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

January 7, 2021

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

RE: **Notice of Exempt Modification for T-Mobile:**
876390 - T-Mobile Site ID: CT11511A
116 Grant Hill Road, Brooklyn, CT 06234
Latitude: 41° 47′ 29.64″ / Longitude: -72° 0′ 54.04″

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antennas at the 137-foot mount on the existing 150-foot Monopole Tower, located at 116 Grant Hill Road, Brooklyn, CT. The tower is owned by Crown Castle and the property is owned by Mr. and Mrs. Bernier. T-Mobile now intends to replace six (6) existing antennas with three (3) new 1900 MHz antennas and three (3) new 600/700 MHz antennas. The new antennas will be installed at the 137-ft level of the tower and some will be capable of providing 5G services. T-Mobile is also proposing tower mount modification as shown on the enclosed Mount Analysis Report.

Planned Modifications:
Tower:

Remove:
(6) 1 5/8" Coax

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

(3) EMS RR90-17-02DP Antenna **(REMOVE)** – (3) RFS-APX16DWV-S-E-A20 Antenna 1900 MHz **(REPLACE)**

Install New:
(1) 1 5/8" Hybrid Fiber Line
(3) Radio 4449 B71/B12

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

Ground:

Upgrade to existing ground cabinet. (Internally)

The facility was approved by the Town of Brooklyn, though original zoning documents have not been located despite diligent inquiry and efforts. The original building permit, permit number 5802, issued on April 14, 2000 by the Town of Brooklyn Building Department permitting the construction of a 150' monopole tower. No conditions of approval are known. T-Mobile's was approved for tower sharing at this facility by the Council on July 8, 2003.

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 Richard Ives, First Selectman for the Town of Brooklyn, Jana Butts Roberson, AICP, Town Planner, Crown Castle as the tower owner, and Mr. and Mrs. Bernier as the property owners.

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:

Richard Ives, First Selectman (*via email only to r.ives@brooklynct.org*)
Town of Brooklyn
4 Wolf Den Road
Brooklyn, CT 06234

Jana Butts Roberson, AICP, Town Planner (*via email only to j.roberson@brooklynct.org*)
Town of Brooklyn
4 Wolf Den Road
Brooklyn, CT 06234

Mr. and Mrs. Bernier, Property Owner (*via email only to bernier66@att.net*)
116 Grant Hill Road
Brooklyn, CT 06234

Crown Castle, Tower Owner

From:	Zsamba, Anne Marie
To:	bernier66@att.net
Subject:	Notice of Exempt Modification - T-Mobile - 116 Grant Hill Rd, Brooklyn - 876390
Date:	Thursday, January 7, 2021 2:00:00 PM
Attachments:	EM-T-MOBILE-116 GRANT HILL RD BROOKLYN-876390-CT11511A-NOTICE.pdf

To The Bernier's, as Property Owners:

Attached please find T-Mobile's exempt modification application that is being submitted to the Connecticut Siting Council today, January 7, 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: "r.ives@brooklynct.org"
Subject: Notice of Exempt Modification - T-Mobile - 116 Grant Hill Rd, Brooklyn - 876390
Date: Thursday, January 7, 2021 2:00:00 PM
Attachments: EM-T-MOBILE-116 GRANT HILL RD BROOKLYN-876390-CT11511A-NOTICE.pdf

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Dear First Selectman Ives:

Attached please find T-Mobile's exempt modification application that is being submitted to the Connecticut Siting Council today, January 7, 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: "j.roberson@brooklynct.org"
Subject: Notice of Exempt Modification - T-Mobile - 116 Grant Hill Rd, Brooklyn - 876390
Date: Thursday, January 7, 2021 2:00:00 PM
Attachments: EM-T-MOBILE-116 GRANT HILL RD BROOKLYN-876390-CT11511A-NOTICE.pdf

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Dear Town Planner Roberson:

Attached please find T-Mobile's exempt modification application that is being submitted to the Connecticut Siting Council today, January 7, 2021.

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

Best,
Anne Marie Zsamba

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

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

Exhibit A

Original Facility Approval

APPLICATION FOR BUILDING PERMIT

PERMIT NO. Nº 005802

(Application must be typed or printed)

TOWN OF BROOKLYN
CONNECTICUT

LOCATION OF JOB (NO. & STREET)		CARD NO.	MAP	BLOCK	LOT
116 Grant Hill			4		5
OWNER: Robert Bemis	TEL.	ADDRESS (NO., STREET, TOWN, STATE, ZIP): Same			
APPLICANT: Sprint Spectrum	TEL.	ADDRESS (NO., STREET, TOWN, STATE, ZIP): 9 Barnes Ind. Rd Wallingford Ct 06492			
BUILDER	TEL.	ADDRESS (NO., STREET, TOWN, STATE, ZIP)			
LICENSE #		NAME & TEL # OF PERSON RESPONSIBLE			

All Permits Must Be Posted And Visible From The Street

SIZE OF BUILDING

STORIES _____ NO. OF FAMILIES _____

HEIGHT _____ DEPTH _____ FRONT _____

TOTAL FLOOR AREA (NEW) _____ SQ.FT.

TYPE OF WORK BEING DONE

- ☐ ORIG. CONSTRUCTION
- ☐ REPAIR
- ☐ ALTERATION
- ☐ DEMOLITION
- ☐ ADDITION _____

CONSTRUCTION VALUE

ESTIMATED _____

ACTUAL _____

TYPE OF HEAT

- ☐ ELECTRIC
- ☐ SOLAR
- ☐ GAS
- ☐ OTHER
- ☐ OIL _____

DISTANCES FROM LOT LINE
(Circle Front Lot Line)

EAST _____ WEST _____ NORTH _____ SOUTH _____

PROPOSED USE

- ☐ NEW HOME (Single Family)
- ☐ MULTI FAMILY _____
  - # OF BEDROOMS _____
  - WATER SUPPLY _____
- ☐ ADDITION _____
- ☐ GARAGE _____
- ☐ DECK/PORCH _____
- ☐ SHED _____
- ☐ POOL _____
- ☐ COMMERCIAL/PUBLIC _____
- ☐ OTHER _____

BUILDING PLANS — REQUIRED _____ ATTACHED _____

MATERIALS LIST — ON PLANS _____ ATTACHED _____

OTHER REQUIREMENTS

ZONING PERMIT — REQ'D. _____ ATTACHED _____

PLOT PLAN — REQ'D. _____ ATTACHED _____

SEPTIC PERMIT — REQ'D. _____ ATTACHED _____

APPROVALS

ZONING _____ FIRE MARSHAL _____

WETLAND _____ ENGINEER _____

SANITATION _____ STREET SUPT. _____

FEE COVERS

	VALUE	FEE
☑ CONSTRUCTION	118,000	826
☐ PLUMBING		
☐ HEATING		
☐ ELECTRICAL		
☐ SEPTIC		
☑ ZONING		35
☐ OTHER		
TOTAL		861

CHECK # 0588 DATE PAID 4-6-00

DESCRIPTION OF WORK / REMARKS:

150' ~~tower~~ telecommunications tower

All work covered by this application has been authorized by the (owner) or (agent) of this property and will be done according to state regulations. This permit shall lapse if work does not commence within 6 months.

4/17/00 (Date) — Owner/Agent Signature

☑ APPROVED ☐ DISAPPROVED

4/17/00 (Date) — Building Official

Office Copy - White Owner Copy - Yellow Assessor's Copy – Pink Building Official – Green Building Official - Goldenrod

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@po.state.ct.us
Web Site: www.state.ct.us/csc/index.htm

July 9, 2003

Stephen J. Humes
LeBoeuf, Lamb, Greene & MacRae
Goodwin Square
225 Asylum Street
Hartford, CT 06103

RE: **TS-T-MOBILE-019-030617** - Omnipoint Communications, Inc. request for an order to approve tower sharing at an existing telecommunications facility located at 116 Grant Hill Road, Brooklyn, Connecticut.

Dear Attorney Humes:

At a public meeting held July 8, 2003, the Connecticut Siting Council (Council) ruled that the shared use of this existing tower site is technically, legally, environmentally, and economically feasible and meets public safety concerns, and therefore, in compliance with General Statutes § 16-50aa, the Council has ordered the shared use of this facility to avoid the unnecessary proliferation of tower structures. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Any additional change to this facility may require an explicit request to this agency pursuant to General Statutes § 16-50aa or notice pursuant to Regulations of Connecticut State Agencies Section 16-50j-73, as applicable. Such request or notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

This decision applies only to this request for tower sharing and is not applicable to any other request or construction.

The proposed shared use is to be implemented as specified in your letter dated June 17, 2003.

Thank you for your attention and cooperation.

Very truly yours,

Pamela B. Katz, P.E.
Chairman

PBK/laf

c: Honorable Maurice F. Bowen, First Selectman, Town of Brooklyn
Chester Dobrowski, Zoning Enforcement Officer, Town of Brooklyn
Thomas J. Regan, Esq., Brown Rudnick Berlack Israels, LLP
Christopher B. Fisher, Esq., Cuddy & Feder LLP

Exhibit B

Property Card

116 GRANT HILL RD

Location	116 GRANT HILL RD	**Mblu**	4/ / 5/ CELL/
Acct#	00024910	**Owner**	SPRINT SPECTRUM
Assessment	$845,500	**Appraisal**	$1,207,800
PID	3735	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$1,207,800	$0	$1,207,800

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$845,500	$0	$845,500

Owner of Record

Owner	SPRINT SPECTRUM	**Sale Price**	$0
Co-Owner	C/O GLOBAL SIGNAL AC1 II LLC	**Certificate**	
Care Of		**Book**	0000
Address	PMB331 4017 WASHINGTON RD MCMURRAY, PA 15317	**Page**	0000
		Sale Date	10/01/2009
		Qualified	U

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Sale Date**	**Book**	**Page**
SPRINT SPECTRUM	$0		10/01/2009	0000	0000

Building Information

Building 1 : Section 1

Year Built:	
Living Area:	0
Replacement Cost:	$0
Building Percent Good:	
Replacement Cost Less Depreciation:	$0

Building Attributes	
Field	**Description**
Style:	Outbuildings
Model	
Grade:	
Stories:	
Occupancy	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure:	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Total Bthrms:	
Total Half Baths:	
Total Xtra Fixtrs:	
Total Rooms:	
Bath Style:	
Kitchen Style:	
Num Kitchens	
Cndtn	
Num Park	
Fireplaces	
Fndtn Cndtn	
Basement	

Building Photo

(http://images.vgsi.com/photos/BrooklynCTPhotos//default.jpg)

Building Layout

Building Sub-Areas (sq ft)	Legend
No Data for Building Sub-Areas	

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code 4300

Land Line Valuation

Size (Acres) 0

Description	TEL TWR MDL00	**Frontage**	
Zone		**Depth**	
Neighborhood		**Assessed Value**	$0
Alt Land Appr	No	**Appraised Value**	$0
Category			

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
SHD5	Cell Shed			360.00 SF	$54,000	1
FN3	FENCE-6' CHAIN			280.00 L.F.	$1,300	1
TWR	CELL TOWER			1.00 UNITS	$90,000	1
ARY	CELL ARRAY			5.00 UNIT	$1,062,500	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2019	$1,055,300	$0	$1,055,300
2018	$1,055,300	$0	$1,055,300
2017	$1,055,300	$0	$1,055,300

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2019	$738,700	$0	$738,700
2018	$738,700	$0	$738,700
2017	$738,700	$0	$738,700

116 GRANT HILL RD

Location	116 GRANT HILL RD	**Mblu**	4/ / 5/ /
Acct#	00024900	**Owner**	BERNIER JEAN PAUL & DAWNA G
Assessment	$360,930	**Appraisal**	$686,300
PID	255	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$191,800	$494,500	$686,300
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$134,400	$226,530	$360,930

Owner of Record

Owner	BERNIER JEAN PAUL & DAWNA G
Co-Owner	
Care Of	
Address	116 GRANT HILL RD BROOKLYN, CT 06234

Sale Price	$0
Certificate	
Book	0462
Page	0288
Sale Date	09/17/2009
Instrument	29
Qualified	U

Ownership History

Ownership History						
Owner	**Sale Price**	**Certificate**	**Instrument**	**Sale Date**	**Book**	**Page**
BERNIER JEAN PAUL & DAWNA G	$0		29	09/17/2009	0462	0288
BERNIER ROBERT E	$0		29	09/17/2009	0462	0287
BERNIER ROBERT E+AGNES P	$500			06/19/1968	0045	0291
BERNIER ROBERT E & AGNES P	$0			11/28/1955	0032	0549

Building Information

Building 1 : Section 1

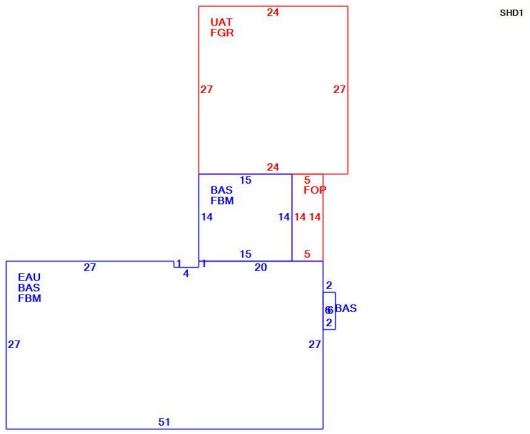
Year Built: 1956
Living Area: 1,595
Replacement Cost: $265,281
Building Percent Good: 70
Replacement Cost Less Depreciation: $185,700

Building Attributes	
Field	**Description**
Style:	Cape Cod
Model	Residential
Grade:	C+
Stories:	1.25
Occupancy	2
Exterior Wall 1	Vinyl Siding
Exterior Wall 2	Clapboard
Roof Structure:	Gable/Hip
Roof Cover	Asph/F Gls/Cmp
Interior Wall 1	Drywall/Sheet
Interior Wall 2	
Interior Flr 1	Hardwood
Interior Flr 2	Carpet
Heat Fuel	Oil
Heat Type:	Hot Water
AC Type:	None
Total Bedrooms:	2 Bedrooms
Total Bthrms:	3
Total Half Baths:	0
Total Xtra Fixtrs:	1
Total Rooms:	6
Bath Style:	Average
Kitchen Style:	Modern
Num Kitchens	
Cndtn	
Num Park	
Fireplaces	
Fndtn Cndtn	
Basement	

Building Photo

(http://images.vgsi.com/photos/BrooklynCTPhotos//\00\00\02\13.JPG)

Building Layout



(ParcelSketch.ashx?pid=255&bid=255)

Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	1,595	1,595
EAU	Attic, Expansion, Unfinished	1,373	0
FBM	Basement, Finished	1,583	0
FGR	Garage	648	0
FOP	Porch, Open	70	0
UAT	Attic, Unfinished	648	0
		5,917	1,595

Extra Features

Extra Features				Legend
Code	**Description**	**Size**	**Value**	**Bldg #**
FPL1	FIREPLACE 1 ST	1.00 UNITS	$1,500	1

FPO	EXTRA FPL OPEN	2.00 UNITS	$1,100	1
KIT1	EXTRA KITCHEN	1.00 UNITS	$3,500	1

Land

Land Use

Use Code	1070
Description	SFR w/INLAW
Zone	RA
Neighborhood	0050
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	105.00
Frontage	
Depth	
Assessed Value	$226,530
Appraised Value	$494,500

Outbuildings

Outbuildings	Legend
No Data for Outbuildings	

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2019	$147,300	$447,400	$594,700
2018	$147,300	$447,400	$594,700
2017	$147,300	$447,400	$594,700

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2019	$103,200	$232,530	$335,730
2018	$103,200	$232,530	$335,730
2017	$103,200	$232,530	$335,730

Exhibit C

Construction Drawings

T-MOBILE SITE NAME:

SPRINT- BROOKLYN

T-MOBILE SITE NUMBER:

CT11511A

CROWN BU: 876390 / APP#: 494419

67D04G CONFIGURATION

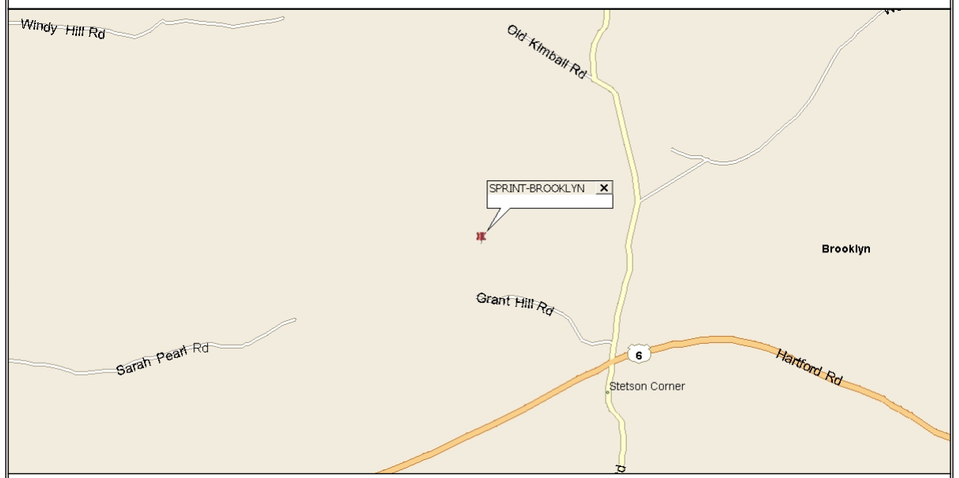
116 GRANT HILL ROAD
BROOKLYN, CT 06234

EXISTING 150'-0" MONOPOLE

PROJECT SUMMARY

SITE TYPE:	EXISTING EQUIPMENT UPGRADE
SITE ADDRESS:	116 GRANT HILL ROAD BROOKLYN, CT 06234
JURISDICTION:	WINDHAM COUNTY
NAD83	
LATITUDE:	41.791553° N
LONGITUDE:	72.015125° W
TOWER OWNER:	CROWN CASTLE 3200 HORIZON DRIVE, SUITE 150 KING OF PRUSSIA, PA 19406 JASON SMITH (610) 635-3225
CUSTOMER/APPLICANT:	T-MOBILE 4 SYLVAN WAY PARSIPPANY, NJ 07054 (973) 397-4800
OCCUPANCY TYPE:	UNMANNED
A.D.A. COMPLIANCE:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION

LOCATION MAP



NO SCALE

DRAWING INDEX

SHEET #	SHEET DESCRIPTION	REV. #
T-1	TITLE SHEET	1
A-1	OVERALL SITE PLAN	1
A-2	ANTENNA/CABLE SCHEDULE AND AZIMUTH PLANS	1
A-3	TOWER ELEVATION	1
A-4	ANTENNA AND RRU DETAILS	1
E-1	PANEL SCEHDULE AND ONE-LINE DIAGRAM	1
S1	MOUNT MOD DETAILS	0
S2	MOUNT MOD DETAILS	0

CONTACT INFORMATION

A&E FIRM:	B+T GROUP 1717 S. BOULDER, STE. 300 TULSA, OK 74119	ELECTRIC PROVIDER:	NORTHEAST UTILITIES (CL&P) 1-800-286-2000
CONTACT:	MIKE OAKES	TELCO PROVIDER:	AT&T 1-855-637-9527
PHONE:	(918) 587-4630		

DRIVING DIRECTIONS

DEPART BRADLEY INTERNATIONAL AIRPORT ON TERMINAL RD. ROAD NAME CHANGES TO BRADLEY FIELD CONNECTOR. ROAD NAME CHANGES TO CT-20 [BRADLEY FIELD CONNECTOR]. TAKE RAMP (RIGHT) ONTO I-91 [RICHARD P HORAN MEMORIAL HWY]. AT EXIT 35A, TAKE RAMP (RIGHT) ONTO I-291. TURN OFF ONTO RAMP. KEEP STRAIGHT TO STAY ON RAMP. TAKE RAMP (LEFT) ONTO I-384. ROAD NAME CHANGES TO US-44 [US-6]. BEAR RIGHT ONTO US-6 [HOPRIVER RD]. KEEP STRAIGHT ONTO RAMP. TURN RIGHT ONTO US-6 [CT-66]. TURN LEFT ONTO CHERRY HILL RD, THEN IMMEDIATELY TURN LEFT ONTO GRANT HILL RD. TURN RIGHT ONTO LOCAL ROAD(S). ARRIVE AT SPRINT-BROOKLYN.

A/E DOCUMENT REVIEW STATUS

TITLE	SIGNATURE	DATE
T-MOBILE PROP:		
T-MOBILE R.F. MGR.:		
T-MOBILE NetOps:		
T-MOBILE CONST. MGR.:		
INTERCONNECT:		
T-MOBILE SITE DEV. MGR.:		
PROPERTY OWNER:		
PLANNING:		

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

CODE COMPLIANCE

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

CODE TYPE	CODE
BUILDING/DWELLING	2018 CT SBC
STRUCTURAL	2018 CT SBC
MECHANICAL	2018 CT SBC
ELECTRICAL	2018 CT SBC

PROJECT DESCRIPTION

THE PROPOSED PROJECT INCLUDES:

- REMOVE (6) 1 5/8" COAX CABLES.
- REMOVE (6) B12 RADIOS (GROUND LEVEL).
- REMOVE (1) DUS41.
- REMOVE & REPLACE (6) EXISTING ANTENNAS AT 137'-0".
- INSTALL (3) NEW RRUS AT 137'-0".
- INSTALL (1) NEW 6x12 HCS FIBER.
- INSTALL (2) BB 6630s.
- MODIFY EXISTING MOUNTS PER MOUNT MODIFICATION REPORT BY B+T GROUP DATED 7/9/19.

DO NOT SCALE DRAWINGS

ALL DRAWINGS CONTAINED HEREIN ARE FORMATTED FOR 11X17. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

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

811

CT11511A
BU #: 876390
SPRINT- BROOKLYN
116 GRANT HILL ROAD
BROOKLYN, CT 06234
EXISTING 150'-0" MONOPOLE

PROJECT NO:	136355.004.01
CHECKED BY:	GEH

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION
0	7/29/19	DAC	CONSTRUCTION
1	11/25/20	JTS	CONSTRUCTION

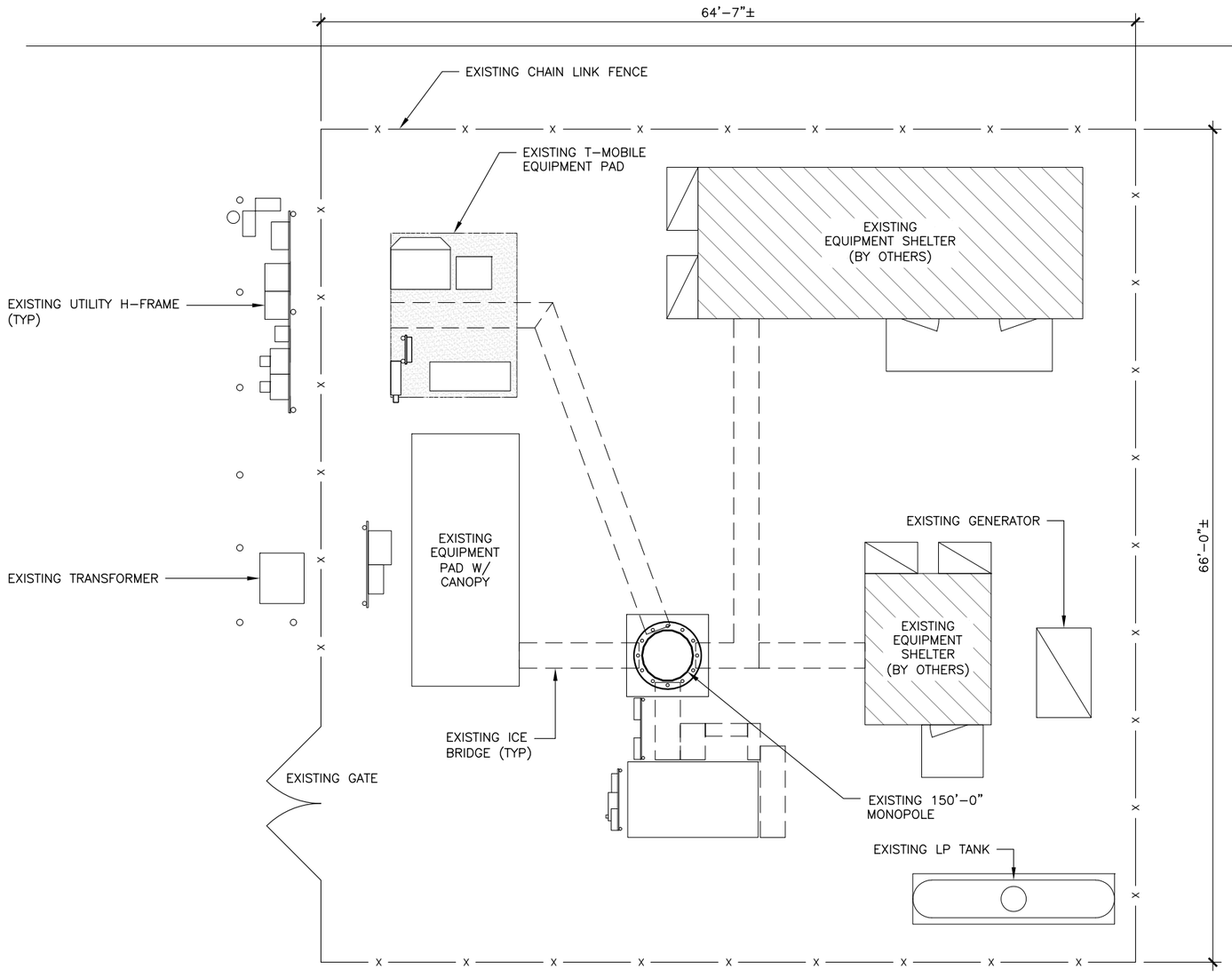
B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/21

STATE OF CONNECTICUT
31627
LICENSED
PROFESSIONAL ENGINEER

11/25/20

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

SHEET NUMBER: T-1
REVISION: 1



1 OVERALL SITE PLAN

SCALE: 0' 4' 8' 16' 32'

N

GENERAL NOTES:

1. SUBJECT PROPERTY IS SITUATED AT 116 GRANT HILL ROAD, BROOKLYN, CT 06234.
2. APPLICANT: T-MOBILE
   A DELAWARE LIMITED LIABILITY COMPANY
   4 SYLVAN WAY
   PARSIPPANY, NEW JERSEY 07054
   (973) 397-4800

   TOWER OWNER: CROWN CASTLE INTERNATIONAL

- THE APPLICANT IS TO UPDATE THEIR NETWORK BY INSTALLING SIX (6) NEW PANEL ANTENNAS, THREE (3) RRUS, AND ONE (1) ADDITIONAL CABLE MOUNTED ON AN EXISTING MONOPOLE.

3. THIS FACILITY SHALL BE VISITED ON THE AVERAGE OF ONCE A MONTH FOR MAINTENANCE AND SHALL BE MONITORED FROM A REMOTE FACILITY.
4. THE EXISTING SITE IS LOCATED AT LATITUDE OF 41.791553° N± AND LONGITUDE OF 72.015125° W±. THE HORIZONTAL DATUM ARE IN TERMS OF NORTH AMERICAN DATUM OF 1983 (NAD 83).
5. THIS SET OF PLANS HAS BEEN PREPARED FOR THE PURPOSES OF MUNICIPAL AND AGENCY REVIEW AND APPROVAL. THIS SET OF PLANS SHALL NOT BE UTILIZED AS CONSTRUCTION DOCUMENTS UNTIL ALL CONDITIONS OF APPROVAL HAVE BEEN SATISFIED AND EACH OF THE DRAWINGS HAVE BEEN REVISED TO INDICATED "ISSUED FOR CONSTRUCTION"
6. ALL MATERIALS, WORKMANSHIP, AND CONSTRUCTION FOR THE SITE IMPROVEMENTS SHOWN HEREON SHALL BE IN ACCORDANCE WITH:

   6.A. CURRENT PREVAILING MUNICIPAL AND/OR COUNTY SPECIFICATIONS, STANDARDS, AND REQUIREMENTS.
   6.B. CURRENT PREVAILING UTILITY COMPANY AUTHORITY SPECIFICATIONS, STANDARDS AND REQUIREMENTS.

7. THE CONTRACTOR SHALL NOTIFY B+T GROUP, P.A. IMMEDIATELY IF ANY FIELD-CONDITIONS ENCOUNTERED DIFFER FROM THOSE REPRESENTED HEREON, AND/OR IF SUCH CONDITIONS WOULD OR COULD RENDER THE DESIGNS SHOWN HEREON INAPPROPRIATE AND/OR INEFFECTIVE.
8. THE CONTRACTOR IS RESPONSIBLE TO PROTECT, REPAIR AND/OR REPLACE ANY DAMAGED STRUCTURES, UTILITIES OR LANDSCAPED AREA WHICH MAY BE DISTURBED DURING THE CONSTRUCTION OF THIS FACILITY.
9. THE CONSTRUCTION CONTRACTOR IS SOLELY RESPONSIBLE FOR DETERMINING ALL CONSTRUCTION MEANS AND METHODS. THE CONSTRUCTION CONTRACTOR IS ALSO RESPONSIBLE FOR ALL JOB SITE SAFETY.
10. SITE INFORMATION SHOWN TAKEN FROM CROWN CASTLE SITE PLANS AND FROM CROWN CASTLE INSPECTION PHOTOS.
11. NO GUARANTEE IS MADE NOR SHOULD BE ASSUMED AS TO THE COMPLETENESS OR ACCURACY OF THE HORIZONTAL OR VERTICAL LOCATIONS. ALL PARTIES UTILIZING THIS INFORMATION SHALL FIELD VERIFY THE ACCURACY AND COMPLETENESS OF THE INFORMATION SHOWN PRIOR TO CONSTRUCTION ACTIVITIES.
12. ALL IMPROVEMENTS SHALL BE SUBJECT TO INSPECTION AND APPROVAL BY THE TOWNSHIP ENGINEER WHO WILL BE GIVEN PROPER NOTIFICATION PRIOR TO THE START OF ANY CONSTRUCTION.

