X	-.005	%5
2	M87	X	-.005	%45
3	M87	X	-.004	%30
4	M87	X	0	0
5	M87	X	0	0
6	M90	X	-.024	%10
7	M90	X	-.024	%90
8	M90	X	-.006	%30
9	M90	X	0	0
10	M90	X	0	0
11	M101	X	-.002	%30
12	M101	X	0	0
13	M101	X	0	0
14	M101	X	0	0
15	M101	X	0	0
16	M104	X	-.006	%30
17	M104	X	0	0
18	M104	X	0	0
19	M104	X	0	0
20	M104	X	0	0
21	M94	X	-.005	%5
22	M94	X	-.005	%45
23	M94	X	0	0
24	M94	X	0	0
25	M94	X	0	0
26	M97	X	-.024	%10
27	M97	X	-.024	%90
28	M97	X	0	0
29	M97	X	0	0
30	M97	X	0	0

Member Point Loads (BLC 6 : 0 Wind - Service)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M87	Z	-.004	%5
2	M87	Z	-.004	%45
3	M87	Z	-.002	%30
4	M87	Z	0	0
5	M87	Z	0	0
6	M90	Z	-.019	%10
7	M90	Z	-.019	%90
8	M90	Z	-.003	%30
9	M90	Z	0	0
10	M90	Z	0	0
11	M101	Z	-.001	%30
12	M101	Z	0	0
13	M101	Z	0	0

Member Point Loads (BLC 6 : 0 Wind - Service) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
14	M101	Z	0	0
15	M101	Z	0	0
16	M104	Z	-.003	%30
17	M104	Z	0	0
18	M104	Z	0	0
19	M104	Z	0	0
20	M104	Z	0	0
21	M94	Z	-.004	%5
22	M94	Z	-.004	%45
23	M94	Z	0	0
24	M94	Z	0	0
25	M94	Z	0	0
26	M97	Z	-.019	%10
27	M97	Z	-.019	%90
28	M97	Z	0	0
29	M97	Z	0	0
30	M97	Z	0	0

Member Point Loads (BLC 7 : 90 Wind - Service)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M87	X	-.002	%5
2	M87	X	-.002	%45
3	M87	X	-.001	%30
4	M87	X	0	0
5	M87	X	0	0
6	M90	X	-.009	%10
7	M90	X	-.009	%90
8	M90	X	-.002	%30
9	M90	X	0	0
10	M90	X	0	0
11	M101	X	-.0007	%30
12	M101	X	0	0
13	M101	X	0	0
14	M101	X	0	0
15	M101	X	0	0
16	M104	X	-.002	%30
17	M104	X	0	0
18	M104	X	0	0
19	M104	X	0	0
20	M104	X	0	0
21	M94	X	-.002	%5
22	M94	X	-.002	%45
23	M94	X	0	0
24	M94	X	0	0
25	M94	X	0	0
26	M97	X	-.009	%10
27	M97	X	-.009	%90
28	M97	X	0	0
29	M97	X	0	0
30	M97	X	0	0

Member Point Loads (BLC 8 : Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M87	Y	-.068	%5
2	M87	Y	-.068	%45
3	M87	Y	-.048	%30

Member Point Loads (BLC 8 : Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
4	M87	Y	0	0
5	M87	Y	0	0
6	M90	Y	-.303	%10
7	M90	Y	-.303	%90
8	M90	Y	-.062	%30
9	M90	Y	0	0
10	M90	Y	0	0
11	M101	Y	-.029	%30
12	M101	Y	0	0
13	M101	Y	0	0
14	M101	Y	0	0
15	M101	Y	0	0
16	M104	Y	-.062	%30
17	M104	Y	0	0
18	M104	Y	0	0
19	M104	Y	0	0
20	M104	Y	0	0
21	M94	Y	-.068	%5
22	M94	Y	-.068	%45
23	M94	Y	0	0
24	M94	Y	0	0
25	M94	Y	0	0
26	M97	Y	-.303	%10
27	M97	Y	-.303	%90
28	M97	Y	0	0
29	M97	Y	0	0
30	M97	Y	0	0

Member Point Loads (BLC 14 : Maint LL 2)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.25	%5

Member Point Loads (BLC 16 : Maint LL 4)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M3	Y	-.25	%5

Member Point Loads (BLC 18 : Maint LL 6)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M5	Y	-.25	%5

