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

July 17, 2019

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

RE: **Notice of Exempt Modification for T-Mobile:**
806368 - T-Mobile Site ID: CT11248A
374 Three Mile Road, Glastonbury, CT 06033
Latitude: 41° 41′ 36.93″ / Longitude: -72° 32′ 50.11″

Dear Ms. Bachman:

T-Mobile currently maintains nine (9) total antennas at the 118-foot mount on the existing 145-foot Monopole Tower, located at 374 Three Mile Road, Glastonbury, CT. The tower is owned by Crown Castle and the property is owned by Mr. and Mrs. John Flanagan. T-Mobile now intends to replace six (6) existing antennas with three (3) new 600/700 MHz antennas and three (3) new 1900/2100 MHz antennas at the 118-foot mount. T-Mobile is also proposing tower mount modifications as shown on the enclosed mount analysis.

Planned Modifications:
Tower:

Remove: (6) 1 5/8" Coax
(1) 3/8" Coax

Remove and Replace:
(3) AIR21 KRC118023-1_B2P_B4A Antenna **(REMOVE)** - (3) AIR32 KRD901146-1_B66A_B2A Antenna 1900/2100 MHz **(REPLACE)**

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

(3) RRUS11 B12 **(REMOVE)** - (3) RADIO 4449 B12/B71 **(REPLACE)**

Install New:
(3) 1 5/8" Hybrid Lines

Existing to Remain:

(3) AIR21 KRC118023-1_B2A_B4P Antenna 1900/2100 MHz
(6) 1 5/8" Coax
(1) 9x18 HCS Cable
(3) KRY 112 144 TMA

Ground:
Internal upgrade to existing cabinet.
Upgrade existing main breaker to 200A service.

The facility was approved by the Connecticut Siting Council on October 21, 1996. The Council's Decision and Order included conditions which this proposed exempt modification complies with.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Richard J. Johnson, Town of Glastonbury Town Manager, Khara Dodds, Director of Land Use & Planning Services, Crown Castle, the tower owner, and Mr. and Mrs. John Flanagan, the property owner.

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

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

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

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

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

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

Sincerely,

Anne Marie Zsamba

Real Estate Specialist
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065
(201) 236-9224
AnneMarie.Zsamba@crowncastle.com

Attachments

cc:

Richard J. Johnson, Town Manager
Town of Glastonbury
Town Hall – 2nd Floor
2155 Main Street
Glastonbury, CT 06033
860.652.7500

Khara Dodds, Director of Land Use & Planning Services
Town of Glastonbury
Town Hall – 3rd Floor
2155 Main Street
Glastonbury, CT 06033
860.652.7510

Mr. and Mrs. John Flanagan, Property Owner
366 Three Mile Road
Glastonbury, CT 06033

Crown Castle, Tower Owner

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

ORIGIN ID:GFLA (518) 373-3523
ANNE MARIE ZSAMBA
CROWN CASTLE
3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065
UNITED STATES US

SHIP DATE: 11JUL19
ACTWGT: 2.00 LB
CAD: 104924194/INET4100

BILL SENDER

TO **KHARA DODDS, LAND USE DIRECTOR**
TOWN OF GLASTONBURY
TOWN HALL - 3RD FLOOR
2155 MAIN STREET
GLASTONBURY CT 06033
(860) 652-7510

REF: 1734.7680
INV:
PO:
DEPT:

565J2/A6F9/23AD

J191019010701uv

FedEx Express

FRI - 12 JUL 10:30A
PRIORITY OVERNIGHT

TRK# 0201 **7756 8602 7039**

EB BDLA

06033
BDL
CT-US

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ORIGIN ID:GFLA (518) 373-3523
ANNE MARIE ZSAMBA
CROWN CASTLE
3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065
UNITED STATES US

SHIP DATE: 11JUL19
ACTWGT: 2.00 LB
CAD: 104924194/INET4100

BILL SENDER

TO **RICHARD J. JOHNSON, TOWN MANAGER**
TOWN OF GLASTONBURY
TOWN HALL - 2ND FLOOR
2155 MAIN STREET
GLASTONBURY CT 06033
(860) 652-7500

REF: 1734.7680
INV:
PO:
DEPT:

565J2/A6F9/23AD

J191019010701uv

FedEx Express

FRI - 12 JUL 10:30A
PRIORITY OVERNIGHT

TRK# 0201 **7756 8600 2583**

EB BDLA

06033
BDL
CT-US

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ORIGIN ID:GFLA (518) 373-3523
ANNE MARIE ZSAMBA
CROWN CASTLE
3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065
UNITED STATES US

SHIP DATE: 11JUL19
ACTWGT: 4.00 LB
CAD: 104924194/INET4100

BILL SENDER

TO **MELANIE BACHMAN**
CONNECTICUT SITING COUNCIL
10 FRANKLIN SQUARE

NEW BRITAIN CT 06051
(860) 827-2951
INV:
PO:
REF: 1765.6680
DEPT:

565J2/A6F9/23AD

J191019010701uv

FedEx Express

FRI - 12 JUL 10:30A
PRIORITY OVERNIGHT

TRK# 0201 **7756 8594 5838**

EB BDLA

06051
BDL
CT-US

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Exhibit A

Original Facility Approval

DOCKET NO. 174 - An application of Cellco Partnership d/b/a Bell Atlantic NYNEX Mobile for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance, and operation of a cellular telecommunications facility and associated equipment located within an approximately 30-acre parcel at 366 Three Mile Road, in the East Glastonbury section of the Town of Glastonbury, Connecticut. The proposed alternate one site is located within the same approximately 30-acre parcel at 366 Three Mile Road. The proposed alternate two site is located within an approximately 50-acre parcel at 1952 New London Turnpike, in the East Glastonbury section of the Town of Glastonbury, Connecticut.

Connecticut Siting Council

October 21, 1996

Decision and Order

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, operation, and maintenance of a cellular telecommunications tower and equipment building at the proposed prime site in Glastonbury, Connecticut, including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate either alone or cumulatively with other effects when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application and therefore directs that a Certificate of Environmental Compatibility and Public Need, as provided by General Statutes § 16-50k, be issued to Bell Atlantic NYNEX Mobile (BANM) for the construction, operation, and maintenance of a cellular telecommunications tower, associated equipment, and building at the proposed prime site, located within a 30-acre parcel at Three Mile Road, Glastonbury, Connecticut. We find the effects on scenic resources and adjacent land uses of the first alternate site and second alternate site to be significant, and therefore deny certification of these sites.

The facility shall be constructed, operated, and maintained substantially as specified in the Council's record in this matter, and subject to the following conditions:

1. The tower shall be constructed as a monopole, no taller than necessary to provide the proposed communications service, sufficient to accommodate the antennas of Springwich Cellular Limited Partnership and the Town of Glastonbury, and not to exceed a height of 150 feet above ground level (AGL).

2. The Certificate Holder shall prepare a Development and Management (D&M) Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D&M Plan shall be submitted to and approved by the Council prior to the commencement of facility construction and shall include relocation of the tower within the leased parcel to prevent the fall zone of the tower from crossing the nearby Connecticut Light and Power Company transmission lines; plans for the tower foundation; specifications for the placement of all antennas to be attached to this tower; plans for the equipment building and security fence; plans for the access road and utility line installation from Three Mile Road; plans for site clearing and tree trimming; plans for water drainage and erosion and sedimentation controls consistent with the Connecticut Guidelines for Soil Erosion and Sediment Control, as amended, and plans for the

construction of an architecturally treated gate at the entrance to the access road from Three Mile Road; and plans for the installation of a propane tank to fuel the emergency generator.

3. Upon the establishment of any new State or federal radio frequency standards applicable to frequencies of this facility, the facility granted herein shall be brought into compliance with such standards.

4. The Certificate Holder shall provide the Council a recalculated report of electromagnetic radio frequency power density if and when circumstances in operation cause a change in power density above the levels originally calculated and provided in the application.

5. The Certificate Holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing.

6. If the facility does not initially provide, or permanently ceases to provide cellular services following completion of construction, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapplication for any continued or new use shall be made to the Council before any such use is made.

7. Unless otherwise approved by the Council, this Decision and Order shall be void if all construction authorized herein is not completed within three years of the effective date of this Decision and Order or within three years after all appeals to this Decision and Order have been resolved.

8. The Certificate Holder shall notify the Council upon completion of construction and provide the final cost to construct the facility.

Pursuant to General Statutes § 16-50p, we hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed below, and notice of issuance shall be published in The Hartford Courant and The Glastonbury Citizen.

By this Decision and Order, the Council disposes of the legal rights, duties, and privileges of each party named or admitted to the proceeding in accordance with Section 16-50j-17 of the Regulations of Connecticut State Agencies.

The parties and intervenors to this proceeding are:

APPLICANT	**ITS REPRESENTATIVE**
Bell Atlantic NYNEX Mobile	Kenneth C. Baldwin, Esq. Brian C. S. Freeman, Esq. Robinson & Cole One Commercial Plaza Hartford, CT 06103-3597 Mr. David S. Malko, P.E. Sandy M. Ranciato, Manager - Real Estate/Zoning Bell Atlantic NYNEX Mobile

	20 Alexander Drive Wallingford, CT 06492
PARTY Town of Glastonbury	**ITS REPRESENTATIVE** William S. Fish, Jr., Esq. Kevin S. Murphy, Esq. Tyler, Cooper & Alcorn CityPlace - 35th Floor Hartford, CT 06103-3488
INTERVENOR Springwich Cellular Limited Partnership	**ITS REPRESENTATIVE** Peter J. Tyrrell, Esq. Springwich Cellular Limited Partnership 500 Enterprise Drive Rocky Hill, CT 06067-3900

Exhibit B

Property Card

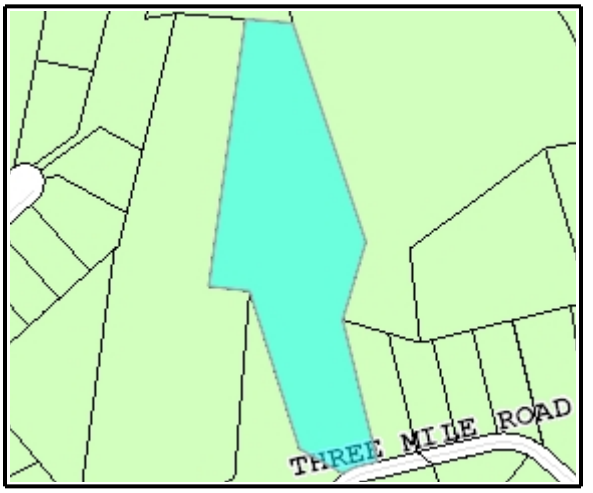
Town of Glastonbury GIS Parcel Report

Report Generated 7/10/2019 11:39:25 AM

Owner of Record

GIS ID: 70600374
Owner: FLANAGAN JOSEPHINE I+JOHN R
Co-Owner:
Address: 366 THREE MILE RD
City, State ZIP: GLASTONBURY, CT 06033

Account Number: 70600374
Property Address: 374 THREE MILE RD



Property highlighted in blue

Parcel Information

Map/Street/Lot I8 / 7060 / S0035 **Property ID:** 13664
Developer Lot ID: 72 **Water:** Well
Parcel Acreage: 9.08 **Sewer:** Septic
Zoning Code: RR **Census:** 5204

Valuation Summary

Item	Appraised Value	Assessed Value
Buildings	0	0
Land	1044200	684200
Appurtenances	173300	121300
Total	**1217500**	**805500**

Building Picture Not Applicable

Owner of Record	Deed / Page	Sale Date	Sale Price
FLANAGAN JOSEPHINE I+JOHN R	2725/0212	12/31/2009	0
FLANAGAN JOSEPHINE I TRUSTEE	2725/0205	12/31/2009	0
FLANAGAN JOSEPHINE I TRUSTEE	2725/ 210	12/31/2009	0
FLANAGAN JOSEPHINE I TRUSTEE	1884/0085	07/30/2003	0
FLANAGAN JOSEPHINE I TR+JOSEPHINE I	1828/0149	06/02/2003	0
FLANAGAN JOSEPHINE I TR+JAMES F	1828/0145	06/02/2003	0
FLANAGAN JOSEPHINE+JAMES F	0251/1107	12/31/1980	0

Building Information

Building ID 0

Year Constructed :
Building Type :
Style :
Occupany :
Stories :
Building Zone :
Roof Type :
Roof Material :
Est. Gross S.F. :
Est. Living S.F. :

Number of Rooms :
Number of Bedrooms :
Number of Bathrooms :
Number of Half-Baths :
Exterior Wall :
Interior Wall :
Interior Floor :
Interior Floor #2 :
Air Conditioning Type :
Heat Type :
Fuel Type :

Building Sketch Not Applicable

Subarea Type	Est. Gross S.F.	Est. Living S.F.

Outbuilding Type	Est. Gross S.F.	Comments
Cell Shed	924.00	

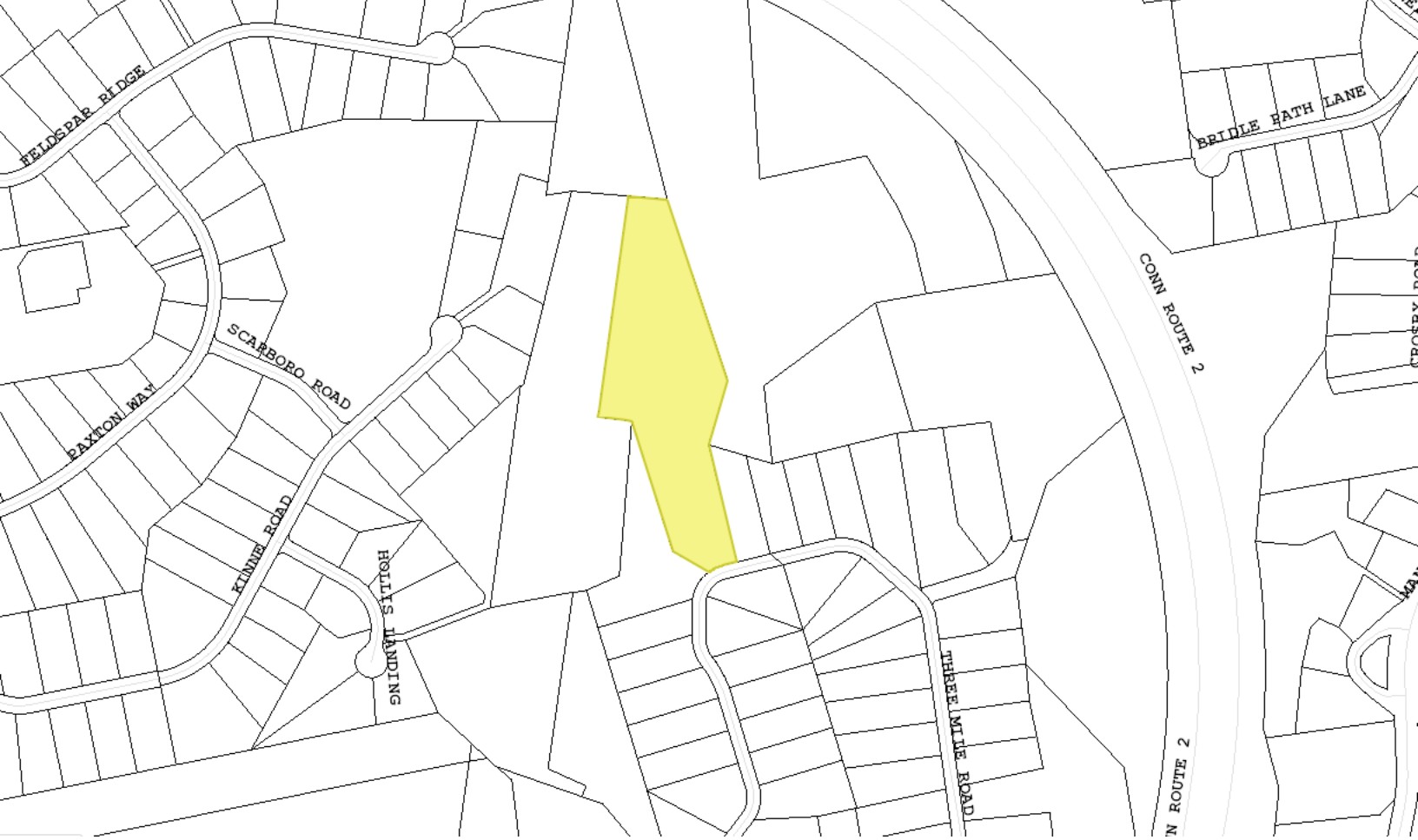

FELDSPAR RIDGE
PAXTON WAY
SCARBORO ROAD
KINNE ROAD
HOLLIS LANDING
BRIDLE PATH LANE
CONN ROUTE 2
THREE MILE ROAD

Exhibit C

Construction Drawings

T-Mobile

T-MOBILE SITE NAME:

GLASTONBURY

T-MOBILE SITE NUMBER:

CT11248A

CROWN BU: 806368 / APP#: 479822

67D92DB CONFIGURATION

374 THREE MILE RD
GLASTONBURY, CT 06033

EXISTING 145'-0" MONOPOLE

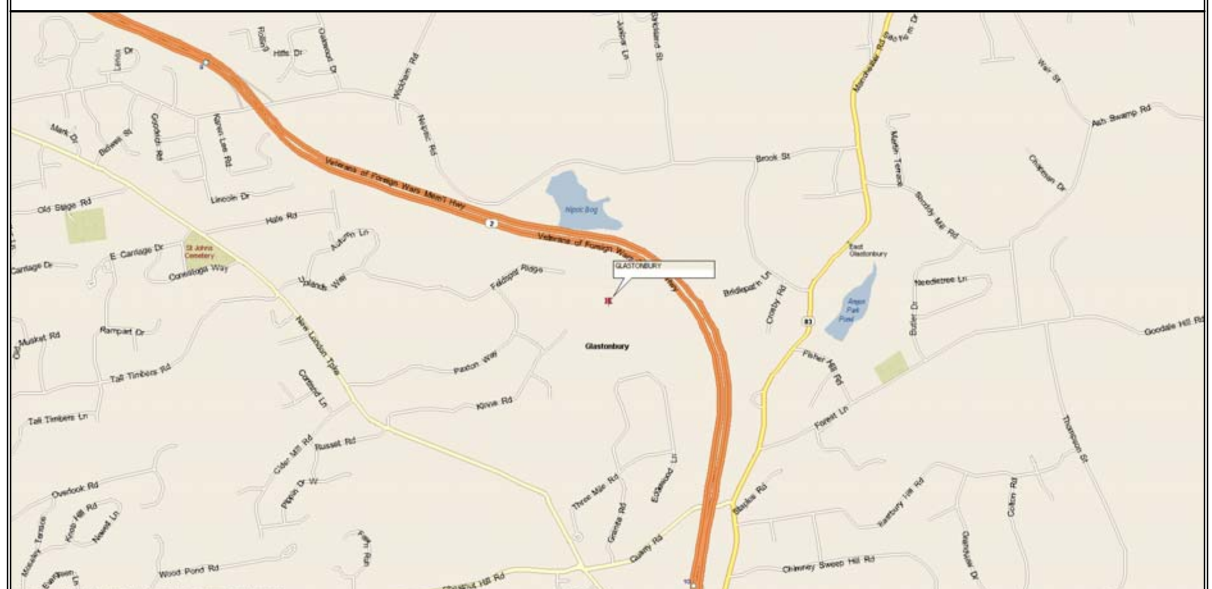
PROJECT SUMMARY

SITE TYPE:	EXISTING EQUIPMENT UPGRADE
SITE ADDRESS:	374 THREE MILE RD GLASTONBURY, CT 06033
JURISDICTION:	HARTFORD COUNTY

NAD83

LATITUDE: LONGITUDE:	41.693585° N 72.547365° 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	ENLARGED SITE PLAN AND ANTENNA ORIENTATION	1
A-3	TOWER ELEVATION	1
A-4	ANTENNA, RRH AND TMA DETAILS	1
A-4.1	PLUMBING DIAGRAM	1
E-1	ELECTRICAL PANEL & ONE-LINE	1

CONTACT INFORMATION

A&E FIRM:	B+T GROUP 1717 S. BOULDER, STE. 300 TULSA, OK 74119
CONTACT:	STEVE THORNHILL
PHONE:	(918) 587-4630
ELECTRIC PROVIDER:	N/A
TELCO PROVIDER:	N/A

DRIVING DIRECTIONS

DEPART BRADLEY INTERNATIONAL AIRPORT ON TERMINAL RD. ROAD NAME CHANGES TO BRADLEY FIELD CONNECTOR. ROAD NAME CHANGES TO CT-20. TAKE RAMP ONTO I-91. AT EXIT 30. TAKE RAMP ONTO I-84. AT EXIT 55. TAKE RAMP ONTO CT-2. AT EXIT 7. KEEP LEFT ONTO RAMP. ROAD NAME CHANGES TO CT-17. KEEP LEFT ONTO RAMP. BEAR RIGHT ONTO NEW LONDON TPKE. TURN LEFT ONTO KINNE RD. BEAR RIGHT ONTO ACCESS ROAD. ARRIVE GLASTONBURY.

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) EXISTING ANTENNAS AT 118'-0".
- REMOVE (3) EXISTING RRUS AT 118'-0".
- REMOVE (3) 1 5/8" COAX CABLES.
- REMOVE (1) DUS41.
- REMOVE (1) XMU.
- INSTALL (6) NEW ANTENNAS AT 118'-0".
- INSTALL (3) NEW RRHS AT 118'-0".
- INSTALL (2) BB6630s.
- INSTALL (3) NEW 1 5/8" HYBRID CABLES FOR NEW ANTENNAS.
- UPGRADE EXISTING MAIN BREAKER FROM 100A TO 200A.
- UPGRADE 6131 CABINET BREAKER FROM 100A TO 125A.
- SWAP BREAKER PANEL FOR PPC CABINET.
- MODIFY EXISTING MOUNTS PER MOUNT ANALYSIS BY PAUL J FORD & COMPANY DATED 4/29/2019.

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

B+T GRP

CROWN CASTLE

T-Mobile

CT11248A
BU #: 806368
GLASTONBURY
374 THREE MILE RD
GLASTONBURY, CT 06033
EXISTING 145'-0" MONOPOLE

PROJECT NO:	83033.001.01
CHECKED BY:	RMC

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION
A	5/16/19	JDP	PRELIMINARY REVIEW
0	6/27/19	JJD	CONSTRUCTION
1	7/15/19	GEH	CONSTRUCTION

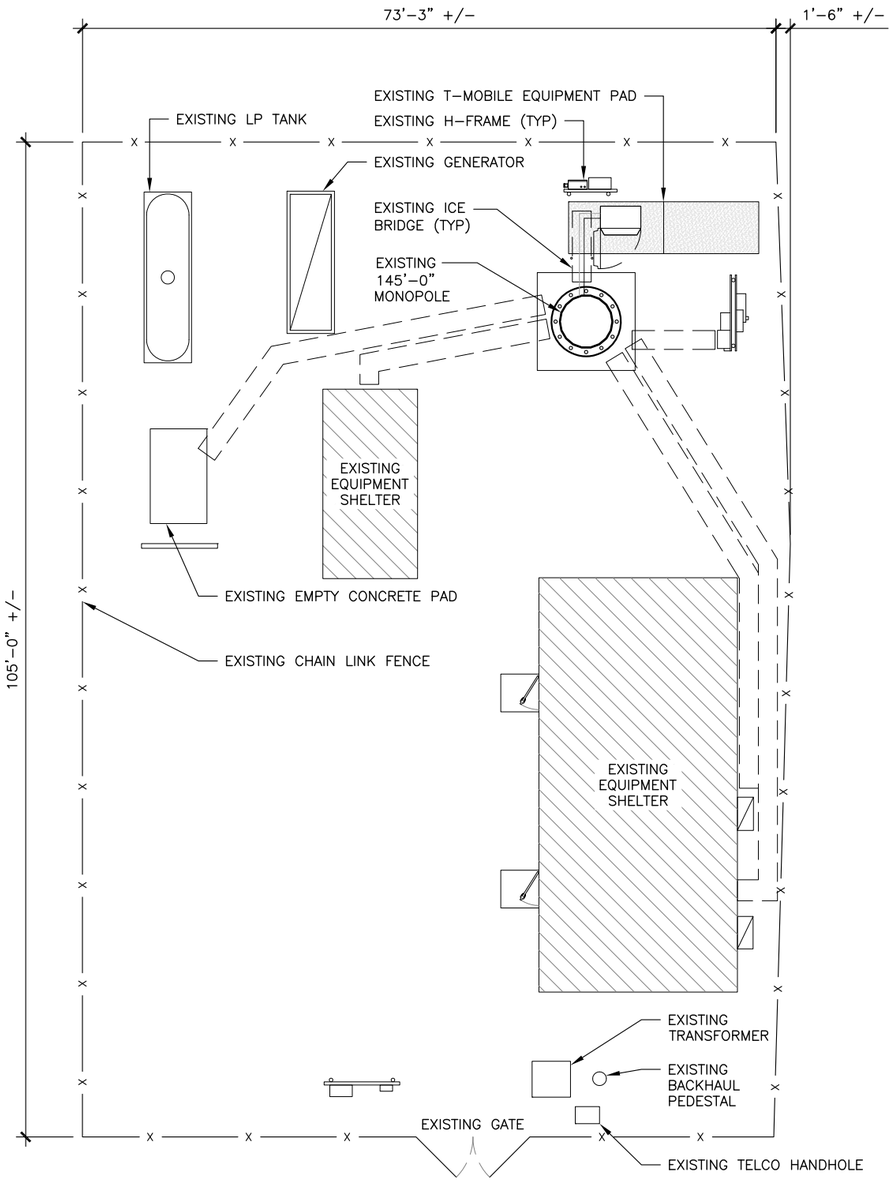
B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/20

STATE OF CONNECTICUT LICENSED PROFESSIONAL ENGINEER
7/15/19

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:	REVISION:
T-1	1

83033_806368_HRT 049B.dwg – Sheet:T-1 – User: ghayes – Jul 15, 2019 – 3:35pm



1 OVERALL SITE PLAN

SCALE: 0' 8' 16' 32' 48'

N

GENERAL NOTES:

1. SUBJECT PROPERTY IS KNOWN AS BLOCK TBD LOT TBD AS SHOWN ON THE GLASTONBURY TOWNSHIP TAX MAP AND IS SITUATED AT 374 THREE MILE RD, GLASTONBURY, CT 06033.

