



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

August 19, 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:
876380 - T-Mobile Site ID: CTNH350A
202 Great Hollow Road, Woodbury, CT 06798
Latitude: 41° 31' 19.20" / Longitude: -73° 13' 14.65"**

Dear Ms. Bachman:

T-Mobile currently maintains nine (9) antennas at the 87-foot mount on the existing 139-foot Monopole Tower, located at 202 Great Hollow Road, Woodbury, CT. The tower is owned by Crown Castle and the property is owned by O&G Industries. T-Mobile now intends to replace six (6) existing antennas with three (3) new 600/700 MHz antennas. The new antennas will be installed at the 87-ft level of the tower.

Planned Modifications:

Tower:

Remove:

- (3) 1 5/8" Coax
- (3) APXV18-206516S-C-A20 Antenna

Remove and Replace:

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

Install New:

- (1) 1 5/8" Hybrid Fiber Line
- (3) Radio 4449 B71/B12

Existing to Remain:

- (9) 1 5/8" Coax
- (3) APXV18-206516S-C-A20 Antenna 1900 MHz
- (3) TMA

Ground:

Upgrade to existing ground cabinet. (Internally)

The facility was approved by the Connecticut Siting Council in Docket No. 236 on June 19, 2003. This approval was given with conditions, which T-Mobile's 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 Barbara Perkinson, First Selectwoman for the Town of Woodbury, Maryellen Edwards, Town Planner, Crown Castle as the tower owner, and O&G Industries, 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:

Barbara Perkinson, First Selectwoman
Town of Woodbury
Town Hall – Selectwoman's Office

Melanie A. Bachman

Page 3

281 Main Street South
Woodbury, CT 06798
203-263-2141

Maryellen Edwards, Town Planner
Town of Woodbury
Town Hall – Planning Department
281 Main Street South
Woodbury, CT 06798
203.263.3467

O&G Industries Inc.
112 Wall Street
Torrington, CT 06790

Crown Castle, Tower Owner

ORIGIN ID: ONHA (585) 445-5896
RICHARD ZAJAC
CROWN CASTLE
300 MERIDIAN CENTRE
ROCHESTER, NY 14618
UNITED STATES US

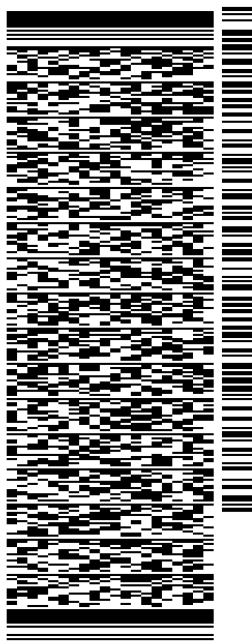
SHIP DATE: 14AUG19
ACTWGT: 4.00 LB
CAD: 104924194IN/ET4160

BILL SENDER

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

NEW BRITAIN CT 06051

(860) 827-2951 REF: 1765 6880
INV/ DEPT:
PO:



J192019062401uv

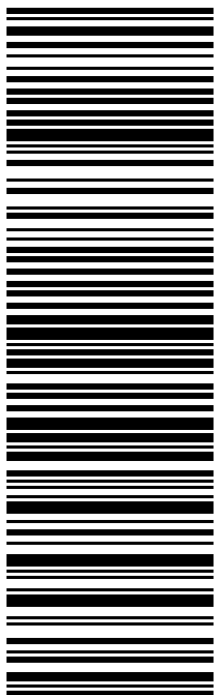
567J3/E9E7/05A2

TRK# 7759 8106 9796
0201

THU - 15 AUG 10:30A
PRIORITY OVERNIGHT

XE BDLA

06051
CT-US BDL



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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 Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

ORIGIN ID: ONHA (585) 445-5896
RICHARD ZAJAC
CROWN CASTLE
300 MERIDIAN CENTRE
ROCHESTER, NY 14618
UNITED STATES US

SHIP DATE: 14AUG19
ACTWG1: 2.00 LB
CAD: 104924194IN1ET4160

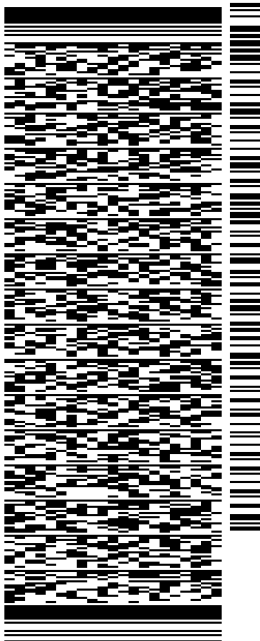
BILL SENDER

TO BARBARA PERKINSON, FIRST SELECTWMAN

TOWN OF WOODBURY
SELECTWOMAN'S OFFICE
281 MAIN STREET SOUTH
WOODBURY CT 06798

(203) 263-2141 REF: 1734.7890
INV/ PO: DEPT:

567J3/E9E7/05A2



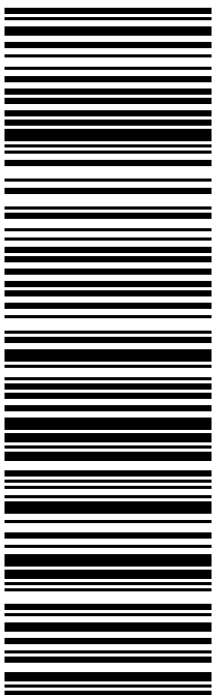
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TRK# 7759 8108 7773
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PRIORITY OVERNIGHT

XE HFDA

06798
CT-US BDL



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ROCHESTER, NY 14618
UNITED STATES US

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ACTWGT: 2.00 LB
CAD: 104924194/INET4160

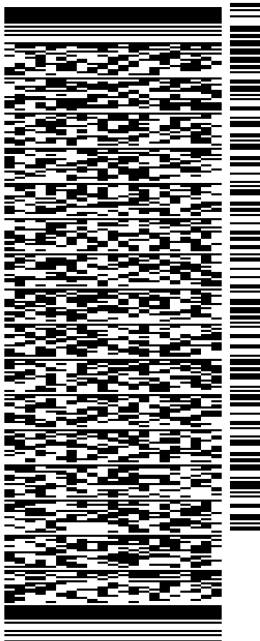
BILL SENDER

TO MARYELLEN EDWARDS, TOWN PLANNER

TOWN OF WOODBURY
PLANNING DEPARTMENT
281 MAIN STREET SOUTH
WOODBURY CT 06798

(203) 263-3467 REF: 1734.7890
INV/ PO: DEPT:

567J3/E9E7/05A2



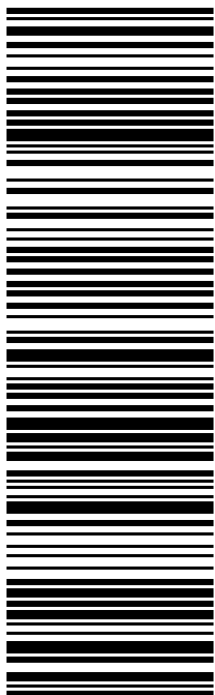
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PRIORITY OVERNIGHT

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CT-US BDL



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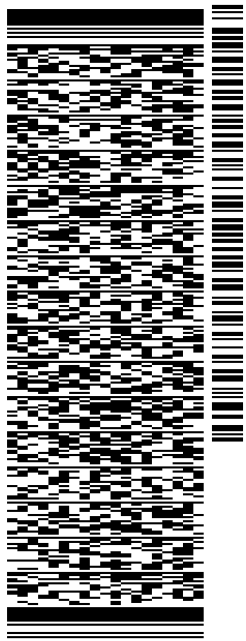
BILL SENDER

TO **O&G INDUSTRIES INC.**

112 WALL STREET

TORRINGTON CT 06790

(201) 236-9224 REF: 1734.7890
INV: DEPT:
PO:



TRK# 7759 8111 3693
#0201

THU - 15 AUG 10:30A
PRIORITY OVERNIGHT

XEHFDA

06790
CT-US BDL



567J3/E9E7/05A2

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Exhibit A

Original Facility Approval



STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051


Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: siting.council@po.state.ct.us

Web Site: www.state.ct.us/csc/index.htm

June 24, 2003

TO: Parties and Intervenors

FROM: S. Derek Phelps, Executive Director 

RE: **DOCKET NO. 236** - Sprint Spectrum L.P. application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a wireless telecommunications facility off Great Hollow Road or at 103 Great Hollow Road, South Woodbury, Connecticut.

By its Decision and Order dated June 19, 2003, the Connecticut Siting Council granted a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a wireless telecommunications facility located at Site A off of Great Hollow Road, Woodbury, Connecticut.

Enclosed are the Council's Findings of Fact, Opinion, and Decision and Order.

SDP/laf

Enclosures (4)

c: Albert Palko, State Documents Librarian
Council Members



STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

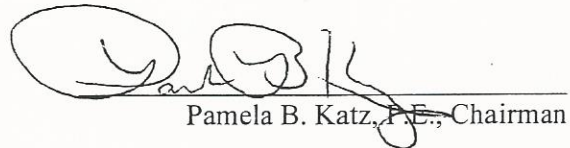
E-Mail: siting.council@po.state.ct.us

Web Site: www.state.ct.us/csc/index.htm

**CERTIFICATE
OF
ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED
DOCKET NO. 236**

Pursuant to General Statutes § 16-50k, as amended, the Connecticut Siting Council hereby issues a Certificate of Environmental Compatibility and Public Need to Sprint Spectrum, L.P. d/b/a Sprint PCS for the construction, maintenance and operation of a wireless telecommunications facility located at Site A off of Great Hollow Road, Woodbury, Connecticut. This Certificate is issued in accordance with and subject to the terms and conditions set forth in the Decision and Order of the Council on June 19, 2003.

By order of the Council,


Pamela B. Katz, P.E., Chairman

June 19, 2003



STATE OF CONNECTICUT

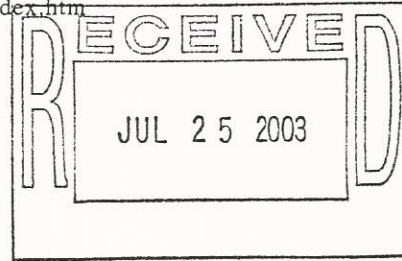
CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: siting.council@po.state.ct.us

Web Site: www.state.ct.us/csc/index.htm



June 24, 2003

Thomas J. Regan, Esq.
Brown Rudnick Berlack Israels LLP
185 Asylum Street, CityPlace I
Hartford, CT 06103-3402

RE: **DOCKET NO. 236** - Sprint Spectrum L.P. application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a wireless telecommunications facility off Great Hollow Road or at 103 Great Hollow Road, South Woodbury, Connecticut.

Dear Attorney Regan:

By its Decision and Order dated June 19, 2003, the Connecticut Siting Council (Council) granted a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a wireless telecommunications facility at Site A off of Great Hollow Road in Woodbury to Sprint Spectrum.

Enclosed are the Council's Certificate, Findings of Fact, Opinion, and Decision and Order.

Very truly yours,

S. Derek Phelps
Executive Director

SDP/CML

Enclosures (4)

Town of Woodbury

Zoning Permit

Number 8156 Date: February 3, 2004

Permission granted to: O & G Ind. (owner) / Peter Maxwell (agent)

To Construct: Telecommunications facilities

Address: Great Hollow Road

District OS-80 Map 34 Lot 15

Set back distance from lot lines

Front:: N/A
 Right Side: N/A
 Left Side: N/A
 Rear: N/A

A-2 Requirements Foundation *N/A* Final *N/A* Both Required

Reviewed and approved: ~~Judi Lynch, Land Use Administrator~~
Mark DeWitt, Town Planner
 Building Height must be as shown and indicated on the final plan.



PROPERTY OWNER: ROBERT CHASE, TRUSTEE
 C/O O&G INDUSTRIES
 WOODBURY, CT

PROPERTY LESSEE: SPRINT SITES USA
 535 EAST CRESCENT AVENUE
 RAMSEY, NEW JERSEY 07446

APPLICANT/SUBLESSEE: AT&T WIRELESS PCS LLC
 12 OMEGA DRIVE
 STAMFORD, CONNECTICUT 06902

LATITUDE: 41.52201' (NAD 83)
 LONGITUDE: 73.22074' (NAD 83)
 ELEVATION: 590' AMSL
 JURISDICTION: TOWN OF WOODBURY, CONNECTICUT

CURRENT USE: TELECOMMUNICATIONS FACILITY
 PROPOSED USE: TELECOMMUNICATIONS FACILITY

SITE QUALIFICATION PARTICIPANTS

	NAME	COMPANY	NUMBER
A/E	IGNACIO C ARTAIZ	URS CORPORATION AES	(860) 529-8882
SAC	HOLLIS REDDING	OPTASITE, INC.	(860) 657-1460
RF	KUMAR RUGHOOBUR	BECHTEL	(203) 630-9930
CON	ALI HEMMATI	BECHTEL	(201) 707-8161
LANDLORD	RUSS VAN OUDENAREN	SPRINT SITES USA	(201) 995-4023
OTHER	-	-	-



URS CORPORATION AES

Town of Woodbury

Date: 1/30/04

Zoning Permit Number 8156

Address of property: Great Hollow Road

Map No. 34 Lot No. 15 Subdivision Name: _____

Name of Owner: O & G Industries Phone Number: 860-489-9261

Address of Owner: 112 Wall Street

DESCRIPTION OF WORK PROPOSED

concrete pad & telecommunications equipment cabinets within existing fenced enclosure; antennas on existing monopole

Size of structure: _____ Height of structure: 110'

Square footage: _____ Number of stories: _____

Type of construction: 100x100 SF lease area

Zone: R-40 OS-60 OS-80 OS-100 GA MSD PI EE MQ

Width of lot: _____ Depth of lot: _____ Total Acreage: _____

Setback distances from property lines

Front yard: 223 Rear yard: _____

Right side yard: NA Left side yard: _____

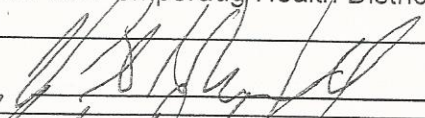
Name of Agent: Peter H. Maxwell Phone Number: 860-202-0219

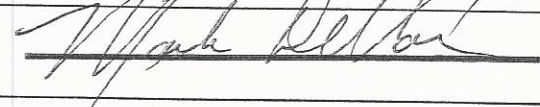
Address of Agent: URS Corp, 795 Brook St, Bldg 5, Rocky Hill, CT 06067

Please Note:
An agent must provide an approval letter from the owner of the subject property before application will be approved.

Check all applicable

- Is this property in the Historic District? Yes No
- Does this application involve any grading or filling? Yes No
- Will there be construction in or within 100 feet of a wetland watercourse? Yes No
- Will this require approval from the Pomperaug Health District Yes No
- Other _____

Signature of Owner/Agent: 

Approved by:  Date: 2-3-04

Please Note

This issued permit is based upon the plot plan submitted. Falsification by misrepresentation or omission, or failure to comply with the conditions of approval of this permit shall constitute a violation of the Town of Woodbury Zoning Regulations.

Exhibit B

Property Card

The Assessor's office is responsible for the maintenance of records on the ownership of properties. Assessments are computed at 70% of the estimated market value of real property at the time of the last revaluation which was 2018.

Town of Woodbury

First Deed from the Indians 1659



Information on the Property Records for the Municipality of Woodbury was last updated on 2/23/2019.

Parcel Information

Location:	202 GREAT HOLLOW RD	Property Use:	Residential	Primary Use:	Residential
Unique ID:	45300	Map Block Lot:	034-015	Acres:	210.30
490 Acres:	208.46	Zone:	OS80	Volume / Page:	360/ 104
Developers Map / Lot:		Census:	3621		

Value Information

	Appraised Value	Assessed Value
Land	1,869,813	191,400
Buildings	0	0
Detached Outbuildings	332,302	232,610
Total	2,202,115	424,010

Owner's Information

Owner's Data

O & G INDUSTRIES INC
112 WALL STREET
TORRINGTON CT 06790

Detached Outbuildings

Type:	Year Built:	Length:	Width:	Area:
Building/Equipment Cell Towers	2010			300
Building/Equipment Cell Towers	2010			64
Building/Equipment Cell Towers	2010			160
Building/Equipment Cell Towers	2010			200
Fencing Cell Towers	2010			600
Mono Pole Cell Towers	2002			150
Pad Cell Towers	2010			160
Pad Cell Towers	2002	20	10	200

Owner History - Sales

Owner Name	Volume	Page	Sale Date	Deed Type	Valid Sale	Sale Price
O & G INDUSTRIES INC	360	104	03/20/2008		No	\$0
CHASE ROBERT L-TTEE	241	210	05/28/1999		No	\$0

Building Permits

Permit Number	Permit Type	Date Opened	Date Closed	Permit Status	Reason
---------------	-------------	-------------	-------------	---------------	--------

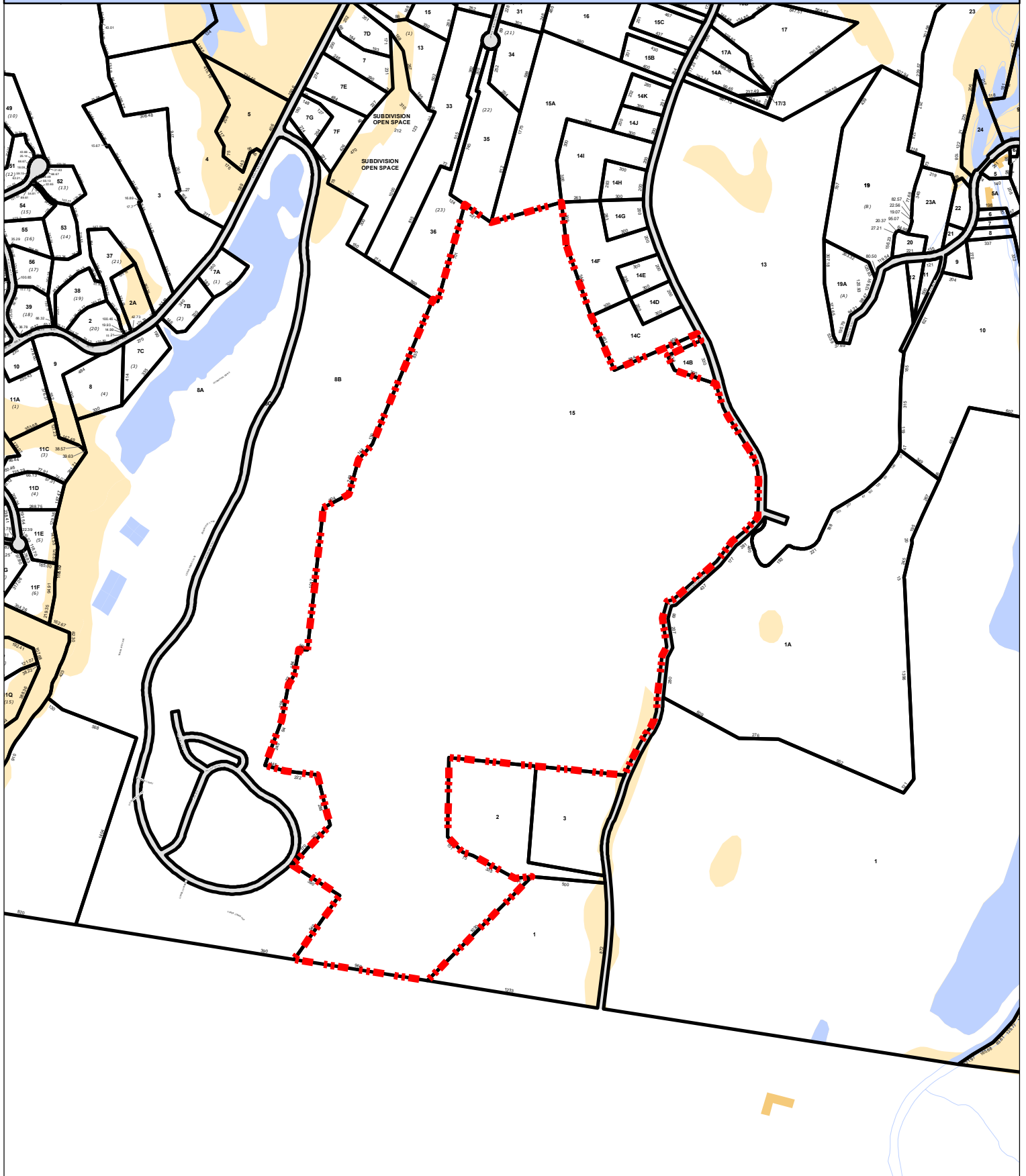
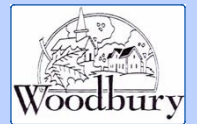
Permit Number	Permit Type	Date Opened	Date Closed	Permit Status	Reason
19-60	Electrical	01/31/2019		Closed	INSTALL CONDUIT AND WIRING TO INSTALL AND GENERATE DC GENERATOR INTO EXISTING DC SYSTEM
B181-17	Other	09/14/2017		Closed	UPGRADE TELECOMMUNICATION ANTENNA - SPRINT - 3 NEW ANTENNA, 3 REMOTE RADIO HEAD AND A HYBRID FIBER
B053-17	Other	04/20/2017		Closed	AT&T TO REMOVE AND REPLACE THREE ANTENNAS AND ADD THREE R R U'S (NON-ANTENNA) TO EXISTING EQUIPMENT
B036-16	Other	03/17/2016		Closed	AT&T TO REMOVE AND REPLACE 3 ANTENNAS & ADD 3 RRU'S TO EXISTING EQUIPMENT
B067-15	Other	05/11/2015		Closed	REMOVING & REPLACING 3 ATTENNAS W/3 NEW + ADD I NEW CABINET ON THE EXISTING CONCRETE PAD
B004-15	Other	01/15/2015		Closed	REPLACING ANTENNA PANELS ON EXISTING TOWER ADDING REMOTE RADIO HEADS
B226-14	Other	12/11/2014		Closed	SPRINT TO ADD 3 ATENNA'S & 3 RRH & 1 FIBER CABLES TO ANTENNA
B013-14	Other	02/09/2014		Closed	ADD 50 K DIESEL GENERATORS ON 4'X 8' CONCRETE PAD, CONDUIT TO A T A MOUNTED ON EXISTING SHELTER. AL
B145-13	Comm Renovations	08/19/2013		Closed	INSTALL 1 ANTENNA & RELOCATE GROUND EQUIPMENT & ELECTRICAL
B241-12	Comm Renovations	12/19/2012		Closed	CELL TOWER-INSTALL 3 NEW ANTENNAS & ONE CABINET ON GROUND
B225-12	Comm Renovations	12/12/2012		Closed	REPLACE R EXISTING ANTENNAS W/3 NEW SPRINT ANTENNAS ON EXISTING TOWER ADDING 6 REMOTE RADIO HEADS T
8555		07/29/2003		Closed	CELL TOWER(140');OPEN SPACE-1990(69.46 AC);FOREST LAND-1991(123.0 AC); FOREST LAND REVISED-1996(CER

Information Published With Permission From The Assessor

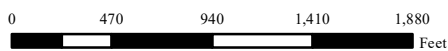
Town of Woodbury, Connecticut - Assessment Parcel Map

Parcel: 034-015

Address: 202 GREAT HOLLOW RD



Approximate Scale: 1 inch = 900 feet



*Disclaimer: This map is for informational purposes only.
All information is subject to verification by any user.
The Town of Woodbury and its mapping contractors assume no
legal responsibility for the information contained herein.*

Map Produced:
9/14/2018

Exhibit C

Construction Drawings

SCOPE OF WORK

ITEMS TO BE INSTALLED ON & REMOVED FROM EXISTING TOWER & ON GROUND:

- REMOVE T-MOBILE ANTENNA (LNx-8515DS-A1M) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- REMOVE T-MOBILE ANTENNA (APXV18-206516S-C-A20) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- REMOVE T-MOBILE COAX CABLE (TOTAL OF 3).
- INSTALL T-MOBILE ANTENNA (APXVAARR24_43-U-NA20) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- INSTALL T-MOBILE RADIO (4449 B71+B12) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- INSTALL T-MOBILE 6x12 HCS HYBRID CABLE (TOTAL OF 1).

ITEMS TO BE INSTALLED ON EXISTING EQUIPMENT PAD:

- REMOVE (1) DUS41
- INSTALL (2) ERICSSON BASEBAND 6830 UNITS

ITEMS TO REMAIN:

- (3) ANTENNAS, (3) TMAS, (9) COAX CABLES.

SITE ADDRESS: 202 GREAT HOLLOW ROAD
WOODBURY, CT 06798

LATITUDE (NAD 83): N 41° 31' 19.20"

LONGITUDE (NAD 83): W -73° 13' 14.85"

COUNTY: LITCHFIELD

JURISDICTION: —

LANDLORD: CROWN CASTLE INTERNATIONAL
500 W. CUMMINGS PARK, STE 3600
WOBBURN, MA 01801

STRUCTURE TYPE: MONOPOLE/ OUTDOOR

STRUCTURE HEIGHT: 139'-0"

RAD CENTER: 87'-0"

CURRENT USE: TELECOMMUNICATIONS FACILITY

PROPOSED USE: TELECOMMUNICATIONS FACILITY

NOTE:

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



T-MOBILE NORTH EAST LLC
103 MONARCH DRIVE
LIVERPOOL, NY 13088



3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065



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



L600 PROJECT

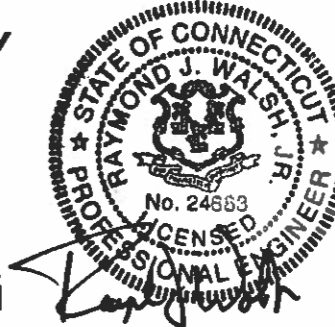
SITE NUMBER: CTNH350A

SITE NAME: NH350/GLOBAL-WOODBURY

CROWN SITE NAME: O&G WOODBURY

BU#: 876380

T-MOBILE RAN TEMPLATE: 67D04G



DRAWING INDEX

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

VICINITY MAP



HEAD WEST ON ST. JAMES AVE TOWARD TRINITY PLACE (0.1 MILE), MERGE ONTO I-90 W VIA THE RAMP TO NEW YORK (0.2 MILE), MERGE ONTO I-90 W (10.2 MILES), KEEP LEFT TO STAY ON I-90 W (44.1 MILES), USE THE RIGHT 2 LANES TO TAKE EXIT 9 FOR I-84 TOWARD US-20/HARTFORD/NEW YORK CITY (0.7 MILE), CONTINUE ONTO I-84 FOR (42.1 MILES), KEEP LEFT TO STAY ON I-84 (30.7 MILES), TAKE EXIT 17 FOR CT-64 TOWARD CT-63/ MIDDLEBURY/ WATERTOWN (0.2 MILE), CONTINUE ON CT-64 W/CHASE PKWY (3.4 MILES), TURN RIGHT TO STAY ON CT-64 W (4.2 MILES), TURN RIGHT ONTO US-6 E/MAIN ST S (0.6 MILE), TURN LEFT ONTO HOLLOW RD (0.3 MILE), SLIGHT LEFT ONTO CT-317 W/SYCAMORE AVE (0.4 MILE), TURN LEFT ONTO BEAR HILL RD (0.3 MILE), TURN LEFT ONTO GREAT HOLLOW RD. (1.1 MILES), SITE WILL BE LOCATED TO THE AT END OF ROAD.

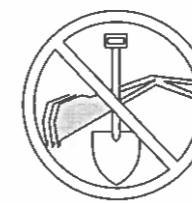
GENERAL NOTES

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

CROWN CASTLE SITE ID #: 876380
CROWN CASTLE SITE NAME: O&G WOODBURY

ENGINEERING

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



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



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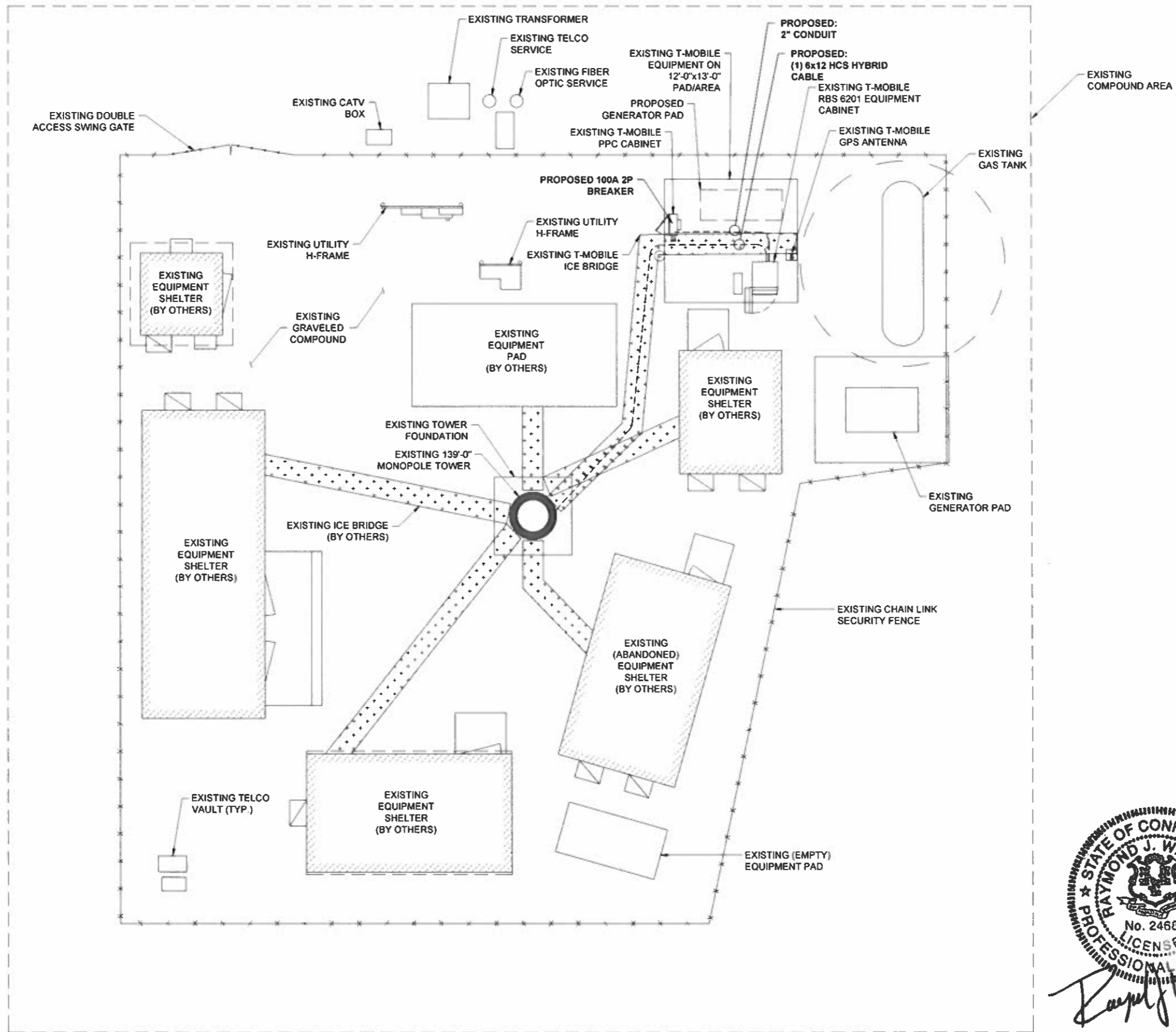
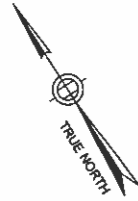
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NH350/GLOBAL-WOODBURY
CTNH350A
O&G WOODBURY
876380
202 GREAT HOLLOW ROAD
WOODBURY, CT 06798

TITLE SHEET

T-1



NOTES:

- 1 PLAN BASED ON ASBUILT DRAWINGS ISSUED BY CROWN CASTLE ON 02/06/2019. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS AND LOCATION/ORIENTATION OF EXISTING EQUIPMENT.