B+T GRP

CROWN CASTLE

T-Mobile

CT11511A
BU #: 876390

SPRINT- BROOKLYN

116 GRANT HILL ROAD
BROOKLYN, CT 06234

EXISTING 150'-0" MONOPOLE

PROJECT NO:	136355.004.01
CHECKED BY:	GEH

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION
0	7/29/19	DAC	CONSTRUCTION
1	11/25/20	JTS	CONSTRUCTION

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

STATE OF CONNECTICUT
31627
LICENSED
PROFESSIONAL ENGINEER

11/25/20

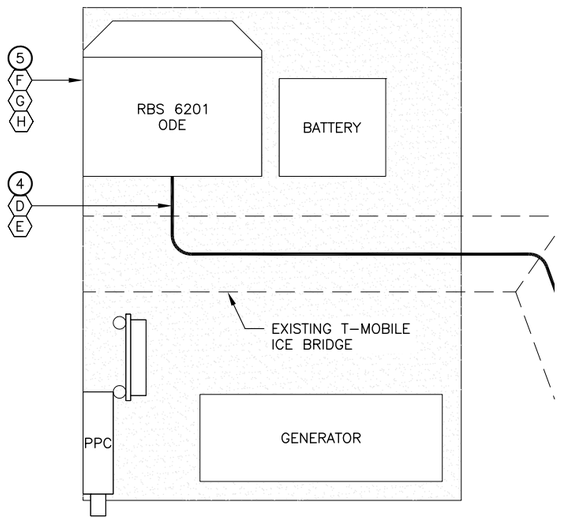
SHEET NUMBER:	REVISION:
A-1	1

LEGEND

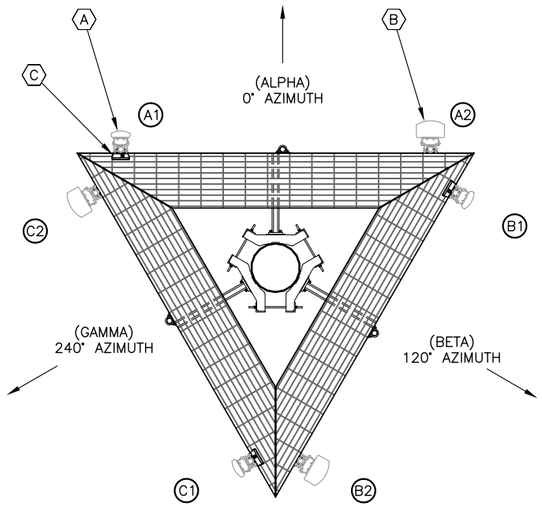
EXISTING/DEMOLITION NOTES		INSTALLATION NOTES	
A	EXISTING EMS RR90-17-02DP ANTENNA TO BE REMOVED (TOTAL OF 3)	1	INSTALL RFS APX16DWV-16DWV-S-E-A20 ANTENNA PROVIDE NEW 2-7/8" OD SCH40 PIPE MAST (LENGTH TO BE 6'-0") (TYP OF 1 PER SECTOR, TOTAL OF 3)
B	EXISTING ANDREW LNX6515DS-A1M ANTENNA TO BE REMOVED (TOTAL OF 3)	2	INSTALL RFS APXVAARR24_43-U-NA20 ANTENNA PROVIDE NEW 2-7/8" OD SCH40 PIPE MAST (LENGTH TO BE 9'-0") (TYP OF 1 PER SECTOR, TOTAL OF 3)
C	EXISTING KRY 112 489/2 TMA TO REMAIN (TOTAL OF 3)	3	INSTALL RADIO 4449 B71/B12 (TYP OF 1 PER SECTOR, TOTAL OF 3)
D	EXISTING 1 5/8" COAX TO REMAIN (TOTAL OF 6)	4	INSTALL (1) 6x12 HCS FIBER. RUN FROM EQUIPMENT TO ANTENNAS FOLLOWING EXISTING ROUTING
E	REMOVE (6) 1 5/8" COAX CABLES	5	INSTALL (2) BB 6630
F	EXISTING RADIO RUS01 B2 TO REMAIN (TOTAL OF (6)		
G	REMOVE (6) RADIO RUS01 B12		
H	REMOVE (1) DUS41		

ANTENNA AND CABLE SCHEDULE

SECTOR	POSITION	EXISTING ANTENNAS	PROPOSED ANTENNA CONFIGURATION		E-TILT	M-TILT	ANTENNA CENTERLINE	TMA/RRU	CABLES	JUMPER TYPE	CABLE LENGTH
0° – ALPHA	A1	RFS APX16DWV-16DWV-S-E-A20	LTE GSM	–	2°/2°	0°	137'-0"	1/0	(2) 1 5/8" COAX	1/2" COAX	188'-0"
	A2	RFS APXVAARR24_43-U-NA20	LTE	B71 B12	2°/2°	0°		0/1	(1) 6x12 HCS FIBER	DC/FIBER	188'-0"
120° – BETA	B1	RFS APX16DWV-16DWV-S-E-A20	LTE GSM	–	2°/2°	0°	137'-0"	1/0	(2) 1 5/8" COAX	1/2" COAX	188'-0"
	B2	RFS APXVAARR24_43-U-NA20	LTE	B71 B12	2°/2°	0°		0/1	SHARED	DC/FIBER	188'-0"
240° – GAMMA	C1	RFS APX16DWV-16DWV-S-E-A20	LTE GSM	–	2°/2°	0°	137'-0"	1/0	(2) 1 5/8" COAX	1/2" COAX	188'-0"
	C2	RFS APXVAARR24_43-U-NA20	LTE	B71 B12	2°/2°	0°		0/1	SHARED	DC/FIBER	188'-0"



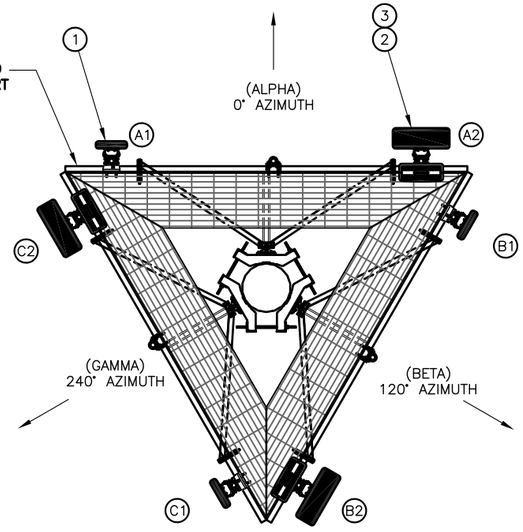
1 ENLARGED AREA PLAN
SCALE: 0' 1' 2' 4' 10'



2 EXISTING ANTENNA ORIENTATION
SCALE: 0' 1' 4' 8' 16'

N

EXISTING MOUNT TO BE MODIFIED PER MOUNT MODIFICATION REPORT BY B+T GROUP DATED 7/9/19



3 PROPOSED ANTENNA ORIENTATION
SCALE: 0' 1' 4' 8' 16'

N

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LEGEND

EXISTING/DEMOLITION NOTES		INSTALLATION NOTES	
A	EXISTING EMS RR90-17-02DP ANTENNA TO BE REMOVED (TOTAL OF 3)	1	INSTALL RFS APX16DWV-16DWV-S-E-A20 ANTENNA PROVIDE NEW 2-7/8" OD SCH40 PIPE MAST (LENGTH TO BE 6'-0") (TYP OF 1 PER SECTOR, TOTAL OF 3)
B	EXISTING ANDREW LNX6515DS-A1M ANTENNA TO BE REMOVED (TOTAL OF 3)	2	INSTALL RFS APXVAARR24_43-U-NA20 ANTENNA PROVIDE NEW 2-7/8" OD SCH40 PIPE MAST (LENGTH TO BE 9'-0") (TYP OF 1 PER SECTOR, TOTAL OF 3)
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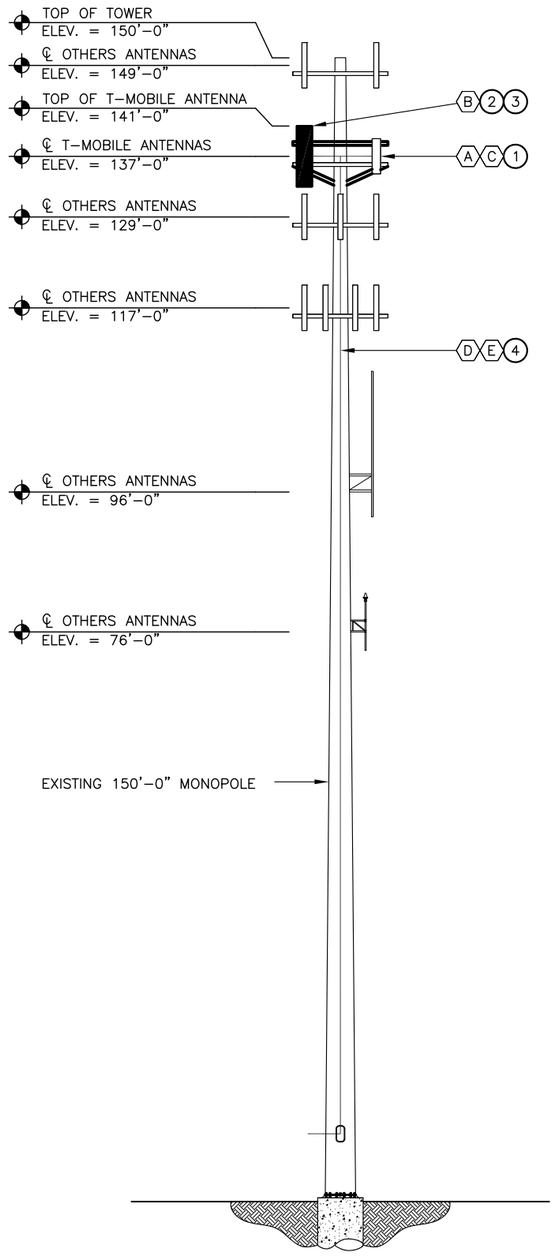
D	EXISTING 1 5/8" COAX TO REMAIN (TOTAL OF 6)	4	INSTALL (1) 6x12 HCS FIBER. RUN FROM EQUIPMENT TO ANTENNAS FOLLOWING EXISTING ROUTING
E	REMOVE (6) 1 5/8" COAX CABLES		

EXISTING MOUNT TO BE MODIFIED PER MOUNT MODIFICATION REPORT BY B+T GROUP DATED 7/9/19

LEGEND:

NEW

EXISTING



1 TOWER ELEVATION

SCALE: 0' 10' 20' 30' 40' 1"=20'

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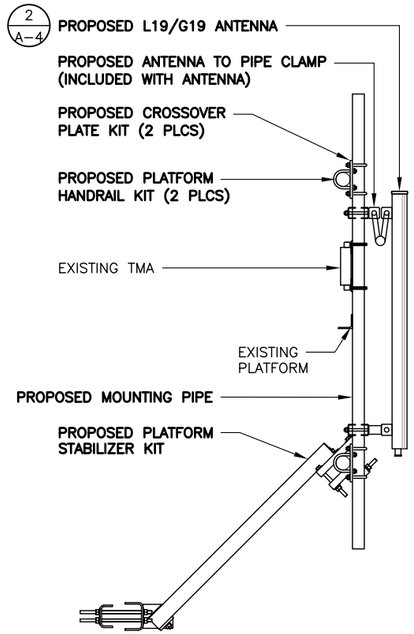
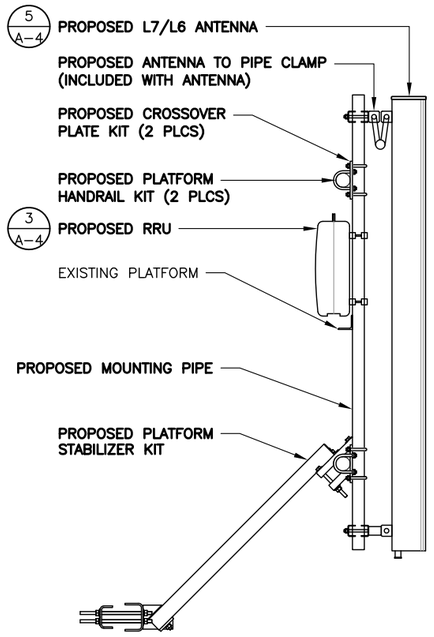


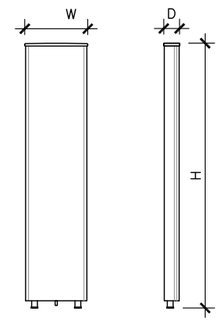
1 PROPOSED L19/G19 ANTENNA & TMA MOUNTING DETAIL

SCALE: N.T.S.



4 PROPOSED L7/L6 ANTENNA & RRU MOUNTING DETAIL

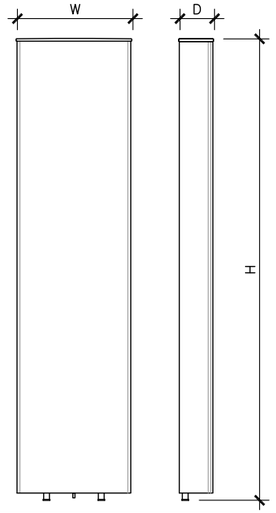
SCALE: N.T.S.



ANTENNA SPECS	
MANUFACTURER	RFS
MODEL #	APX16DWV-16DWV-S-E-A20
WIDTH	13.3"
DEPTH	3.2"
HEIGHT	55.9"
WEIGHT	40.7 LBS

2 L19/G19 ANTENNA DETAIL

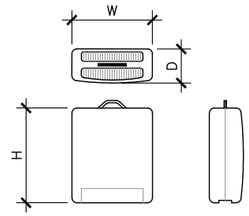
SCALE: N.T.S.



ANTENNA SPECS	
MANUFACTURER	RFS
MODEL #	APXVAARR24_43-U-NA20
WIDTH	24.0"
DEPTH	8.7"
HEIGHT	95.9"
WEIGHT	128.0 LBS

5 L7/L6 ANTENNA DETAIL

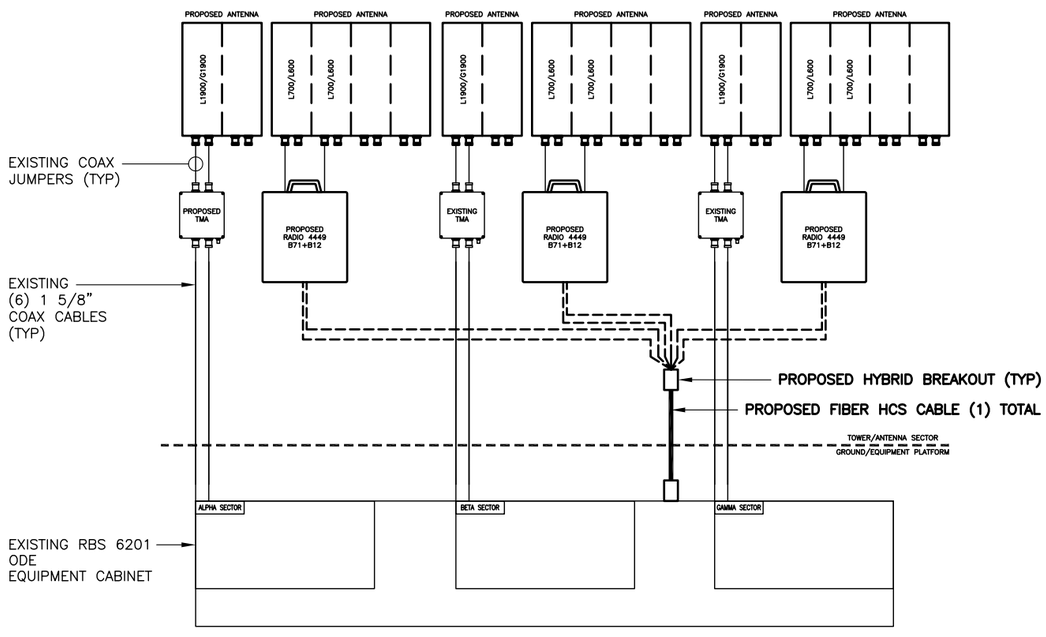
SCALE: N.T.S.



RRU SPECIFICATIONS	
MANUFACTURER	ERICSSON
MODEL #	4449
WIDTH	13.2"
DEPTH	10.4"
HEIGHT	14.9"
WEIGHT	74 LBS

3 REMOTE RADIO UNIT (RRU)

SCALE: N.T.S.



6 ANTENNA & CABLING SCHEMATIC

SCALE: N.T.S.

NOTES:
1. TAG ALL EXISTING AND PROPOSED CABLES/JUMPERS PER T-MOBILE SPECIFICATIONS.
2. SEE RF SCHEDULE FOR CABLE AND JUMPER LENGTHS.
3. REFER TO ANTENNA ORIENTATION ON SHEET A-3 FOR EXACT ANTENNA POSITIONING.

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SHEET NUMBER: A-4

REVISION: 1

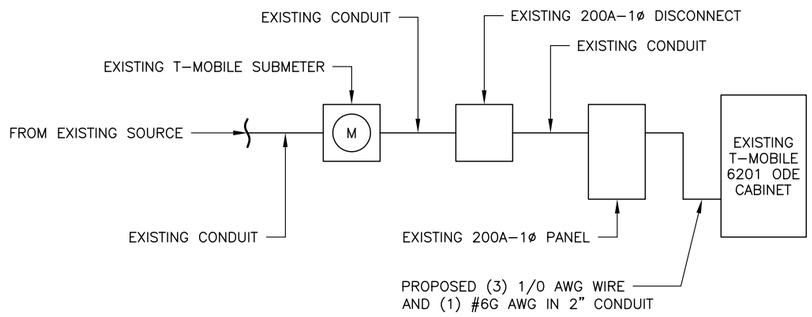
FINAL PANEL SCHEDULE							
LOAD	POLES	AMPS	BUS L1	BUS L2	AMPS	POLES	LOAD
			1	7	60A	2	SURGE PROTECTION
			2	8			
			3	9	**100A**	2	RBS 6201 ODE
			4	10			
POWER BATTERY	1	20A	5	11			
GFCI	1	20A	6	12			

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

REPLACE EXISTING BREAKER IN POSITION 9 AND 10 WITH A NEW 2P 100A BREAKER
REPLACE EXISTING WIRES FOR EXISTING 6201 ODE CABINET WITH (3) 1/0 AWG THWN (COPPER) AND (1) #6G AWG. MINIMUM CONDUIT SIZE TO BE 2".
IF 100A BREAKER WILL NOT PROPERLY FIT IN EXISTING PANEL, REPLACE (E) PANEL WITH SQUARE D PANEL QO12040M200RB (OR APPROVED EQUAL).
UPGRADE FEEDER WIRES TO MEET AMPACITY IF NEW PANEL IS REQUIRED.
FINAL PANEL DESIGN AND CALCULATIONS FOR WIRE SIZE WERE BASED OFF OF EXISTING PHOTOS

1 FINAL T-MOBILE PANEL DETAIL

SCALE: N.T.S.



2 ONE-LINE DIAGRAM

SCALE: N.T.S.

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MI CHECKLIST

REQUIRED	REPORT ITEM	BRIEF DESCRIPTION
		PRE-CONSTRUCTION
X	MI CHECKLIST DRAWING	THIS CHECKLIST SHALL BE INCLUDED IN THE MI REPORT.
N/A	EOR APPROVED SHOP DRAWINGS	FABRICATION DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW. THE CONTRACTOR SHALL PROVIDE APPROVED SHOP DRAWINGS TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	ASSEMBLY DRAWINGS	ONCE THE PRE-MODIFICATION MAPPING IS COMPLETE, PRIOR TO FABRICATION, THE CONTRACTOR SHALL PROVIDE DETAILED ASSEMBLY DRAWINGS. THESE ARE TO INCLUDE, BUT ARE NOT LIMITED TO, A VISUAL LAYOUT OF NEW REINFORCEMENT, EXISTING REINFORCEMENT CONFIGURATION, PORTHOLES, MOUNTS, STEP PEGS, SAFETY CLIMBS AND ANY OTHER MISCELLANEOUS ITEMS WHICH MAY AFFECT SUCCESSFUL INSTALLATION OF MODIFICATIONS ON THE TOWER. THESE DRAWINGS SHALL BE SUBMITTED TO THE EOR FOR APPROVAL. APPROVED ASSEMBLY DRAWINGS SHALL BE SUBMITTED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	FABRICATION INSPECTION	A LETTER FROM THE FABRICATOR, STATING THAT THE WORK WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THE CONTRACT DOCUMENTS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	FABRICATOR CERTIFIED WELD INSPECTION	A VISUAL OBSERVATION BY CWI OF A PORTION OF WELDING ON THE PROPOSED STRUCTURAL MEMBERS IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	MATERIAL TEST REPORT (MTR)	MILL CERTIFICATION SHALL BE PROVIDED FOR ALL STEEL AS SPECIFIED IN THE MODIFICATION DRAWINGS AND THIS DOCUMENTATION SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	FABRICATOR NDE INSPECTION	CRITICAL SHOP WELDS THAT REQUIRE TESTING ARE NOTED ON THESE CONTRACT DRAWINGS. A CERTIFIED WELD INSPECTOR SHALL PERFORM NON-DESTRUCTIVE EXAMINATION AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	PACKING SLIPS	THE MATERIAL SHIPPING LIST SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
		CONSTRUCTION (PERFORMED BY CONTRACTOR)
X	CONSTRUCTION INSPECTIONS	A LETTER FROM THE GENERAL CONTRACTOR STATING THAT THE WORKMANSHIP WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THESE CONTRACT DRAWINGS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	CONTRACTOR'S CERTIFIED WELD INSPECTION	A CERTIFIED WELD INSPECTOR SHALL INSPECT AND TEST AS NECESSARY ALL FIELD WELDS. A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	ON SITE COLD GALVANIZING VERIFICATION	THE GENERAL CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE MI INSPECTOR VERIFYING THAT ANY ON-SITE COLD GALVANIZING WAS APPLIED AS SPECIFIED IN THE MODIFICATION DRAWINGS.
X	GC AS-BUILT DOCUMENTS	THE GENERAL CONTRACTOR SHALL SUBMIT A COPY OF THE CONTRACT DRAWINGS EITHER STATING "INSTALLED AS DESIGNED" OR NOTING ANY CHANGES THAT WERE REQUIRED AND APPROVED BY THE ENGINEER OF RECORD DUE TO FIELD CONDITIONS.
		POST-CONSTRUCTION
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)	THE MI INSPECTOR SHALL OBSERVE AND REPORT ANY DISCREPANCIES BETWEEN THE CONTRACTORS REDLINE DRAWING AND THE ACTUAL COMPLETED INSTALLATION.
X	PHOTOGRAPHS	PHOTOGRAPHS SHALL BE SUBMITTED TO THE MI WHICH DOCUMENT ALL PHASES OF THE CONSTRUCTION. THE PHOTOS SHALL BE ORGANIZED IN A MANNER THAT EASILY IDENTIFIES THE EXACT LOCATION OF THE PHOTO.
ADDITIONAL TESTING AND INSPECTIONS:		
NOTE: X DENOTES A DOCUMENT NEEDED FOR THE MI REPORT AND N/A DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE MI REPORT		

MODIFICATION INSPECTION NOTES:

GENERAL

THE MODIFICATION INSPECTION (MI) IS A VISUAL INSPECTION OF TOWER MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTIONS AND OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS, AS DESIGNED BY THE ENGINEER OF RECORD (EOR).

THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, NOR DOES THE MI INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES.

TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PO IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY. IF CONTACT INFORMATION IS NOT KNOWN, CONTACT B+T GROUP.

MI INSPECTOR

THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO FOR THE MI TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ONSITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS

THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GENERAL CONTRACTOR (GC) INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING THE IN-FIELD INSPECTIONS, AND SUBMITTING THE MI REPORT.

GENERAL CONTRACTOR

THE GC IS REQUIRED TO CONTACT THE MI INSPECTOR AS SOON AS RECEIVING A PO FOR THE MODIFICATION INSTALLATION OR TURNKEY PROJECT TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE MI INSPECTIONS
- BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS

THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST.

RECOMMENDATIONS

THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING A MI REPORT:

- IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLY 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
- THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY DEFICIENCIES CORRECTED DURING THE INITIAL MI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MI CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON SITE.

CANCELLATION OR DELAYS IN SCHEDULED MI

IF THE GC AND MI INSPECTOR AGREE TO A DATE ON WHICH THE MI WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, CARRIER SHALL NOT BE RESPONSIBLE FOR ANY COSTS, FEES, LOSS OF DEPOSITS AND/OR OTHER PENALTIES RELATED TO THE CANCELLATION OR DELAY INCURRED BY EITHER PARTY FOR ANY TIME (E.G. TRAVEL AND LODGING, COSTS OF KEEPING EQUIPMENT ON-SITE, ETC.). IF CARRIER CONTRACTS DIRECTLY FOR A THIRD PARTY MI, EXCEPTIONS MAY BE MADE IN THE EVENT THAT THE DELAY/CANCELLATION IS CAUSED BY WEATHER OR OTHER CONDITIONS THAT MAY COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.

CORRECTION OF FAILING MI'S

IF THE MODIFICATION INSPECTOR FAILS THE MI ("FAILED MI"), THE GC SHALL WORK WITH CARRIER TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:

- CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI.
- OR, WITH CARRIER'S APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION
- THE ADDITIONAL COST INCURRED IN THE SECOND SUPERVISION PROCESS WOULD BE BORNE BY THE GENERAL CONTRACTOR.

MI VERIFICATION INSPECTIONS

CARRIER RESERVES THE RIGHT TO CONDUCT A MI VERIFICATION INSPECTION TO VERIFY THE ACCURACY AND COMPLETENESS OF PREVIOUSLY COMPLETED MI INSPECTION(S) ON TOWER MODIFICATION PROJECTS.

ALL VERIFICATION INSPECTIONS SHALL BE HELD TO THE SAME SPECIFICATIONS AND REQUIREMENTS IN THE CONTRACT DOCUMENTS.

VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASSING MI" OR "PASS AS NOTED MI" REPORT FOR THE ORIGINAL PROJECT.

REQUIRED PHOTOS

BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:

- PRE-CONSTRUCTION GENERAL SITE CONDITION
- PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION
  - RAW MATERIALS
  - PHOTOS OF ALL CRITICAL DETAILS
  - FOUNDATION MODIFICATIONS
  - WELD PREPARATION
  - BOLT INSTALLATION AND TORQUE
  - FINAL INSTALLED CONDITION
  - SURFACE COATING REPAIR
- POST CONSTRUCTION PHOTOGRAPHS
  - PHOTOS OF MODIFIED SECTIONS INDIVIDUALLY INDICATING ELEVATION
  - FINAL INFIELD CONDITION

PHOTOS OF ELEVATED MODIFICATIONS TAKEN FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.

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

T-Mobile

CROWN CASTLE

HAMPTON / BERNIER

116 GRANT HILL RD.
BROOKLYN, CT 06234
WINDHAM

EXISTING PLATFORM
AT 137'-00"

PROJECT NO:	136355.003.01
CHECKED BY:	JV

ISSUED FOR:

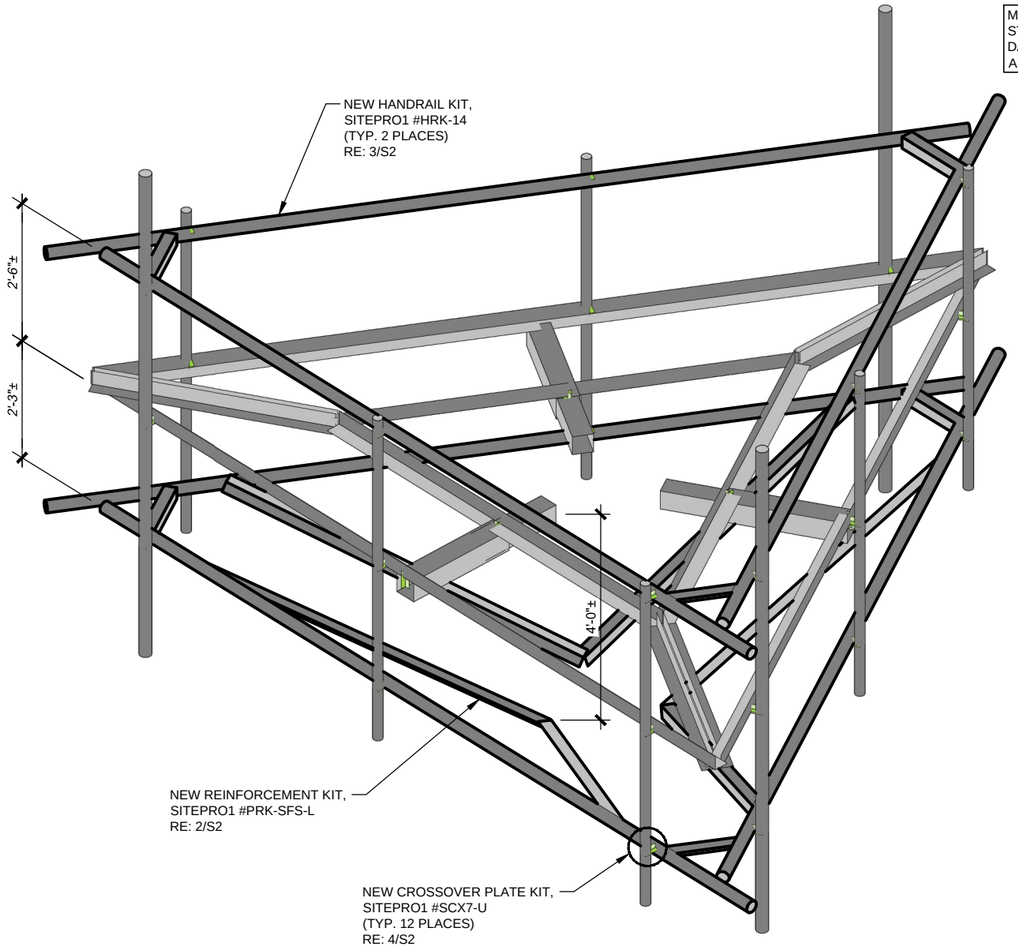
REV	DATE	DRWN	DESCRIPTION
0	07/09/19	NGR	CONSTRUCTION

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/20

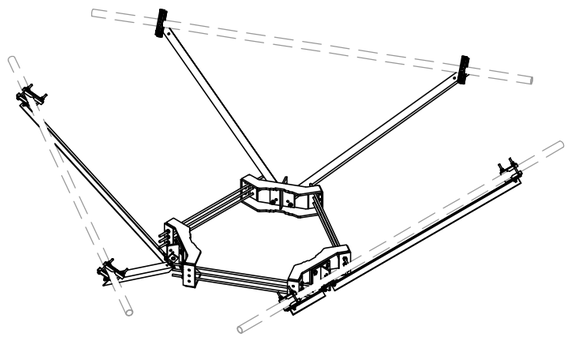
STATE OF CONNECTICUT
SCOTT VANCE
31627
LICENSED
PROFESSIONAL ENGINEER
7/9/19

SHEET NUMBER:	REVISION:
S1	0

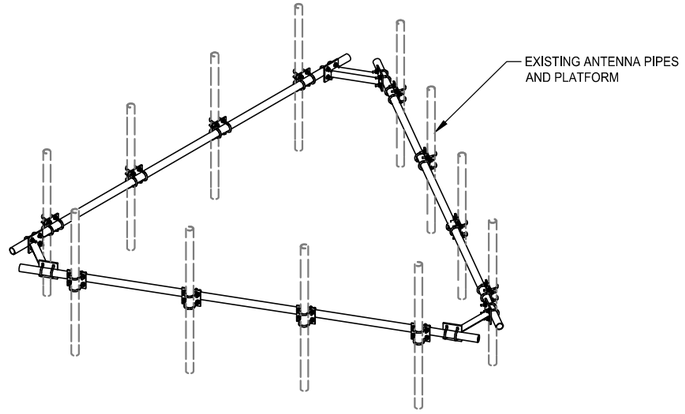
MODIFICATIONS BASED ON THE FAILING STRUCTURAL ANALYSIS FROM B+T GROUP DATED 07/02/19 AND ACCOMPANIED BY ANALYSIS FROM B+T GROUP DATED 07/09/19



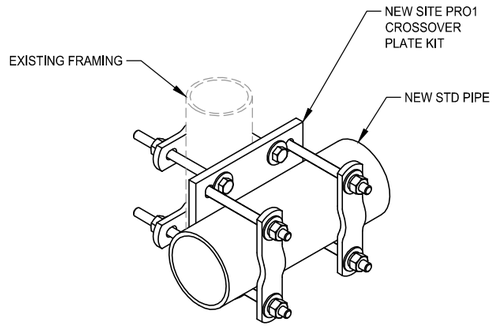
1 MODIFIED PLATFORM
SCALE: N.T.S.



2 SITEPRO1 PRK-SFS-L REINFORCEMENT KIT
SCALE: N.T.S.



3 SITE PRO1 HRK-14 HANDRAIL KIT
SCALE: N.T.S.



4 SITE PRO1 SCX7-U CROSSOVER PLATE KIT
SCALE: N.T.S.

GENERAL NOTES

1.1 CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS AND DIMENSIONS PRIOR TO THE MOBILIZING ON THE SITE FOR INSTALLATION OF THE MOUNT MODIFICATION AND SHALL NOTIFY THE ENGINEER OF RECORD IF THE FIELD CONDITIONS VARY FROM WHAT IS SHOWN ON THE DRAWINGS. IN ADDITION, THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF RECORD PRIOR TO MOBILIZING AT THE SITE IF THE MOUNT REINFORCEMENT SHOWN WILL NEED TO BE REVISED TO SATISFY FIELD CONDITIONS

1.2 CONTRACTOR SHALL RELOCATE NON-ANTENNA EQUIPMENT ALONG THE EXISTING PIPE MOUNT THAT IT IS MOUNTED TO, TO ALLOW FOR INSTALLATION OF MOUNT REINFORCEMENT. ENGINEER OF RECORD WILL BE NOTIFIED IF NON-ANTENNA EQUIPMENT NEEDS TO BE RELOCATED TO ANY OTHER EXISTING MEMBERS TO ALLOW FOR INSTALLATION OF MOUNT MODIFICATION.