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 THREE (3) ADDITIONAL CABLES 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 41.693585° N± AND LONGITUDE OF 72.547365° 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

CT11248A
BU #: 806368

GLASTONBURY

374 THREE MILE RD
GLASTONBURY, CT 06033

EXISTING 145'-0" MONOPOLE

PROJECT NO:	83033.001.01
CHECKED BY:	RMC

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION
A	5/16/19	JDP	PRELIMINARY REVIEW
0	6/27/19	JJD	CONSTRUCTION
1	7/15/19	GEH	CONSTRUCTION

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

STATE OF CONNECTICUT
LICENSED PROFESSIONAL ENGINEER
7/15/19

SHEET NUMBER: A-1

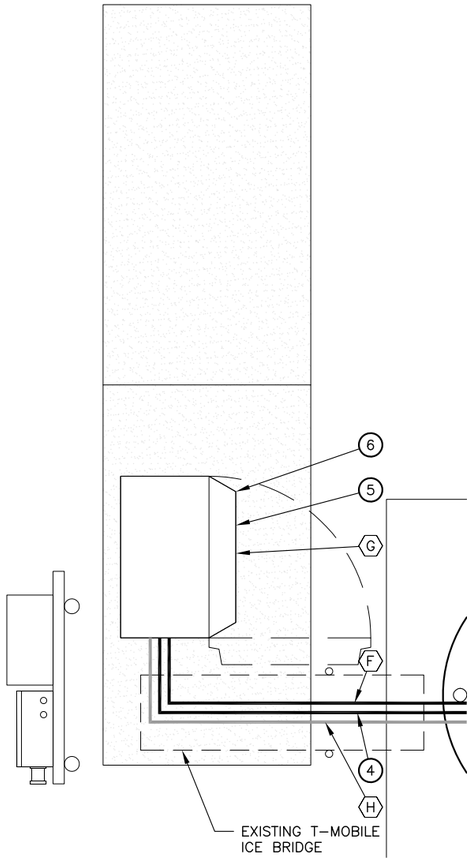
REVISION: 1

LEGEND

EXISTING/DEMOLITION NOTES		INSTALLATION NOTES	
A	EXISTING ERICSSON AIR21 KRC118023-1_B2P_B4A ANTENNA TO BE REMOVED (TOTAL OF 3)	1	INSTALL ERICSSON AIR32 KRD901146-1_B66A_B2A (5 FT) ANTENNAS ON EXISTING MOUNT. (TYP. OF 1 PER SECTOR, TOTAL OF 3)
B	EXISTING RRUS11 B12 RRU TO BE REMOVED (TOTAL OF 3)	2	INSTALL RFS APXVAARR24_43-U-NA20 (8 FT) ANTENNAS ON EXISTING MOUNT. (TYP. OF 1 PER SECTOR, TOTAL OF 3)
C	EXISTING ANDREW LNX-6515DS-A1M ANTENNA TO BE REMOVED (TOTAL OF 3)	3	INSTALL RADIO 4449 B12/B71 (TYP. OF 1 PER SECTOR, TOTAL OF 3)
D	EXISTING ERICSSON AIR21 KRC118023-1_B2A_B4P ANTENNA TO REMAIN (TOTAL OF 3)	4	INSTALL (3) 1 5/8" HYBRID FIBER TRUNK. FROM EQUIPMENT TO ANTENNAS FOLLOWING EXISTING ROUTING
E	EXISTING KRY 112 144 TMA TO REMAIN (TOTAL OF 3)	5	INSTALL (2) NEW BB 6630S IN EXISTING RBS6131 CABINET.
F	EXISTING (6) 1 5/8" COAX CABLES AND (1) ERICSSON 9X18 HCS CABLE TO REMAIN	6	UPGRADE EXISTING MAIN BREAKER TO 200A
G	REMOVE (1) DUS41 AND (1) XMU.		
H	REMOVE (6) 1 5/8" COAX AND (1) 3/8" COAX.		

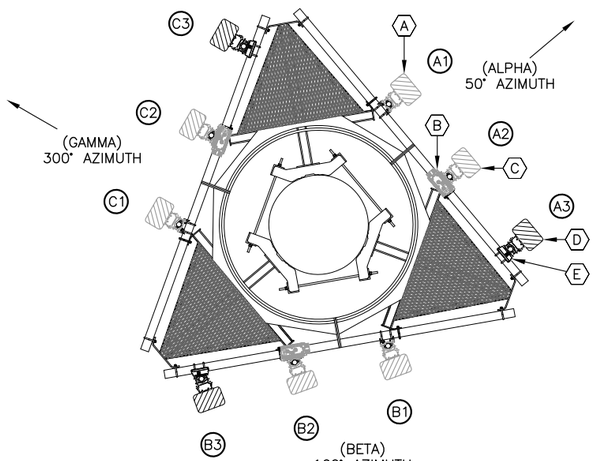
ANTENNA AND CABLE SCHEDULE

SECTOR	POSITION	EXISTING ANTENNAS	PROPOSED ANTENNA CONFIGURATION		E-TILT	M-TILT	ANTENNA CENTERLINE	TMA/RRH	CABLES	JUMPER TYPE	CABLE LENGTH
50° – ALPHA	**A1**	**ERICSSON AIR32 KRD901146-1_B66A_B2A**	**LTE**	**–**	**2°/2°**	**0°**	118'-0"	**0/0**	(1) 1 5/8" HYBRID FIBER TRUNK	(2)FIBER	166'-0"
	A2	**RFS APXVAARR24_43-U-NA20**	**LTE**	**B71+ B12**	**2°**	**0°**		**0/1**	**(1) 1 5/8" HYBRID FIBER TRUNK**	**(1) FIBER (4) COAX**	**166'-0"**
	A3	ERICSSON AIR21 KRC118023-1_B2A_B4P	GSM UMTS	–	2°/2°	0°		1/0	(2) 1 5/8" COAX	(2) FIBER (2) COAX	166'-0"
160° – BETA	**B1**	**ERICSSON AIR32 KRD901146-1_B66A_B2A**	**LTE**	**–**	**2°/2°**	**0°**	118'-0"	**0/0**	SHARED FIBER	(2)FIBER	166'-0"
	B2	**RFS APXVAARR24_43-U-NA20**	**LTE**	**B71+ B12**	**2°**	**0°**		**0/1**	**(1) 1 5/8" HYBRID FIBER TRUNK**	**(1) FIBER (4) COAX**	**166'-0"**
	B3	ERICSSON AIR21 KRC118023-1_B2A_B4P	GSM UMTS	–	2°/2°	0°		1/0	(2) 1 5/8" COAX	(2) FIBER (2) COAX	166'-0"
300° – GAMMA	**G1**	**ERICSSON AIR32 KRD901146-1_B66A_B2A**	**LTE**	**–**	**2°/2°**	**0°**	118'-0"	**0/0**	SHARED FIBER	(2)FIBER	166'-0"
	G2	**RFS APXVAARR24_43-U-NA20**	**LTE**	**B71+ B12**	**2°**	**0°**		**0/1**	**(1) 1 5/8" HYBRID FIBER TRUNK**	**(1) FIBER (4) COAX**	**166'-0"**
	G3	ERICSSON AIR21 KRC118023-1_B2A_B4P	GSM UMTS	–	2°/2°	0°		1/0	(2) 1 5/8" COAX	(2) FIBER (2) COAX	166'-0"



1 ENLARGED AREA PLAN

SCALE: 0' 1' 2' 4' 10'

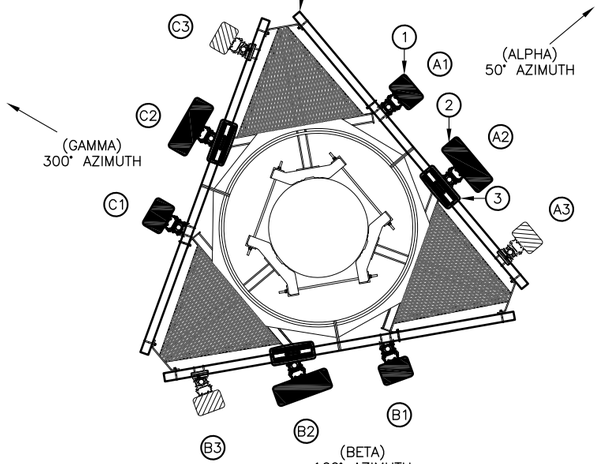


2 EXISTING ANTENNA ORIENTATION

SCALE: 0' 1' 4' 8' 16'

N

INSTALL NEW HANDRAIL KIT
SITEPRO P/N: HRK12
PER MA BY PAUL J FORD & COMPANY
DATED 5/29/2019



3 PROPOSED ANTENNA ORIENTATION

SCALE: 0' 1' 4' 8' 16'

N

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BU #: 806368

GLASTONBURY

374 THREE MILE RD
GLASTONBURY, CT 06033

EXISTING 145'-0" MONOPOLE

PROJECT NO:	83033.001.01
CHECKED BY:	RMC

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B&T ENGINEERING, INC.
PEC.0001564
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STATE OF CONNECTICUT
LICENSED PROFESSIONAL ENGINEER
7/15/19

SHEET NUMBER:	REVISION:
A-2	1

LEGEND

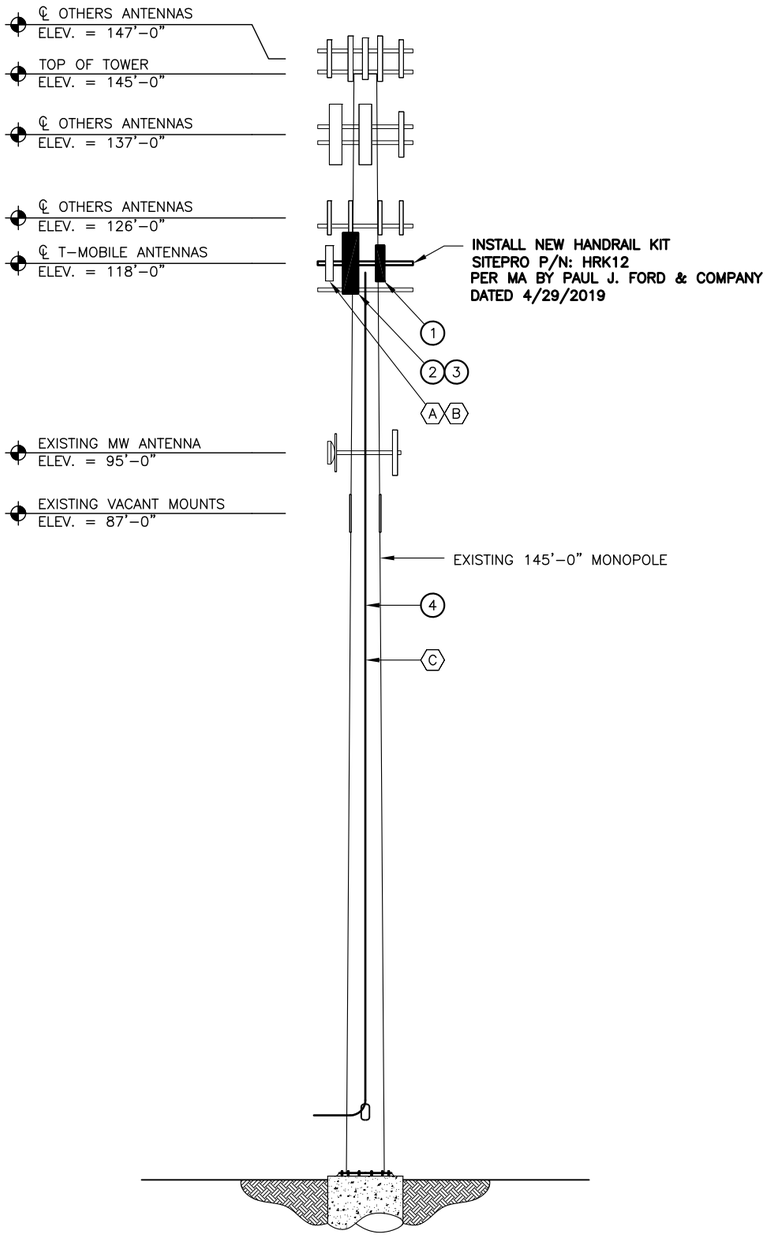
EXISTING/DEMOLITION NOTES		INSTALLATION NOTES	
A	EXISTING ERICSSON AIR21 KRC118023-1_B2A_B4P ANTENNA TO REMAIN (TOTAL OF 3)	1	INSTALL ERICSSON AIR32 KRD901146-1_B66A_B2A (5 FT) ANTENNAS ON EXISTING MOUNT. (TYP. OF 1 PER SECTOR, TOTAL OF 3)
B	EXISTING KRY 112 144 TMA TO REMAIN (TOTAL OF 3)	2	INSTALL RPS APXVAARR24_43-U-NA20 (8 FT) ANTENNAS ON EXISTING MOUNT. (TYP. OF 1 PER SECTOR, TOTAL OF 3)
C	EXISTING (6) 1 5/8" COAX CABLES AND (1) ERICSSON 9X18 HCS CABLE TO REMAIN	3	INTALL RADIO 4449 B12/B71 (TYP. OF 1 PER SECTOR, TOTAL OF 3)
		4	INSTALL (3) 1 5/8" HYBRID FIBER TRUNK. FROM EQUIPMENT TO ANTENNAS FOLLOWING EXISTING ROUTING

STRUCTURAL ANALYSIS NOTE:

REFER TO STRUCTURAL ANALYSIS OR STRUCTURAL LETTER FOR APPROVAL OF ADDITIONAL NEW APPURTENANCES.

LEGEND:

- NEW
- EXISTING
- FUTURE



1 TOWER ELEVATION

SCALE: 0' 15' 30' 45' 60' 1"=30'

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CROWN CASTLE

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CT11248A
BU #: 806368

GLASTONBURY

374 THREE MILE RD
GLASTONBURY, CT 06033

EXISTING 145'-0" MONOPOLE

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CHECKED BY:	RMC

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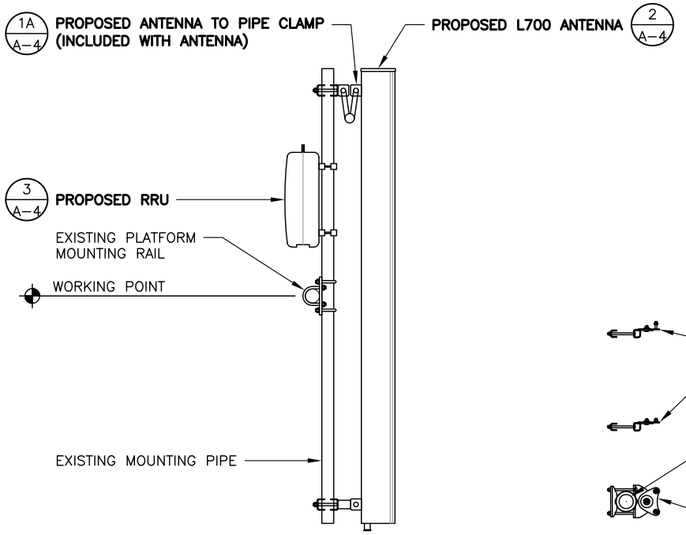
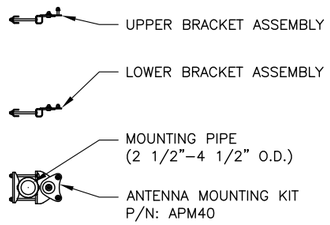
LICENSED PROFESSIONAL ENGINEER
7/15/19

SHEET NUMBER:	REVISION:
A-3	1



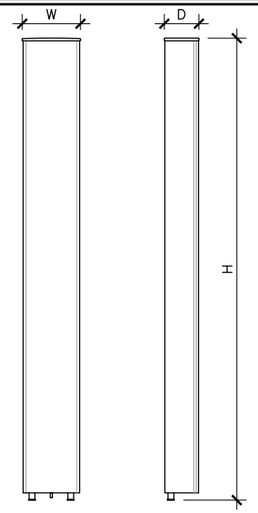
1 PROPOSED L600/L700 ANTENNA & RRU MOUNTING DETAIL

SCALE: N.T.S.



1A ANTENNA MOUNTING BRACKET

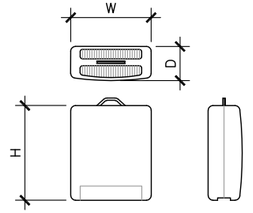
SCALE: N.T.S.



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

2 L600/L700 ANTENNA DETAIL

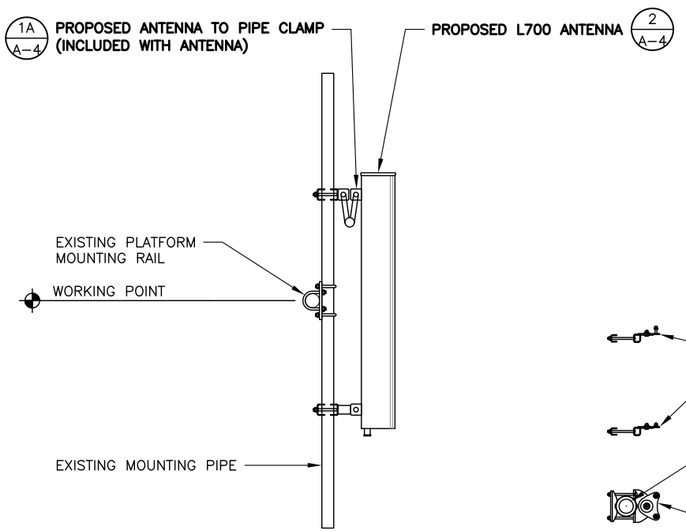
SCALE: N.T.S.



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

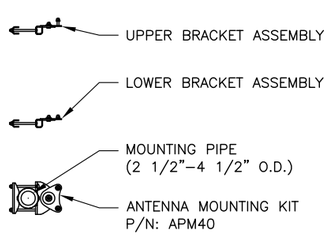
3 REMOTE RADIO UNIT (RRU)

SCALE: N.T.S.



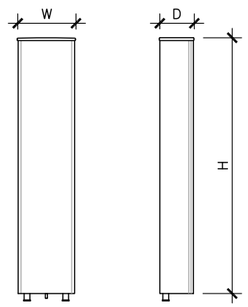
1 PROPOSED L2100/L1900 ANTENNA & RRU MOUNTING DETAIL

SCALE: N.T.S.



1A ANTENNA MOUNTING BRACKET

SCALE: N.T.S.



ANTENNA SPECS	
MANUFACTURER	ERICSSON
MODEL #	AIR32 KRD901146-1
WIDTH	12.9"
DEPTH	8.7"
HEIGHT	56.6"
WEIGHT	132.0 LBS

2 L2011/L1900 ANTENNA DETAIL

SCALE: N.T.S.

B+T GRP

CROWN CASTLE

T-Mobile

CT11248A
BU #: 806368

GLASTONBURY

374 THREE MILE RD
GLASTONBURY, CT 06033

EXISTING 145'-0" MONOPOLE

PROJECT NO:	83033.001.01
CHECKED BY:	RMC

ISSUED FOR:

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1	7/15/19	GEH	CONSTRUCTION

B&T ENGINEERING, INC.
PEC.0001564
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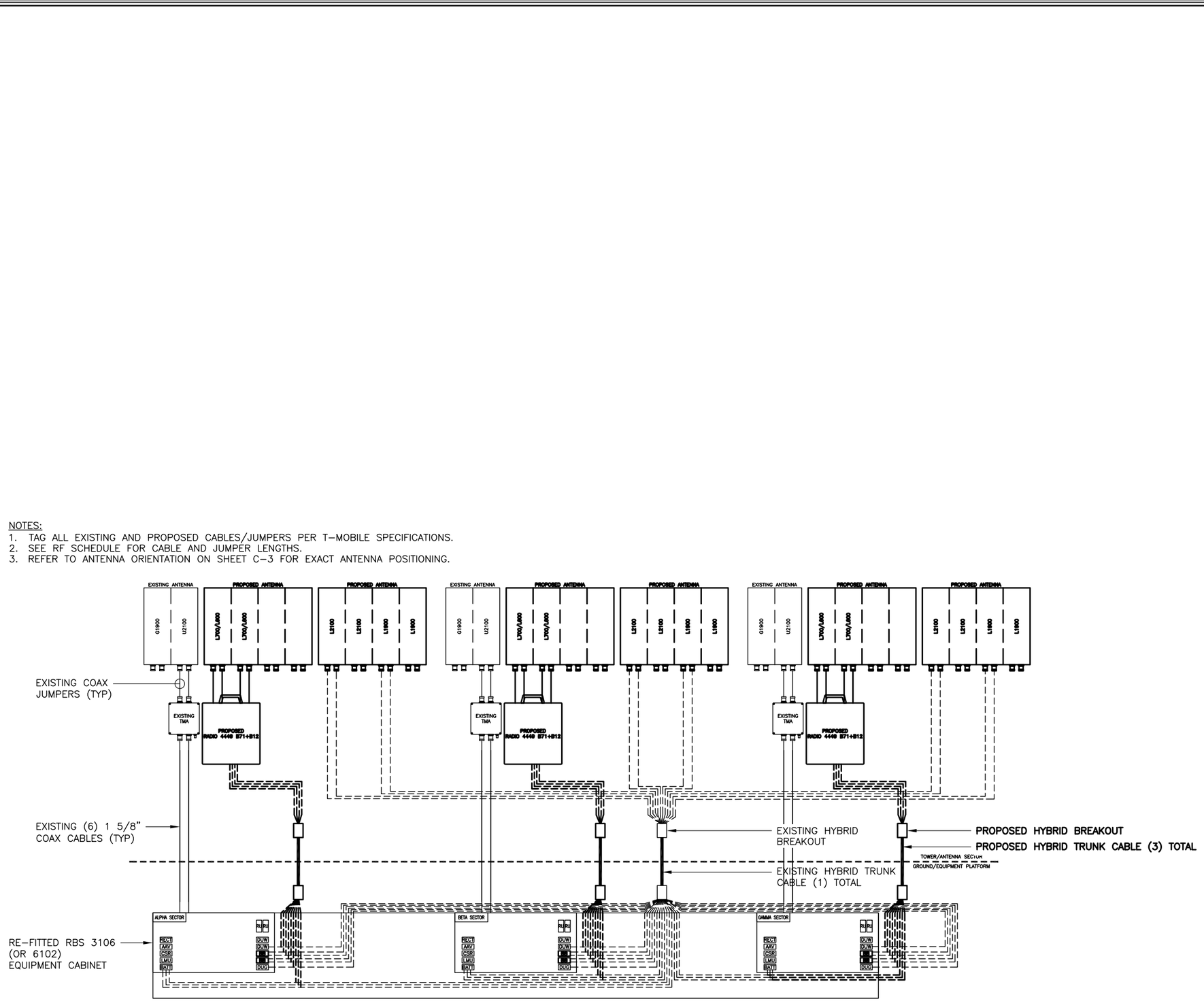
SHEET NUMBER: A-4

REVISION: 1

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 C-3 FOR EXACT ANTENNA POSITIONING.



1 ANTENNA & CABLING SCHEMATIC
SCALE: N.T.S.

B+T GRP

CROWN CASTLE

T···Mobile

CT11248A
BU #: 806368

GLASTONBURY

374 THREE MILE RD
GLASTONBURY, CT 06033

EXISTING 145'-0" MONOPOLE

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STATE OF CONNECTICUT
36279
LICENSED PROFESSIONAL ENGINEER
7/15/19

SHEET NUMBER: A-4.1
REVISION: 1

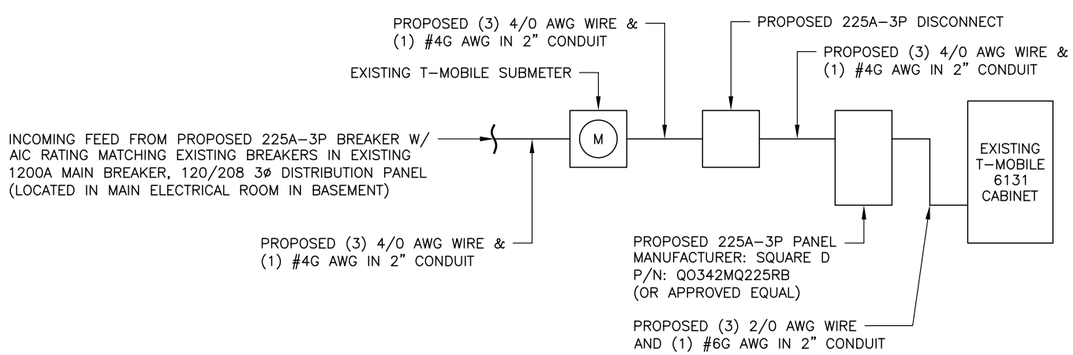
FINAL PANEL SCHEDULE							
LOAD	POLES	AMPS	BUS L1	BUS L2	AMPS	POLES	LOAD
TELCO	1	20A	1	2	60A	2	3106
			3	4			
			5	6	**125A**	2	6131
			7	8			

RATED VOLTAGE: ■120/240 □_____. 1 PHASE, 3 WIRE	BRANCH POLES: ■16 □24 □30 □42	APPROVED MF'RS	
RATED AMPS: □100 ■225 □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			

EXISTING 100A BREAKER PANEL TO BE REPLACED W/ NEW 225A BREAKER PANEL. SQUARE D P/N: QO142MQ225RB (OR APPROVED EQUAL)
REPLACE EXISTING 100A BREAKER W/ NEW 125A BREAKER
REPLACE EXISTING WIRES FOR EXISTING 6131 CABINET WITH (3) 2/0 AWG THWN (COPPER) AND (1) #6G AWG. MINIMUM CONDUIT SIZE TO BE 2"
FINAL PANEL DESIGN AND CALCULATIONS FOR WIRE SIZE WERE BASED OFF OF EXISTING DOCUMENTS AND PHOTOS

1 FINAL T-MOBILE PANEL DETAIL

SCALE: N.T.S.



2 ONE-LINE DIAGRAM

SCALE: N.T.S.

B+T GRP

CROWN CASTLE

T···Mobile

CT11248A
BU #: 806368

GLASTONBURY

374 THREE MILE RD
GLASTONBURY, CT 06033

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STATE OF CONNECTICUT
LICENSED
PROFESSIONAL ENGINEER
7/15/19

SHEET NUMBER:	REVISION:
E-1	1

Exhibit D

Structural Analysis Report

Date: **July 17, 2019**

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

Black & Veatch Corp.
6800 W 115th St. Suite 2292
Overland Park, KS 66211
(913) 458-6909

Subject:	**Structural Analysis Report**	
Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CT11248A
	Carrier Site Name:	Glastonbury
Crown Castle Designation:	**Crown Castle BU Number:**	806368
	Crown Castle Site Name:	HRT 049B 943215
	Crown Castle JDE Job Number:	559175
	Crown Castle Work Order Number:	1769478
	Crown Castle Order Number:	479822 Rev. 0
Engineering Firm Designation:	**Black & Veatch Corp. Project Number:**	400087
Site Data:	**374 Three Mile Rd., Glastonbury, Hartford County, CT** **Latitude *41° 41' 36.93"*, Longitude *-72° 32' 50.11"*** **144.813 Foot - Monopole Tower**	

Dear Heather Simeone,

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

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

LC7: Proposed Equipment Configuration **Sufficient Capacity – 56.5%**

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

Structural analysis prepared by: Poonapob Medsuwun

Respectfully submitted by:

Josh J. Riley, P.E.
Professional Engineer

07/17/2019

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 144.813 ft Monopole tower designed by Engineered Endeavors, Inc.

The tower has been modified per reinforcement drawings prepared by GPD Associates in March of 2005. Reinforcement consists of addition of base plate stiffeners. In this analysis, we found that the existing base plate without the modifications has adequate capacity and therefore the existing base plate stiffeners were not considered in this analysis.