T-Mobile

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

CROWN CASTLE

3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065

JACOBS

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

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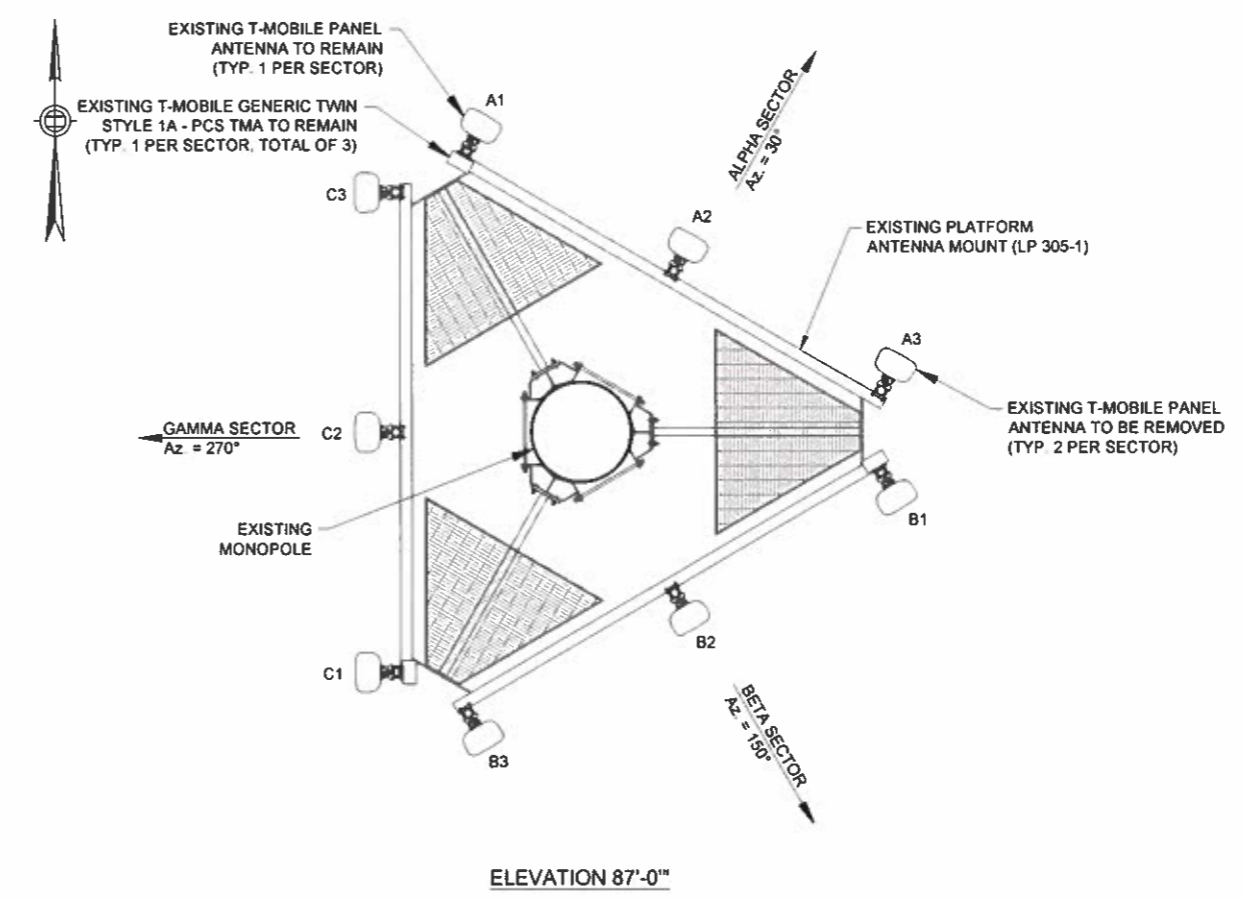
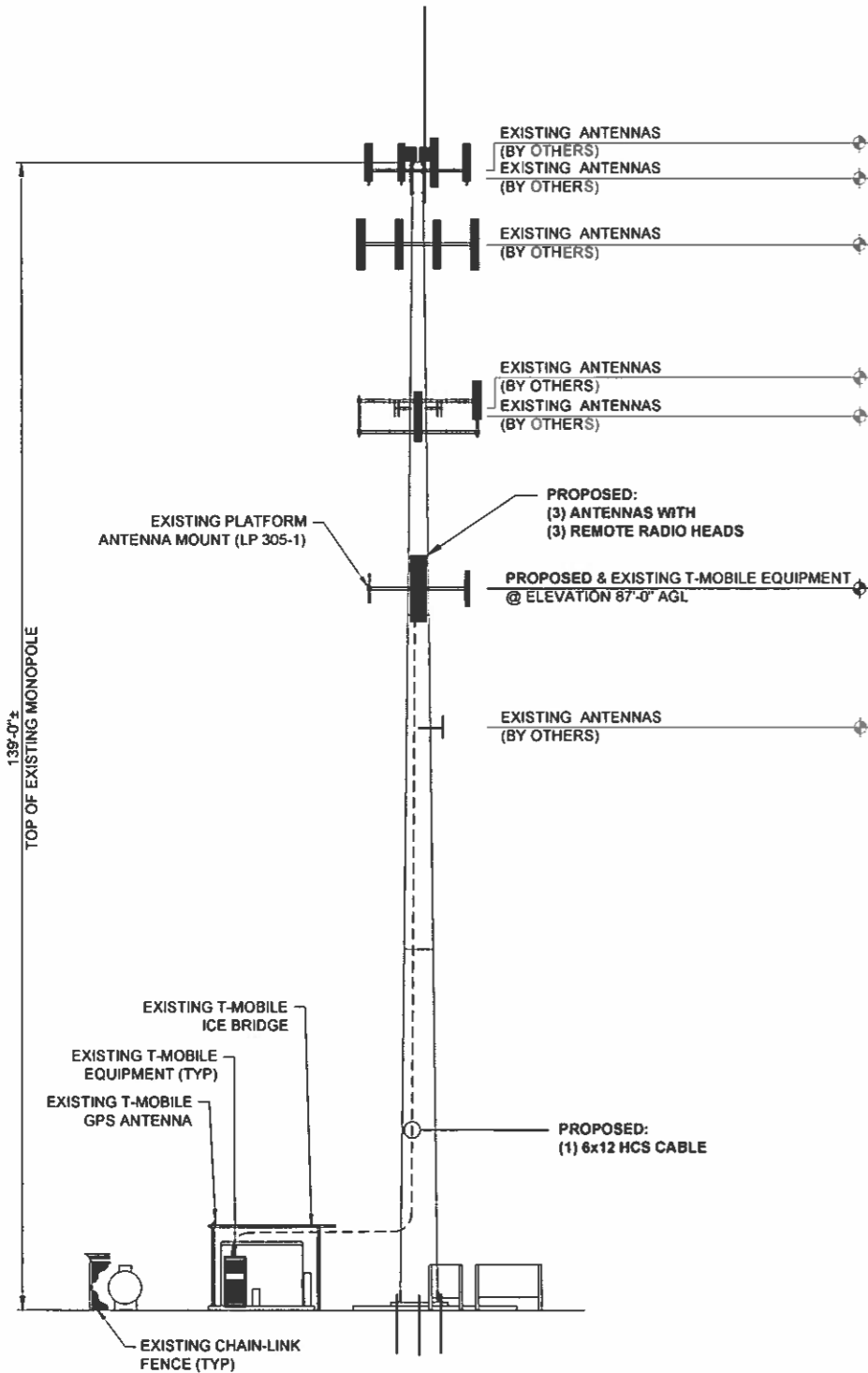
NH350/GLOBAL-WOODBURY
CTNH350A
O&G WOODBURY
876380
202 GREAT HOLLOW ROAD
WOODBURY, CT 06796

SITE PLAN

C-1

NOTES:

- CONTRACTOR SHALL REFER TO THE STRUCTURAL ANALYSIS REPORT. SITE NUMBER: CTNH350A, SITE NAME: NH350/GLOBAL-WOODBURY, CROWN BU NUMBER: 876380, CROWN SITE NAME: O&G WOODBURY, CROWN ORDER NUMBER: 479855, ISSUED BY BLACK & VEATCH, DATED ON 06/27/2019. PER THIS ANALYSIS NO MODIFICATIONS ARE REQUIRED. THE CONTRACTOR SHALL VERIFY ALL EXISTING MEMBERS AND HARDWARE ARE INSTALLED PROPERLY AS DESCRIBED IN THIS REPORT.

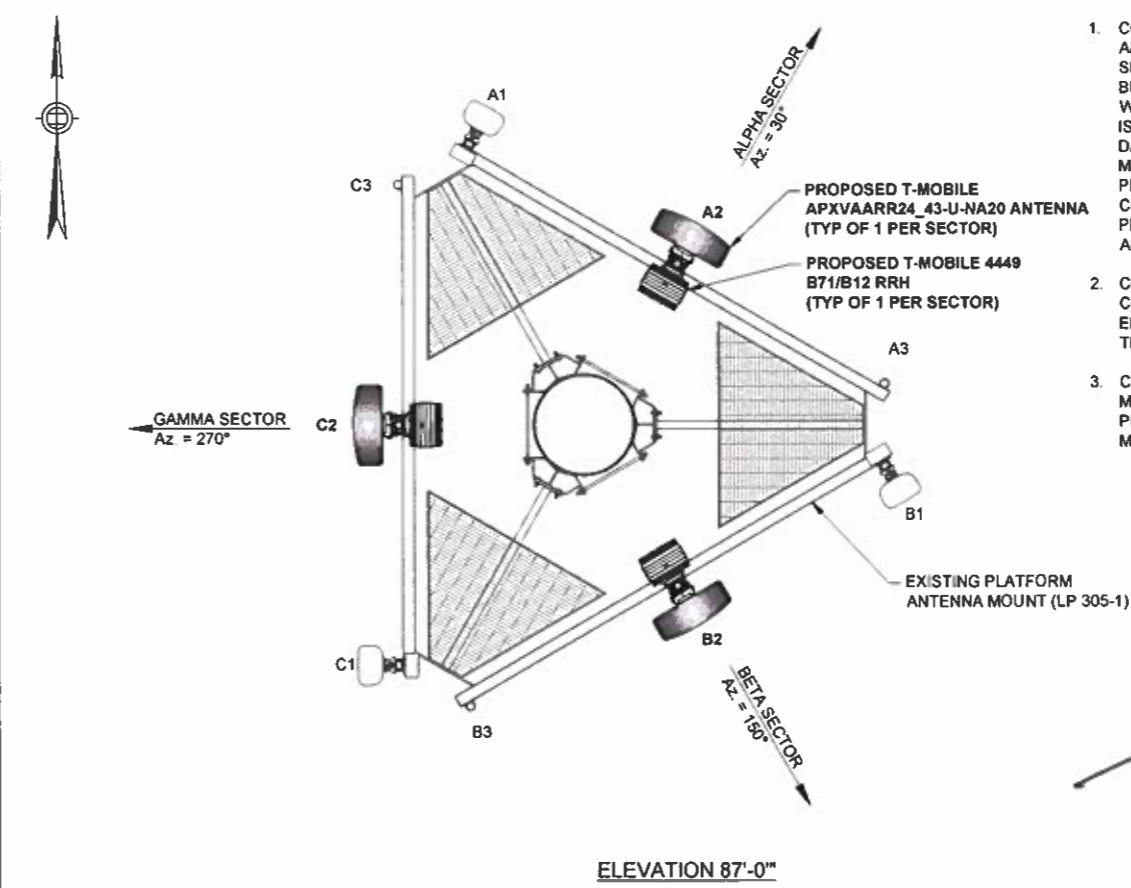


2 EXISTING ANTENNA LAYOUT

SCALE: N.T.S.

NOTES:

- CONTRACTOR SHALL REFER TO THE MOUNT ANALYSIS REPORT. SITE NUMBER: CTNH350A, SITE NAME: NH350/GLOBAL-WOODBURY, CROWN BU NUMBER: 876380, CROWN SITE NAME: O&G WOODBURY, CROWN ORDER NUMBER: 479855, ISSUED BY MASTEC NETWORK SOLUTIONS, DATED ON 05/16/2019. PER THIS ANALYSIS NO MODIFICATIONS ARE REQUIRED FOR THE PROPOSED EQUIPMENT. CONTRACTOR SHALL CONFIRM ALL T-MOBILE EXISTING AND PROPOSED EQUIPMENT ARE INSTALLED IN ACCORDANCE WITH THIS REPORT.
- CONTRACTOR TO VERIFY FINAL RF CONFIGURATION AND NOTIFY CARRIER AND ENGINEER W/ ANY DISCREPANCIES PRIOR TO THE INSTALLATION.
- CONTRACTOR SHALL NOT EXCEED MOUNTING MORE THAN (2) RRHS PER ANTENNA MOUNTING PIPE - RELOCATE TO AN ADJACENT ANTENNA MOUNTING PIPE AS NEEDED.



3 PROPOSED ANTENNA LAYOUT

SCALE: N.T.S.

1 TOWER ELEVATION

SCALE: 3/32" = 1'-0"

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

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

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

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SUBMITTALS

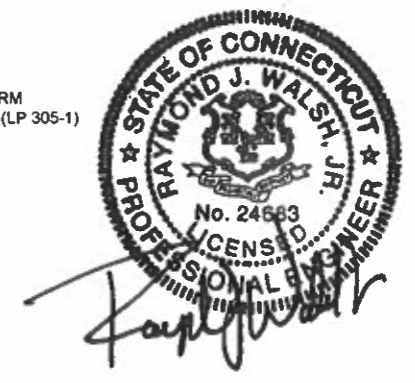
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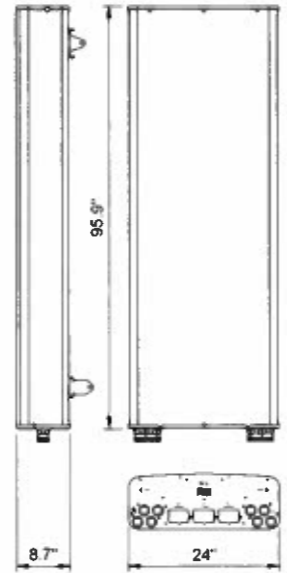
NH350/GLOBAL-WOODBURY
CTNH350A
O&G WOODBURY
876380
202 GREAT HOLLOW ROAD
WOODBURY, CT 06798

PROPOSED TOWER
ELEVATION &
ANTENNA LAYOUT
PLAN

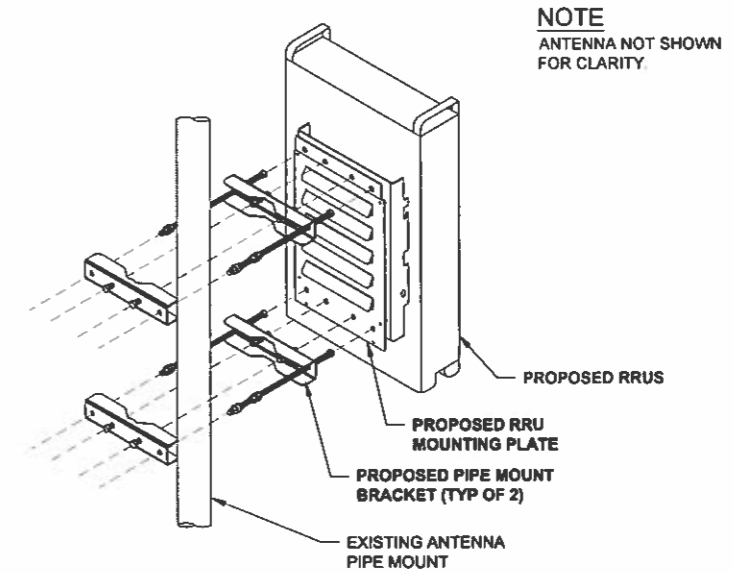
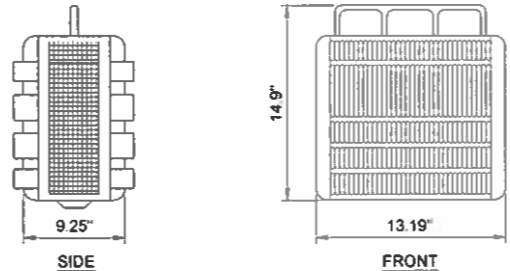
S-1



MANUFACTURER: RFS
 MODEL NO.: APXVAARR24_43-U-NA20
 COLOR: LIGHT GRAY
 DIMENSIONS (LxWxD): 95.9" x 24" x 8.7"
 2436mm x 609mm x 222mm
 WEIGHT (lbs): 58
 CONNECTOR: 8 x 4 3-10 FEMALE AT BOTTOM +
 6 AISG CONNECTORS (3 MALE/3 FEMALE)
 SURVIVAL/RATED WIND VELOCITY (KMH): 241 (150)



MANUFACTURER: ERICSSON
 MODEL NO.: 4449 B71+B12
 COLOR: LIGHT GRAY
 DIMENSIONS (LxWxD): 14.9" x 13.19" x 9.25"
 378mm x 335mm x 235mm
 WEIGHT (lbs): 74



NOTE
 ANTENNA NOT SHOWN
 FOR CLARITY.

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

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

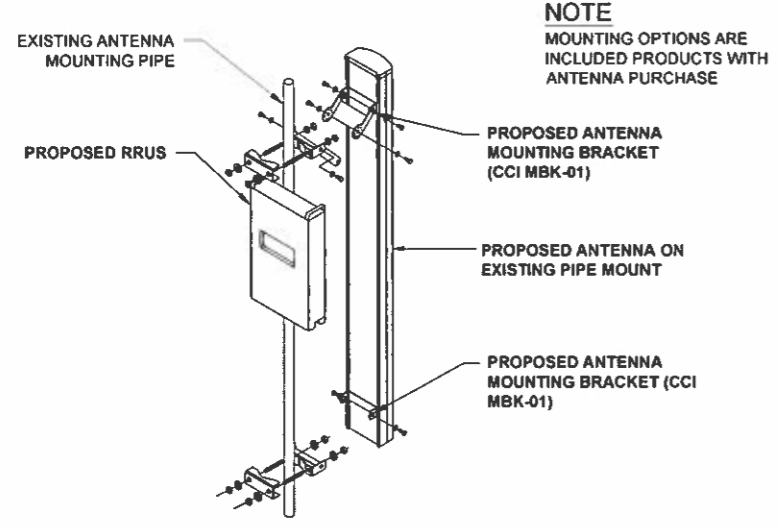
JACOBS
 JACOBS ENGINEERING GROUP, INC.
 120 ST. JAMES AVENUE, 5TH FLOOR
 BOSTON, MA 02116

1 ANTENNA SPECIFICATIONS SCALE: N.T.S.

2 RRUS SPECIFICATIONS SCALE: N.T.S.

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

SCALE: N.T.S.



NOTE
 MOUNTING OPTIONS ARE
 INCLUDED PRODUCTS WITH
 ANTENNA PURCHASE

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

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

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

SCALE: N.T.S.

PROJECT NO: ERCC0004
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NH350/GLOBAL-WOODBURY
 CTNH350A
 O&G WOODBURY
 876380
 202 GREAT HOLLOW ROAD
 WOODBURY, CT 06798

EQUIPMENT
 DETAILS



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

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

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

SCALE: N.T.S.

67D04G - TOWER TOP EQUIPMENT SCHEDULE (RE: NH350/GLOBAL-WOODBURY)													
ANTENNA NUMBER (FROM L TO R)	ANTENNA MODEL	ANTENNA AZIMUTH	MECH. TILT	ELEC. TILT	ANTENNA CENTERLINE FROM GROUND	TMA/RRUS MODEL	TMA/RRUS QUANTITY	COAX/HYBRID CABLE			JUMPERS		
								SIZE/TYPE	QUANTITY	LENGTH	TYPE	QTY	LENGTH
A1	APXV18-206516S-C-A20	30°	0°	2°	87'-0"	TWIN STYLE 1A-PCS TMA	1	1-1/4" COAX	3	130'	-	-	-
A2	APXVAARR24_43-U-NA20	30°	0°	2°	87'-0"	RADIO 4449 B71+B12	1	6x12 HCS	1	130'	-	-	-
B1	APXV18-206516S-C-A20	150°	0°	2°	87'-0"	TWIN STYLE 1A-PCS TMA	1	1-1/4" COAX	3	130'	-	-	-
B2	APXVAARR24_43-U-NA20	150°	0°	2°	87'-0"	RADIO 4449 B71+B12	1	-	-	-	-	-	-
C1	APXV18-206516S-C-A20	270°	0°	2°	87'-0"	TWIN STYLE 1A-PCS TMA	1	1-1/4" COAX	3	130'	-	-	-
C2	APXVAARR24_43-U-NA20	270°	0°	2°	87'-0"	RADIO 4449 B71+B12	1	-	-	-	-	-	-

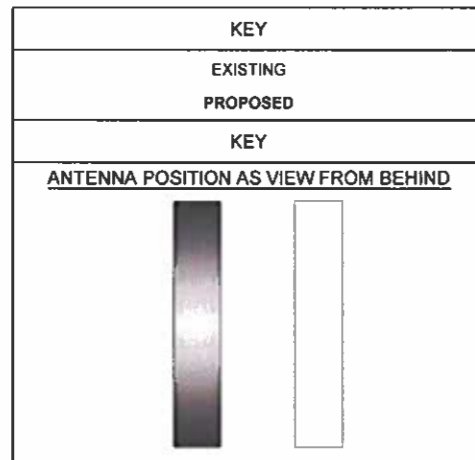
NOTES:

- EQUIPMENT LISTED IN BOLD, DELINEATES THAT THE EQUIPMENT IS PROPOSED
- * DENOTES THAT EQUIPMENT IS TO BE GROUND MOUNTED



1 EQUIPMENT INFORMATION CHART

SCALE: NONE



EQUIPMENT NOTES:

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

67D04G - TOWER LOADING SUMMARY				
EQUIPMENT TYPE	EXISTING QUANTITY	QUANTITY REMOVED	QUANTITY ADDED	TOTAL QUANTITY
PANEL ANTENNA	9	6	3	6
COAX CABLE	12	3	0	9
HYBRID CABLE	0	0	1	1
FIBER JUMPER	0	0	0	0
COAX JUMPER	0	0	0	0
TMA	3	0	0	3
RADIO	0	0	3	3

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NH350/GLOBAL-WOODBURY
CTNH350A
O&G WOODBURY
876380
202 GREAT HOLLOW ROAD
WOODBURY, CT 06798

ANTENNA INFORMATION CHART

RF-1

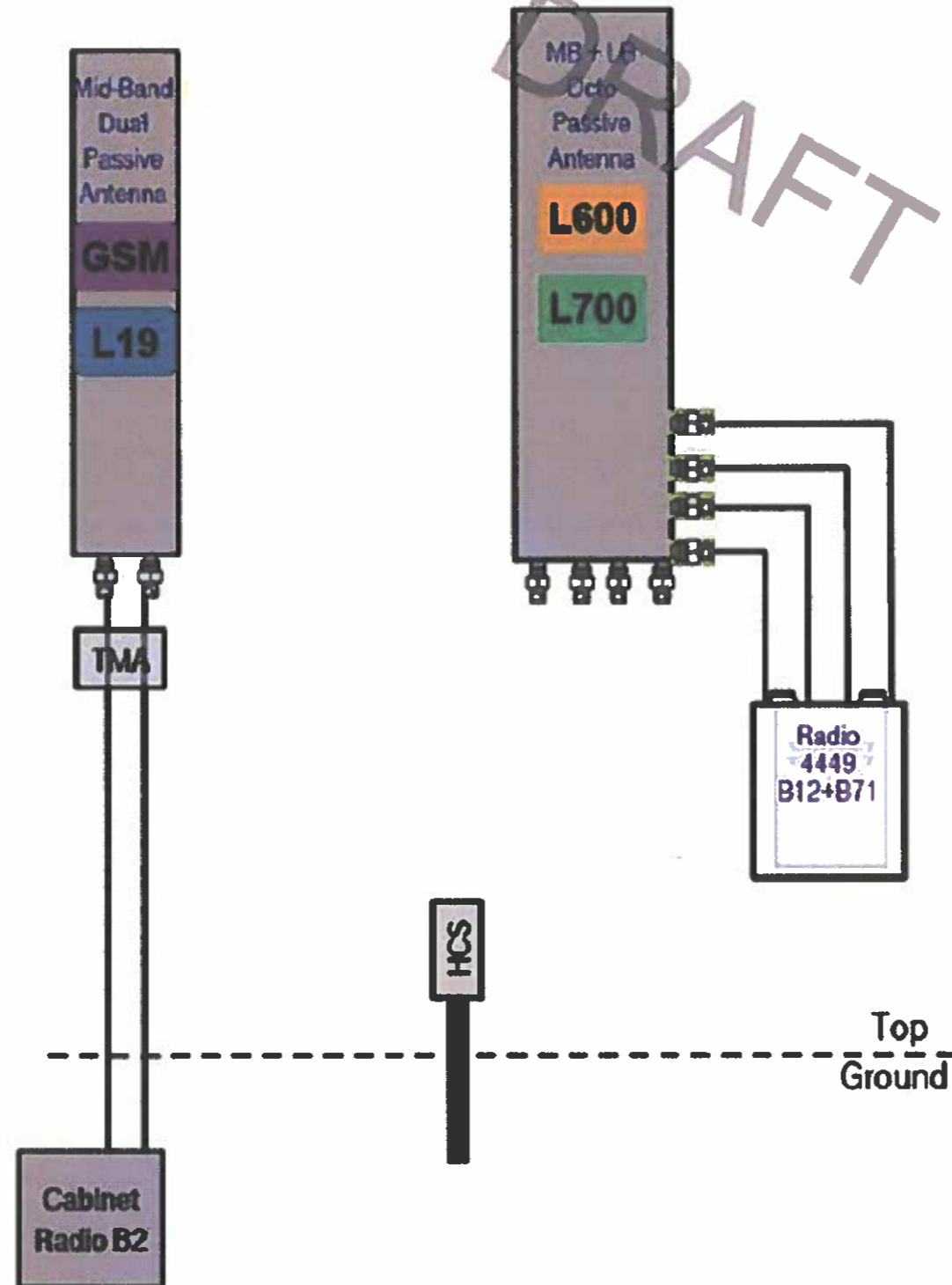
2 ANTENNA KEY

SCALE: NONE

3 ANTENNA & CABLE SCHEDULE

SCALE: NONE

SITE CONFIGURATION: 67D04G



DRAFT



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



3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065



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

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NH350/GLOBAL-WOODBURY
CTNH350A
O&G WOODBURY
876380
202 GREAT HOLLOW ROAD
WOODBURY, CT 06798

RF EQUIPMENT SCHEMATIC

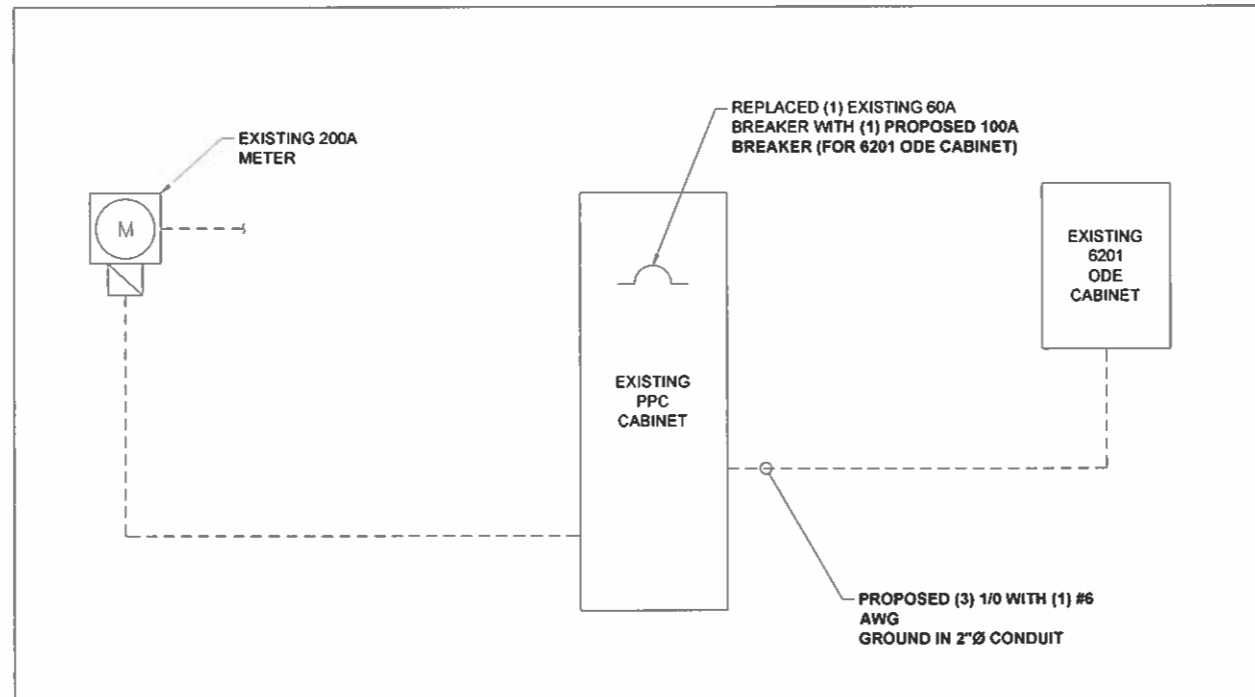
RF-2

ONE LINE DIAGRAM NOTES:

1. ELECTRICAL SERVICE SHALL BE 200A, 240/120V, 1Ø, 3W
2. FOR COMPLETE INTERNAL WIRING AND ARRANGEMENT, REFER TO VENDOR PRINTS PROVIDED BY EQUIPMENT MANUFACTURER.