Member Point Loads (BLC 20 : Maint LL 8)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M2	Y	-.25	%5

Member Point Loads (BLC 22 : Maint LL 10)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M4	Y	-.25	%5

Member Point Loads (BLC 24 : Maint LL 12)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M6	Y	-.25	%5

Member Point Loads (BLC 25 : Maint LL 13)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]

Member Point Loads (BLC 25 : Maint LL 13) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M8	Y	-.25	%50

Member Point Loads (BLC 26 : Maint LL 14)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M9	Y	-.25	%50

Member Point Loads (BLC 27 : Maint LL 15)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M7	Y	-.25	%50

Member Distributed Loads (BLC 2 : 0 Wind - No Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	-.022	-.022	0	0
2	M2	Z	-.022	-.022	0	0
3	M3	Z	-.022	-.022	0	0
4	M4	Z	-.022	-.022	0	0
5	M5	Z	-.022	-.022	0	0
6	M6	Z	-.022	-.022	0	0
7	M7	Z	-.021	-.021	0	0
8	M8	Z	-.021	-.021	0	0
9	M9	Z	-.021	-.021	0	0
10	M10	Z	-.019	-.019	0	0
11	M87	Z	-.008	-.008	0	0
12	M90	Z	-.008	-.008	0	0
13	M94	Z	-.008	-.008	0	0
14	M97	Z	-.008	-.008	0	0
15	M101	Z	-.008	-.008	0	0
16	M104	Z	-.008	-.008	0	0
17	M108	Z	-.018	-.018	0	0
18	M109	Z	-.008	-.008	0	0

Member Distributed Loads (BLC 3 : 90 Wind - No Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	-.022	-.022	0	0
2	M2	X	-.022	-.022	0	0
3	M3	X	-.022	-.022	0	0
4	M4	X	-.022	-.022	0	0
5	M5	X	-.022	-.022	0	0
6	M6	X	-.022	-.022	0	0
7	M7	X	-.021	-.021	0	0
8	M8	X	-.021	-.021	0	0
9	M9	X	-.021	-.021	0	0
10	M10	X	-.019	-.019	0	0
11	M87	X	-.008	-.008	0	0
12	M90	X	-.008	-.008	0	0
13	M94	X	-.008	-.008	0	0
14	M97	X	-.008	-.008	0	0
15	M101	X	-.008	-.008	0	0
16	M104	X	-.008	-.008	0	0
17	M108	X	-.018	-.018	0	0
18	M109	X	-.008	-.008	0	0

Member Distributed Loads (BLC 4 : 0 Wind - Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]

Member Distributed Loads (BLC 4 : 0 Wind - Ice) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	-.007	-.007	0	0
2	M2	Z	-.007	-.007	0	0
3	M3	Z	-.007	-.007	0	0
4	M4	Z	-.007	-.007	0	0
5	M5	Z	-.007	-.007	0	0
6	M6	Z	-.007	-.007	0	0
7	M7	Z	-.007	-.007	0	0
8	M8	Z	-.007	-.007	0	0
9	M9	Z	-.007	-.007	0	0
10	M10	Z	-.006	-.006	0	0
11	M87	Z	-.002	-.002	0	0
12	M90	Z	-.002	-.002	0	0
13	M94	Z	-.002	-.002	0	0
14	M97	Z	-.002	-.002	0	0
15	M101	Z	-.002	-.002	0	0
16	M104	Z	-.002	-.002	0	0
17	M108	Z	-.006	-.006	0	0
18	M109	Z	-.005	-.005	0	0

Member Distributed Loads (BLC 5 : 90 Wind - Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	-.007	-.007	0	0
2	M2	X	-.007	-.007	0	0
3	M3	X	-.007	-.007	0	0
4	M4	X	-.007	-.007	0	0
5	M5	X	-.007	-.007	0	0
6	M6	X	-.007	-.007	0	0
7	M7	X	-.007	-.007	0	0
8	M8	X	-.007	-.007	0	0
9	M9	X	-.007	-.007	0	0
10	M10	X	-.006	-.006	0	0
11	M87	X	-.002	-.002	0	0
12	M90	X	-.002	-.002	0	0
13	M94	X	-.002	-.002	0	0
14	M97	X	-.002	-.002	0	0
15	M101	X	-.002	-.002	0	0
16	M104	X	-.002	-.002	0	0
17	M108	X	-.006	-.006	0	0
18	M109	X	-.005	-.005	0	0