2) ANALYSIS CRITERIA

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

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
118.0	118.0	1	cci tower mounts	Handrail Kit [NA 507-1]	10	1-5/8
		1	cci tower mounts	Platform Mount [LP 601-1]		
		3	ericsson	AIR -32 B2A/B66AA w/ Mount Pipe		
		3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe		
		3	ericsson	KRY 112 144/1		
		3	ericsson	RADIO 4449 B12/B71		
		3	rfs celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe		

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
147.0	148.0	3	alcatel lucent	B66A RRH4X45	14 1	1-5/8 1-1/4
		3	alcatel lucent	RRH2X60-700		
		3	alcatel lucent	RRH2X60-PCS		
		9	andrew	SBNHH-1D65B w/ Mount Pipe		
		2	antel	LPA-80063/6CF w/ Mount Pipe		
		2	rfs celwave	DB-T1-6Z-8AB-0Z		
		4	swedcom	SC-E 6014 REV2 w/ Mount Pipe		
	147.0	1	cci tower mounts	Platform Mount [LP 1001-1]		
	145.0	6	rfs celwave	FD9R6004/2C-3L		
137.0	138.0	1	cci antennas	HPA-65R-BUU-H6 w/ Mount Pipe		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
		2	cci antennas	HPA-65R-BUU-H8 w/ Mount Pipe	12 2 1 1 1	1-1/4 3/4 1/2 3/8 conduit
		3	communication components inc.	DTMABP7819VG12A		
		3	ericsson	RRUS 11 B12		
		3	ericsson	RRUS 32 B2		
		1	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe		
		12	powerwave technologies	7020.00		
		3	powerwave technologies	7770.00 w/ Mount Pipe		
		2	powerwave technologies	P65-17-XLH-RR w/ Mount Pipe		
		3	powerwave technologies	TT19-08BP111-001		
		1	raycap	DC6-48-60-18-8F		
	137.0	1	cci tower mounts	Platform Mount [LP 1001-1]		
126.0	130.0	2	gps	GPS_A	6 1	1-1/4 1/2
	128.0	12	decibel	DB844G65ZAXY w/ Mount Pipe		
	126.0	1	cci tower mounts	Platform Mount [LP 601-1]		
		1	cci tower mounts	Side Arm Mount [SO 701-3]		
		1	cci tower mounts	Side Arm Mount [SO 306-1]		
		1	sigfox	CAVITY FILTER		
		1	sigfox	CXL 900-3LW		
		1	sigfox	LNA		
95.0	97.0	1	commscope	HT65A-F-2X2 w/ Mount Pipe	2 1	1-1/4 1-1/8
		1	nokia	FWHR		
	96.0	1	repeater technologies	DA1900-39		
	95.0	2	cci tower mounts	T-Arm Mount [TA 702-1]		
87.0	87.0	3	allgon	7250.02 w/ Mount Pipe	3	1-1/4
		1	cci tower mounts	Pipe Mount [PM 601-3]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Dr. Clarence Welti, P.E., P.C.	262197	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Engineered Endeavors Incorporated	974245	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Engineered Endeavors Incorporated	262188	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	GPD Associates	1037241	CCISITES
4-POST MODIFICATION INSPECTION	GPD Group	1090825	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) Tower and structures were built and maintained in accordance with the manufacturer's specifications.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
3) The wind loading EPA of the panel antennas has been analyzed and determined by the tower owner. Verification of its accuracy is outside the scope of this structural analysis/design. Black & Veatch does not assume any responsibility for its accuracy.
4) This analysis was performed under the assumption that all information provided to Black & Veatch is current and correct. This is to include site data, appurtenance loading, tower/foundation details, and geotechnical data. The loading on the structure is based on CAD level drawings and carrier orders provided by the owner. If any of this information is not current and correct, this report should be considered obsolete and further analysis will be required.

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

4) ANALYSIS RESULTS

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

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	144.813 - 92.3333	Pole	TP35.675x20.5x0.3438	1	-22.75	2304.69	46.4	Pass
L2	92.3333 - 44.5208	Pole	TP48.658x33.5537x0.4375	2	-37.72	4009.58	50.5	Pass
L3	44.5208 - 0	Pole	TP60.5x45.8987x0.4688	3	-59.47	5565.70	55.1	Pass
							Summary	
						Pole (L3)	55.1	Pass
						Rating =	55.1	Pass

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

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	53.0	Pass
	Base Plate		56.5	Pass
1,2	Base Foundation (Compared w/ Design Loads)	0	54.5	Pass

Structure Rating (max from all components) =	56.5%

Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity Rating per TIA-222-H Section 15.5
2) Foundation capacity determined by comparing analysis reactions to original design reactions.

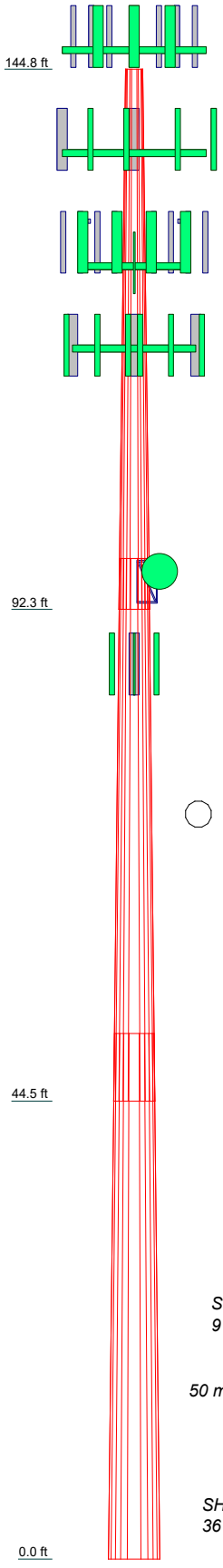
4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	52.48	12	0.3438	4.96	20.5000	35.6750		5.5
2	52.77	12	0.4375	6.58	33.5537	48.6580	A572-65	10.3
3	51.10	12	0.4688		45.8987	60.5000		13.8
								29.6



ALL REACTIONS ARE FACTORED

AXIAL 110 K

SHEAR 9 K

MOMENT 1005 kip-ft

TORQUE 1 kip-ft

50 mph WIND - 2.0000 in ICE

AXIAL 59 K

SHEAR 36 K

MOMENT 3867 kip-ft

TORQUE 5 kip-ft

REACTIONS - 125 mph WIND

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 125 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 2.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TIA-222-H Annex S
9. TOWER RATING: 55.1%

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Black & Veatch Corp.
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Overland Park, KS 66211
Phone: (913) 458-2984
FAX: (913) 458-8136

Job: ***HRT 049B 943215 (BU# 806368)***			
Project: ***400087 (806368.1769478)***			
Client: Crown Castle	Drawn by: Josh Riley	App'd:	
Code: TIA-222-H	Date: 07/17/19	Scale: NTS	
Path: C:\Users\r689982\OneDrive - Black & Veatch\Desktop\806368\806368.1769478 Structural Analysis.eri		Dwg No. E-1	

Tower Input Data

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

1) Tower is located in Hartford County, Connecticut.
2) Tower base elevation above sea level: 467.00 ft.
3) Basic wind speed of 125 mph.
4) Risk Category II.
5) Exposure Category B.
6) Simplified Topographic Factor Procedure for wind speed-up calculations is used.
7) Topographic Category: 1.
8) Crest Height: 0.00 ft.
9) Nominal ice thickness of 2.0000 in.
10) Ice thickness is considered to increase with height.
11) Ice density of 56 pcf.
12) A wind speed of 50 mph is used in combination with ice.
13) Deflections calculated using a wind speed of 60 mph.
14) TIA-222-H Annex S.
15) A non-linear (P-delta) analysis was used.
16) Pressures are calculated at each section.
17) Stress ratio used in pole design is 1.05.
18) Tower analysis based on target reliabilities in accordance with Annex S.
19) Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
20) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	*Elevation*	*Section Length*	*Splice Length*	*Number of Sides*	*Top Diameter*	*Bottom Diameter*	*Wall Thickness*	*Bend Radius*	*Pole Grade*
	ft	*ft*	*ft*		*in*	*in*	*in*	*in*	
L1	144.81-92.33	52.48	4.96	12	20.5000	35.6750	0.3438	1.3750	A572-65 (65 ksi)

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L2	92.33-44.52	52.77	6.58	12	33.5537	48.6580	0.4375	1.7500	A572-65 (65 ksi)
L3	44.52-0.00	51.10		12	45.8987	60.5000	0.4688	1.8750	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	21.1019	22.3104	1156.9477	7.2159	10.6190	108.9507	2344.2898	10.9805	4.5728	13.303
	36.8122	39.1073	6231.0543	12.6486	18.4796	337.1847	12625.8054	19.2474	8.6396	25.134
L2	36.0523	46.6525	6530.4457	11.8556	17.3808	375.7268	13232.4536	22.9609	7.8199	17.874
	50.2201	67.9306	20161.1364	17.2629	25.2048	799.8913	40851.9282	33.4334	11.8678	27.127
L3	49.2998	68.5708	18063.8246	16.2639	23.7755	759.7656	36602.2059	33.7485	11.0446	23.562
	62.4689	90.6097	41678.8054	21.4912	31.3390	1329.9341	84452.5593	44.5953	14.9578	31.91

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 144.81-92.33				1	1	1			
L2 92.33-44.52				1	1	1			
L3 44.52-0.00				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
*** 147 R ***										
HB158-1-08U8-S8J18(1-5/8)	C	No	Surface Ar (CaAa)	144.81 - 0.00	2	2	-0.030 0.064	1.9800		1.30
HB114-21U3M12-XXXF(1-1/4)	C	No	Surface Ar (CaAa)	144.81 - 0.00	1	1	0.070 0.107	1.5400		1.22
LDF6-50A(1-1/4)	A	No	Surface Ar (CaAa)	126.00 - 0.00	6	6	-0.500 -0.294	1.5500		0.60
*** 95 R ***										
TYPE SOOW(1-1/8)	B	No	Surface Ar (CaAa)	95.00 - 0.00	1	1	0.230 0.253	1.1600		0.96
LDF6-50A(1-1/4)	B	No	Surface Ar (CaAa)	95.00 - 0.00	2	2	0.160 0.223	1.5500		0.60
*** 87 ***										
LDF6-50A(1-1/4)	B	No	Surface Ar (CaAa)	87.00 - 0.00	3	3	-0.040 0.054	1.5500		0.60
Safety Line 3/8	B	No	Surface Ar (CaAa)	136.00 - 0.00	1	1	0.070 0.090	0.3750		0.22
****** ******										

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
HJ7-50A(1-5/8)	C	No	No	Inside Pole	144.81 - 0.00	12	No Ice	0.00	1.04
							1/2" Ice	0.00	1.04
							1" Ice	0.00	1.04
							2" Ice	0.00	1.04
*** 137 ***									
FB-L98B-002-75000(3/8)	C	No	No	Inside Pole	137.00 - 0.00	1	No Ice	0.00	0.06
							1/2" Ice	0.00	0.06
							1" Ice	0.00	0.06
							2" Ice	0.00	0.06
LCF12-50J(1/2)	C	No	No	Inside Pole	137.00 - 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
WR-VG86ST-BRD(3/4)	C	No	No	Inside Pole	137.00 - 0.00	2	No Ice	0.00	0.58
							1/2" Ice	0.00	0.58
							1" Ice	0.00	0.58
							2" Ice	0.00	0.58
LCF114-50J(1-1/4)	C	No	No	Inside Pole	137.00 - 0.00	12	No Ice	0.00	0.70
							1/2" Ice	0.00	0.70
							1" Ice	0.00	0.70
							2" Ice	0.00	0.70
*** 126 Reserved ***									
EC4-50(1/2)	A	No	No	Inside Pole	126.00 - 0.00	1	No Ice	0.00	0.16
							1/2" Ice	0.00	0.16
							1" Ice	0.00	0.16
							2" Ice	0.00	0.16
*** 118 ***									
(6) LDF7-50A(1-5/8) + (3) HCS 6x12 4AWG + (1) MLE Hybrid 9Power/18Fiber RL 2	A	No	No	Inside Pole	118.00 - 0.00	10	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
******									
2" innerduct conduit	C	No	No	Inside Pole	137.00 - 0.00	1	No Ice	0.00	0.20
							1/2" Ice	0.00	0.20
							1" Ice	0.00	0.20
							2" Ice	0.00	0.20
******									
******									

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	144.81-92.33	A	0.000	0.000	31.310	0.000	0.34
		B	0.000	0.000	2.774	0.000	0.02
		C	0.000	0.000	28.864	0.000	1.30
L2	92.33-44.52	A	0.000	0.000	44.466	0.000	0.57
		B	0.000	0.000	41.914	0.000	0.19
		C	0.000	0.000	26.297	0.000	1.26
L3	44.52-0.00	A	0.000	0.000	41.404	0.000	0.53
		B	0.000	0.000	41.338	0.000	0.19
		C	0.000	0.000	24.486	0.000	1.17

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	144.81-92.33	A	1.929	0.000	0.000	55.371	0.000	1.04
		B		0.000	0.000	22.139	0.000	0.30
		C		0.000	0.000	79.607	0.000	2.39
L2	92.33-44.52	A	1.827	0.000	0.000	78.636	0.000	1.57
		B		0.000	0.000	130.981	0.000	1.87
		C		0.000	0.000	72.528	0.000	2.25
L3	44.52-0.00	A	1.629	0.000	0.000	72.087	0.000	1.40
		B		0.000	0.000	123.157	0.000	1.69
		C		0.000	0.000	65.491	0.000	2.02

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	144.81-92.33	-2.5775	3.1266	-1.6168	3.4498
L2	92.33-44.52	-0.3945	2.1606	1.4428	2.1016
L3	44.52-0.00	-0.2673	2.2513	1.7685	2.3177

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

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	2	HB158-1-08U8-S8J18(1-5/8)	92.33 - 144.81	1.0000	1.0000
L1	3	HB114-21U3M12-XXXF(1-1/4)	92.33 - 144.81	1.0000	1.0000
L1	12	LDF6-50A(1-1/4)	92.33 - 126.00	1.0000	1.0000
L1	18	TYPE SOOW(1-1/8)	92.33 - 95.00	1.0000	1.0000
L1	20	LDF6-50A(1-1/4)	92.33 - 95.00	1.0000	1.0000
L1	25	Safety Line 3/8	92.33 - 136.00	1.0000	1.0000
L1	22	LDF6-50A(1-1/4)	92.33 - 87.00	1.0000	1.0000
L2	2	HB158-1-08U8-S8J18(1-5/8)	44.52 - 92.33	1.0000	1.0000
L2	3	HB114-21U3M12-XXXF(1-1/4)	44.52 - 92.33	1.0000	1.0000
L2	12	LDF6-50A(1-1/4)	44.52 - 92.33	1.0000	1.0000
L2	18	TYPE SOOW(1-1/8)	44.52 - 92.33	1.0000	1.0000
L2	20	LDF6-50A(1-1/4)	44.52 - 92.33	1.0000	1.0000
L2	22	LDF6-50A(1-1/4)	44.52 - 87.00	1.0000	1.0000
L2	25	Safety Line 3/8	44.52 - 92.33	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
*** 147 Reserved ***									
Platform Mount [LP 1001-1]	C	None		0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice	47.70 59.50 71.30 94.90	47.70 59.50 71.30 94.90	3.02 3.62 4.22 5.43
(2) SC-E 6014 REV2 w/ Mount Pipe	A	From Face	4.00 0.00 1.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.56 3.91 4.26 4.98	4.22 4.78 5.35 6.55	0.03 0.07 0.12 0.22
(2) SC-E 6014 REV2 w/ Mount Pipe	B	From Face	4.00 0.00 1.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.56 3.91 4.26 4.98	4.22 4.78 5.35 6.55	0.03 0.07 0.12 0.22
SBNHH-1D65B w/ Mount Pipe	A	From Face	4.00 -3.50 1.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.49 4.89 5.72	3.30 3.68 4.07 4.87	0.07 0.13 0.20 0.39
SBNHH-1D65B w/ Mount Pipe	B	From Face	4.00 -3.50 1.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.49 4.89 5.72	3.30 3.68 4.07 4.87	0.07 0.13 0.20 0.39
SBNHH-1D65B w/ Mount Pipe	C	From Face	4.00 -3.50 1.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.49 4.89 5.72	3.30 3.68 4.07 4.87	0.07 0.13 0.20 0.39
SBNHH-1D65B w/ Mount Pipe	A	From Face	4.00 0.00 1.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.49 4.89 5.72	3.30 3.68 4.07 4.87	0.07 0.13 0.20 0.39
SBNHH-1D65B w/ Mount Pipe	B	From Face	4.00 0.00 1.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.49 4.89 5.72	3.30 3.68 4.07 4.87	0.07 0.13 0.20 0.39
SBNHH-1D65B w/ Mount Pipe	C	From Face	4.00 0.00 1.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.49 4.89 5.72	3.30 3.68 4.07 4.87	0.07 0.13 0.20 0.39
SBNHH-1D65B w/ Mount Pipe	A	From Face	4.00 3.50 1.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.49 4.89 5.72	3.30 3.68 4.07 4.87	0.07 0.13 0.20 0.39
SBNHH-1D65B w/ Mount Pipe	B	From Face	4.00 3.50 1.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.49 4.89 5.72	3.30 3.68 4.07 4.87	0.07 0.13 0.20 0.39

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
SBNHH-1D65B w/ Mount Pipe	C	From Face	4.00 3.50 1.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.49 4.89 5.72	3.30 3.68 4.07 4.87	0.07 0.13 0.20 0.39
(2) LPA-80063/6CF w/ Mount Pipe	C	From Face	4.00 0.00 1.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice	9.83 10.40 10.93 12.03	10.22 11.38 12.27 14.09	0.05 0.14 0.25 0.48
(2) FD9R6004/2C-3L	A	From Face	4.00 0.00 -2.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.31 0.39 0.47 0.65	0.08 0.12 0.17 0.29	0.00 0.01 0.01 0.02
(2) FD9R6004/2C-3L	B	From Face	4.00 0.00 -2.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.31 0.39 0.47 0.65	0.08 0.12 0.17 0.29	0.00 0.01 0.01 0.02
(2) FD9R6004/2C-3L	C	From Face	4.00 0.00 -2.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.31 0.39 0.47 0.65	0.08 0.12 0.17 0.29	0.00 0.01 0.01 0.02
RRH2X60-700	A	From Face	4.00 0.00 1.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.50 3.76 4.03 4.58	1.82 2.05 2.29 2.79	0.06 0.08 0.11 0.17
RRH2X60-700	B	From Face	4.00 0.00 1.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.50 3.76 4.03 4.58	1.82 2.05 2.29 2.79	0.06 0.08 0.11 0.17
RRH2X60-700	C	From Face	4.00 0.00 1.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.50 3.76 4.03 4.58	1.82 2.05 2.29 2.79	0.06 0.08 0.11 0.17
(2) DB-T1-6Z-8AB-0Z	A	From Face	4.00 0.00 1.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.80 5.07 5.35 5.93	2.00 2.19 2.39 2.81	0.04 0.08 0.12 0.21
RRH2X60-PCS	A	From Face	4.00 0.00 1.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.20 2.39 2.59 3.01	1.72 1.90 2.09 2.48	0.06 0.08 0.10 0.16
RRH2X60-PCS	B	From Face	4.00 0.00 1.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.20 2.39 2.59 3.01	1.72 1.90 2.09 2.48	0.06 0.08 0.10 0.16
RRH2X60-PCS	C	From Face	4.00 0.00 1.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.20 2.39 2.59 3.01	1.72 1.90 2.09 2.48	0.06 0.08 0.10 0.16
B66A RRH4X45	A	From Face	4.00 0.00 1.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.58 2.79 3.01 3.48	1.63 1.81 2.00 2.40	0.06 0.08 0.10 0.16

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
B66A RRH4X45	B	From Face	4.00 0.00 1.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.58 2.79 3.01 3.48	1.63 1.81 2.00 2.40	0.06 0.08 0.10 0.16
B66A RRH4X45	C	From Face	4.00 0.00 1.00	0.0000	147.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.58 2.79 3.01 3.48	1.63 1.81 2.00 2.40	0.06 0.08 0.10 0.16
*** 137 Existing*** Platform Mount [LP 1001-1]	C	None		0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	47.70 59.50 71.30 94.90	47.70 59.50 71.30 94.90	3.02 3.62 4.22 5.43
7770.00 w/ Mount Pipe	A	From Leg	4.00 -7.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.75 6.18 6.61 7.49	4.25 5.01 5.71 7.16	0.06 0.10 0.16 0.29
7770.00 w/ Mount Pipe	B	From Leg	4.00 -7.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.75 6.18 6.61 7.49	4.25 5.01 5.71 7.16	0.06 0.10 0.16 0.29
7770.00 w/ Mount Pipe	C	From Leg	4.00 -7.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.75 6.18 6.61 7.49	4.25 5.01 5.71 7.16	0.06 0.10 0.16 0.29
HPA-65R-BUU-H6 w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	9.22 9.98 10.76 12.36	6.25 6.96 7.70 9.22	0.07 0.14 0.22 0.42
HPA-65R-BUU-H8 w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	12.25 13.19 14.16 16.14	8.33 9.23 10.15 12.05	0.10 0.19 0.30 0.54
HPA-65R-BUU-H8 w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	12.25 13.19 14.16 16.14	8.33 9.23 10.15 12.05	0.10 0.19 0.30 0.54
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Leg	4.00 -7.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.63 5.06 5.51 6.43	3.27 3.69 4.12 5.00	0.07 0.13 0.20 0.38
P65-17-XLH-RR w/ Mount Pipe	B	From Leg	4.00 -7.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	11.70 12.42 13.15 14.52	8.94 10.45 11.99 14.31	0.09 0.18 0.27 0.50
P65-17-XLH-RR w/ Mount Pipe	C	From Leg	4.00 -7.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	11.70 12.42 13.15 14.52	8.94 10.45 11.99 14.31	0.09 0.18 0.27 0.50
(4) 7020.00	A	From Leg	4.00 0.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice	0.10 0.15 0.20 0.33	0.17 0.24 0.31 0.48	0.00 0.01 0.01 0.02

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice			
(4) 7020.00	B	From Leg	4.00 0.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.10 0.15 0.20 0.33	0.17 0.24 0.31 0.48	0.00 0.01 0.01 0.02
(4) 7020.00	C	From Leg	4.00 0.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.10 0.15 0.20 0.33	0.17 0.24 0.31 0.48	0.00 0.01 0.01 0.02
TT19-08BP111-001	A	From Leg	4.00 0.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.55 0.65 0.75 0.98	0.45 0.53 0.63 0.84	0.02 0.02 0.03 0.05
TT19-08BP111-001	B	From Leg	4.00 0.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.55 0.65 0.75 0.98	0.45 0.53 0.63 0.84	0.02 0.02 0.03 0.05
TT19-08BP111-001	C	From Leg	4.00 0.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.55 0.65 0.75 0.98	0.45 0.53 0.63 0.84	0.02 0.02 0.03 0.05
RRUS 32 B2	A	From Leg	4.00 0.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.73 2.95 3.18 3.66	1.67 1.86 2.05 2.46	0.05 0.07 0.10 0.16
RRUS 32 B2	B	From Leg	4.00 0.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.73 2.95 3.18 3.66	1.67 1.86 2.05 2.46	0.05 0.07 0.10 0.16
RRUS 32 B2	C	From Leg	4.00 0.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.73 2.95 3.18 3.66	1.67 1.86 2.05 2.46	0.05 0.07 0.10 0.16
RRUS 11 B12	A	From Leg	4.00 0.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.83 3.04 3.26 3.71	1.18 1.33 1.48 1.83	0.05 0.07 0.10 0.15
RRUS 11 B12	B	From Leg	4.00 0.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.83 3.04 3.26 3.71	1.18 1.33 1.48 1.83	0.05 0.07 0.10 0.15
RRUS 11 B12	C	From Leg	4.00 0.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.83 3.04 3.26 3.71	1.18 1.33 1.48 1.83	0.05 0.07 0.10 0.15
DTMABP7819VG12A	A	From Leg	4.00 0.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.98 1.10 1.23 1.52	0.34 0.42 0.51 0.71	0.02 0.03 0.04 0.06
DTMABP7819VG12A	B	From Leg	4.00 0.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice	0.98 1.10 1.23 1.52	0.34 0.42 0.51 0.71	0.02 0.03 0.04 0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice			
DTMABP7819VG12A	C	From Leg	4.00 0.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.98 1.10 1.23 1.52	0.34 0.42 0.51 0.71	0.02 0.03 0.04 0.06
DC6-48-60-18-8F	A	From Leg	4.00 0.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.92 1.46 1.64 2.04	0.92 1.46 1.64 2.04	0.02 0.04 0.06 0.11
*** 126 Reserved ***									
Side Arm Mount [SO 306-1]	C	From Face	0.00 0.00 0.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.98 1.70 2.42 3.86	2.18 3.80 5.42 8.66	0.04 0.06 0.08 0.12
CXL 900-3LW	C	From Face	4.00 0.00 0.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.14 0.33 0.48 0.81	0.14 0.33 0.48 0.81	0.00 0.00 0.01 0.02
LNA	C	From Face	4.00 0.00 0.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.14 0.19 0.25 0.39	0.05 0.09 0.13 0.24	0.00 0.00 0.00 0.01
CAVITY FILTER	C	From Face	4.00 0.00 0.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.19 0.25 0.32 0.47	0.08 0.12 0.17 0.29	0.00 0.00 0.01 0.02
GPS_A	A	From Face	4.00 0.00 4.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.26 0.32 0.39 0.56	0.26 0.32 0.39 0.56	0.00 0.00 0.01 0.02
GPS_A	B	From Face	4.00 0.00 4.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.26 0.32 0.39 0.56	0.26 0.32 0.39 0.56	0.00 0.00 0.01 0.02
(4) DB844G65ZAXY w/ Mount Pipe	A	From Face	4.00 0.00 2.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.58 4.96 5.34 6.14	4.80 5.42 6.04 7.34	0.03 0.08 0.13 0.26
(4) DB844G65ZAXY w/ Mount Pipe	B	From Face	4.00 0.00 2.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.58 4.96 5.34 6.14	4.80 5.42 6.04 7.34	0.03 0.08 0.13 0.26
(4) DB844G65ZAXY w/ Mount Pipe	C	From Face	4.00 0.00 2.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.58 4.96 5.34 6.14	4.80 5.42 6.04 7.34	0.03 0.08 0.13 0.26
Side Arm Mount [SO 701-3]	C	From Leg	4.00 0.00 0.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.83 3.92 5.01 7.19	2.83 3.92 5.01 7.19	0.20 0.24 0.28 0.36
Platform Mount [LP 601-1]	C	None		0.0000	126.00	No Ice 1/2" Ice	28.47 33.59 38.71	28.47 33.59 38.71	1.12 1.51 1.91

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice	48.95	48.95	2.69
						2" Ice			
Transition Ladder	C	From Leg	2.00 0.00 -2.00	0.0000	126.00	No Ice	6.00	6.00	0.16
						1/2" Ice	8.00	8.00	0.24
						1" Ice	10.00	10.00	0.32
						2" Ice	14.00	14.00	0.48
*** 118 Proposed***									
Platform Mount [LP 601-1]	C	None		0.0000	118.00	No Ice	28.47	28.47	1.12
						1/2" Ice	33.59	33.59	1.51
						1" Ice	38.71	38.71	1.91
						2" Ice	48.95	48.95	2.69
Handrail Kit [NA 507-1]	C	None		0.0000	118.00	No Ice	4.80	4.80	0.25
						1/2" Ice	6.70	6.70	0.29
						1" Ice	8.60	8.60	0.34
						2" Ice	12.40	12.40	0.44
Transition Ladder	C	From Face	2.00 0.00 -4.00	0.0000	118.00	No Ice	6.00	6.00	0.16
						1/2" Ice	8.00	8.00	0.24
						1" Ice	10.00	10.00	0.32
						2" Ice	14.00	14.00	0.48
AIR -32 B2A/B66AA w/ Mount Pipe	A	From Leg	3.00 -6.00 0.00	0.0000	118.00	No Ice	6.75	6.07	0.15
						1/2" Ice	7.20	6.87	0.21
						1" Ice	7.65	7.58	0.28
						2" Ice	8.57	9.06	0.44
AIR -32 B2A/B66AA w/ Mount Pipe	B	From Leg	3.00 -6.00 0.00	0.0000	118.00	No Ice	6.75	6.07	0.15
						1/2" Ice	7.20	6.87	0.21
						1" Ice	7.65	7.58	0.28
						2" Ice	8.57	9.06	0.44
AIR -32 B2A/B66AA w/ Mount Pipe	C	From Leg	3.00 -6.00 0.00	0.0000	118.00	No Ice	6.75	6.07	0.15
						1/2" Ice	7.20	6.87	0.21
						1" Ice	7.65	7.58	0.28
						2" Ice	8.57	9.06	0.44
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Leg	3.00 0.00 0.00	0.0000	118.00	No Ice	14.69	6.87	0.19
						1/2" Ice	15.46	7.55	0.31
						1" Ice	16.23	8.25	0.46
						2" Ice	17.82	9.67	0.79
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Leg	3.00 0.00 0.00	0.0000	118.00	No Ice	14.69	6.87	0.19
						1/2" Ice	15.46	7.55	0.31
						1" Ice	16.23	8.25	0.46
						2" Ice	17.82	9.67	0.79
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Leg	3.00 0.00 0.00	0.0000	118.00	No Ice	14.69	6.87	0.19
						1/2" Ice	15.46	7.55	0.31
						1" Ice	16.23	8.25	0.46
						2" Ice	17.82	9.67	0.79
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	3.00 6.00 0.00	0.0000	118.00	No Ice	6.33	5.64	0.11
						1/2" Ice	6.78	6.43	0.17
						1" Ice	7.21	7.13	0.23
						2" Ice	8.12	8.59	0.38
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	3.00 6.00 0.00	0.0000	118.00	No Ice	6.33	5.64	0.11
						1/2" Ice	6.78	6.43	0.17
						1" Ice	7.21	7.13	0.23
						2" Ice	8.12	8.59	0.38
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	3.00 6.00	0.0000	118.00	No Ice	6.33	5.64	0.11
						1/2" Ice	6.78	6.43	0.17