NOTES:

1. CONTRACTOR SHALL VERIFY AVAILABLE FAULT CURRENT WITH POWER COMPANY AND ENSURE ALL ELECTRICAL EQUIPMENT IS SUITABLE FOR AVAILABLE FAULT CURRENT.
2. CONTRACTOR SHALL COORDINATE UTILITY SERVICES WITH LOCAL UTILITY COMPANIES. VERIFY ALL REQUIREMENTS WITH UTILITY COMPANY STANDARDS.
3. ONE-LINE DIAGRAM IS SCHEMATIC ONLY AND NOT INDICATIVE OF ACTUAL EQUIPMENT LAYOUT.
4. CONTRACTOR SHALL LABEL METER SOCKET WITH SERVICE OWNER NAMEPLATE W/ 1/2" MINIMUM LETTERS.



T-Mobile

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

CROWN CASTLE

3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065

JACOBS

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

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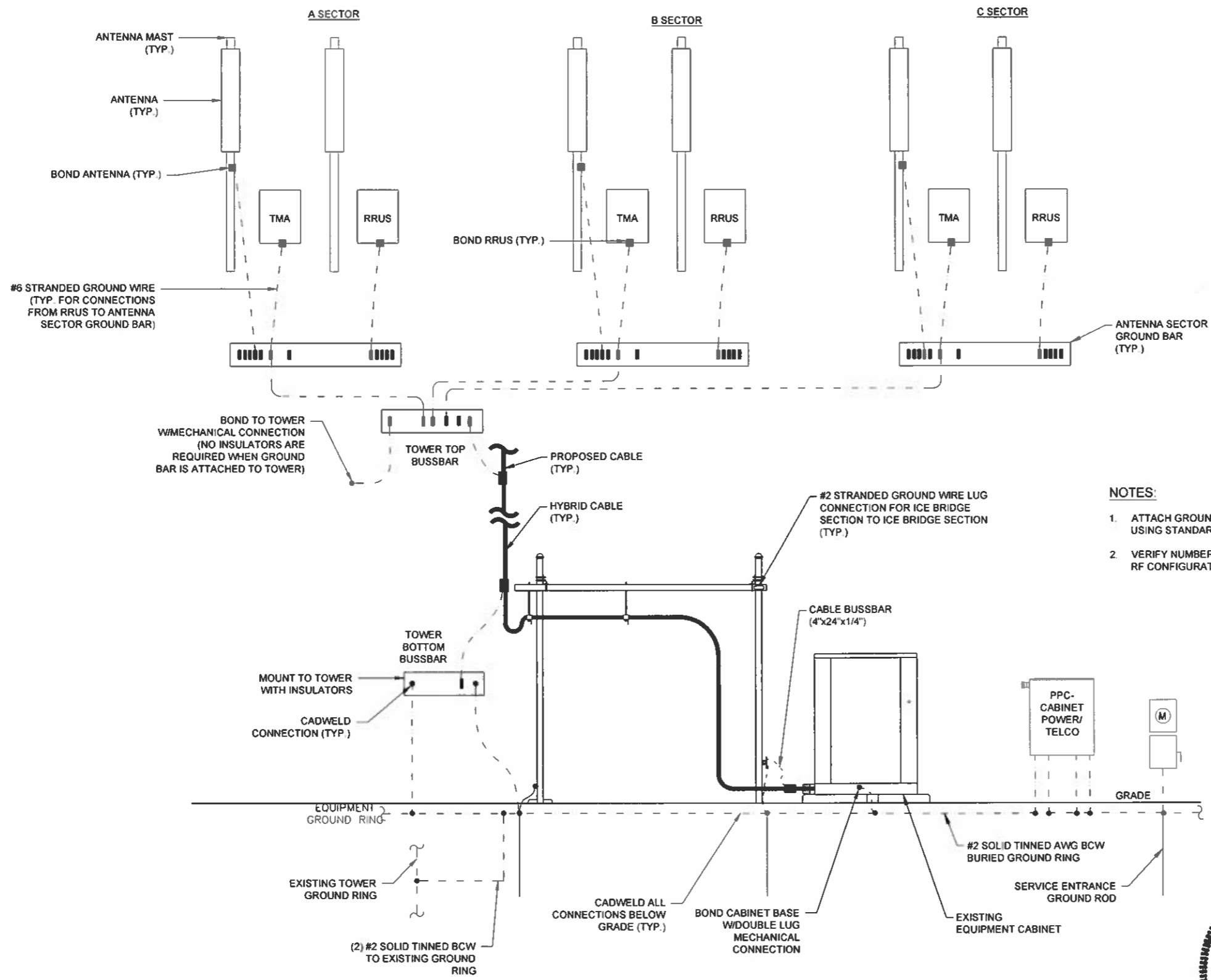
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NH350/GLOBAL-WOODBURY
CTNH350A
O&G WOODBURY
876380
202 GREAT HOLLOW ROAD
WOODBURY, CT 06796

ONE LINE
DIAGRAM

E-1



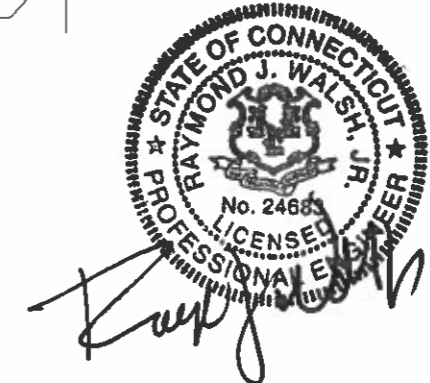


NOTES:

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

GROUNDING NOTES:

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



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



3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065



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

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NH350/GLOBAL-WOODBURY
CTNH350A
O&G WOODBURY
876380
202 GREAT HOLLOW ROAD
WOODBURY, CT 06796

GROUNDING RISER
DIAGRAM

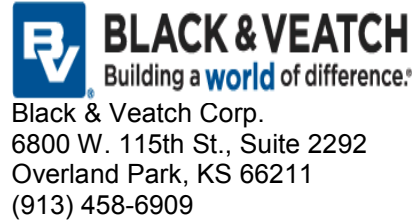
G-1

Exhibit D

Structural Analysis Report

Date: **June 27, 2019**

Steve Tuttle
Crown Castle
3 Corporate Dr
Clifton Park, NY 12065



Subject: **Structural Analysis Report**

Carrier Designation: **T-Mobile Co-Locate**
Carrier Site Number: CTNH350A
Carrier Site Name: NH350/Global-Woodbury

Crown Castle Designation: **Crown Castle BU Number:** 876380
Crown Castle Site Name: O&G WOODBURY
Crown Castle JDE Job Number: 559334
Crown Castle Work Order Number: 1760939
Crown Castle Order Number: 479855 Rev. 0

Engineering Firm Designation: **Black & Veatch Corp. Project Number:** 400087

Site Data: **Great Hollow Road, Woodbury, Litchfield County, CT**
Latitude 41° 31' 19.2", Longitude -73° 13' 14.65"
138.375 Foot - Monopole Tower

Dear Steve Tuttle,

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:

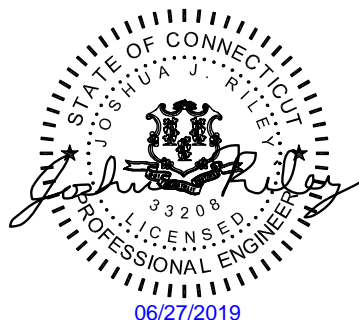
LC4.7: Proposed Equipment Configuration **Sufficient Capacity**

This analysis utilizes an ultimate 3-second gust wind speed of 120 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: Anup Chitale

Respectfully submitted by:

Joshua J. Riley, P.E.
Professional Engineer



Riley, Joshua J
Riley, Joshua J Jun 27 2019 10:08 AM
CSign

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1) INTRODUCTION

This Tower Is A 138.375 Ft Monopole Tower Designed by Engineered Endeavors, Inc.

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

The tower has been modified per reinforcement drawings prepared by Semaan Engineering Solutions, Inc. in November of 2005. Reinforcement consists of addition of base plate stiffeners. Refer to Legacy Modification Inspection Report prepared by Tower Engineering Professionals in March of 2019. This modification is considered ineffective in this analysis.

The tower has been modified per reinforcement drawings prepared by GPD Group, Inc. in December of 2011. Reinforcement consists of addition of new anchor bolts to existing base plate. Refer to Post Modification Inspection Report prepared by GPD Group, Inc. in January of 2013. This modification is considered effective in this analysis.

The tower has been proposed to modify as per the Modification design by Black & Veatch Corp. in April of 2019. Reinforcement consists of (16) base plate stiffener at elevation 0'. All mentioned modifications are considered as effective and are considered in this analysis.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	120 mph
Exposure Category:	B
Topographic Factor:	1
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
87.0	87.0	1	cci tower mounts	Platform Mount [LP 305-1]	10	1 5/8
		3	ericsson	KRY 112 489/2		
		3	ericsson	RADIO 4449 B12/B71		
		3	rfs celwave	APXV18-206516S-C-A20 w/ Mount Pipe		
		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)
138.0	148.0	1	dbspectra	DS9A09F36D-N	14 2 4 2 1	1 1/4 3/8 7/16 3/4 1/2
	139.0	6	cci antennas	TPX-070821		
		3	commscope	ATSBT-TOP-FF-4G		
		3	ericsson	RRUS 32		
		3	ericsson	RRUS 4449 B5/B12		
		3	ericsson	RRUS 4478 B14		
		3	ericsson	RRUS 8843 B2/B66A		
		4	kathrein	80010964 w/ Mount Pipe		
		2	kathrein	80010965 w/ Mount Pipe		
		3	powerwave technologies	7770.00 w/ Mount Pipe		
		3	powerwave technologies	TT19-08BP111-001		
		2	quintel technology	QS46512-2 w/ Mount Pipe		
		1	quintel technology	QS66512-2 w/ Mount Pipe		
		3	raycap	DC6-48-60-18-8F		
	138.0	1	cci tower mounts	Platform Mount [LP 303-1]		
137.0	140.0	3	ericsson	TME-RRUS-11	-	-
	137.0	1	cci tower mounts	Pipe Mount [PM 601-3]		
136.0	148.0	1	telewave	ANT150F6	1	1 1/4
	140.5	1	cci tower mounts	Pipe Mount [PM 601-1]		
129.0	129.0	1	cci tower mounts	Platform Mount [16' LP 304-1]	19	1 5/8
		3	alcatel lucent	RRH2x60-AWS		
		6	andrew	HBXX-6517DS-A2M w/ Mount Pipe		
		3	andrew	LNx-8513DS-A1M w/ Mount Pipe		
		3	antel	BXA-70063/6CF-2 w/ Mount Pipe		
		1	rfs celwave	DB-B1-6C-12AB-0Z		
109.0	109.0	3	alcatel lucent	PCS 1900MHz 4x45W-65MHz	-	-
		3	alcatel lucent	RRH2X50-800		
		3	alcatel lucent	TD-RRH8x20-25		
		1	cci tower mounts	Pipe Mount [PM 601-3]		
		1	cci tower mounts	Side Arm Mount [SO 102-3]		
		9	rfs celwave	ACU-A20-N		
108.0	110.0	3	rfs celwave	APXVTM14-ALU-I20 w/ Mount Pipe	4	1 1/4
	108.0	1	cci tower mounts	Platform Mount [14' LP 714-1]		
		1	cci tower mounts	Miscellaneous [NA 510-1]		
		3	rfs celwave	APXVSPP18-C-A20 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)
70.0	71.0	1	lucent	KS24019-L112A	1	1/2
	70.0	1	cci tower mounts	Side Arm Mount [SO 701-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Dr.Clarence Welti, P.E.	1531967	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Engineered Endeavors, Inc.	2122534	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Engineered Endeavors, Inc.	1533002	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Semaan Engineering Solutions	2055776	CCISITES
4-POST-MODIFICATION INSPECTION	Tower Engineering Professionals	8290781	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	GPD Group, Inc.	3030835	CCISITES
4-POST-MODIFICATION INSPECTION	GPD Group, Inc.	3420974	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Black & Veatch Corp.	8337308	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 have been 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	138.375 - 108.375	Pole	TP24.5x17.375x0.1875	1	-10.01	888.76	59.3	Pass
L2	108.375 - 83.6328	Pole	TP31.88x24.5x0.25	2	-15.47	1476.51	57.6	Pass
L3	83.6328 - 42.9089	Pole	TP43.42x30.0432x0.3125	3	-26.55	2519.51	57.3	Pass
L4	42.9089 - 0	Pole	TP55.5x41.0411x0.3125	4	-40.14	3362.35	65.7	Pass
							Summary	
						Pole (L4)	65.7	Pass
						Rating =	65.7	Pass

Table 5 - Tower Component Stresses vs. Capacity (Monopole Tower) – LC4.7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Flange Bolts	108.377	36.5	Pass
1	Flange Plates		22.6	Pass
1	Anchor Rods	0	46.6	Pass
1	Additional Anchor Rods		33.3	Pass
1	Base Plate		60.1	Pass
1	Base Foundation	0	42.1	Pass
1	Base Foundation Soil Interaction		49.7	Pass

Structure Rating (max from all components) =	65.7%
---	--------------

Note:

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

4.1) Recommendations

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

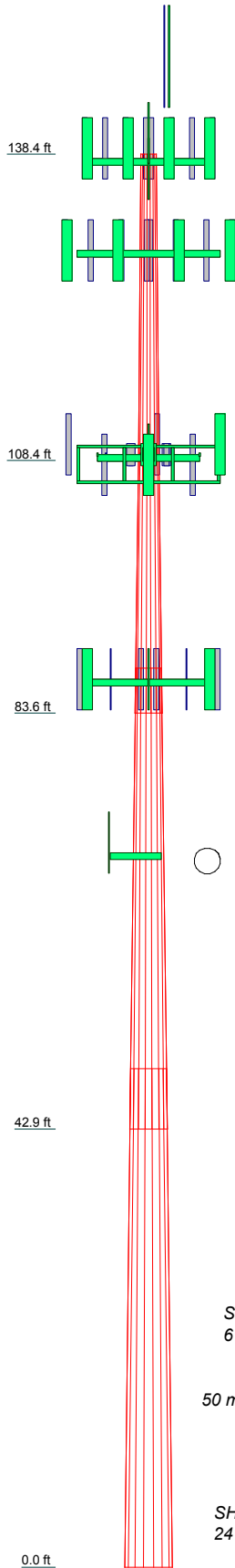
APPENDIX A
TNXTOWER OUTPUT

MATERIAL STRENGTH

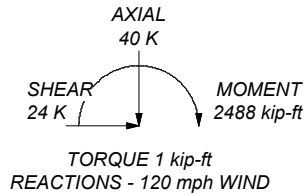
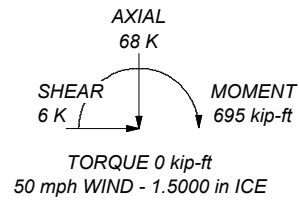
GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Litchfield County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 120 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TIA-222-H Annex S.
9. TOWER RATING: 65.7%



ALL REACTIONS
ARE FACTORED



Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	30.00	18	0.1875	17.3750	24.5000	31.8800	A572-65	1.3
2	24.74	18	0.2500	4.48	24.5000	31.8800	A572-65	1.9
3	45.21	18	0.3125	5.93	30.0432	43.4200	A572-65	5.6
4	46.84	18	0.3125	41.0411	55.5000		A572-65	7.9
								16.6

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Job: **O&G WOODBURY (BU# 876380)**
 Project: **400087 (876380.1760939)**
 Client: Crown Castle
 Code: TIA-222-H
 Path: Y:\TELECOM\2019\Engineering\Projects\CCLISA sites\876380.1760939 - TIA\Structural\876380.1760939 Structural Analysis.dwg
 Drawn by: Anup Chitale
 Date: 06/27/19
 App'd:
 Scale: NTS
 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 Litchfield County, Connecticut.
2. Tower base elevation above sea level: 590.00 ft.
3. Basic wind speed of 120 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 1.5000 in.
10. Ice thickness is considered to increase with height.
11. Ice density of 56 pcf.
12. A wind speed of 50 mph is used in combination with ice.
13. Temperature drop of 50 °F.
14. Deflections calculated using a wind speed of 60 mph.
15. 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
 Consider Moments - Horizontals
 Consider Moments - Diagonals
 Use Moment Magnification
 Use Code Stress Ratios
 Use Code Safety Factors - Guys
 Escalate Ice
 Always Use Max Kz
 Use Special Wind Profile

Include Bolts In Member Capacity

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

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

Autocalc Torque Arm Areas

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

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

Poles

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

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade (65 ksi)
L1	138.38-108.38	30.00	0.00	18	17.3750	24.5000	0.1875	0.7500	A572-65 (65 ksi)
L2	108.38-83.63	24.74	4.48	18	24.5000	31.8800	0.2500	1.0000	A572-65 (65 ksi)
L3	83.63-42.91	45.21	5.93	18	30.0432	43.4200	0.3125	1.2500	A572-65 (65 ksi)
L4	42.91-0.00	48.84		18	41.0411	55.5000	0.3125	1.2500	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	It/Q in ²	w in	w/t
L1	17.6141	10.2287	381.7542	6.1016	8.8265	43.2509	764.0106	5.1153	2.7280	14.549
	24.8490	14.4690	1080.5242	8.6309	12.4460	86.8170	2162.4702	7.2359	3.9820	21.237
L2	24.8394	19.2424	1429.6167	8.6088	12.4460	114.8656	2861.1145	9.6230	3.8720	15.488
	32.3332	25.0984	3172.3563	11.2287	16.1950	195.8844	6348.8868	12.5516	5.1709	20.684
L3	31.8051	29.4891	3293.1328	10.5544	15.2619	215.7742	6590.5988	14.7474	4.7376	15.16
	44.0416	42.7573	10038.132	15.3032	22.0574	455.0922	20089.472	21.3827	7.0919	22.694
L4	43.4079	40.3977	8466.2920	14.4587	20.8489	406.0789	16943.724	20.2027	6.6732	21.354
	56.3080	54.7391	21062.822	19.5916	28.1940	747.0675	42153.359	27.3748	9.2180	29.498

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	Gusset Grade	Adjust. Factor A _r	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontal in	Double Angle Stitch Bolt Spacing Redundants in
L1 138.38-108.38				1	1	1			
L2 108.38-83.63				1	1	1			
L3 83.63-42.91				1	1	1			
L4 42.91-0.00				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
Safety Line 3/8	B	No	Surface Ar (CaAa)	138.38 - 9.00	1	1	0.490 - 0.500	0.3750		0.22
LDF7-50A(1-5/8)	A	No	Surface Ar (CaAa)	129.00 - 8.00	8	7	0.000 - 0.361	1.9800		0.82

LDF4-50A(1/2)	A	No	Surface Ar (CaAa)	70.00 - 8.00	1	1	-0.400 - -0.387	0.6250		0.15

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight plf

FB-L98B-002-75000(3/8)	C	No	No	Inside Pole	138.00 - 0.00	2	No Ice	0.00	0.06
							1/2" Ice	0.00	0.06
							1" Ice	0.00	0.06
							2" Ice	0.00	0.06
WR-VG122ST-BRDA(7/16)	C	No	No	Inside Pole	138.00 - 0.00	4	No Ice	0.00	0.14
							1/2" Ice	0.00	0.14
							1" Ice	0.00	0.14
							2" Ice	0.00	0.14
WR-VG86ST-BRD(3/4)	C	No	No	Inside Pole	138.00 - 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	138.00 - 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

LCF114-50J(1-1/4)	C	No	No	Inside Pole	138.00 - 0.00	2	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
LDF4-50A(1/2)	C	No	No	Inside Pole	138.00 - 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

AVA6-50(1-1/4)	C	No	No	Inside Pole	136.00 - 0.00	1	No Ice	0.00	0.46
							1/2" Ice	0.00	0.46
							1" Ice	0.00	0.46
							2" Ice	0.00	0.46

LDF7-50A(1-5/8)	A	No	No	Inside Pole	129.00 - 0.00	11	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

HB114-1-0813U4-M5J(1-1/4)	C	No	No	Inside Pole	108.00 - 0.00	3	No Ice	0.00	1.20
							1/2" Ice	0.00	1.20
							1" Ice	0.00	1.20
							2" Ice	0.00	1.20
HB114-21U3M12-XXXF(1-1/4)	C	No	No	Inside Pole	108.00 - 0.00	1	No Ice	0.00	1.22
							1/2" Ice	0.00	1.22
							1" Ice	0.00	1.22
							2" Ice	0.00	1.22

LDF7-50A(1-5/8)	C	No	No	Inside Pole	87.00 - 0.00	9	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
HCS 6X12 4AWG(1-5/8)	C	No	No	Inside Pole	87.00 - 0.00	1	No Ice	0.00	2.40
							1/2" Ice	0.00	2.40
							1" Ice	0.00	2.40
							2" Ice	0.00	2.40

Feed Line/Linear Appurtenances Section Areas

Tower Sectio n	Tower Elevation ft	Face	A_R ft ²	A_F ft ²	$C_{AA}A_A$ In Face ft ²	$C_{AA}A_A$ Out Face ft ²	Weight K
L1	138.38-108.38	A	0.000	0.000	28.586	0.000	0.32
		B	0.000	0.000	1.125	0.000	0.01
		C	0.000	0.000	0.000	0.000	0.36
L2	108.38-83.63	A	0.000	0.000	34.293	0.000	0.39
		B	0.000	0.000	0.928	0.000	0.01
		C	0.000	0.000	0.000	0.000	0.45
L3	83.63-42.91	A	0.000	0.000	58.137	0.000	0.64
		B	0.000	0.000	1.527	0.000	0.01
		C	0.000	0.000	0.000	0.000	1.09
L4	42.91-0.00	A	0.000	0.000	50.566	0.000	0.62
		B	0.000	0.000	1.272	0.000	0.01
		C	0.000	0.000	0.000	0.000	1.15

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Sectio n	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft ²	A_F ft ²	$C_{AA}A_A$ In Face ft ²	$C_{AA}A_A$ Out Face ft ²	Weight K
L1	138.38-108.38	A	1.454	0.000	0.000	43.229	0.000	0.81
		B		0.000	0.000	9.847	0.000	0.10
		C		0.000	0.000	0.000	0.000	0.36
L2	108.38-83.63	A	1.418	0.000	0.000	51.636	0.000	0.95
		B		0.000	0.000	7.944	0.000	0.08
		C		0.000	0.000	0.000	0.000	0.45
L3	83.63-42.91	A	1.359	0.000	0.000	94.365	0.000	1.67
		B		0.000	0.000	13.076	0.000	0.14
		C		0.000	0.000	0.000	0.000	1.09
L4	42.91-0.00	A	1.216	0.000	0.000	84.016	0.000	1.51
		B		0.000	0.000	10.491	0.000	0.11
		C		0.000	0.000	0.000	0.000	1.15

Feed Line Center of Pressure

Section	Elevation ft	CP_x in	CP_z in	CP_x Ice in	CP_z Ice in
L1	138.38-108.38	-3.2144	-4.1749	-1.8621	-2.8212
L2	108.38-83.63	-4.2204	-5.4444	-2.7315	-3.9125
L3	83.63-42.91	-4.7577	-5.8036	-3.5366	-4.0345
L4	42.91-0.00	-4.4111	-5.2469	-3.5674	-3.7156

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

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	1	Safety Line 3/8	108.38 - 138.38	1.0000	1.0000
L1	14	LDF7-50A(1-5/8)	108.38 - 129.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L2	1	Safety Line 3/8	83.63 - 108.38	1.0000	1.0000
L2	14	LDF7-50A(1-5/8)	83.63 - 108.38	1.0000	1.0000
L2	26	LDF4-50A(1/2)	83.63 - 70.00	1.0000	1.0000
L3	1	Safety Line 3/8	42.91 - 83.63	1.0000	1.0000
L3	14	LDF7-50A(1-5/8)	42.91 - 83.63	1.0000	1.0000
L3	26	LDF4-50A(1/2)	42.91 - 70.00	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
138									
Platform Mount [LP 303-1]	C	None		0.0000	138.00	No Ice	14.66	14.66	1.25
						1/2" Ice	18.87	18.87	1.48
						Ice	23.08	23.08	1.71
						1" Ice	31.50	31.50	2.18
						2" Ice			
5'x2" Mount Pipe	C	From Face	1.00 0.00 2.50	0.0000	138.00	No Ice	1.19	1.19	0.02
						1/2" Ice	1.50	1.50	0.03
						Ice	1.81	1.81	0.04
						1" Ice	2.46	2.46	0.08
						2" Ice			
7770.00 w/ Mount Pipe	A	From Face	3.00 -6.00 1.00	0.0000	138.00	No Ice	5.75	4.25	0.06
						1/2" Ice	6.18	5.01	0.10
						Ice	6.61	5.71	0.16
						1" Ice	7.49	7.16	0.29
						2" Ice			
7770.00 w/ Mount Pipe	B	From Face	3.00 -2.00 1.00	0.0000	138.00	No Ice	5.75	4.25	0.06
						1/2" Ice	6.18	5.01	0.10
						Ice	6.61	5.71	0.16
						1" Ice	7.49	7.16	0.29
						2" Ice			
7770.00 w/ Mount Pipe	C	From Face	3.00 -6.00 1.00	0.0000	138.00	No Ice	5.75	4.25	0.06
						1/2" Ice	6.18	5.01	0.10
						Ice	6.61	5.71	0.16
						1" Ice	7.49	7.16	0.29
						2" Ice			
80010965 w/ Mount Pipe	A	From Face	3.00 -2.00 1.00	0.0000	138.00	No Ice	14.05	7.63	0.13
						1/2" Ice	14.69	8.90	0.22
						Ice	15.30	9.96	0.33
						1" Ice	16.53	11.92	0.57
						2" Ice			
80010965 w/ Mount Pipe	A	From Face	3.00 2.00 1.00	0.0000	138.00	No Ice	14.05	7.63	0.13
						1/2" Ice	14.69	8.90	0.22
						Ice	15.30	9.96	0.33
						1" Ice	16.53	11.92	0.57
						2" Ice			
QS66512-2 w/ Mount Pipe	A	From Face	3.00 6.00 1.00	0.0000	138.00	No Ice	8.64	6.66	0.14
						1/2" Ice	9.29	9.66	0.21
						Ice	9.91	10.62	0.30
						1" Ice	11.18	12.61	0.49

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
QS46512-2 w/ Mount Pipe	B	From Face	3.00 6.00 1.00	0.0000	138.00	2" Ice			
						No Ice	5.79	6.35	0.12
						1/2"	6.21	7.06	0.18
						Ice	6.62	7.74	0.25
QS46512-2 w/ Mount Pipe	C	From Face	3.00 6.00 1.00	0.0000	138.00	1" Ice	7.48	9.14	0.40
						2" Ice			
						No Ice	5.79	6.35	0.12
						1/2"	6.21	7.06	0.18
80010964 w/ Mount Pipe	B	From Face	3.00 -6.00 1.00	0.0000	138.00	Ice	6.62	7.74	0.25
						1" Ice	7.48	9.14	0.40
						2" Ice			
						No Ice	10.23	5.51	0.11
80010964 w/ Mount Pipe	B	From Face	3.00 2.00 1.00	0.0000	138.00	1/2"	10.74	6.37	0.18
						Ice	11.24	7.12	0.26
						1" Ice	12.25	8.64	0.45
						2" Ice			
80010964 w/ Mount Pipe	C	From Face	3.00 -2.00 1.00	0.0000	138.00	No Ice	10.23	5.51	0.11
						1/2"	10.74	6.37	0.18
						Ice	11.24	7.12	0.26
						1" Ice	12.25	8.64	0.45
80010964 w/ Mount Pipe	C	From Face	3.00 2.00 1.00	0.0000	138.00	2" Ice			
						No Ice	10.23	5.51	0.11
						1/2"	10.74	6.37	0.18
						Ice	11.24	7.12	0.26
TT19-08BP111-001	A	From Face	3.00 0.00 1.00	0.0000	138.00	1" Ice	12.25	8.64	0.45
						2" Ice			
						No Ice	0.55	0.45	0.02
						1/2"	0.65	0.53	0.02
TT19-08BP111-001	B	From Face	3.00 0.00 1.00	0.0000	138.00	Ice	0.75	0.63	0.03
						1" Ice	0.98	0.84	0.05
						2" Ice			
						No Ice	0.55	0.45	0.02
TT19-08BP111-001	C	From Face	3.00 0.00 1.00	0.0000	138.00	1/2"	0.65	0.53	0.02
						Ice	0.75	0.63	0.03
						1" Ice	0.98	0.84	0.05
						2" Ice			
RRUS 4478 B14	A	From Face	3.00 0.00 1.00	0.0000	138.00	No Ice	1.84	1.06	0.06
						1/2"	2.01	1.20	0.08
						Ice	2.19	1.34	0.09
						1" Ice	2.57	1.66	0.14
RRUS 4478 B14	B	From Face	3.00 0.00 1.00	0.0000	138.00	2" Ice			
						No Ice	1.84	1.06	0.06
						1/2"	2.01	1.20	0.08
						Ice	2.19	1.34	0.09
RRUS 4478 B14	C	From Face	3.00 0.00 1.00	0.0000	138.00	1" Ice	2.57	1.66	0.14
						2" Ice			
						No Ice	1.84	1.06	0.06
						1/2"	2.01	1.20	0.08
RRUS 32	A	From Face	3.00 0.00 1.00	0.0000	138.00	Ice	2.19	1.34	0.09
						1" Ice	2.57	1.66	0.14
						2" Ice			
						No Ice	2.86	1.78	0.06
						1/2"	3.08	1.97	0.08
						Ice	3.32	2.17	0.10
						1" Ice	3.81	2.58	0.16
						2" Ice			