Member Distributed Loads (BLC 6 : 0 Wind - Service)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	-.001	-.001	0	0
2	M2	Z	-.001	-.001	0	0
3	M3	Z	-.001	-.001	0	0
4	M4	Z	-.001	-.001	0	0
5	M5	Z	-.001	-.001	0	0
6	M6	Z	-.001	-.001	0	0
7	M7	Z	-.001	-.001	0	0
8	M8	Z	-.001	-.001	0	0
9	M9	Z	-.001	-.001	0	0
10	M10	Z	-.001	-.001	0	0
11	M87	Z	-.0002	-.0002	0	0
12	M90	Z	-.0002	-.0002	0	0
13	M94	Z	-.0002	-.0002	0	0
14	M97	Z	-.0002	-.0002	0	0

Member Distributed Loads (BLC 6 : 0 Wind - Service) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
15	M101	Z	-.0002	-.0002	0	0
16	M104	Z	-.0002	-.0002	0	0
17	M108	Z	-.001	-.001	0	0
18	M109	Z	-.0005	-.0005	0	0

Member Distributed Loads (BLC 7 : 90 Wind - Service)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	-.001	-.001	0	0
2	M2	X	-.001	-.001	0	0
3	M3	X	-.001	-.001	0	0
4	M4	X	-.001	-.001	0	0
5	M5	X	-.001	-.001	0	0
6	M6	X	-.001	-.001	0	0
7	M7	X	-.001	-.001	0	0
8	M8	X	-.001	-.001	0	0
9	M9	X	-.001	-.001	0	0
10	M10	X	-.001	-.001	0	0
11	M87	X	-.0002	-.0002	0	0
12	M90	X	-.0002	-.0002	0	0
13	M94	X	-.0002	-.0002	0	0
14	M97	X	-.0002	-.0002	0	0
15	M101	X	-.0002	-.0002	0	0
16	M104	X	-.0002	-.0002	0	0
17	M108	X	-.001	-.001	0	0
18	M109	X	-.0005	-.0005	0	0

Member Distributed Loads (BLC 8 : Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.021	-.021	0	0
2	M2	Y	-.021	-.021	0	0
3	M3	Y	-.021	-.021	0	0
4	M4	Y	-.021	-.021	0	0
5	M5	Y	-.021	-.021	0	0
6	M6	Y	-.021	-.021	0	0
7	M7	Y	-.021	-.021	0	0
8	M8	Y	-.021	-.021	0	0
9	M9	Y	-.021	-.021	0	0
10	M10	Y	-.021	-.021	0	0
11	M87	Y	-.013	-.013	0	0
12	M90	Y	-.013	-.013	0	0
13	M94	Y	-.013	-.013	0	0
14	M97	Y	-.013	-.013	0	0
15	M101	Y	-.013	-.013	0	0
16	M104	Y	-.013	-.013	0	0
17	M108	Y	-.021	-.021	0	0
18	M109	Y	-.014	-.014	0	0

Member Distributed Loads (BLC 28 : BLC 1 Transient Area Loads)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.0004154	-.002	2.688	4.031
2	M1	Y	-.002	-.003	4.031	5.375
3	M108	Y	-.003	-.002	.179	1.792
4	M6	Y	-.007	-.007	3.245	4.749
5	M8	Y	-.007	-.007	2.829	4.169
6	M10	Y	-.008	-.008	1.8	2.8

Member Distributed Loads (BLC 28 : BLC 1 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
7	M109	Y	-.008	-.008	.005	1.792
8	M1	Y	-.0007496	-.008	.538	3.225
9	M6	Y	-.006	-.006	1.128	2.697
10	M10	Y	-.006	-.006	.735	1.95
11	M5	Y	-.005	-.005	4.768	5.375
12	M7	Y	-.003	-.005	0	1.487
13	M8	Y	-.006	-.005	3.469	4.956
14	M2	Y	-.004	-.004	4.742	5.375
15	M8	Y	-.007	-.004	0	1.487
16	M9	Y	-.003	-.004	3.469	4.956
17	M2	Y	-.003	-.008	.537	1.612
18	M2	Y	-.008	-.012	1.612	2.688
19	M2	Y	-.012	-.014	2.688	3.763
20	M3	Y	-.005	-.008	.537	2.15
21	M3	Y	-.008	-.01	2.15	3.762
22	M9	Y	-.012	-.009	0	2.478
23	M9	Y	-.009	-.006	2.478	4.956
24	M4	Y	-.005	-.005	4.768	5.375
25	M7	Y	-.003	-.005	3.469	4.956
26	M9	Y	-.006	-.005	0	1.487
27	M4	Y	-.005	-.008	.537	2.15
28	M4	Y	-.008	-.01	2.15	3.762
29	M5	Y	-.003	-.008	.537	1.612
30	M5	Y	-.008	-.012	1.612	2.687
31	M5	Y	-.012	-.014	2.687	3.762
32	M7	Y	-.006	-.009	0	2.478
33	M7	Y	-.009	-.012	2.478	4.956