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			Ice	7.21	7.13	0.23
						1" Ice	8.12	8.59	0.38
						2" Ice			
RADIO 4449 B12/B71	A	From Leg	3.00	0.0000	118.00	No Ice	1.65	1.30	0.08
			0.00			1/2"	1.81	1.44	0.09
			0.00			Ice	1.98	1.60	0.11
						1" Ice	2.34	1.92	0.16
						2" Ice			
RADIO 4449 B12/B71	B	From Leg	3.00	0.0000	118.00	No Ice	1.65	1.30	0.08
			0.00			1/2"	1.81	1.44	0.09
			0.00			Ice	1.98	1.60	0.11
						1" Ice	2.34	1.92	0.16
						2" Ice			
RADIO 4449 B12/B71	C	From Leg	3.00	0.0000	118.00	No Ice	1.65	1.30	0.08
			0.00			1/2"	1.81	1.44	0.09
			0.00			Ice	1.98	1.60	0.11
						1" Ice	2.34	1.92	0.16
						2" Ice			
KRY 112 144/1	A	From Leg	3.00	0.0000	118.00	No Ice	0.35	0.17	0.01
			0.00			1/2"	0.43	0.23	0.01
			0.00			Ice	0.51	0.30	0.02
						1" Ice	0.70	0.46	0.03
						2" Ice			
KRY 112 144/1	B	From Leg	3.00	0.0000	118.00	No Ice	0.35	0.17	0.01
			0.00			1/2"	0.43	0.23	0.01
			0.00			Ice	0.51	0.30	0.02
						1" Ice	0.70	0.46	0.03
						2" Ice			
KRY 112 144/1	C	From Leg	3.00	0.0000	118.00	No Ice	0.35	0.17	0.01
			0.00			1/2"	0.43	0.23	0.01
			0.00			Ice	0.51	0.30	0.02
						1" Ice	0.70	0.46	0.03
						2" Ice			
*** 95 Reserved ***									
T-Arm Mount [TA 702-1]	B	From Face	0.00	60.0000	95.00	No Ice	2.78	2.23	0.11
			0.00			1/2"	3.39	2.43	0.14
			0.00			Ice	4.00	2.63	0.17
						1" Ice	5.22	3.03	0.23
						2" Ice			
T-Arm Mount [TA 702-1]	C	From Face	0.00	60.0000	95.00	No Ice	2.78	2.23	0.11
			0.00			1/2"	3.39	2.43	0.14
			0.00			Ice	4.00	2.63	0.17
						1" Ice	5.22	3.03	0.23
						2" Ice			
6' x 2" Mount Pipe	C	From Face	0.00	60.0000	95.00	No Ice	1.43	1.43	0.02
			-2.50			1/2"	1.92	1.92	0.03
			0.00			Ice	2.29	2.29	0.05
						1" Ice	3.06	3.06	0.09
						2" Ice			
HT65A-F-2X2 w/ Mount Pipe	B	From Face	3.00	0.0000	95.00	No Ice	3.90	3.83	0.04
			-2.50			1/2"	4.33	4.58	0.07
			2.00			Ice	4.75	5.27	0.12
						1" Ice	5.58	6.70	0.22
						2" Ice			
FWHR	B	From Face	3.00	0.0000	95.00	No Ice	1.03	0.51	0.03
			0.00			1/2"	1.16	0.60	0.04
			2.00			Ice	1.30	0.70	0.05
						1" Ice	1.59	0.92	0.08
						2" Ice			
Ice Shield 1.5' x 2.0'	C	From Leg	3.00	0.0000	95.00	No Ice	0.30	0.40	0.03
			-2.50			1/2"	0.41	0.55	0.04
			4.00			Ice	0.54	0.70	0.06
						1" Ice	0.80	1.04	0.12
						2" Ice			
*** 87 Abandoned ***									

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
Pipe Mount [PM 601-3]	C	None		0.0000	87.00	No Ice	4.39	4.39	0.20
						1/2" Ice	5.48	5.48	0.24
						1" Ice	6.57	6.57	0.28
						2" Ice	8.75	8.75	0.36
7250.02 w/ Mount Pipe	A	From Leg	1.00 0.00 0.00	0.0000	87.00	No Ice	4.24	3.32	0.04
						1/2" Ice	4.71	4.30	0.07
						1" Ice	5.17	5.05	0.12
						2" Ice	6.11	6.60	0.22
7250.02 w/ Mount Pipe	B	From Leg	1.00 0.00 0.00	0.0000	87.00	No Ice	4.24	3.32	0.04
						1/2" Ice	4.71	4.30	0.07
						1" Ice	5.17	5.05	0.12
						2" Ice	6.11	6.60	0.22
7250.02 w/ Mount Pipe	C	From Leg	1.00 0.00 0.00	0.0000	87.00	No Ice	4.24	3.32	0.04
						1/2" Ice	4.71	4.30	0.07
						1" Ice	5.17	5.05	0.12
						2" Ice	6.11	6.60	0.22
****** ******									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
*** 95 R *** repeater technologies DA1900-39	C	Paraboloid w/Shroud (HP)	From Face	3.00 -2.50 1.00	-30.0000		95.00	3.54	No Ice	9.86	0.05
									1/2" Ice	10.32	0.10
									1" Ice	10.77	0.15
									2" Ice	11.68	0.26
****** ******											

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice

Comb. No.	Description
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice
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	144.813 - 92.3333	Pole	Max Tension	33	0.00	-0.00	0.00
			Max. Compression	26	-54.47	4.98	-7.20
			Max. Mx	20	-22.75	852.92	3.89
			Max. My	14	-22.79	-3.69	-839.02
			Max. Vy	20	-24.52	852.92	3.89
			Max. Vx	14	24.11	-3.69	-839.02
			Max. Torque	9			-4.76
L2	92.3333 - 44.5208	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-78.72	2.42	-7.90
			Max. Mx	20	-37.72	2153.95	19.19
			Max. My	14	-37.74	-14.56	-2121.87
			Max. Vy	20	-30.83	2153.95	19.19
			Max. Vx	2	-30.51	18.86	2121.61
			Max. Torque	7			-5.25
L3	44.5208 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-109.92	0.94	-7.04
			Max. Mx	20	-59.47	3866.56	36.60
			Max. My	2	-59.47	31.71	3818.43
			Max. Vy	20	-36.17	3866.56	36.60
			Max. Vx	2	-35.87	31.71	3818.43
			Max. Torque	7			-5.24

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	31	109.92	-7.54	-4.36
	Max. H_x	20	59.49	36.14	0.34
	Max. H_z	2	59.49	0.25	35.84
	Max. M_x	2	3818.43	0.25	35.84
	Max. M_z	8	3861.64	-36.12	-0.25
	Max. Torsion	19	5.21	31.01	-17.77
	Min. Vert	17	44.62	17.75	-30.92
	Min. H_x	8	59.49	-36.12	-0.25
	Min. H_z	14	59.49	-0.22	-35.75
	Min. M_x	14	-3813.87	-0.22	-35.75
	Min. M_z	20	-3866.56	36.14	0.34
	Min. Torsion	7	-5.24	-31.05	17.70

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	49.58	0.00	0.00	1.86	1.13	-0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	59.49	-0.25	-35.84	-3818.43	31.71	0.82
0.9 Dead+1.0 Wind 0 deg - No Ice	44.62	-0.25	-35.84	-3784.40	31.05	0.81
1.2 Dead+1.0 Wind 30 deg - No Ice	59.49	17.68	-30.99	-3298.64	-1885.71	3.20
0.9 Dead+1.0 Wind 30 deg - No Ice	44.62	17.68	-30.99	-3269.34	-1868.94	3.20
1.2 Dead+1.0 Wind 60 deg - No Ice	59.49	31.05	-17.70	-1881.24	-3314.59	5.23
0.9 Dead+1.0 Wind 60 deg - No Ice	44.62	31.05	-17.70	-1864.77	-3284.85	5.24
1.2 Dead+1.0 Wind 90 deg - No Ice	59.49	36.12	0.25	32.38	-3861.64	5.22
0.9 Dead+1.0 Wind 90 deg - No Ice	44.62	36.12	0.25	31.50	-3826.93	5.23
1.2 Dead+1.0 Wind 120 deg - No Ice	59.49	31.16	18.06	1931.83	-3331.18	3.86
0.9 Dead+1.0 Wind 120 deg - No Ice	44.62	31.16	18.06	1913.70	-3301.26	3.87
1.2 Dead+1.0 Wind 150 deg - No Ice	59.49	18.10	31.04	3314.04	-1936.86	1.71
0.9 Dead+1.0 Wind 150 deg - No Ice	44.62	18.10	31.04	3283.37	-1919.61	1.72
1.2 Dead+1.0 Wind 180 deg - No Ice	59.49	0.22	35.75	3813.87	-26.02	-0.88
0.9 Dead+1.0 Wind 180 deg - No Ice	44.62	0.22	35.75	3778.68	-26.14	-0.88
1.2 Dead+1.0 Wind 210 deg - No Ice	59.49	-17.75	30.92	3297.07	1895.20	-3.48
0.9 Dead+1.0 Wind 210 deg - No Ice	44.62	-17.75	30.92	3266.58	1877.61	-3.48
1.2 Dead+1.0 Wind 240 deg - No Ice	59.49	-31.01	17.77	1892.90	3313.39	-5.20
0.9 Dead+1.0 Wind 240 deg - No Ice	44.62	-31.01	17.77	1875.16	3282.92	-5.21
1.2 Dead+1.0 Wind 270 deg - No Ice	59.49	-36.14	-0.34	-36.60	3866.56	-4.92
0.9 Dead+1.0 Wind 270 deg - No Ice	44.62	-36.14	-0.34	-36.87	3831.09	-4.93
1.2 Dead+1.0 Wind 300 deg - No Ice	59.49	-31.23	-18.13	-1934.25	3340.59	-3.82

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
0.9 Dead+1.0 Wind 300 deg - No Ice	44.62	-31.23	-18.13	-1917.30	3309.87	-3.84
1.2 Dead+1.0 Wind 330 deg - No Ice	59.49	-18.15	-31.12	-3317.27	1944.25	-1.74
0.9 Dead+1.0 Wind 330 deg - No Ice	44.62	-18.15	-31.12	-3287.77	1926.21	-1.75
1.2 Dead+1.0 Ice	109.92	-0.00	0.00	7.04	0.94	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice	109.92	-0.05	-8.66	-986.65	7.10	-0.05
1.2 Dead+1.0 Wind 30 deg+1.0 Ice	109.92	4.29	-7.49	-851.84	-492.60	0.63
1.2 Dead+1.0 Wind 60 deg+1.0 Ice	109.92	7.52	-4.28	-484.28	-863.37	1.23
1.2 Dead+1.0 Wind 90 deg+1.0 Ice	109.92	8.69	0.05	13.33	-999.27	1.39
1.2 Dead+1.0 Wind 120 deg+1.0 Ice	109.92	7.54	4.36	508.14	-866.83	1.18
1.2 Dead+1.0 Wind 150 deg+1.0 Ice	109.92	4.37	7.50	868.69	-502.93	0.70
1.2 Dead+1.0 Wind 180 deg+1.0 Ice	109.92	0.04	8.64	999.38	-4.57	0.04
1.2 Dead+1.0 Wind 210 deg+1.0 Ice	109.92	-4.30	7.47	865.16	495.86	-0.68
1.2 Dead+1.0 Wind 240 deg+1.0 Ice	109.92	-7.51	4.30	500.18	864.56	-1.23
1.2 Dead+1.0 Wind 270 deg+1.0 Ice	109.92	-8.70	-0.07	-0.53	1001.66	-1.33
1.2 Dead+1.0 Wind 300 deg+1.0 Ice	109.92	-7.55	-4.37	-494.99	870.09	-1.17
1.2 Dead+1.0 Wind 330 deg+1.0 Ice	109.92	-4.38	-7.51	-855.69	505.80	-0.70
Dead+Wind 0 deg - Service	49.58	-0.05	-7.78	-822.72	7.71	0.18
Dead+Wind 30 deg - Service	49.58	3.84	-6.72	-710.53	-406.13	0.70
Dead+Wind 60 deg - Service	49.58	6.74	-3.84	-404.60	-714.54	1.14
Dead+Wind 90 deg - Service	49.58	7.84	0.05	8.43	-832.62	1.14
Dead+Wind 120 deg - Service	49.58	6.76	3.92	418.40	-718.12	0.84
Dead+Wind 150 deg - Service	49.58	3.93	6.74	716.72	-417.17	0.38
Dead+Wind 180 deg - Service	49.58	0.05	7.76	824.60	-4.75	-0.19
Dead+Wind 210 deg - Service	49.58	-3.85	6.71	713.05	409.91	-0.76
Dead+Wind 240 deg - Service	49.58	-6.73	3.86	409.99	716.01	-1.14
Dead+Wind 270 deg - Service	49.58	-7.84	-0.07	-6.46	835.42	-1.08
Dead+Wind 300 deg - Service	49.58	-6.78	-3.94	-416.05	721.89	-0.84
Dead+Wind 330 deg - Service	49.58	-3.94	-6.75	-714.56	420.51	-0.38

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.00	-49.58	0.00	0.00	49.58	0.00	0.000%
2	-0.25	-59.49	-35.84	0.25	59.49	35.84	0.000%
3	-0.25	-44.62	-35.84	0.25	44.62	35.84	0.000%
4	17.68	-59.49	-30.99	-17.68	59.49	30.99	0.000%
5	17.68	-44.62	-30.99	-17.68	44.62	30.99	0.000%
6	31.05	-59.49	-17.70	-31.05	59.49	17.70	0.000%
7	31.05	-44.62	-17.70	-31.05	44.62	17.70	0.000%
8	36.12	-59.49	0.25	-36.12	59.49	-0.25	0.000%
9	36.12	-44.62	0.25	-36.12	44.62	-0.25	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
10	31.16	-59.49	18.06	-31.16	59.49	-18.06	0.000%
11	31.16	-44.62	18.06	-31.16	44.62	-18.06	0.000%
12	18.10	-59.49	31.04	-18.10	59.49	-31.04	0.000%
13	18.10	-44.62	31.04	-18.10	44.62	-31.04	0.000%
14	0.22	-59.49	35.75	-0.22	59.49	-35.75	0.000%
15	0.22	-44.62	35.75	-0.22	44.62	-35.75	0.000%
16	-17.75	-59.49	30.92	17.75	59.49	-30.92	0.000%
17	-17.75	-44.62	30.92	17.75	44.62	-30.92	0.000%
18	-31.01	-59.49	17.77	31.01	59.49	-17.77	0.000%
19	-31.01	-44.62	17.77	31.01	44.62	-17.77	0.000%
20	-36.14	-59.49	-0.34	36.14	59.49	0.34	0.000%
21	-36.14	-44.62	-0.34	36.14	44.62	0.34	0.000%
22	-31.23	-59.49	-18.13	31.23	59.49	18.13	0.000%
23	-31.23	-44.62	-18.13	31.23	44.62	18.13	0.000%
24	-18.15	-59.49	-31.12	18.15	59.49	31.12	0.000%
25	-18.15	-44.62	-31.12	18.15	44.62	31.12	0.000%
26	0.00	-109.92	0.00	0.00	109.92	-0.00	0.000%
27	-0.05	-109.92	-8.66	0.05	109.92	8.66	0.000%
28	4.29	-109.92	-7.49	-4.29	109.92	7.49	0.000%
29	7.52	-109.92	-4.28	-7.52	109.92	4.28	0.000%
30	8.69	-109.92	0.05	-8.69	109.92	-0.05	0.000%
31	7.54	-109.92	4.36	-7.54	109.92	-4.36	0.000%
32	4.37	-109.92	7.50	-4.37	109.92	-7.50	0.000%
33	0.04	-109.92	8.64	-0.04	109.92	-8.64	0.000%
34	-4.30	-109.92	7.47	4.30	109.92	-7.47	0.000%
35	-7.51	-109.92	4.30	7.51	109.92	-4.30	0.000%
36	-8.70	-109.92	-0.07	8.70	109.92	0.07	0.000%
37	-7.55	-109.92	-4.37	7.55	109.92	4.37	0.000%
38	-4.38	-109.92	-7.51	4.38	109.92	7.51	0.000%
39	-0.05	-49.58	-7.78	0.05	49.58	7.78	0.000%
40	3.84	-49.58	-6.72	-3.84	49.58	6.72	0.000%
41	6.74	-49.58	-3.84	-6.74	49.58	3.84	0.000%
42	7.84	-49.58	0.05	-7.84	49.58	-0.05	0.000%
43	6.76	-49.58	3.92	-6.76	49.58	-3.92	0.000%
44	3.93	-49.58	6.74	-3.93	49.58	-6.74	0.000%
45	0.05	-49.58	7.76	-0.05	49.58	-7.76	0.000%
46	-3.85	-49.58	6.71	3.85	49.58	-6.71	0.000%
47	-6.73	-49.58	3.86	6.73	49.58	-3.86	0.000%
48	-7.84	-49.58	-0.07	7.84	49.58	0.07	0.000%
49	-6.78	-49.58	-3.94	6.78	49.58	3.94	0.000%
50	-3.94	-49.58	-6.75	3.94	49.58	6.75	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00013483
3	Yes	4	0.00000001	0.00005284
4	Yes	5	0.00000001	0.00022295
5	Yes	5	0.00000001	0.00010420
6	Yes	5	0.00000001	0.00019354
7	Yes	5	0.00000001	0.00008953
8	Yes	4	0.00000001	0.00098791
9	Yes	4	0.00000001	0.00064464
10	Yes	5	0.00000001	0.00023736
11	Yes	5	0.00000001	0.00011058
12	Yes	5	0.00000001	0.00021103
13	Yes	5	0.00000001	0.00009750
14	Yes	4	0.00000001	0.00022492
15	Yes	4	0.00000001	0.00012965
16	Yes	5	0.00000001	0.00020029
17	Yes	5	0.00000001	0.00009259
18	Yes	5	0.00000001	0.00023643
19	Yes	5	0.00000001	0.00011051

20	Yes	4	0.00000001	0.00075162
21	Yes	4	0.00000001	0.00049055
22	Yes	5	0.00000001	0.00020579
23	Yes	5	0.00000001	0.00009482
24	Yes	5	0.00000001	0.00022702
25	Yes	5	0.00000001	0.00010546
26	Yes	4	0.00000001	0.00000311
27	Yes	4	0.00000001	0.00019467
28	Yes	4	0.00000001	0.00039559
29	Yes	4	0.00000001	0.00033852
30	Yes	4	0.00000001	0.00027858
31	Yes	4	0.00000001	0.00047819
32	Yes	4	0.00000001	0.00037094
33	Yes	4	0.00000001	0.00020529
34	Yes	4	0.00000001	0.00037595
35	Yes	4	0.00000001	0.00047967
36	Yes	4	0.00000001	0.00027517
37	Yes	4	0.00000001	0.00035637
38	Yes	4	0.00000001	0.00042714
39	Yes	4	0.00000001	0.00001638
40	Yes	4	0.00000001	0.00007464
41	Yes	4	0.00000001	0.00005672
42	Yes	4	0.00000001	0.00004920
43	Yes	4	0.00000001	0.00008484
44	Yes	4	0.00000001	0.00005860
45	Yes	4	0.00000001	0.00001714
46	Yes	4	0.00000001	0.00005657
47	Yes	4	0.00000001	0.00009022
48	Yes	4	0.00000001	0.00004585
49	Yes	4	0.00000001	0.00005816
50	Yes	4	0.00000001	0.00007237

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	144.813 - 92.3333	14.774	48	0.9581	0.0076
L2	97.2917 - 44.5208	6.395	48	0.6552	0.0024
L3	51.1042 - 0	1.684	48	0.3079	0.0007

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
147.00	Platform Mount [LP 1001-1]	48	14.774	0.9581	0.0076	57908
137.00	Platform Mount [LP 1001-1]	48	13.278	0.9113	0.0066	37061
126.00	Side Arm Mount [SO 306-1]	48	11.209	0.8446	0.0052	15390
118.00	Platform Mount [LP 601-1]	48	9.761	0.7946	0.0043	10798
96.00	repeater technologies DA1900-39	48	6.209	0.6459	0.0023	6170
95.00	T-Arm Mount [TA 702-1]	48	6.068	0.6386	0.0022	6160
87.00	Pipe Mount [PM 601-3]	48	5.005	0.5790	0.0018	6312

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	144.813 - 92.3333	68.326	20	4.4251	0.0348
L2	97.2917 - 44.5208	29.612	20	3.0345	0.0109
L3	51.1042 - 0	7.799	20	1.4259	0.0033

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
147.00	Platform Mount [LP 1001-1]	20	68.326	4.4251	0.0348	12686
137.00	Platform Mount [LP 1001-1]	20	61.416	4.2113	0.0302	8119
126.00	Side Arm Mount [SO 306-1]	20	51.861	3.9054	0.0240	3370
118.00	Platform Mount [LP 601-1]	20	45.171	3.6760	0.0197	2363
96.00	repeater technologies DA1900-39	20	28.753	2.9915	0.0105	1347
95.00	T-Arm Mount [TA 702-1]	20	28.098	2.9579	0.0102	1344
87.00	Pipe Mount [PM 601-3]	20	23.180	2.6824	0.0081	1375

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	144.813 - 92.3333 (1)	TP35.675x20.5x0.3438	52.48	0.00	0.0	37.5203	-22.75	2194.94	0.010
L2	92.3333 - 44.5208 (2)	TP48.658x33.5537x0.4375	52.77	0.00	0.0	65.2761	-37.72	3818.65	0.010
L3	44.5208 - 0 (3)	TP60.5x45.8987x0.4688	51.10	0.00	0.0	90.6097	-59.47	5300.67	0.011

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	144.813 - 92.3333 (1)	TP35.675x20.5x0.3438	852.93	1793.08	0.476	0.00	1793.08	0.000
L2	92.3333 - 44.5208 (2)	TP48.658x33.5537x0.4375	2154.04	4149.03	0.519	0.00	4149.03	0.000
L3	44.5208 - 0 (3)	TP60.5x45.8987x0.4688	3866.73	6827.62	0.566	0.00	6827.62	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	144.813 - 92.3333 (1)	TP35.675x20.5x0.3438	24.52	658.48	0.037	4.71	1963.41	0.002
L2	92.3333 - 44.5208 (2)	TP48.658x33.5537x0.4375	30.83	1145.60	0.027	4.93	4669.30	0.001
L3	44.5208 - 0 (3)	TP60.5x45.8987x0.4688	36.18	1590.20	0.023	4.92	8397.08	0.001

Pole Interaction Design Data

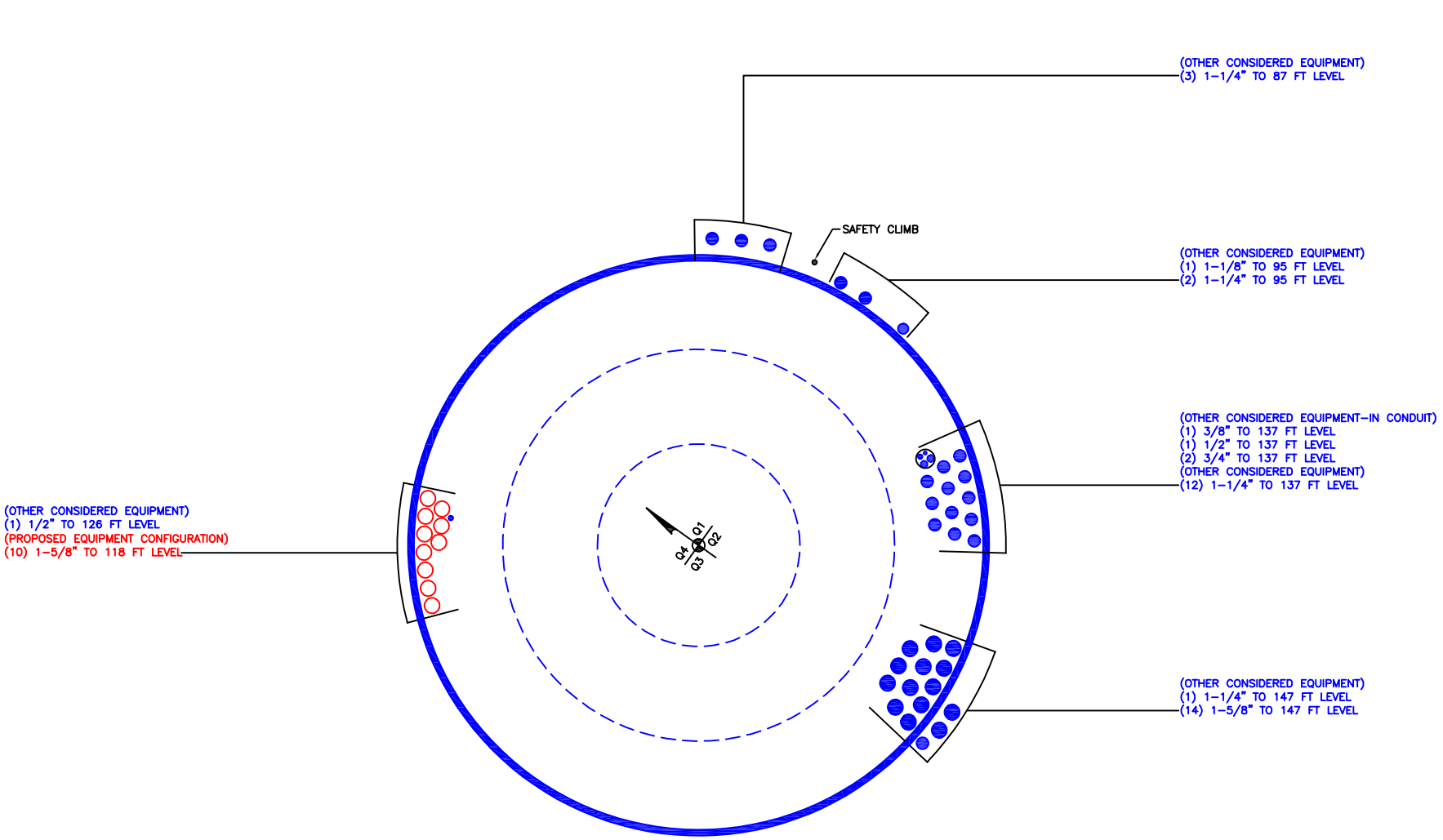
Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	144.813 - 92.3333 (1)	0.010	0.476	0.000	0.037	0.002	0.488	1.050	4.8.2
L2	92.3333 - 44.5208 (2)	0.010	0.519	0.000	0.027	0.001	0.530	1.050	4.8.2
L3	44.5208 - 0 (3)	0.011	0.566	0.000	0.023	0.001	0.578	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	144.813 - 92.3333	Pole	TP35.675x20.5x0.3438	1	-22.75	2304.69	46.4	Pass
L2	92.3333 - 44.5208	Pole	TP48.658x33.5537x0.4375	2	-37.72	4009.58	50.5	Pass
L3	44.5208 - 0	Pole	TP60.5x45.8987x0.4688	3	-59.47	5565.70	55.1	Pass
							Summary	
						Pole (L3)	55.1	Pass
						RATING =	**55.1**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 806368 TOWER ID:C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