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
RRUS 32	B	From Face	3.00 0.00 1.00	0.0000	138.00	2" Ice			
						No Ice	2.86	1.78	0.06
						1/2"	3.08	1.97	0.08
						Ice	3.32	2.17	0.10
						1" Ice	3.81	2.58	0.16
RRUS 32	C	From Face	3.00 0.00 1.00	0.0000	138.00	2" Ice			
						No Ice	2.86	1.78	0.06
						1/2"	3.08	1.97	0.08
						Ice	3.32	2.17	0.10
						1" Ice	3.81	2.58	0.16
ATSBT-TOP-FF-4G	A	From Face	3.00 0.00 1.00	0.0000	138.00	2" Ice			
						No Ice	0.17	0.09	0.00
						1/2"	0.23	0.14	0.00
						Ice	0.29	0.19	0.01
						1" Ice	0.44	0.32	0.01
ATSBT-TOP-FF-4G	B	From Face	3.00 0.00 1.00	0.0000	138.00	2" Ice			
						No Ice	0.17	0.09	0.00
						1/2"	0.23	0.14	0.00
						Ice	0.29	0.19	0.01
						1" Ice	0.44	0.32	0.01
ATSBT-TOP-FF-4G	C	From Face	3.00 0.00 1.00	0.0000	138.00	2" Ice			
						No Ice	0.17	0.09	0.00
						1/2"	0.23	0.14	0.00
						Ice	0.29	0.19	0.01
						1" Ice	0.44	0.32	0.01
(2) TPX-070821	A	From Face	3.00 0.00 1.00	0.0000	138.00	2" Ice			
						No Ice	0.47	0.10	0.01
						1/2"	0.56	0.15	0.01
						Ice	0.66	0.20	0.02
						1" Ice	0.87	0.33	0.03
(2) TPX-070821	B	From Face	3.00 0.00 1.00	0.0000	138.00	2" Ice			
						No Ice	0.47	0.10	0.01
						1/2"	0.56	0.15	0.01
						Ice	0.66	0.20	0.02
						1" Ice	0.87	0.33	0.03
(2) TPX-070821	C	From Face	3.00 0.00 1.00	0.0000	138.00	2" Ice			
						No Ice	0.47	0.10	0.01
						1/2"	0.56	0.15	0.01
						Ice	0.66	0.20	0.02
						1" Ice	0.87	0.33	0.03
RRUS 4449 B5/B12	A	From Face	3.00 0.00 1.00	0.0000	138.00	2" Ice			
						No Ice	1.97	1.41	0.07
						1/2"	2.14	1.56	0.09
						Ice	2.33	1.73	0.11
						1" Ice	2.72	2.07	0.16
RRUS 4449 B5/B12	B	From Face	3.00 0.00 1.00	0.0000	138.00	2" Ice			
						No Ice	1.97	1.41	0.07
						1/2"	2.14	1.56	0.09
						Ice	2.33	1.73	0.11
						1" Ice	2.72	2.07	0.16
RRUS 4449 B5/B12	C	From Face	3.00 0.00 1.00	0.0000	138.00	2" Ice			
						No Ice	1.97	1.41	0.07
						1/2"	2.14	1.56	0.09
						Ice	2.33	1.73	0.11
						1" Ice	2.72	2.07	0.16
RRUS 8843 B2/B66A	A	From Face	3.00 0.00 1.00	0.0000	138.00	2" Ice			
						No Ice	1.64	1.35	0.07
						1/2"	1.80	1.50	0.09
						Ice	1.97	1.65	0.11
						1" Ice	2.32	1.99	0.16
RRUS 8843 B2/B66A	B	From Face	3.00 0.00 1.00	0.0000	138.00	2" Ice			
						No Ice	1.64	1.35	0.07
						1/2"	1.80	1.50	0.09
						Ice	1.97	1.65	0.11
						1" Ice	2.32	1.99	0.16

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
RRUS 8843 B2/B66A	C	From Face	3.00	0.0000	138.00	2" Ice			
			0.00			No Ice	1.64	1.35	0.07
			1.00			1/2"	1.80	1.50	0.09
						Ice	1.97	1.65	0.11
						1" Ice	2.32	1.99	0.16
DC6-48-60-18-8F	A	From Face	1.00	0.0000	138.00	2" Ice			
			0.00			No Ice	0.92	0.92	0.02
			1.00			1/2"	1.46	1.46	0.04
						Ice	1.64	1.64	0.06
						1" Ice	2.04	2.04	0.11
DC6-48-60-18-8F	B	From Face	1.00	0.0000	138.00	2" Ice			
			0.00			No Ice	0.92	0.92	0.02
			1.00			1/2"	1.46	1.46	0.04
						Ice	1.64	1.64	0.06
						1" Ice	2.04	2.04	0.11
DC6-48-60-18-8F	C	From Face	1.00	0.0000	138.00	2" Ice			
			0.00			No Ice	0.92	0.92	0.02
			1.00			1/2"	1.46	1.46	0.04
						Ice	1.64	1.64	0.06
						1" Ice	2.04	2.04	0.11
DS9A09F36D-N	C	From Face	1.00	0.0000	138.00	2" Ice			
			-2.00			No Ice	6.33	6.33	0.08
			10.00			1/2"	8.47	8.47	0.12
						Ice	10.63	10.63	0.18
						1" Ice	14.99	14.99	0.34
137 Pipe Mount [PM 601-3]	C	None		0.0000	137.00	2" Ice			
						No Ice	4.39	4.39	0.20
						1/2"	5.48	5.48	0.24
						Ice	6.57	6.57	0.28
						1" Ice	8.75	8.75	0.36
TME-RRUS-11	A	From Face	1.00	0.0000	137.00	2" Ice			
			0.00			No Ice	2.78	1.19	0.05
			3.00			1/2"	2.99	1.33	0.07
						Ice	3.21	1.49	0.09
						1" Ice	3.66	1.83	0.15
TME-RRUS-11	B	From Face	1.00	0.0000	137.00	2" Ice			
			0.00			No Ice	2.78	1.19	0.05
			3.00			1/2"	2.99	1.33	0.07
						Ice	3.21	1.49	0.09
						1" Ice	3.66	1.83	0.15
TME-RRUS-11	C	From Face	1.00	0.0000	137.00	2" Ice			
			0.00			No Ice	2.78	1.19	0.05
			3.00			1/2"	2.99	1.33	0.07
						Ice	3.21	1.49	0.09
						1" Ice	3.66	1.83	0.15
136 Pipe Mount [PM 601-1]	B	From Face	0.50	0.0000	136.00	2" Ice			
			0.00			No Ice	3.00	0.90	0.07
			4.50			1/2"	3.74	1.12	0.08
						Ice	4.48	1.34	0.09
						1" Ice	5.96	1.78	0.12
ANT150F6	B	From Face	1.00	0.0000	136.00	2" Ice			
			0.00			No Ice	4.80	4.80	0.03
			12.00			1/2"	6.83	6.83	0.07
						Ice	8.87	8.87	0.11
						1" Ice	13.01	13.01	0.25
129 Platform Mount [16' LP 304-1]	C	None		0.0000	129.00	2" Ice			
						No Ice	19.27	19.27	1.49
						1/2"	24.76	24.76	1.79
						Ice	30.26	30.26	2.10
						1" Ice	41.25	41.25	2.70
HBXX-6517DS-A2M w/	A	From Face	4.00	0.0000	129.00	No Ice	7.97	5.99	0.08

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
Mount Pipe			-8.00 0.00			1/2" Ice 1" Ice 2" Ice	8.73 6.72 9.51 7.47 11.11 9.02	0.14 0.21 0.40	
HBXX-6517DS-A2M w/ Mount Pipe	B	From Face	4.00 -8.00 0.00	0.0000	129.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.97 8.73 9.51 11.11 9.02	5.99 6.72 7.47 9.02	0.08 0.14 0.21 0.40
HBXX-6517DS-A2M w/ Mount Pipe	C	From Face	4.00 -8.00 0.00	0.0000	129.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.97 8.73 9.51 11.11 9.02	5.99 6.72 7.47 9.02	0.08 0.14 0.21 0.40
BXA-70063/6CF-2 w/ Mount Pipe	A	From Face	4.00 -3.00 0.00	0.0000	129.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.81 8.36 8.87 9.93 9.18	5.40 6.55 7.41 9.18	0.04 0.10 0.17 0.33
BXA-70063/6CF-2 w/ Mount Pipe	B	From Face	4.00 -3.00 0.00	0.0000	129.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.81 8.36 8.87 9.93 9.18	5.40 6.55 7.41 9.18	0.04 0.10 0.17 0.33
BXA-70063/6CF-2 w/ Mount Pipe	C	From Face	4.00 -3.00 0.00	0.0000	129.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.81 8.36 8.87 9.93 9.18	5.40 6.55 7.41 9.18	0.04 0.10 0.17 0.33
LNx-8513DS-A1M w/ Mount Pipe	A	From Face	4.00 3.00 0.00	0.0000	129.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.41 8.97 9.50 10.59 11.02	7.08 8.27 9.18 11.02	0.06 0.13 0.21 0.39
LNx-8513DS-A1M w/ Mount Pipe	B	From Face	4.00 3.00 0.00	0.0000	129.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.41 8.97 9.50 10.59 11.02	7.08 8.27 9.18 11.02	0.06 0.13 0.21 0.39
LNx-8513DS-A1M w/ Mount Pipe	C	From Face	4.00 3.00 0.00	0.0000	129.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.41 8.97 9.50 10.59 11.02	7.08 8.27 9.18 11.02	0.06 0.13 0.21 0.39
HBXX-6517DS-A2M w/ Mount Pipe	A	From Face	4.00 8.00 0.00	0.0000	129.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.97 8.73 9.51 11.11 9.02	5.99 6.72 7.47 9.02	0.08 0.14 0.21 0.40
HBXX-6517DS-A2M w/ Mount Pipe	B	From Face	4.00 8.00 0.00	0.0000	129.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.97 8.73 9.51 11.11 9.02	5.99 6.72 7.47 9.02	0.08 0.14 0.21 0.40
HBXX-6517DS-A2M w/ Mount Pipe	C	From Face	4.00 8.00 0.00	0.0000	129.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.97 8.73 9.51 11.11 9.02	5.99 6.72 7.47 9.02	0.08 0.14 0.21 0.40
RRH2x60-AWS	A	From Face	4.00 0.00 0.00	0.0000	129.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.50 3.76 4.03 4.58 3.09	2.10 2.34 2.58 3.09	0.06 0.08 0.11 0.18
RRH2x60-AWS	B	From Face	4.00	0.0000	129.00	No Ice	3.50	2.10	0.06

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A _{Front}	C _A A _{Side}	Weight	
			Horz	Lateral						Vert
			ft	ft	°	ft	ft ²	ft ²	K	
			0.00			1/2"	3.76	2.34	0.08	
			0.00			Ice	4.03	2.58	0.11	
						1" Ice	4.58	3.09	0.18	
						2" Ice				
RRH2x60-AWS	C	From Face	4.00		0.0000	129.00	No Ice	3.50	2.10	0.06
			0.00				1/2"	3.76	2.34	0.08
			0.00				Ice	4.03	2.58	0.11
							1" Ice	4.58	3.09	0.18
							2" Ice			
DB-B1-6C-12AB-0Z	A	From Face	1.00		0.0000	129.00	No Ice	3.36	2.19	0.02
			0.00				1/2"	3.60	2.39	0.05
			0.00				Ice	3.84	2.61	0.08
							1" Ice	4.34	3.05	0.16
							2" Ice			
*** *** ***109***										
Side Arm Mount [SO 102-3]	C	None			0.0000	109.00	No Ice	3.00	3.00	0.08
							1/2"	3.48	3.48	0.11
							Ice	3.96	3.96	0.14
							1" Ice	4.92	4.92	0.20
							2" Ice			
Pipe Mount [PM 601-3]	C	From Face	0.50		0.0000	109.00	No Ice	4.39	4.39	0.20
			0.00				1/2"	5.48	5.48	0.24
			0.00				Ice	6.57	6.57	0.28
							1" Ice	8.75	8.75	0.36
							2" Ice			
TD-RRH8x20-25	A	From Face	1.00		0.0000	109.00	No Ice	4.05	1.53	0.07
			0.00				1/2"	4.30	1.71	0.10
			0.00				Ice	4.56	1.90	0.13
							1" Ice	5.10	2.30	0.20
							2" Ice			
TD-RRH8x20-25	B	From Face	1.00		0.0000	109.00	No Ice	4.05	1.53	0.07
			0.00				1/2"	4.30	1.71	0.10
			0.00				Ice	4.56	1.90	0.13
							1" Ice	5.10	2.30	0.20
							2" Ice			
TD-RRH8x20-25	C	From Face	1.00		0.0000	109.00	No Ice	4.05	1.53	0.07
			0.00				1/2"	4.30	1.71	0.10
			0.00				Ice	4.56	1.90	0.13
							1" Ice	5.10	2.30	0.20
							2" Ice			
PCS 1900MHz 4x45W-65MHz	A	From Face	1.00		0.0000	109.00	No Ice	2.32	2.24	0.06
			0.00				1/2"	2.53	2.44	0.08
			0.00				Ice	2.74	2.65	0.11
							1" Ice	3.19	3.09	0.17
							2" Ice			
PCS 1900MHz 4x45W-65MHz	B	From Face	1.00		0.0000	109.00	No Ice	2.32	2.24	0.06
			0.00				1/2"	2.53	2.44	0.08
			0.00				Ice	2.74	2.65	0.11
							1" Ice	3.19	3.09	0.17
							2" Ice			
PCS 1900MHz 4x45W-65MHz	C	From Face	1.00		0.0000	109.00	No Ice	2.32	2.24	0.06
			0.00				1/2"	2.53	2.44	0.08
			0.00				Ice	2.74	2.65	0.11
							1" Ice	3.19	3.09	0.17
							2" Ice			
RRH2X50-800	A	From Face	1.00		0.0000	109.00	No Ice	1.70	1.28	0.05
			0.00				1/2"	1.86	1.43	0.07
			0.00				Ice	2.03	1.58	0.09
							1" Ice	2.40	1.91	0.14
							2" Ice			
RRH2X50-800	B	From Face	1.00		0.0000	109.00	No Ice	1.70	1.28	0.05
			0.00				1/2"	1.86	1.43	0.07
			0.00				Ice	2.03	1.58	0.09

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K	
RRH2X50-800	C	From Face	1.00 0.00 0.00	0.0000	109.00	1" Ice	2.40	1.91	0.14
						2" Ice	1.70	1.28	0.05
						No Ice	1.86	1.43	0.07
						1/2" Ice	2.03	1.58	0.09
						1" Ice	2.40	1.91	0.14
(3) ACU-A20-N	A	From Face	1.00 0.00 0.00	0.0000	109.00	2" Ice	0.07	0.12	0.00
						No Ice	0.10	0.16	0.00
						1/2" Ice	0.15	0.21	0.00
						1" Ice	0.26	0.34	0.01
						2" Ice	0.07	0.12	0.00
(3) ACU-A20-N	B	From Face	1.00 0.00 0.00	0.0000	109.00	No Ice	0.10	0.16	0.00
						1/2" Ice	0.15	0.21	0.00
						1" Ice	0.26	0.34	0.01
						2" Ice	0.07	0.12	0.00
						No Ice	0.10	0.16	0.00
(3) ACU-A20-N	C	From Face	1.00 0.00 0.00	0.0000	109.00	1" Ice	0.15	0.21	0.00
						2" Ice	0.26	0.34	0.01
						No Ice	0.07	0.12	0.00
						1/2" Ice	0.10	0.16	0.00
						Ice	0.15	0.21	0.00
108 Platform Mount [14' LP 714-1]	C	None		0.0000	108.00	No Ice	34.97	34.97	1.49
						1/2" Ice	41.28	41.28	1.90
						Ice	47.59	47.59	2.31
						1" Ice	60.21	60.21	3.14
						2" Ice	6.00	6.00	0.26
Miscellaneous [NA 510-1]	C	None		0.0000	108.00	No Ice	8.50	8.50	0.34
						1/2" Ice	11.00	11.00	0.42
						1" Ice	16.00	16.00	0.59
						2" Ice	1.43	1.43	0.02
						No Ice	1.92	1.92	0.03
6'x2" Mount Pipe	A	From Face	4.00 7.00 0.00	0.0000	108.00	Ice	2.29	2.29	0.05
						1" Ice	3.06	3.06	0.09
						2" Ice	1.43	1.43	0.02
						No Ice	1.92	1.92	0.03
						1/2" Ice	2.29	2.29	0.05
6'x2" Mount Pipe	B	From Face	4.00 7.00 0.00	0.0000	108.00	1" Ice	3.06	3.06	0.09
						2" Ice	1.43	1.43	0.02
						No Ice	1.92	1.92	0.03
						1/2" Ice	2.29	2.29	0.05
						Ice	2.29	2.29	0.05
6'x2" Mount Pipe	C	From Face	4.00 7.00 0.00	0.0000	108.00	1" Ice	3.06	3.06	0.09
						2" Ice	1.43	1.43	0.02
						No Ice	1.92	1.92	0.03
						1/2" Ice	2.29	2.29	0.05
						Ice	2.29	2.29	0.05
APXVTM14-ALU-I20 w/ Mount Pipe	A	From Face	4.00 -7.00 2.00	0.0000	108.00	2" Ice	4.09	2.86	0.08
						No Ice	4.48	3.23	0.13
						1/2" Ice	4.88	3.61	0.19
						1" Ice	5.71	4.40	0.33
						2" Ice	4.09	2.86	0.08
APXVTM14-ALU-I20 w/ Mount Pipe	B	From Face	4.00 -7.00 2.00	0.0000	108.00	No Ice	4.48	3.23	0.13
						1/2" Ice	4.88	3.61	0.19
						1" Ice	5.71	4.40	0.33
						2" Ice	4.09	2.86	0.08
						No Ice	4.48	3.23	0.13
APXVTM14-ALU-I20 w/ Mount Pipe	C	From Face	4.00 -7.00 2.00	0.0000	108.00	Ice	4.88	3.61	0.19
						1" Ice	5.71	4.40	0.33
						2" Ice	4.09	2.86	0.08
						No Ice	4.48	3.23	0.13
						1/2" Ice	4.88	3.61	0.19
APXVSP18-C-A20 w/ Mount Pipe	A	From Face	4.00 0.00	0.0000	108.00	1" Ice	4.60	4.01	0.10
						2" Ice	5.05	4.45	0.16
						No Ice			
						1/2" Ice			
						Ice			

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
			0.00			Ice 5.50	4.89	0.23
						1" Ice 6.44	5.82	0.42
						2" Ice		
APXVSPP18-C-A20 w/ Mount Pipe	B	From Face	4.00 0.00 0.00	0.0000	108.00	No Ice 4.60	4.01	0.10
						1/2" 5.05	4.45	0.16
						Ice 5.50	4.89	0.23
						1" Ice 6.44	5.82	0.42
						2" Ice		
APXVSPP18-C-A20 w/ Mount Pipe	C	From Face	4.00 0.00 0.00	0.0000	108.00	No Ice 4.60	4.01	0.10
						1/2" 5.05	4.45	0.16
						Ice 5.50	4.89	0.23
						1" Ice 6.44	5.82	0.42
						2" Ice		
*** ***87***								
Platform Mount [LP 305-1]	C	None		0.0000	87.00	No Ice 18.01	18.01	1.12
						1/2" 23.33	23.33	1.35
						Ice 28.65	28.65	1.58
						1" Ice 39.29	39.29	2.05
						2" Ice		
6' x 2" Mount Pipe	A	From Face	3.00 0.00 0.00	0.0000	87.00	No Ice 1.43	1.43	0.02
						1/2" 1.92	1.92	0.03
						Ice 2.29	2.29	0.05
						1" Ice 3.06	3.06	0.09
						2" Ice		
6' x 2" Mount Pipe	B	From Face	3.00 0.00 0.00	0.0000	87.00	No Ice 1.43	1.43	0.02
						1/2" 1.92	1.92	0.03
						Ice 2.29	2.29	0.05
						1" Ice 3.06	3.06	0.09
						2" Ice		
6' x 2" Mount Pipe	C	From Face	3.00 0.00 0.00	0.0000	87.00	No Ice 1.43	1.43	0.02
						1/2" 1.92	1.92	0.03
						Ice 2.29	2.29	0.05
						1" Ice 3.06	3.06	0.09
						2" Ice		
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Face	3.00 -6.00 0.00	0.0000	87.00	No Ice 14.69	6.87	0.19
						1/2" 15.46	7.55	0.31
						Ice 16.23	8.25	0.46
						1" Ice 17.82	9.67	0.79
						2" Ice		
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Face	3.00 -6.00 0.00	0.0000	87.00	No Ice 14.69	6.87	0.19
						1/2" 15.46	7.55	0.31
						Ice 16.23	8.25	0.46
						1" Ice 17.82	9.67	0.79
						2" Ice		
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Face	3.00 -6.00 0.00	0.0000	87.00	No Ice 14.69	6.87	0.19
						1/2" 15.46	7.55	0.31
						Ice 16.23	8.25	0.46
						1" Ice 17.82	9.67	0.79
						2" Ice		
APXV18-206516S-C-A20 w/ Mount Pipe	A	From Face	3.00 6.00 0.00	0.0000	87.00	No Ice 2.55	2.15	0.04
						1/2" 2.96	2.55	0.07
						Ice 3.38	2.96	0.11
						1" Ice 4.26	3.83	0.21
						2" Ice		
APXV18-206516S-C-A20 w/ Mount Pipe	B	From Face	3.00 6.00 0.00	0.0000	87.00	No Ice 2.55	2.15	0.04
						1/2" 2.96	2.55	0.07
						Ice 3.38	2.96	0.11
						1" Ice 4.26	3.83	0.21
						2" Ice		
APXV18-206516S-C-A20 w/ Mount Pipe	C	From Face	3.00 6.00 0.00	0.0000	87.00	No Ice 2.55	2.15	0.04
						1/2" 2.96	2.55	0.07
						Ice 3.38	2.96	0.11
						1" Ice 4.26	3.83	0.21
						2" Ice		

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A _{Front}	C _A A _{Side}	Weight
			Horz	Lateral					
RADIO 4449 B12/B71	A	From Face	3.00	0.0000	87.00	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 Face	3.00	0.0000	87.00	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 Face	3.00	0.0000	87.00	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 112 489/2	A	From Face	3.00	0.0000	87.00	No Ice	0.56	0.37	0.02
			0.00			1/2"	0.66	0.45	0.02
			0.00			Ice	0.76	0.54	0.03
						1" Ice	1.00	0.75	0.05
						2" Ice			
KRY 112 489/2	B	From Face	3.00	0.0000	87.00	No Ice	0.56	0.37	0.02
			0.00			1/2"	0.66	0.45	0.02
			0.00			Ice	0.76	0.54	0.03
						1" Ice	1.00	0.75	0.05
						2" Ice			
KRY 112 489/2	C	From Face	3.00	0.0000	87.00	No Ice	0.56	0.37	0.02
			0.00			1/2"	0.66	0.45	0.02
			0.00			Ice	0.76	0.54	0.03
						1" Ice	1.00	0.75	0.05
						2" Ice			
70	Side Arm Mount [SO 701-1]	From Leg	0.00	0.0000	70.00	No Ice	0.85	1.67	0.07
0.00					1/2"	1.14	2.34	0.08	
0.00					Ice	1.43	3.01	0.09	
					1" Ice	2.01	4.35	0.12	
					2" Ice				
KS24019-L112A	C	From Leg	3.00	0.0000	70.00	No Ice	0.14	0.14	0.01
			0.00			1/2"	0.20	0.20	0.01
			1.00			Ice	0.26	0.26	0.01
						1" Ice	0.41	0.41	0.02
						2" Ice			

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

Comb. No.	Description
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	138.375 - 108.375	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-22.93	0.81	1.14
			Max. Mx	20	-10.02	296.41	3.61
			Max. My	2	-10.04	3.74	292.23
			Max. Vy	20	-12.57	296.41	3.61
			Max. Vx	2	-12.43	3.74	292.23
			Max. Torque	9			1.21
L2	108.375 - 83.6328	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-32.66	1.58	1.70
			Max. Mx	20	-15.47	612.52	6.27
			Max. My	2	-15.49	6.45	605.14
			Max. Vy	20	-16.19	612.52	6.27
			Max. Vx	2	-16.02	6.45	605.14
			Max. Torque	20			-0.98
L3	83.6328 - 42.9089	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-49.86	3.70	2.94
			Max. Mx	20	-26.56	1378.49	11.60
			Max. My	2	-26.58	12.13	1364.26
			Max. Vy	20	-20.77	1378.49	11.60

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L4	42.9089 - 0	Pole	Max. Vx	2	-20.62	12.13	1364.26
			Max. Torque	20			-0.98
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-68.03	5.95	4.48
			Max. Mx	20	-40.14	2464.63	18.32
			Max. My	2	-40.14	19.09	2442.66
			Max. Vy	20	-23.69	2464.63	18.32
			Max. Vx	2	-23.54	19.09	2442.66
			Max. Torque	20			-0.92

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	36	68.03	6.46	0.01
	Max. H _x	20	40.15	23.66	0.13
	Max. H _z	3	30.12	0.13	23.51
	Max. M _x	2	2442.66	0.13	23.51
	Max. M _z	8	2461.59	-23.66	-0.13
	Max. Torsion	8	0.92	-23.66	-0.13
	Min. Vert	25	30.12	11.93	20.43
	Min. H _x	9	30.12	-23.66	-0.13
	Min. H _z	15	30.12	-0.13	-23.51
	Min. M _x	14	-2441.12	-0.13	-23.51
	Min. M _z	20	-2464.63	23.66	0.13
	Min. Torsion	20	-0.92	23.66	0.13

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturing Moment, M _x kip-ft	Overturing Moment, M _z kip-ft	Torque kip-ft
Dead Only	33.46	0.00	0.00	-0.61	1.21	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	40.15	-0.13	-23.51	-2442.66	19.09	-0.00
0.9 Dead+1.0 Wind 0 deg - No Ice	30.12	-0.13	-23.51	-2413.39	18.45	0.00
1.2 Dead+1.0 Wind 30 deg - No Ice	40.15	11.99	-20.78	-2155.84	-1241.76	-0.46
0.9 Dead+1.0 Wind 30 deg - No Ice	30.12	11.99	-20.78	-2130.07	-1227.40	-0.46
1.2 Dead+1.0 Wind 60 deg - No Ice	40.15	20.69	-11.81	-1224.22	-2151.05	-0.80
0.9 Dead+1.0 Wind 60 deg - No Ice	30.12	20.69	-11.81	-1209.51	-2125.84	-0.80
1.2 Dead+1.0 Wind 90 deg - No Ice	40.15	23.66	0.13	16.80	-2461.59	-0.92
0.9 Dead+1.0 Wind 90 deg - No Ice	30.12	23.66	0.13	16.75	-2432.63	-0.92
1.2 Dead+1.0 Wind 120 deg - No Ice	40.15	20.53	11.87	1235.34	-2137.83	-0.80
0.9 Dead+1.0 Wind 120 deg - No Ice	30.12	20.53	11.87	1220.80	-2112.71	-0.80
1.2 Dead+1.0 Wind 150 deg - No Ice	40.15	11.93	20.43	2122.69	-1243.79	-0.46
0.9 Dead+1.0 Wind 150 deg - No Ice	30.12	11.93	20.43	2097.60	-1229.31	-0.46
1.2 Dead+1.0 Wind 180 deg - No Ice	40.15	0.13	23.51	2441.12	-16.04	0.00
0.9 Dead+1.0 Wind 180 deg	30.12	0.13	23.51	2412.25	-16.19	-0.00

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
- No Ice						
1.2 Dead+1.0 Wind 210 deg	40.15	-11.99	20.78	2154.29	1244.80	0.46
- No Ice						
0.9 Dead+1.0 Wind 210 deg	30.12	-11.99	20.78	2128.93	1229.66	0.46
- No Ice						
1.2 Dead+1.0 Wind 240 deg	40.15	-20.69	11.81	1222.68	2154.09	0.80
- No Ice						
0.9 Dead+1.0 Wind 240 deg	30.12	-20.69	11.81	1208.37	2128.09	0.80
- No Ice						
1.2 Dead+1.0 Wind 270 deg	40.15	-23.66	-0.13	-18.32	2464.63	0.92
- No Ice						
0.9 Dead+1.0 Wind 270 deg	30.12	-23.66	-0.13	-17.88	2434.89	0.92
- No Ice						
1.2 Dead+1.0 Wind 300 deg	40.15	-20.53	-11.87	-1236.86	2140.88	0.80
- No Ice						
0.9 Dead+1.0 Wind 300 deg	30.12	-20.53	-11.87	-1221.93	2114.97	0.80
- No Ice						
1.2 Dead+1.0 Wind 330 deg	40.15	-11.93	-20.43	-2124.23	1246.85	0.46
- No Ice						
0.9 Dead+1.0 Wind 330 deg	30.12	-11.93	-20.43	-2098.74	1231.58	0.46
- No Ice						
1.2 Dead+1.0 Ice+1.0 Temp	68.03	-0.00	-0.00	-4.48	5.95	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	68.03	-0.01	-6.45	-689.09	7.97	0.03
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	68.03	3.22	-5.58	-596.44	-335.27	-0.05
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	68.03	5.59	-3.21	-345.18	-587.05	-0.12
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	68.03	6.46	0.01	-2.66	-679.89	-0.16
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	68.03	5.60	3.24	339.35	-588.96	-0.15
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	68.03	3.24	5.60	589.21	-338.57	-0.11
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	68.03	0.01	6.45	679.95	4.16	-0.03
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	68.03	-3.22	5.58	587.30	347.40	0.05
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	68.03	-5.59	3.21	336.05	599.18	0.12
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	68.03	-6.46	-0.01	-6.48	692.02	0.16
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	68.03	-5.60	-3.24	-348.49	601.09	0.15
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	68.03	-3.24	-5.60	-598.34	350.70	0.11
Dead+Wind 0 deg - Service	33.46	-0.03	-5.54	-571.75	5.37	0.00
Dead+Wind 30 deg - Service	33.46	2.82	-4.89	-504.70	-289.53	-0.11
Dead+Wind 60 deg - Service	33.46	4.87	-2.78	-286.80	-502.20	-0.19
Dead+Wind 90 deg - Service	33.46	5.57	0.03	3.46	-574.82	-0.22
Dead+Wind 120 deg - Service	33.46	4.83	2.79	288.47	-499.10	-0.19
Dead+Wind 150 deg - Service	33.46	2.81	4.81	496.00	-289.99	-0.11
Dead+Wind 180 deg - Service	33.46	0.03	5.54	570.47	-2.84	-0.00
Dead+Wind 210 deg - Service	33.46	-2.82	4.89	503.41	292.06	0.11
Dead+Wind 240 deg - Service	33.46	-4.87	2.78	285.51	504.72	0.19
Dead+Wind 270 deg - Service	33.46	-5.57	-0.03	-4.75	577.35	0.22
Dead+Wind 300 deg - Service	33.46	-4.83	-2.79	-289.75	501.63	0.19
Dead+Wind 330 deg - Service	33.46	-2.81	-4.81	-497.29	292.52	0.11