Member Distributed Loads (BLC 29 : BLC 8 Transient Area Loads)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.0004781	-.002	2.688	4.031
2	M1	Y	-.002	-.004	4.031	5.375
3	M8	Y	-.002	-.002	.311	1.311
4	M108	Y	-.003	-.003	.509	1.33
5	M6	Y	-.007	-.007	3.245	4.749
6	M8	Y	-.008	-.008	2.829	4.169
7	M10	Y	-.009	-.009	1.8	2.8
8	M109	Y	-.009	-.009	.005	1.792
9	M1	Y	-.0008245	-.009	.538	3.225
10	M6	Y	-.007	-.007	1.128	2.697
11	M10	Y	-.007	-.007	.735	1.95
12	M5	Y	-.005	-.005	4.768	5.375
13	M7	Y	-.003	-.005	0	1.487
14	M8	Y	-.006	-.005	3.469	4.956
15	M2	Y	-.005	-.005	4.742	5.375
16	M8	Y	-.008	-.005	0	1.487
17	M9	Y	-.003	-.005	3.469	4.956
18	M2	Y	-.003	-.009	.537	1.612
19	M2	Y	-.009	-.013	1.612	2.688
20	M2	Y	-.013	-.015	2.688	3.763
21	M3	Y	-.006	-.008	.537	2.15
22	M3	Y	-.008	-.011	2.15	3.762
23	M9	Y	-.013	-.01	0	2.478
24	M9	Y	-.01	-.007	2.478	4.956
25	M4	Y	-.005	-.005	4.768	5.375
26	M7	Y	-.003	-.005	3.469	4.956

Member Distributed Loads (BLC 29 : BLC 8 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
27	M9	Y	-.006	-.005	0	1.487
28	M4	Y	-.006	-.008	.537	2.15
29	M4	Y	-.008	-.011	2.15	3.762
30	M5	Y	-.003	-.009	.537	1.612
31	M5	Y	-.009	-.013	1.612	2.687
32	M5	Y	-.013	-.015	2.687	3.762
33	M7	Y	-.007	-.01	0	2.478
34	M7	Y	-.01	-.013	2.478	4.956

Member Area Loads (BLC 1 : Dead)