1.3 MODIFICATION SHALL BE COMPLETED PRIOR TO ADDING THE PROPOSED APPURTENANCES.

1.4 ALL WORK SHALL COMPLY WITH THE TIA-222-H STANDARD, TIA-1019-A STANDARD, AS WELL AS ANY OTHER GOVERNING BUILDING CODES.

1.5 FIELD WORK WILL BE DONE AROUND EXISTING COAXIAL CABLE AND EQUIPMENT. ALL WORK SHALL BE DONE IN A MANNER SUCH THAT NO DAMAGE OCCURS TO THE EXISTING EQUIPMENT OR THE STRUCTURE.

1.6 A MINIMUM OF TWO COATS OF ZINGA COLD GALVANIZING COMPOUND (OR APPROVED EQUIVALENT) SHALL BE APPLIED TO ANY FIELD CUTS OR FIELD DRILLED HOLES.

1.7 THE USE OF A GAS TORCH OR WELDER WILL NOT BE PERMITTED ON THE TOWER WITHOUT THE CONSENT OF THE OWNER.

1.8 ALL FIELD CONNECTIONS SHALL BE MADE WITH A325N BOLTS, U.N.O.

1.9 IN LIEU OF TEMPORARY BRACING, CONTRACTOR MAY HAVE A STABILITY ANALYSIS PERFORMED BY AN ENGINEER LICENSED IN THE STATE THE TOWER IS LOCATED. THE ANALYSIS SHALL USE A MINIMUM WIND SPEED OF 45 mph (3-SEC) PER TIA-1019.

1.10 ALL CUTTING AND WELDING ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH CCUSA POLICY "CUTTING AND WELDING PLAN" (DOC #ENG-PLN-10015) ON AN ONGOING BASIS THROUGHOUT THE ENTIRE LIFE OF THE PROJECT.

1.11 DIMENSIONS WITH "±" MUST BE WITHIN 3" OF THE INDICATED DIMENSION.

FABRICATION

2.1 ALL WORK SHALL BE DONE IN ACCORDANCE WITH A.I.S.C. "SPECIFICATIONS FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS."

2.2 STRUCTURAL STEEL SHALL MEET THE FOLLOWING SPECIFICATIONS:

	YIELD	ASTM SPECS
STEEL PIPE, U.N.O.	35ksi	A53 GR.B

2.3 ALL NEW MATERIAL INCLUDING STRUCTURAL STEEL AND FASTENERS SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 AND A153.

2.4 WELDING SHALL MEET ANSI/AWS D1.1 STRUCTURAL WELDING CODE (LATEST REVISION). ELECTRODES SHALL BE E80 SERIES.

2.5 CONTRACTOR SHALL PROVIDE SHOP FABRICATION DRAWINGS TO B+T GROUP 5 DAYS PRIOR TO FABRICATION.

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CROWN CASTLE

HAMPTON / BERNIER

116 GRANT HILL RD.
BROOKLYN, CT 06234
WINDHAM

EXISTING PLATFORM
AT 137'-00"

PROJECT NO:	136355.003.01
CHECKED BY:	JV

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION
0	07/09/19	NGR	CONSTRUCTION

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/20

STATE OF CONNECTICUT
SCOTT M. VANCE
31627
LICENSED
PROFESSIONAL ENGINEER

7/9/19

SHEET NUMBER:	REVISION:
S2	0

Exhibit D

Structural Analysis Report

Date: **July 23, 2019**

Heather Simeone
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277

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

Subject: Structural Analysis Report

Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CT11511A
	Carrier Site Name:	Sprint- Brooklyn
Crown Castle Designation:	**Crown Castle BU Number:**	876390
	Crown Castle Site Name:	Hampton / Bernier
	Crown Castle JDE Job Number:	576719
	Crown Castle Work Order Number:	1750704
	Crown Castle Order Number:	494419 Rev. 0
Engineering Firm Designation:	**TEP Project Number:**	25693.284017
Site Data:	**116 Grant Hill Rd., Brooklyn, Windham County, CT 06234**	
	Latitude *41° 47' 29.64"*, Longitude *-72° 0' 54.04"*	
	150 Foot - Monopole Tower	

Dear Heather Simeone,

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

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

LC7: Proposed Equipment Configuration **Sufficient Capacity - 94.9%**

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

Structural analysis prepared by: Matthew Fry, E.I.T. / CJB

Respectfully submitted by:

William H. Martin, P.E., S.E.

Electronic Copy

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 150-ft monopole tower designed by Engineered Endeavors, Inc. The tower has been modified per reinforcement drawings prepared by Tower Engineering Professionals in May of 2008. All information provided to TEP was assumed to be accurate and complete.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	130 mph
Exposure Category:	B
Topographic Factor:	1.512
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
137.0	138.0	3	Ericsson	KRY 112 489/2	7	1-5/8
		3	Ericsson	RADIO 4449 B12/B71		
		3	RFS Celwave	APX16DWV-16DWV-S-E-A20 w/ Mount Pipe		
		3	RFS Celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe		
	137.0	1	Tower Mounts	Platform Mount [LP 1201-1]		
		2	Site Pro 1	HRK-14		
		1	Site Pro 1	PRK-SFS-L		

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)
149.0	151.0	3	Alcatel Lucent	PCS 1900MHz 4x45W-65MHz	4	1-1/4
		6	Alcatel Lucent	RRH2X50-800		
		3	Alcatel Lucent	TD-RRH8x20-25		
		3	Commscope	NNVV-65B-R4 w/ Mount Pipe		
		3	RFS Celwave	APXVTM14-ALU-I20 w/ Mount Pipe		
	149.0	1	Site Pro1	HRK12-3HD		
		1	Site Pro1	CAGE TOP		
129.0	129.0	1	Tower Mounts	Side Arm Mount [SO 102-3]	-	-
	127.0	3	Ericsson	TME-RRUS-11		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
127.0	129.0	3	KMW Communications	AM-X-CD-17-65-00T-RET w/ Mount Pipe	3 12	3/8 1-1/4
		6	Powerwave Technologies	7770.00 w/ Mount Pipe		
	127.0	6	Powerwave Technologies	LGP 17201		
		6	Powerwave Technologies	LGP13519		
		1	Raycap	DC6-48-60-18-8F		
		1	Tower Mounts	Side Arm Mount [SO 102-3]		
		1	Tower Mounts	T-Arm Mount [TA 601-3]		
117.0	119.0	3	Antel	BXA-171085-12CF-EDIN-2 w/ Mount Pipe	18	1-5/8
		3	Antel	BXA-70063-6CF-2 w/ Mount Pipe		
		6	Antel	LPA-80080/4CF w/ Mount Pipe		
	117.0	1	Tower Mounts	Platform Mount [LP 303-1]		
96.0	100.0	1	Telewave	ANT450F6	1	7/8
	96.0	1	Tower Mounts	Side Arm Mount [SO 701-1]		
90.0	100.0	1	Dbspectra	DS9A09F36D-N	2 1	1-1/4 1/2
	90.0	1	Bird Technologies Group	TTA-429-94C-08179		
		1	Tower Mounts	Pipe Mount [PM 601-1]		
		1	Tower Mounts	Side Arm Mount [SO 307-1]		
81.0	85.0	1	Telewave	ANT450F6	1	7/8
	81.0	1	Tower Mounts	Side Arm Mount [SO 701-1]		
76.0	77.0	1	Lucent	KS24019-L112A	1	1/2
	76.0	1	Tower Mounts	Side Arm Mount [SO 701-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
Geotechnical Report	Criscuolo Shepard Associates, PC	1615347	CCISites
Tower Foundation Drawings	Engineered Endeavors, Inc.	1615410	CCISites
Tower Manufacturer Drawings	Engineered Endeavors, Inc.	1533003	CCISites
Tower Reinforcement Drawings	Tower Engineering Professionals	2255030	CCISites
Post Modification Inspection	Tower Engineering Professionals	2383064	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.

3.2) Assumptions

1) The tower and foundation were built and maintained in accordance with the manufacturer's specification.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2, and the referenced drawings.
3) All tower components are in sufficient condition to carry their full design capacity.
4) 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.
5) All antenna mounts and mounting hardware are structurally sufficient to carry the full design capacity requirements of appurtenance wind area and weight as provided by the original manufacturer specifications. It is the carrier's responsibility to ensure compliance to the structural limitations of the existing and/or proposed antenna mounts. TEP did not perform a site visit to verify the size, condition or capacity of the antenna mounts and did not analyze antennas supporting mounts as part of this structural analysis report.
6) When applicable, the effective projected area (EPA) of appurtenances was determined by computation fluid dynamics (CFD) testing performed by Crown Castle. TEP assumes the means and methods used to determine the EPA's yields results that follow the intent of TIA-222-H and are accurate and complete.
7) TEP assumes that the anchor bolts are effective pier reinforcement and are properly terminated into the mat as mechanically anchored deformed reinforcement per ACI 318 Section 25.4.4.

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	ϕP_{allow} (K)	% Capacity	Pass / Fail
L1	150 - 123.29	Pole	TP22.9x17x0.1875	1	-10.14	802.65	65.9	Pass
L2	123.29 - 88.88	Pole	TP30x21.7696x0.3125	2	-16.95	1752.41	85.8	Pass
L3	88.88 - 43.8	Pole	TP39.2x28.4504x0.375	3	-28.27	2752.19	94.9	Pass
L4	43.8 - 0	Pole	TP48x37.2689x0.4375	4	-45.22	4056.91	89.9	Pass
							Summary	
						Pole (L3)	94.9	Pass
						RATING =	**94.9**	**Pass**

Table 5 - Tower Component Stresses vs. Capacity - LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Anchor Rods	-	89.8	Pass
1,2	Base Plate	-	80.4	Pass
1,2	Base Foundation Soil Interaction	-	83.8	Pass
1,2	Base Foundation Structural	-	55.4	Pass

Structure Rating (max from all components) =	**94.9%**

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

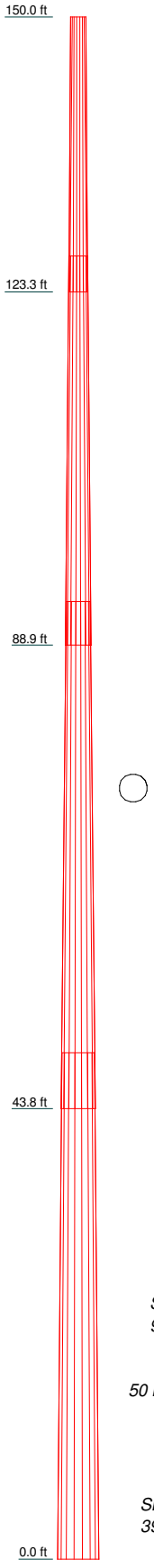
4.1) Recommendations

1) If the load differs from that described in Tables 1 and 2 of this report, the referenced drawings, or the provisions of this analysis are found to be invalid, another structural analysis should be performed.
2) The tower and its foundation have sufficient capacity to carry the proposed load configuration. No modifications are required at this time.

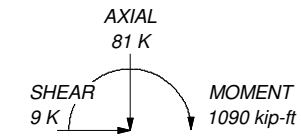
APPENDIX A

TNXTOWER OUTPUT

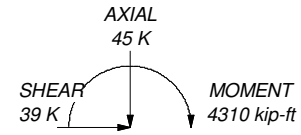
Section	1	2	3	4	5
Length (ft)	26.71	37.83	49.33	49.22	20.8
Number of Sides	18	18	18	18	1.1
Thickness (in)	0.1875	0.3125	0.3750	0.4375	3.3
Socket Length (ft)	3.42	4.25	5.42		6.7
Top Dia (in)	17.0000	21.7696	28.4504	37.2689	9.8
Bot Dia (in)	22.9000	30.0000	39.2000	48.0000	
Grade	A572-65				
Weight (K)	1.1	3.3	6.7	9.8	20.8



ALL REACTIONS ARE FACTORED



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



TORQUE 2 kip-ft
REACTIONS - 130 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
NNVV-65B-R4 w/ Mount Pipe	149	TME-RRUS-11	129
NNVV-65B-R4 w/ Mount Pipe	149	2.4" Dia. x 3-ft	129
NNVV-65B-R4 w/ Mount Pipe	149	2.4" Dia. x 3-ft	129
APXVTM14-ALU-I20 w/ Mount Pipe	149	2.4" Dia. x 3-ft	129
APXVTM14-ALU-I20 w/ Mount Pipe	149	Side Arm Mount [SO 102-3]	129
APXVTM14-ALU-I20 w/ Mount Pipe	149	2.4" Dia. x 4-ft	129
(2) RRH2X50-800	149	2.4" Dia. x 4-ft	129
(2) RRH2X50-800	149	2.4" Dia. x 4-ft	129
(2) RRH2X50-800	149	(2) 7770.00 w/ Mount Pipe	127
PCS 1900MHz 4x45W-65MHz	149	(2) 7770.00 w/ Mount Pipe	127
PCS 1900MHz 4x45W-65MHz	149	(2) 7770.00 w/ Mount Pipe	127
PCS 1900MHz 4x45W-65MHz	149	AM-X-CD-17-65-00T-RET w/ Mount Pipe	127
TD-RRH8x20-25	149	AM-X-CD-17-65-00T-RET w/ Mount Pipe	127
TD-RRH8x20-25	149	AM-X-CD-17-65-00T-RET w/ Mount Pipe	127
TD-RRH8x20-25	149	(2) LGP 17201	127
2.4" Dia. x 6-ft	149	(2) LGP 17201	127
2.4" Dia. x 6-ft	149	(2) LGP 17201	127
2.4" Dia. x 6-ft	149	(2) LGP13519	127
8' Ladder	149	(2) LGP13519	127
Miscellaneous [NA 507-1]	149	(2) LGP13519	127
Platform Mount [LP 712-1]	149	DC6-48-60-18-8F	127
Platform Mount [LP 303-1]	149	Side Arm Mount [SO 102-3]	127
APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	137	T-Arm Mount [TA 601-3]	127
APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	137	(2) LPA-80080/4CF w/ Mount Pipe	117
APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	137	(2) LPA-80080/4CF w/ Mount Pipe	117
APXVAARR24_43-U-NA20 w/ Mount Pipe	137	(2) LPA-80080/4CF w/ Mount Pipe	117
APXVAARR24_43-U-NA20 w/ Mount Pipe	137	BXA-70063-6CF-2 w/ Mount Pipe	117
APXVAARR24_43-U-NA20 w/ Mount Pipe	137	BXA-70063-6CF-2 w/ Mount Pipe	117
KRY 112 489/2	137	BXA-70063-6CF-2 w/ Mount Pipe	117
KRY 112 489/2	137	BXA-171085-12CF-EDIN-2 w/ Mount Pipe	117
KRY 112 489/2	137	BXA-171085-12CF-EDIN-2 w/ Mount Pipe	117
RADIO 4449 B12/B71	137	BXA-171085-12CF-EDIN-2 w/ Mount Pipe	117
RADIO 4449 B12/B71	137	Platform Mount [LP 303-1]	117
RADIO 4449 B12/B71	137	ANT450F6	96
2.4" Dia. x 6-ft	137	Side Arm Mount [SO 701-1]	96
2.4" Dia. x 6-ft	137	DS9A09F36D-N	90
2.4" Dia. x 6-ft	137	TTA-429-94C-08179	90
Platform Mount [LP 1201-1]	137	1.9" Dia. x 6-ft	90
Side Arm Mount [SO 102-3]	137	Pipe Mount [PM 601-1]	90
(2) Miscellaneous [NA 510-1]	137	Side Arm Mount [SO 307-1]	90
(2) L3x3x1/4 (5.5' long)	137	ANT450F6	81
(2) L3x3x1/4 (5.5' long)	137	Side Arm Mount [SO 701-1]	81
(2) L3x3x1/4 (5.5' long)	137	KS24019-L112A	76
TME-RRUS-11	129	Side Arm Mount [SO 701-1]	76
TME-RRUS-11	129		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Windham County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 130 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 5 with Crest Height of 110.00 ft
8. TOWER RATING: 94.9%

Tower Engineering Professionals

Tower Engineering Professionals, Inc.
326 Tryon Road
Raleigh, NC 27603
Phone: (619) 661-6351
FAX: (619) 661-6350

Job: ***Hampton / Bernier (BU 876390)***			
Project: ***TEP No. 25693.284017***			
Client: Crown Castle	Drawn by: CJB	App'd:	
Code: TIA-222-H	Date: 07/22/19	Scale: NTS	
Path: C:\Users\cbowen\Desktop\25693\876390_1750704_LC7.eri		Dwg No. E-1	

Tower Input Data

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

Tower is located in Windham County, Connecticut.
Tower base elevation above sea level: 715.00 ft.
Basic wind speed of 130 mph.
Risk Category II.
Exposure Category B.
Crest Height: 110.00 ft.
Rigorous Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Feature: Continuous Ridge.
Slope Distance L: 920.00 ft.
Distance from Crest x: 0.00 ft.
Horizontal Distance Downwind: No.
Nominal ice thickness of 1.5000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.05.
Tower analysis based on target reliabilities in accordance with Annex S.
Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	150.00-123.29	26.71	3.42	18	17.0000	22.9000	0.1875	0.7500	A572-65 (65 ksi)
L2	123.29-88.88	37.83	4.25	18	21.7696	30.0000	0.3125	1.2500	A572-65 (65 ksi)
L3	88.88-43.80	49.33	5.42	18	28.4504	39.2000	0.3750	1.5000	A572-65 (65 ksi)
L4	43.80-0.00	49.22		18	37.2689	48.0000	0.4375	1.7500	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	17.2333	10.0055	357.3078	5.9684	8.6360	41.3742	715.0858	5.0037	2.6620	14.197
	23.2243	13.5168	880.9281	8.0629	11.6332	75.7253	1763.0154	6.7597	3.7004	19.735
L2	22.8127	21.2827	1237.9543	7.6173	11.0589	111.9416	2477.5376	10.6434	3.2814	10.501
	30.4146	29.4463	3278.8026	10.5391	15.2400	215.1445	6561.9196	14.7259	4.7300	15.136
L3	29.7718	33.4167	3327.7548	9.9668	14.4528	230.2502	6659.8883	16.7115	4.3473	11.593
	39.7469	46.2115	8800.5544	13.7829	19.9136	441.9369	17612.6889	23.1101	6.2392	16.638
L4	38.9763	51.1450	8765.5170	13.0752	18.9326	462.9852	17542.5679	25.5774	5.7893	13.233
	48.6730	66.0465	18876.2818	16.8847	24.3840	774.1257	37777.4015	33.0295	7.6780	17.55

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 150.00-123.29				1	1	1			
L2 123.29-88.88				1	1	1			
L3 88.88-43.80				1	1	1			
L4 43.80-0.00				1	1	1			

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
137										
LDF7-50A(1-5/8)	A	No	Surface Ar (CaAa)	137.00 - 0.00	3	3	-0.250 -0.250	1.9800		0.82
117										
LDF7-50A(1-5/8)	B	No	Surface Ar (CaAa)	117.00 - 0.00	18	9	0.250 0.250	1.9800		0.82
***										
Safety Line 3/8	C	No	Surface Ar	150.00 -	1	1	0.000	0.3750		0.22

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
** *			(CaAa)	0.00			0.000			

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
149									
HB114-1-0813U4-M5J(1-1/4)	C	No	No	Inside Pole	149.00 - 0.00	3	No Ice	0.00	1.20
							1/2" Ice	0.00	1.20
							1" Ice	0.00	1.20
							2" Ice	0.00	1.20
HB114-13U3M12-XXXF(1-1/4)	C	No	No	Inside Pole	149.00 - 0.00	1	No Ice	0.00	0.99
							1/2" Ice	0.00	0.99
							1" Ice	0.00	0.99
							2" Ice	0.00	0.99
HCS 6X12 4AWG(1-5/8")	A	No	No	Inside Pole	137.00 - 0.00	1	No Ice	0.00	2.40
							1/2" Ice	0.00	2.40
							1" Ice	0.00	2.40
							2" Ice	0.00	2.40
LDF7-50A(1-5/8)	A	No	No	Inside Pole	137.00 - 0.00	3	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
							2" Ice	0.00	0.82
127									
LDF6-50A(1-1/4)	C	No	No	Inside Pole	127.00 - 0.00	12	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
FB-L98B-002-75000 (3/8)	C	No	No	Inside Pole	127.00 - 0.00	3	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
2" Flexible Conduit	C	No	No	Inside Pole	127.00 - 0.00	1	No Ice	0.00	0.34
							1/2" Ice	0.00	0.34
							1" Ice	0.00	0.34
							2" Ice	0.00	0.34
96									
HCC 78-50J(7/8")	B	No	No	CaAa (Out Of Face)	96.00 - 0.00	1	No Ice	0.00	0.53
							1/2" Ice	0.00	1.51
							1" Ice	0.00	3.10
							2" Ice	0.00	8.10
90									
LDF4-50A(1/2)	B	No	No	CaAa (Out Of Face)	90.00 - 0.00	1	No Ice	0.00	0.15
							1/2" Ice	0.00	0.84
							1" Ice	0.00	2.14
							2" Ice	0.00	6.56
LDF6-50A(1-1/4)	B	No	No	CaAa (Out Of Face)	90.00 - 0.00	2	No Ice	0.00	0.60
							1/2" Ice	0.00	1.85
							1" Ice	0.00	3.72
							2" Ice	0.00	9.27
81									
HCC 78-50J(7/8")	B	No	No	CaAa (Out Of Face)	81.00 - 0.00	1	No Ice	0.00	0.53
							1/2" Ice	0.00	1.51

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
							1" Ice	0.00	3.10
							2" Ice	0.00	8.10
76									
LDF4-50A(1/2)	A	No	No	Inside Pole	76.00 - 0.00	1	No Ice	0.00	0.15
							1/2" Ice	0.00	0.15
							1" Ice	0.00	0.15
							2" Ice	0.00	0.15
**									
*									

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	150.00-123.29	A	0.000	0.000	8.144	0.000	0.10
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	1.002	0.000	0.15
L2	123.29-88.88	A	0.000	0.000	20.440	0.000	0.25
		B	0.000	0.000	50.110	0.000	0.42
		C	0.000	0.000	1.290	0.000	0.43
L3	88.88-43.80	A	0.000	0.000	26.778	0.000	0.33
		B	0.000	0.000	80.333	0.000	0.77
		C	0.000	0.000	1.691	0.000	0.56
L4	43.80-0.00	A	0.000	0.000	26.017	0.000	0.33
		B	0.000	0.000	78.052	0.000	0.75
		C	0.000	0.000	1.643	0.000	0.55

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	150.00-123.29	A	1.598	0.000	0.000	15.658	0.000	0.27
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	9.539	0.000	0.26
L2	123.29-88.88	A	1.585	0.000	0.000	39.298	0.000	0.68
		B		0.000	0.000	73.873	0.000	1.46
		C		0.000	0.000	12.289	0.000	0.56
L3	88.88-43.80	A	1.554	0.000	0.000	51.337	0.000	0.90
		B		0.000	0.000	118.281	0.000	3.56
		C		0.000	0.000	15.983	0.000	0.74
L4	43.80-0.00	A	1.441	0.000	0.000	49.537	0.000	0.86
		B		0.000	0.000	114.580	0.000	3.44
		C		0.000	0.000	15.255	0.000	0.71

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	150.00-123.29	-2.2645	0.2423	-1.8929	1.0032
L2	123.29-88.88	3.3821	0.1197	2.1845	0.6095
L3	88.88-43.80	4.6824	0.1306	3.2102	0.6681
L4	43.80-0.00	5.3351	0.1524	3.5938	0.7547

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	9	LDF7-50A(1-5/8)	123.29 - 137.00	1.0000	1.0000
L1	28	Safety Line 3/8	123.29 - 150.00	1.0000	1.0000
L1	15	LDF7-50A(1-5/8)	123.29 - 117.00	1.0000	1.0000
L2	9	LDF7-50A(1-5/8)	88.88 - 123.29	1.0000	1.0000
L2	15	LDF7-50A(1-5/8)	88.88 - 117.00	1.0000	1.0000
L2	28	Safety Line 3/8	88.88 - 123.29	1.0000	1.0000
L3	9	LDF7-50A(1-5/8)	43.80 - 88.88	1.0000	1.0000
L3	15	LDF7-50A(1-5/8)	43.80 - 88.88	1.0000	1.0000
L3	28	Safety Line 3/8	43.80 - 88.88	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
149									
NNVV-65B-R4 w/ Mount Pipe	A	From Centroid-Leg	4.00 -6.00 2.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice	12.51 13.11 13.67 14.82	7.41 8.60 9.50 11.33	0.10 0.19 0.29 0.52
NNVV-65B-R4 w/ Mount Pipe	B	From Centroid-Leg	4.00 -6.00 2.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice	12.51 13.11 13.67 14.82	7.41 8.60 9.50 11.33	0.10 0.19 0.29 0.52
NNVV-65B-R4 w/ Mount Pipe	C	From Centroid-Leg	4.00 -6.00 2.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice	12.51 13.11 13.67 14.82	7.41 8.60 9.50 11.33	0.10 0.19 0.29 0.52

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
APXVTM14-ALU-I20 w/ Mount Pipe	A	From Centroid-Leg	4.00 6.00 2.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.48 4.88 5.71	2.86 3.23 3.61 4.40	0.08 0.13 0.19 0.33
APXVTM14-ALU-I20 w/ Mount Pipe	B	From Centroid-Leg	4.00 6.00 2.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.48 4.88 5.71	2.86 3.23 3.61 4.40	0.08 0.13 0.19 0.33
APXVTM14-ALU-I20 w/ Mount Pipe	C	From Centroid-Leg	4.00 6.00 2.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.48 4.88 5.71	2.86 3.23 3.61 4.40	0.08 0.13 0.19 0.33
(2) RRH2X50-800	A	From Centroid-Leg	4.00 -2.00 2.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.13 2.32 2.51 2.92	1.77 1.95 2.13 2.51	0.05 0.07 0.10 0.16
(2) RRH2X50-800	B	From Centroid-Leg	4.00 -6.00 2.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.13 2.32 2.51 2.92	1.77 1.95 2.13 2.51	0.05 0.07 0.10 0.16
(2) RRH2X50-800	B	From Centroid-Leg	4.00 6.00 2.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.13 2.32 2.51 2.92	1.77 1.95 2.13 2.51	0.05 0.07 0.10 0.16
PCS 1900MHz 4x45W-65MHz	A	From Centroid-Leg	4.00 -2.00 2.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.32 2.53 2.74 3.19	2.24 2.44 2.65 3.09	0.06 0.08 0.11 0.17
PCS 1900MHz 4x45W-65MHz	B	From Centroid-Leg	4.00 -6.00 2.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.32 2.53 2.74 3.19	2.24 2.44 2.65 3.09	0.06 0.08 0.11 0.17
PCS 1900MHz 4x45W-65MHz	B	From Centroid-Leg	4.00 6.00 2.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.32 2.53 2.74 3.19	2.24 2.44 2.65 3.09	0.06 0.08 0.11 0.17
TD-RRH8x20-25	A	From Centroid-Leg	4.00 -2.00 2.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.70 3.95 4.20 4.72	1.29 1.46 1.64 2.02	0.07 0.09 0.12 0.18
TD-RRH8x20-25	B	From Centroid-Leg	4.00 -6.00 2.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.70 3.95 4.20 4.72	1.29 1.46 1.64 2.02	0.07 0.09 0.12 0.18
TD-RRH8x20-25	B	From Centroid-Leg	4.00 6.00 2.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.70 3.95 4.20 4.72	1.29 1.46 1.64 2.02	0.07 0.09 0.12 0.18
2.4" Dia. x 6-ft	A	From Centroid-Leg	4.00 0.00 2.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	0.02 0.03 0.05 0.09
2.4" Dia. x 6-ft	B	From Centroid-Leg	4.00 0.00 2.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	0.02 0.03 0.05 0.09
2.4" Dia. x 6-ft	C	From	4.00	0.0000	149.00	No Ice	1.43	1.43	0.02

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
		Centroid-Leg	0.00 2.00			1/2" Ice 1" Ice 2" Ice	1.92 2.29 3.06	1.92 2.29 3.06	0.03 0.05 0.09
8' Ladder	C	From Centroid-Leg	2.00 0.00 -2.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.53 4.36 7.19 12.86	5.33 8.08 10.83 16.33	0.10 0.11 0.13 0.16
Miscellaneous [NA 507-1]	C	None		0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.80 6.70 8.60 12.40	4.80 6.70 8.60 12.40	0.25 0.29 0.34 0.44
Platform Mount [LP 712-1]	C	None		0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice	24.53 29.94 35.35 46.17	24.53 29.94 35.35 46.17	1.34 1.65 1.96 2.58
Platform Mount [LP 303-1]	C	None		0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice	14.66 18.87 23.08 31.50	14.66 18.87 23.08 31.50	1.25 1.48 1.71 2.18
137									
APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	A	From Centroid-Leg	4.00 -6.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.29 6.86 7.45 8.68	2.76 3.27 3.79 4.90	0.06 0.11 0.16 0.29
APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	B	From Centroid-Leg	4.00 -6.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.29 6.86 7.45 8.68	2.76 3.27 3.79 4.90	0.06 0.11 0.16 0.29
APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	C	From Centroid-Leg	4.00 -6.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.29 6.86 7.45 8.68	2.76 3.27 3.79 4.90	0.06 0.11 0.16 0.29
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Centroid-Leg	4.00 6.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	14.69 15.46 16.23 17.82	6.87 7.55 8.25 9.67	0.19 0.31 0.46 0.79
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Centroid-Leg	4.00 6.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	14.69 15.46 16.23 17.82	6.87 7.55 8.25 9.67	0.19 0.31 0.46 0.79
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Centroid-Leg	4.00 6.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	14.69 15.46 16.23 17.82	6.87 7.55 8.25 9.67	0.19 0.31 0.46 0.79
KRY 112 489/2	A	From Centroid-Leg	4.00 -6.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.56 0.66 0.76 1.00	0.37 0.45 0.54 0.75	0.02 0.02 0.03 0.05
KRY 112 489/2	B	From Centroid-Leg	4.00 -6.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.56 0.66 0.76 1.00	0.37 0.45 0.54 0.75	0.02 0.02 0.03 0.05
KRY 112 489/2	C	From Centroid-Leg	4.00 -6.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.56 0.66 0.76 1.00	0.37 0.45 0.54 0.75	0.02 0.02 0.03 0.05
RADIO 4449 B12/B71	A	From	4.00	0.0000	137.00	No Ice	1.64	1.15	0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
		Centroid-Leg	6.00 1.00			1/2" Ice 1" Ice 2" Ice	1.80 1.97 2.33	1.29 1.44 1.75	0.09 0.11 0.15
RADIO 4449 B12/B71	B	From Centroid-Leg	4.00 6.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.64 1.80 1.97 2.33	1.15 1.29 1.44 1.75	0.07 0.09 0.11 0.15
RADIO 4449 B12/B71	C	From Centroid-Leg	4.00 6.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.64 1.80 1.97 2.33	1.15 1.29 1.44 1.75	0.07 0.09 0.11 0.15
2.4" Dia. x 6-ft	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	0.02 0.03 0.05 0.09
2.4" Dia. x 6-ft	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	0.02 0.03 0.05 0.09
2.4" Dia. x 6-ft	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	0.02 0.03 0.05 0.09
Platform Mount [LP 1201-1]	C	None		0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	23.10 26.80 30.50 37.90	23.10 26.80 30.50 37.90	2.10 2.50 2.90 3.70
Side Arm Mount [SO 102-3]	C	None		0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.00 3.48 3.96 4.92	3.00 3.48 3.96 4.92	0.08 0.11 0.14 0.20
(2) Miscellaneous [NA 510-1]	C	None		0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.00 8.50 11.00 16.00	6.00 8.50 11.00 16.00	0.26 0.34 0.41 0.56
(2) L3x3x1/4 (5.5' long)	A	From Centroid-Leg	2.00 0.00 0.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.61 3.01 3.41 4.24	2.61 3.01 3.41 4.24	0.03 0.04 0.06 0.12
(2) L3x3x1/4 (5.5' long)	B	From Centroid-Leg	2.00 0.00 0.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.61 3.01 3.41 4.24	2.61 3.01 3.41 4.24	0.03 0.04 0.06 0.12
(2) L3x3x1/4 (5.5' long)	C	From Centroid-Leg	2.00 0.00 0.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.61 3.01 3.41 4.24	2.61 3.01 3.41 4.24	0.03 0.04 0.06 0.12
129 TME-RRUS-11	A	From Leg	2.00 -2.00 -2.00	0.0000	129.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.79 3.00 3.21 3.67	1.19 1.34 1.50 1.84	0.05 0.07 0.09 0.15
TME-RRUS-11	B	From Leg	2.00 -2.00 -2.00	-10.0000	129.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.79 3.00 3.21 3.67	1.19 1.34 1.50 1.84	0.05 0.07 0.09 0.15
TME-RRUS-11	C	From Leg	2.00	-10.0000	129.00	No Ice	2.79	1.19	0.05