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-33.46	0.00	0.00	33.46	0.00	0.000%
2	-0.13	-40.15	-23.51	0.13	40.15	23.51	0.000%
3	-0.13	-30.12	-23.51	0.13	30.12	23.51	0.000%
4	11.99	-40.15	-20.78	-11.99	40.15	20.78	0.000%
5	11.99	-30.12	-20.78	-11.99	30.12	20.78	0.000%
6	20.69	-40.15	-11.81	-20.69	40.15	11.81	0.000%
7	20.69	-30.12	-11.81	-20.69	30.12	11.81	0.000%
8	23.66	-40.15	0.13	-23.66	40.15	-0.13	0.000%
9	23.66	-30.12	0.13	-23.66	30.12	-0.13	0.000%
10	20.53	-40.15	11.87	-20.53	40.15	-11.87	0.000%
11	20.53	-30.12	11.87	-20.53	30.12	-11.87	0.000%
12	11.93	-40.15	20.43	-11.93	40.15	-20.43	0.000%
13	11.93	-30.12	20.43	-11.93	30.12	-20.43	0.000%
14	0.13	-40.15	23.51	-0.13	40.15	-23.51	0.000%
15	0.13	-30.12	23.51	-0.13	30.12	-23.51	0.000%
16	-11.99	-40.15	20.78	11.99	40.15	-20.78	0.000%
17	-11.99	-30.12	20.78	11.99	30.12	-20.78	0.000%
18	-20.69	-40.15	11.81	20.69	40.15	-11.81	0.000%
19	-20.69	-30.12	11.81	20.69	30.12	-11.81	0.000%
20	-23.66	-40.15	-0.13	23.66	40.15	0.13	0.000%
21	-23.66	-30.12	-0.13	23.66	30.12	0.13	0.000%
22	-20.53	-40.15	-11.87	20.53	40.15	11.87	0.000%
23	-20.53	-30.12	-11.87	20.53	30.12	11.87	0.000%
24	-11.93	-40.15	-20.43	11.93	40.15	20.43	0.000%
25	-11.93	-30.12	-20.43	11.93	30.12	20.43	0.000%
26	0.00	-68.03	0.00	0.00	68.03	0.00	0.000%
27	-0.01	-68.03	-6.45	0.01	68.03	6.45	0.000%
28	3.22	-68.03	-5.58	-3.22	68.03	5.58	0.000%
29	5.59	-68.03	-3.21	-5.59	68.03	3.21	0.000%
30	6.46	-68.03	0.01	-6.46	68.03	-0.01	0.000%
31	5.60	-68.03	3.24	-5.60	68.03	-3.24	0.000%
32	3.24	-68.03	5.60	-3.24	68.03	-5.60	0.000%
33	0.01	-68.03	6.45	-0.01	68.03	-6.45	0.000%
34	-3.22	-68.03	5.58	3.22	68.03	-5.58	0.000%
35	-5.59	-68.03	3.21	5.59	68.03	-3.21	0.000%
36	-6.46	-68.03	-0.01	6.46	68.03	0.01	0.000%
37	-5.60	-68.03	-3.24	5.60	68.03	3.24	0.000%
38	-3.24	-68.03	-5.60	3.24	68.03	5.60	0.000%
39	-0.03	-33.46	-5.54	0.03	33.46	5.54	0.000%
40	2.82	-33.46	-4.89	-2.82	33.46	4.89	0.000%
41	4.87	-33.46	-2.78	-4.87	33.46	2.78	0.000%
42	5.57	-33.46	0.03	-5.57	33.46	-0.03	0.000%
43	4.83	-33.46	2.79	-4.83	33.46	-2.79	0.000%
44	2.81	-33.46	4.81	-2.81	33.46	-4.81	0.000%
45	0.03	-33.46	5.54	-0.03	33.46	-5.54	0.000%
46	-2.82	-33.46	4.89	2.82	33.46	-4.89	0.000%
47	-4.87	-33.46	2.78	4.87	33.46	-2.78	0.000%
48	-5.57	-33.46	-0.03	5.57	33.46	0.03	0.000%
49	-4.83	-33.46	-2.79	4.83	33.46	2.79	0.000%
50	-2.81	-33.46	-4.81	2.81	33.46	4.81	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00005689
3	Yes	4	0.00000001	0.00059216
4	Yes	6	0.00000001	0.00015342
5	Yes	6	0.00000001	0.00004947
6	Yes	6	0.00000001	0.00015727
7	Yes	6	0.00000001	0.00005104

8	Yes	5	0.00000001	0.00007656
9	Yes	4	0.00000001	0.00086445
10	Yes	6	0.00000001	0.00015174
11	Yes	6	0.00000001	0.00004885
12	Yes	6	0.00000001	0.00015690
13	Yes	6	0.00000001	0.00005081
14	Yes	5	0.00000001	0.00006114
15	Yes	4	0.00000001	0.00066920
16	Yes	6	0.00000001	0.00015727
17	Yes	6	0.00000001	0.00005085
18	Yes	6	0.00000001	0.00015049
19	Yes	6	0.00000001	0.00004855
20	Yes	5	0.00000001	0.00018048
21	Yes	5	0.00000001	0.00008456
22	Yes	6	0.00000001	0.00015935
23	Yes	6	0.00000001	0.00005157
24	Yes	6	0.00000001	0.00015315
25	Yes	6	0.00000001	0.00004935
26	Yes	4	0.00000001	0.00007652
27	Yes	5	0.00000001	0.00073567
28	Yes	6	0.00000001	0.00013365
29	Yes	6	0.00000001	0.00013503
30	Yes	5	0.00000001	0.00072512
31	Yes	6	0.00000001	0.00013201
32	Yes	6	0.00000001	0.00013315
33	Yes	5	0.00000001	0.00072190
34	Yes	6	0.00000001	0.00013463
35	Yes	6	0.00000001	0.00013354
36	Yes	5	0.00000001	0.00073927
37	Yes	6	0.00000001	0.00013960
38	Yes	6	0.00000001	0.00013808
39	Yes	4	0.00000001	0.00009466
40	Yes	4	0.00000001	0.00076527
41	Yes	4	0.00000001	0.00083576
42	Yes	4	0.00000001	0.00015317
43	Yes	4	0.00000001	0.00074392
44	Yes	4	0.00000001	0.00081777
45	Yes	4	0.00000001	0.00009515
46	Yes	4	0.00000001	0.00082205
47	Yes	4	0.00000001	0.00073731
48	Yes	4	0.00000001	0.00017510
49	Yes	4	0.00000001	0.00085876
50	Yes	4	0.00000001	0.00076850

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	138.375 - 108.375	20.224	49	1.4948	0.0063
L2	108.375 - 83.6328	11.656	46	1.1456	0.0017
L3	88.1146 - 42.9089	7.430	46	0.8486	0.0008
L4	48.836 - 0	2.172	46	0.4207	0.0003

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
138.00	Platform Mount [LP 303-1]	49	20.109	1.4908	0.0063	17487
137.00	Pipe Mount [PM 601-3]	49	19.802	1.4803	0.0061	17487

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
136.00	Pipe Mount [PM 601-1]	49	19.496	1.4698	0.0060	17487
129.00	Platform Mount [16' LP 304-1]	49	17.371	1.3951	0.0047	9326
109.00	Side Arm Mount [SO 102-3]	46	11.809	1.1542	0.0018	3073
108.00	Platform Mount [14' LP 714-1]	46	11.565	1.1403	0.0017	3051
87.00	Platform Mount [LP 305-1]	46	7.231	0.8331	0.0008	5209
70.00	Side Arm Mount [SO 701-1]	46	4.547	0.6276	0.0005	5026

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	138.375 - 108.375	86.318	22	6.3883	0.0260
L2	108.375 - 83.6328	49.872	16	4.9003	0.0069
L3	88.1146 - 42.9089	31.794	16	3.6335	0.0034
L4	48.836 - 0	9.294	16	1.8009	0.0011

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
138.00	Platform Mount [LP 303-1]	22	85.828	6.3715	0.0274	4191
137.00	Pipe Mount [PM 601-3]	22	84.523	6.3267	0.0266	4191
136.00	Pipe Mount [PM 601-1]	22	83.218	6.2820	0.0258	4191
129.00	Platform Mount [16' LP 304-1]	22	74.158	5.9644	0.0202	2234
109.00	Side Arm Mount [SO 102-3]	16	50.525	4.9372	0.0077	732
108.00	Platform Mount [14' LP 714-1]	16	49.483	4.8780	0.0074	727
87.00	Platform Mount [LP 305-1]	16	30.942	3.5680	0.0035	1226
70.00	Side Arm Mount [SO 701-1]	16	19.457	2.6876	0.0022	1180

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	KI/r	A in ²	P _u K	φP _n K	Ratio P _u / φP _n
L1	138.375 - 108.375 (1)	TP24.5x17.375x0.1875	30.00	0.00	0.0	14.469 0	-10.01	846.43	0.012
L2	108.375 - 83.6328 (2)	TP31.88x24.5x0.25	24.74	0.00	0.0	24.037 6	-15.47	1406.20	0.011
L3	83.6328 - 42.9089 (3)	TP43.42x30.0432x0.3125	45.21	0.00	0.0	41.017 6	-26.55	2399.53	0.011
L4	42.9089 - 0 (4)	TP55.5x41.0411x0.3125	48.84	0.00	0.0	54.739 1	-40.14	3202.24	0.013

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux}	ϕM_{nx}	Ratio	M_{uy}	ϕM_{ny}	Ratio
			kip-ft	kip-ft	$\frac{M_{ux}}{\phi M_{nx}}$	kip-ft	kip-ft	$\frac{M_{uy}}{\phi M_{ny}}$
L1	138.375 - 108.375 (1)	TP24.5x17.375x0.1875	298.47	490.86	0.608	0.00	490.86	0.000
L2	108.375 - 83.6328 (2)	TP31.88x24.5x0.25	615.81	1039.22	0.593	0.00	1039.22	0.000
L3	83.6328 - 42.9089 (3)	TP43.42x30.0432x0.3125	1386.34	2349.93	0.590	0.00	2349.93	0.000
L4	42.9089 - 0 (4)	TP55.5x41.0411x0.3125	2488.07	3679.57	0.676	0.00	3679.57	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u	ϕV_n	Ratio	Actual T_u	ϕT_n	Ratio
			K	K	$\frac{V_u}{\phi V_n}$	kip-ft	kip-ft	$\frac{T_u}{\phi T_n}$
L1	138.375 - 108.375 (1)	TP24.5x17.375x0.1875	12.64	253.93	0.050	1.09	540.66	0.002
L2	108.375 - 83.6328 (2)	TP31.88x24.5x0.25	16.23	421.86	0.038	0.89	1119.17	0.001
L3	83.6328 - 42.9089 (3)	TP43.42x30.0432x0.3125	21.09	719.86	0.029	0.46	2607.00	0.000
L4	42.9089 - 0 (4)	TP55.5x41.0411x0.3125	24.02	960.67	0.025	0.46	4642.97	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio P_u	Ratio M_{ux}	Ratio M_{uy}	Ratio V_u	Ratio T_u	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		ϕP_n	ϕM_{nx}	ϕM_{ny}	ϕV_n	ϕT_n			
L1	138.375 - 108.375 (1)	0.012	0.608	0.000	0.050	0.002	0.623	1.050	4.8.2
L2	108.375 - 83.6328 (2)	0.011	0.593	0.000	0.038	0.001	0.605	1.050	4.8.2
L3	83.6328 - 42.9089 (3)	0.011	0.590	0.000	0.029	0.000	0.602	1.050	4.8.2
L4	42.9089 - 0 (4)	0.013	0.676	0.000	0.025	0.000	0.689	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	138.375 - 108.375	Pole	TP24.5x17.375x0.1875	1	-10.01	888.76	59.3	Pass
L2	108.375 - 83.6328	Pole	TP31.88x24.5x0.25	2	-15.47	1476.51	57.6	Pass
L3	83.6328 - 42.9089	Pole	TP43.42x30.0432x0.3125	3	-26.55	2519.51	57.3	Pass
L4	42.9089 - 0	Pole	TP55.5x41.0411x0.3125	4	-40.14	3362.35	65.7	Pass
Summary								
Pole (L4)							65.7	Pass
RATING =							65.7	Pass

APPENDIX B
BASE LEVEL DRAWING



(OTHER CONSIDERED EQUIPMENT)
(19) 1-5/8" TO 129 FT LEVEL

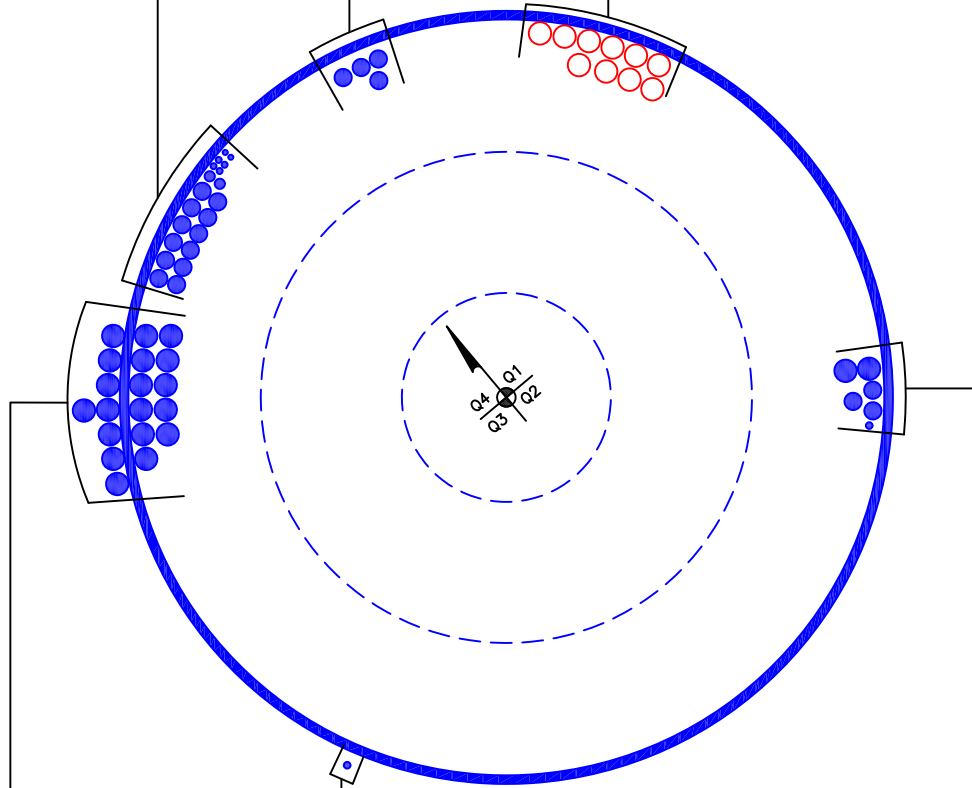
(OTHER CONSIDERED EQUIPMENT)
(2) 3/8" TO 138 FT LEVEL
(4) 7/16" TO 138 FT LEVEL
(2) 3/4" TO 138 FT LEVEL
(12) 1-1/4" TO 138 FT LEVEL

(OTHER CONSIDERED EQUIPMENT)
(1) 1/2" TO 70 FT LEVEL

(OTHER CONSIDERED EQUIPMENT)
(4) 1-1/4" TO 108 FT LEVEL

(PROPOSED EQUIPMENT CONFIGURATION)
(10) 1-5/8" TO 87 FT LEVEL

(OTHER CONSIDERED EQUIPMENT)
(1) 1-5/8" TO 112 FT LEVEL
(1) 1-5/8" TO 118 FT LEVEL
(1) 1-1/4" TO 136 FT LEVEL
(1) 1/2" TO 138 FT LEVEL
(2) 1-1/4" TO 138 FT LEVEL



APPENDIX C
ADDITIONAL CALCULATIONS

Monopole Flange Plate Connection

Elevation = 108.375 ft.

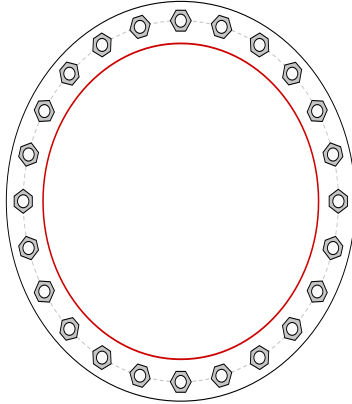


BU #	876380
Site Name	O&G WOODBURY
Order #	479855 Rev. 0
TIA-222 Revision	
	H

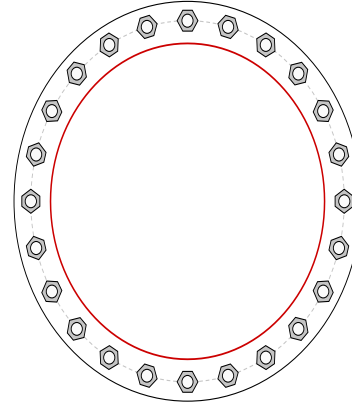
Applied Loads	
Moment (kip-ft)	298.47
Axial Force (kips)	10.01
Shear Force (kips)	12.64

*TIA-222-H Section 15.5 Applied

Top Plate - External



Bottom Plate - External



Connection Properties

Bolt Data

(24) 1" ϕ bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 28" BC

Top Plate Data

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

Top Stiffener Data

N/A

Top Pole Data

24.5" x 0.1875" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Bottom Plate Data

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

Bottom Stiffener Data

N/A

Bottom Pole Data

24.5" x 0.25" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	20.89
Allowable (kips)	54.53
Stress Rating:	36.5% Pass

Top Plate Capacity

Max Stress (ksi):	12.82	(Flexural)
Allowable Stress (ksi):	54.00	
Stress Rating:	22.6%	Pass
Tension Side Stress Rating:	12.2%	Pass

Bottom Plate Capacity

Max Stress (ksi):	12.82	(Flexural)
Allowable Stress (ksi):	54.00	
Stress Rating:	22.6%	Pass
Tension Side Stress Rating:	12.2%	Pass

Monopole Base Plate Connection

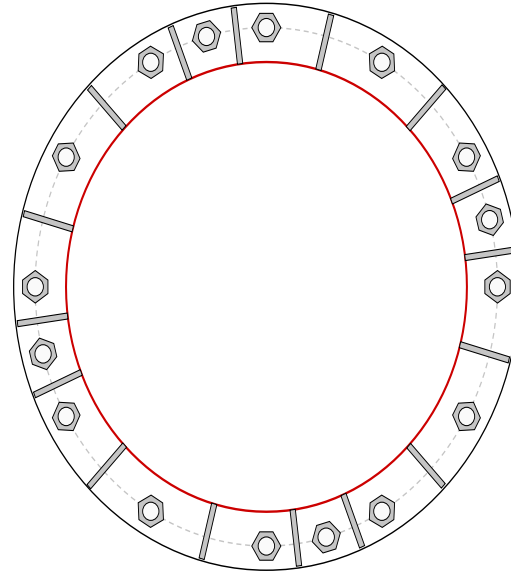


Site Info	
BU #	876380
Site Name	O&G WOODBURY
Order #	479855 Rev. 0

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
I_{ar} (in)	1.125

Applied Loads	
Moment (kip-ft)	2488.07
Axial Force (kips)	40.14
Shear Force (kips)	24.02

*TIA-222-H Section 15.5 Applied



Connection Properties	Analysis Results
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Anchor Rod Data
 GROUP 1: (12) 2-1/4" ϕ bolts (A615-75 N; $F_y=75$ ksi, $F_u=100$ ksi) on 64" BC
 GROUP 2: (4) 2-1/4" ϕ bolts (F1554-105 N; $F_y=105$ ksi, $F_u=125$ ksi) on 64" BC

Base Plate Data
 70" OD x 1.5" Plate (A572-60; $F_y=60$ ksi, $F_u=75$ ksi)

Stiffener Data
 (16) 15"H x 7"W x 0.75"T, Notch: 0.75"
 plate: $F_y=65$ ksi ; weld: $F_y=80$ ksi
 horiz. weld: 0.375" groove, 45° dbl bevel, 0.25" fillet
 vert. weld: 0.25" fillet

Pole Data
 55.5" x 0.3125" 18-sided pole (A572-65; $F_y=65$ ksi, $F_u=80$ ksi)

Anchor Rod Summary (units of kips, kip-in)		
GROUP 1:		
$P_u_c = 119.08$	$\phi Pn_c = 243.75$	Stress Rating
$V_u = 1.5$	$\phi Vn = 73.13$	46.6%
$M_u = n/a$	$\phi Mn = n/a$	Pass
GROUP 2:		
$P_u_c = 119.08$	$\phi Pn_c = 341.25$	Stress Rating
$V_u = 1.5$	$\phi Vn = 102.38$	33.3%
$M_u = n/a$	$\phi Mn = n/a$	Pass

Base Plate Summary		
Max Stress (ksi):	34.06	(Roark's Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	60.1%	Pass

Stiffener Summary		
Horizontal Weld:	29.7%	Pass
Vertical Weld:	50.1%	Pass
Plate Flexure+Shear:	11.9%	Pass
Plate Tension+Shear:	29.2%	Pass
Plate Compression:	38.8%	Pass
Pole Summary		
Punching Shear:	15.5%	Pass

Pier and Pad Foundation



BU #: 876380
 Site Name: O&G WOODBURY
 App. Number: 479855 Rev. 0

TIA-222 Revision: H
 Tower Type: Monopole

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

Superstructure Analysis Reactions		
Compression, P_{comp} :	40	kips
Base Shear, Vu_{comp} :	24	kips
Moment, M_u :	2488	ft-kips
Tower Height, H :	138.377	ft
BP Dist. Above Fdn, bp_{dist} :	3.375	in

Foundation Analysis Checks				
	Capacity	Demand	Rating*	Check
<i>Lateral (Sliding) (kips)</i>	273.32	24.00	8.4%	Pass
<i>Bearing Pressure (ksf)</i>	9.00	2.16	24.0%	Pass
<i>Overtuning (kip*ft)</i>	5382.81	2674.75	49.7%	Pass
<i>Pier Flexure (Comp.) (kip*ft)</i>	5871.75	2596.00	42.1%	Pass
<i>Pier Compression (kip)</i>	31187.52	79.69	0.2%	Pass
<i>Pad Flexure (kip*ft)</i>	4020.44	856.12	20.3%	Pass
<i>Pad Shear - 1-way (kips)</i>	824.79	143.46	16.6%	Pass
<i>Pad Shear - 2-way (Comp) (ksi)</i>	0.190	0.027	13.4%	Pass
<i>Flexural 2-way (Comp) (kip*ft)</i>	4364.46	1557.60	34.0%	Pass

Pier Properties		
Pier Shape:	Square	
Pier Diameter, $dpier$:	7	ft
Ext. Above Grade, E :	1	ft
Pier Rebar Size, S_c :	8	
Pier Rebar Quantity, mc :	46	
Pier Tie/Spiral Size, St :	4	
Pier Tie/Spiral Quantity, mt :	5	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier} :	3	in

*Rating per TIA-222-H Section 15.5

Soil Rating*:	49.7%
Structural Rating*:	42.1%

Pad Properties		
Depth, D :	6.5	ft
Pad Width, W :	23	ft
Pad Thickness, T :	3	ft
Pad Rebar Size (Top), Sp_{top} :	8	
Pad Top Rebar Quantity (Top), mp_{top} :	21	
Pad Rebar Size (Bottom), Sp :	8	
Pad Rebar Quantity (Bottom), mp :	37	
Pad Clear Cover, cc_{pad} :	3	in

Material Properties		
Rebar Grade, F_y :	60	ksi
Concrete Compressive Strength, F'_c :	4	ksi
Dry Concrete Density, δ_c :	150	pcf

Soil Properties		
Total Soil Unit Weight, γ :	135	pcf
Ultimate Gross Bearing, Q_{ult} :	12.000	ksf
Cohesion, C_u :	0.000	ksf
Friction Angle, ϕ :	34	degrees
SPT Blow Count, N_{blows} :		
Base Friction, μ :		
Neglected Depth, N :	3.50	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, gw :	n/a	ft

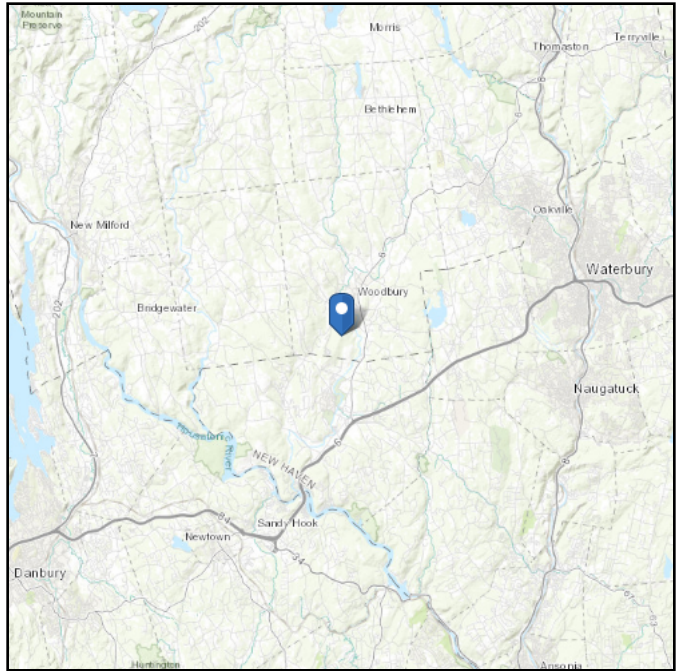
<--Toggle between Gross and Net

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 589.96 ft (NAVD 88)
Latitude: 41.522
Longitude: -73.220736



Wind

Results:

Wind Speed:	118 Vmph
10-year MRI	76 Vmph
25-year MRI	85 Vmph
50-year MRI	90 Vmph
100-year MRI	97 Vmph

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

Date Accessed: Thu Jun 27 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.

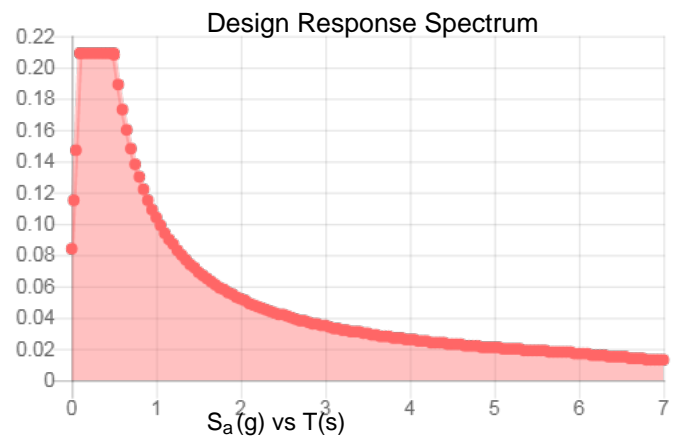
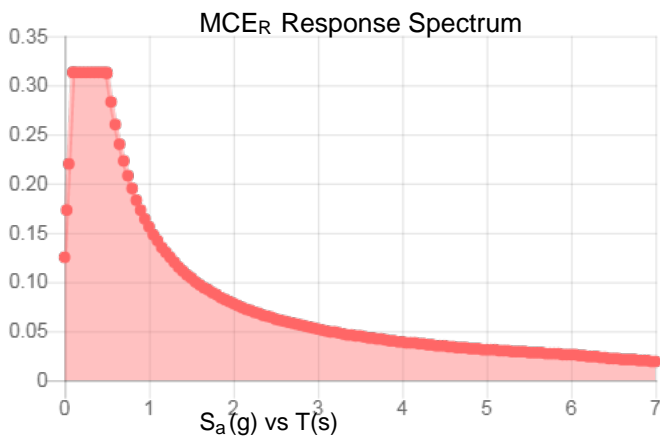
Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

Site Soil Class: D - Stiff Soil

Results:

S_S :	0.196	S_{DS} :	0.209
S_1 :	0.065	S_{D1} :	0.104
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.103
S_{MS} :	0.313	PGA _M :	0.164
S_{M1} :	0.156	F _{PGA} :	1.594
		I_e :	1

Seismic Design Category B



Data Accessed:

Thu Jun 27 2019

Date Source:

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

Ice

Results:

Ice Thickness: 0.75 in.
Concurrent Temperature: 15 F
Gust Speed: 50 mph

Data Source: Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8

Date Accessed: Thu Jun 27 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.

The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided “as is” and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

ASCE does not intend, nor should anyone interpret, the results provided by this Tool to replace the sound judgment of a competent professional, having knowledge and experience in the appropriate field(s) of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the contents of this Tool or the ASCE 7 standard.

In using this Tool, you expressly assume all risks associated with your use. Under no circumstances shall ASCE or its officers, directors, employees, members, affiliates, or agents be liable to you or any other person for any direct, indirect, special, incidental, or consequential damages arising from or related to your use of, or reliance on, the Tool or any information obtained therein. To the fullest extent permitted by law, you agree to release and hold harmless ASCE from any and all liability of any nature arising out of or resulting from any use of data provided by the ASCE 7 Hazard Tool.

Exhibit E

Mount Analysis



Date: **May 16, 2019**

Charles McGuirt
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

MasTec Network Solutions
507 Airport Blvd, Suite 111
Morrisville, NC 27560
(919) 244-5207

Subject: **Mount Analysis**

Carrier Designation: **T-Mobile Equipment Change-Out**
Carrier Site Number: CTNH350A
Carrier Site Name: NH350/Global-Woodbury

Crown Castle Designation: **Crown Castle BU Number:** 876380
Crown Castle Site Name: O&G WOODBURY
Crown Castle JDE Number: 559334
Crown Castle Order Number: 479855 Revision 0

Engineering Firm Designation: **MasTec Network Solutions Project Number:** 18756-MNT1

Site Data: **Great Hollow Road, Woodbury, Litchfield County, CT 06798**
Latitude: 41° 31' 19.20" Longitude: -73° 13' 14.65"

Structure Information **Tower Height & Type:** 139 ft Monopole
Mount Elevation: 87 ft
Mount Width & Type: 12.5 ft Platform Mount

Dear Charles McGuirt,

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

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

Platform Mount

Sufficient


This analysis utilizes an ultimate 3-second gust wind speed of 120 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Mount analysis prepared by: Elisa Mathon

Respectfully Submitted by:

Raphael Mohamed, PE, PEng
Senior Director of Engineering
CT PE License No. 25112

Raphael Mohamed



Digitally signed by Raphael Mohamed
DN:
E=Raphael.Mohamed@mastec.com,
CN=Raphael Mohamed, OU=Users,
OU=MasTec Network Solutions,
OU=Service Lines, DC=mastec,
DC=local
Date: 2019.05.16 17:41:38-04'00'

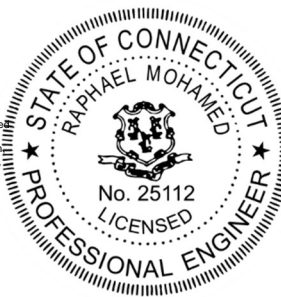


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3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

3.1) Analysis Method

3.2) Assumptions

4) ANALYSIS RESULTS

Table 3 - Mount Component Stresses vs. Capacity

4.1) Recommendations

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6) APPENDIX B

Software Input Calculations

7) APPENDIX C

Software Analysis Output

8) APPENDIX D

Additional Calculations

1) INTRODUCTION

This is a 12.5 ft Platform Mount mapped by P-SEC.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category	II
Ultimate Wind Speed:	120 mph
Exposure Category:	B
Topographic Category:	1
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Seismic Ss:	0.196
Seismic S1:	0.065
Live Loading Wind Speed:	30 mph
Live Loading at Mid/End-Points:	250 lb
Man Live Loading at Mount Pipes	500 lb

Table 1 - Proposed Loading Configuration

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount / Modification Details
87.0	87.0	3	rfs/celwave	APXV18-206516S-C-A20	(1) 12.5ft Platform
		3	rfs/celwave	APXVAARR24_43-U-NA20	
		3	ericsson	KRY 112 489/2	
		3	ericsson	RADIO 4449 B12/B71	

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
4-ORDER INFORMATION	CROWN CASTLE	Order No. 479855, Rev. 0	CCIsites
4-MOUNT MAPPING	P-SEC	Project No. 19651-07	On File

3.1) Analysis Method

RISA-3D (Version No. 17.0.2), a commercially available analysis software package, was used to create a three-dimensional model of the antenna mounting system and calculate member stresses for various loading cases.