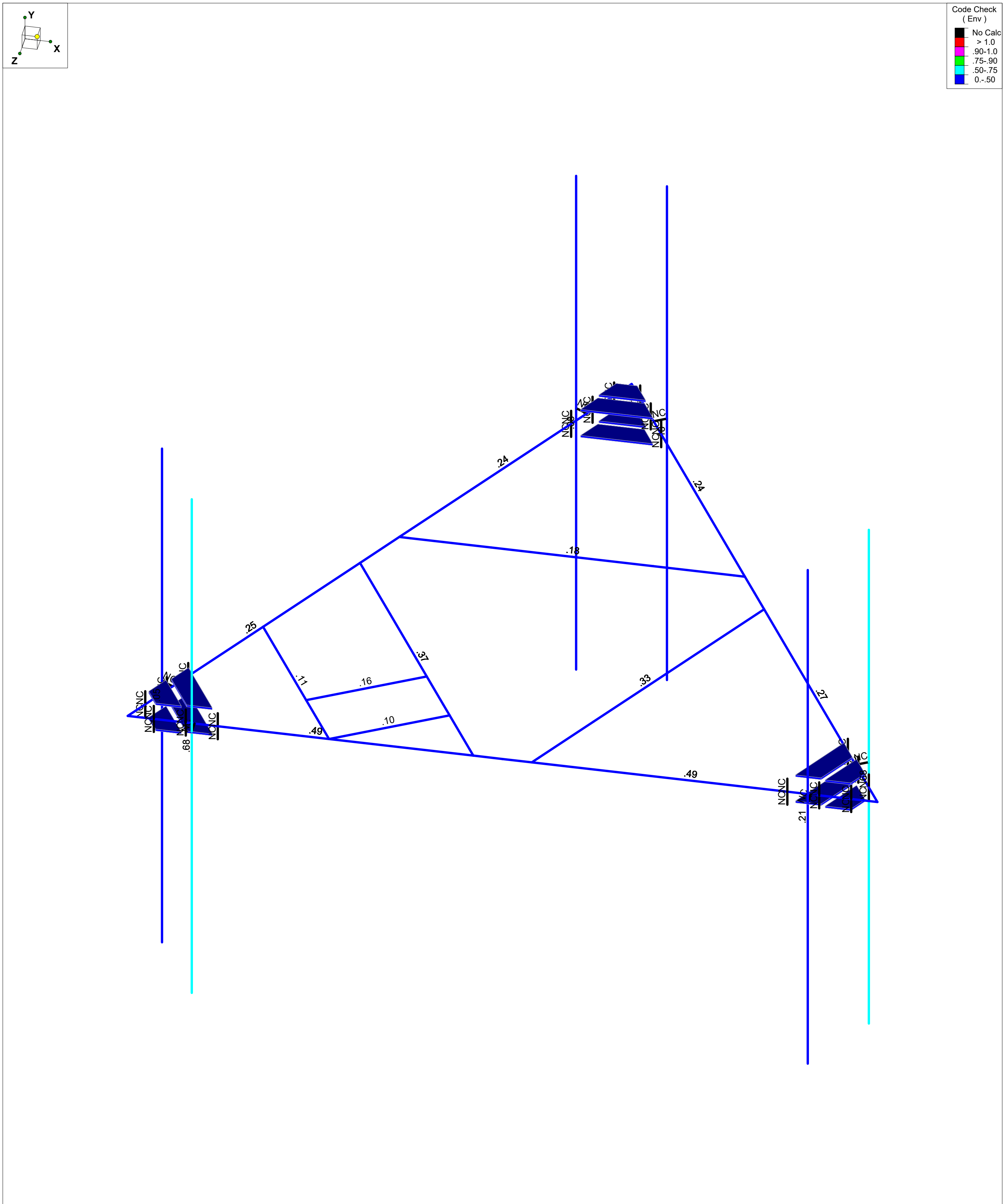
	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[ksf]
1	N129	N130	N9		Y	Two Way	-.01
2	N131	N13	N10	N132	Y	Two Way	-.01
3	N36	N39	N129	N13	Y	Two Way	-.01
4	N73	N79	N78	N72	Y	Two Way	-.01
5	N9	N74	N75	N69	Y	Two Way	-.01
6	N12	N11	N57	N54	Y	Two Way	-.01
7	N76	N77	N71	N70	Y	Two Way	-.01
8	N7	N8	N18	N21	Y	Two Way	-.01

Member Area Loads (BLC 8 : Ice)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[ksf]
1	N129	N130	N9		Y	Two Way	-.011
2	N131	N13	N10	N132	Y	Two Way	-.011
3	N36	N39	N129	N13	Y	Two Way	-.011
4	N73	N79	N78	N72	Y	Two Way	-.011
5	N9	N74	N75	N69	Y	Two Way	-.011
6	N12	N11	N57	N54	Y	Two Way	-.011
7	N76	N77	N71	N70	Y	Two Way	-.011
8	N7	N8	N18	N21	Y	Two Way	-.011