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			-2.00			1/2" Ice	3.00	1.34	0.07
			-2.00			1" Ice	3.21	1.50	0.09
						2" Ice	3.67	1.84	0.15
2.4" Dia. x 3-ft	A	From Leg	2.00	0.0000	129.00	No Ice	0.58	0.58	0.01
			-2.00			1/2" Ice	0.77	0.77	0.02
			0.00			1" Ice	0.97	0.97	0.02
						2" Ice	1.39	1.39	0.05
2.4" Dia. x 3-ft	B	From Leg	2.00	0.0000	129.00	No Ice	0.58	0.58	0.01
			-2.00			1/2" Ice	0.77	0.77	0.02
			0.00			1" Ice	0.97	0.97	0.02
						2" Ice	1.39	1.39	0.05
2.4" Dia. x 3-ft	C	From Leg	2.00	0.0000	129.00	No Ice	0.58	0.58	0.01
			-2.00			1/2" Ice	0.77	0.77	0.02
			0.00			1" Ice	0.97	0.97	0.02
						2" Ice	1.39	1.39	0.05
Side Arm Mount [SO 102-3]	C	None		0.0000	129.00	No Ice	3.00	3.00	0.08
						1/2" Ice	3.48	3.48	0.11
						1" Ice	3.96	3.96	0.14
						2" Ice	4.92	4.92	0.20
2.4" Dia. x 4-ft	A	From Leg	2.00	0.0000	129.00	No Ice	0.87	0.00	0.01
			0.00			1/2" Ice	1.12	0.00	0.02
			0.00			1" Ice	1.37	0.00	0.03
						2" Ice	1.91	0.00	0.06
2.4" Dia. x 4-ft	B	From Leg	2.00	0.0000	129.00	No Ice	0.87	0.00	0.01
			0.00			1/2" Ice	1.12	0.00	0.02
			0.00			1" Ice	1.37	0.00	0.03
						2" Ice	1.91	0.00	0.06
2.4" Dia. x 4-ft	C	From Leg	2.00	0.0000	129.00	No Ice	0.87	0.00	0.01
			0.00			1/2" Ice	1.12	0.00	0.02
			0.00			1" Ice	1.37	0.00	0.03
						2" Ice	1.91	0.00	0.06
127									
(2) 7770.00 w/ Mount Pipe	A	From Leg	3.00	0.0000	127.00	No Ice	5.75	4.25	0.06
			0.00			1/2" Ice	6.18	5.01	0.10
			2.00			1" Ice	6.61	5.71	0.16
						2" Ice	7.49	7.16	0.29
(2) 7770.00 w/ Mount Pipe	B	From Leg	3.00	-10.0000	127.00	No Ice	5.75	4.25	0.06
			0.00			1/2" Ice	6.18	5.01	0.10
			2.00			1" Ice	6.61	5.71	0.16
						2" Ice	7.49	7.16	0.29
(2) 7770.00 w/ Mount Pipe	C	From Leg	3.00	-10.0000	127.00	No Ice	5.75	4.25	0.06
			0.00			1/2" Ice	6.18	5.01	0.10
			2.00			1" Ice	6.61	5.71	0.16
						2" Ice	7.49	7.16	0.29
AM-X-CD-17-65-00T-RET w/ Mount Pipe	A	From Leg	3.00	0.0000	127.00	No Ice	6.09	4.31	0.09
			0.00			1/2" Ice	6.66	4.86	0.17
			2.00			1" Ice	7.24	5.42	0.26
						2" Ice	8.43	6.57	0.48
AM-X-CD-17-65-00T-RET w/ Mount Pipe	B	From Leg	3.00	-10.0000	127.00	No Ice	6.09	4.31	0.09
			0.00			1/2" Ice	6.66	4.86	0.17
			2.00			1" Ice	7.24	5.42	0.26
						2" Ice	8.43	6.57	0.48
AM-X-CD-17-65-00T-RET w/ Mount Pipe	C	From Leg	3.00	-10.0000	127.00	No Ice	6.09	4.31	0.09
			0.00			1/2" Ice	6.66	4.86	0.17
			2.00			1" Ice	7.24	5.42	0.26
						2" Ice	8.43	6.57	0.48
(2) LGP 17201	A	From Leg	3.00	0.0000	127.00	No Ice	1.67	0.47	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			-5.00			1/2" Ice	1.83	0.57	0.04
			0.00			1" Ice	2.00	0.68	0.06
						2" Ice	2.36	0.91	0.09
(2) LGP 17201	B	From Leg	3.00	-10.0000	127.00	No Ice	1.67	0.47	0.03
			-5.00			1/2" Ice	1.83	0.57	0.04
			0.00			1" Ice	2.00	0.68	0.06
						2" Ice	2.36	0.91	0.09
(2) LGP 17201	C	From Leg	3.00	-10.0000	127.00	No Ice	1.67	0.47	0.03
			-5.00			1/2" Ice	1.83	0.57	0.04
			0.00			1" Ice	2.00	0.68	0.06
						2" Ice	2.36	0.91	0.09
(2) LGP13519	A	From Leg	3.00	0.0000	127.00	No Ice	0.29	0.18	0.01
			5.00			1/2" Ice	0.36	0.24	0.01
			0.00			1" Ice	0.44	0.31	0.01
						2" Ice	0.62	0.47	0.02
(2) LGP13519	B	From Leg	3.00	-10.0000	127.00	No Ice	0.29	0.18	0.01
			5.00			1/2" Ice	0.36	0.24	0.01
			0.00			1" Ice	0.44	0.31	0.01
						2" Ice	0.62	0.47	0.02
(2) LGP13519	C	From Leg	3.00	-10.0000	127.00	No Ice	0.29	0.18	0.01
			5.00			1/2" Ice	0.36	0.24	0.01
			0.00			1" Ice	0.44	0.31	0.01
						2" Ice	0.62	0.47	0.02
DC6-48-60-18-8F	B	From Leg	3.00	-10.0000	127.00	No Ice	1.21	1.21	0.03
			0.00			1/2" Ice	1.89	1.89	0.05
			0.00			1" Ice	2.11	2.11	0.08
						2" Ice	2.57	2.57	0.14
Side Arm Mount [SO 102-3]	C	None		0.0000	127.00	No Ice	3.00	3.00	0.08
						1/2" Ice	3.48	3.48	0.11
						1" Ice	3.96	3.96	0.14
						2" Ice	4.92	4.92	0.20
T-Arm Mount [TA 601-3]	C	None		0.0000	127.00	No Ice	10.90	10.90	0.73
						1/2" Ice	14.65	14.65	0.93
						1" Ice	18.40	18.40	1.13
						2" Ice	25.90	25.90	1.52
117									
(2) LPA-80080/4CF w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 2.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.11 3.58 4.02 4.90	6.82 7.65 8.35 9.81	0.03 0.08 0.14 0.27
(2) LPA-80080/4CF w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 2.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.11 3.58 4.02 4.90	6.82 7.65 8.35 9.81	0.03 0.08 0.14 0.27
(2) LPA-80080/4CF w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 2.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.11 3.58 4.02 4.90	6.82 7.65 8.35 9.81	0.03 0.08 0.14 0.27
BXA-70063-6CF-2 w/ Mount Pipe	A	From Centroid-Leg	4.00 -2.00 2.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.81 8.36 8.87 9.93	5.80 6.95 7.82 9.60	0.04 0.10 0.17 0.34
BXA-70063-6CF-2 w/ Mount Pipe	B	From Centroid-Leg	4.00 2.00 2.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.81 8.36 8.87 9.93	5.80 6.95 7.82 9.60	0.04 0.10 0.17 0.34
BXA-70063-6CF-2 w/ Mount	C	From	4.00	0.0000	117.00	No Ice	7.81	5.80	0.04

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Pipe		Centroid-Leg	2.00			1/2" Ice	8.36	6.95	0.10
			2.00			1" Ice	8.87	7.82	0.17
						2" Ice	9.93	9.60	0.34
BXA-171085-12CF-EDIN-2 w/ Mount Pipe	A	From Centroid-Leg	4.00	0.0000	117.00	No Ice	5.02	5.28	0.04
			2.00			1/2" Ice	5.57	6.45	0.09
			2.00			1" Ice	6.09	7.33	0.14
						2" Ice	7.15	9.13	0.27
BXA-171085-12CF-EDIN-2 w/ Mount Pipe	B	From Centroid-Leg	4.00	0.0000	117.00	No Ice	5.02	5.28	0.04
			-2.00			1/2" Ice	5.57	6.45	0.09
			2.00			1" Ice	6.09	7.33	0.14
						2" Ice	7.15	9.13	0.27
BXA-171085-12CF-EDIN-2 w/ Mount Pipe	C	From Centroid-Leg	4.00	0.0000	117.00	No Ice	5.02	5.28	0.04
			-2.00			1/2" Ice	5.57	6.45	0.09
			2.00			1" Ice	6.09	7.33	0.14
						2" Ice	7.15	9.13	0.27
Platform Mount [LP 303-1]	C	None		0.0000	117.00	No Ice	14.66	14.66	1.25
						1/2" Ice	18.87	18.87	1.48
						1" Ice	23.08	23.08	1.71
						2" Ice	31.50	31.50	2.18
96									
ANT450F6	C	From Leg	3.00	0.0000	96.00	No Ice	1.90	1.90	0.01
			0.00			1/2" Ice	2.73	2.73	0.02
			4.00			1" Ice	3.40	3.40	0.04
						2" Ice	4.40	4.40	0.10
Side Arm Mount [SO 701-1]	C	From Leg	1.50	0.0000	96.00	No Ice	0.85	1.67	0.07
			0.00			1/2" Ice	1.14	2.34	0.08
			0.00			1" Ice	1.43	3.01	0.09
						2" Ice	2.01	4.35	0.12
90									
DS9A09F36D-N	A	From Leg	5.00	0.0000	90.00	No Ice	6.33	6.33	0.08
			0.00			1/2" Ice	8.47	8.47	0.12
			10.00			1" Ice	10.63	10.63	0.18
						2" Ice	14.99	14.99	0.34
TTA-429-94C-08179	A	From Leg	5.00	0.0000	90.00	No Ice	1.03	1.03	0.01
			0.00			1/2" Ice	1.17	1.17	0.02
			0.00			1" Ice	1.32	1.32	0.04
						2" Ice	1.64	1.64	0.07
1.9" Dia. x 6-ft	A	From Leg	2.50	0.0000	90.00	No Ice	1.14	0.00	0.02
			0.00			1/2" Ice	1.76	0.00	0.03
			0.00			1" Ice	2.14	0.00	0.04
						2" Ice	2.90	0.00	0.08
Pipe Mount [PM 601-1]	A	From Leg	0.50	0.0000	90.00	No Ice	3.00	0.90	0.07
			0.00			1/2" Ice	3.74	1.12	0.08
			0.00			1" Ice	4.48	1.34	0.09
						2" Ice	5.96	1.78	0.12
Side Arm Mount [SO 307-1]	A	From Leg	2.50	0.0000	90.00	No Ice	0.98	2.60	0.05
			0.00			1/2" Ice	1.70	4.50	0.07
			0.00			1" Ice	2.42	6.40	0.09
						2" Ice	3.86	10.20	0.14
81									
ANT450F6	C	From Leg	3.00	0.0000	81.00	No Ice	1.90	1.90	0.01
			0.00			1/2" Ice	2.73	2.73	0.02
			4.00			1" Ice	3.40	3.40	0.04
						2" Ice	4.40	4.40	0.10
Side Arm Mount [SO 701-1]	C	From Leg	1.50	0.0000	81.00	No Ice	0.85	1.67	0.07
			0.00			1/2" Ice	1.14	2.34	0.08
			0.00			1" Ice	1.43	3.01	0.09

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	2.01	4.35	0.12
76									
KS24019-L112A	C	From Leg	3.00	30.0000	76.00	No Ice	0.08	0.08	0.01
			0.00			1/2" Ice	0.13	0.13	0.01
			1.00			1" Ice	0.19	0.19	0.01
						2" Ice	0.35	0.35	0.02
Side Arm Mount [SO 701-1]	C	From Leg	1.50	30.0000	76.00	No Ice	0.85	1.67	0.07
			0.00			1/2" Ice	1.14	2.34	0.08
			0.00			1" Ice	1.43	3.01	0.09
						2" Ice	2.01	4.35	0.12
**									

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp

Comb. No.	Description
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	150 - 123.29	Pole	Max Tension	48	0.00	-0.00	-0.00
			Max. Compression	26	-27.75	-3.33	-0.31
			Max. Mx	8	-10.24	-271.15	-6.18
			Max. My	14	-10.11	-7.21	-272.98
			Max. Vy	8	19.78	-271.15	-6.18
			Max. Vx	2	-19.96	4.98	272.65
			Max. Torque	14			1.12
L2	123.29 - 88.88	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-41.26	-4.21	0.62
			Max. Mx	8	-17.20	-1089.27	-12.94
			Max. My	2	-16.95	11.72	1108.75
			Max. Vy	8	26.98	-1089.27	-12.94
			Max. Vx	2	-27.99	11.72	1108.75
			Max. Torque	21			-2.40
L3	88.88 - 43.8	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-58.24	-7.59	4.67
			Max. Mx	8	-28.49	-2402.74	-22.26
			Max. My	2	-28.27	21.58	2496.09
			Max. Vy	8	31.97	-2402.74	-22.26
			Max. Vx	2	-34.18	21.58	2496.09
			Max. Torque	21			-2.46
L4	43.8 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-81.30	-13.12	6.25
			Max. Mx	8	-45.22	-4090.51	-32.95
			Max. My	2	-45.22	31.64	4310.11
			Max. Vy	8	36.58	-4090.51	-32.95
			Max. Vx	2	-39.46	31.64	4310.11
			Max. Torque	19			-2.20

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	30	81.30	-9.06	-0.04
	Max. H_x	20	45.27	36.52	0.23
	Max. H_z	2	45.27	0.23	39.40
	Max. M_x	2	4310.11	0.23	39.40
	Max. M_z	8	4090.51	-36.52	-0.23
	Max. Torsion	7	2.18	-31.52	18.22
	Min. Vert	11	33.95	-31.74	-18.61
	Min. H_x	8	45.27	-36.52	-0.23
	Min. H_z	14	45.27	-0.23	-39.40
	Min. M_x	14	-4305.24	-0.23	-39.40
	Min. M_z	20	-4083.19	36.52	0.23
	Min. Torsion	19	-2.19	31.52	-18.22

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	37.72	0.00	-0.00	-1.98	-3.00	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	45.27	-0.23	-39.40	-4310.11	31.64	-0.91
0.9 Dead+1.0 Wind 0 deg - No Ice	33.95	-0.23	-39.40	-4236.12	31.90	-0.92
1.2 Dead+1.0 Wind 30 deg - No Ice	45.27	18.07	-31.79	-3556.13	-2016.57	-1.78
0.9 Dead+1.0 Wind 30 deg - No Ice	33.95	18.07	-31.79	-3494.13	-1980.88	-1.79
1.2 Dead+1.0 Wind 60 deg - No Ice	45.27	31.52	-18.22	-2033.80	-3525.59	-2.17
0.9 Dead+1.0 Wind 60 deg - No Ice	33.95	31.52	-18.22	-1998.16	-3463.76	-2.18
1.2 Dead+1.0 Wind 90 deg - No Ice	45.27	36.52	0.23	32.95	-4090.51	-1.98
0.9 Dead+1.0 Wind 90 deg - No Ice	33.95	36.52	0.23	32.86	-4018.89	-1.99
1.2 Dead+1.0 Wind 120 deg - No Ice	45.27	31.74	18.61	2089.82	-3560.26	-1.27
0.9 Dead+1.0 Wind 120 deg - No Ice	33.95	31.74	18.61	2054.23	-3497.76	-1.27
1.2 Dead+1.0 Wind 150 deg - No Ice	45.27	18.46	32.01	3585.94	-2077.43	-0.23
0.9 Dead+1.0 Wind 150 deg - No Ice	33.95	18.46	32.01	3524.55	-2040.51	-0.22
1.2 Dead+1.0 Wind 180 deg - No Ice	45.27	0.23	39.40	4305.24	-39.08	0.88
0.9 Dead+1.0 Wind 180 deg - No Ice	33.95	0.23	39.40	4232.53	-37.37	0.89
1.2 Dead+1.0 Wind 210 deg - No Ice	45.27	-18.07	31.79	3551.32	2009.15	1.76
0.9 Dead+1.0 Wind 210 deg - No Ice	33.95	-18.07	31.79	3490.58	1975.43	1.78
1.2 Dead+1.0 Wind 240 deg - No Ice	45.27	-31.52	18.22	2029.00	3518.22	2.18
0.9 Dead+1.0 Wind 240 deg - No Ice	33.95	-31.52	18.22	1994.61	3458.35	2.19
1.2 Dead+1.0 Wind 270 deg - No Ice	45.27	-36.52	-0.23	-37.80	4083.19	2.01

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
0.9 Dead+1.0 Wind 270 deg - No Ice	33.95	-36.52	-0.23	-36.44	4013.51	2.01
1.2 Dead+1.0 Wind 300 deg - No Ice	45.27	-31.74	-18.61	-2094.72	3552.92	1.29
0.9 Dead+1.0 Wind 300 deg - No Ice	33.95	-31.74	-18.61	-2057.84	3492.37	1.29
1.2 Dead+1.0 Wind 330 deg - No Ice	45.27	-18.46	-32.01	-3590.85	2070.03	0.21
0.9 Dead+1.0 Wind 330 deg - No Ice	33.95	-18.46	-32.01	-3528.18	2035.08	0.21
1.2 Dead+1.0 Ice+1.0 Temp	81.30	0.00	-0.00	-6.25	-13.12	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	81.30	-0.04	-9.12	-1087.17	-6.17	-0.37
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	81.30	4.49	-7.88	-938.83	-544.13	-0.64
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	81.30	7.82	-4.52	-540.62	-939.83	-0.74
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	81.30	9.06	0.04	0.76	-1087.23	-0.64
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	81.30	7.87	4.60	540.25	-946.86	-0.37
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	81.30	4.57	7.92	933.29	-556.32	0.00
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	81.30	0.04	9.12	1074.59	-20.26	0.37
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	81.30	-4.49	7.88	926.27	517.70	0.64
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	81.30	-7.82	4.52	528.06	913.41	0.74
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	81.30	-9.06	-0.04	-13.33	1060.83	0.64
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	81.30	-7.87	-4.60	-552.83	920.45	0.37
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	81.30	-4.57	-7.92	-945.88	529.90	-0.00
Dead+Wind 0 deg - Service	37.72	-0.05	-7.91	-860.64	3.97	-0.18
Dead+Wind 30 deg - Service	37.72	3.62	-6.38	-710.07	-404.11	-0.36
Dead+Wind 60 deg - Service	37.72	6.32	-3.66	-406.75	-704.74	-0.45
Dead+Wind 90 deg - Service	37.72	7.33	0.05	5.01	-817.34	-0.41
Dead+Wind 120 deg - Service	37.72	6.37	3.73	414.88	-711.78	-0.26
Dead+Wind 150 deg - Service	37.72	3.70	6.42	713.04	-416.31	-0.05
Dead+Wind 180 deg - Service	37.72	0.05	7.91	856.57	-10.12	0.18
Dead+Wind 210 deg - Service	37.72	-3.62	6.38	706.00	397.97	0.36
Dead+Wind 240 deg - Service	37.72	-6.32	3.66	402.69	698.60	0.45
Dead+Wind 270 deg - Service	37.72	-7.33	-0.05	-9.08	811.19	0.41
Dead+Wind 300 deg - Service	37.72	-6.37	-3.73	-418.95	705.63	0.26
Dead+Wind 330 deg - Service	37.72	-3.70	-6.42	-717.11	410.17	0.05

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-37.72	0.00	-0.00	37.72	0.00	0.000%
2	-0.23	-45.27	-39.40	0.23	45.27	39.40	0.000%
3	-0.23	-33.95	-39.40	0.23	33.95	39.40	0.000%
4	18.07	-45.27	-31.79	-18.07	45.27	31.79	0.000%
5	18.07	-33.95	-31.79	-18.07	33.95	31.79	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
6	31.52	-45.27	-18.22	-31.52	45.27	18.22	0.000%
7	31.52	-33.95	-18.22	-31.52	33.95	18.22	0.000%
8	36.52	-45.27	0.23	-36.52	45.27	-0.23	0.000%
9	36.52	-33.95	0.23	-36.52	33.95	-0.23	0.000%
10	31.74	-45.27	18.61	-31.74	45.27	-18.61	0.000%
11	31.74	-33.95	18.61	-31.74	33.95	-18.61	0.000%
12	18.46	-45.27	32.01	-18.46	45.27	-32.01	0.000%
13	18.46	-33.95	32.01	-18.46	33.95	-32.01	0.000%
14	0.23	-45.27	39.40	-0.23	45.27	-39.40	0.000%
15	0.23	-33.95	39.40	-0.23	33.95	-39.40	0.000%
16	-18.07	-45.27	31.79	18.07	45.27	-31.79	0.000%
17	-18.07	-33.95	31.79	18.07	33.95	-31.79	0.000%
18	-31.52	-45.27	18.22	31.52	45.27	-18.22	0.000%
19	-31.52	-33.95	18.22	31.52	33.95	-18.22	0.000%
20	-36.52	-45.27	-0.23	36.52	45.27	0.23	0.000%
21	-36.52	-33.95	-0.23	36.52	33.95	0.23	0.000%
22	-31.74	-45.27	-18.61	31.74	45.27	18.61	0.000%
23	-31.74	-33.95	-18.61	31.74	33.95	18.61	0.000%
24	-18.46	-45.27	-32.01	18.46	45.27	32.01	0.000%
25	-18.46	-33.95	-32.01	18.46	33.95	32.01	0.000%
26	0.00	-81.30	0.00	-0.00	81.30	0.00	0.000%
27	-0.04	-81.30	-9.12	0.04	81.30	9.12	0.000%
28	4.49	-81.30	-7.88	-4.49	81.30	7.88	0.000%
29	7.82	-81.30	-4.52	-7.82	81.30	4.52	0.000%
30	9.06	-81.30	0.04	-9.06	81.30	-0.04	0.000%
31	7.87	-81.30	4.60	-7.87	81.30	-4.60	0.000%
32	4.57	-81.30	7.92	-4.57	81.30	-7.92	0.000%
33	0.04	-81.30	9.12	-0.04	81.30	-9.12	0.000%
34	-4.49	-81.30	7.88	4.49	81.30	-7.88	0.000%
35	-7.82	-81.30	4.52	7.82	81.30	-4.52	0.000%
36	-9.06	-81.30	-0.04	9.06	81.30	0.04	0.000%
37	-7.87	-81.30	-4.60	7.87	81.30	4.60	0.000%
38	-4.57	-81.30	-7.92	4.57	81.30	7.92	0.000%
39	-0.05	-37.72	-7.91	0.05	37.72	7.91	0.000%
40	3.62	-37.72	-6.38	-3.62	37.72	6.38	0.000%
41	6.32	-37.72	-3.66	-6.32	37.72	3.66	0.000%
42	7.33	-37.72	0.05	-7.33	37.72	-0.05	0.000%
43	6.37	-37.72	3.73	-6.37	37.72	-3.73	0.000%
44	3.70	-37.72	6.42	-3.70	37.72	-6.42	0.000%
45	0.05	-37.72	7.91	-0.05	37.72	-7.91	0.000%
46	-3.62	-37.72	6.38	3.62	37.72	-6.38	0.000%
47	-6.32	-37.72	3.66	6.32	37.72	-3.66	0.000%
48	-7.33	-37.72	-0.05	7.33	37.72	0.05	0.000%
49	-6.37	-37.72	-3.73	6.37	37.72	3.73	0.000%
50	-3.70	-37.72	-6.42	3.70	37.72	6.42	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00001059
2	Yes	5	0.00000001	0.00045078
3	Yes	5	0.00000001	0.00018375
4	Yes	7	0.00000001	0.00008969
5	Yes	6	0.00000001	0.00033084
6	Yes	7	0.00000001	0.00009096

7	Yes	6	0.00000001	0.00033614
8	Yes	5	0.00000001	0.00032417
9	Yes	5	0.00000001	0.00012856
10	Yes	7	0.00000001	0.00008851
11	Yes	6	0.00000001	0.00032444
12	Yes	7	0.00000001	0.00009020
13	Yes	6	0.00000001	0.00033159
14	Yes	5	0.00000001	0.00067301
15	Yes	5	0.00000001	0.00025944
16	Yes	7	0.00000001	0.00009045
17	Yes	6	0.00000001	0.00033417
18	Yes	7	0.00000001	0.00008911
19	Yes	6	0.00000001	0.00032861
20	Yes	5	0.00000001	0.00079027
21	Yes	5	0.00000001	0.00031952
22	Yes	7	0.00000001	0.00009050
23	Yes	6	0.00000001	0.00033287
24	Yes	7	0.00000001	0.00008896
25	Yes	6	0.00000001	0.00032630
26	Yes	4	0.00000001	0.00013745
27	Yes	6	0.00000001	0.00029865
28	Yes	6	0.00000001	0.00083488
29	Yes	6	0.00000001	0.00084688
30	Yes	6	0.00000001	0.00030016
31	Yes	6	0.00000001	0.00084365
32	Yes	6	0.00000001	0.00085969
33	Yes	6	0.00000001	0.00029676
34	Yes	6	0.00000001	0.00078544
35	Yes	6	0.00000001	0.00077180
36	Yes	6	0.00000001	0.00029459
37	Yes	6	0.00000001	0.00083619
38	Yes	6	0.00000001	0.00082284
39	Yes	4	0.00000001	0.00036761
40	Yes	5	0.00000001	0.00026499
41	Yes	5	0.00000001	0.00027090
42	Yes	4	0.00000001	0.00035751
43	Yes	5	0.00000001	0.00027476
44	Yes	5	0.00000001	0.00028753
45	Yes	4	0.00000001	0.00040528
46	Yes	5	0.00000001	0.00025954
47	Yes	5	0.00000001	0.00025205
48	Yes	4	0.00000001	0.00042837
49	Yes	5	0.00000001	0.00028387
50	Yes	5	0.00000001	0.00027293

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	150 - 123.29 (1)	TP22.9x17x0.1875	26.71	0.00	0.0	13.0672	-10.14	764.43	0.013
L2	123.29 - 88.88 (2)	TP30x21.7696x0.3125	37.83	0.00	0.0	28.5292	-16.95	1668.96	0.010
L3	88.88 - 43.8 (3)	TP39.2x28.4504x0.375	49.33	0.00	0.0	44.8057	-28.27	2621.13	0.011

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L4	43.8 - 0 (4)	TP48x37.2689x0.4375	49.22	0.00	0.0	66.0465	-45.22	3863.72	0.012

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	150 - 123.29 (1)	TP22.9x17x0.1875	277.63	413.83	0.671	0.00	413.83	0.000
L2	123.29 - 88.88 (2)	TP30x21.7696x0.3125	1108.82	1249.92	0.887	0.00	1249.92	0.000
L3	88.88 - 43.8 (3)	TP39.2x28.4504x0.375	2496.19	2537.12	0.984	0.00	2537.12	0.000
L4	43.8 - 0 (4)	TP48x37.2689x0.4375	4310.23	4628.73	0.931	0.00	4628.73	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	150 - 123.29 (1)	TP22.9x17x0.1875	20.06	229.33	0.087	0.79	440.97	0.002
L2	123.29 - 88.88 (2)	TP30x21.7696x0.3125	27.99	500.69	0.056	0.08	1261.18	0.000
L3	88.88 - 43.8 (3)	TP39.2x28.4504x0.375	34.18	786.34	0.043	0.91	2592.30	0.000
L4	43.8 - 0 (4)	TP48x37.2689x0.4375	39.46	1159.12	0.034	0.91	4828.05	0.000

Pole Interaction Design Data

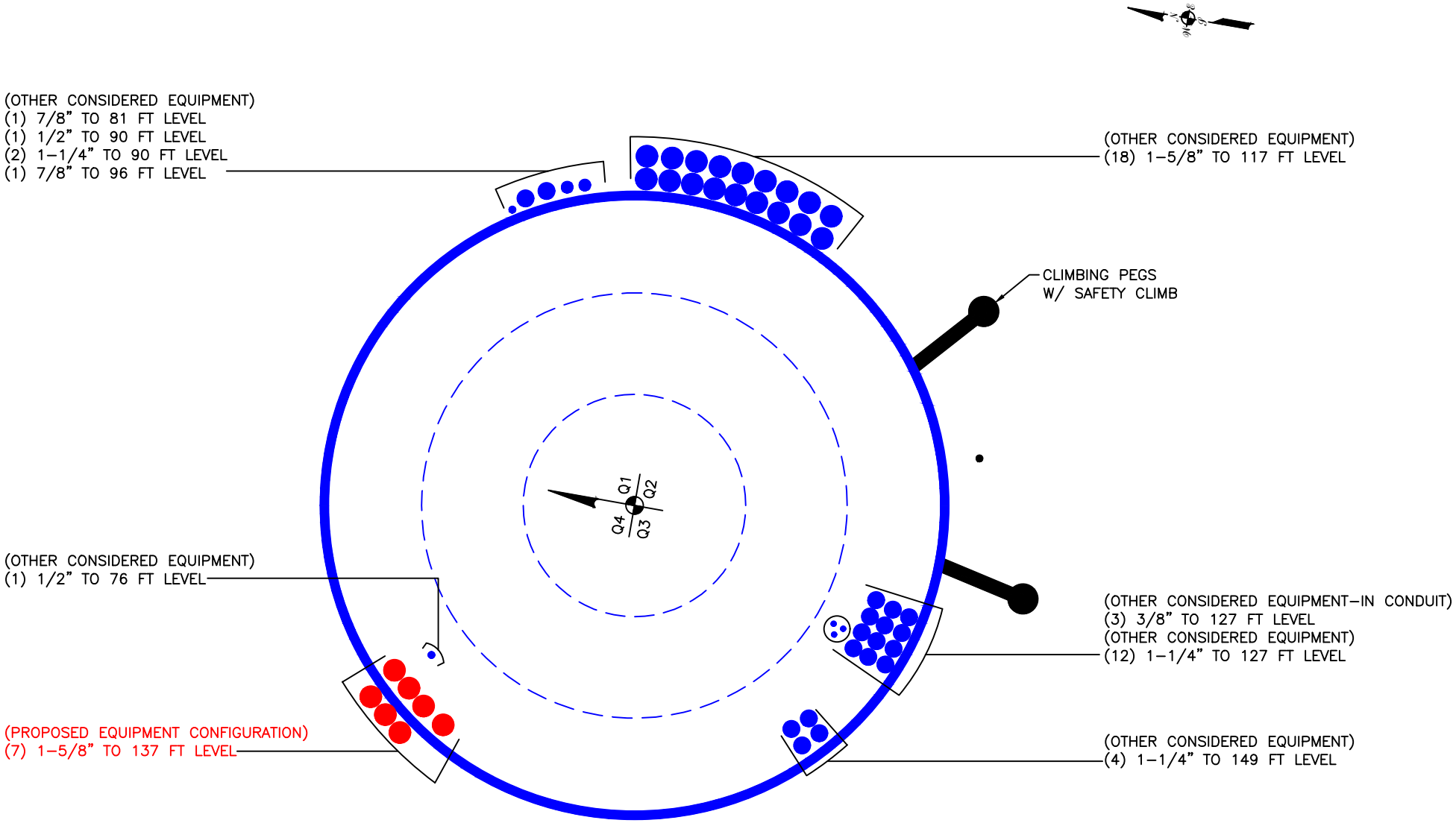
Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150 - 123.29 (1)	0.013	0.671	0.000	0.087	0.002	0.692	1.050	4.8.2
L2	123.29 - 88.88 (2)	0.010	0.887	0.000	0.056	0.000	0.900	1.050	4.8.2
L3	88.88 - 43.8 (3)	0.011	0.984	0.000	0.043	0.000	0.997	1.050	4.8.2
L4	43.8 - 0 (4)	0.012	0.931	0.000	0.034	0.000	0.944	1.050	4.8.2