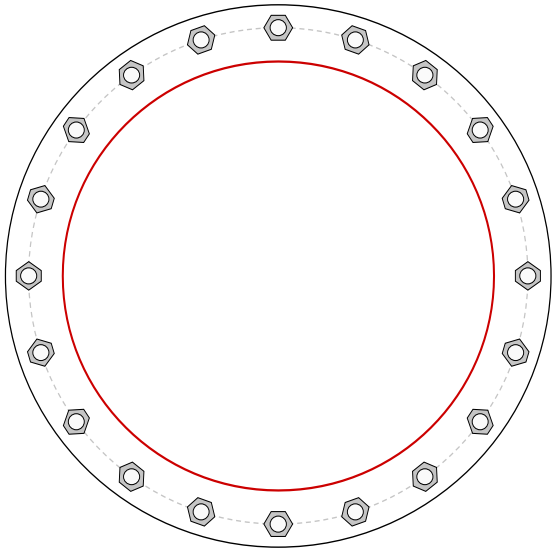
Monopole Base Plate Connection

Site Info	
BU #	806368
Site Name	HRT 049B 943215
Order #	479822 Rev 0

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	1.875

Applied Loads	
Moment (kip-ft)	3866.73
Axial Force (kips)	59.47
Shear Force (kips)	36.18

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

(20) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 70" BC

Base Plate Data

76.5" OD x 2.25" Plate (A871; Fy=60 ksi, Fu=75 ksi)

Stiffener Data

N/A

Pole Data

60.5" x 0.46875" 12-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

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

Pu_c = 135.49	ϕPn_c = 243.75	**Stress Rating**
Vu = 1.81	ϕVn = 73.13	**53.0%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary

Max Stress (ksi):	32.03	(Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	**56.5%**	**Pass**

BLACK & VEATCH
Building a world of difference.
6800 W. 115th St., Suite 2292
Overland Park, KS 66211
Phone: (913) 458-8145

Client:	Crown Castle	*Design:*	PMN
Project:	400087	*Date:*	7/17/2019
Site:	HRT 049B 943215	*Verify:*	
Title:	**Monopole Pad & Pier Foundation Reaction Comparison**	*Date:*	
		Code:	TIA/EIA-222-H

Template Version 1.6

FOUNDATION ANALYSIS:

Original Tower Design Reactions:

Tower Base:

Shear:	60.2	Kip
Overturning Moment:	6751.9	Kip-ft

Note:
1. Design loads were multiple by 1.35 for comparison as allowed by TIA-222-H, Section 15.6.2

TnxTower Reactions:

Tower Base:

Shear:	36.2	Kip
Overturning Moment:	3866.7	Kip-ft

Stress Ratio:

Tower Base:

Shear:	**57.2%**
Overturning Moment:	**54.5%**

Conclusion: **Calculated reactions are less than those for which the foundation was originally designed. Therefore, the existing foundation is considered to have been designed and constructed with adequate capacity to support the existing and proposed loads.**

Controlling Foundation Stress Ratio: **54.5%**

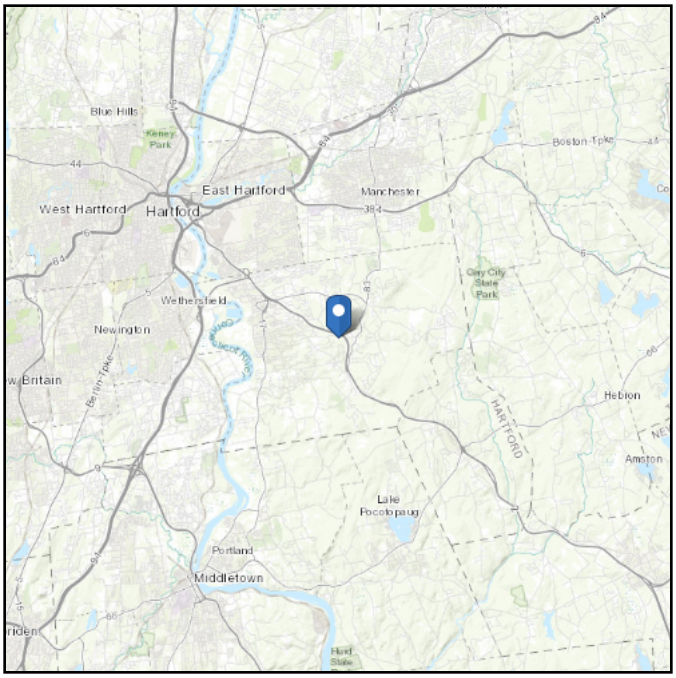
NOTE: Although the shear capacity is at 57.2%, the moment reaction is the governing criteria for a monopole drilled shaft foundation. Therefore, the overall capacity for this foundation is 54.5%.

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 467.15 ft (NAVD 88)
Latitude: 41.693592
Longitude: -72.547253



Wind

Results:

Wind Speed:	125 Vmph
10-year MRI	77 Vmph
25-year MRI	87 Vmph
50-year MRI	94 Vmph
100-year MRI	102 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 Jul 17 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.

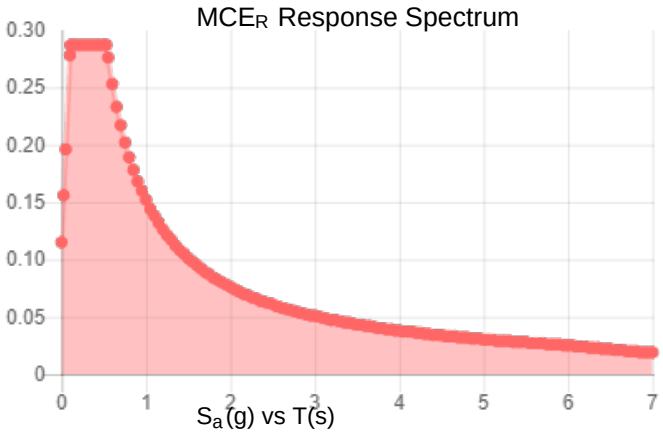
Seismic

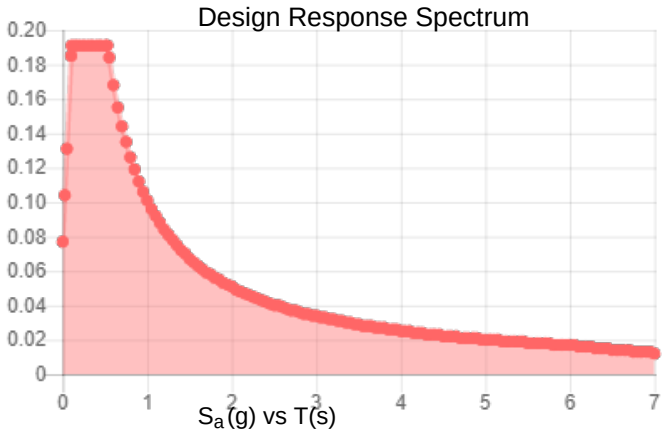
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.179	S_{DS} :	0.191
S_1 :	0.063	S_{D1} :	0.101
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.09
S_{MS} :	0.287	PGA_M :	0.145
S_{M1} :	0.152	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B





Data Accessed: Wed Jul 17 2019

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

Ice

Results:

Ice Thickness:	1.00 in.
Concurrent Temperature:	5 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Wed Jul 17 2019

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

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

Exhibit E

Mount Analysis

PAUL J. FORD & COMPANY

Date: April 29, 2019

Kevin Morrow
Crown Castle
3530 Toringdon Way
Charlotte, NC 28277

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

Subject:	**Mount Analysis Report**	
Carrier Designation:	***T-Mobile* Equipment Change-out**	
	Carrier Site Number:	CT11248A
	Carrier Site Name:	Glastonbury
Crown Castle Designation:	**Crown Castle BU Number:**	806368
	Crown Castle Site Name:	HRT 049B 943215
	Crown Castle JDE Job Number:	559175
	Crown Castle Purchase Order Number:	1370222
	Crown Castle Order Number:	479822 Rev. 0
Engineering Firm Designation:	**Paul J Ford and Company Project Number:**	A37519-1551.002.7190
Site Data:	**374 Three Mile Rd, Glastonbury, Hartford County, CT** **Latitude 41.693592°, Longitude -72.547253°**	
Structure Information:	**Tower Height & Type:**	**145 Foot Monopole**
	Mount Elevation:	**118 Foot**
	Mount Type:	**(1) 12 Foot Platform**

Dear Kevin Morrow,

Paul J Ford and Company is pleased to submit this "Mount Analysis Report" to determine the structural integrity of the T-Mobile antenna mounting system with the proposed appurtenance and equipment addition on the abovementioned supporting tower structure. Analysis of the existing supporting tower structure is to be completed by others and therefore is not part of this analysis. Analysis of the antenna mounting system as a tie-off point is not part of this document.

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

12' Platform **SUFFICIENT***

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

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

Respectfully submitted by:

Jared Forbes, E.I.
Structural Designer
jforbes@pauljford.com

RMD

STATE OF CONNECTICUT
JOSEPH PACHICARAH JACOBS
No. PEN 22731
LICENSED PROFESSIONAL ENGINEER

APR 2 9 2019

TABLE OF CONTENTS

1) INTRODUCTION

The existing mount under consideration is (1) 12' Platform mount mapped by RKS on 04/05/2019.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	125 mph
Exposure Category:	B
Topographic Factor at Base:	1.000
Topographic Factor at Mount:	1.000
Ice Thickness:	2.0 in
Wind Speed with Ice:	50 mph
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
118	118	3	Ericsson	AIR -32 B2A/B66AA	(1) 12' Platform
		3	Ericsson	ERICSSON AIR 21 B2A B4P	
		3	RFS/Celwave	APXVAARR24_43-U-NA20	
		3	Ericsson	KRY 112 144/1	
		3	Ericsson	RADIO 4449 B12/B71	

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
Mount Mapping	806368 Dated: 04/22/2019	8352814	CCISites
Order	ID: 479822 Rev. 0 Dated: 04/17/2019	-	CCISites

3.1) Analysis Method

RISA-3D (version 15.0.4), 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.

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

3.2) Assumptions

1) *The analysis of the existing tower or the effect of the mount attachment to the tower is not within the current scope of work.*
2) *The antenna mounting system was properly fabricated, installed and maintained in good condition, twist free and plumb in accordance with its original design and manufacturer's specifications and all bolts are tightened as specified by the manufacturer and AISC requirements.*
3) *The configuration of antennas, mounts, and other appurtenances are as specified in Table 1.*
4) *All member connections have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report. All U-Bolt connections have been properly tightened. This analysis will be required to be revised if the existing conditions in the field differ from those shown in the above referenced documents or assumed in this analysis. No allowance was made for any damaged, missing, or rusted members.*
5) *Steel grades are as follows, unless noted otherwise:*
   - *a) Channel, Solid Round, Angle, Plate, Unistrut* — *ASTM A36 (GR 36)*
   - *b) Pipe* — *ASTM A53 (GR 35)*
   - *c) HSS (Rectangular)* — *ASTM 500 (GR B-46)*
   - *d) HSS (Round)* — *ASTM 500 (GR B-42)*
   - *e) Threaded Rods* — *ASTM F1554 (GR 36)*
   - *f) Connection Bolts* — *ASTM A325*
   - *g) U-Bolts* — *SAE J429 (GR 2)*
6) *Proposed equipment is to be installed in the locations specified in Appendix A. Any changes to the proposed equipment locations will render this report invalid.*

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

4) ANALYSIS RESULTS

Table 3- Mount Component Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Face Horizontals	118	45.7	Pass
1	Bracing Members		71.3	Pass
1	Support Rails		9.9	Pass
1	Grating Support Members		71.3	Pass
1	Standoff Members		62.3	Pass
1	Mount Pipes		70.9	Pass
1	Mount to Tower Connection		71.6	Pass

Mount Rating (max from all components) =	**71.6%**

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

4.1) Recommendations

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

- Install SitePro1 HRK12 Handrail Kit or EOR approved equivalent as indicated in "Appendix E – Supplemental Modification Information" and in conformance with the attached manufacturer drawings.
- All existing and proposed antennas and their respective mount pipes shall be centered vertically with respect to the mount. See "Appendix D: Standard Antenna Centering Conditions" in this report for reference. Pipe relocation may require unbolting existing connections and installing new U-bolt connections.

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

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

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

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

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

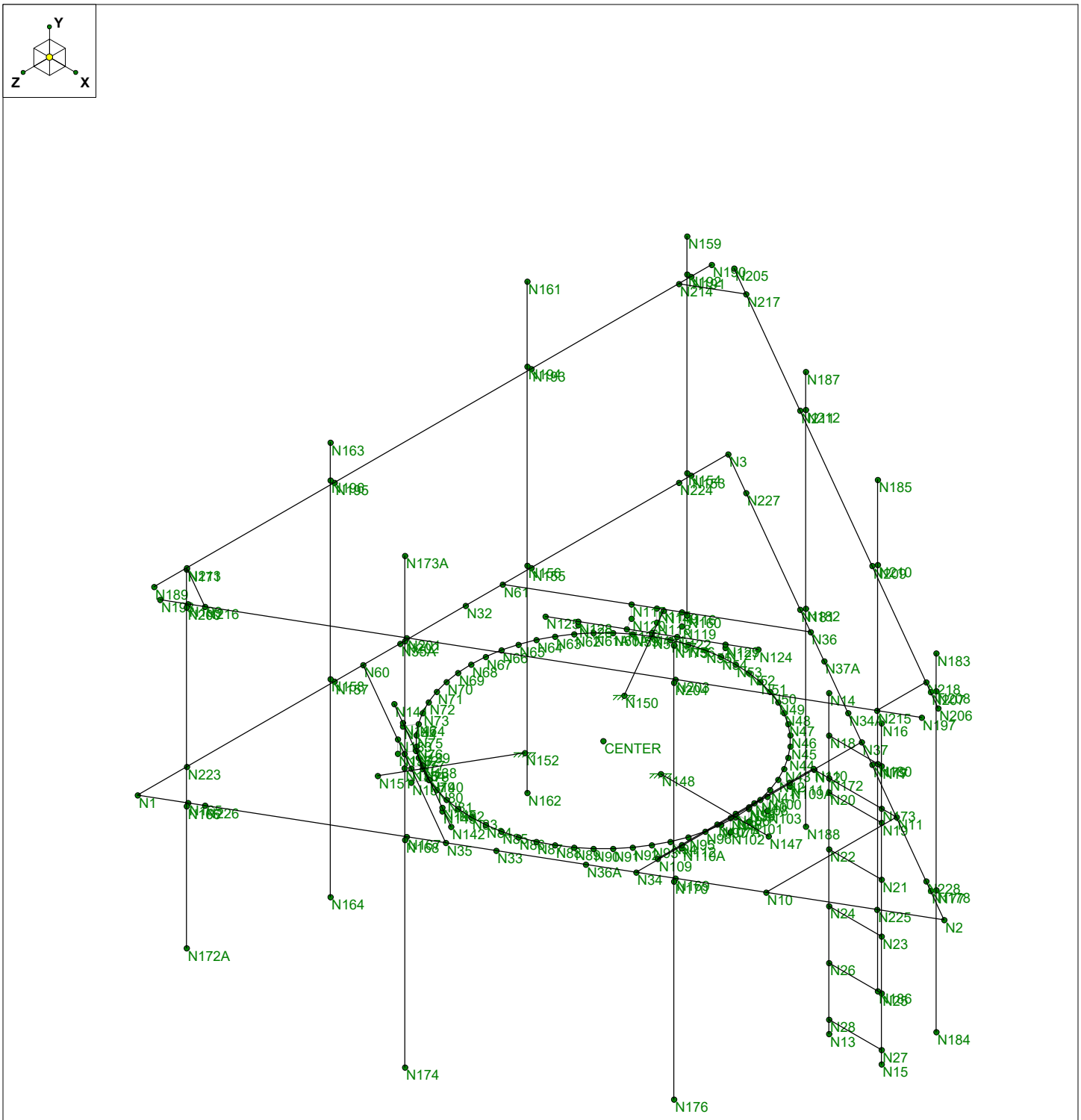
4) The standard of care for all Professional Engineering Services performed or furnished by Paul J. Ford and Company under this project will be the skill and care used by members of the Consultant's profession practicing under similar circumstances at the same time and in the same locality.

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

****

APPENDIX A

WIRE FRAME AND RENDERED MODELS



Envelope Only Solution

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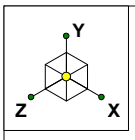
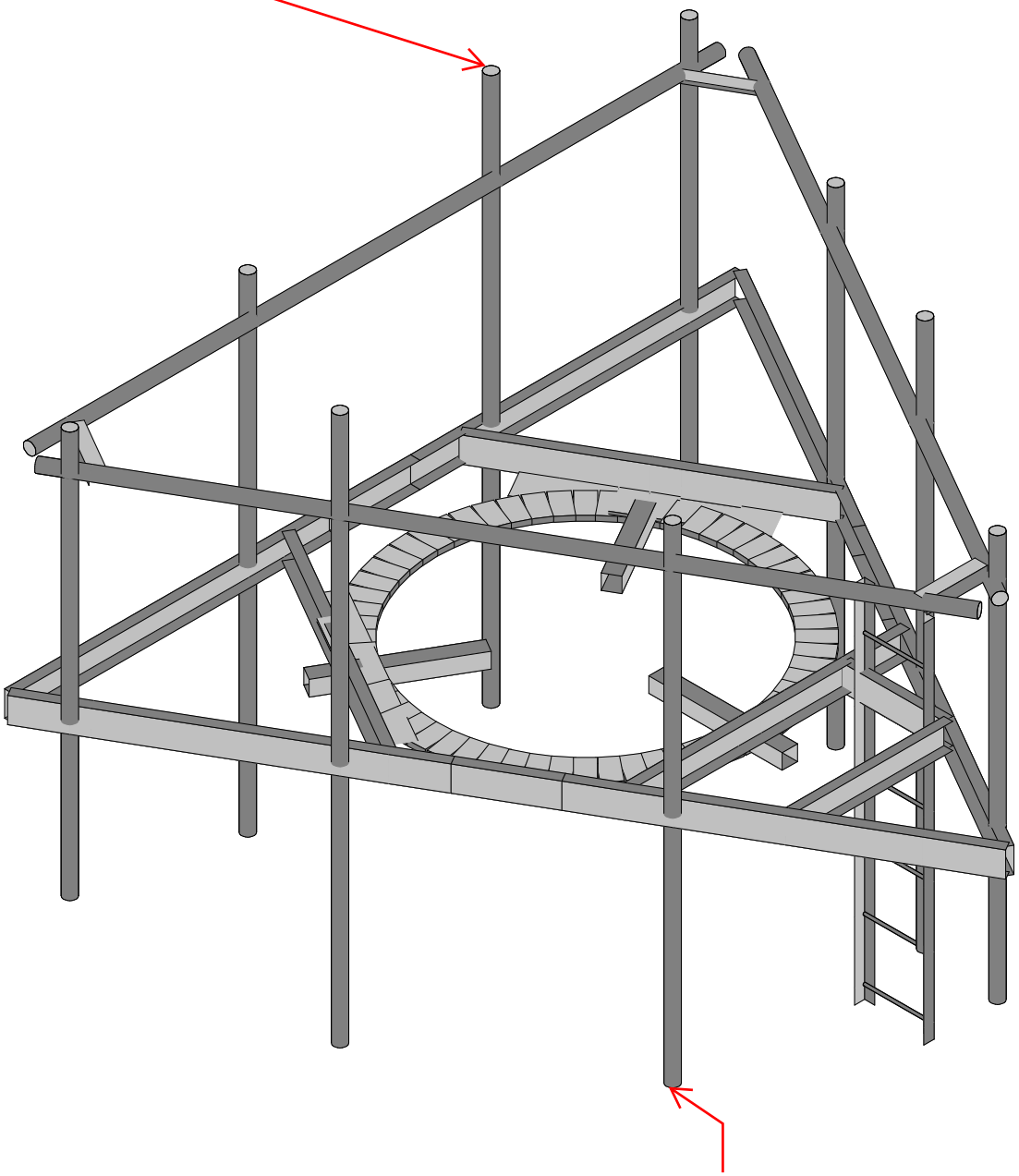


Proposed: (Typical)
(1) RFS/Celwave APXVAARR24_43-U-NA20



Proposed: (Typical)
(1) Ericsson AIR -32 B2A/B66AA
(1) Ericsson RADIO 4449 B12/B71

Envelope Only Solution

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37519-1551.002.7190		37519-1551.002.7190_Wind Load....

APPENDIX B

SOFTWARE INPUT CALCULATION

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

Project # 37519-1551.002.7190
By JGF

Date: 04/29/19

Analysis 30 degrees

v1.0, Effective 04/03/2018

Mount Loading per TIA-222-H

Structure Information

Mount Type =	3 Sectors	
Mount Elev, z =	118	ft
Ground Elev, z_s =	467.15	ft
Wind Speed =	125	mph
Ice Wind Speed =	50	mph
Ice Thickness =	2	in
Exposure Cat =	B	
Structure Class =	II	
Topographic Cat =	1	
Crest Height =	0	ft

Velocity Pressure Coefficients

z_g =	1200	ft	
a =	7.00		
K_{zmin} =	0.70		
K_z =	1.04		Calculated Value
Ke =	0.98		Ground Elevation Factor
K_z =	1.04		Velocity Press Coef (Section 2.6.5.2)
K_{zt} =	1.00		Topographic Factor (Section 2.6.6.4)
Gh =	1.00		Gust Effect Factor (Section 2.6.7)
K_d =	0.95		Wind Dir Probability Factor (Table 2-2)
K_a =	0.90		Shielding factor (Section 16.6)
q_z=	34.84	psf	Velocity Pressure (Section 2.6.9.6)

Ice Loading

Ii =	1.00		Ice Importance Factor (Table 2-3)
Iwi =	1.00		Wind Ice Importance Factor (Table 2-3)
q_z=	6.30	psf	Ice Velocity Pressure (Section 2.6.9.6)
K_{iz} =	1.14		Ice Escalation Factor (Section 2.6.8)
T_{iz} =	2.27	in	Factored Ice Thickness (Section 2.6.8)
h =	1.00	in	Bar Grating Height
W_i =	15.27	psf	Grating Ice Weight

Wind Pressures

Pressure =	34.840	psf
Ice Pressure =	6.299	psf

Antenna Attachment Labels & Elevations (inches with Respect to Bottom of Member)

Face	Label	Top Elev (in)	Bot Elev (in)	Length, in	Face	Label	Top Elev (in)	Bot Elev (in)	Length, in	Face	Label	Top Elev (in)	Bot Elev (in)	Length, in	Face	Label	Top Elev (in)	Bot Elev (in)
A	A1	68.0	24	96.0	B	B1	68.0	24	96.0	C	C1	68.0	24	96.0	D			
A	A2	90.0	6	108.0	B	B2	90.0	6	108.0	C	C2	90.0	6	108.0	D			
A	A3	52.0	8	80.0	B	B3	52.0	8	80.0	C	C3	52.0	8	80.0	D			
A (2)	A1	64.0	64	96.0	B (2)	B1	64.0	64	96.0	C (2)	C1	64.0	64	96.0	D			
A (2)	A3	48	48	80.0	B (2)	B3	48	48	80.0	C (2)	C3	48	48	80.0	D			
A					B					C					D			
A					B					C					D			
A					B					C					D			
A					B					C					D			
A					B					C					D			

Antennas

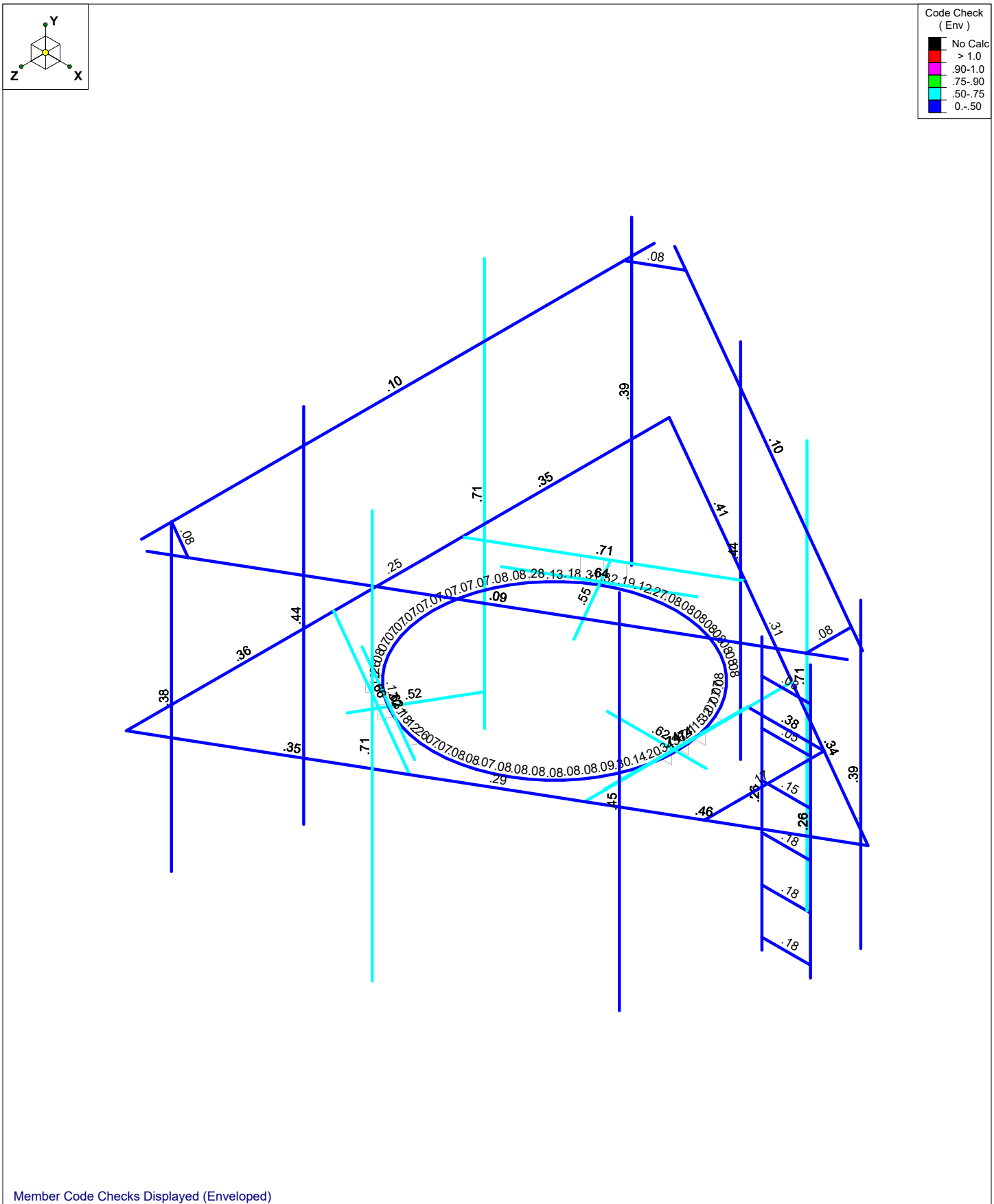
Item	Manufacturer	Antenna	Height (in)	Width (in)	Depth (in)	Flat or Round	Weight (lbs)	Antenna Attachment Locations					
								Label	Label	Label	Label	Label	Label
1	ERICSSON	AIR -32 B2A/B66AA	56.6	12.9	8.7	Flat	132.2	A1	B1	C1			
2	ERICSSON	ERICSSON AIR 21 B2A B4P	56	12.1	7.87	Flat	91.5	A3	B3	C3			
3	RFS CELWAVE	APXVAARR24_43-U-NA20	95.9	24	8.7	Flat	128	A2	B2	C2			
4	ERICSSON	KRY 112 144/1	7	6	3	Flat	11	A3(2)	B3(2)	C3(2)			
5	ERICSSON	RADIO 4449 B12/B71	15	13.2	9.3	Flat	74	A1(2)	B1(2)	C1(2)			
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													