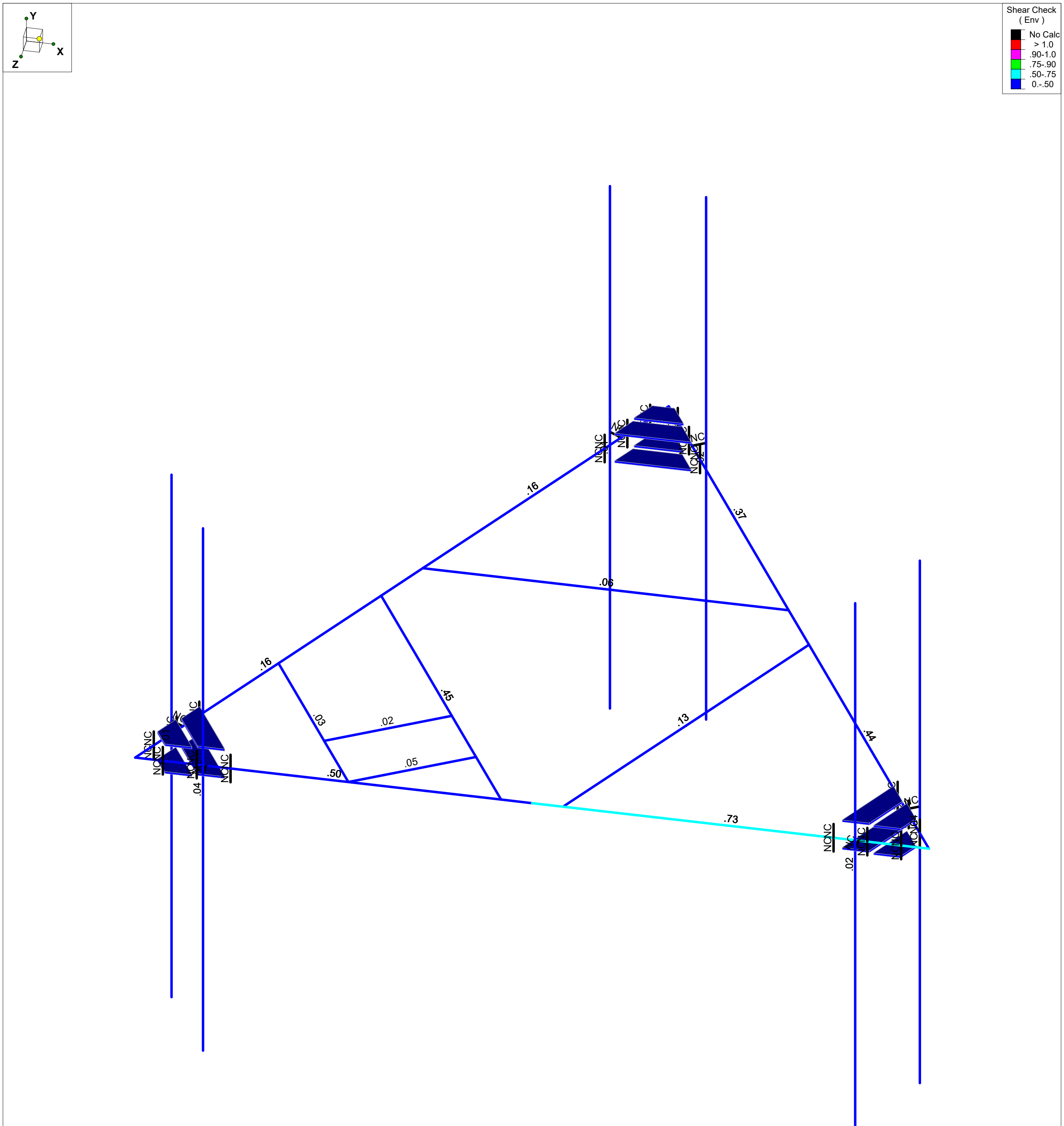
APPENDIX C

SOFTWARE ANALYSIS OUTPUT



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

B+T Group	841301 - Willington-River Rd	SK - 5
PKK		June 5, 2019 at 11:20 AM
135909.001.01.R1		135909_001_01_R1-Willington-Riv...



Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

B+T Group	841301 - Willington-River Rd	SK - 6
PKK		June 5, 2019 at 11:20 AM
135909.001.01.R1		135909_001_01_R1-Willington-Riv...