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	150 - 123.29	Pole	TP22.9x17x0.1875	1	-10.14	802.65	65.9	Pass
L2	123.29 - 88.88	Pole	TP30x21.7696x0.3125	2	-16.95	1752.41	85.8	Pass
L3	88.88 - 43.8	Pole	TP39.2x28.4504x0.375	3	-28.27	2752.19	94.9	Pass
L4	43.8 - 0	Pole	TP48x37.2689x0.4375	4	-45.22	4056.91	89.9	Pass
							Summary	
						Pole (L3)	94.9	Pass
						RATING =	**94.9**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 876390 TOWER ID: C_BASELEVEL

APPENDIX C

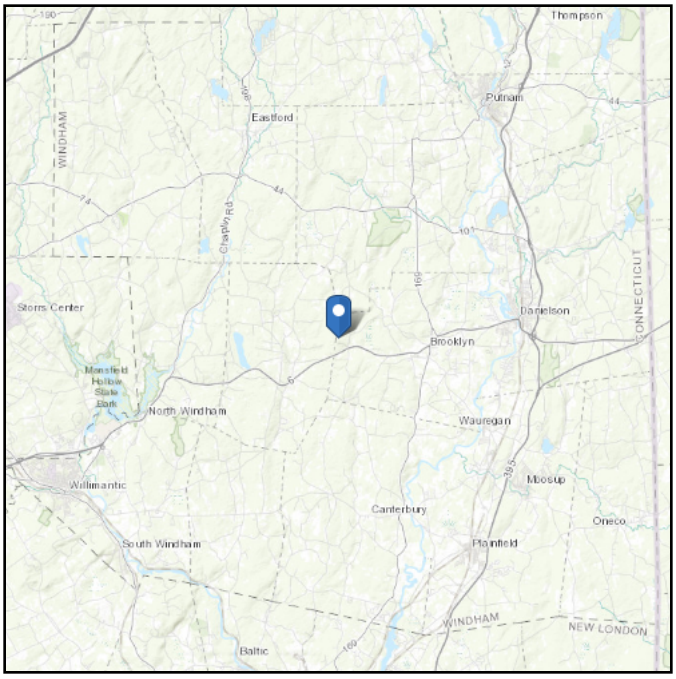
ADDITIONAL CALCULATIONS

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 715.2 ft (NAVD 88)
Latitude: 41.791567
Longitude: -72.015011



Wind

Results:

Wind Speed:	129 Vmph 130 Vmph per Jurisdiction
10-year MRI	78 Vmph
25-year MRI	88 Vmph
50-year MRI	96 Vmph
100-year MRI	105 Vmph

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

Date Accessed: Wed Mar 06 2019

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

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

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

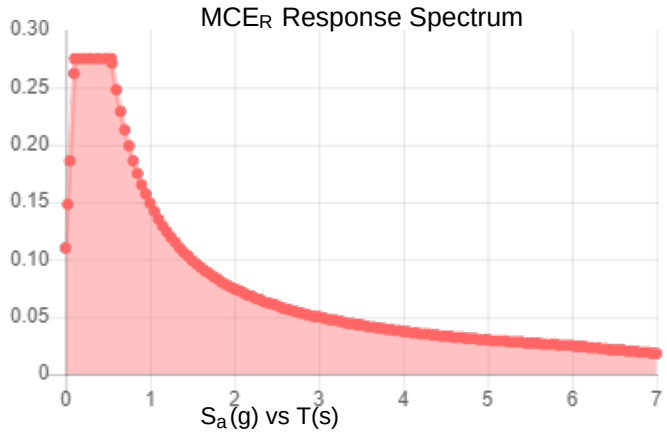
Seismic

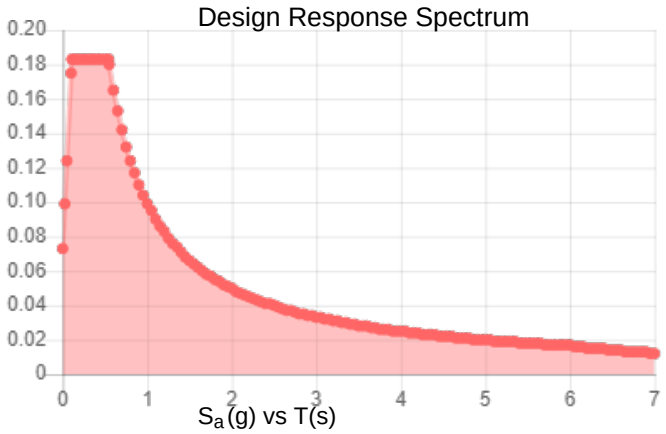
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.172	S_{DS} :	0.183
S_1 :	0.062	S_{D1} :	0.099
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.086
S_{MS} :	0.275	PGA_M :	0.137
S_{M1} :	0.149	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B





Data Accessed: Wed Mar 06 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:	0.75 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Wed Mar 06 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.

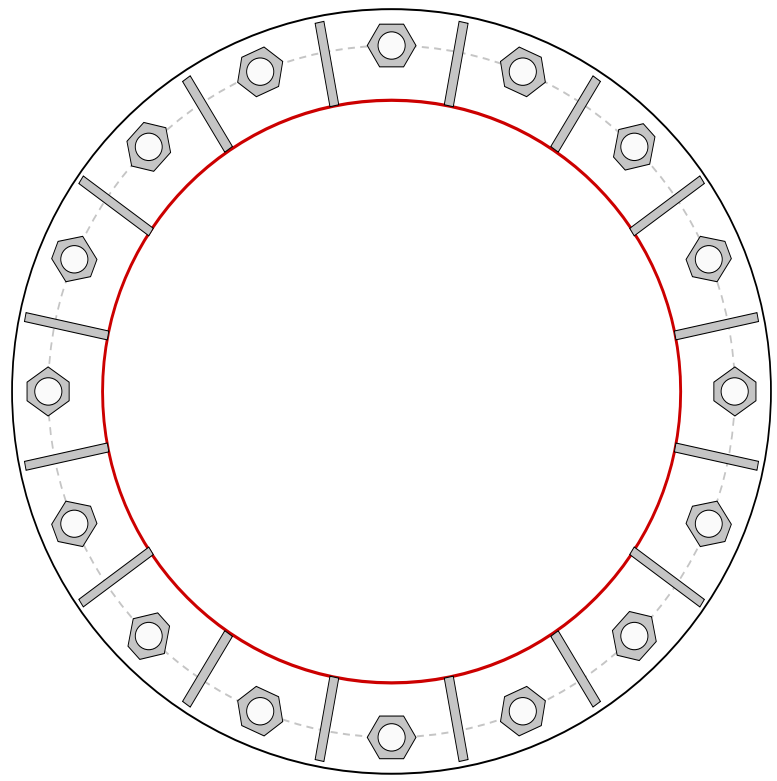
Monopole Base Plate Connection

Site Info	
BU #	876390
Site Name	Hampton / Bernier
Order #	494419 Rev. 0

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	1

Applied Loads	
Moment (kip-ft)	4310.23
Axial Force (kips)	45.22
Shear Force (kips)	39.46

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

(16) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 57" BC

Base Plate Data

63" OD x 2" Plate (A871 Gr 60; Fy=60 ksi, Fu=75 ksi)

Stiffener Data

(16) 18"H x 7"W x 0.75"T, Notch: 0.75"
plate: Fy= 50 ksi ; weld: Fy= 70 ksi
horiz. weld: 0.375" groove, 45° dbl bevelFALSE
vert. weld: 0.375" fillet

Pole Data

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

Analysis Results

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

Pu_c = 229.54	ϕPn_c = 243.75	**Stress Rating**
Vu = 2.47	ϕVn = 73.13	**89.8%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary

Max Stress (ksi):	39.66	(Roark's Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	**69.9%**	**Pass**

Stiffener Summary

Horizontal Weld:	**73.2%**	**Pass**
Vertical Weld:	**55.2%**	**Pass**
Plate Flexure+Shear:	**27.1%**	**Pass**
Plate Tension+Shear:	**74.2%**	**Pass**
Plate Compression:	**80.4%**	**Pass**

Pole Summary

Punching Shear:	**14.2%**	**Pass**

Pier and Pad Foundation

BU # :	876390
Site Name:	Hampton / Bernier
App. Number:	494419 Rev. 0

TIA-222 Revision:	H
Tower Type:	Monopole

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

Superstructure Analysis Reactions

Compression, P_{comp}:	45	kips
Base Shear, Vu_comp:	39	kips
Moment, M_u:	4310	ft-kips
Tower Height, **H**:	150	ft
BP Dist. Above Fdn, bp_{dist}:	3.25	in

Pier Properties

Pier Shape:	Square	
Pier Diameter, **dpier**:	6.5	ft
Ext. Above Grade, **E**:	1	ft
Pier Rebar Size, **Sc**:	9	
Pier Rebar Quantity, **mc**:	26	
Pier Tie/Spiral Size, **St**:	4	
Pier Tie/Spiral Quantity, **mt**:	4	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier}:	3	in

Pad Properties

Depth, **D**:	5	ft
Pad Width, **W**:	25.25	ft
Pad Thickness, **T**:	3	ft
Pad Rebar Size (Top), Sp_{top}:	9	
Pad Top Rebar Quantity (Top), mp_{top}:	20	
Pad Rebar Size (Bottom), **Sp**:	9	
Pad Rebar Quantity (Bottom), **mp**:	35	
Pad Clear Cover, cc_{pad}:	3	in

Material Properties

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

Soil Properties

Total Soil Unit Weight, γ:	125	pcf
Ultimate Net Bearing, Qnet:	16.000	ksf
Cohesion, **Cu**:	0.000	ksf
Friction Angle, φ:	30	degrees
SPT Blow Count, N_{blows}:	6	
Base Friction, μ:	0.5	
Neglected Depth, **N**:	3.33	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, **gw**:	n/a	ft

<--Toggle between Gross and Net

Foundation Analysis Checks

	Capacity	Demand	Rating*	Check
Lateral (Sliding) (kips)	215.53	39.00	**17.2%**	**Pass**
Bearing Pressure (ksf)	12.47	3.62	**29.0%**	**Pass**
*Overturning (kip*ft)*	5435.92	4554.56	**83.8%**	**Pass**
Pier Compression (kip)	26891.28	67.82	**0.2%**	**Pass**
*Pad Flexure (kip*ft)*	4770.48	2415.69	**48.2%**	**Pass**
Pad Shear - 1-way (kips)	899.95	334.75	**35.4%**	**Pass**
Pad Shear - 2-way (Comp) (ksi)	0.190	0.000	**0.0%**	**Pass**
*Flexural 2-way (Comp) (kip*ft)*	4566.12	2656.20	**55.4%**	**Pass**

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

Soil Rating*:	**83.8%**
Structural Rating*:	**55.4%**

		PASS	PASS	Hampton / Bernier (BU 876390)	
	Results Summary:	LC1	LC2	TEP #:	25693.284017
	Soil Interaction:	N/A	N/A	Analysis:	MKF 7/22/2019
Drilled Caisson Tool - Input	Foundation Structural*:	37.4%	9.4%	Check:	CJB 7/22/2019

*Rating per TIA-222-H Section 15.5

Code Revisions: TIA-222-H ACI 318-14 **Tower Type:** Monopole

	LC1	LC2	
Moment:	4,310.00	1,090.00	kip-ft
Axial (download):	45.00	81.00	kip
Shear:	39.00	9.00	kip
Axial (uplift):			kip

Shaft Information

Diameter:	6.50	ft
Projection:	1.00	ft
Caisson Length:	3.00	ft
f'c:	4.000	ksi
Max εc:	0.003	in/in

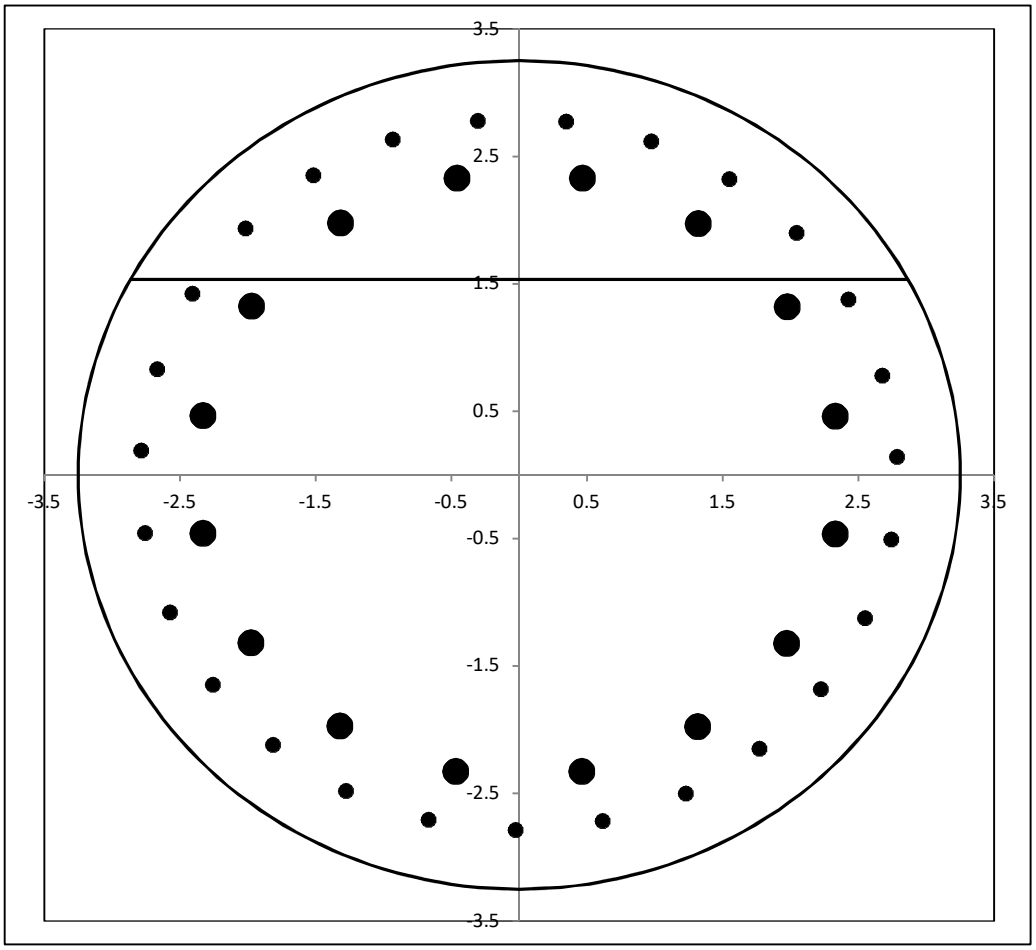
Cage 1 Reinforcement

Tie Bar Size:	4	*(fy = 60.0 ksi)*
Clear Cover to Tie:	4.44	*in (Cage Ø = 66.99in)*
Tie Bar Spacing:	10.00	in
Vertical Bar Size:	9	
Vertical Bar Quantity:	27	*(ρ =0.565%)*
fy:	60.0	ksi
E:	29,000	ksi

Cage 2 Reinforcement

Cage Diameter:	57.00	in	
Offset Angle:	0.0	degrees	
Vertical Bar Size:	Other	**→ Anet =**	3.25
Vertical Bar Qty:	16	*(ρ =1.088%)*	
Cage 2 resists compression?	Yes		
Effective Cage Depth:	3	ft	
fy:	75	ksi	
E:	29,000	ksi	

Reinforcement Capacity



		LC1	LC2	
	Vu =	50.7	50.7	kip
	Vc =	607.3	609.5	kip
fy,tie = 60.0	Vs =	173.4	173.4	kip
	ϕVn =	585.5	587.2	kip
	Capacity =	8.2%	8.2%	
		PASS	PASS	

	LC1	LC2	
Mu =	4310.0	1090.0	kip-ft
ϕMn =	10964.6	11021.3	kip-ft
Capacity =	37.4%	9.4%	
	PASS	PASS	

Exhibit E

Mount Analysis

Date: July 9, 2019

Kevin Morrow
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
(704) 405-6619

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

Subject:	**Mount Modification Report**	
Carrier Designation:	**T-Mobile Equipment Change-Out**	
	Carrier Site Number:	CT11511A
	Carrier Site Name:	Sprint- Brooklyn
Crown Castle Designation:	**Crown Castle BU Number:**	876390
	Crown Castle Site Name:	Hampton / Bernier
	Crown Castle JDE Job Number:	576719
	Crown Castle Order Number:	494419, Rev.0
Engineering Firm Designation:	**B+T Group Report Designation:**	136355.003.01
Site Data:	**116 Grant Hill Rd., Brooklyn, CT, Windham, 06234** **Latitude 41° 47' 29.64" Longitude -72° 0' 54.04"**	
Structure Information:	**Tower Height & Type:**	**150 ft. Monopole**
	Mount Elevation:	**137 ft.**
	Mount Type:	**14 ft. Platform Mount**

Dear Mr. Morrow,

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

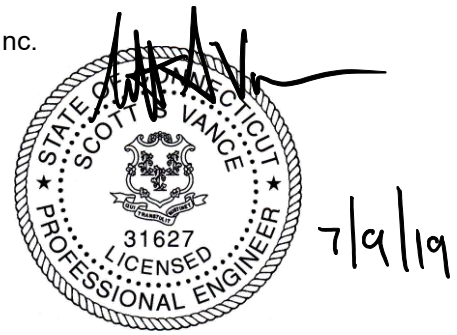
The purpose of the analysis is to determine acceptability of the mount's stress level. Based on our analysis we have determined the stress level to be:

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

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

Mount structural analysis prepared by: Joseph Variamparampil

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



7/9/19

Scott S. Vance, P.E.

TABLE OF CONTENTS

1) INTRODUCTION

This is a 14' Platform Mount, mapped by B+T Group.

2) ANALYSIS CRITERIA

Building Code:	2015 IBC
TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	130 mph
Exposure Category:	B
Topographic Factor at Base:	1.512
Topographic Factor at Mount:	1.512
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Seismic S_s:	0.172
Seismic S_1:	0.062
Live Loading Wind Speed:	30 mph
Man Live Load at Mid/End-Points:	250 lb
Man Live Load at Mount Pipes:	500 lb

Table 1 - Proposed Equipment Configuration

Mount Centerline (ft.)	Antenna Centerline (ft.)	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount / Modification Details
137	138	3	RFS	APX16DWV-16DWVS-E-A20	14 ft. Platform Mount
		3	RFS	APXVAARR24_43-U-NA20	
		3	Ericsson	KRY 112 489/2	
		3	Ericsson	RADIO 4449 B12/B71	

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
CCI Order	Existing Loading Proposed Loading	Date: 05/31/2019	Crown Castle
Mount Mapping	B+T Group	Date: 06/27/2019	On File
Mount Analysis Report	B+T Group	Date: 07/02/2019	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.

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	137	60.7	Pass
	Support Angles	M8	137	39.3	Pass
	Support Tubes	M39A	137	31.3	Pass
	Mount Pipes	M39	137	67.9	Pass
1,2,3	Handrail Pipes	M55	137	59.2	Pass
	Handrail Connection Angles	M68	137	75.5	Pass
	Reinforcement Angles	M72	137	45.9	Pass

Structure Rating (max from all components) =	75.5%

Notes:
1) See additional documentation in "Appendix B" for calculations supporting the % capacity consumed.
2) All sectors are typical
3) Proposed members

4.1) RECOMMENDATIONS

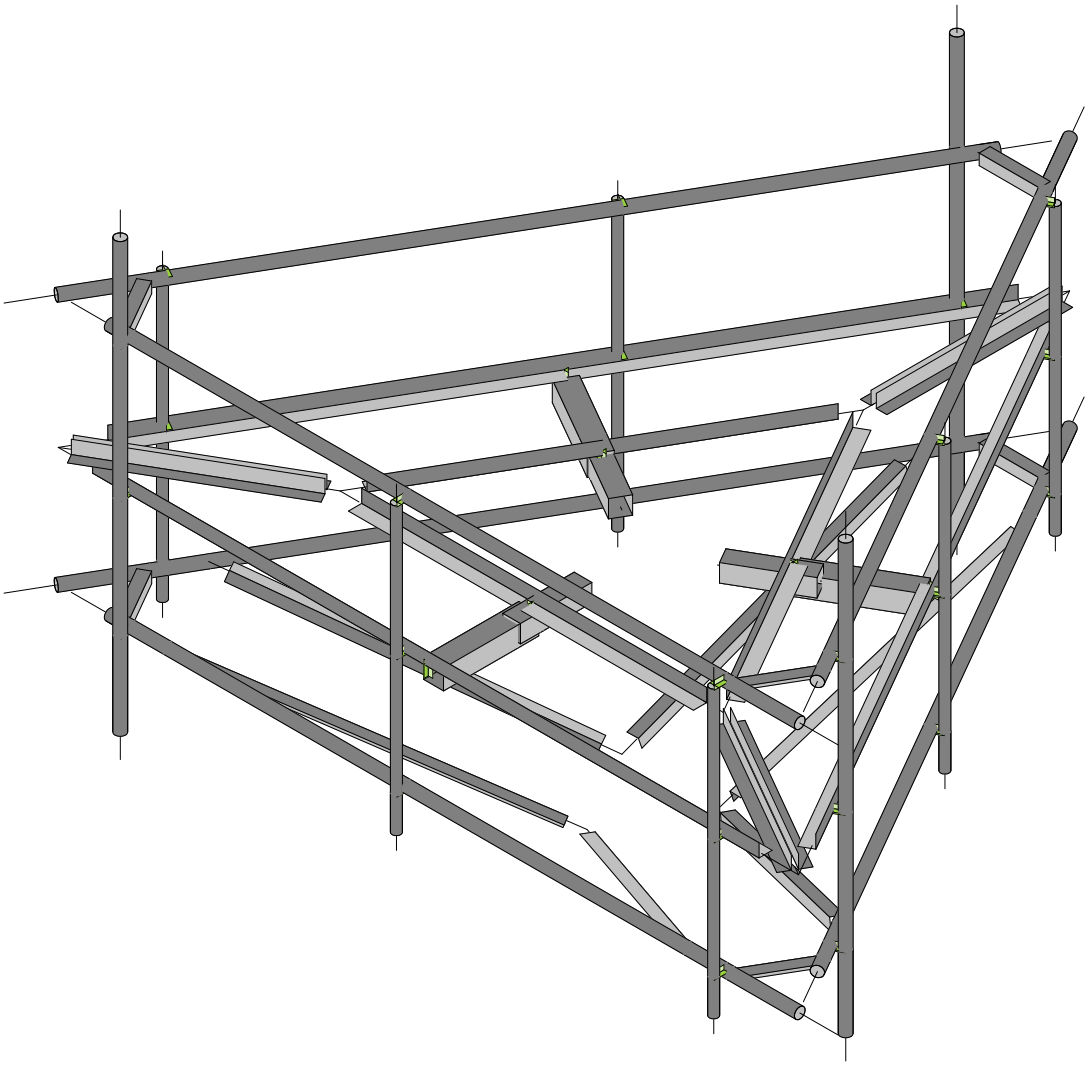
The mount has sufficient capacity to carry the proposed loading configuration. In order for the results of the analysis to be considered valid, the structural modifications listed below must be completed.

1. Installation of (2) Handrail Kits, SitePro1 Part# HRK14
2. Installation of (1) Reinforcement Kit, SitePro1 Part# PRK-SFS-L

Engineering detail drawings have been provided in Appendix C – Mount Modification Design Drawings.

APPENDIX A

WIRE FRAME AND RENDERED MODELS



Envelope Only Solution

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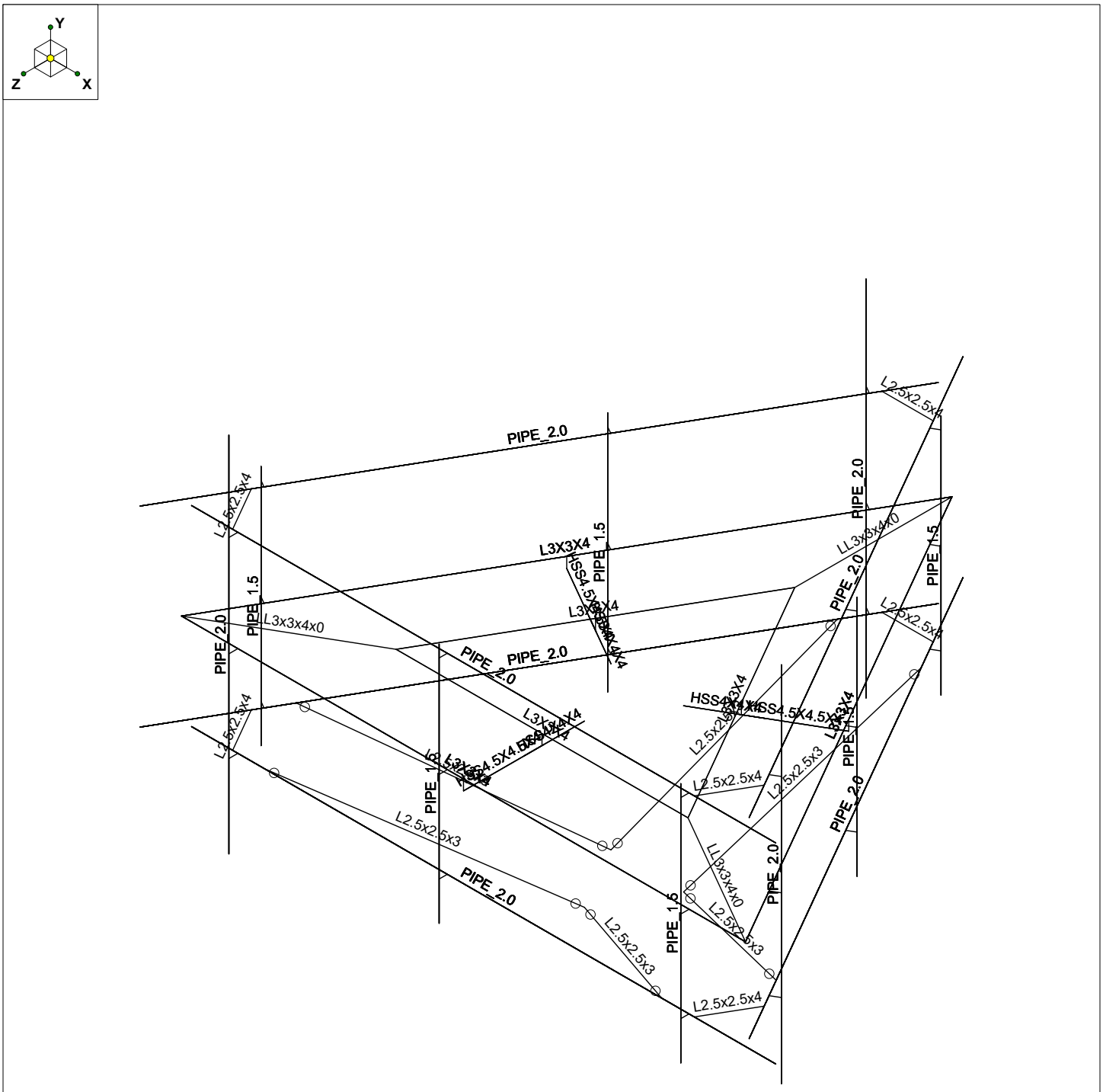

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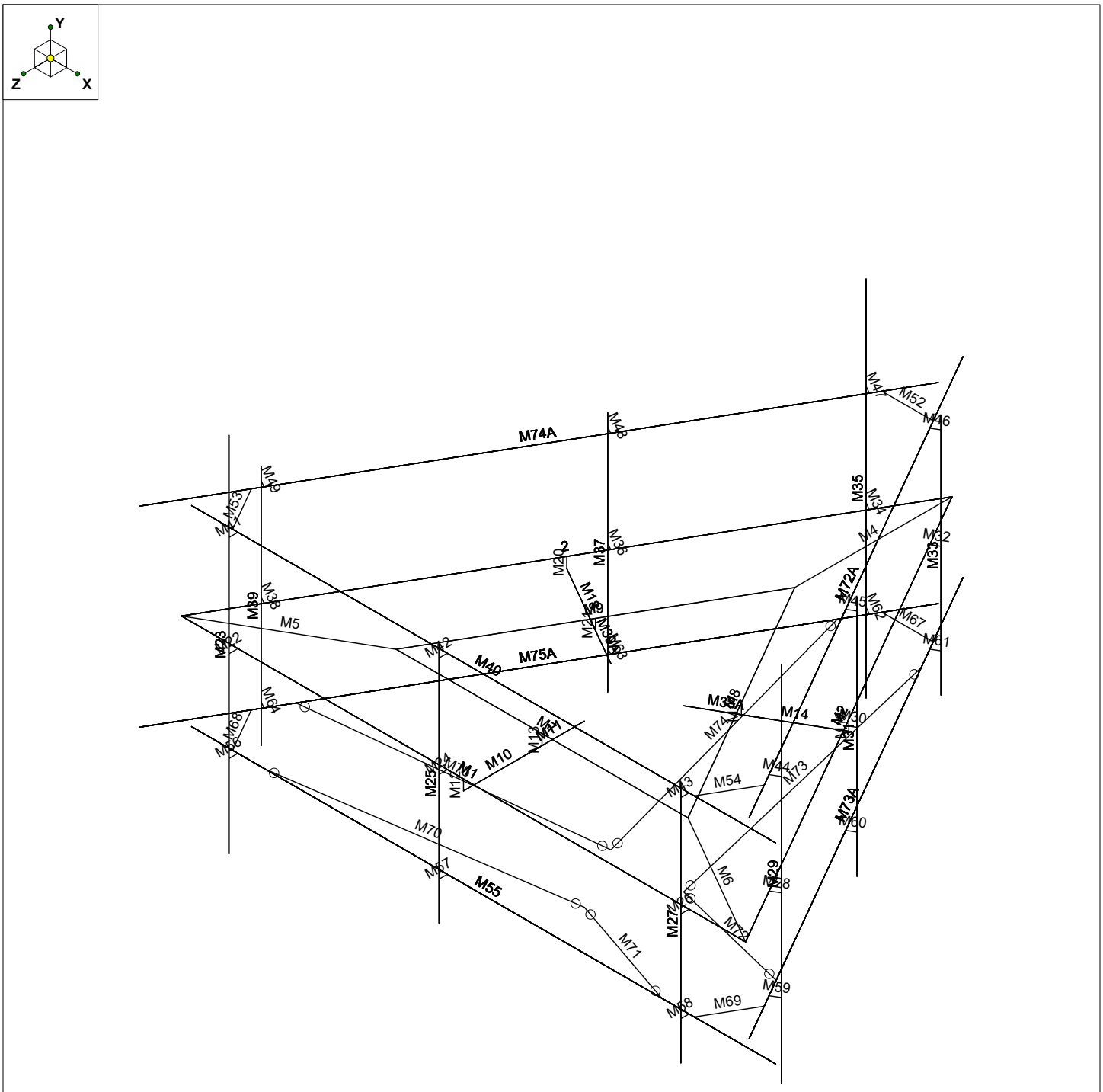