Dishes

Item	Manufacturer	Microwave Dish	Dia (in)	Dish Type	Weight (lbs)	Dish Attachment Locations					
						Label	Label	Label	Label	Label	Label
1											
2											
3											
4											
5											

APPENDIX C

SOFTWARE ANALYSIS OUTPUT



Member Code Checks Displayed (Enveloped)
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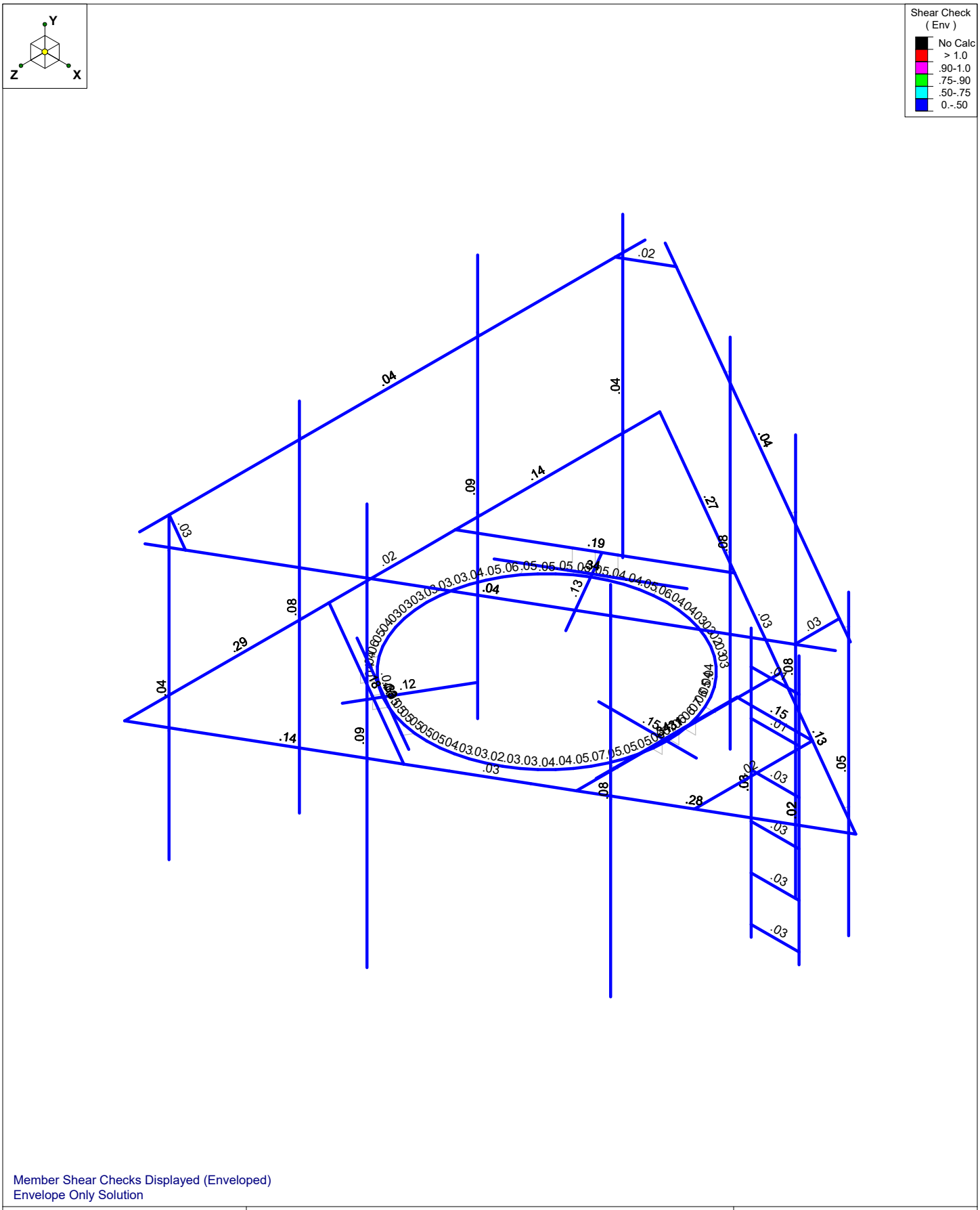

Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

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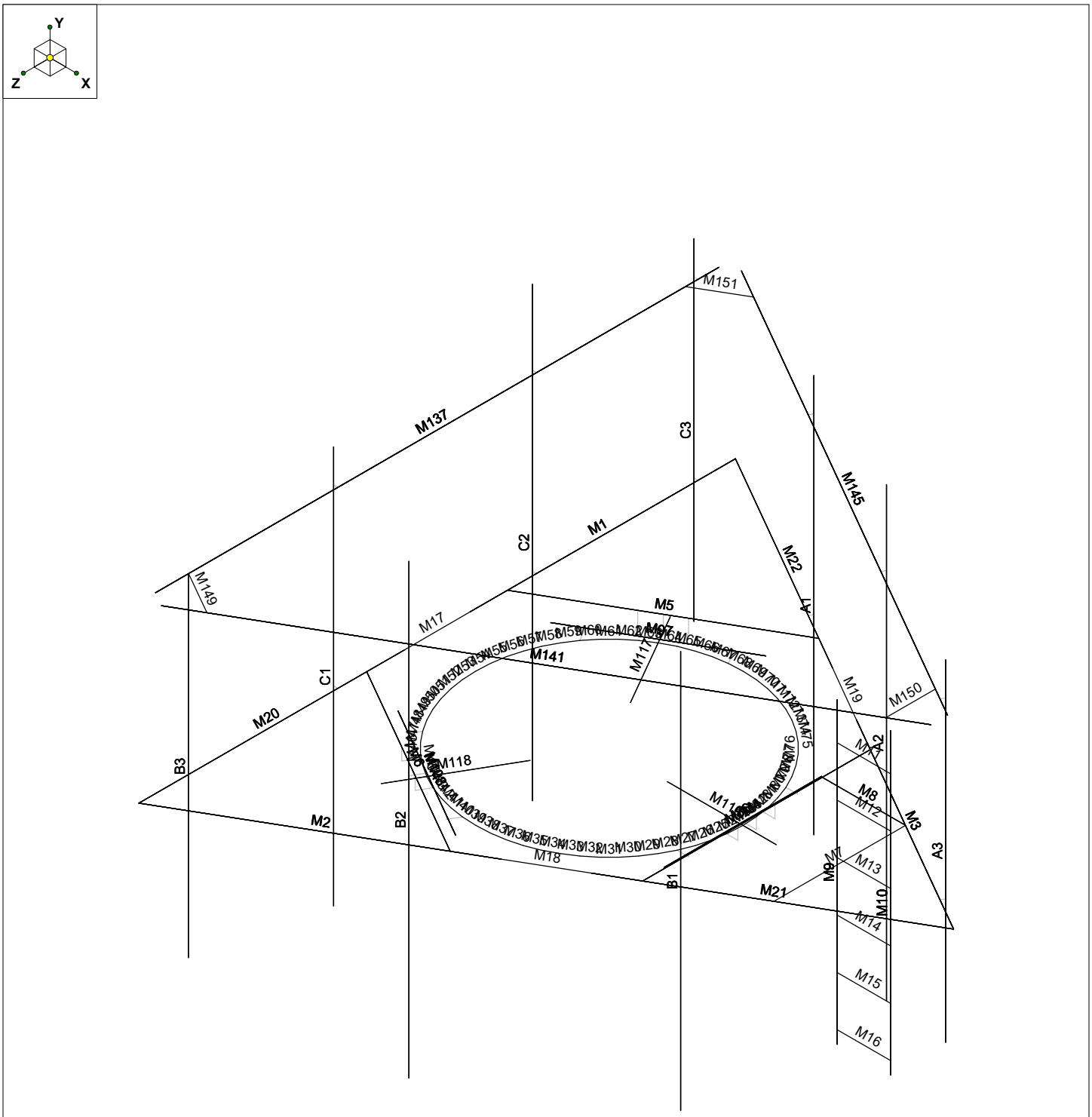

Envelope Only Solution

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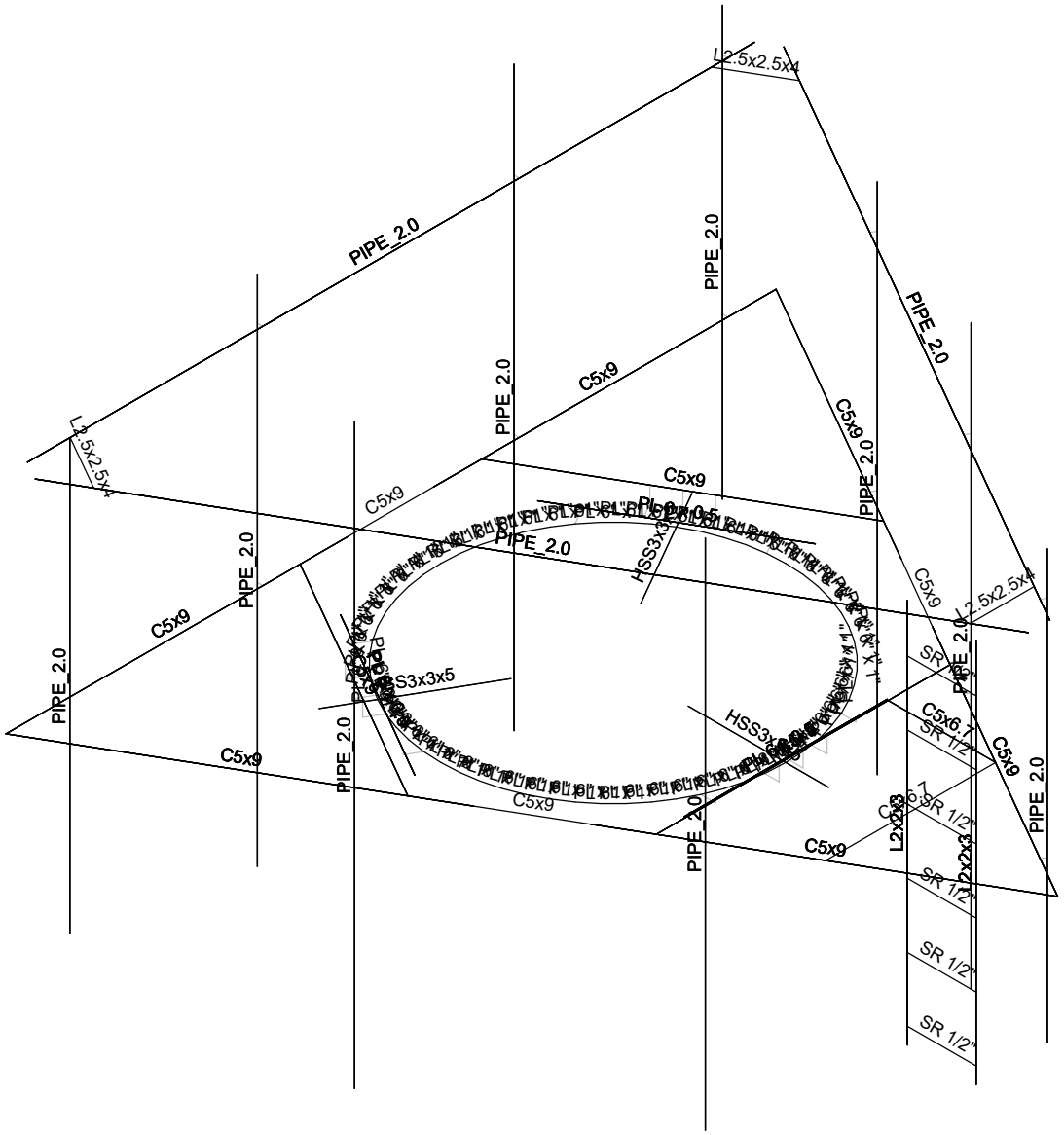

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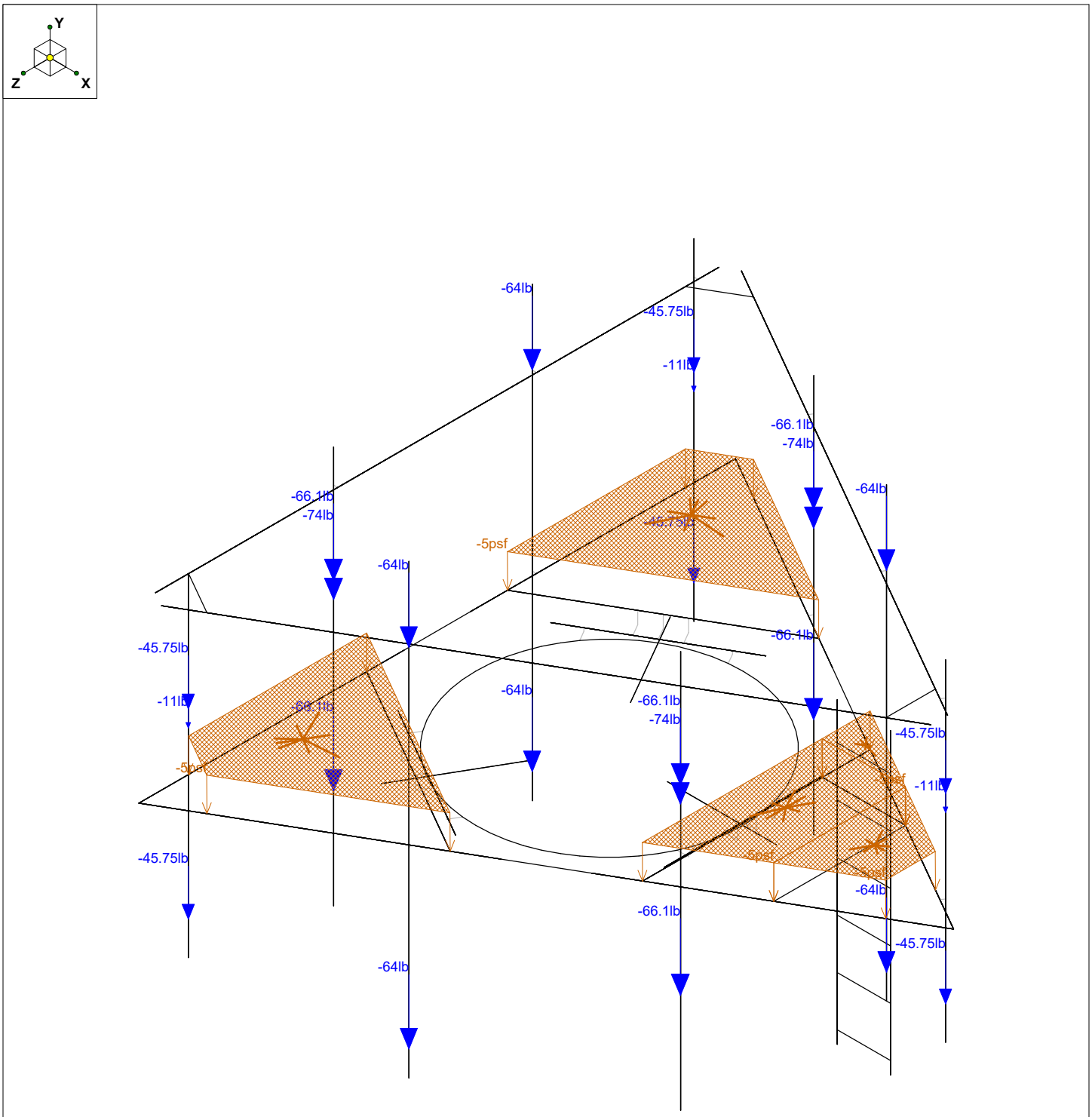

Loads: BLC 1, Dead
Envelope Only Solution

Paul J. Ford and Company	BU 806368 / HRT 049B 943215	SK - 7
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37519-1551.002.7190		37519-1551.002.7190_Wind Load....

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	No
Max Iterations for Wall Stiffness	3
Gravity Acceleration (in/sec^2)	386.4
Wall Mesh Size (in)	12
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 14th(360-10): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	None
Cold Formed Steel Code	None
Wood Code	None
Wood Temperature	< 100F
Concrete Code	None
Masonry Code	None
Aluminum Code	None - Building

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

(Global) Model Settings, Continued

Seismic Code	ASCE 7-05
Seismic Base Elevation (in)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Occupancy Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	4
Cd X	4
Rho Z	1
Rho X	1

Hot Rolled Steel Properties

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

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design R...
1	M1	N3	N32		180	C5x9	None	None	A36 Gr.36	Typical
2	M2	N1	N33		180	C5x9	None	None	A36 Gr.36	Typical
3	M3	N2	N34A		180	C5x9	None	None	A36 Gr.36	Typical
4	M4	N37	N34		180	C5x9	None	None	A36 Gr.36	Typical
5	M5	N61	N36		180	C5x9	None	None	A36 Gr.36	Typical
6	M6	N35	N60		180	C5x9	None	None	A36 Gr.36	Typical
7	M7	N11	N10		180	C5x6.7	None	None	A36 Gr.36	Typical
8	M8	N11	N12			C5x6.7	None	None	A36 Gr.36	Typical
9	M9	N13	N14		90	L2x2x3	None	None	A36 Gr.36	Typical
10	M10	N15	N16			L2x2x3	None	None	A36 Gr.36	Typical
11	M11	N17	N18			SR 1/2"	None	None	A36 Gr.36	Typical
12	M12	N19	N20			SR 1/2"	None	None	A36 Gr.36	Typical
13	M13	N21	N22			SR 1/2"	None	None	A36 Gr.36	Typical
14	M14	N23	N24			SR 1/2"	None	None	A36 Gr.36	Typical
15	M15	N25	N26			SR 1/2"	None	None	A36 Gr.36	Typical
16	M16	N27	N28			SR 1/2"	None	None	A36 Gr.36	Typical
17	M17	N32	N35A		180	C5x9	None	None	A36 Gr.36	Typical
18	M18	N33	N36A		180	C5x9	None	None	A36 Gr.36	Typical
19	M19	N34A	N37A		180	C5x9	None	None	A36 Gr.36	Typical
20	M20	N35A	N1		180	C5x9	None	None	A36 Gr.36	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design R...
21	M21	N36A	N2		180	C5x9	None	None	A36 Gr.36	Typical
22	M22	N37A	N3		180	C5x9	None	None	A36 Gr.36	Typical
23	M23	N39	N38		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
24	M24	N38	N97		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
25	M25	N97	N96		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
26	M26	N96	N95		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
27	M27	N95	N94		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
28	M28	N94	N93		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
29	M29	N93	N92		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
30	M30	N92	N91		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
31	M31	N91	N90		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
32	M32	N90	N89		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
33	M33	N89	N88		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
34	M34	N88	N87		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
35	M35	N87	N86		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
36	M36	N86	N85		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
37	M37	N85	N84		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
38	M38	N84	N83		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
39	M39	N83	N82		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
40	M40	N82	N81		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
41	M41	N81	N80		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
42	M42	N80	N79		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
43	M43	N79	N78		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
44	M44	N78	N77		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
45	M45	N77	N76		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
46	M46	N76	N75		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
47	M47	N75	N74		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
48	M48	N74	N73		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
49	M49	N73	N72		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
50	M50	N72	N71		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
51	M51	N71	N70		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
52	M52	N70	N69		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
53	M53	N69	N68		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
54	M54	N68	N67		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
55	M55	N67	N66		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
56	M56	N66	N65		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
57	M57	N65	N64		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
58	M58	N64	N63		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
59	M59	N63	N62		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
60	M60	N62	N61A		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
61	M61	N61A	N60A		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
62	M62	N60A	N59		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
63	M63	N59	N58		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
64	M64	N58	N57		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
65	M65	N57	N56		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
66	M66	N56	N55		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
67	M67	N55	N54		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
68	M68	N54	N53		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
69	M69	N53	N52		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
70	M70	N52	N51		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
71	M71	N51	N50		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
72	M72	N50	N49		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
73	M73	N49	N48		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
74	M74	N48	N47		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
75	M75	N47	N46		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
76	M76	N46	N45		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
77	M77	N45	N44		90	PL 6" x 1"	None	None	A36 Gr.36	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design R...
78	M78	N44	N43		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
79	M79	N43	N42		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
80	M80	N42	N41		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
81	M81	N41	N40		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
82	M82	N40	N39		90	PL 6" x 1"	None	None	A36 Gr.36	Typical
83	M83	N102	N99			RIGID	None	None	RIGID	Typical
84	M84	N101	N98			RIGID	None	None	RIGID	Typical
85	M85	N103	N100			RIGID	None	None	RIGID	Typical
86	M86	N110	N109		90	PL 6 x 0.5	None	None	A36 Gr.36	Typical
87	M87	N102	N107A			RIGID	None	None	RIGID	Typical
88	M88	N101	N106			RIGID	None	None	RIGID	Typical
89	M89	N103	N108			RIGID	None	None	RIGID	Typical
90	M90	N94	N110A			RIGID	None	None	RIGID	Typical
91	M91	N42	N109A			RIGID	None	None	RIGID	Typical
92	M92	N110A	N112			RIGID	None	None	RIGID	Typical
93	M93	N109A	N111			RIGID	None	None	RIGID	Typical
94	M94	N119	N116			RIGID	None	None	RIGID	Typical
95	M95	N118	N115			RIGID	None	None	RIGID	Typical
96	M96	N120	N117			RIGID	None	None	RIGID	Typical
97	M97	N125	N124		90	PL 6 x 0.5	None	None	A36 Gr.36	Typical
98	M98	N119	N122			RIGID	None	None	RIGID	Typical
99	M99	N118	N121			RIGID	None	None	RIGID	Typical
100	M100	N120	N123			RIGID	None	None	RIGID	Typical
101	M101	N54	N127			RIGID	None	None	RIGID	Typical
102	M102	N62	N126			RIGID	None	None	RIGID	Typical
103	M103	N127	N129			RIGID	None	None	RIGID	Typical
104	M104	N126	N128			RIGID	None	None	RIGID	Typical
105	M105	N136	N133			RIGID	None	None	RIGID	Typical
106	M106	N135	N132			RIGID	None	None	RIGID	Typical
107	M107	N137	N134			RIGID	None	None	RIGID	Typical
108	M108	N142	N141		90	PL 6 x 0.5	None	None	A36 Gr.36	Typical
109	M109	N136	N139			RIGID	None	None	RIGID	Typical
110	M110	N135	N138			RIGID	None	None	RIGID	Typical
111	M111	N137	N140			RIGID	None	None	RIGID	Typical
112	M112	N74	N144			RIGID	None	None	RIGID	Typical
113	M113	N82	N143			RIGID	None	None	RIGID	Typical
114	M114	N144	N146			RIGID	None	None	RIGID	Typical
115	M115	N143	N145			RIGID	None	None	RIGID	Typical
116	M116	N148	N147			HSS3x3x5	None	None	A500 Gr.46	Typical
117	M117	N150	N149			HSS3x3x5	None	None	A500 Gr.46	Typical
118	M118	N152	N151			HSS3x3x5	None	None	A500 Gr.46	Typical
119	M119	N154	N153			RIGID	None	None	RIGID	Typical
120	M120	N156	N155			RIGID	None	None	RIGID	Typical
121	M121	N158	N157			RIGID	None	None	RIGID	Typical
122	C3	N160	N159			PIPE_2.0	None	None	A53 Gr. B (35 ksi)	Typical
123	C2	N162	N161			PIPE_2.0	None	None	A53 Gr. B (35 ksi)	Typical
124	C1	N164	N163			PIPE_2.0	None	None	A53 Gr. B (35 ksi)	Typical
125	M125	N166	N165			RIGID	None	None	RIGID	Typical
126	M126	N168	N167			RIGID	None	None	RIGID	Typical
127	M127	N170	N169			RIGID	None	None	RIGID	Typical
128	B3	N172A	N171			PIPE_2.0	None	None	A53 Gr. B (35 ksi)	Typical
129	B2	N174	N173A			PIPE_2.0	None	None	A53 Gr. B (35 ksi)	Typical
130	B1	N176	N175			PIPE_2.0	None	None	A53 Gr. B (35 ksi)	Typical
131	M131	N178	N177			RIGID	None	None	RIGID	Typical
132	M132	N180	N179			RIGID	None	None	RIGID	Typical
133	M133	N182	N181			RIGID	None	None	RIGID	Typical
134	A3	N184	N183			PIPE_2.0	None	None	A53 Gr. B (35 ksi)	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design R...
135	A2	N186	N185			PIPE_2.0	None	None	A53 Gr. B (35 ksi)	Typical
136	A1	N188	N187			PIPE_2.0	None	None	A53 Gr. B (35 ksi)	Typical
137	M137	N189	N190			PIPE_2.0	None	None	A53 Gr. B (35 ksi)	Typical
138	M138	N192	N191			RIGID	None	None	RIGID	Typical
139	M139	N194	N193			RIGID	None	None	RIGID	Typical
140	M140	N196	N195			RIGID	None	None	RIGID	Typical
141	M141	N197	N198			PIPE_2.0	None	None	A53 Gr. B (35 ksi)	Typical
142	M142	N200	N199			RIGID	None	None	RIGID	Typical
143	M143	N202	N201			RIGID	None	None	RIGID	Typical
144	M144	N204	N203			RIGID	None	None	RIGID	Typical
145	M145	N205	N206			PIPE_2.0	None	None	A53 Gr. B (35 ksi)	Typical
146	M146	N208	N207			RIGID	None	None	RIGID	Typical
147	M147	N210	N209			RIGID	None	None	RIGID	Typical
148	M148	N212	N211			RIGID	None	None	RIGID	Typical
149	M149	N216	N213		90	L2.5x2.5x4	None	None	A36 Gr.36	Typical
150	M150	N218	N215		90	L2.5x2.5x4	None	None	A36 Gr.36	Typical
151	M151	N214	N217		90	L2.5x2.5x4	None	None	A36 Gr.36	Typical

Member Advanced Data

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Analysis ...	Inactive	Seismic Design ...
1	M1						Yes			None
2	M2						Yes			None
3	M3						Yes			None
4	M4						Yes			None
5	M5						Yes			None
6	M6						Yes			None
7	M7						Yes			None
8	M8						Yes			None
9	M9						Yes			None
10	M10						Yes			None
11	M11						Yes			None
12	M12						Yes			None
13	M13						Yes			None
14	M14						Yes			None
15	M15						Yes			None
16	M16						Yes			None
17	M17						Yes			None
18	M18						Yes			None
19	M19						Yes			None
20	M20						Yes			None
21	M21						Yes			None
22	M22						Yes			None
23	M23						Yes			None
24	M24						Yes			None
25	M25						Yes			None
26	M26						Yes			None
27	M27						Yes			None
28	M28						Yes			None
29	M29						Yes			None
30	M30						Yes			None
31	M31						Yes			None
32	M32						Yes			None
33	M33						Yes			None
34	M34						Yes			None
35	M35						Yes			None

Member Advanced Data (Continued)