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N133	max	.872	5	2.407	21	1.612	3	.038	79	.16	5	.257	14
2		min	-.878	11	.53	77	-1.612	9	-.67	14	-.147	11	-.046	43
3	N134	max	.787	6	2.402	20	1.462	13	.077	83	.133	7	.04	83
4		min	-.786	12	.378	79	-1.46	7	-.272	19	-.132	13	-.135	75
5	N135	max	.889	4	1.133	83	.397	2	.014	83	.084	10	.17	24
6		min	-.886	10	.136	81	-.398	8	-.015	20	-.085	4	-.203	85
7	Totals:	max	2.351	5	5.499	19	3.319	2						
8		min	-2.351	11	1.68	13	-3.319	8						

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

	Member	Shape	Code Check	Loc[ft]	LC	Shear ...	Loc[ft]	Dir	LC	phi*Pn...	phi*Pnt...	phi*Mn...	phi*Mn...	Cb	Eqn
1	M1	C5X1.75X0.32	.489	4.983	22	.497	.952	z	14	30.173	63.128	2.07	9.514	1.965	H1-1b
2	M2	C5X1.75X0.32	.487	4.983	18	.734	.952	z	8	30.173	63.128	2.07	9.514	1.686	H1-1b
3	M3	C5X1.75X0.32	.269	4.983	2	.439	.952	y	19	30.173	63.128	2.07	9.514	2.144	H1-1b
4	M4	C5X1.75X0.32	.243	4.983	3	.367	.952	z	13	30.173	63.128	2.07	9.514	1.43	H1-1b
5	M5	C5X1.75X0.32	.241	4.983	49	.162	5.375	y	21	30.173	63.128	2.07	9.514	1.679	H1-1b
6	M6	C5X1.75X0.32	.255	4.983	14	.163	4.983	y	21	30.173	63.128	2.07	9.514	1.742	H1-1b
7	M7	C5X1.75X0.32	.176	2.478	2	.060	2.478	y	83	33.705	63.128	2.07	9.514	1.347	H1-1b
8	M8	C5X1.75X0.32	.372	2.478	18	.455	2.478	y	25	33.705	63.128	2.07	9.514	1.371	H1-1b
9	M9	C5X1.75X0.32	.334	2.478	21	.125	2.478	y	20	33.705	63.128	2.07	9.514	1.353	H1-1b
10	M10	C5X1.75X0.32	.114	0	13	.033	.992	z	25	51.021	63.128	2.07	9.514	1.32	H1-1b
11	M87	PIPE_2.0	.209	3.984	8	.022	3.984		8	13.511	32.13	1.872	1.872	2.205	H1-1b
12	M90	PIPE_2.0	.683	4.073	8	.044	3.984		8	13.511	32.13	1.872	1.872	1.753	H1-1b
13	M94	PIPE_2.0	.178	3.984	2	.018	3.984		2	13.511	32.13	1.872	1.872	1.683	H1-1b
14	M97	PIPE_2.0	.682	4.073	8	.038	4.073		8	13.511	32.13	1.872	1.872	1.359	H1-1b
15	M101	PIPE_2.0	.053	3.984	8	.006	3.984		8	13.511	32.13	1.872	1.872	1.88	H1-1b
16	M104	PIPE_2.0	.080	3.984	2	.009	3.984		2	13.511	32.13	1.872	1.872	2.438	H1-1b
17	M108	C5X1.75X0.32	.099	0	18	.051	.877	y	21	57.735	63.128	2.07	9.514	1.689	H1-1b
18	M109	L2x2x3	.165	1.792	19	.019	1.792	z	24	19.918	23.393	.558	1.239	1.996	H2-1

Exhibit F

Power Density/RF Emissions Report

Transcom Engineering, Inc.

Wireless Network Design and Deployment

Radio Frequency Emissions Analysis Report

T-MOBILE Existing Facility

Site ID: CT11261C

Tolland/I-84/ Fill-In
426 River Road
Willington, CT 06279

July 22, 2019

Transcom Engineering Project Number: 737001-0109

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**9.62 %**

Transcom Engineering, Inc PO Box 1048 Sterling MA 01564

July 22, 2019

T-MOBILE
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, CT 6009

Emissions Analysis for Site: **CT11261C – Tolland/I-84/ Fill-In**

Transcom Engineering, Inc ("Transcom") was directed to analyze the proposed upgrades to the T-MOBILE facility located at **426 River Road, Willington, CT**, 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 (μW/cm2). 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.

Population 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 & 700 MHz 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) and 2100 MHz (AWS) 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.

<u>Occupational/controlled exposure</u> 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 performed for the proposed upgrades to the T-MOBILE antenna facility located at **426 River Road, Willington, CT**, 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 manufactures supplied specifications, minus 10 dB for directional panel antennas, 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.

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. All power values expressed and analyzed are maximum power levels expected to be used on all radios.