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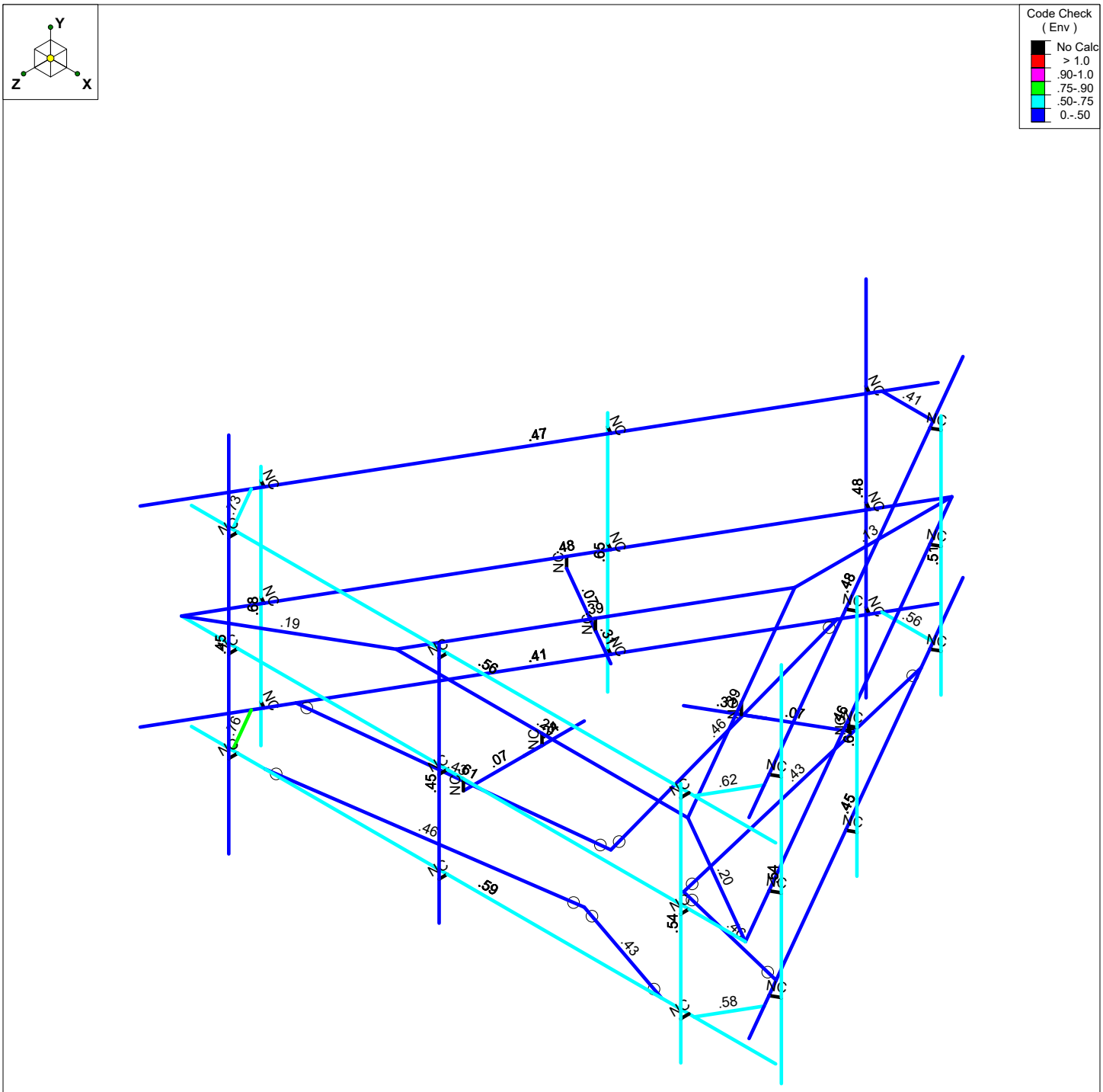

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Envelope Only Solution

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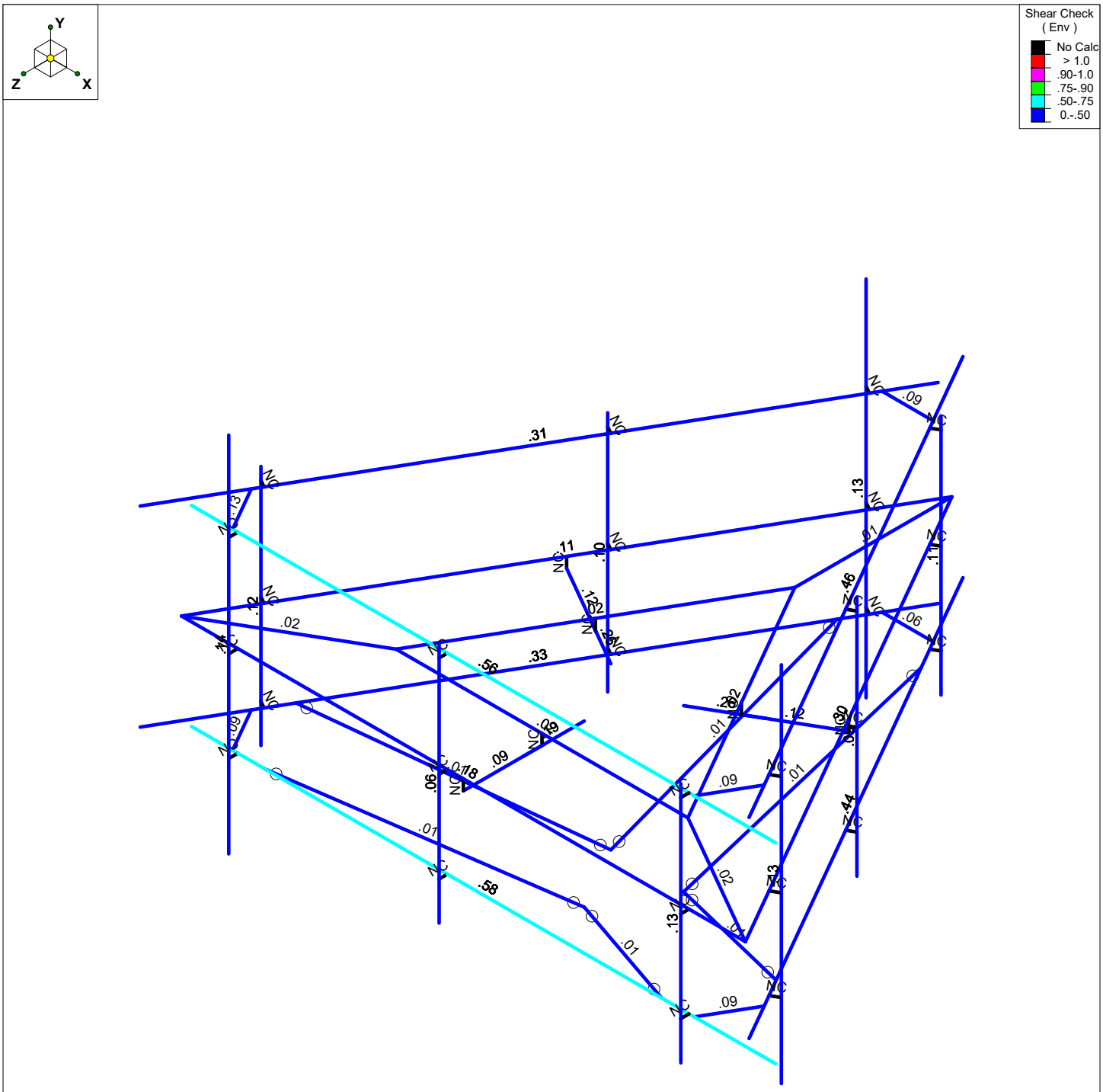

Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

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APPENDIX B

SOFTWARE INPUT CALCULATIONS AND SOFTWARE ANALYSIS OUTPUT

PROJECT	**136355.002.01 - Hampton Be**		**KSC**
SUBJECT	**Platform Mount Mount Analysis**		
DATE	**07/08/19**	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)	$EPA_{N\text{-}Ice}*K_a$ (ft^2)	$EPA_{T\text{-}Ice}*K_a$ (ft^2)	$F_{A\ No\ Ice\ (N)}$	$F_{A\ No\ Ice\ (T)}$	$F_{A\ Ice\ (N)}$	$F_{A\ Ice\ (T)}$
RFS	APX16DWV-16DWVS-E-A20	0.5	4.20	1.28	2.32	0.55	3.24	1.34	0.19	0.06	0.03	0.01
RFS	APX16DWV-16DWVS-E-A20	0.5	4.20	1.28	2.32	0.55	3.24	1.34	0.19	0.06	0.03	0.01
Ericsson	KRY 112 489/2	1	1.80	1.20	0.42	0.27	0.95	0.74	0.03	0.02	0.00	0.00
RFS	APXVAARR24_43-U-NA20	0.5	4.00	1.27	7.19	2.61	8.74	3.96	0.60	0.26	0.09	0.04
RFS	APXVAARR24_43-U-NA20	0.5	4.00	1.27	7.19	2.61	8.74	3.96	0.60	0.26	0.09	0.04
Ericsson	RADIO 4449 B12/B71	1	1.13	1.20	1.23	0.86	2.04	1.57	0.10	0.07	0.01	0.01
RFS	APX16DWV-16DWVS-E-A20	0.5	4.20	1.28	2.32	0.55	3.24	1.34	0.19	0.06	0.03	0.01
RFS	APX16DWV-16DWVS-E-A20	0.5	4.20	1.28	2.32	0.55	3.24	1.34	0.19	0.06	0.03	0.01
Ericsson	KRY 112 489/2	1	1.80	1.20	0.42	0.27	0.95	0.74	0.03	0.02	0.00	0.00
RFS	APXVAARR24_43-U-NA20	0.5	4.00	1.27	7.19	2.61	8.74	3.96	0.60	0.26	0.09	0.04
RFS	APXVAARR24_43-U-NA20	0.5	4.00	1.27	7.19	2.61	8.74	3.96	0.60	0.26	0.09	0.04
Ericsson	RADIO 4449 B12/B71	1	1.13	1.20	1.23	0.86	2.04	1.57	0.10	0.07	0.01	0.01
RFS	APX16DWV-16DWVS-E-A20	0.5	4.20	1.28	2.32	0.55	3.24	1.34	0.19	0.06	0.03	0.01
RFS	APX16DWV-16DWVS-E-A20	0.5	4.20	1.28	2.32	0.55	3.24	1.34	0.19	0.06	0.03	0.01
Ericsson	KRY 112 489/2	1	1.80	1.20	0.42	0.27	0.95	0.74	0.03	0.02	0.00	0.00
RFS	APXVAARR24_43-U-NA20	0.5	4.00	1.27	7.19	2.61	8.74	3.96	0.60	0.26	0.09	0.04
RFS	APXVAARR24_43-U-NA20	0.5	4.00	1.27	7.19	2.61	8.74	3.96	0.60	0.26	0.09	0.04
Ericsson	RADIO 4449 B12/B71	1	1.13	1.20	1.23	0.86	2.04	1.57	0.10	0.07	0.01	0.01

PROJECT	**136355.002.01 - Hampton Be**		**KSC**
SUBJECT	**Platform Mount Mount Analysis**		
DATE	**07/08/19**	PAGE	OF

B+T Group
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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)	$EPA_{N\text{-}Ice}*K_a$ (ft^2)	$EPA_{T\text{-}Ice}*K_a$ (ft^2)	$F_{A\ No\ Ice\ (N)}$	$F_{A\ No\ Ice\ (T)}$	$F_{A\ Ice\ (N)}$	$F_{A\ Ice\ (T)}$

PROJECT	**136355.002.01 - Hampton Be**		**KSC**
SUBJECT	**Platform Mount Mount Analysis**		
DATE	**07/08/19**	PAGE	OF

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Manufacturer	Model	Qty	Aspect Ratio	C_a flat/round	EPA_N*K_a (ft^2)	EPA_T*K_a (ft^2)	$EPA_{N\text{-}Ice}*K_a$ (ft^2)	$EPA_{T\text{-}Ice}*K_a$ (ft^2)	$F_{A\ No\ Ice\ (N)}$	$F_{A\ No\ Ice\ (T)}$	$F_{A\ Ice\ (N)}$	$F_{A\ Ice\ (T)}$

Hot Rolled Steel Properties

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

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	MF-H1	L3X3X4	Beam	Single Angle	A36 Gr.36	Typical	1.44	1.23	1.23	.031
2	MF-P1	PIPE_1.5	Column	Pipe	A53 Gr.B	Typical	.749	.293	.293	.586
3	F1-ST1	HSS4X4X4	Beam	Tube	A500 Gr....	Typical	3.37	7.8	7.8	12.8
4	F1-S1	L3X3X4	Beam	Single Angle	A36 Gr.36	Typical	1.44	1.23	1.23	.031
5	F1-S2	LL3x3x4x0	Beam	Double Angle (No G...	A36 Gr.36	Typical	2.88	4.5	2.46	.063
6	MF-P2	PIPE_2.0	Column	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
7	F1-ST2	HSS4.5X...	Beam	Tube	A500 Gr....	Typical	3.84	11.4	11.4	18.5
8	New HR Pipe	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
9	New HT Angle Conne...	L2.5x2.5x4	Beam	Single Angle	A36 Gr.36	Typical	1.19	.692	.692	.026
10	New Reinforcement A...	L2.5x2.5x3	Beam	Single Angle	A36 Gr.36	Typical	.901	.535	.535	.011

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N3	N4		270	MF-H1	Beam	Single Angle	A36 Gr.36	Typical
2	M2	N4	N2		270	MF-H1	Beam	Single Angle	A36 Gr.36	Typical
3	2	N2	N3		270	MF-H1	Beam	Single Angle	A36 Gr.36	Typical
4	M4	N2	N7		180	F1-S2	Beam	Double Angle (...	A36 Gr.36	Typical
5	M5	N3	N6		180	F1-S2	Beam	Double Angle (...	A36 Gr.36	Typical
6	M6	N4	N5		180	F1-S2	Beam	Double Angle (...	A36 Gr.36	Typical
7	M7	N5	N6		270	F1-S1	Beam	Single Angle	A36 Gr.36	Typical
8	M8	N7	N5		270	F1-S1	Beam	Single Angle	A36 Gr.36	Typical
9	M9	N6	N7		270	F1-S1	Beam	Single Angle	A36 Gr.36	Typical
10	M10	N11	N8			F1-ST2	Beam	Tube	A500 Gr.B...	Typical
11	M11	N62	N9			F1-ST1	Beam	Tube	A500 Gr.B...	Typical
12	M12	N10	N11			RIGID	None	None	RIGID	Typical
13	M13	N12	N13			RIGID	None	None	RIGID	Typical
14	M14	N17	N14			F1-ST2	Beam	Tube	A500 Gr.B...	Typical
15	M16	N16	N17			RIGID	None	None	RIGID	Typical
16	M17	N18	N19			RIGID	None	None	RIGID	Typical
17	M18	N23	N20			F1-ST2	Beam	Tube	A500 Gr.B...	Typical
18	M20	N22	N23			RIGID	None	None	RIGID	Typical
19	M21	N24	N25			RIGID	None	None	RIGID	Typical
20	M22	N26	N27			RIGID	None	None	RIGID	Typical
21	M23	N28	N29			MF-P2	Column	Pipe	A53 Gr.B	Typical
22	M24	N30	N31			RIGID	None	None	RIGID	Typical
23	M25	N32	N33			MF-P1	Column	Pipe	A53 Gr.B	Typical
24	M26	N34	N35			RIGID	None	None	RIGID	Typical
25	M27	N36	N37			MF-P1	Column	Pipe	A53 Gr.B	Typical
26	M28	N38	N39			RIGID	None	None	RIGID	Typical
27	M29	N40	N41			MF-P2	Column	Pipe	A53 Gr.B	Typical
28	M30	N42	N43			RIGID	None	None	RIGID	Typical
29	M31	N44	N45			MF-P1	Column	Pipe	A53 Gr.B	Typical
30	M32	N46	N47			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
31	M33	N48	N49			MF-P1	Column	Pipe	A53 Gr.B	Typical
32	M34	N50	N51			RIGID	None	None	RIGID	Typical
33	M35	N52	N53			MF-P2	Column	Pipe	A53 Gr.B	Typical
34	M36	N54	N55			RIGID	None	None	RIGID	Typical
35	M37	N56	N57			MF-P1	Column	Pipe	A53 Gr.B	Typical
36	M38	N58	N59			RIGID	None	None	RIGID	Typical
37	M39	N60	N61			MF-P1	Column	Pipe	A53 Gr.B	Typical
38	M38A	N62A	N61A			F1-ST1	Beam	Tube	A500 Gr.B...	Typical
39	M39A	N64	N63			F1-ST1	Beam	Tube	A500 Gr.B...	Typical
40	M40	N65	N66		270	New HR Pipe	Beam	Pipe	A53 Gr.B	Typical
41	M41	N67	N68			RIGID	None	None	RIGID	Typical
42	M42	N69	N70			RIGID	None	None	RIGID	Typical
43	M43	N71	N72			RIGID	None	None	RIGID	Typical
44	M44	N73	N74			RIGID	None	None	RIGID	Typical
45	M45	N75	N76			RIGID	None	None	RIGID	Typical
46	M46	N77	N78			RIGID	None	None	RIGID	Typical
47	M47	N79	N80			RIGID	None	None	RIGID	Typical
48	M48	N81	N82			RIGID	None	None	RIGID	Typical
49	M49	N83	N84			RIGID	None	None	RIGID	Typical
50	M52	N90	N91		180	New HT Angle...	Beam	Single Angle	A36 Gr.36	Typical
51	M53	N91A	N92		180	New HT Angle...	Beam	Single Angle	A36 Gr.36	Typical
52	M54	N93	N94		180	New HT Angle...	Beam	Single Angle	A36 Gr.36	Typical
53	M55	N95	N96		270	New HR Pipe	Beam	Pipe	A53 Gr.B	Typical
54	M56	N97	N98			RIGID	None	None	RIGID	Typical
55	M57	N99	N100			RIGID	None	None	RIGID	Typical
56	M58	N101	N102			RIGID	None	None	RIGID	Typical
57	M59	N103	N104			RIGID	None	None	RIGID	Typical
58	M60	N105	N106			RIGID	None	None	RIGID	Typical
59	M61	N107	N108			RIGID	None	None	RIGID	Typical
60	M62	N109	N110			RIGID	None	None	RIGID	Typical
61	M63	N111	N112			RIGID	None	None	RIGID	Typical
62	M64	N113	N114			RIGID	None	None	RIGID	Typical
63	M67	N119	N120		180	New HT Angle...	Beam	Single Angle	A36 Gr.36	Typical
64	M68	N121	N122		180	New HT Angle...	Beam	Single Angle	A36 Gr.36	Typical
65	M69	N123	N124		180	New HT Angle...	Beam	Single Angle	A36 Gr.36	Typical
66	M70	N125	N126		180	New Reinforce...	Beam	Single Angle	A36 Gr.36	Typical
67	M71	N125	N127		90	New Reinforce...	Beam	Single Angle	A36 Gr.36	Typical
68	M72A	N126A	N127A		270	New HR Pipe	Beam	Pipe	A53 Gr.B	Typical
69	M73A	N128A	N129A		270	New HR Pipe	Beam	Pipe	A53 Gr.B	Typical
70	M74A	N130A	N131A		270	New HR Pipe	Beam	Pipe	A53 Gr.B	Typical
71	M75A	N132A	N133A		270	New HR Pipe	Beam	Pipe	A53 Gr.B	Typical
72	M72	N128	N129		180	New Reinforce...	Beam	Single Angle	A36 Gr.36	Typical
73	M73	N128	N130		90	New Reinforce...	Beam	Single Angle	A36 Gr.36	Typical
74	M74	N131	N132		180	New Reinforce...	Beam	Single Angle	A36 Gr.36	Typical
75	M75	N131	N133		90	New Reinforce...	Beam	Single Angle	A36 Gr.36	Typical

Hot Rolled Steel Design Parameters

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[i...	Lcomp bot[i...	L-torq...	Kyy	Kzz	Cb	Functi...
1	M1	MF-H1	168	84		Lbyy						Lateral
2	M2	MF-H1	168	84		Lbyy						Lateral
3	2	MF-H1	168	84		Lbyy						Lateral
4	M4	F1-S2	46.8			Lbyy						Lateral
5	M5	F1-S2	46.8			Lbyy						Lateral
6	M6	F1-S2	46.8			Lbyy						Lateral
7	M7	F1-S1	86.94			Lbyy						Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[i...	Lcomp bot[i...	L-torq...	Kyy	Kzz	Cb	Functi...
8	M8	F1-S1	86.94			Lbyy						Lateral
9	M9	F1-S1	86.94			Lbyy						Lateral
10	M10	F1-ST2	24			Lbyy						Lateral
11	M11	F1-ST1	18			Lbyy						Lateral
12	M14	F1-ST2	24			Lbyy						Lateral
13	M18	F1-ST2	24			Lbyy						Lateral
14	M23	MF-P2	108			Lbyy						Lateral
15	M25	MF-P1	72			Lbyy						Lateral
16	M27	MF-P1	72			Lbyy						Lateral
17	M29	MF-P2	108			Lbyy						Lateral
18	M31	MF-P1	72			Lbyy						Lateral
19	M33	MF-P1	72			Lbyy						Lateral
20	M35	MF-P2	108			Lbyy						Lateral
21	M37	MF-P1	72			Lbyy						Lateral
22	M39	MF-P1	72			Lbyy						Lateral
23	M38A	F1-ST1	18			Lbyy						Lateral
24	M39A	F1-ST1	18			Lbyy						Lateral
25	M40	New HR Pi...	174			Lbyy						Lateral
26	M52	New HT An...	15.238			Lbyy						Lateral
27	M53	New HT An...	15.238			Lbyy						Lateral
28	M54	New HT An...	15.238			Lbyy						Lateral
29	M55	New HR Pi...	174			Lbyy						Lateral
30	M67	New HT An...	15.238			Lbyy						Lateral
31	M68	New HT An...	15.238			Lbyy						Lateral
32	M69	New HT An...	15.238			Lbyy						Lateral
33	M70	New Reinfo...	73.194			Lbyy						Lateral
34	M71	New Reinfo...	73.194			Lbyy						Lateral
35	M72A	New HR Pi...	174			Lbyy						Lateral
36	M73A	New HR Pi...	174			Lbyy						Lateral
37	M74A	New HR Pi...	174			Lbyy						Lateral
38	M75A	New HR Pi...	174			Lbyy						Lateral
39	M72	New Reinfo...	73.194			Lbyy						Lateral
40	M73	New Reinfo...	73.194			Lbyy						Lateral
41	M74	New Reinfo...	73.194			Lbyy						Lateral
42	M75	New Reinfo...	73.194			Lbyy						Lateral

Joint Coordinates and Temperatures

	Label	X [in]	Y [in]	Z [in]	Temp [F]	Detach From Diap...
1	N1	0	0	0	0	
2	N2	-0.	3.092	-96.994845	0	
3	N3	-84	3.092	48.497423	0	
4	N4	84	3.092	48.497423	0	
5	N5	43.470011	3.092	25.097423	0	
6	N6	-43.470011	3.092	25.097423	0	
7	N7	-0.	3.092	-50.194845	0	
8	N8	0.	0	24.497423	0	
9	N9	0.	0	12.497423	0	
10	N10	0.	3.092	48.497423	0	
11	N11	0.	1.08e-14	48.497423	0	
12	N12	0.	3.092	25.097423	0	
13	N13	0.	0	25.097423	0	
14	N14	21.21539	0	-12.248711	0	
15	N16	42	3.092	-24.248711	0	
16	N17	42	1.08e-14	-24.248711	0	
17	N18	21.735006	3.092	-12.548711	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [in]	Y [in]	Z [in]	Temp [F]	Detach From Diap...
18	N19	21.735006	0	-12.548711	0	
19	N20	-21.21539	-1.2e-15	-12.248711	0	
20	N22	-42	3.092	-24.248711	0	
21	N23	-42	9.6e-15	-24.248711	0	
22	N24	-21.735006	3.092	-12.548711	0	
23	N25	-21.735006	-1.2e-15	-12.548711	0	
24	N26	-67.2	3.092	48.497423	0	
25	N27	-67.2	3.092	51.187823	0	
26	N28	-67.2	59.492	51.187823	0	
27	N29	-67.2	-48.508	51.187823	0	
28	N30	-4.8	3.092	48.497423	0	
29	N31	-4.8	3.092	50.947423	0	
30	N32	-4.8	36.692	50.947423	0	
31	N33	-4.8	-35.308	50.947423	0	
32	N34	67.2	3.092	48.497423	0	
33	N35	67.2	3.092	50.947423	0	
34	N36	67.2	36.692	50.947423	0	
35	N37	67.2	-35.308	50.947423	0	
36	N38	74.4	3.092	31.869735	0	
37	N39	76.729955	3.092	30.524535	0	
38	N40	76.729955	61.892	30.524535	0	
39	N41	76.729955	-46.108	30.524535	0	
40	N42	43.2	3.092	-22.17025	0	
41	N43	45.321762	3.092	-23.39525	0	
42	N44	45.321762	36.692	-23.39525	0	
43	N45	45.321762	-35.308	-23.39525	0	
44	N46	9.	3.092	-81.406388	0	
45	N47	11.121762	3.092	-82.631388	0	
46	N48	11.121762	36.692	-82.631388	0	
47	N49	11.121762	-35.308	-82.631388	0	
48	N50	-9	3.092	-81.406388	0	
49	N51	-11.329955	3.092	-82.751588	0	
50	N52	-11.329955	60.692	-82.751588	0	
51	N53	-11.329955	-47.308	-82.751588	0	
52	N54	-37.2	3.092	-32.562555	0	
53	N55	-39.321762	3.092	-33.787555	0	
54	N56	-39.321762	36.692	-33.787555	0	
55	N57	-39.321762	-35.308	-33.787555	0	
56	N58	-75	3.092	32.908965	0	
57	N59	-77.121762	3.092	31.683965	0	
58	N60	-77.121762	36.692	31.683965	0	
59	N61	-77.121762	-35.308	31.683965	0	
60	N62	0.	0	30.497423	0	
61	N61A	10.823085	0	-6.248711	0	
62	N62A	26.411543	0	-15.248711	0	
63	N63	-10.823085	0	-6.248711	0	
64	N64	-26.411543	0	-15.248711	0	
65	N65	-81	33.092	48.497423	0	
66	N66	93	33.092	48.497423	0	
67	N67	-67.2	33.092	48.497423	0	
68	N68	-67.2	33.092	51.187823	0	
69	N69	-4.8	33.092	48.497423	0	
70	N70	-4.8	33.092	50.947423	0	
71	N71	67.2	33.092	48.497423	0	
72	N72	67.2	33.092	50.947423	0	
73	N73	74.4	33.092	31.869735	0	
74	N74	76.729955	33.092	30.524535	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [in]	Y [in]	Z [in]	Temp [F]	Detach From Diap...
75	N75	43.2	33.092	-22.17025	0	
76	N76	45.321762	33.092	-23.39525	0	
77	N77	9.	33.092	-81.406388	0	
78	N78	11.121762	33.092	-82.631388	0	
79	N79	-9	33.092	-81.406388	0	
80	N80	-11.329955	33.092	-82.751588	0	
81	N81	-37.2	33.092	-32.562555	0	
82	N82	-39.321762	33.092	-33.787555	0	
83	N83	-75	33.092	32.908965	0	
84	N84	-77.121762	33.092	31.683965	0	
85	N90	-7.618802	33.092	-83.798693	0	
86	N91	7.618802	33.092	-83.798693	0	
87	N91A	-68.762396	33.092	48.497423	0	
88	N92	-76.381198	33.092	35.30127	0	
89	N93	76.381198	33.092	35.30127	0	
90	N94	68.762396	33.092	48.497423	0	
91	N95	-81	-23.908	48.497423	0	
92	N96	93	-23.908	48.497423	0	
93	N97	-67.2	-23.908	48.497423	0	
94	N98	-67.2	-23.908	51.187823	0	
95	N99	-4.8	-23.908	48.497423	0	
96	N100	-4.8	-23.908	50.947423	0	
97	N101	67.2	-23.908	48.497423	0	
98	N102	67.2	-23.908	50.947423	0	
99	N103	74.4	-23.908	31.869735	0	
100	N104	76.729955	-23.908	30.524535	0	
101	N105	43.2	-23.908	-22.17025	0	
102	N106	45.321762	-23.908	-23.39525	0	
103	N107	9.	-23.908	-81.406388	0	
104	N108	11.121762	-23.908	-82.631388	0	
105	N109	-9	-23.908	-81.406388	0	
106	N110	-11.329955	-23.908	-82.751588	0	
107	N111	-37.2	-23.908	-32.562555	0	
108	N112	-39.321762	-23.908	-33.787555	0	
109	N113	-75	-23.908	32.908965	0	
110	N114	-77.121762	-23.908	31.683965	0	
111	N119	-7.618802	-23.908	-83.798693	0	
112	N120	7.618802	-23.908	-83.798693	0	
113	N121	-68.762396	-23.908	48.497423	0	
114	N122	-76.381198	-23.908	35.30127	0	
115	N123	76.381198	-23.908	35.30127	0	
116	N124	68.762396	-23.908	48.497423	0	
117	N125	0	-48	12.497424	0	
118	N126	-58.999998	-23.908	48.497423	0	
119	N127	58.999998	-23.908	48.497423	0	
120	N126A	82.5	33.092	45.899346	0	
121	N127A	-4.5	33.092	-104.789074	0	
122	N128A	82.5	-23.908	45.899346	0	
123	N129A	-4.5	-23.908	-104.789074	0	
124	N130A	-1.5	33.092	-94.396769	0	
125	N131A	-88.5	33.092	56.291651	0	
126	N132A	-1.5	-23.908	-94.396769	0	
127	N133A	-88.5	-23.908	56.291651	0	
128	N128	10.823087	-48	-6.248712	0	
129	N129	71.499997	-23.908	26.846782	0	
130	N130	12.500006	-23.908	-75.3442	0	
131	N131	-10.823087	-48	-6.248712	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [in]	Y [in]	Z [in]	Temp [F]	Detach From Diap...
132	N132	-12.500006	-23.908	-75.3442	0	
133	N133	-71.499997	-23.908	26.846782	0	

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/i...
1	N26	L	Y	-.5
2	N50	L	Y	-.5
3	N38	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/i...
1	N30	L	Y	-.5
2	N54	L	Y	-.5
3	N42	L	Y	-.5

Joint Loads and Enforced Displacements (BLC 11 : Live Load c)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/i...
1	N34	L	Y	-.5
2	N58	L	Y	-.5
3	N46	L	Y	-.5

Member Point Loads (BLC 1 : Dead)

	Member Label	Direction	Magnitude[k,k-ft]	Location[in,%]
1	M27	Y	-.02	%10
2	M27	Y	-.02	%70
3	M27	Y	-.015	%25
4	M27	Y	0	0
5	M27	Y	0	0
6	M23	Y	-.064	%10
7	M23	Y	-.064	%90
8	M23	Y	-.075	%30
9	M23	Y	0	0
10	M23	Y	0	0
11	M39	Y	-.02	%10
12	M39	Y	-.02	%70
13	M39	Y	-.015	%25
14	M39	Y	0	0
15	M39	Y	0	0
16	M35	Y	-.064	%10
17	M35	Y	-.064	%90
18	M35	Y	-.075	%30
19	M35	Y	0	0
20	M35	Y	0	0
21	M33	Y	-.02	%10
22	M33	Y	-.02	%70
23	M33	Y	-.015	%25
24	M33	Y	0	0
25	M33	Y	0	0
26	M29	Y	-.064	%10
27	M29	Y	-.064	%90
28	M29	Y	-.075	%30
29	M29	Y	0	0
30	M29	Y	0	0