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Analysis ...	Inactive	Seismic Design ...
36	M36						Yes			None
37	M37						Yes			None
38	M38						Yes			None
39	M39						Yes			None
40	M40						Yes			None
41	M41						Yes			None
42	M42						Yes			None
43	M43						Yes			None
44	M44						Yes			None
45	M45						Yes			None
46	M46						Yes			None
47	M47						Yes			None
48	M48						Yes			None
49	M49						Yes			None
50	M50						Yes			None
51	M51						Yes			None
52	M52						Yes			None
53	M53						Yes			None
54	M54						Yes			None
55	M55						Yes			None
56	M56						Yes			None
57	M57						Yes			None
58	M58						Yes			None
59	M59						Yes			None
60	M60						Yes			None
61	M61						Yes			None
62	M62						Yes			None
63	M63						Yes			None
64	M64						Yes			None
65	M65						Yes			None
66	M66						Yes			None
67	M67						Yes			None
68	M68						Yes			None
69	M69						Yes			None
70	M70						Yes			None
71	M71						Yes			None
72	M72						Yes			None
73	M73						Yes			None
74	M74						Yes			None
75	M75						Yes			None
76	M76						Yes			None
77	M77						Yes			None
78	M78						Yes			None
79	M79						Yes			None
80	M80						Yes			None
81	M81						Yes			None
82	M82						Yes			None
83	M83						Yes			None
84	M84						Yes			None
85	M85						Yes			None
86	M86						Yes			None
87	M87						Yes			None
88	M88						Yes			None
89	M89						Yes			None
90	M90						Yes			None
91	M91						Yes			None
92	M92						Yes			None

Member Advanced Data (Continued)

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Analysis ...	Inactive	Seismic Design ...
93	M93						Yes			None
94	M94						Yes			None
95	M95						Yes			None
96	M96						Yes			None
97	M97						Yes			None
98	M98						Yes			None
99	M99						Yes			None
100	M100						Yes			None
101	M101						Yes			None
102	M102						Yes			None
103	M103						Yes			None
104	M104						Yes			None
105	M105						Yes			None
106	M106						Yes			None
107	M107						Yes			None
108	M108						Yes			None
109	M109						Yes			None
110	M110						Yes			None
111	M111						Yes			None
112	M112						Yes			None
113	M113						Yes			None
114	M114						Yes			None
115	M115						Yes			None
116	M116						Yes			None
117	M117						Yes			None
118	M118						Yes			None
119	M119						Yes			None
120	M120						Yes			None
121	M121						Yes			None
122	C3						Yes			None
123	C2						Yes			None
124	C1						Yes			None
125	M125						Yes			None
126	M126						Yes			None
127	M127						Yes			None
128	B3						Yes			None
129	B2						Yes			None
130	B1						Yes			None
131	M131						Yes			None
132	M132						Yes			None
133	M133						Yes			None
134	A3						Yes			None
135	A2						Yes			None
136	A1						Yes			None
137	M137						Yes			None
138	M138		OOOXOX				Yes			None
139	M139		OOOXOX				Yes			None
140	M140		OOOXOX				Yes			None
141	M141						Yes			None
142	M142		OOOXOX				Yes			None
143	M143		OOOXOX				Yes			None
144	M144		OOOXOX				Yes			None
145	M145						Yes			None
146	M146		OOOXOX				Yes			None
147	M147		OOOXOX				Yes			None
148	M148		OOOXOX				Yes			None
149	M149	OOOOOX	OOOOOX				Yes			None

Member Advanced Data (Continued)

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Analysis ...	Inactive	Seismic Design ...
150	M150	OOOOOX	OOOOOX				Yes			None
151	M151	OOOOOX	OOOOOX				Yes			None

Hot Rolled Steel Design Parameters

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torqu...	Kyy	Kzz	Cb	Function
1	M1	C5x9	64			Lbyy						Lateral
2	M2	C5x9	64			Lbyy						Lateral
3	M3	C5x9	64			Lbyy						Lateral
4	M4	C5x9	55			Lbyy						Lateral
5	M5	C5x9	55			Lbyy						Lateral
6	M6	C5x9	55			Lbyy						Lateral
7	M7	C5x6.7	31.781			Lbyy						Lateral
8	M8	C5x6.7	20.108			Lbyy						Lateral
9	M9	L2x2x3	72			Lbyy						Lateral
10	M10	L2x2x3	72			Lbyy						Lateral
11	M11	SR 1/2"	12.835			Lbyy						Lateral
12	M12	SR 1/2"	12.835			Lbyy						Lateral
13	M13	SR 1/2"	12.835			Lbyy						Lateral
14	M14	SR 1/2"	12.835			Lbyy						Lateral
15	M15	SR 1/2"	12.835			Lbyy						Lateral
16	M16	SR 1/2"	12.835			Lbyy						Lateral
17	M17	C5x9	16			Lbyy						Lateral
18	M18	C5x9	16			Lbyy						Lateral
19	M19	C5x9	16			Lbyy						Lateral
20	M20	C5x9	64			Lbyy						Lateral
21	M21	C5x9	64			Lbyy						Lateral
22	M22	C5x9	64			Lbyy						Lateral
23	M23	PL 6" x 1"	3.378									Lateral
24	M24	PL 6" x 1"	3.378									Lateral
25	M25	PL 6" x 1"	3.378									Lateral
26	M26	PL 6" x 1"	3.378									Lateral
27	M27	PL 6" x 1"	3.378									Lateral
28	M28	PL 6" x 1"	3.378									Lateral
29	M29	PL 6" x 1"	3.378									Lateral
30	M30	PL 6" x 1"	3.378									Lateral
31	M31	PL 6" x 1"	3.378									Lateral
32	M32	PL 6" x 1"	3.378									Lateral
33	M33	PL 6" x 1"	3.378									Lateral
34	M34	PL 6" x 1"	3.378									Lateral
35	M35	PL 6" x 1"	3.378									Lateral
36	M36	PL 6" x 1"	3.378									Lateral
37	M37	PL 6" x 1"	3.378									Lateral
38	M38	PL 6" x 1"	3.378									Lateral
39	M39	PL 6" x 1"	3.378									Lateral
40	M40	PL 6" x 1"	3.378									Lateral
41	M41	PL 6" x 1"	3.378									Lateral
42	M42	PL 6" x 1"	3.378									Lateral
43	M43	PL 6" x 1"	3.378									Lateral
44	M44	PL 6" x 1"	3.378									Lateral
45	M45	PL 6" x 1"	3.378									Lateral
46	M46	PL 6" x 1"	3.378									Lateral
47	M47	PL 6" x 1"	3.378									Lateral
48	M48	PL 6" x 1"	3.378									Lateral
49	M49	PL 6" x 1"	3.378									Lateral
50	M50	PL 6" x 1"	3.378									Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torqu...	Kyy	Kzz	Cb	Function
51	M51	PL 6" x 1"	3.378									Lateral
52	M52	PL 6" x 1"	3.378									Lateral
53	M53	PL 6" x 1"	3.378									Lateral
54	M54	PL 6" x 1"	3.378									Lateral
55	M55	PL 6" x 1"	3.378									Lateral
56	M56	PL 6" x 1"	3.378									Lateral
57	M57	PL 6" x 1"	3.378									Lateral
58	M58	PL 6" x 1"	3.378									Lateral
59	M59	PL 6" x 1"	3.378									Lateral
60	M60	PL 6" x 1"	3.378									Lateral
61	M61	PL 6" x 1"	3.378									Lateral
62	M62	PL 6" x 1"	3.378									Lateral
63	M63	PL 6" x 1"	3.378									Lateral
64	M64	PL 6" x 1"	3.378									Lateral
65	M65	PL 6" x 1"	3.378									Lateral
66	M66	PL 6" x 1"	3.378									Lateral
67	M67	PL 6" x 1"	3.378									Lateral
68	M68	PL 6" x 1"	3.378									Lateral
69	M69	PL 6" x 1"	3.378									Lateral
70	M70	PL 6" x 1"	3.378									Lateral
71	M71	PL 6" x 1"	3.378									Lateral
72	M72	PL 6" x 1"	3.378									Lateral
73	M73	PL 6" x 1"	3.378									Lateral
74	M74	PL 6" x 1"	3.378									Lateral
75	M75	PL 6" x 1"	3.378									Lateral
76	M76	PL 6" x 1"	3.378									Lateral
77	M77	PL 6" x 1"	3.378									Lateral
78	M78	PL 6" x 1"	3.378									Lateral
79	M79	PL 6" x 1"	3.378									Lateral
80	M80	PL 6" x 1"	3.378									Lateral
81	M81	PL 6" x 1"	3.378									Lateral
82	M82	PL 6" x 1"	3.378									Lateral
83	M86	PL 6 x 0.5	38									Lateral
84	M97	PL 6 x 0.5	38									Lateral
85	M108	PL 6 x 0.5	38									Lateral
86	M116	HSS3x3x5	26.272									Lateral
87	M117	HSS3x3x5	26.272									Lateral
88	M118	HSS3x3x5	26.272									Lateral
89	C3	PIPE_2.0	80									Lateral
90	C2	PIPE_2.0	108									Lateral
91	C1	PIPE_2.0	96									Lateral
92	B3	PIPE_2.0	80									Lateral
93	B2	PIPE_2.0	108									Lateral
94	B1	PIPE_2.0	96									Lateral
95	A3	PIPE_2.0	80									Lateral
96	A2	PIPE_2.0	108									Lateral
97	A1	PIPE_2.0	96									Lateral
98	M137	PIPE_2.0	136									Lateral
99	M141	PIPE_2.0	136									Lateral
100	M145	PIPE_2.0	136									Lateral
101	M149	L2.5x2.5x4	12									Lateral
102	M150	L2.5x2.5x4	12									Lateral
103	M151	L2.5x2.5x4	12									Lateral

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Member)	Surface(...
1	Dead	None		-1.1			30		5	
2	Live	None								
3	Wind 0	None					60	206		
4	Wind 30	None					60	206		
5	Wind 60	None					60	206		
6	Wind 90	None					60	206		
7	Wind 120	None					60	206		
8	Wind 150	None					60	206		
9	Ice Load	None					30	103	5	
10	Ice 0	None					60	206		
11	Ice 30	None					60	206		
12	Ice 60	None					60	206		
13	Ice 90	None					60	206		
14	Ice 120	None					60	206		
15	Ice 150	None					60	206		
16	Lm	None				1				
17	Lv	None				1				
18	BLC 1 Transient Are...	None						27		
19	BLC 9 Transient Are...	None						27		

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..	BLC	Fac...
1	1.4 D	Yes	Y		1	1.4																				
2	1.2 D + 1.6 L	Yes	Y		1	1.2	2	1.6																		
3	1.2 D + 1.0 Wo @ 0	Yes	Y		1	1.2	3	1																		
4	1.2 D + 1.0 Wo @ 30	Yes	Y		1	1.2	4	1																		
5	1.2 D + 1.0 Wo @ 60	Yes	Y		1	1.2	5	1																		
6	1.2 D + 1.0 Wo @ 90	Yes	Y		1	1.2	6	1																		
7	1.2 D + 1.0 Wo @ 120	Yes	Y		1	1.2	7	1																		
8	1.2 D + 1.0 Wo @ 150	Yes	Y		1	1.2	8	1																		
9	1.2 D + 1.0 Wo @ 180	Yes	Y		1	1.2	3	-1																		
10	1.2 D + 1.0 Wo @ 210	Yes	Y		1	1.2	4	-1																		
11	1.2 D + 1.0 Wo @ 240	Yes	Y		1	1.2	5	-1																		
12	1.2 D + 1.0 Wo @ 270	Yes	Y		1	1.2	6	-1																		
13	1.2 D + 1.0 Wo @ 300	Yes	Y		1	1.2	7	-1																		
14	1.2 D + 1.0 Wo @ 330	Yes	Y		1	1.2	8	-1																		
15	1.2 D + 1.0 Di + 1.0 Wi...	Yes	Y		1	1.2	9	1	10	1																
16	1.2 D + 1.0 Di + 1.0 Wi...	Yes	Y		1	1.2	9	1	11	1																
17	1.2 D + 1.0 Di + 1.0 Wi...	Yes	Y		1	1.2	9	1	12	1																
18	1.2 D + 1.0 Di + 1.0 Wi...	Yes	Y		1	1.2	9	1	13	1																
19	1.2 D + 1.0 Di + 1.0 Wi...	Yes	Y		1	1.2	9	1	14	1																
20	1.2 D + 1.0 Di + 1.0 Wi...	Yes	Y		1	1.2	9	1	15	1																
21	1.2 D + 1.0 Di + 1.0 Wi...	Yes	Y		1	1.2	9	1	10	-1																
22	1.2 D + 1.0 Di + 1.0 Wi...	Yes	Y		1	1.2	9	1	11	-1																
23	1.2 D + 1.0 Di + 1.0 Wi...	Yes	Y		1	1.2	9	1	12	-1																
24	1.2 D + 1.0 Di + 1.0 Wi...	Yes	Y		1	1.2	9	1	13	-1																
25	1.2 D + 1.0 Di + 1.0 Wi...	Yes	Y		1	1.2	9	1	14	-1																
26	1.2 D + 1.0 Di + 1.0 Wi...	Yes	Y		1	1.2	9	1	15	-1																
27	1.2 D + 1.5 Lm + 1.0 ...	Yes	Y		1	1.2	3	.058	16	1.5																
28	1.2 D + 1.5 Lm + 1.0 ...	Yes	Y		1	1.2	4	.058	16	1.5																
29	1.2 D + 1.5 Lm + 1.0 ...	Yes	Y		1	1.2	5	.058	16	1.5																
30	1.2 D + 1.5 Lm + 1.0 ...	Yes	Y		1	1.2	6	.058	16	1.5																
31	1.2 D + 1.5 Lm + 1.0 ...	Yes	Y		1	1.2	7	.058	16	1.5																
32	1.2 D + 1.5 Lm + 1.0 ...	Yes	Y		1	1.2	8	.058	16	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...
33	1.2 D + 1.5 Lm + 1.0 ...	Yes	Y		1	1.2	3	-.058	16	1.5																
34	1.2 D + 1.5 Lm + 1.0 ...	Yes	Y		1	1.2	4	-.058	16	1.5																
35	1.2 D + 1.5 Lm + 1.0 ...	Yes	Y		1	1.2	5	-.058	16	1.5																
36	1.2 D + 1.5 Lm + 1.0 ...	Yes	Y		1	1.2	6	-.058	16	1.5																
37	1.2 D + 1.5 Lm + 1.0 ...	Yes	Y		1	1.2	7	-.058	16	1.5																
38	1.2 D + 1.5 Lm + 1.0 ...	Yes	Y		1	1.2	8	-.058	16	1.5																
39	1.2 D + 1.5 Lv	Yes	Y		1	1.2	17	1.5																		

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-in]	LC	MY [k-in]	LC	MZ [k-in]	LC
1	N148	max	3160.031	12	4142.077	18	1617.29	3	3.112	3	16.079	9	72.795	18
2		min	-2318.643	6	725.487	12	-1634.509	9	-2.843	9	-15.975	3	10.124	12
3	N150	max	1281.441	12	3642.381	26	1821.274	14	55.884	26	14.128	5	-4.177	7
4		min	-1688.314	6	626.648	8	-2447.761	8	8.056	8	-13.781	11	-31.594	25
5	N152	max	1042.423	10	3486.121	22	2501.684	4	-7.528	4	12.637	13	-4.044	5
6		min	-1476.298	4	596.2	4	-1857.405	10	-53.614	22	-13.141	7	-30.451	23
7	Totals:	max	5391.024	12	10661.09	17	5132.485	3						
8		min	-5391.016	6	3567.79	11	-5132.479	9						

Envelope AISC 14th(360-10): LRFD Steel Code Checks

	Member	Shape	Code Check	Loc[in]	LC	Shear Che...	Loc[in]	Dir	LC	phi*Pn...	phi*Pnt...	phi*Mn...	phi*Mn...	Cb	Eqn
1	M86	PL 6 x 0.5	.744	5.938	16	.344	14.25	y	18	9778.0...	97200	12.15	145.8	1.689	H1-1b
2	M4	C5x9	.740	22.917	24	.308	22.917	y	18	43605....	85536	22.909	142.236	1.679	H1-1b
3	M5	C5x9	.713	32.083	18	.190	32.083	y	26	43605....	85536	22.909	142.236	1.635	H1-1b
4	C2	PIPE_2.0	.709	47.25	5	.088	48.375		13	12143....	32130	22.459	22.459	1.547	H1-1b
5	B2	PIPE_2.0	.709	47.25	7	.085	48.375		9	12143....	32130	22.459	22.459	1.681	H1-1b
6	A2	PIPE_2.0	.709	47.25	3	.077	48.375		5	12143....	32130	22.459	22.459	1.894	H1-1b
7	M6	C5x9	.657	22.917	16	.184	32.083	y	22	43605....	85536	22.909	142.236	1.649	H1-1b
8	M97	PL 6 x 0.5	.644	32.062	16	.340	23.75	y	26	9778.0...	97200	12.15	145.8	1.716	H1-1b
9	M116	HSS3x3x5	.623	0	20	.147	0	y	16	11699...	121716	120.06	120.06	2.323	H1-1b
10	M108	PL 6 x 0.5	.619	5.937	20	.331	14.25	y	22	9778.0...	97200	12.15	145.8	1.695	H1-1b
11	M117	HSS3x3x5	.548	0	17	.131	0	y	16	11699...	121716	120.06	120.06	2.321	H1-1b
12	M118	HSS3x3x5	.524	0	19	.124	0	y	20	11699...	121716	120.06	120.06	2.314	H1-1b
13	M21	C5x9	.457	9.333	15	.276	9.333	z	14	34351....	85536	22.909	142.236	1.698	H1-1b
14	B1	PIPE_2.0	.449	46	10	.083	46		13	14916....	32130	22.459	22.459	1.76	H1-1b
15	A1	PIPE_2.0	.440	46	6	.076	46		3	14916....	32130	22.459	22.459	1.81	H1-1b
16	C1	PIPE_2.0	.440	46	4	.077	46		11	14916....	32130	22.459	22.459	1.909	H1-1b
17	M22	C5x9	.410	8.667	18	.272	9.333	z	10	34351....	85536	22.909	142.236	1.778	H1-1b
18	A3	PIPE_2.0	.391	30	12	.053	30		11	18857....	32130	22.459	22.459	1.987	H1-1b
19	C3	PIPE_2.0	.385	30	8	.040	30		13	18857....	32130	22.459	22.459	2.021	H1-1b
20	B3	PIPE_2.0	.384	30	6	.039	30		9	18857....	32130	22.459	22.459	1.991	H1-1b
21	M8	C5x6.7	.375	20.108	10	.152	16.547	z	4	58379....	63828	19.245	115.02	1.163	H1-1b
22	M20	C5x9	.364	8.667	8	.287	9.333	z	6	34351....	85536	22.909	142.236	1.884	H1-1b
23	M23	PL 6" x 1"	.361	3.378	17	.066	3.378	y	11	19300...	194400	48.6	291.6	2.048	H1-1b
24	M2	C5x9	.355	55.333	18	.138	8.667	z	13	34351....	85536	22.909	142.236	2.667	H1-1b
25	M1	C5x9	.354	55.333	10	.141	8.667	z	5	34351....	85536	22.909	142.236	1.568	H1-1b
26	M24	PL 6" x 1"	.344	0	19	.055	0	y	12	19300...	194400	48.6	291.6	1.975	H1-1b
27	M3	C5x9	.340	55.333	8	.133	8.667	z	10	34351....	85536	22.909	142.236	1.193	H1-1b
28	M64	PL 6" x 1"	.323	0	15	.046	0	y	9	19300...	194400	48.6	291.6	1.534	H1-1b
29	M80	PL 6" x 1"	.321	0	18	.066	3.378	y	11	19300...	194400	48.6	291.6	1.21	H1-1b
30	M63	PL 6" x 1"	.310	3.378	24	.050	3.378	y	7	19300...	194400	48.6	291.6	1.375	H1-1b
31	M19	C5x9	.307	16	18	.032	0	y	32	80795....	85536	22.909	142.236	1.007	H1-1b
32	M43	PL 6" x 1"	.306	3.378	21	.050	3.378	y	3	19300...	194400	48.6	291.6	1.597	H1-1b
33	M27	PL 6" x 1"	.301	3.378	18	.052	0	y	12	19300...	194400	48.6	291.6	1.216	H1-1b

Envelope AISC 14th(360-10): LRFD Steel Code Checks (Continued)

	Member	Shape	Code Check	Loc[in]	LC	Shear Che...	Loc[in]	Dir	LC	phi*Pn...	phi*Pnt...	phi*Mn...	phi*Mn...	Cb	Eqn
34	M44	PL 6" x 1"	.299	0	23	.046	0	y	4	19300...	194400	48.6	291.6	1.377	H1-1b
35	M18	C5x9	.289	0	18	.029	16	y	30	80795....	85536	22.909	142.236	1.083	H1-1b
36	M60	PL 6" x 1"	.275	0	26	.051	3.378	y	7	19300...	194400	48.6	291.6	1.222	H1-1b
37	M67	PL 6" x 1"	.269	3.378	26	.046	0	y	9	19300...	194400	48.6	291.6	1.222	H1-1b
38	M9	L2x2x3	.262	54	14	.027	54	z	5	4761.1...	23392.8	6.693	13.003	1.563	H2-1
39	M40	PL 6" x 1"	.262	0	22	.051	3.378	y	14	19300...	194400	48.6	291.6	1.215	H1-1b
40	M47	PL 6" x 1"	.260	3.378	22	.044	0	y	4	19300...	194400	48.6	291.6	1.224	H1-1b
41	M10	L2x2x3	.257	54	10	.024	39	y	7	4761.1...	23392.8	6.693	13.022	1.573	H2-1
42	M17	C5x9	.252	16	26	.018	0	z	10	80795....	85536	22.909	142.236	1.005	H1-1b
43	M82	PL 6" x 1"	.212	3.378	17	.064	3.378	y	11	19300...	194400	48.6	291.6	1.57	H1-1b
44	M25	PL 6" x 1"	.203	0	19	.052	0	y	12	19300...	194400	48.6	291.6	1.588	H1-1b
45	M65	PL 6" x 1"	.191	0	15	.044	0	y	9	19300...	194400	48.6	291.6	1.747	H1-1b
46	M15	SR 1/2"	.185	0	11	.032	12.835		7	3652.0...	6361.74	.636	.636	2.277	H1-1b
47	M14	SR 1/2"	.185	0	11	.034	12.835		7	3652.0...	6361.74	.636	.636	2.277	H1-1b
48	M62	PL 6" x 1"	.180	3.378	24	.048	3.378	y	7	19300...	194400	48.6	291.6	2.087	H1-1b
49	M42	PL 6" x 1"	.180	3.378	21	.048	3.378	y	3	19300...	194400	48.6	291.6	1.702	H1-1b
50	M16	SR 1/2"	.175	0	13	.029	12.835		7	3652.0...	6361.74	.636	.636	2.277	H1-1b
51	M45	PL 6" x 1"	.174	0	23	.043	0	y	4	19300...	194400	48.6	291.6	2.045	H1-1b
52	M7	C5x6.7	.173	0	26	.017	15.56	z	26	51076....	63828	19.245	115.02	2.147	H1-1b
53	M81	PL 6" x 1"	.150	0	18	.064	3.378	y	11	19300...	194400	48.6	291.6	1.297	H1-1b
54	M13	SR 1/2"	.148	0	13	.029	12.835		7	3652.0...	6361.74	.636	.636	2.276	H1-1b
55	M26	PL 6" x 1"	.139	3.378	18	.050	0	y	12	19300...	194400	48.6	291.6	1.31	H1-1b
56	M61	PL 6" x 1"	.129	0	26	.049	3.378	y	7	19300...	194400	48.6	291.6	1.325	H1-1b
57	M66	PL 6" x 1"	.121	3.378	26	.045	3.378	y	16	19300...	194400	48.6	291.6	1.325	H1-1b
58	M46	PL 6" x 1"	.120	3.378	22	.045	3.378	y	23	19300...	194400	48.6	291.6	1.337	H1-1b
59	M41	PL 6" x 1"	.120	0	22	.048	3.378	y	3	19300...	194400	48.6	291.6	1.308	H1-1b
60	M145	PIPE_2.0	.099	43.917	7	.037	90.667		13	7658.2...	32130	22.459	22.459	1.841	H1-1b
61	M137	PIPE_2.0	.095	43.917	3	.035	90.667		9	7658.2...	32130	22.459	22.459	1.819	H1-1b
62	M141	PIPE_2.0	.091	43.917	11	.036	90.667		5	7658.2...	32130	22.459	22.459	1.76	H1-1b
63	M28	PL 6" x 1"	.088	0	16	.065	0	y	18	19300...	194400	48.6	291.6	1.072	H1-1b
64	M29	PL 6" x 1"	.083	0	18	.054	0	y	18	19300...	194400	48.6	291.6	1.053	H1-1b
65	M68	PL 6" x 1"	.082	0	26	.056	0	y	26	19300...	194400	48.6	291.6	1.161	H1-1b
66	M150	L2.5x2.5x4	.082	0	13	.026	12	y	5	37318....	38556	13.363	30.449	1.136	H2-1
67	M149	L2.5x2.5x4	.082	0	5	.026	12	y	9	37318....	38556	13.363	30.449	1.136	H2-1
68	M69	PL 6" x 1"	.081	0	26	.045	0	y	26	19300...	194400	48.6	291.6	1.095	H1-1b
69	M30	PL 6" x 1"	.081	0	19	.044	0	y	18	19300...	194400	48.6	291.6	1.043	H1-1b
70	M59	PL 6" x 1"	.081	3.378	16	.060	0	y	16	19300...	194400	48.6	291.6	1.139	H1-1b
71	M48	PL 6" x 1"	.080	0	19	.058	3.378	y	20	19300...	194400	48.6	291.6	1.173	H1-1b
72	M70	PL 6" x 1"	.080	0	15	.036	0	y	14	19300...	194400	48.6	291.6	1.057	H1-1b
73	M31	PL 6" x 1"	.080	0	19	.037	0	y	28	19300...	194400	48.6	291.6	1.026	H1-1b
74	M151	L2.5x2.5x4	.080	12	13	.025	12	y	13	37318....	38556	13.363	30.449	1.136	H2-1
75	M71	PL 6" x 1"	.079	0	15	.031	0	y	13	19300...	194400	48.6	291.6	1.032	H1-1b
76	M32	PL 6" x 1"	.078	0	19	.032	0	y	28	19300...	194400	48.6	291.6	1.011	H1-1b
77	M72	PL 6" x 1"	.078	0	15	.027	0	y	13	19300...	194400	48.6	291.6	1.012	H1-1b
78	M58	PL 6" x 1"	.077	3.378	25	.050	3.378	y	16	19300...	194400	48.6	291.6	1.023	H1-1b
79	M33	PL 6" x 1"	.077	0	20	.028	0	y	28	19300...	194400	48.6	291.6	1.006	H1-1b
80	M73	PL 6" x 1"	.076	0	16	.025	0	y	30	19300...	194400	48.6	291.6	1.003	H1-1b
81	M34	PL 6" x 1"	.076	0	20	.025	3.378	y	11	19300...	194400	48.6	291.6	1.009	H1-1b
82	M74	PL 6" x 1"	.076	0	16	.028	0	y	30	19300...	194400	48.6	291.6	1.016	H1-1b
83	M75	PL 6" x 1"	.076	3.378	17	.032	3.378	y	30	19300...	194400	48.6	291.6	1.024	H1-1b
84	M76	PL 6" x 1"	.075	3.378	17	.036	3.378	y	30	19300...	194400	48.6	291.6	1.046	H1-1b
85	M36	PL 6" x 1"	.075	3.378	21	.032	3.378	y	10	19300...	194400	48.6	291.6	1.034	H1-1b
86	M37	PL 6" x 1"	.075	3.378	21	.037	3.378	y	10	19300...	194400	48.6	291.6	1.055	H1-1b
87	M77	PL 6" x 1"	.075	3.378	17	.045	3.378	y	18	19300...	194400	48.6	291.6	1.075	H1-1b
88	M35	PL 6" x 1"	.075	3.378	21	.028	3.378	y	11	19300...	194400	48.6	291.6	1.018	H1-1b
89	M39	PL 6" x 1"	.075	3.378	22	.055	3.378	y	22	19300...	194400	48.6	291.6	1.154	H1-1b
90	M38	PL 6" x 1"	.075	3.378	21	.045	3.378	y	22	19300...	194400	48.6	291.6	1.083	H1-1b