All emissions values for additional carriers were taken from the Connecticut Siting Council (CSC) active MPE database. Values in this database are provided by the individual carriers themselves

For each sector the following channel counts, frequency bands and power levels were utilized as shown in *Table 1*:

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
LTE	1900 MHz (PCS)	4	40
LTE	2100 MHz (AWS)	2	60
GSM	1900 MHz (PCS)	1	15
LTE / 5G NR	600 MHz	2	40
LTE	700 MHz	2	20

Table 1: Channel Data Table

The following antennas listed in *Table 2* were used in the modeling for transmission in the 600, 700 MHz, 1900 MHz (PCS) and 2100 MHz (AWS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, 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.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	RFS APXVAARR24_43-U-NA20	100
A	2	EMS RR90-17-XXDP (Dormant)	100
C	1	RFS APXVAARR24_43-U-NA20	100
C	2	EMS RR90-17-XXDP (Dormant)	100

Table 2: Antenna Data

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

Cable losses were factored in the calculations for this site. Since all **1900 MHz (PCS) & 2100 MHz (AWS)** radios are ground mounted the following cable loss values were used. For each ground mounted **1900 MHz (PCS)** radio there was **1.95 dB** of cable loss calculated into the system gains / losses for this site. For each ground mounted **2100 MHz (AWS)** radio there was **2.06 dB** of cable loss calculated into the system gains / losses for this site. These values were calculated based upon the manufacturers specifications for **160 feet** of **1-1/4”** coax.

RESULTS

Per the calculations completed for the proposed T-MOBILE configurations *Table 3* shows resulting emissions power levels and percentages of the FCC's allowable general population limit.

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	RFS APXVAARR24_43-U-NA20	1900 MHz (PCS) / 2100 MHz (AWS) / 600 MHz / 700 MHz	15.65 / 16.35 / 12.95 / 13.35	11	415	9,767.84	5.34
Antenna A2	EMS RR90-17-XXDP	Dormant	N/A	0	0	0.00	0.00
Sector A Composite MPE%							**5.34**
Antenna C1	RFS APXVAARR24_43-U-NA20	1900 MHz (PCS) / 2100 MHz (AWS) / 600 MHz / 700 MHz	15.65 / 16.35 / 12.95 / 13.35	11	415	9,767.84	5.34
Antenna C2	EMS RR90-17-XXDP	Dormant	N/A	0	0	0.00	0.00
Sector C Composite MPE%							**5.34**

Table 3: T-MOBILE Emissions Levels

The Following table (*table 4*) shows all additional carriers on site and their MPE% as recorded in the CSC active MPE database for this facility along with the newly calculated maximum T-MOBILE MPE contributions per this report. FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. For this site, both sectors have the same configuration yielding the same results on both sectors. *Table 5* below shows a summary for each T-MOBILE Sector as well as the composite MPE value for the site.

Site Composite MPE%	
Carrier	**MPE%**
T-MOBILE – Max Per Sector Value	**5.34 %**
Willington FD	0.49 %
AT&T	3.79 %
Site Total MPE %:	**9.62 %**

Table 4: All Carrier MPE Contributions

T-MOBILE Sector A Total:	5.34 %
T-MOBILE Sector C Total:	5.34 %
Site Total:	9.62 %

Table 5: Site MPE Summary

FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. *Table 6* below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated T-MOBILE sector(s). For this site, both sectors have the same configuration yielding the same results on both sectors.

T-MOBILE _ Frequency Band / Technology Max Power Values (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
T-Mobile 1900 MHz (PCS) LTE	4	937.69	100	15.26	1900 MHz (PCS)	1000	1.53%
T-Mobile 2100 MHz (AWS) LTE	2	1,611.21	100	13.11	2100 MHz (AWS)	1000	1.31%
T-Mobile 1900 MHz (PCS) GSM	1	351.63	100	1.43	1900 MHz (PCS)	1000	0.14%
T-Mobile 600 MHz LTE / 5G NR	2	788.97	100	6.42	600 MHz	400	1.61%
T-Mobile 700 MHz LTE	2	432.54	100	3.52	700 MHz	467	0.75%
						Total:	**5.34%**

Table 6: T-MOBILE Maximum Sector MPE Power Values

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:	5.34 %
Sector C:	5.34 %
T-MOBILE Maximum Total (per sector):	5.34 %
Site Total:	9.62 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **9.62 %** 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.

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