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[in,%]
1	M27	Z	-.195	%10
2	M27	Z	-.195	%70
3	M27	Z	-.033	%25
4	M27	Z	0	0
5	M27	Z	0	0
6	M23	Z	-.598	%10
7	M23	Z	-.598	%90
8	M23	Z	-.097	%30
9	M23	Z	0	0
10	M23	Z	0	0
11	M39	Z	-.195	%10
12	M39	Z	-.195	%70
13	M39	Z	-.033	%25
14	M39	Z	0	0
15	M39	Z	0	0
16	M35	Z	-.598	%10
17	M35	Z	-.598	%90
18	M35	Z	-.097	%30
19	M35	Z	0	0
20	M35	Z	0	0
21	M33	Z	-.195	%10
22	M33	Z	-.195	%70
23	M33	Z	-.033	%25
24	M33	Z	0	0
25	M33	Z	0	0
26	M29	Z	-.598	%10
27	M29	Z	-.598	%90
28	M29	Z	-.097	%30
29	M29	Z	0	0
30	M29	Z	0	0

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[in,%]
1	M27	X	-.064	%10
2	M27	X	-.064	%70
3	M27	X	-.022	%25
4	M27	X	0	0
5	M27	X	0	0
6	M23	X	-.262	%10
7	M23	X	-.262	%90
8	M23	X	-.068	%30
9	M23	X	0	0
10	M23	X	0	0
11	M39	X	-.064	%10
12	M39	X	-.064	%70
13	M39	X	-.022	%25
14	M39	X	0	0
15	M39	X	0	0
16	M35	X	-.262	%10
17	M35	X	-.262	%90
18	M35	X	-.068	%30
19	M35	X	0	0
20	M35	X	0	0
21	M33	X	-.064	%10
22	M33	X	-.064	%70
23	M33	X	-.022	%25

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[in,%]
24	M33	X	0	0
25	M33	X	0	0
26	M29	X	-.262	%10
27	M29	X	-.262	%90
28	M29	X	-.068	%30
29	M29	X	0	0
30	M29	X	0	0

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[in,%]
1	M27	Z	-.029	%10
2	M27	Z	-.029	%70
3	M27	Z	-.005	%25
4	M27	Z	0	0
5	M27	Z	0	0
6	M23	Z	-.088	%10
7	M23	Z	-.088	%90
8	M23	Z	-.014	%30
9	M23	Z	0	0
10	M23	Z	0	0
11	M39	Z	-.029	%10
12	M39	Z	-.029	%70
13	M39	Z	-.005	%25
14	M39	Z	0	0
15	M39	Z	0	0
16	M35	Z	-.088	%10
17	M35	Z	-.088	%90
18	M35	Z	-.014	%30
19	M35	Z	0	0
20	M35	Z	0	0
21	M33	Z	-.029	%10
22	M33	Z	-.029	%70
23	M33	Z	-.005	%25
24	M33	Z	0	0
25	M33	Z	0	0
26	M29	Z	-.088	%10
27	M29	Z	-.088	%90
28	M29	Z	-.014	%30
29	M29	Z	0	0
30	M29	Z	0	0

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[in,%]
1	M27	X	-.009	%10
2	M27	X	-.009	%70
3	M27	X	-.003	%25
4	M27	X	0	0
5	M27	X	0	0
6	M23	X	-.039	%10
7	M23	X	-.039	%90
8	M23	X	-.01	%30
9	M23	X	0	0
10	M23	X	0	0
11	M39	X	-.009	%10
12	M39	X	-.009	%70
13	M39	X	-.003	%25

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[in,%]
14	M39	X	0	0
15	M39	X	0	0
16	M35	X	-.039	%10
17	M35	X	-.039	%90
18	M35	X	-.01	%30
19	M35	X	0	0
20	M35	X	0	0
21	M33	X	-.009	%10
22	M33	X	-.009	%70
23	M33	X	-.003	%25
24	M33	X	0	0
25	M33	X	0	0
26	M29	X	-.039	%10
27	M29	X	-.039	%90
28	M29	X	-.01	%30
29	M29	X	0	0
30	M29	X	0	0

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[in,%]
1	M27	Z	-.01	%10
2	M27	Z	-.01	%70
3	M27	Z	-.002	%25
4	M27	Z	0	0
5	M27	Z	0	0
6	M23	Z	-.032	%10
7	M23	Z	-.032	%90
8	M23	Z	-.005	%30
9	M23	Z	0	0
10	M23	Z	0	0
11	M39	Z	-.01	%10
12	M39	Z	-.01	%70
13	M39	Z	-.002	%25
14	M39	Z	0	0
15	M39	Z	0	0
16	M35	Z	-.032	%10
17	M35	Z	-.032	%90
18	M35	Z	-.005	%30
19	M35	Z	0	0
20	M35	Z	0	0
21	M33	Z	-.01	%10
22	M33	Z	-.01	%70
23	M33	Z	-.002	%25
24	M33	Z	0	0
25	M33	Z	0	0
26	M29	Z	-.032	%10
27	M29	Z	-.032	%90
28	M29	Z	-.005	%30
29	M29	Z	0	0
30	M29	Z	0	0

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[in,%]
1	M27	X	-.003	%10
2	M27	X	-.003	%70
3	M27	X	-.001	%25

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[in,%]
4	M27	X	0	0
5	M27	X	0	0
6	M23	X	-.014	%10
7	M23	X	-.014	%90
8	M23	X	-.004	%30
9	M23	X	0	0
10	M23	X	0	0
11	M39	X	-.003	%10
12	M39	X	-.003	%70
13	M39	X	-.001	%25
14	M39	X	0	0
15	M39	X	0	0
16	M35	X	-.014	%10
17	M35	X	-.014	%90
18	M35	X	-.004	%30
19	M35	X	0	0
20	M35	X	0	0
21	M33	X	-.003	%10
22	M33	X	-.003	%70
23	M33	X	-.001	%25
24	M33	X	0	0
25	M33	X	0	0
26	M29	X	-.014	%10
27	M29	X	-.014	%90
28	M29	X	-.004	%30
29	M29	X	0	0
30	M29	X	0	0

Member Point Loads (BLC 8 : Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[in,%]
1	M27	Y	-.089	%10
2	M27	Y	-.089	%70
3	M27	Y	-.021	%25
4	M27	Y	0	0
5	M27	Y	0	0
6	M23	Y	-.269	%10
7	M23	Y	-.269	%90
8	M23	Y	-.055	%30
9	M23	Y	0	0
10	M23	Y	0	0
11	M39	Y	-.089	%10
12	M39	Y	-.089	%70
13	M39	Y	-.021	%25
14	M39	Y	0	0
15	M39	Y	0	0
16	M35	Y	-.269	%10
17	M35	Y	-.269	%90
18	M35	Y	-.055	%30
19	M35	Y	0	0
20	M35	Y	0	0
21	M33	Y	-.089	%10
22	M33	Y	-.089	%70
23	M33	Y	-.021	%25
24	M33	Y	0	0
25	M33	Y	0	0
26	M29	Y	-.269	%10

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[in,%]
27	M29	Y	-.269	%90
28	M29	Y	-.055	%30
29	M29	Y	0	0
30	M29	Y	0	0

Member Point Loads (BLC 13 : Maint LL 1)

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

Member Point Loads (BLC 14 : Maint LL 2)

	Member Label	Direction	Magnitude[k,k-ft]	Location[in,%]
1	M1	Y	-.25	%95

Member Point Loads (BLC 15 : Maint LL 3)

	Member Label	Direction	Magnitude[k,k-ft]	Location[in,%]
1	2	Y	-.25	%5

Member Point Loads (BLC 16 : Maint LL 4)

	Member Label	Direction	Magnitude[k,k-ft]	Location[in,%]
1	2	Y	-.25	%95

Member Point Loads (BLC 17 : Maint LL 5)

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

Member Point Loads (BLC 18 : Maint LL 6)

	Member Label	Direction	Magnitude[k,k-ft]	Location[in,%]
1	M2	Y	-.25	%95

Member Point Loads (BLC 19 : Maint LL 7)

	Member Label	Direction	Magnitude[k,k-ft]	Location[in,%]
1	M10	Y	-.25	%50

Member Point Loads (BLC 20 : Maint LL 8)

	Member Label	Direction	Magnitude[k,k-ft]	Location[in,%]
1	M18	Y	-.25	%50

Member Point Loads (BLC 21 : Maint LL 9)

	Member Label	Direction	Magnitude[k,k-ft]	Location[in,%]
1	M14	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[in,%]	End Location[in,%]
1	M1	Z	-.029	-.029	0	0
2	M2	Z	-.029	-.029	0	0
3	2	Z	-.029	-.029	0	0
4	M4	Z	-.025	-.025	0	0
5	M5	Z	-.025	-.025	0	0
6	M6	Z	-.025	-.025	0	0
7	M7	Z	-.029	-.029	0	0
8	M8	Z	-.029	-.029	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[in,%]	End Location[in,%]
9	M9	Z	-.029	-.029	0	0
10	M10	Z	-.029	-.029	0	0
11	M11	Z	-.025	-.025	0	0
12	M14	Z	-.029	-.029	0	0
13	M18	Z	-.029	-.029	0	0
14	M23	Z	-.014	-.014	0	0
15	M25	Z	-.011	-.011	0	0
16	M27	Z	-.011	-.011	0	0
17	M29	Z	-.014	-.014	0	0
18	M31	Z	-.011	-.011	0	0
19	M33	Z	-.011	-.011	0	0
20	M35	Z	-.014	-.014	0	0
21	M37	Z	-.011	-.011	0	0
22	M39	Z	-.011	-.011	0	0
23	M38A	Z	-.025	-.025	0	0
24	M39A	Z	-.025	-.025	0	0
25	M40	Z	-.014	-.014	0	0
26	M52	Z	-.016	-.016	0	0
27	M53	Z	-.016	-.016	0	0
28	M54	Z	-.016	-.016	0	0
29	M55	Z	-.014	-.014	0	0
30	M67	Z	-.016	-.016	0	0
31	M68	Z	-.016	-.016	0	0
32	M69	Z	-.016	-.016	0	0
33	M70	Z	-.025	-.025	0	0
34	M71	Z	-.025	-.025	0	0
35	M72A	Z	-.014	-.014	0	0
36	M73A	Z	-.014	-.014	0	0
37	M74A	Z	-.014	-.014	0	0
38	M75A	Z	-.014	-.014	0	0
39	M72	Z	-.025	-.025	0	0
40	M73	Z	-.025	-.025	0	0
41	M74	Z	-.025	-.025	0	0
42	M75	Z	-.025	-.025	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[in,%]	End Location[in,%]
1	M1	X	-.029	-.029	0	0
2	M2	X	-.029	-.029	0	0
3	2	X	-.029	-.029	0	0
4	M4	X	-.025	-.025	0	0
5	M5	X	-.025	-.025	0	0
6	M6	X	-.025	-.025	0	0
7	M7	X	-.029	-.029	0	0
8	M8	X	-.029	-.029	0	0
9	M9	X	-.029	-.029	0	0
10	M10	X	-.029	-.029	0	0
11	M11	X	-.025	-.025	0	0
12	M14	X	-.029	-.029	0	0
13	M18	X	-.029	-.029	0	0
14	M23	X	-.014	-.014	0	0
15	M25	X	-.011	-.011	0	0
16	M27	X	-.011	-.011	0	0
17	M29	X	-.014	-.014	0	0
18	M31	X	-.011	-.011	0	0
19	M33	X	-.011	-.011	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[in,%]	End Location[in,%]
20	M35	X	-.014	-.014	0	0
21	M37	X	-.011	-.011	0	0
22	M39	X	-.011	-.011	0	0
23	M38A	X	-.025	-.025	0	0
24	M39A	X	-.025	-.025	0	0
25	M40	X	-.014	-.014	0	0
26	M52	X	-.016	-.016	0	0
27	M53	X	-.016	-.016	0	0
28	M54	X	-.016	-.016	0	0
29	M55	X	-.014	-.014	0	0
30	M67	X	-.016	-.016	0	0
31	M68	X	-.016	-.016	0	0
32	M69	X	-.016	-.016	0	0
33	M70	X	-.025	-.025	0	0
34	M71	X	-.025	-.025	0	0
35	M72A	X	-.014	-.014	0	0
36	M73A	X	-.014	-.014	0	0
37	M74A	X	-.014	-.014	0	0
38	M75A	X	-.014	-.014	0	0
39	M72	X	-.025	-.025	0	0
40	M73	X	-.025	-.025	0	0
41	M74	X	-.025	-.025	0	0
42	M75	X	-.025	-.025	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[in,%]	End Location[in,%]
1	M1	Z	-.01	-.01	0	0
2	M2	Z	-.01	-.01	0	0
3	2	Z	-.01	-.01	0	0
4	M4	Z	-.009	-.009	0	0
5	M5	Z	-.009	-.009	0	0
6	M6	Z	-.009	-.009	0	0
7	M7	Z	-.011	-.011	0	0
8	M8	Z	-.011	-.011	0	0
9	M9	Z	-.011	-.011	0	0
10	M10	Z	-.009	-.009	0	0
11	M11	Z	-.009	-.009	0	0
12	M14	Z	-.009	-.009	0	0
13	M18	Z	-.009	-.009	0	0
14	M23	Z	-.003	-.003	0	0
15	M25	Z	-.003	-.003	0	0
16	M27	Z	-.003	-.003	0	0
17	M29	Z	-.003	-.003	0	0
18	M31	Z	-.003	-.003	0	0
19	M33	Z	-.003	-.003	0	0
20	M35	Z	-.003	-.003	0	0
21	M37	Z	-.003	-.003	0	0
22	M39	Z	-.003	-.003	0	0
23	M38A	Z	-.009	-.009	0	0
24	M39A	Z	-.009	-.009	0	0
25	M40	Z	-.003	-.003	0	0
26	M52	Z	-.008	-.008	0	0
27	M53	Z	-.008	-.008	0	0
28	M54	Z	-.008	-.008	0	0
29	M55	Z	-.003	-.003	0	0
30	M67	Z	-.008	-.008	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[in,%]	End Location[in,%]
31	M68	Z	-.008	-.008	0	0
32	M69	Z	-.008	-.008	0	0
33	M70	Z	-.01	-.01	0	0
34	M71	Z	-.01	-.01	0	0
35	M72A	Z	-.003	-.003	0	0
36	M73A	Z	-.003	-.003	0	0
37	M74A	Z	-.003	-.003	0	0
38	M75A	Z	-.003	-.003	0	0
39	M72	Z	-.01	-.01	0	0
40	M73	Z	-.01	-.01	0	0
41	M74	Z	-.01	-.01	0	0
42	M75	Z	-.01	-.01	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[in,%]	End Location[in,%]
1	M1	X	-.01	-.01	0	0
2	M2	X	-.01	-.01	0	0
3	2	X	-.01	-.01	0	0
4	M4	X	-.009	-.009	0	0
5	M5	X	-.009	-.009	0	0
6	M6	X	-.009	-.009	0	0
7	M7	X	-.011	-.011	0	0
8	M8	X	-.011	-.011	0	0
9	M9	X	-.011	-.011	0	0
10	M10	X	-.009	-.009	0	0
11	M11	X	-.009	-.009	0	0
12	M14	X	-.009	-.009	0	0
13	M18	X	-.009	-.009	0	0
14	M23	X	-.003	-.003	0	0
15	M25	X	-.003	-.003	0	0
16	M27	X	-.003	-.003	0	0
17	M29	X	-.003	-.003	0	0
18	M31	X	-.003	-.003	0	0
19	M33	X	-.003	-.003	0	0
20	M35	X	-.003	-.003	0	0
21	M37	X	-.003	-.003	0	0
22	M39	X	-.003	-.003	0	0
23	M38A	X	-.009	-.009	0	0
24	M39A	X	-.009	-.009	0	0
25	M40	X	-.003	-.003	0	0
26	M52	X	-.008	-.008	0	0
27	M53	X	-.008	-.008	0	0
28	M54	X	-.008	-.008	0	0
29	M55	X	-.003	-.003	0	0
30	M67	X	-.008	-.008	0	0
31	M68	X	-.008	-.008	0	0
32	M69	X	-.008	-.008	0	0
33	M70	X	-.01	-.01	0	0
34	M71	X	-.01	-.01	0	0
35	M72A	X	-.003	-.003	0	0
36	M73A	X	-.003	-.003	0	0
37	M74A	X	-.003	-.003	0	0
38	M75A	X	-.003	-.003	0	0
39	M72	X	-.01	-.01	0	0
40	M73	X	-.01	-.01	0	0
41	M74	X	-.01	-.01	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[in,%]	End Location[in,%]
42	M75	X	-.01	-.01	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[in,%]	End Location[in,%]
1	M1	Z	-.002	-.002	0	0
2	M2	Z	-.002	-.002	0	0
3	2	Z	-.002	-.002	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	-.002	-.002	0	0
8	M8	Z	-.002	-.002	0	0
9	M9	Z	-.002	-.002	0	0
10	M10	Z	-.002	-.002	0	0
11	M11	Z	-.001	-.001	0	0
12	M14	Z	-.002	-.002	0	0
13	M18	Z	-.002	-.002	0	0
14	M23	Z	-.0004	-.0004	0	0
15	M25	Z	-.0003	-.0003	0	0
16	M27	Z	-.0003	-.0003	0	0
17	M29	Z	-.0004	-.0004	0	0
18	M31	Z	-.0003	-.0003	0	0
19	M33	Z	-.0003	-.0003	0	0
20	M35	Z	-.0004	-.0004	0	0
21	M37	Z	-.0003	-.0003	0	0
22	M39	Z	-.0003	-.0003	0	0
23	M38A	Z	-.001	-.001	0	0
24	M39A	Z	-.001	-.001	0	0
25	M40	Z	-.0004	-.0004	0	0
26	M52	Z	-.0009	-.0009	0	0
27	M53	Z	-.0009	-.0009	0	0
28	M54	Z	-.0009	-.0009	0	0
29	M55	Z	-.0004	-.0004	0	0
30	M67	Z	-.0009	-.0009	0	0
31	M68	Z	-.0009	-.0009	0	0
32	M69	Z	-.0009	-.0009	0	0
33	M70	Z	-.001	-.001	0	0
34	M71	Z	-.001	-.001	0	0
35	M72A	Z	-.0004	-.0004	0	0
36	M73A	Z	-.0004	-.0004	0	0
37	M74A	Z	-.0004	-.0004	0	0
38	M75A	Z	-.0004	-.0004	0	0
39	M72	Z	-.001	-.001	0	0
40	M73	Z	-.001	-.001	0	0
41	M74	Z	-.001	-.001	0	0
42	M75	Z	-.001	-.001	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[in,%]	End Location[in,%]
1	M1	X	-.002	-.002	0	0
2	M2	X	-.002	-.002	0	0
3	2	X	-.002	-.002	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	-.002	-.002	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[in,%]	End Location[in,%]
8	M8	X	-.002	-.002	0	0
9	M9	X	-.002	-.002	0	0
10	M10	X	-.002	-.002	0	0
11	M11	X	-.001	-.001	0	0
12	M14	X	-.002	-.002	0	0
13	M18	X	-.002	-.002	0	0
14	M23	X	-.0004	-.0004	0	0
15	M25	X	-.0003	-.0003	0	0
16	M27	X	-.0003	-.0003	0	0
17	M29	X	-.0004	-.0004	0	0
18	M31	X	-.0003	-.0003	0	0
19	M33	X	-.0003	-.0003	0	0
20	M35	X	-.0004	-.0004	0	0
21	M37	X	-.0003	-.0003	0	0
22	M39	X	-.0003	-.0003	0	0
23	M38A	X	-.001	-.001	0	0
24	M39A	X	-.001	-.001	0	0
25	M40	X	-.0004	-.0004	0	0
26	M52	X	-.0009	-.0009	0	0
27	M53	X	-.0009	-.0009	0	0
28	M54	X	-.0009	-.0009	0	0
29	M55	X	-.0004	-.0004	0	0
30	M67	X	-.0009	-.0009	0	0
31	M68	X	-.0009	-.0009	0	0
32	M69	X	-.0009	-.0009	0	0
33	M70	X	-.001	-.001	0	0
34	M71	X	-.001	-.001	0	0
35	M72A	X	-.0004	-.0004	0	0
36	M73A	X	-.0004	-.0004	0	0
37	M74A	X	-.0004	-.0004	0	0
38	M75A	X	-.0004	-.0004	0	0
39	M72	X	-.001	-.001	0	0
40	M73	X	-.001	-.001	0	0
41	M74	X	-.001	-.001	0	0
42	M75	X	-.001	-.001	0	0

Member Distributed Loads (BLC 8 : Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[in,%]	End Location[in,%]
1	M1	Y	-.015	-.015	0	0
2	M2	Y	-.015	-.015	0	0
3	2	Y	-.015	-.015	0	0
4	M4	Y	-.02	-.02	0	0
5	M5	Y	-.02	-.02	0	0
6	M6	Y	-.02	-.02	0	0
7	M7	Y	-.015	-.015	0	0
8	M8	Y	-.015	-.015	0	0
9	M9	Y	-.015	-.015	0	0
10	M10	Y	-.02	-.02	0	0
11	M11	Y	-.019	-.019	0	0
12	M14	Y	-.02	-.02	0	0
13	M18	Y	-.02	-.02	0	0
14	M23	Y	-.011	-.011	0	0
15	M25	Y	-.01	-.01	0	0
16	M27	Y	-.01	-.01	0	0
17	M29	Y	-.011	-.011	0	0
18	M31	Y	-.01	-.01	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[in,%]	End Location[in,%]
19	M33	Y	-.01	-.01	0	0
20	M35	Y	-.011	-.011	0	0
21	M37	Y	-.01	-.01	0	0
22	M39	Y	-.01	-.01	0	0
23	M38A	Y	-.019	-.019	0	0
24	M39A	Y	-.019	-.019	0	0
25	M40	Y	-.011	-.011	0	0
26	M52	Y	-.014	-.014	0	0
27	M53	Y	-.014	-.014	0	0
28	M54	Y	-.014	-.014	0	0
29	M55	Y	-.011	-.011	0	0
30	M67	Y	-.014	-.014	0	0
31	M68	Y	-.014	-.014	0	0
32	M69	Y	-.014	-.014	0	0
33	M70	Y	-.014	-.014	0	0
34	M71	Y	-.014	-.014	0	0
35	M72A	Y	-.011	-.011	0	0
36	M73A	Y	-.011	-.011	0	0
37	M74A	Y	-.011	-.011	0	0
38	M75A	Y	-.011	-.011	0	0
39	M72	Y	-.014	-.014	0	0
40	M73	Y	-.014	-.014	0	0
41	M74	Y	-.014	-.014	0	0
42	M75	Y	-.014	-.014	0	0

Member Distributed Loads (BLC 22 : BLC 1 Transient Area Loads)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[in,%]	End Location[in,%]
1	M1	Y	-.0002016	-.006	0	24
2	M1	Y	-.006	-.01	24	48
3	M1	Y	-.01	-.009	48	72
4	M1	Y	-.009	-.009	72	96
5	M1	Y	-.009	-.01	96	120
6	M1	Y	-.01	-.006	120	144
7	M1	Y	-.006	-.0002016	144	168
8	M5	Y	-.002	-.009	0	23.4
9	M5	Y	-.009	-.017	23.4	46.8
10	M6	Y	-.002	-.009	0	23.4
11	M6	Y	-.009	-.017	23.4	46.8
12	M7	Y	-.01	-.01	.117	86.823
13	M2	Y	-.002	-.005	0	28
14	M2	Y	-.005	-.009	28	56
15	M2	Y	-.009	-.012	56	84
16	M2	Y	-.012	-.009	84	112
17	M2	Y	-.009	-.005	112	140
18	M2	Y	-.005	-.002	140	168
19	M4	Y	-.002	-.009	0	23.4
20	M4	Y	-.009	-.017	23.4	46.8
21	M8	Y	-.01	-.01	.117	86.823
22	2	Y	-.002	-.005	0	28
23	2	Y	-.005	-.009	28	56
24	2	Y	-.009	-.012	56	84
25	2	Y	-.012	-.009	84	112
26	2	Y	-.009	-.005	112	140
27	2	Y	-.005	-.002	140	168
28	M9	Y	-.01	-.01	.117	86.823

Member Distributed Loads (BLC 23 : BLC 8 Transient Area Loads)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[in,%]	End Location[in,%]
1	M1	Y	-.0002008	-.006	0	24
2	M1	Y	-.006	-.01	24	48
3	M1	Y	-.01	-.009	48	72
4	M1	Y	-.009	-.009	72	96
5	M1	Y	-.009	-.01	96	120
6	M1	Y	-.01	-.006	120	144
7	M1	Y	-.006	-.0002008	144	168
8	M5	Y	-.002	-.009	0	23.4
9	M5	Y	-.009	-.017	23.4	46.8
10	M6	Y	-.002	-.009	0	23.4
11	M6	Y	-.009	-.017	23.4	46.8
12	M7	Y	-.01	-.01	.117	86.823
13	M2	Y	-.002	-.005	0	28
14	M2	Y	-.005	-.009	28	56
15	M2	Y	-.009	-.012	56	84
16	M2	Y	-.012	-.009	84	112
17	M2	Y	-.009	-.005	112	140
18	M2	Y	-.005	-.002	140	168
19	M4	Y	-.002	-.009	0	23.4
20	M4	Y	-.009	-.017	23.4	46.8
21	M8	Y	-.01	-.01	.117	86.823
22	2	Y	-.002	-.005	0	28
23	2	Y	-.005	-.009	28	56
24	2	Y	-.009	-.012	56	84
25	2	Y	-.012	-.009	84	112
26	2	Y	-.009	-.005	112	140
27	2	Y	-.005	-.002	140	168
28	M9	Y	-.01	-.01	.117	86.823

Member Area Loads (BLC 1 : Dead)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[ksf]
1	N3	N6	N5	N4	Y	Two Way	-.01
2	N4	N5	N7	N2	Y	Two Way	-.01
3	N2	N3	N6	N7	Y	Two Way	-.01

Member Area Loads (BLC 8 : Ice)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[ksf]
1	N3	N6	N5	N4	Y	Two Way	-.01
2	N4	N5	N7	N2	Y	Two Way	-.01
3	N2	N3	N6	N7	Y	Two Way	-.01

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
1	Dead	DL		-1			30		3	
2	0 Wind - No Ice	WLZ					30	42		
3	90 Wind - No Ice	WLX					30	42		
4	0 Wind - Ice	WLZ					30	42		
5	90 Wind - Ice	WLX					30	42		
6	0 Wind - Service	WLZ					30	42		
7	90 Wind - Service	WLX					30	42		
8	Ice	OL1					30	42	3	
9	Live Load a	LL				3				
10	Live Load b	LL				3				

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
11	Live Load c	LL				3				
12	Live Load d	LL								
13	Maint LL 1	LL					1			
14	Maint LL 2	LL					1			
15	Maint LL 3	LL					1			
16	Maint LL 4	LL					1			
17	Maint LL 5	LL					1			
18	Maint LL 6	LL					1			
19	Maint LL 7	LL					1			
20	Maint LL 8	LL					1			
21	Maint LL 9	LL					1			
22	BLC 1 Transient Area...	None						28		
23	BLC 8 Transient Area...	None						28		

Load Combinations

	Description	So...	P...	S...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...
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/I...	Yes	Y		1	1.2	4	1			8	1												
15	1.2 D + 1.0 - 30 W...	Yes	Y		1	1.2	4	.866	5	.5	8	1												
16	1.2 D + 1.0 - 60 W...	Yes	Y		1	1.2	5	.866	4	.5	8	1												
17	1.2 D + 1.0 - 90 W...	Yes	Y		1	1.2	5	1			8	1												
18	1.2 D + 1.0 - 120 ...	Yes	Y		1	1.2	5	.866	4	-.5	8	1												
19	1.2 D + 1.0 - 150 ...	Yes	Y		1	1.2	4	-.866	5	.5	8	1												
20	1.2 D + 1.0 - 180 ...	Yes	Y		1	1.2	4	-1			8	1												
21	1.2 D + 1.0 - 210 ...	Yes	Y		1	1.2	4	-.866	5	-.5	8	1												
22	1.2 D + 1.0 - 240 ...	Yes	Y		1	1.2	5	-.866	4	-.5	8	1												
23	1.2 D + 1.0 - 270 ...	Yes	Y		1	1.2	5	-1			8	1												
24	1.2 D + 1.0 - 300 ...	Yes	Y		1	1.2	5	-.866	4	.5	8	1												
25	1.2 D + 1.0 - 330 ...	Yes	Y		1	1.2	4	.866	5	-.5	8	1												
26	1.2 D + 1.5 LL a +...	Yes	Y		1	1.2	6	1			9	1.5												
27	1.2 D + 1.5 LL a +...	Yes	Y		1	1.2	6	.866	7	.5	9	1.5												
28	1.2 D + 1.5 LL a +...	Yes	Y		1	1.2	7	.866	6	.5	9	1.5												
29	1.2 D + 1.5 LL a +...	Yes	Y		1	1.2	7	1			9	1.5												
30	1.2 D + 1.5 LL a +...	Yes	Y		1	1.2	7	.866	6	-.5	9	1.5												
31	1.2 D + 1.5 LL a +...	Yes	Y		1	1.2	6	-.866	7	.5	9	1.5												
32	1.2 D + 1.5 LL a +...	Yes	Y		1	1.2	6	-1			9	1.5												
33	1.2 D + 1.5 LL a +...	Yes	Y		1	1.2	6	-.866	7	-.5	9	1.5												
34	1.2 D + 1.5 LL a +...	Yes	Y		1	1.2	7	-.866	6	-.5	9	1.5												
35	1.2 D + 1.5 LL a +...	Yes	Y		1	1.2	7	-1			9	1.5												
36	1.2 D + 1.5 LL a +...	Yes	Y		1	1.2	7	-.866	6	.5	9	1.5												
37	1.2 D + 1.5 LL a +...	Yes	Y		1	1.2	6	.866	7	-.5	9	1.5												
38	1.2 D + 1.5 LL b +...	Yes	Y		1	1.2	6	1			10	1.5												
39	1.2 D + 1.5 LL b +...	Yes	Y		1	1.2	6	.866	7	.5	10	1.5												

Load Combinations (Continued)