Envelope AISC 14th(360-10): LRFD Steel Code Checks (Continued)

	Member	Shape	Code Check	Loc[in]	LC	Shear Che...	Loc[in]	Dir	LC	phi*Pn...	phi*Pnt...	phi*Mn...	phi*Mn...	Cb	Eqn
91	M57	PL 6" x 1"	.075	3.378	25	.040	3.378	y	16	19300...	194400	48.6	291.6	1.015	H1-1b
92	M49	PL 6" x 1"	.074	0	22	.047	0	y	20	19300...	194400	48.6	291.6	1.023	H1-1b
93	M79	PL 6" x 1"	.074	3.378	18	.064	3.378	y	18	19300...	194400	48.6	291.6	1.244	H1-1b
94	M78	PL 6" x 1"	.074	3.378	17	.054	3.378	y	18	19300...	194400	48.6	291.6	1.121	H1-1b
95	M56	PL 6" x 1"	.073	3.378	25	.032	3.378	y	14	19300...	194400	48.6	291.6	1.007	H1-1b
96	M50	PL 6" x 1"	.072	0	23	.038	0	y	20	19300...	194400	48.6	291.6	1.025	H1-1b
97	M55	PL 6" x 1"	.071	3.378	25	.028	3.378	y	3	19300...	194400	48.6	291.6	1	H1-1b
98	M51	PL 6" x 1"	.071	0	23	.032	0	y	9	19300...	194400	48.6	291.6	1.016	H1-1b
99	M52	PL 6" x 1"	.069	0	23	.028	0	y	9	19300...	194400	48.6	291.6	1.009	H1-1b
100	M54	PL 6" x 1"	.069	3.378	24	.025	3.378	y	3	19300...	194400	48.6	291.6	1.001	H1-1b
101	M53	PL 6" x 1"	.068	3.378	24	.025	0	y	9	19300...	194400	48.6	291.6	1.01	H1-1b
102	M12	SR 1/2"	.050	0	13	.010	12.835		19	3652.0...	6361.74	.636	.636	2.237	H1-1b
103	M11	SR 1/2"	.032	12.835	23	.009	12.835		23	3652.0...	6361.74	.636	.636	2.833	H1-1b

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

Project # 37519-1551.002.7190
By JGF
Date: 04/29/19
v0.1, Effective 07/10/18

MOUNT TO TOWER CONNECTION CHECKS

REACTIONS

Px=	1.63451	Kip
Py=	4.14208	Kip
(Axial)Pz=	3.16031	Kip
Mx=	72.795	Kip-in
My=	16.079	Kip-in
(Torque)Mz=	3.112	Kip-in

WELD CHECKS

Standoff Member Type		Square	
Width	=	3	in
Depth (only for square members)	=	3	in
Assumed Weld Size	=	0.4844	
Total Forces in X direction	=	0.402	kips
Total Forces in Y direction	=	0.820	kips
Total Forces in Z direction	=	7.67	kips
Resultant	=	7.72	kips
Φ*Fw (Kip/in)/16" weld	=	1.392	
Capacity used		71.60%	

BOLT CHECKS

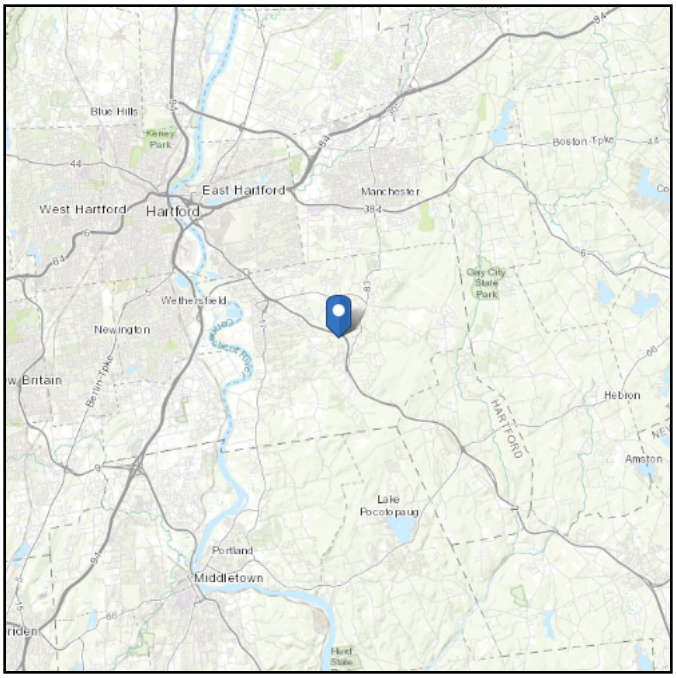
Tension Reaction	8.20	kip
Shear Reaction	1.28	kip
Bolt Type	A325N	
Bolt Diameter	0.625	in
Tensile Strength	20.7	kips
Shear Strength	12.4	kips
Reduced Tensile Strength	-	kips
Tensile Capacity Used	39.6%	**Note: Tension reduction not required if tension or shear capacity < 30%**
Shear Capacity Used	10.3%	

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 467.15 ft (NAVD 88)
Latitude: 41.693592
Longitude: -72.547253



Wind

Results:

Wind Speed:	125 Vmph
10-year MRI	77 Vmph
25-year MRI	87 Vmph
50-year MRI	94 Vmph
100-year MRI	102 Vmph
Data Source:	ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, incorporating errata of March 12, 2014
Date Accessed:	Mon Apr 29 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.

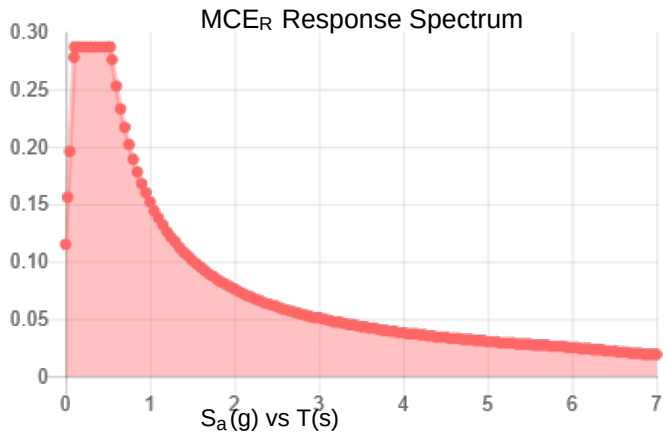
Seismic

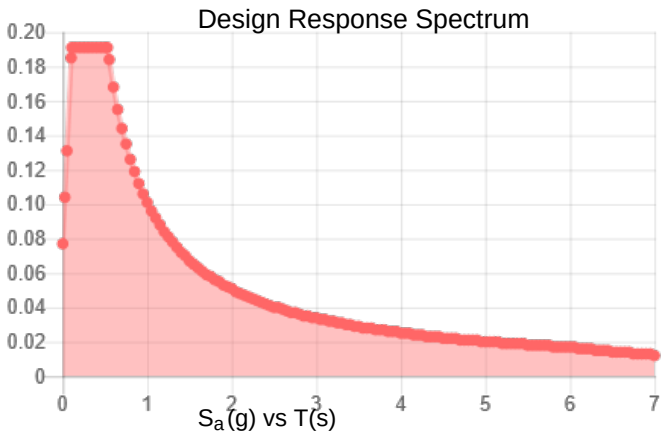
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.179	S_{DS} :	0.191
S_1 :	0.063	S_{D1} :	0.101
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.09
S_{MS} :	0.287	PGA_M :	0.145
S_{M1} :	0.152	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B





Data Accessed: Mon Apr 29 2019

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

Ice

Results:

Ice Thickness:	1.00 in.
Concurrent Temperature:	5 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Mon Apr 29 2019

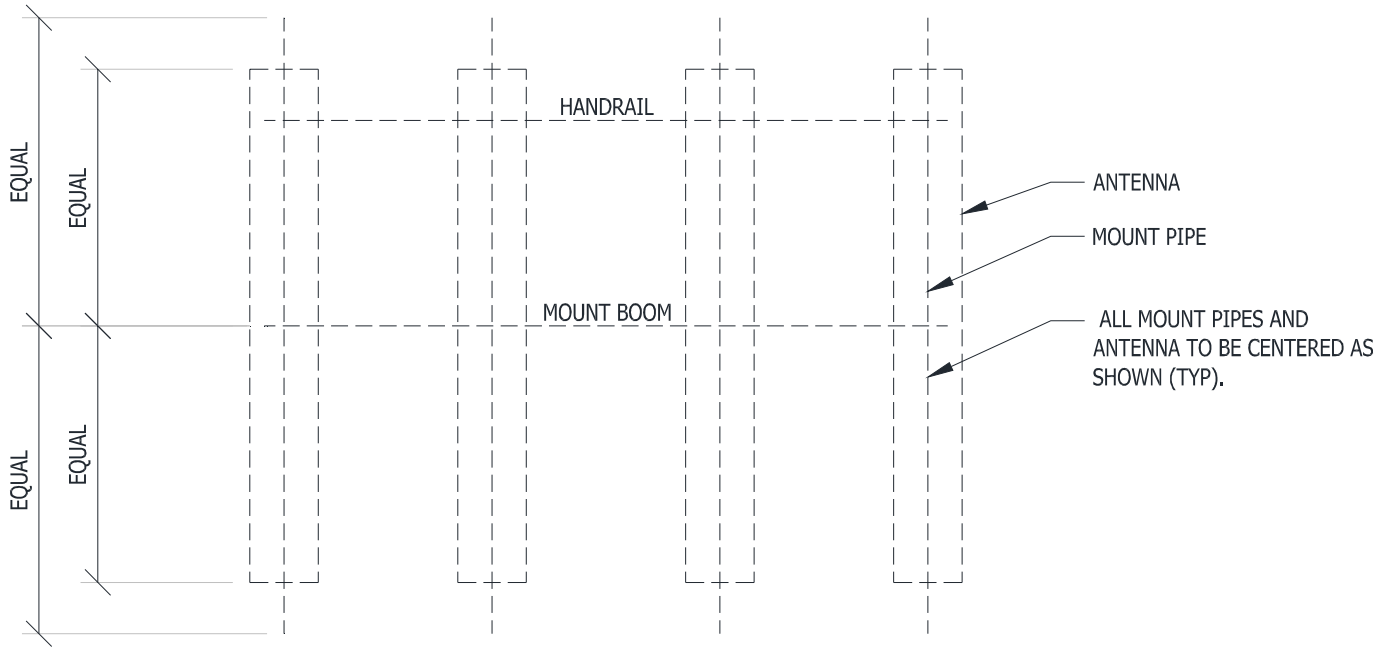
Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

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.

APPENDIX D

STANDARD ANTENNA CENTERING CONDITIONS

LOW PROFILE PLATFORM WITH HANDRAIL



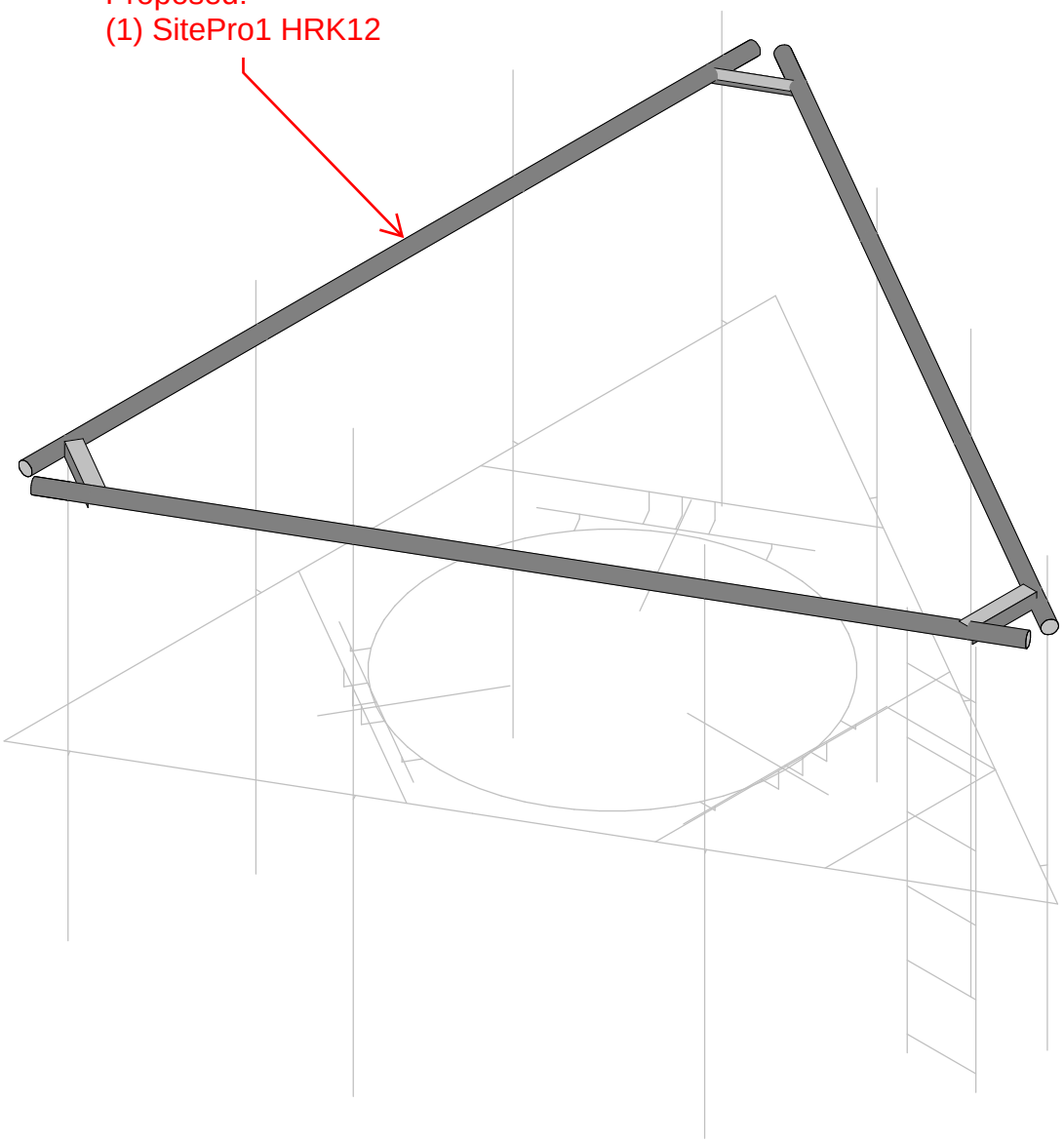
FRONT ELEVATION

Note: Quantity of antennas shown above is representative only and may or may not represent the actual quantity of antennas considered in the analysis.

APPENDIX E

SUPPLEMENTAL MODIFICATION INFORMATION

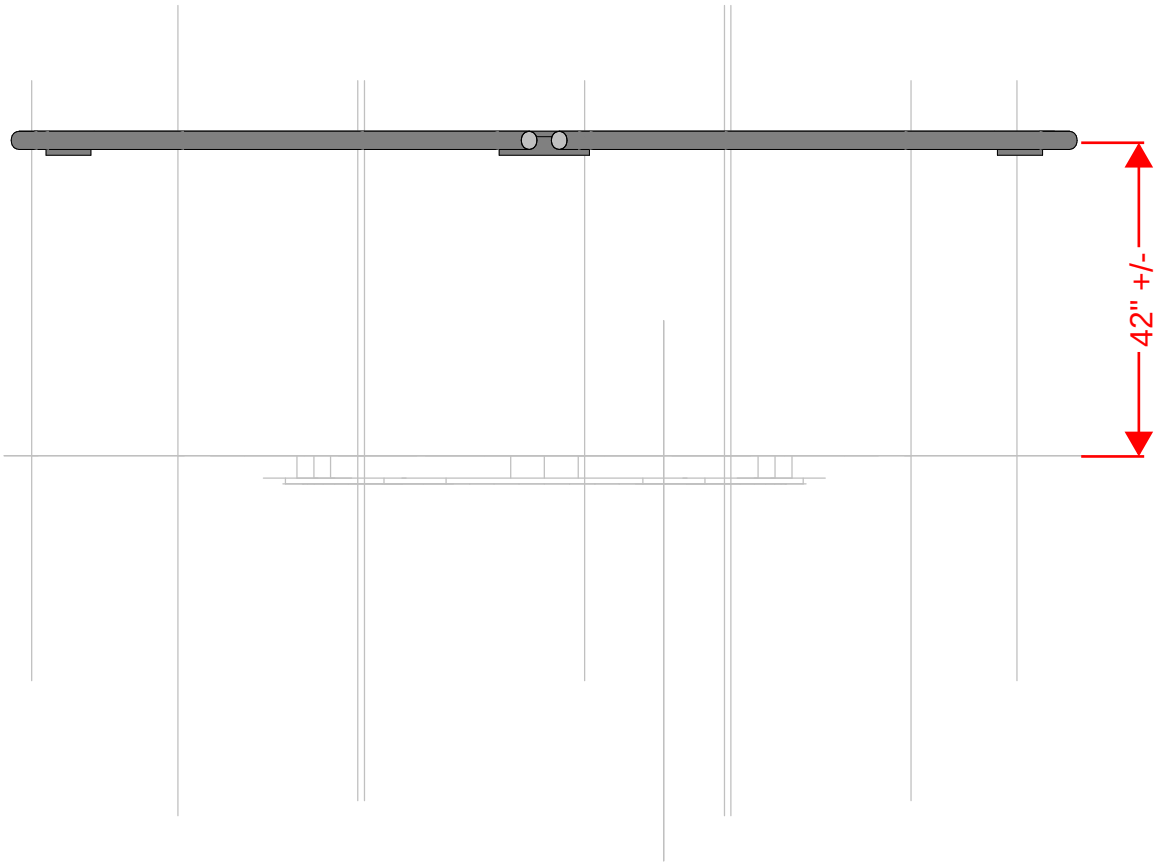
MODIFICATION DRAWING 1 OF 2



Loads: BLC 1, Dead

Paul J. Ford and Company	BU 806368 / HRT 049B 943215	SK - 8
JGF		Apr 29, 2019 at 1:24 PM
37519-1551.002.7190		37519-1551.002.7190_Wind Load....

MODIFICATION DRAWING 2 OF 2



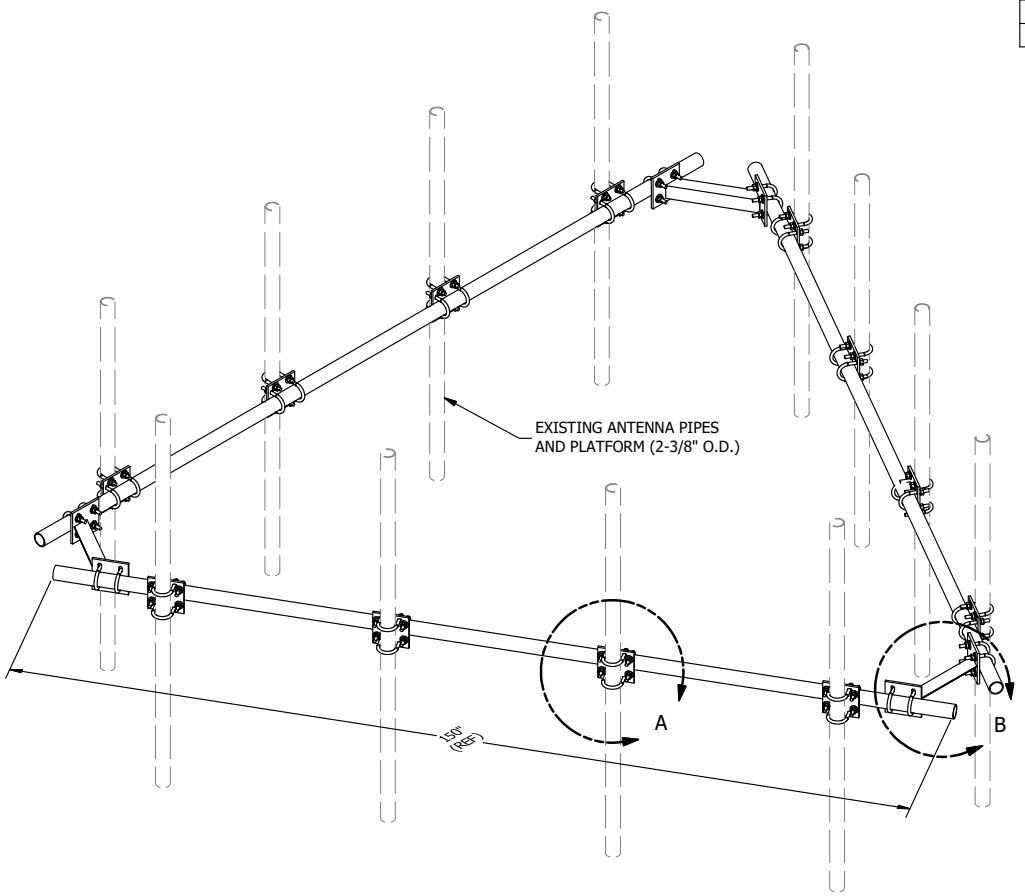
Loads: BLC 1, Dead

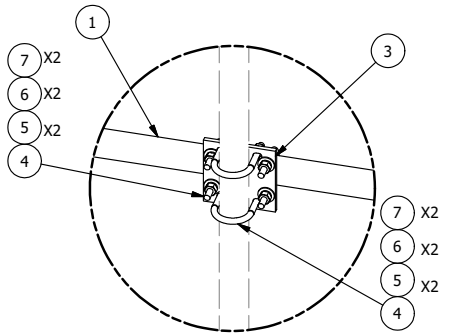
Paul J. Ford and Company	BU 806368 / HRT 049B 943215	SK - 9
JGF		Apr 29, 2019 at 1:24 PM
37519-1551.002.7190		37519-1551.002.7190_Wind Load. ...

APPENDIX F

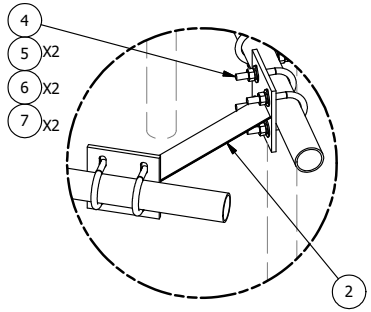
MANUFACTURER DRAWINGS (FOR REFERENCE ONLY)

PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	3	P2150	2-3/8" O.D. X 150" SCH 40 GALVANIZED PIPE	150 in	45.77	137.31
2	3	X-AHCP	ANGLE HANDRAIL CORNER PLATE		12.92	38.76
3	12	SCX1	CROSSOVER PLATE 2-3/8" X 2-3/8"	6 in	3.71	44.50
4	60	X-UB1212	1/2" X 2-1/2" X 4-1/2" X 2" U-BOLT (HDG.)		0.63	37.51
5	120	G12FW	1/2" HDG USS FLATWASHER	3/32 in	0.03	4.09
6	120	G12LW	1/2" HDG LOCKWASHER	1/8 in	0.01	1.67
7	120	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	8.60
					TOTAL WT. #	272.43





DETAIL A



DETAIL B

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
A	REPLACED HCP WITH X-AHCP		CEK	7/10/2014

REVISION HISTORY

TOLERANCE NOTES

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

DESCRIPTION: **HANDRAIL KIT FOR 12'-6" FACE**

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

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.
	KC8 5/30/2012		HRK12

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	01	CUSTOMER	BMC 7/13/2014	HRK12

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: CT11248A

Glastonbury
366 South Three Mile Road
Glastonbury, CT 06033

May 17, 2019

Transcom Engineering Project Number: 737001-0015

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**17.89 %**

May 17, 2019

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

Emissions Analysis for Site: **CT11248A – Glastonbury**

Transcom Engineering, Inc ("Transcom") was directed to analyze the proposed upgrades to the T-MOBILE facility located at **366 South Three Mile Road, Glastonbury, 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 **366 South Three Mile Road, Glastonbury, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-MOBILE is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. All power values expressed and analyzed are maximum power levels expected to be used on all radios.

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

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

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
LTE	1900 MHz (PCS)	4	40
LTE	2100 MHz (AWS)	2	60
GSM	1900 MHz (PCS)	1	15
UMTS	2100 MHz (AWS)	1	40
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	Ericsson AIR32 B66A / B2A	116
A	2	Ericsson AIR21 B2A/B4P	116
A	3	RFS APXVAARR24_43-U-NA20	116
B	1	Ericsson AIR32 B66A / B2A	116
B	2	Ericsson AIR21 B2A/B4P	116
B	3	RFS APXVAARR24_43-U-NA20	116
C	1	Ericsson AIR32 B66A / B2A	116
C	2	Ericsson AIR21 B2A/B4P	116
C	3	RFS APXVAARR24_43-U-NA20	116

Table 2: Antenna Data

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

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	Ericsson AIR32 B66A / B2A	1900 MHz (PCS) / 2100 MHz (AWS)	15.85	6	280	10,768.57	3.20
Antenna A2	Ericsson AIR21 B2A/B4P	1900 MHz (PCS) / 2100 MHz (AWS)	15.9	2	55	2,139.75	0.64
Antenna A3	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	12.95 / 13.35	4	120	2,443.03	1.72
						Sector A Composite MPE%	**5.56**
Antenna B1	Ericsson AIR32 B66A / B2A	1900 MHz (PCS) / 2100 MHz (AWS)	15.85	6	280	10,768.57	3.20
Antenna B2	Ericsson AIR21 B2A/B4P	1900 MHz (PCS) / 2100 MHz (AWS)	15.9	2	55	2,139.75	0.64
Antenna B3	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	12.95 / 13.35	4	120	2,443.03	1.72
						Sector B Composite MPE%	**5.56**
Antenna C1	Ericsson AIR32 B66A / B2A	1900 MHz (PCS) / 2100 MHz (AWS)	15.85	6	280	10,768.57	3.20
Antenna C2	Ericsson AIR21 B2A/B4P	1900 MHz (PCS) / 2100 MHz (AWS)	15.9	2	55	2,139.75	0.64
Antenna C3	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	12.95 / 13.35	4	120	2,443.03	1.72
						Sector C Composite MPE%	**5.56**

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	**5.56 %**
SIGFOX	0.03 %
Nextel	0.40 %
Verizon Wireless	4.07 %
AT&T	3.39 %
Sprint	0.65 %
XM Satellite Radio	3.79 %
Site Total MPE %:	**17.89 %**

Table 4: All Carrier MPE Contributions

T-MOBILE Sector A Total:	5.56 %
T-MOBILE Sector B Total:	5.56 %
T-MOBILE Sector C Total:	5.56 %
Site Total:	17.89 %

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	1,538.37	116	18.28	1900 MHz (PCS)	1000	1.83%
T-Mobile 2100 MHz (AWS) LTE	2	2,307.55	116	13.71	2100 MHz (AWS)	1000	1.37%
T-Mobile 1900 MHz (PCS) GSM	1	583.57	116	1.73	1900 MHz (PCS)	1000	0.17%
T-Mobile 2100 MHz (AWS) UMTS	1	1,556.18	116	4.62	2100 MHz (AWS)	1000	0.46%
T-Mobile 600 MHz LTE / 5G NR	2	788.97	116	4.69	600 MHz	400	1.17%
T-Mobile 700 MHz LTE	2	432.54	116	2.57	700 MHz	467	0.55%
						Total:	**5.56%**

Table 6: T-MOBILE Maximum Sector MPE Power Values

Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general population exposure to RF Emissions.

The anticipated maximum composite contributions from the T-MOBILE facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

T-MOBILE Sector	Power Density Value (%)
Sector A:	5.56 %
Sector B:	5.56 %
Sector C:	5.56 %
T-MOBILE Maximum Total (per sector):	5.56 %
Site Total:	17.89 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **17.89 %** 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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