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

3.2) Assumptions

- 1) The antenna mounting system was properly fabricated, installed and maintained in good condition in accordance with its original design and manufacturer's specifications.
- 2) The configuration of antennas, mounts, and other appurtenances are as specified in Tables 1 and the referenced drawings.
- 3) All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
- 4) Steel grades have been assumed as follows, unless noted otherwise:

Channel, Solid Round, Angle, Plate	ASTM A36 (GR 36)
HSS (Rectangular)	ASTM 500 (GR B-46)
Pipe	ASTM A53 (GR B-35)
Connection Bolts	ASTM A325

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

4) ANALYSIS RESULTS

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

Notes	Component	Beam No.	Centerline (ft)	% Capacity	Pass / Fail
1	Mount Pipe	--	87	50.4	Pass
1	Mount Pipe Large	--	87	2.3	Pass
1	Horizontal	--	87	42.0	Pass
1	Standoff	--	87	27.3	Pass
1	Plate	--	87	55.9	Pass
1	Grating Angles	--	87	18.5	Pass
1	Bolt Connection	--	87	19.0	Pass
1	Plate Connection	--	87	28.3	Pass

Structure Rating (max from all components) =	55.9%
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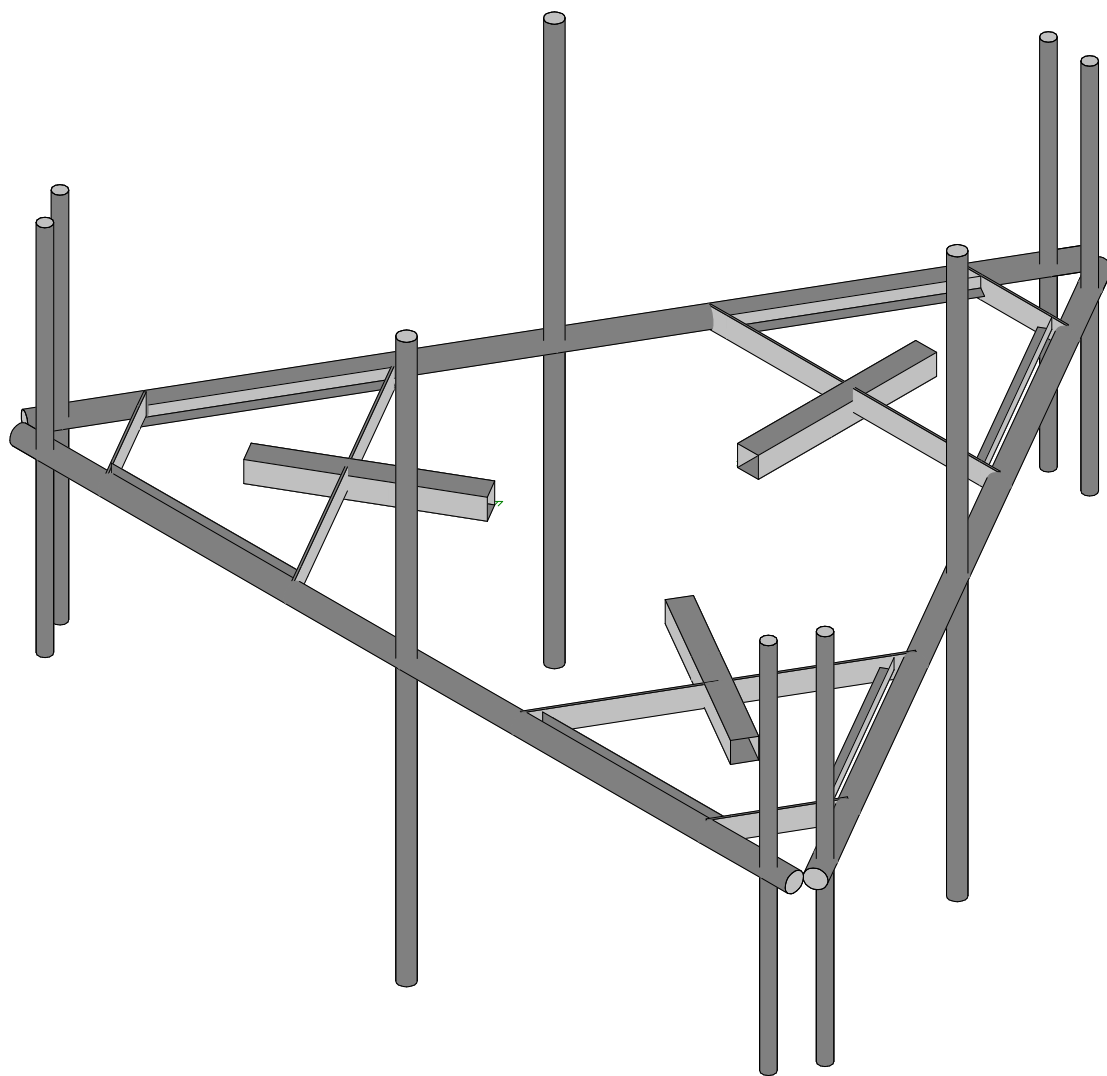
Notes:

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

4.1) Recommendations

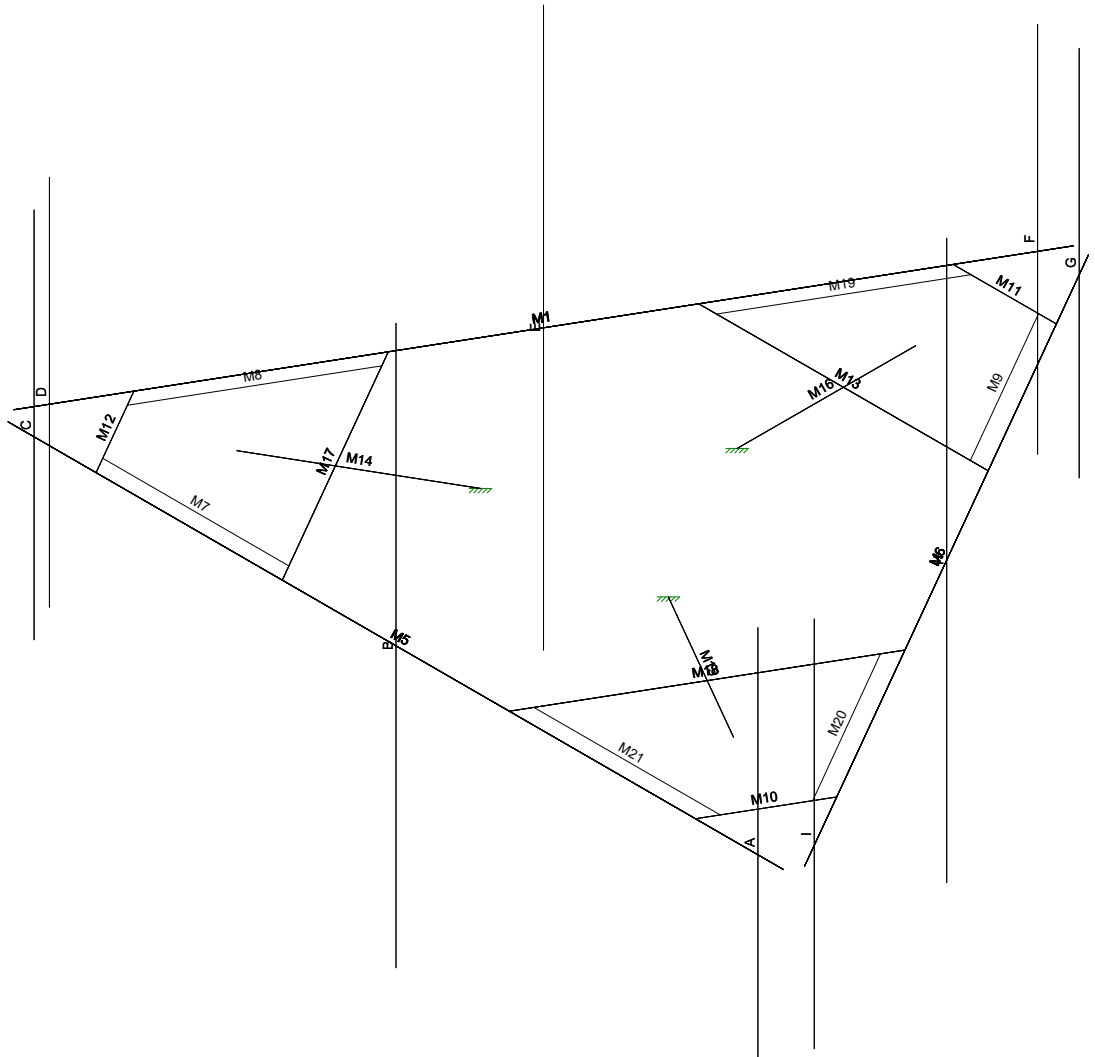
The mount has sufficient capacity to carry the proposed configuration. No modifications are required at this time.

APPENDIX A
WIRE FRAME AND RENDERED MODELS



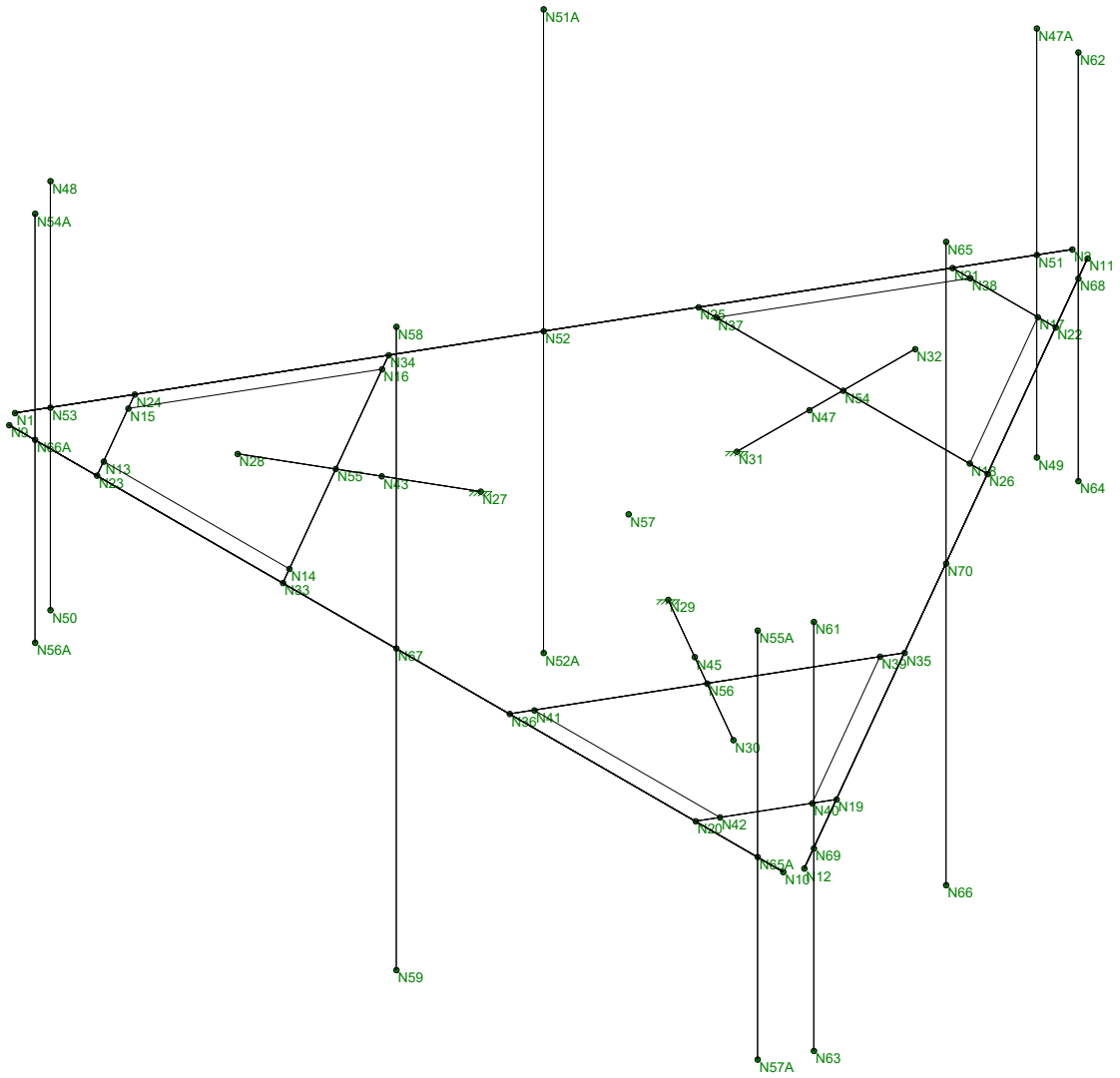
Envelope Only Solution

MasTec	876380-O&G WOODBURY	Rendered View
EJM		May 15, 2019 at 4:41 PM
18756-MNT1		18756.R3D



Envelope Only Solution

MasTec	876380-O&G WOODBURY	Member Labels
EJM		May 15, 2019 at 4:42 PM
18756-MNT1		18756.R3D

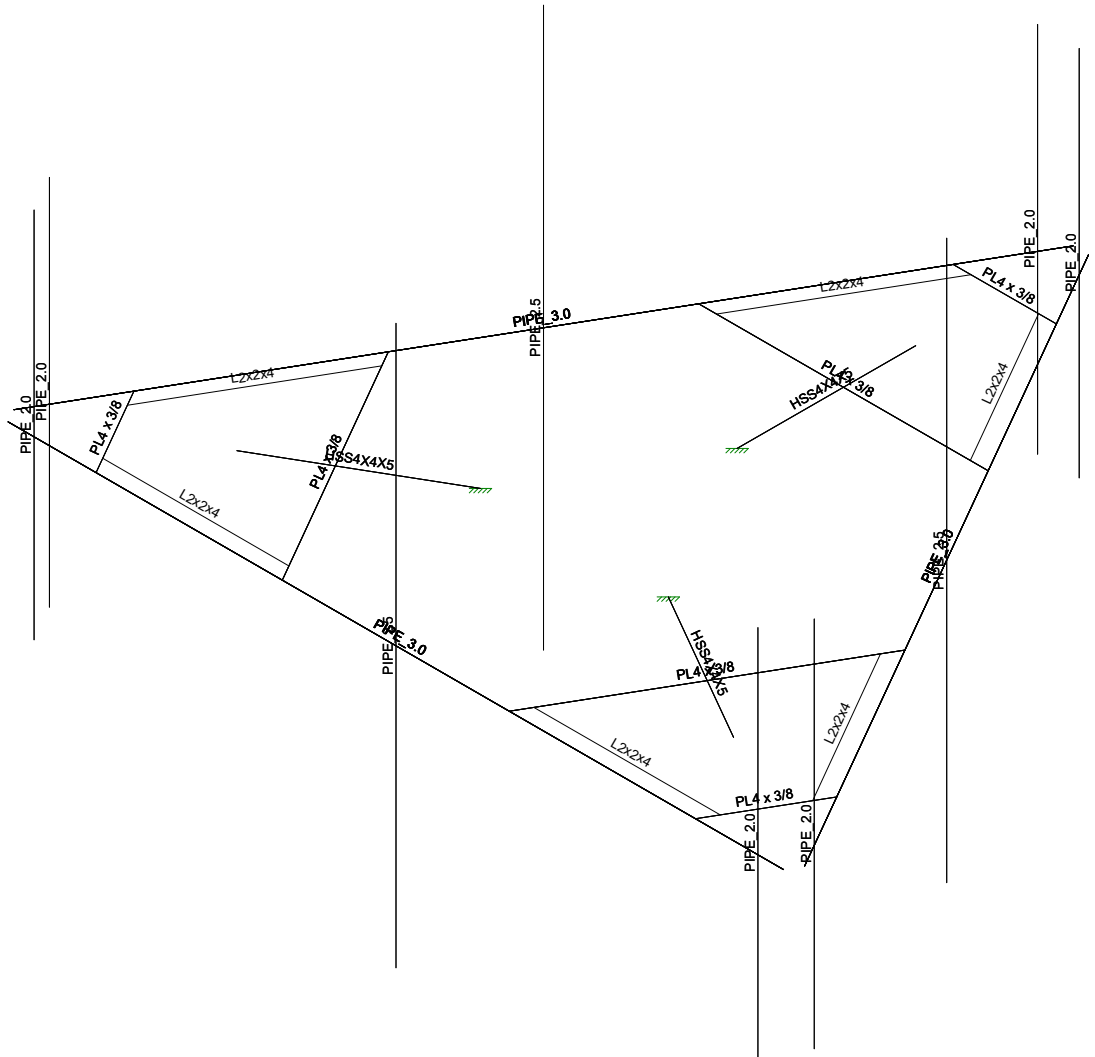


Envelope Only Solution

MasTec
EJM
18756-MNT1

876380-O&G WOODBURY

Node Labels
May 15, 2019 at 4:42 PM
18756.R3D



Envelope Only Solution

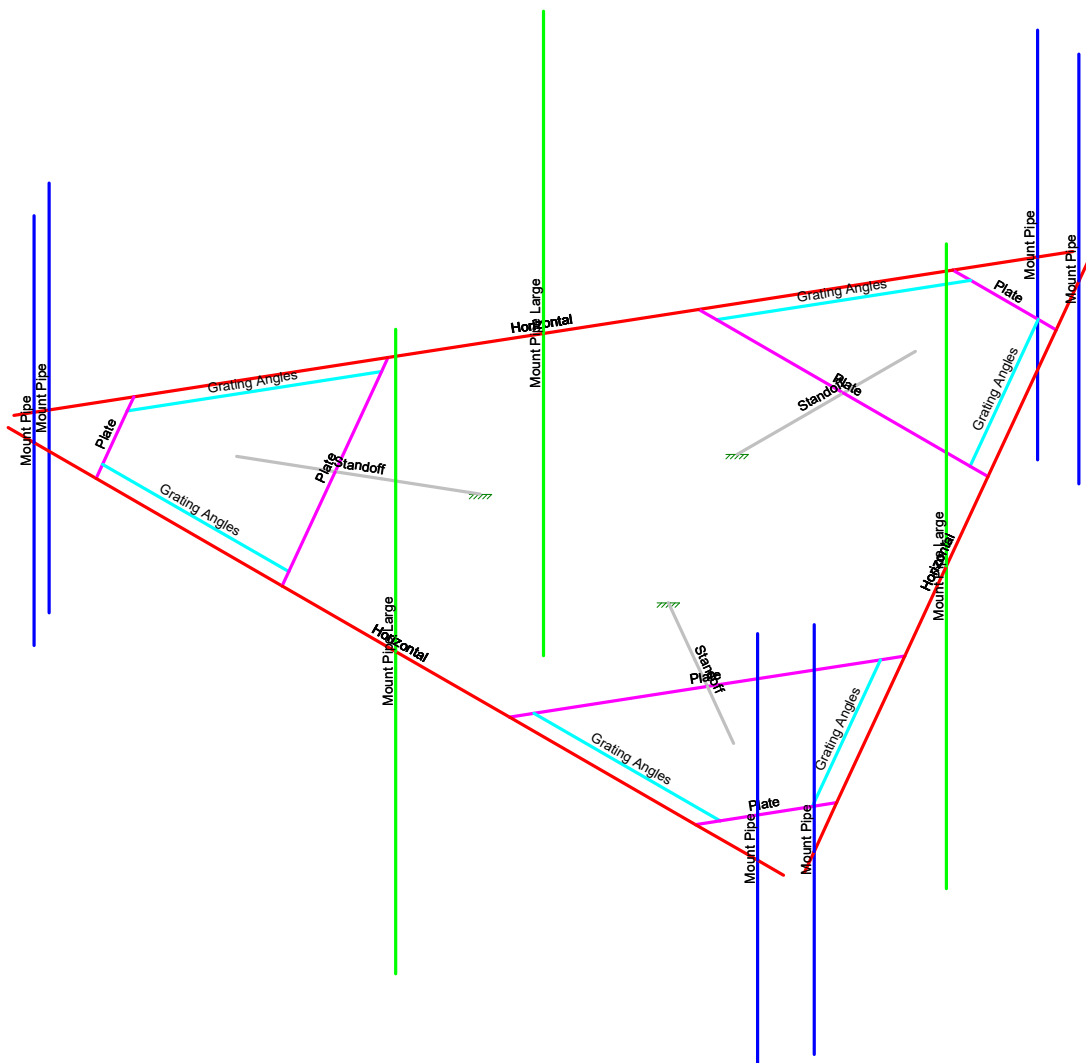
MasTec
EJM
18756-MNT1

876380-O&G WOODBURY

Member Shapes
May 15, 2019 at 4:42 PM
18756.R3D



Section Sets	
Blue	Mount Pipe
Green	Mount Pipe Large
Red	Horizontal
Grey	Standoff
Pink	Plate
Cyan	Grating Angles

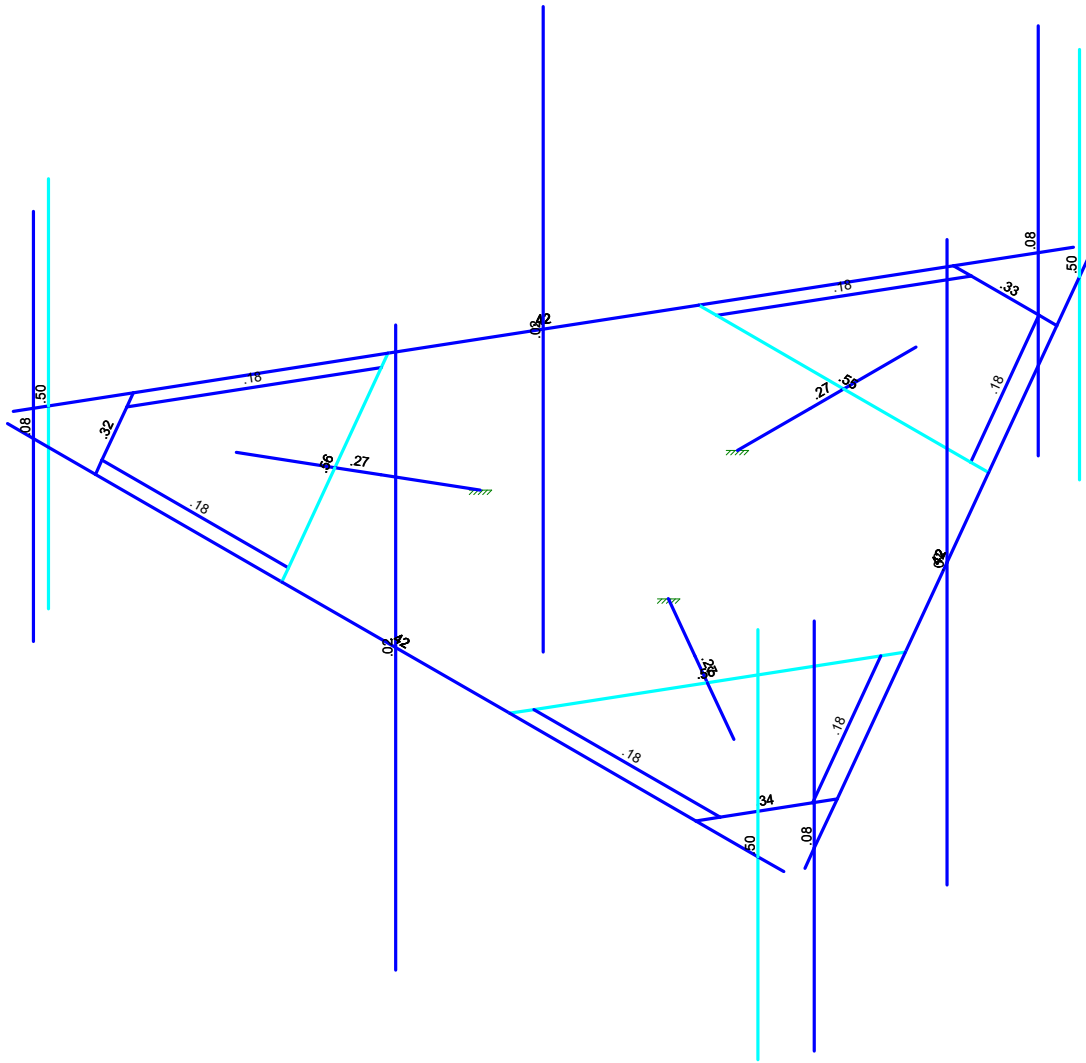


Envelope Only Solution

MasTec	876380-O&G WOODBURY	Section Sets
EJM		May 15, 2019 at 4:42 PM
18756-MNT1		18756.R3D



Code Check (Env)	
Black	No Calc
Red	> 1.0
Magenta	.90-1.0
Green	.75-.90
Cyan	.50-.75
Blue	0-.50



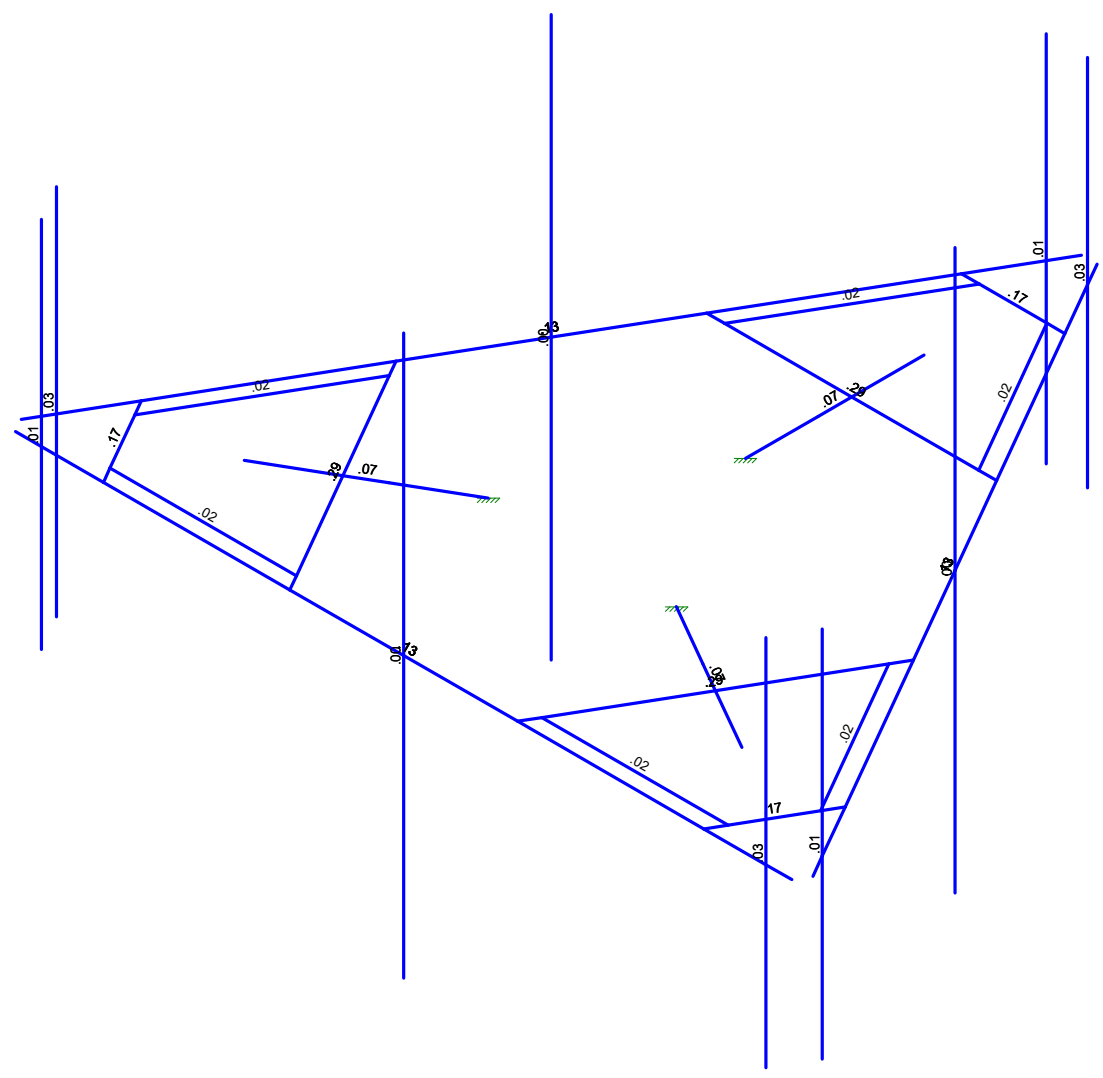
Member Code Checks Displayed (Enveloped)
Envelope Only Solution

MasTec	876380-O&G WOODBURY	Unity Check
EJM		May 16, 2019 at 9:33 AM
18756-MNT1		18756.R3D



Shear Check
(Env)