	Description	So...	P...	S...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...
40	1.2 D + 1.5 LL b +...	Yes	Y		1	1.2	7	.866	6	.5	10	1.5														
41	1.2 D + 1.5 LL b +...	Yes	Y		1	1.2	7	1			10	1.5														
42	1.2 D + 1.5 LL b +...	Yes	Y		1	1.2	7	.866	6	-.5	10	1.5														
43	1.2 D + 1.5 LL b +...	Yes	Y		1	1.2	6	-.866	7	.5	10	1.5														
44	1.2 D + 1.5 LL b +...	Yes	Y		1	1.2	6	-1			10	1.5														
45	1.2 D + 1.5 LL b +...	Yes	Y		1	1.2	6	-.866	7	-.5	10	1.5														
46	1.2 D + 1.5 LL b +...	Yes	Y		1	1.2	7	-.866	6	-.5	10	1.5														
47	1.2 D + 1.5 LL b +...	Yes	Y		1	1.2	7	-1			10	1.5														
48	1.2 D + 1.5 LL b +...	Yes	Y		1	1.2	7	-.866	6	.5	10	1.5														
49	1.2 D + 1.5 LL b +...	Yes	Y		1	1.2	6	.866	7	-.5	10	1.5														
50	1.2 D + 1.5 LL c + ...	Yes	Y		1	1.2	6	1			11	1.5														
51	1.2 D + 1.5 LL c + ...	Yes	Y		1	1.2	6	.866	7	.5	11	1.5														
52	1.2 D + 1.5 LL c + ...	Yes	Y		1	1.2	7	.866	6	.5	11	1.5														
53	1.2 D + 1.5 LL c + ...	Yes	Y		1	1.2	7	1			11	1.5														
54	1.2 D + 1.5 LL c + ...	Yes	Y		1	1.2	7	.866	6	-.5	11	1.5														
55	1.2 D + 1.5 LL c + ...	Yes	Y		1	1.2	6	-.866	7	.5	11	1.5														
56	1.2 D + 1.5 LL c + ...	Yes	Y		1	1.2	6	-1			11	1.5														
57	1.2 D + 1.5 LL c + ...	Yes	Y		1	1.2	6	-.866	7	-.5	11	1.5														
58	1.2 D + 1.5 LL c + ...	Yes	Y		1	1.2	7	-.866	6	-.5	11	1.5														
59	1.2 D + 1.5 LL c + ...	Yes	Y		1	1.2	7	-1			11	1.5														
60	1.2 D + 1.5 LL c + ...	Yes	Y		1	1.2	7	-.866	6	.5	11	1.5														
61	1.2 D + 1.5 LL c + ...	Yes	Y		1	1.2	6	.866	7	-.5	11	1.5														
62	1.2 D + 1.5 LL d +...	Yes	Y		1	1.2	6	1			12	1.5														
63	1.2 D + 1.5 LL d +...	Yes	Y		1	1.2	6	.866	7	.5	12	1.5														
64	1.2 D + 1.5 LL d +...	Yes	Y		1	1.2	7	.866	6	.5	12	1.5														
65	1.2 D + 1.5 LL d +...	Yes	Y		1	1.2	7	1			12	1.5														
66	1.2 D + 1.5 LL d +...	Yes	Y		1	1.2	7	.866	6	-.5	12	1.5														
67	1.2 D + 1.5 LL d +...	Yes	Y		1	1.2	6	-.866	7	.5	12	1.5														
68	1.2 D + 1.5 LL d +...	Yes	Y		1	1.2	6	-1			12	1.5														
69	1.2 D + 1.5 LL d +...	Yes	Y		1	1.2	6	-.866	7	-.5	12	1.5														
70	1.2 D + 1.5 LL d +...	Yes	Y		1	1.2	7	-.866	6	-.5	12	1.5														
71	1.2 D + 1.5 LL d +...	Yes	Y		1	1.2	7	-1			12	1.5														
72	1.2 D + 1.5 LL d +...	Yes	Y		1	1.2	7	-.866	6	.5	12	1.5														
73	1.2 D + 1.5 LL d +...	Yes	Y		1	1.2	6	.866	7	-.5	12	1.5														
74	1.2 D + 1.5 LL Mai...	Yes	Y		1	1.2					13	1.5														
75	1.2 D + 1.5 LL Mai...	Yes	Y		1	1.2					14	1.5														
76	1.2 D + 1.5 LL Mai...	Yes	Y		1	1.2					15	1.5														
77	1.2 D + 1.5 LL Mai...	Yes	Y		1	1.2					16	1.5														
78	1.2 D + 1.5 LL Mai...	Yes	Y		1	1.2					17	1.5														
79	1.2 D + 1.5 LL Mai...	Yes	Y		1	1.2					18	1.5														
80	1.2 D + 1.5 LL Mai...	Yes	Y		1	1.2					19	1.5														
81	1.2 D + 1.5 LL Mai...	Yes	Y		1	1.2					20	1.5														
82	1.2 D + 1.5 LL Mai...	Yes	Y		1	1.2					21	1.5														

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	N9	max	3.817	5	1.302	20	.978	2	.042	2	2.807	5	1.202	11
2		min	-3.764	11	.155	2	-1.18	8	-3.016	20	-2.715	11	-1.225	5
3	N61A	max	2.447	3	1.303	24	4.501	3	2.163	2	3.807	9	2.667	22
4		min	-2.657	9	.213	7	-4.425	9	-1.227	8	-3.726	3	-.037	4
5	N63	max	2.541	7	1.303	16	4.621	13	2.034	2	3.86	13	.089	12
6		min	-2.375	13	.241	10	-4.487	7	-1.053	8	-3.781	7	-2.666	18
7	N125	max	.178	6	2.016	14	2.929	14	0	11	0	13	0	13
8		min	-.314	12	.54	7	.65	8	0	18	0	7	0	7
9	N128	max	2.689	17	2.042	17	-.293	2	0	16	0	4	0	21

Envelope Joint Reactions (Continued)

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
10		min	.472	11	.496	10	-1.321	20	0	10	0	58	0	3
11	N131	max	-.509	4	2.034	22	-.153	2	0	2	0	8	0	2
12		min	-2.463	23	.486	3	-1.685	20	0	8	0	2	0	20
13	Totals:	max	7.713	5	9.738	24	10.632	2						
14		min	-7.713	11	3.116	6	-10.632	8						

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

	Member	Shape	Code Check	Lo...	LC	She...	Lo...	...	LC	phi*P...	phi*P...	phi*M...	phi*M...	...	Eqn
1	M55	PIPE_2.0	.592	12....	8	.578	12....		8	4.679	32.13	1.872	1.872	...	H3-6
2	M40	PIPE_2.0	.563	12....	2	.560	12....		2	4.679	32.13	1.872	1.872	...	H3-6
3	M72A	PIPE_2.0	.480	14.5	7	.464	12....		7	4.679	32.13	1.872	1.872	...	H3-6
4	M73A	PIPE_2.0	.446	14.5	13	.440	12....		13	4.679	32.13	1.872	1.872	...	H3-6
5	M75A	PIPE_2.0	.409	16....	2	.335	12....		4	4.679	32.13	1.872	1.872	...	H1-1b
6	M74A	PIPE_2.0	.470	16....	8	.308	12....		10	4.679	32.13	1.872	1.872	...	H1-1b
7	M2	L3X3X4	.457	168	13	.296	84	z	18	15.746	46.656	1.688	3.387	...	H2-1
8	M38A	HSS4X4X4	.312	18	2	.260	18	z	9	138.21	139.5..	16.181	16.181	...	H1-1b
9	M39A	HSS4X4X4	.313	18	2	.257	18	z	13	138.21	139.5..	16.181	16.181	...	H1-1b
10	M11	HSS4X4X4	.240	18	6	.189	18	z	5	138.21	139.5..	16.181	16.181	...	H1-1b
11	M1	L3X3X4	.607	168	8	.183	84	z	14	15.746	46.656	1.688	3.561	...	H2-1
12	M23	PIPE_2.0	.448	56....	8	.136	57....		3	12.144	32.13	1.872	1.872	...	H1-1b
13	M29	PIPE_2.0	.540	58.5	2	.135	59....		19	12.144	32.13	1.872	1.872	...	H1-1b
14	M27	PIPE_1.5	.537	33	7	.131	33....		2	11.974	23.593	1.105	1.105	...	H1-1b
15	M35	PIPE_2.0	.479	57....	2	.126	58.5		23	12.144	32.13	1.872	1.872	...	H1-1b
16	M53	L2.5x2.5x4	.732	0	2	.125	15....	y	2	36.58	38.556	1.114	2.537	...	H2-1
17	M39	PIPE_1.5	.679	33	2	.122	33....		20	11.974	23.593	1.105	1.105	...	H1-1b
18	M14	HSS4.5X4.5X4	.075	18	2	.120	24	z	9	156.9..	158.9..	20.907	20.907	...	H1-1b
19	M18	HSS4.5X4.5X4	.071	18	2	.118	24	z	13	156.9..	158.9..	20.907	20.907	...	H1-1b
20	M33	PIPE_1.5	.510	33....	3	.115	33....		16	11.974	23.593	1.105	1.105	...	H1-1b
21	2	L3X3X4	.480	0	3	.112	84	z	21	15.746	46.656	1.688	3.633	...	H2-1
22	M37	PIPE_1.5	.647	33	8	.099	33		7	11.974	23.593	1.105	1.105	...	H1-1b
23	M52	L2.5x2.5x4	.407	0	11	.091	15....	y	9	36.58	38.556	1.114	2.537	...	H2-1
24	M68	L2.5x2.5x4	.755	0	8	.089	15....	y	8	36.58	38.556	1.114	2.537	...	H2-1
25	M69	L2.5x2.5x4	.582	15....	25	.088	0	y	8	36.58	38.556	1.114	2.537	...	H2-1
26	M10	HSS4.5X4.5X4	.067	18	22	.087	24	z	5	156.9..	158.9..	20.907	20.907	...	H1-1b
27	M31	PIPE_1.5	.636	33	3	.086	33		3	11.974	23.593	1.105	1.105	...	H1-1b
28	M54	L2.5x2.5x4	.620	0	7	.086	15....	y	7	36.58	38.556	1.114	2.537	...	H2-1
29	M67	L2.5x2.5x4	.561	15....	16	.063	15....	y	3	36.58	38.556	1.114	2.537	...	H2-1
30	M25	PIPE_1.5	.447	33....	7	.059	33....		8	11.974	23.593	1.105	1.105	...	H1-1b
31	M6	LL3x3x4x0	.195	0	2	.019	46.8	z	13	76.391	93.312	6.48	4.361	...	H1-1b
32	M5	LL3x3x4x0	.190	0	8	.019	46.8	z	9	76.391	93.312	6.48	4.361	...	H1-1b
33	M9	L3X3X4	.388	43....	7	.016	43....	z	18	14.729	46.656	1.688	3.268	...	H2-1
34	M8	L3X3X4	.393	43....	9	.016	43....	z	22	14.729	46.656	1.688	3.283	...	H2-1
35	M7	L3X3X4	.277	43....	4	.016	43....	z	18	14.729	46.656	1.688	3.226	...	H2-1
36	M4	LL3x3x4x0	.135	0	6	.013	46.8	z	5	76.391	93.312	6.48	4.361	...	H1-1b
37	M75	L2.5x2.5x3	.431	36....	17	.012	73....	y	3	8.827	29.192	.873	1.523	...	H2-1
38	M71	L2.5x2.5x3	.429	36....	21	.012	73....	y	7	8.827	29.192	.873	1.523	...	H2-1
39	M70	L2.5x2.5x3	.457	36....	19	.010	73....	z	3	8.827	29.192	.873	1.523	...	H2-1
40	M73	L2.5x2.5x3	.434	36....	25	.010	0	y	11	8.827	29.192	.873	1.523	...	H2-1
41	M74	L2.5x2.5x3	.455	36....	15	.009	73....	z	10	8.827	29.192	.873	1.523	...	H2-1
42	M72	L2.5x2.5x3	.459	36....	23	.009	0	y	22	8.827	29.192	.873	1.523	...	H2-1

APPENDIX C

MOUNT MODIFICATION DESIGN DRAWINGS (MDD)

MI CHECKLIST

REQUIRED	REPORT ITEM	BRIEF DESCRIPTION
		PRE-CONSTRUCTION
X	MI CHECKLIST DRAWING	THIS CHECKLIST SHALL BE INCLUDED IN THE MI REPORT.
N/A	EOR APPROVED SHOP DRAWINGS	FABRICATION DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW. THE CONTRACTOR SHALL PROVIDE APPROVED SHOP DRAWINGS TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	ASSEMBLY DRAWINGS	ONCE THE PRE-MODIFICATION MAPPING IS COMPLETE, PRIOR TO FABRICATION, THE CONTRACTOR SHALL PROVIDE DETAILED ASSEMBLY DRAWINGS. THESE ARE TO INCLUDE, BUT ARE NOT LIMITED TO, A VISUAL LAYOUT OF NEW REINFORCEMENT, EXISTING REINFORCEMENT CONFIGURATION, PORTHOLES, MOUNTS, STEP PEGS, SAFETY CLIMBS AND ANY OTHER MISCELLANEOUS ITEMS WHICH MAY AFFECT SUCCESSFUL INSTALLATION OF MODIFICATIONS ON THE TOWER. THESE DRAWINGS SHALL BE SUBMITTED TO THE EOR FOR APPROVAL. APPROVED ASSEMBLY DRAWINGS SHALL BE SUBMITTED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	FABRICATION INSPECTION	A LETTER FROM THE FABRICATOR, STATING THAT THE WORK WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THE CONTRACT DOCUMENTS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	FABRICATOR CERTIFIED WELD INSPECTION	A VISUAL OBSERVATION BY CWI OF A PORTION OF WELDING ON THE PROPOSED STRUCTURAL MEMBERS IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	MATERIAL TEST REPORT (MTR)	MILL CERTIFICATION SHALL BE PROVIDED FOR ALL STEEL AS SPECIFIED IN THE MODIFICATION DRAWINGS AND THIS DOCUMENTATION SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	FABRICATOR NDE INSPECTION	CRITICAL SHOP WELDS THAT REQUIRE TESTING ARE NOTED ON THESE CONTRACT DRAWINGS. A CERTIFIED WELD INSPECTOR SHALL PERFORM NON-DESTRUCTIVE EXAMINATION AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	PACKING SLIPS	THE MATERIAL SHIPPING LIST SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
		CONSTRUCTION (PERFORMED BY CONTRACTOR)
X	CONSTRUCTION INSPECTIONS	A LETTER FROM THE GENERAL CONTRACTOR STATING THAT THE WORKMANSHIP WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THESE CONTRACT DRAWINGS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	CONTRACTOR'S CERTIFIED WELD INSPECTION	A CERTIFIED WELD INSPECTOR SHALL INSPECT AND TEST AS NECESSARY ALL FIELD WELDS. A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	ON SITE COLD GALVANIZING VERIFICATION	THE GENERAL CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE MI INSPECTOR VERIFYING THAT ANY ON-SITE COLD GALVANIZING WAS APPLIED AS SPECIFIED IN THE MODIFICATION DRAWINGS.
X	GC AS-BUILT DOCUMENTS	THE GENERAL CONTRACTOR SHALL SUBMIT A COPY OF THE CONTRACT DRAWINGS EITHER STATING "INSTALLED AS DESIGNED" OR NOTING ANY CHANGES THAT WERE REQUIRED AND APPROVED BY THE ENGINEER OF RECORD DUE TO FIELD CONDITIONS.
		POST-CONSTRUCTION
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)	THE MI INSPECTOR SHALL OBSERVE AND REPORT ANY DISCREPANCIES BETWEEN THE CONTRACTORS REDLINE DRAWING AND THE ACTUAL COMPLETED INSTALLATION.
X	PHOTOGRAPHS	PHOTOGRAPHS SHALL BE SUBMITTED TO THE MI WHICH DOCUMENT ALL PHASES OF THE CONSTRUCTION. THE PHOTOS SHALL BE ORGANIZED IN A MANNER THAT EASILY IDENTIFIES THE EXACT LOCATION OF THE PHOTO.
ADDITIONAL TESTING AND INSPECTIONS:		
NOTE: X DENOTES A DOCUMENT NEEDED FOR THE MI REPORT AND N/A DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE MI REPORT		

MODIFICATION INSPECTION NOTES:

GENERAL

THE MODIFICATION INSPECTION (MI) IS A VISUAL INSPECTION OF TOWER MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTIONS AND OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS, AS DESIGNED BY THE ENGINEER OF RECORD (EOR).

THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, NOR DOES THE MI INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES.

TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PO IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY. IF CONTACT INFORMATION IS NOT KNOWN, CONTACT B+T GROUP.

MI INSPECTOR

THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO FOR THE MI TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ONSITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS

THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GENERAL CONTRACTOR (GC) INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING THE IN-FIELD INSPECTIONS, AND SUBMITTING THE MI REPORT.

GENERAL CONTRACTOR

THE GC IS REQUIRED TO CONTACT THE MI INSPECTOR AS SOON AS RECEIVING A PO FOR THE MODIFICATION INSTALLATION OR TURNKEY PROJECT TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE MI INSPECTIONS
- BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS

THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST.

RECOMMENDATIONS

THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING A MI REPORT:

- IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLY 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
- THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY DEFICIENCIES CORRECTED DURING THE INITIAL MI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MI CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON SITE.

CANCELLATION OR DELAYS IN SCHEDULED MI

IF THE GC AND MI INSPECTOR AGREE TO A DATE ON WHICH THE MI WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, CARRIER SHALL NOT BE RESPONSIBLE FOR ANY COSTS, FEES, LOSS OF DEPOSITS AND/OR OTHER PENALTIES RELATED TO THE CANCELLATION OR DELAY INCURRED BY EITHER PARTY FOR ANY TIME (E.G. TRAVEL AND LODGING, COSTS OF KEEPING EQUIPMENT ON-SITE, ETC.). IF CARRIER CONTRACTS DIRECTLY FOR A THIRD PARTY MI, EXCEPTIONS MAY BE MADE IN THE EVENT THAT THE DELAY/CANCELLATION IS CAUSED BY WEATHER OR OTHER CONDITIONS THAT MAY COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.

CORRECTION OF FAILING MI'S

IF THE MODIFICATION INSPECTOR FAILS THE MI ("FAILED MI"), THE GC SHALL WORK WITH CARRIER TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:

- CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI.
- OR, WITH CARRIER'S APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION
- THE ADDITIONAL COST INCURRED IN THE SECOND SUPERVISION PROCESS WOULD BE BORNE BY THE GENERAL CONTRACTOR.

MI VERIFICATION INSPECTIONS

CARRIER RESERVES THE RIGHT TO CONDUCT A MI VERIFICATION INSPECTION TO VERIFY THE ACCURACY AND COMPLETENESS OF PREVIOUSLY COMPLETED MI INSPECTION(S) ON TOWER MODIFICATION PROJECTS.

ALL VERIFICATION INSPECTIONS SHALL BE HELD TO THE SAME SPECIFICATIONS AND REQUIREMENTS IN THE CONTRACT DOCUMENTS.

VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASSING MI" OR "PASS AS NOTED MI" REPORT FOR THE ORIGINAL PROJECT.

REQUIRED PHOTOS

BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:

- PRE-CONSTRUCTION GENERAL SITE CONDITION
- PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION
  - RAW MATERIALS
  - PHOTOS OF ALL CRITICAL DETAILS
  - FOUNDATION MODIFICATIONS
  - WELD PREPARATION
  - BOLT INSTALLATION AND TORQUE
  - FINAL INSTALLED CONDITION
  - SURFACE COATING REPAIR
- POST CONSTRUCTION PHOTOGRAPHS
  - PHOTOS OF MODIFIED SECTIONS INDIVIDUALLY INDICATING ELEVATION
  - FINAL INFIELD CONDITION

PHOTOS OF ELEVATED MODIFICATIONS TAKEN FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.

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T-Mobile

CROWN CASTLE

HAMPTON / BERNIER

116 GRANT HILL RD.
BROOKLYN, CT 06234
WINDHAM

EXISTING PLATFORM
AT 137'-00"

PROJECT NO:	136355.003.01
CHECKED BY:	JV

ISSUED FOR:

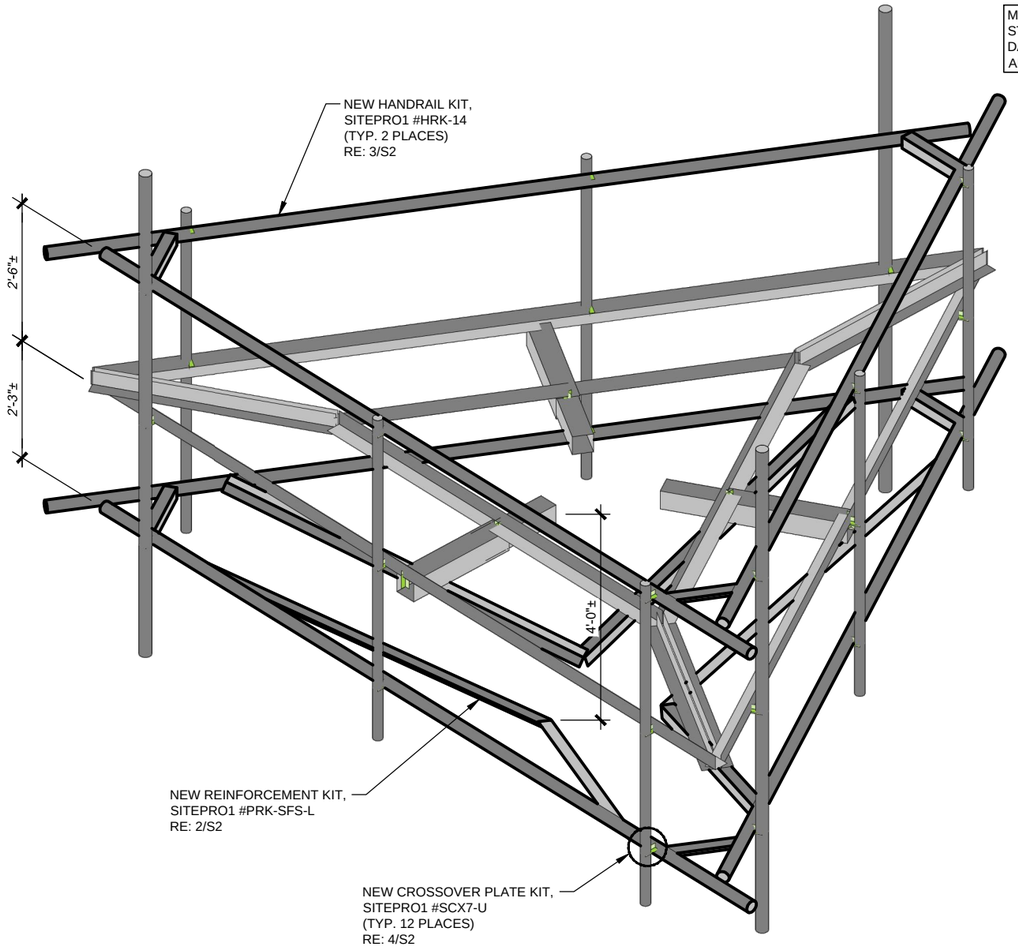
REV	DATE	DRWN	DESCRIPTION
0	07/09/19	NGR	CONSTRUCTION

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/20

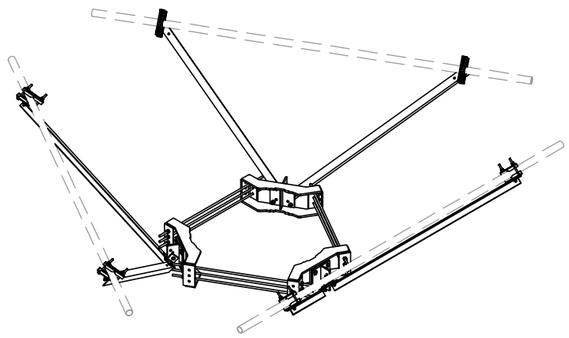
STATE OF CONNECTICUT
SCOTT VANCE
31627
LICENSED
PROFESSIONAL ENGINEER
7/9/19

SHEET NUMBER:	REVISION:
S1	0

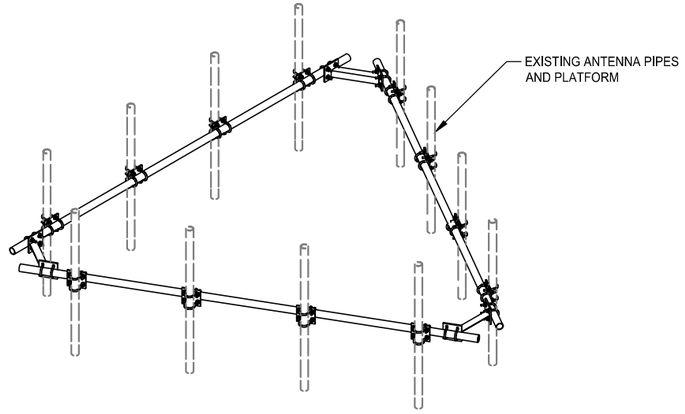
MODIFICATIONS BASED ON THE FAILING STRUCTURAL ANALYSIS FROM B+T GROUP DATED 07/02/19 AND ACCOMPANIED BY ANALYSIS FROM B+T GROUP DATED 07/09/19



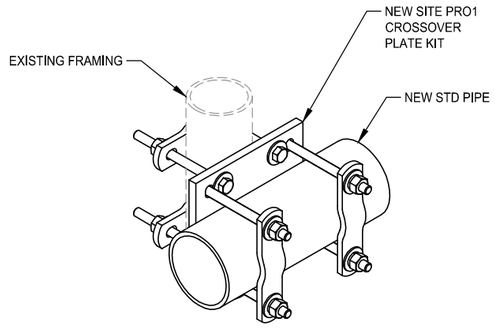
1 MODIFIED PLATFORM
SCALE: N.T.S.



2 SITEPRO1 PRK-SFS-L REINFORCEMENT KIT
SCALE: N.T.S.



3 SITE PRO1 HRK-14 HANDRAIL KIT
SCALE: N.T.S.



4 SITE PRO1 SCX7-U CROSSOVER PLATE KIT
SCALE: N.T.S.

GENERAL NOTES

1.1 CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS AND DIMENSIONS PRIOR TO THE MOBILIZING ON THE SITE FOR INSTALLATION OF THE MOUNT MODIFICATION AND SHALL NOTIFY THE ENGINEER OF RECORD IF THE FIELD CONDITIONS VARY FROM WHAT IS SHOWN ON THE DRAWINGS. IN ADDITION, THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF RECORD PRIOR TO MOBILIZING AT THE SITE IF THE MOUNT REINFORCEMENT SHOWN WILL NEED TO BE REVISED TO SATISFY FIELD CONDITIONS

1.2 CONTRACTOR SHALL RELOCATE NON-ANTENNA EQUIPMENT ALONG THE EXISTING PIPE MOUNT THAT IT IS MOUNTED TO, TO ALLOW FOR INSTALLATION OF MOUNT REINFORCEMENT. ENGINEER OF RECORD WILL BE NOTIFIED IF NON-ANTENNA EQUIPMENT NEEDS TO BE RELOCATED TO ANY OTHER EXISTING MEMBERS TO ALLOW FOR INSTALLATION OF MOUNT MODIFICATION.

1.3 MODIFICATION SHALL BE COMPLETED PRIOR TO ADDING THE PROPOSED APPURTENANCES.

1.4 ALL WORK SHALL COMPLY WITH THE TIA-222-H STANDARD, TIA-1019-A STANDARD, AS WELL AS ANY OTHER GOVERNING BUILDING CODES.

1.5 FIELD WORK WILL BE DONE AROUND EXISTING COAXIAL CABLE AND EQUIPMENT. ALL WORK SHALL BE DONE IN A MANNER SUCH THAT NO DAMAGE OCCURS TO THE EXISTING EQUIPMENT OR THE STRUCTURE.

1.6 A MINIMUM OF TWO COATS OF ZINGA COLD GALVANIZING COMPOUND (OR APPROVED EQUIVALENT) SHALL BE APPLIED TO ANY FIELD CUTS OR FIELD DRILLED HOLES.

1.7 THE USE OF A GAS TORCH OR WELDER WILL NOT BE PERMITTED ON THE TOWER WITHOUT THE CONSENT OF THE OWNER.

1.8 ALL FIELD CONNECTIONS SHALL BE MADE WITH A325N BOLTS, U.N.O.

1.9 IN LIEU OF TEMPORARY BRACING, CONTRACTOR MAY HAVE A STABILITY ANALYSIS PERFORMED BY AN ENGINEER LICENSED IN THE STATE THE TOWER IS LOCATED. THE ANALYSIS SHALL USE A MINIMUM WIND SPEED OF 45 mph (3-SEC) PER TIA-1019.

1.10 ALL CUTTING AND WELDING ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH CCUSA POLICY "CUTTING AND WELDING PLAN" (DOC #ENG-PLN-10015) ON AN ONGOING BASIS THROUGHOUT THE ENTIRE LIFE OF THE PROJECT.

1.11 DIMENSIONS WITH "±" MUST BE WITHIN 3" OF THE INDICATED DIMENSION.

FABRICATION

2.1 ALL WORK SHALL BE DONE IN ACCORDANCE WITH A.I.S.C. "SPECIFICATIONS FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS."

2.2 STRUCTURAL STEEL SHALL MEET THE FOLLOWING SPECIFICATIONS:

	YIELD	ASTM SPECS
STEEL PIPE, U.N.O.	35ksi	A53 GR.B

2.3 ALL NEW MATERIAL INCLUDING STRUCTURAL STEEL AND FASTENERS SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 AND A153.

2.4 WELDING SHALL MEET ANSI/AWS D1.1 STRUCTURAL WELDING CODE (LATEST REVISION). ELECTRODES SHALL BE E80 SERIES.

2.5 CONTRACTOR SHALL PROVIDE SHOP FABRICATION DRAWINGS TO B+T GROUP 5 DAYS PRIOR TO FABRICATION.

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T-Mobile

CROWN CASTLE

HAMPTON / BERNIER

116 GRANT HILL RD.
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WINDHAM

EXISTING PLATFORM
AT 137'-00"

PROJECT NO:	136355.003.01
CHECKED BY:	JV

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION
0	07/09/19	NGR	CONSTRUCTION

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/20

STATE OF CONNECTICUT
SCOTT M. VANCE
31627
LICENSED
PROFESSIONAL ENGINEER

7/9/19

SHEET NUMBER:	REVISION:
S2	0

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: CT11511A

Sprint - Brooklyn
116 Grant Hill Road
Brooklyn, CT 06234

June 5, 2019

Transcom Engineering Project Number: 737001-0143

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**10.26 %**

June 5, 2019

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

Emissions Analysis for Site: **CT11511A – Sprint - Brooklyn**

Transcom Engineering, Inc ("Transcom") was directed to analyze the proposed upgrades to the T-MOBILE facility located at **116 Grant Hill Road, Brooklyn, 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.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were performed for the proposed upgrades to the T-MOBILE antenna facility located at **116 Grant Hill Road, Brooklyn, 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
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 APX16DWV-16DWV-S-E-ACU	137
A	2	RFS APXVAARR24_43-U-NA20	137
B	1	RFS APX16DWV-16DWV-S-E-ACU	137
B	2	RFS APXVAARR24_43-U-NA20	137
C	1	RFS APX16DWV-16DWV-S-E-ACU	137
C	2	RFS APXVAARR24_43-U-NA20	137

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)** radios are ground mounted the following cable loss values were used. For each ground mounted **1900 MHz (PCS)** radio there was **1.65 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 **1-5/8”** 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 APX16DWV-16DWV-S-E-ACU	1900 MHz (PCS)	15.9	5	175	4,656.27	0.97
Antenna A2	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	12.95 / 13.35	4	120	2,443.03	1.22
						Sector A Composite MPE%	**2.19**
Antenna B1	RFS APX16DWV-16DWV-S-E-ACU	1900 MHz (PCS)	15.9	5	175	4,656.27	0.97
Antenna B2	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	12.95 / 13.35	4	120	2,443.03	1.22
						Sector B Composite MPE%	**2.19**
Antenna C1	RFS APX16DWV-16DWV-S-E-ACU	1900 MHz (PCS)	15.9	5	175	4,656.27	0.97
Antenna C2	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	12.95 / 13.35	4	120	2,443.03	1.22
						Sector C Composite MPE%	**2.19**

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, all three sectors have the same configuration yielding the same results on all three 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	**2.19 %**
Sprint	2.62 %
AT&T	2.35 %
Verizon Wireless	2.79 %
CL&P	0.31 %
Site Total MPE %:	**10.26 %**

Table 4: All Carrier MPE Contributions

T-MOBILE Sector A Total:	2.19 %
T-MOBILE Sector B Total:	2.19 %
T-MOBILE Sector C Total:	2.19 %
Site Total:	10.26 %

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, all three sectors have the same configuration yielding the same results on all three sectors.

T-MOBILE _ Frequency Band / Technology Max Power Values (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile 1900 MHz (PCS) LTE	4	1,064.29	137	8.92	1900 MHz (PCS)	1000	0.89%
T-Mobile 1900 MHz (PCS) GSM	1	399.11	137	0.84	1900 MHz (PCS)	1000	0.08%
T-Mobile 600 MHz LTE / 5G NR	2	788.97	137	3.31	600 MHz	400	0.83%
T-Mobile 700 MHz LTE	2	432.54	137	1.81	700 MHz	467	0.39%
						Total:	**2.19%**

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:	2.19 %
Sector B:	2.19 %
Sector C:	2.19 %
T-MOBILE Maximum Total (per sector):	2.19 %
Site Total:	10.26 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **10.26 %** 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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