- No Calc
- > 1.0
- .90-1.0
- .75-.90
- .50-.75
- 0-.50



Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

MasTec
EJM
18756-MNT1

876380-O&G WOODBURY

Shear Check
May 16, 2019 at 9:33 AM
18756.R3D

APPENDIX B
SOFTWARE INPUT CALCULATIONS

Pipe Mount	Antenna	Elevation (ft)	Quantity	Orientation (deg)	Front Exposed (%)	Side Exposed (%)	Type	Height (in)	Width (in)	Depth (in)	Weight (lbs)	Front CaAa (ft ²)	Side CaAa (ft ²)	Front F _A (kips)	Side F _A (kips)	Top %	Bottom %
A	RFS APXVAARR24_43-U-NA20	87	1	0	100.0%	100.0%	Antenna	95.900	24.000	8.700	128.000	20.243	8.889	0.595	0.261	0.0%	100.0%
A	Ericsson KRY 112 489/2	87	1	0	0.0%	100.0%	RRU, TMA, Etc.	11.000	6.100	3.940	15.400	0.559	0.365	0.000	0.011	42.4%	57.6%
A																	
A																	
A																	
A																	
B																	
B																	
B																	
B																	
B																	
C	RFS APXV18-206516S-C-A20	87	1	0	100.0%	100.0%	Antenna	53.100	6.900	3.150	18.700	3.621	2.008	0.106	0.059	13.1%	86.9%
C	Ericsson RADIO 4449 B12/B71	87	1	0	100.0%	100.0%	RRU, TMA, Etc.	14.950	13.190	9.250	75.000	1.643	1.152	0.048	0.034	39.6%	60.4%
C																	
C																	
C																	
C																	
D	RFS APXVAARR24_43-U-NA20	87	1	120	100.0%	100.0%	Antenna	95.900	24.000	8.700	128.000	20.243	8.889	0.345	0.512	0.0%	100.0%
D	Ericsson KRY 112 489/2	87	1	120	0.0%	100.0%	RRU, TMA, Etc.	11.000	6.100	3.940	15.400	0.559	0.365	0.000	0.015	42.4%	57.6%
D																	
D																	
D																	
E																	
E																	
E																	
E																	
F	RFS APXV18-206516S-C-A20	87	1	120	100.0%	100.0%	Antenna	53.100	6.900	3.150	18.700	3.621	2.008	0.071	0.095	13.1%	86.9%
F	Ericsson RADIO 4449 B12/B71	87	1	120	100.0%	100.0%	RRU, TMA, Etc.	14.950	13.190	9.250	75.000	1.643	1.152	0.037	0.045	39.6%	60.4%
F																	
F																	
F																	
G	RFS APXVAARR24_43-U-NA20	87	1	240	100.0%	100.0%	Antenna	95.900	24.000	8.700	128.000	20.243	8.889	0.345	0.512	0.0%	100.0%
G	Ericsson KRY 112 489/2	87	1	240	0.0%	100.0%	RRU, TMA, Etc.	11.000	6.100	3.940	15.400	0.559	0.365	0.000	0.015	42.4%	57.6%
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I	RFS APXV18-206516S-C-A20	87	1	240	100.0%	100.0%	Antenna	53.100	6.900	3.150	18.700	3.621	2.008	0.071	0.095	13.1%	86.9%
I	Ericsson RADIO 4449 B12/B71	87	1	240	100.0%	100.0%	RRU, TMA, Etc.	14.950	13.190	9.250	75.000	1.643	1.152	0.037	0.045	39.6%	60.4%
I																	
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Pipe Mount	Antenna	Elevation (ft)	Quantity	Orientation (deg)	Front Exposed (%)	Side Exposed (%)	Type	Height (in)	Width (in)	Depth (in)	Ice Weight (lb)	Front CaAa (ft²)	Side CaAa (ft²)	Front F _A (klips)	Side F _A (klips)	Top %	Bottom %
A	RFS APXVAARR24_43-U-NA20	87	1	0	100.0%	100.0%	Antenna	95.900	24.000	8.700	438.600	23.521	11.927	0.120	0.061	0.0%	100.0%
A	Ericsson KRY 112 489/2	87	1	0	0.0%	100.0%	RRU, TMA, Etc.	11.000	6.100	3.940	16.500	1.121	0.864	0.000	0.004	42.4%	57.6%
A																	
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C	RFS APXV18-206516S-C-A20	87	1	0	100.0%	100.0%	Antenna	53.100	6.900	3.150	82.536	5.335	3.687	0.027	0.019	13.1%	86.9%
C	Ericsson RADIO 4449 B12/B71	87	1	0	100.0%	100.0%	RRU, TMA, Etc.	14.950	13.190	9.250	44.683	2.509	1.910	0.013	0.010	39.6%	60.4%
C																	
C																	
C																	
D	RFS APXVAARR24_43-U-NA20	87	1	120	100.0%	100.0%	Antenna	95.900	24.000	8.700	438.600	23.521	11.927	0.076	0.105	0.0%	100.0%
D	Ericsson KRY 112 489/2	87	1	120	0.0%	100.0%	RRU, TMA, Etc.	11.000	6.100	3.940	16.500	1.121	0.864	0.000	0.005	42.4%	57.6%
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D																	
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F	RFS APXV18-206516S-C-A20	87	1	120	100.0%	100.0%	Antenna	53.100	6.900	3.150	82.536	5.335	3.687	0.021	0.025	13.1%	86.9%
F	Ericsson RADIO 4449 B12/B71	87	1	120	100.0%	100.0%	RRU, TMA, Etc.	14.950	13.190	9.250	44.683	2.509	1.910	0.011	0.012	39.6%	60.4%
F																	
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G	Ericsson KRY 112 489/2	87	1	240	0.0%	100.0%	RRU, TMA, Etc.	11.000	6.100	3.940	16.500	1.121	0.864	0.000	0.005	42.4%	57.6%
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G																	
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I	RFS APXV18-206516S-C-A20	87	1	240	100.0%	100.0%	Antenna	53.100	6.900	3.150	82.536	5.335	3.687	0.021	0.025	13.1%	86.9%
I	Ericsson RADIO 4449 B12/B71	87	1	240	100.0%	100.0%	RRU, TMA, Etc.	14.950	13.190	9.250	44.683	2.509	1.910	0.011	0.012	39.6%	60.4%
I																	
I																	
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APPENDIX C
SOFTWARE ANALYSIS OUTPUT



Company : MasTec
 Designer : EJM
 Job Number : 18756-MNT1
 Model Name : 876380-O&G WOODBURY

May 16, 2019
 9:34 AM
 Checked By: _____

Hot Rolled Steel Properties

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

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Mount Pipe	PIPE 2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
2	Mount Pipe Large	PIPE 2.5	Beam	Pipe	A53 Gr.B	Typical	1.61	1.45	1.45	2.89
3	Horizontal	PIPE 3.0	Beam	Pipe	A53 Gr.B	Typical	2.07	2.85	2.85	5.69
4	Standoff	HSS4X4X5	Beam	SquareTube	A36 Gr.36	Typical	4.1	9.14	9.14	15.3
5	Plate	PL4 x 3/8	Beam	RECT	A36 Gr.36	Typical	1.5	.018	2	.066
6	Grating Angles	L2x2x4	Beam	Single Angle	A36 Gr.36	Typical	.944	.346	.346	.021

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	N1	0.787805	0	3.815862	0	
2	N2	7.037805	0	-7.009456	0	
3	N9	0.912805	0	4.032368	0	
4	N10	13.412805	0	4.032368	0	
5	N11	7.287805	0	-7.009456	0	
6	N12	13.537805	0	3.815862	0	
7	N13	2.185135	0	3.782368	0	
8	N14	5.185135	0	3.782368	0	
9	N15	1.640476	0	2.838992	0	
10	N16	3.140476	0	0.240916	0	
11	N17	7.707464	0	-5.782587	0	
12	N18	9.207464	0	-3.184511	0	
13	N19	12.829472	0	2.588992	0	
14	N20	11.996139	0	4.032368	0	
15	N21	6.329472	0	-5.782587	0	
16	N22	7.996139	0	-5.782587	0	
17	N23	2.329472	0	4.032368	0	
18	N24	1.496139	0	2.588992	0	
19	N25	4.829472	0	-3.184511	0	
20	N26	9.496139	0	-3.184511	0	
21	N27	5.647261	0	1.154591	0	
22	N28	3.157438	0	2.592091	0	
23	N29	8.67835	0	1.154591	0	
24	N30	11.168173	0	2.592091	0	
25	N31	7.162805	0	-1.470409	0	
26	N32	7.162805	0	-4.345409	0	
27	N33	5.329472	0	4.032368	0	
28	N34	2.996139	0	-0.009084	0	
29	N35	11.329472	0	-0.009084	0	
30	N36	8.996139	0	4.032368	0	
31	N37	5.118147	0	-3.184511	0	
32	N38	6.618147	0	-5.782587	0	
33	N39	11.185135	0	0.240916	0	
34	N40	12.685135	0	2.838992	0	



Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
35	N41	9.140476	0	3.782368	0	
36	N42	12.140476	0	3.782368	0	
37	N43	4.634493	0	1.739313	0	
38	N45	9.691118	0	1.739313	0	
39	N47	7.162805	0	-2.639852	0	
40	N51	6.829472	0	-6.648612	0	
41	N52	3.912805	0	-1.596797	0	
42	N53	0.996139	0	3.455018	0	
43	N54	7.162805	0	-3.184511	0	
44	N55	4.162805	0	2.011642	0	
45	N56	10.162805	0	2.011642	0	
46	N57	7.162805	0	0.279591	0	
47	N47A	6.829472	3.166667	-6.648612	0	
48	N48	0.996139	3.166667	3.455018	0	
49	N49	6.829472	-2.833333	-6.648612	0	
50	N50	0.996139	-2.833333	3.455018	0	
51	N51A	3.912805	4.5	-1.596797	0	
52	N52A	3.912805	-4.5	-1.596797	0	
53	N54A	1.329472	3.166667	4.032368	0	
54	N55A	12.996139	3.166667	4.032368	0	
55	N56A	1.329472	-2.833333	4.032368	0	
56	N57A	12.996139	-2.833333	4.032368	0	
57	N58	7.162805	4.5	4.032368	0	
58	N59	7.162805	-4.5	4.032368	0	
59	N61	13.329472	3.166667	3.455018	0	
60	N62	7.496139	3.166667	-6.648612	0	
61	N63	13.329472	-2.833333	3.455018	0	
62	N64	7.496139	-2.833333	-6.648612	0	
63	N65	10.412805	4.5	-1.596797	0	
64	N66	10.412805	-4.5	-1.596797	0	
65	N65A	12.996139	0	4.032368	0	
66	N66A	1.329472	0	4.032368	0	
67	N67	7.162805	0	4.032368	0	
68	N68	7.496139	0	-6.648612	0	
69	N69	13.329472	0	3.455018	0	
70	N70	10.412805	0	-1.596797	0	

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design Ru...
1	M1	N1	N2			Horizontal	Beam	Pipe	A53 Gr.B	Typical
2	M5	N9	N10			Horizontal	Beam	Pipe	A53 Gr.B	Typical
3	M6	N11	N12			Horizontal	Beam	Pipe	A53 Gr.B	Typical
4	M7	N13	N14		270	Grating Angles	Beam	Single Angle	A36 Gr.36	Typical
5	M8	N15	N16			Grating Angles	Beam	Single Angle	A36 Gr.36	Typical
6	M9	N17	N18			Grating Angles	Beam	Single Angle	A36 Gr.36	Typical
7	M10	N19	N20			Plate	Beam	RECT	A36 Gr.36	Typical
8	M11	N21	N22			Plate	Beam	RECT	A36 Gr.36	Typical
9	M12	N23	N24			Plate	Beam	RECT	A36 Gr.36	Typical
10	M13	N25	N26			Plate	Beam	RECT	A36 Gr.36	Typical
11	M14	N27	N28			Standoff	Beam	SquareTube	A36 Gr.36	Typical
12	M15	N29	N30			Standoff	Beam	SquareTube	A36 Gr.36	Typical
13	M16	N31	N32			Standoff	Beam	SquareTube	A36 Gr.36	Typical
14	M17	N33	N34			Plate	Beam	RECT	A36 Gr.36	Typical
15	M18	N35	N36			Plate	Beam	RECT	A36 Gr.36	Typical
16	M19	N37	N38			Grating Angles	Beam	Single Angle	A36 Gr.36	Typical



Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(d...)	Section/Shape	Type	Design List	Material	Design Ru...
17	M20	N39	N40			Grating Angles	Beam	Single Angle	A36 Gr.36	Typical
18	M21	N41	N42		270	Grating Angles	Beam	Single Angle	A36 Gr.36	Typical
19	D	N48	N50			Mount Pipe	Beam	Pipe	A53 Gr.B	Typical
20	F	N47A	N49			Mount Pipe	Beam	Pipe	A53 Gr.B	Typical
21	E	N51A	N52A			Mount Pipe Large	Beam	Pipe	A53 Gr.B	Typical
22	A	N55A	N57A			Mount Pipe	Beam	Pipe	A53 Gr.B	Typical
23	C	N54A	N56A			Mount Pipe	Beam	Pipe	A53 Gr.B	Typical
24	B	N58	N59			Mount Pipe Large	Beam	Pipe	A53 Gr.B	Typical
25	G	N62	N64			Mount Pipe	Beam	Pipe	A53 Gr.B	Typical
26	I	N61	N63			Mount Pipe	Beam	Pipe	A53 Gr.B	Typical
27	H	N65	N66			Mount Pipe Large	Beam	Pipe	A53 Gr.B	Typical

Joint Loads and Enforced Displacements (BLC 42 : Man 1 (500 lbs))

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)]
1	N65A	L	Y	-5

Joint Loads and Enforced Displacements (BLC 43 : Man 2 (500 lbs))

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)]
1	N53	L	Y	-5

Joint Loads and Enforced Displacements (BLC 44 : Man 3 (500 lbs))

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)]
1	N68	L	Y	-5

Joint Loads and Enforced Displacements (BLC 45 : Man 4 (250 lbs))

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)]
1	N10	L	Y	-25

Joint Loads and Enforced Displacements (BLC 46 : Man 5 (250 lbs))

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)]
1	N1	L	Y	-25

Joint Loads and Enforced Displacements (BLC 47 : Man 6 (250 lbs))

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)]
1	N11	L	Y	-25

Member Point Loads (BLC 1 : Dead)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	A	Y	-.128	%50
2	A	Y	-.015	%50
3	C	Y	-.019	%50
4	C	Y	-.075	%50
5	D	Y	-.128	%50
6	D	Y	-.015	%50
7	F	Y	-.019	%50
8	F	Y	-.075	%50
9	G	Y	-.128	%50
10	G	Y	-.015	%50
11	I	Y	-.019	%50
12	I	Y	-.075	%50



Member Point Loads (BLC 2 : Ice Dead)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	A	Y	-0.439	%50
2	A	Y	-0.017	%50
3	C	Y	-0.083	%50
4	C	Y	-0.045	%50
5	D	Y	-0.439	%50
6	D	Y	-0.017	%50
7	F	Y	-0.083	%50
8	F	Y	-0.045	%50
9	G	Y	-0.439	%50
10	G	Y	-0.017	%50
11	I	Y	-0.083	%50
12	I	Y	-0.045	%50

Member Point Loads (BLC 3 : Full Wind Antenna (0 Deg))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	A	Z	-0.297	0
2	C	Z	-0.053	%13.1
3	C	Z	-0.048	%50
4	D	Z	-0.172	0
5	F	Z	-0.035	%13.1
6	F	Z	-0.037	%50
7	G	Z	-0.172	0
8	I	Z	-0.035	%13.1
9	I	Z	-0.037	%50
10	A	Z	-0.297	%100
11	C	Z	-0.053	%86.9
12	D	Z	-0.172	%100
13	F	Z	-0.035	%86.9
14	G	Z	-0.172	%100
15	I	Z	-0.035	%86.9

Member Point Loads (BLC 4 : Full Wind Antenna (30 Deg))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	A	Z	-0.222	0
2	C	Z	-0.041	%13.1
3	C	Z	-0.039	%50
4	D	Z	-0.113	0
5	F	Z	-0.026	%13.1
6	F	Z	-0.029	%50
7	G	Z	-0.222	0
8	I	Z	-0.041	%13.1
9	I	Z	-0.039	%50
10	A	Z	-0.222	%100
11	C	Z	-0.041	%86.9
12	D	Z	-0.113	%100
13	F	Z	-0.026	%86.9
14	G	Z	-0.222	%100
15	I	Z	-0.041	%86.9
16	A	X	.128	0
17	A	X	.001	%50
18	C	X	.024	%13.1
19	C	X	.022	%50
20	D	X	.065	0
21	D	X	.005	%50
22	F	X	.015	%13.1
23	F	X	.017	%50



Member Point Loads (BLC 4 : Full Wind Antenna (30 Deg)) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft, %]
24	G	X	.128	0
25	G	X	.001	%50
26	I	X	.024	%13.1
27	I	X	.022	%50
28	A	X	.128	%100
29	C	X	.024	%86.9
30	D	X	.065	%100
31	F	X	.015	%86.9
32	G	X	.128	%100
33	I	X	.024	%86.9

Member Point Loads (BLC 5 : Full Wind Antenna (60 Deg))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft, %]
1	A	Z	-.086	0
2	C	Z	-.018	%13.1
3	C	Z	-.019	%50
4	D	Z	-.086	0
5	F	Z	-.018	%13.1
6	F	Z	-.019	%50
7	G	Z	-.149	0
8	I	Z	-.027	%13.1
9	I	Z	-.024	%50
10	A	Z	-.086	%100
11	C	Z	-.018	%86.9
12	D	Z	-.086	%100
13	F	Z	-.018	%86.9
14	G	Z	-.149	%100
15	I	Z	-.027	%86.9
16	A	X	.149	0
17	A	X	.007	%50
18	C	X	.031	%13.1
19	C	X	.032	%50
20	D	X	.149	0
21	D	X	.007	%50
22	F	X	.031	%13.1
23	F	X	.032	%50
24	G	X	.258	0
25	G	X	0	%50
26	I	X	.046	%13.1
27	I	X	.042	%50
28	A	X	.149	%100
29	C	X	.031	%86.9
30	D	X	.149	%100
31	F	X	.031	%86.9
32	G	X	.258	%100
33	I	X	.046	%86.9

Member Point Loads (BLC 6 : Full Wind Antenna (90 Deg))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft, %]
1	A	Z	0	0
2	C	Z	0	%13.1
3	C	Z	0	%50
4	D	Z	0	0
5	F	Z	0	%13.1
6	F	Z	0	%50
7	G	Z	0	0



Member Point Loads (BLC 6 : Full Wind Antenna (90 Deg)) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
8	I	Z	0	%13.1
9	I	Z	0	%50
10	A	Z	0	%100
11	C	Z	0	%86.9
12	D	Z	0	%100
13	F	Z	0	%86.9
14	G	Z	0	%100
15	I	Z	0	%86.9
16	A	X	.131	0
17	A	X	.011	%50
18	C	X	.03	%13.1
19	C	X	.034	%50
20	D	X	.256	0
21	D	X	.003	%50
22	F	X	.047	%13.1
23	F	X	.045	%50
24	G	X	.256	0
25	G	X	.003	%50
26	I	X	.047	%13.1
27	I	X	.045	%50
28	A	X	.131	%100
29	C	X	.03	%86.9
30	D	X	.256	%100
31	F	X	.047	%86.9
32	G	X	.256	%100
33	I	X	.047	%86.9

Member Point Loads (BLC 7 : Full Wind Antenna (120 Deg))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	A	Z	.086	0
2	C	Z	.018	%13.1
3	C	Z	.019	%50
4	D	Z	.149	0
5	F	Z	.027	%13.1
6	F	Z	.024	%50
7	G	Z	.086	0
8	I	Z	.018	%13.1
9	I	Z	.019	%50
10	A	Z	.086	%100
11	C	Z	.018	%86.9
12	D	Z	.149	%100
13	F	Z	.027	%86.9
14	G	Z	.086	%100
15	I	Z	.018	%86.9
16	A	X	.149	0
17	A	X	.007	%50
18	C	X	.031	%13.1
19	C	X	.032	%50
20	D	X	.258	0
21	F	X	.046	%13.1
22	F	X	.042	%50
23	G	X	.149	0
24	G	X	.007	%50
25	I	X	.031	%13.1
26	I	X	.032	%50
27	A	X	.149	%100



Member Point Loads (BLC 7 : Full Wind Antenna (120 Deg)) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
28	C	X	.031	%86.9
29	D	X	.258	%100
30	F	X	.046	%86.9
31	G	X	.149	%100
32	I	X	.031	%86.9

Member Point Loads (BLC 8 : Full Wind Antenna (150 Deg))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	A	Z	.222	0
2	C	Z	.041	%13.1
3	C	Z	.039	%50
4	D	Z	.222	0
5	F	Z	.041	%13.1
6	F	Z	.039	%50
7	G	Z	.113	0
8	I	Z	.026	%13.1
9	I	Z	.029	%50
10	A	Z	.222	%100
11	C	Z	.041	%86.9
12	D	Z	.222	%100
13	F	Z	.041	%86.9
14	G	Z	.113	%100
15	I	Z	.026	%86.9
16	A	X	.128	0
17	A	X	.001	%50
18	C	X	.024	%13.1
19	C	X	.022	%50
20	D	X	.128	0
21	D	X	.001	%50
22	F	X	.024	%13.1
23	F	X	.022	%50
24	G	X	.065	0
25	G	X	.005	%50
26	I	X	.015	%13.1
27	I	X	.017	%50
28	A	X	.128	%100
29	C	X	.024	%86.9
30	D	X	.128	%100
31	F	X	.024	%86.9
32	G	X	.065	%100
33	I	X	.015	%86.9

Member Point Loads (BLC 15 : Ice Wind Antenna (0 Deg))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	A	Z	-.06	0
2	C	Z	-.014	%13.1
3	C	Z	-.013	%50
4	D	Z	-.038	0
5	F	Z	-.01	%13.1
6	F	Z	-.011	%50
7	G	Z	-.038	0
8	I	Z	-.01	%13.1
9	I	Z	-.011	%50
10	A	Z	-.06	%100
11	C	Z	-.014	%86.9
12	D	Z	-.038	%100



Member Point Loads (BLC 15 : Ice Wind Antenna (0 Deg)) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft, %]
13	F	Z	-.01	%86.9
14	G	Z	-.038	%100
15	I	Z	-.01	%86.9

Member Point Loads (BLC 16 : Ice Wind Antenna (30 Deg))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft, %]
1	A	Z	-.046	0
2	C	Z	-.011	%13.1
3	C	Z	-.01	%50
4	D	Z	-.026	0
5	F	Z	-.008	%13.1
6	F	Z	-.008	%50
7	G	Z	-.046	0
8	I	Z	-.011	%13.1
9	I	Z	-.01	%50
10	A	Z	-.046	%100
11	C	Z	-.011	%86.9
12	D	Z	-.026	%100
13	F	Z	-.008	%86.9
14	G	Z	-.046	%100
15	I	Z	-.011	%86.9
16	A	X	.026	0
17	A	X	.001	%50
18	C	X	.006	%13.1
19	C	X	.006	%50
20	D	X	.015	0
21	D	X	.002	%50
22	F	X	.005	%13.1
23	F	X	.005	%50
24	G	X	.026	0
25	G	X	.001	%50
26	I	X	.006	%13.1
27	I	X	.006	%50
28	A	X	.026	%100
29	C	X	.006	%86.9
30	D	X	.015	%100
31	F	X	.005	%86.9
32	G	X	.026	%100
33	I	X	.006	%86.9

Member Point Loads (BLC 17 : Ice Wind Antenna (60 Deg))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft, %]
1	A	Z	-.019	0
2	C	Z	-.005	%13.1
3	C	Z	-.005	%50
4	D	Z	-.019	0
5	F	Z	-.005	%13.1
6	F	Z	-.005	%50
7	G	Z	-.03	0
8	I	Z	-.007	%13.1
9	I	Z	-.006	%50
10	A	Z	-.019	%100
11	C	Z	-.005	%86.9
12	D	Z	-.019	%100
13	F	Z	-.005	%86.9
14	G	Z	-.03	%100



Member Point Loads (BLC 17 : Ice Wind Antenna (60 Deg)) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft, %]
15	I	Z	-.007	%86.9
16	A	X	.033	0
17	A	X	.003	%50
18	C	X	.009	%13.1
19	C	X	.009	%50
20	D	X	.033	0
21	D	X	.003	%50
22	F	X	.009	%13.1
23	F	X	.009	%50
24	G	X	.052	0
25	G	X	0	%50
26	I	X	.012	%13.1
27	I	X	.011	%50
28	A	X	.033	%100
29	C	X	.009	%86.9
30	D	X	.033	%100
31	F	X	.009	%86.9
32	G	X	.052	%100
33	I	X	.012	%86.9

Member Point Loads (BLC 18 : Ice Wind Antenna (90 Deg))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft, %]
1	A	Z	0	0
2	C	Z	0	%13.1
3	C	Z	0	%50
4	D	Z	0	0
5	F	Z	0	%13.1
6	F	Z	0	%50
7	G	Z	0	0
8	I	Z	0	%13.1
9	I	Z	0	%50
10	A	Z	0	%100
11	C	Z	0	%86.9
12	D	Z	0	%100
13	F	Z	0	%86.9
14	G	Z	0	%100
15	I	Z	0	%86.9
16	A	X	.03	0
17	A	X	.004	%50
18	C	X	.009	%13.1
19	C	X	.01	%50
20	D	X	.053	0
21	D	X	.001	%50
22	F	X	.013	%13.1
23	F	X	.012	%50
24	G	X	.053	0
25	G	X	.001	%50
26	I	X	.013	%13.1
27	I	X	.012	%50
28	A	X	.03	%100
29	C	X	.009	%86.9
30	D	X	.053	%100
31	F	X	.013	%86.9
32	G	X	.053	%100
33	I	X	.013	%86.9



Member Point Loads (BLC 19 : Ice Wind Antenna (120 Deg))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft, %]
1	A	Z	.019	0
2	C	Z	.005	%13.1
3	C	Z	.005	%50
4	D	Z	.03	0
5	F	Z	.007	%13.1
6	F	Z	.006	%50
7	G	Z	.019	0
8	I	Z	.005	%13.1
9	I	Z	.005	%50
10	A	Z	.019	%100
11	C	Z	.005	%86.9
12	D	Z	.03	%100
13	F	Z	.007	%86.9
14	G	Z	.019	%100
15	I	Z	.005	%86.9
16	A	X	.033	0
17	A	X	.003	%50
18	C	X	.009	%13.1
19	C	X	.009	%50
20	D	X	.052	0
21	F	X	.012	%13.1
22	F	X	.011	%50
23	G	X	.033	0
24	G	X	.003	%50
25	I	X	.009	%13.1
26	I	X	.009	%50
27	A	X	.033	%100
28	C	X	.009	%86.9
29	D	X	.052	%100
30	F	X	.012	%86.9
31	G	X	.033	%100
32	I	X	.009	%86.9

Member Point Loads (BLC 20 : Ice Wind Antenna (150 Deg))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft, %]
1	A	Z	.046	0
2	C	Z	.005	%13.1
3	C	Z	.005	%50
4	D	Z	.03	0
5	F	Z	.007	%13.1
6	F	Z	.006	%50
7	G	Z	.019	0
8	I	Z	.005	%13.1
9	I	Z	.005	%50
10	A	Z	.046	%100
11	C	Z	.005	%86.9
12	D	Z	.03	%100
13	F	Z	.007	%86.9
14	G	Z	.019	%100
15	I	Z	.005	%86.9
16	A	X	.026	0
17	A	X	.003	%50
18	C	X	.009	%13.1
19	C	X	.009	%50
20	D	X	.052	0
21	F	X	.012	%13.1



Member Point Loads (BLC 20 : Ice Wind Antenna (150 Deg)) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
22	F	X	.011	%50
23	G	X	.033	0
24	G	X	.003	%50
25	I	X	.009	%13.1
26	I	X	.009	%50
27	A	X	.026	%100
28	C	X	.009	%86.9
29	D	X	.052	%100
30	F	X	.012	%86.9
31	G	X	.033	%100
32	I	X	.009	%86.9

Member Point Loads (BLC 27 : Seismic Antenna (0 Deg))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	A	Z	-.013	%50
2	A	Z	-.002	%50
3	C	Z	-.002	%50
4	C	Z	-.008	%50
5	D	Z	-.013	%50
6	D	Z	-.002	%50
7	F	Z	-.002	%50
8	F	Z	-.008	%50
9	G	Z	-.013	%50
10	G	Z	-.002	%50
11	I	Z	-.002	%50
12	I	Z	-.008	%50

Member Point Loads (BLC 28 : Seismic Antenna (90 Deg))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	A	X	.013	%50
2	A	X	.002	%50
3	C	X	.002	%50
4	C	X	.008	%50
5	D	X	.013	%50
6	D	X	.002	%50
7	F	X	.002	%50
8	F	X	.008	%50
9	G	X	.013	%50
10	G	X	.002	%50
11	I	X	.002	%50
12	I	X	.008	%50

Member Point Loads (BLC 41 : Seismic Vertical Antennas)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	A	Y	-.026	%50
2	A	Y	-.003	%50
3	C	Y	-.004	%50
4	C	Y	-.015	%50
5	D	Y	-.026	%50
6	D	Y	-.003	%50
7	F	Y	-.004	%50
8	F	Y	-.015	%50
9	G	Y	-.026	%50
10	G	Y	-.003	%50
11	I	Y	-.004	%50



Member Point Loads (BLC 41 : Seismic Vertical Antennas) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
12	I	Y	-0.15	%50

Member Distributed Loads (BLC 2 : Ice Dead)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft.F,...	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-0.01	-0.01	0	%100
2	M5	Y	-0.01	-0.01	0	%100
3	M6	Y	-0.01	-0.01	0	%100
4	M7	Y	-0.009	-0.009	0	%100
5	M8	Y	-0.009	-0.009	0	%100
6	M9	Y	-0.009	-0.009	0	%100
7	M10	Y	-0.011	-0.011	0	%100
8	M11	Y	-0.011	-0.011	0	%100
9	M12	Y	-0.011	-0.011	0	%100
10	M13	Y	-0.011	-0.011	0	%100
11	M14	Y	-0.015	-0.015	0	%100
12	M15	Y	-0.015	-0.015	0	%100
13	M16	Y	-0.015	-0.015	0	%100
14	M17	Y	-0.011	-0.011	0	%100
15	M18	Y	-0.011	-0.011	0	%100
16	M19	Y	-0.009	-0.009	0	%100
17	M20	Y	-0.009	-0.009	0	%100
18	M21	Y	-0.009	-0.009	0	%100
19	D	Y	-0.008	-0.008	0	%100
20	F	Y	-0.008	-0.008	0	%100
21	E	Y	-0.009	-0.009	0	%100
22	A	Y	-0.008	-0.008	0	%100
23	C	Y	-0.008	-0.008	0	%100
24	B	Y	-0.009	-0.009	0	%100
25	G	Y	-0.008	-0.008	0	%100
26	I	Y	-0.008	-0.008	0	%100
27	H	Y	-0.009	-0.009	0	%100

Member Distributed Loads (BLC 9 : Full Wind Members (0 Deg))

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft.F,...	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	-0.003	-0.003	0	%100
2	M5	Z	-0.01	-0.01	0	%100
3	M6	Z	-0.003	-0.003	0	%100
4	M7	Z	-0.01	-0.01	0	%100
5	M8	Z	-0.002	-0.002	0	%100
6	M9	Z	-0.002	-0.002	0	%100
7	M10	Z	-0.005	-0.005	0	%100
8	M11	Z	-0.02	-0.02	0	%100
9	M12	Z	-0.005	-0.005	0	%100
10	M13	Z	-0.02	-0.02	0	%100
11	M14	Z	-0.015	-0.015	0	%100
12	M15	Z	-0.015	-0.015	0	%100
13	M16	Z	0	0	0	%100
14	M17	Z	-0.005	-0.005	0	%100
15	M18	Z	-0.005	-0.005	0	%100
16	M19	Z	-0.002	-0.002	0	%100
17	M20	Z	-0.002	-0.002	0	%100
18	M21	Z	-0.01	-0.01	0	%100
19	F	Z	-0.007	-0.007	0	%13.1
20	C	Z	-0.007	-0.007	0	%13.1
21	I	Z	-0.007	-0.007	0	%13.1



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 Designer : EJM
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Member Distributed Loads (BLC 9 : Full Wind Members (0 Deg)) (Continued)

	Member Label	Direction	Start Magnitude[k/ft....	End Magnitude[k/ft.F....	Start Location[ft.%]	End Location[ft.%]
22	F	Z	-0.007	-0.007	%86.9	%100
23	E	Z	-0.008	-0.008	0	%100
24	C	Z	-0.007	-0.007	%86.9	%100
25	B	Z	-0.008	-0.008	0	%100
26	I	Z	-0.007	-0.007	%86.9	%100
27	H	Z	-0.008	-0.008	0	%100
28	M1	X	0	0	0	%100
29	M5	X	0	0	0	%100
30	M6	X	0	0	0	%100
31	M7	X	0	0	0	%100
32	M8	X	0	0	0	%100
33	M9	X	0	0	0	%100
34	M10	X	0	0	0	%100
35	M11	X	0	0	0	%100
36	M12	X	0	0	0	%100
37	M13	X	0	0	0	%100
38	M14	X	0	0	0	%100
39	M15	X	0	0	0	%100
40	M16	X	0	0	0	%100
41	M17	X	0	0	0	%100
42	M18	X	0	0	0	%100
43	M19	X	0	0	0	%100
44	M20	X	0	0	0	%100
45	M21	X	0	0	0	%100
46	F	X	0	0	0	%13.1
47	A	X	0	0	0	%100
48	C	X	0	0	0	%100
49	I	X	0	0	0	%13.1
50	F	X	0	0	%86.9	%100
51	E	X	0	0	0	%100
52	B	X	0	0	0	%100
53	I	X	0	0	%86.9	%100
54	H	X	0	0	0	%100

Member Distributed Loads (BLC 10 : Full Wind Members (30 Deg))

	Member Label	Direction	Start Magnitude[k/ft....	End Magnitude[k/ft.F....	Start Location[ft.%]	End Location[ft.%]
1	M1	Z	0	0	0	%100
2	M5	Z	-0.007	-0.007	0	%100
3	M6	Z	-0.007	-0.007	0	%100
4	M7	Z	-0.006	-0.006	0	%100
5	M8	Z	0	0	0	%100
6	M9	Z	-0.006	-0.006	0	%100
7	M10	Z	0	0	0	%100
8	M11	Z	-0.013	-0.013	0	%100
9	M12	Z	-0.013	-0.013	0	%100
10	M13	Z	-0.013	-0.013	0	%100
11	M14	Z	-0.004	-0.004	0	%100
12	M15	Z	-0.017	-0.017	0	%100
13	M16	Z	-0.004	-0.004	0	%100
14	M17	Z	-0.013	-0.013	0	%100
15	M18	Z	0	0	0	%100
16	M19	Z	0	0	0	%100
17	M20	Z	-0.006	-0.006	0	%100
18	M21	Z	-0.006	-0.006	0	%100
19	F	Z	-0.006	-0.006	0	%13.1
20	C	Z	-0.006	-0.006	0	%13.1



Member Distributed Loads (BLC 10 : Full Wind Members (30 Deg)) (Continued)

	Member Label	Direction	Start Magnitude[k/ft....	End Magnitude[k/ft.F....	Start Location[ft.%]	End Location[ft.%]
21	I	Z	-.006	-.006	0	%13.1
22	F	Z	-.006	-.006	%86.9	%100
23	E	Z	-.007	-.007	0	%100
24	C	Z	-.006	-.006	%86.9	%100
25	B	Z	-.007	-.007	0	%100
26	I	Z	-.006	-.006	%86.9	%100
27	H	Z	-.007	-.007	0	%100
28	M1	X	0	0	0	%100
29	M5	X	.004	.004	0	%100
30	M6	X	.004	.004	0	%100
31	M7	X	.004	.004	0	%100
32	M8	X	0	0	0	%100
33	M9	X	.004	.004	0	%100
34	M10	X	0	0	0	%100
35	M11	X	.007	.007	0	%100
36	M12	X	.007	.007	0	%100
37	M13	X	.007	.007	0	%100
38	M14	X	.002	.002	0	%100
39	M15	X	.01	.01	0	%100
40	M16	X	.002	.002	0	%100
41	M17	X	.007	.007	0	%100
42	M18	X	0	0	0	%100
43	M19	X	0	0	0	%100
44	M20	X	.004	.004	0	%100
45	M21	X	.004	.004	0	%100
46	F	X	.003	.003	0	%13.1
47	A	X	.003	.003	0	%100
48	C	X	.003	.003	0	%100
49	I	X	.003	.003	0	%13.1
50	F	X	.003	.003	%86.9	%100
51	E	X	.004	.004	0	%100
52	B	X	.004	.004	0	%100
53	I	X	.003	.003	%86.9	%100
54	H	X	.004	.004	0	%100

Member Distributed Loads (BLC 11 : Full Wind Members (60 Deg))

	Member Label	Direction	Start Magnitude[k/ft....	End Magnitude[k/ft.F....	Start Location[ft.%]	End Location[ft.%]
1	M1	Z	-.001	-.001	0	%100
2	M5	Z	-.001	-.001	0	%100
3	M6	Z	-.005	-.005	0	%100
4	M7	Z	-.001	-.001	0	%100
5	M8	Z	-.001	-.001	0	%100
6	M9	Z	-.005	-.005	0	%100
7	M10	Z	-.002	-.002	0	%100
8	M11	Z	-.002	-.002	0	%100
9	M12	Z	-.01	-.01	0	%100
10	M13	Z	-.002	-.002	0	%100
11	M14	Z	0	0	0	%100
12	M15	Z	-.007	-.007	0	%100
13	M16	Z	-.007	-.007	0	%100
14	M17	Z	-.01	-.01	0	%100
15	M18	Z	-.002	-.002	0	%100
16	M19	Z	-.001	-.001	0	%100
17	M20	Z	-.005	-.005	0	%100
18	M21	Z	-.001	-.001	0	%100
19	F	Z	-.003	-.003	0	%13.1



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Member Distributed Loads (BLC 11 : Full Wind Members (60 Deg)) (Continued)

	Member Label	Direction	Start Magnitude[k/ft....	End Magnitude[k/ft.F....	Start Location[ft,%]	End Location[ft,%]
20	C	Z	-.003	-.003	0	%13.1
21	I	Z	-.003	-.003	0	%13.1
22	F	Z	-.003	-.003	%86.9	%100
23	E	Z	-.004	-.004	0	%100
24	C	Z	-.003	-.003	%86.9	%100
25	B	Z	-.004	-.004	0	%100
26	I	Z	-.003	-.003	%86.9	%100
27	H	Z	-.004	-.004	0	%100
28	M1	X	.002	.002	0	%100
29	M5	X	.002	.002	0	%100
30	M6	X	.009	.009	0	%100
31	M7	X	.002	.002	0	%100
32	M8	X	.002	.002	0	%100
33	M9	X	.008	.008	0	%100
34	M10	X	.004	.004	0	%100
35	M11	X	.004	.004	0	%100
36	M12	X	.017	.017	0	%100
37	M13	X	.004	.004	0	%100
38	M14	X	0	0	0	%100
39	M15	X	.013	.013	0	%100
40	M16	X	.013	.013	0	%100
41	M17	X	.017	.017	0	%100
42	M18	X	.004	.004	0	%100
43	M19	X	.002	.002	0	%100
44	M20	X	.008	.008	0	%100
45	M21	X	.002	.002	0	%100
46	F	X	.006	.006	0	%13.1
47	A	X	.006	.006	0	%100
48	C	X	.006	.006	0	%100
49	I	X	.006	.006	0	%13.1
50	F	X	.006	.006	%86.9	%100
51	E	X	.007	.007	0	%100
52	B	X	.007	.007	0	%100
53	I	X	.006	.006	%86.9	%100
54	H	X	.007	.007	0	%100

Member Distributed Loads (BLC 12 : Full Wind Members (90 Deg))

	Member Label	Direction	Start Magnitude[k/ft....	End Magnitude[k/ft.F....	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	0	0	0	%100
2	M5	Z	0	0	0	%100
3	M6	Z	0	0	0	%100
4	M7	Z	0	0	0	%100
5	M8	Z	0	0	0	%100
6	M9	Z	0	0	0	%100
7	M10	Z	0	0	0	%100
8	M11	Z	0	0	0	%100
9	M12	Z	0	0	0	%100
10	M13	Z	0	0	0	%100
11	M14	Z	0	0	0	%100
12	M15	Z	0	0	0	%100
13	M16	Z	0	0	0	%100
14	M17	Z	0	0	0	%100
15	M18	Z	0	0	0	%100
16	M19	Z	0	0	0	%100
17	M20	Z	0	0	0	%100
18	M21	Z	0	0	0	%100



Member Distributed Loads (BLC 12 : Full Wind Members (90 Deg)) (Continued)

	Member Label	Direction	Start Magnitude[k/ft....	End Magnitude[k/ft.F....	Start Location[ft.%,]	End Location[ft.%,]
19	F	Z	0	0	0	%13.1
20	C	Z	0	0	0	%13.1
21	I	Z	0	0	0	%13.1
22	F	Z	0	0	%86.9	%100
23	E	Z	0	0	0	%100
24	C	Z	0	0	%86.9	%100
25	B	Z	0	0	0	%100
26	I	Z	0	0	%86.9	%100
27	H	Z	0	0	0	%100
28	M1	X	.008	.008	0	%100
29	M5	X	0	0	0	%100
30	M6	X	.008	.008	0	%100
31	M7	X	0	0	0	%100
32	M8	X	.007	.007	0	%100
33	M9	X	.007	.007	0	%100
34	M10	X	.015	.015	0	%100
35	M11	X	0	0	0	%100
36	M12	X	.015	.015	0	%100
37	M13	X	0	0	0	%100
38	M14	X	.005	.005	0	%100
39	M15	X	.005	.005	0	%100
40	M16	X	.02	.02	0	%100
41	M17	X	.015	.015	0	%100
42	M18	X	.015	.015	0	%100
43	M19	X	.007	.007	0	%100
44	M20	X	.007	.007	0	%100
45	M21	X	0	0	0	%100
46	F	X	.007	.007	0	%13.1
47	A	X	.007	.007	0	%100
48	C	X	.007	.007	0	%100
49	I	X	.007	.007	0	%13.1
50	F	X	.007	.007	%86.9	%100
51	E	X	.008	.008	0	%100
52	B	X	.008	.008	0	%100
53	I	X	.007	.007	%86.9	%100
54	H	X	.008	.008	0	%100

Member Distributed Loads (BLC 13 : Full Wind Members (120 Deg))

	Member Label	Direction	Start Magnitude[k/ft....	End Magnitude[k/ft.F....	Start Location[ft.%,]	End Location[ft.%,]
1	M1	Z	.005	.005	0	%100
2	M5	Z	.001	.001	0	%100
3	M6	Z	.001	.001	0	%100
4	M7	Z	.001	.001	0	%100
5	M8	Z	.005	.005	0	%100
6	M9	Z	.001	.001	0	%100
7	M10	Z	.01	.01	0	%100
8	M11	Z	.002	.002	0	%100
9	M12	Z	.002	.002	0	%100
10	M13	Z	.002	.002	0	%100
11	M14	Z	.007	.007	0	%100
12	M15	Z	0	0	0	%100
13	M16	Z	.007	.007	0	%100
14	M17	Z	.002	.002	0	%100
15	M18	Z	.01	.01	0	%100
16	M19	Z	.005	.005	0	%100
17	M20	Z	.001	.001	0	%100



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Member Distributed Loads (BLC 13 : Full Wind Members (120 Deg)) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft.F,...	Start Location[ft, %]	End Location[ft, %]
18	M21	Z	.001	.001	0	%100
19	F	Z	.003	.003	0	%13.1
20	C	Z	.003	.003	0	%13.1
21	I	Z	.003	.003	0	%13.1
22	F	Z	.003	.003	%86.9	%100
23	E	Z	.004	.004	0	%100
24	C	Z	.003	.003	%86.9	%100
25	B	Z	.004	.004	0	%100
26	I	Z	.003	.003	%86.9	%100
27	H	Z	.004	.004	0	%100
28	M1	X	.009	.009	0	%100
29	M5	X	.002	.002	0	%100
30	M6	X	.002	.002	0	%100
31	M7	X	.002	.002	0	%100
32	M8	X	.008	.008	0	%100
33	M9	X	.002	.002	0	%100
34	M10	X	.017	.017	0	%100
35	M11	X	.004	.004	0	%100
36	M12	X	.004	.004	0	%100
37	M13	X	.004	.004	0	%100
38	M14	X	.013	.013	0	%100
39	M15	X	0	0	0	%100
40	M16	X	.013	.013	0	%100
41	M17	X	.004	.004	0	%100
42	M18	X	.017	.017	0	%100
43	M19	X	.008	.008	0	%100
44	M20	X	.002	.002	0	%100
45	M21	X	.002	.002	0	%100
46	F	X	.006	.006	0	%13.1
47	A	X	.006	.006	0	%100
48	C	X	.006	.006	0	%100
49	I	X	.006	.006	0	%13.1
50	F	X	.006	.006	%86.9	%100
51	E	X	.007	.007	0	%100
52	B	X	.007	.007	0	%100
53	I	X	.006	.006	%86.9	%100
54	H	X	.007	.007	0	%100

Member Distributed Loads (BLC 14 : Full Wind Members (150 Deg))

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft.F,...	Start Location[ft, %]	End Location[ft, %]
1	M1	Z	.007	.007	0	%100
2	M5	Z	.007	.007	0	%100
3	M6	Z	0	0	0	%100
4	M7	Z	.006	.006	0	%100
5	M8	Z	.006	.006	0	%100
6	M9	Z	0	0	0	%100
7	M10	Z	.013	.013	0	%100
8	M11	Z	.013	.013	0	%100
9	M12	Z	0	0	0	%100
10	M13	Z	.013	.013	0	%100
11	M14	Z	.017	.017	0	%100
12	M15	Z	.004	.004	0	%100
13	M16	Z	.004	.004	0	%100
14	M17	Z	0	0	0	%100
15	M18	Z	.013	.013	0	%100
16	M19	Z	.006	.006	0	%100



Company : MasTec
 Designer : EJM
 Job Number : 18756-MNT1
 Model Name : 876380-O&G WOODBURY

May 16, 2019
 9:34 AM
 Checked By: _____

Member Distributed Loads (BLC 14 : Full Wind Members (150 Deg)) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft.F,...	Start Location[ft, %]	End Location[ft, %]
17	M20	Z	0	0	0	%100
18	M21	Z	.006	.006	0	%100
19	F	Z	.006	.006	0	%13.1
20	C	Z	.006	.006	0	%13.1
21	I	Z	.006	.006	0	%13.1
22	F	Z	.006	.006	%86.9	%100
23	E	Z	.007	.007	0	%100
24	C	Z	.006	.006	%86.9	%100
25	B	Z	.007	.007	0	%100
26	I	Z	.006	.006	%86.9	%100
27	H	Z	.007	.007	0	%100
28	M1	X	.004	.004	0	%100
29	M5	X	.004	.004	0	%100
30	M6	X	0	0	0	%100
31	M7	X	.004	.004	0	%100
32	M8	X	.004	.004	0	%100
33	M9	X	0	0	0	%100
34	M10	X	.007	.007	0	%100
35	M11	X	.007	.007	0	%100
36	M12	X	0	0	0	%100
37	M13	X	.007	.007	0	%100
38	M14	X	.01	.01	0	%100
39	M15	X	.002	.002	0	%100
40	M16	X	.002	.002	0	%100
41	M17	X	0	0	0	%100
42	M18	X	.007	.007	0	%100
43	M19	X	.004	.004	0	%100
44	M20	X	0	0	0	%100
45	M21	X	.004	.004	0	%100
46	F	X	.003	.003	0	%13.1
47	A	X	.003	.003	0	%100
48	C	X	.003	.003	0	%100
49	I	X	.003	.003	0	%13.1
50	F	X	.003	.003	%86.9	%100
51	E	X	.004	.004	0	%100
52	B	X	.004	.004	0	%100
53	I	X	.003	.003	%86.9	%100
54	H	X	.004	.004	0	%100

Member Distributed Loads (BLC 21 : Ice Wind Members (0 Deg))

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft.F,...	Start Location[ft, %]	End Location[ft, %]
1	M1	Z	-.001	-.001	0	%100
2	M5	Z	-.004	-.004	0	%100
3	M6	Z	-.001	-.001	0	%100
4	M7	Z	-.004	-.004	0	%100
5	M8	Z	-.001	-.001	0	%100
6	M9	Z	-.001	-.001	0	%100
7	M10	Z	-.001	-.001	0	%100
8	M11	Z	-.006	-.006	0	%100
9	M12	Z	-.001	-.001	0	%100
10	M13	Z	-.005	-.005	0	%100
11	M14	Z	-.004	-.004	0	%100
12	M15	Z	-.004	-.004	0	%100
13	M16	Z	0	0	0	%100
14	M17	Z	-.001	-.001	0	%100
15	M18	Z	-.001	-.001	0	%100



Member Distributed Loads (BLC 21 : Ice Wind Members (0 Deg)) (Continued)

	Member Label	Direction	Start Magnitude[k/ft....	End Magnitude[k/ft.F....	Start Location[ft.%]	End Location[ft.%]
16	M19	Z	-0.001	-0.001	0	%100
17	M20	Z	-0.001	-0.001	0	%100
18	M21	Z	-0.004	-0.004	0	%100
19	F	Z	-0.003	-0.003	0	%13.1
20	C	Z	-0.003	-0.003	0	%13.1
21	I	Z	-0.003	-0.003	0	%13.1
22	F	Z	-0.003	-0.003	%86.9	%100
23	E	Z	-0.003	-0.003	0	%100
24	C	Z	-0.003	-0.003	%86.9	%100
25	B	Z	-0.003	-0.003	0	%100
26	I	Z	-0.003	-0.003	%86.9	%100
27	H	Z	-0.003	-0.003	0	%100
28	M1	X	0	0	0	%100
29	M5	X	0	0	0	%100
30	M6	X	0	0	0	%100
31	M7	X	0	0	0	%100
32	M8	X	0	0	0	%100
33	M9	X	0	0	0	%100
34	M10	X	0	0	0	%100
35	M11	X	0	0	0	%100
36	M12	X	0	0	0	%100
37	M13	X	0	0	0	%100
38	M14	X	0	0	0	%100
39	M15	X	0	0	0	%100
40	M16	X	0	0	0	%100
41	M17	X	0	0	0	%100
42	M18	X	0	0	0	%100
43	M19	X	0	0	0	%100
44	M20	X	0	0	0	%100
45	M21	X	0	0	0	%100
46	F	X	0	0	0	%13.1
47	A	X	0	0	0	%100
48	C	X	0	0	0	%100
49	I	X	0	0	0	%13.1
50	F	X	0	0	%86.9	%100
51	E	X	0	0	0	%100
52	B	X	0	0	0	%100
53	I	X	0	0	%86.9	%100
54	H	X	0	0	0	%100

Member Distributed Loads (BLC 22 : Ice Wind Members (30 Deg))

	Member Label	Direction	Start Magnitude[k/ft....	End Magnitude[k/ft.F....	Start Location[ft.%]	End Location[ft.%]
1	M1	Z	0	0	0	%100
2	M5	Z	-0.003	-0.003	0	%100
3	M6	Z	-0.002	-0.002	0	%100
4	M7	Z	-0.003	-0.003	0	%100
5	M8	Z	0	0	0	%100
6	M9	Z	-0.002	-0.002	0	%100
7	M10	Z	0	0	0	%100
8	M11	Z	-0.004	-0.004	0	%100
9	M12	Z	-0.003	-0.003	0	%100
10	M13	Z	-0.004	-0.004	0	%100
11	M14	Z	-0.002	-0.002	0	%100
12	M15	Z	-0.004	-0.004	0	%100
13	M16	Z	-0.001	-0.001	0	%100
14	M17	Z	-0.003	-0.003	0	%100



Member Distributed Loads (BLC 22 : Ice Wind Members (30 Deg)) (Continued)

	Member Label	Direction	Start Magnitude[k/ft....	End Magnitude[k/ft.F....	Start Location[ft, %]	End Location[ft, %]
15	M18	Z	0	0	0	%100
16	M19	Z	0	0	0	%100
17	M20	Z	-.002	-.002	0	%100
18	M21	Z	-.003	-.003	0	%100
19	F	Z	-.003	-.003	0	%13.1
20	C	Z	-.003	-.003	0	%13.1
21	I	Z	-.003	-.003	0	%13.1
22	F	Z	-.003	-.003	%86.9	%100
23	E	Z	-.003	-.003	0	%100
24	C	Z	-.003	-.003	%86.9	%100
25	B	Z	-.003	-.003	0	%100
26	I	Z	-.003	-.003	%86.9	%100
27	H	Z	-.003	-.003	0	%100
28	M1	X	0	0	0	%100
29	M5	X	.002	.002	0	%100
30	M6	X	.001	.001	0	%100
31	M7	X	.002	.002	0	%100
32	M8	X	0	0	0	%100
33	M9	X	.001	.001	0	%100
34	M10	X	0	0	0	%100
35	M11	X	.002	.002	0	%100
36	M12	X	.002	.002	0	%100
37	M13	X	.002	.002	0	%100
38	M14	X	.001	.001	0	%100
39	M15	X	.002	.002	0	%100
40	M16	X	0	0	0	%100
41	M17	X	.002	.002	0	%100
42	M18	X	0	0	0	%100
43	M19	X	0	0	0	%100
44	M20	X	.001	.001	0	%100
45	M21	X	.002	.002	0	%100
46	F	X	.002	.002	0	%13.1
47	A	X	.002	.002	0	%100
48	C	X	.002	.002	0	%100
49	I	X	.002	.002	0	%13.1
50	F	X	.002	.002	%86.9	%100
51	E	X	.002	.002	0	%100
52	B	X	.002	.002	0	%100
53	I	X	.002	.002	%86.9	%100
54	H	X	.002	.002	0	%100

Member Distributed Loads (BLC 23 : Ice Wind Members (60 Deg))

	Member Label	Direction	Start Magnitude[k/ft....	End Magnitude[k/ft.F....	Start Location[ft, %]	End Location[ft, %]
1	M1	Z	0	0	0	%100
2	M5	Z	-.001	-.001	0	%100
3	M6	Z	-.001	-.001	0	%100
4	M7	Z	-.001	-.001	0	%100
5	M8	Z	0	0	0	%100
6	M9	Z	-.001	-.001	0	%100
7	M10	Z	-.001	-.001	0	%100
8	M11	Z	-.002	-.002	0	%100
9	M12	Z	-.002	-.002	0	%100
10	M13	Z	-.001	-.001	0	%100
11	M14	Z	-.001	-.001	0	%100
12	M15	Z	-.002	-.002	0	%100
13	M16	Z	-.001	-.001	0	%100



Member Distributed Loads (BLC 23 : Ice Wind Members (60 Deg)) (Continued)

	Member Label	Direction	Start Magnitude[k/ft....	End Magnitude[k/ft.F....	Start Location[ft, %]	End Location[ft, %]
14	M17	Z	-0.002	-0.002	0	%100
15	M18	Z	-0.001	-0.001	0	%100
16	M19	Z	0	0	0	%100
17	M20	Z	-0.001	-0.001	0	%100
18	M21	Z	-0.001	-0.001	0	%100
19	F	Z	-0.002	-0.002	0	%13.1
20	C	Z	-0.002	-0.002	0	%13.1
21	I	Z	-0.002	-0.002	0	%13.1
22	F	Z	-0.002	-0.002	%86.9	%100
23	E	Z	-0.002	-0.002	0	%100
24	C	Z	-0.002	-0.002	%86.9	%100
25	B	Z	-0.002	-0.002	0	%100
26	I	Z	-0.002	-0.002	%86.9	%100
27	H	Z	-0.002	-0.002	0	%100
28	M1	X	.001	.001	0	%100
29	M5	X	.002	.002	0	%100
30	M6	X	.002	.002	0	%100
31	M7	X	.002	.002	0	%100
32	M8	X	.001	.001	0	%100
33	M9	X	.002	.002	0	%100
34	M10	X	.001	.001	0	%100
35	M11	X	.003	.003	0	%100
36	M12	X	.003	.003	0	%100
37	M13	X	.002	.002	0	%100
38	M14	X	.001	.001	0	%100
39	M15	X	.004	.004	0	%100
40	M16	X	.002	.002	0	%100
41	M17	X	.003	.003	0	%100
42	M18	X	.001	.001	0	%100
43	M19	X	.001	.001	0	%100
44	M20	X	.002	.002	0	%100
45	M21	X	.002	.002	0	%100
46	F	X	.003	.003	0	%13.1
47	A	X	.003	.003	0	%100
48	C	X	.003	.003	0	%100
49	I	X	.003	.003	0	%13.1
50	F	X	.003	.003	%86.9	%100
51	E	X	.003	.003	0	%100
52	B	X	.003	.003	0	%100
53	I	X	.003	.003	%86.9	%100
54	H	X	.003	.003	0	%100

Member Distributed Loads (BLC 24 : Ice Wind Members (90 Deg))

	Member Label	Direction	Start Magnitude[k/ft....	End Magnitude[k/ft.F....	Start Location[ft, %]	End Location[ft, %]
1	M1	Z	0	0	0	%100
2	M5	Z	0	0	0	%100
3	M6	Z	0	0	0	%100
4	M7	Z	0	0	0	%100
5	M8	Z	0	0	0	%100
6	M9	Z	0	0	0	%100
7	M10	Z	0	0	0	%100
8	M11	Z	0	0	0	%100
9	M12	Z	0	0	0	%100
10	M13	Z	0	0	0	%100
11	M14	Z	0	0	0	%100
12	M15	Z	0	0	0	%100



Member Distributed Loads (BLC 24 : Ice Wind Members (90 Deg)) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft.F,...	Start Location[ft, %]	End Location[ft, %]
13	M16	Z	0	0	0	%100
14	M17	Z	0	0	0	%100
15	M18	Z	0	0	0	%100
16	M19	Z	0	0	0	%100
17	M20	Z	0	0	0	%100
18	M21	Z	0	0	0	%100
19	F	Z	0	0	0	%13.1
20	C	Z	0	0	0	%13.1
21	I	Z	0	0	0	%13.1
22	F	Z	0	0	%86.9	%100
23	E	Z	0	0	0	%100
24	C	Z	0	0	%86.9	%100
25	B	Z	0	0	0	%100
26	I	Z	0	0	%86.9	%100
27	H	Z	0	0	0	%100
28	M1	X	.002	.002	0	%100
29	M5	X	.002	.002	0	%100
30	M6	X	.002	.002	0	%100
31	M7	X	.002	.002	0	%100
32	M8	X	.002	.002	0	%100
33	M9	X	.002	.002	0	%100
34	M10	X	.003	.003	0	%100
35	M11	X	.002	.002	0	%100
36	M12	X	.003	.003	0	%100
37	M13	X	.002	.002	0	%100
38	M14	X	.002	.002	0	%100
39	M15	X	.002	.002	0	%100
40	M16	X	.003	.003	0	%100
41	M17	X	.003	.003	0	%100
42	M18	X	.003	.003	0	%100
43	M19	X	.002	.002	0	%100
44	M20	X	.002	.002	0	%100
45	M21	X	.002	.002	0	%100
46	F	X	.003	.003	0	%13.1
47	A	X	.003	.003	0	%100
48	C	X	.003	.003	0	%100
49	I	X	.003	.003	0	%13.1
50	F	X	.003	.003	%86.9	%100
51	E	X	.003	.003	0	%100
52	B	X	.003	.003	0	%100
53	I	X	.003	.003	%86.9	%100
54	H	X	.003	.003	0	%100

Member Distributed Loads (BLC 25 : Ice Wind Members (120 Deg))

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft.F,...	Start Location[ft, %]	End Location[ft, %]
1	M1	Z	.001	.001	0	%100
2	M5	Z	.001	.001	0	%100
3	M6	Z	0	0	0	%100
4	M7	Z	.001	.001	0	%100
5	M8	Z	.001	.001	0	%100
6	M9	Z	0	0	0	%100
7	M10	Z	.002	.002	0	%100
8	M11	Z	.002	.002	0	%100
9	M12	Z	.001	.001	0	%100
10	M13	Z	.001	.001	0	%100
11	M14	Z	.002	.002	0	%100



Member Distributed Loads (BLC 25 : Ice Wind Members (120 Deg)) (Continued)

	Member Label	Direction	Start Magnitude[k/ft....	End Magnitude[k/ft.F....	Start Location[ft.%]	End Location[ft.%]
12	M15	Z	.001	.001	0	%100
13	M16	Z	.001	.001	0	%100
14	M17	Z	.001	.001	0	%100
15	M18	Z	.002	.002	0	%100
16	M19	Z	.001	.001	0	%100
17	M20	Z	0	0	0	%100
18	M21	Z	.001	.001	0	%100
19	F	Z	.002	.002	0	%13.1
20	C	Z	.002	.002	0	%13.1
21	I	Z	.002	.002	0	%13.1
22	F	Z	.002	.002	%86.9	%100
23	E	Z	.002	.002	0	%100
24	C	Z	.002	.002	%86.9	%100
25	B	Z	.002	.002	0	%100
26	I	Z	.002	.002	%86.9	%100
27	H	Z	.002	.002	0	%100
28	M1	X	.002	.002	0	%100
29	M5	X	.002	.002	0	%100
30	M6	X	.001	.001	0	%100
31	M7	X	.002	.002	0	%100
32	M8	X	.002	.002	0	%100
33	M9	X	.001	.001	0	%100
34	M10	X	.003	.003	0	%100
35	M11	X	.003	.003	0	%100
36	M12	X	.001	.001	0	%100
37	M13	X	.002	.002	0	%100
38	M14	X	.004	.004	0	%100
39	M15	X	.001	.001	0	%100
40	M16	X	.002	.002	0	%100
41	M17	X	.001	.001	0	%100
42	M18	X	.003	.003	0	%100
43	M19	X	.002	.002	0	%100
44	M20	X	.001	.001	0	%100
45	M21	X	.002	.002	0	%100
46	F	X	.003	.003	0	%13.1
47	A	X	.003	.003	0	%100
48	C	X	.003	.003	0	%100
49	I	X	.003	.003	0	%13.1
50	F	X	.003	.003	%86.9	%100
51	E	X	.003	.003	0	%100
52	B	X	.003	.003	0	%100
53	I	X	.003	.003	%86.9	%100
54	H	X	.003	.003	0	%100

Member Distributed Loads (BLC 26 : Ice Wind Members (150 Deg))

	Member Label	Direction	Start Magnitude[k/ft....	End Magnitude[k/ft.F....	Start Location[ft.%]	End Location[ft.%]
1	M1	Z	.002	.002	0	%100
2	M5	Z	.003	.003	0	%100
3	M6	Z	0	0	0	%100
4	M7	Z	.003	.003	0	%100
5	M8	Z	.002	.002	0	%100
6	M9	Z	0	0	0	%100
7	M10	Z	.003	.003	0	%100
8	M11	Z	.004	.004	0	%100
9	M12	Z	0	0	0	%100
10	M13	Z	.004	.004	0	%100



Member Distributed Loads (BLC 26 : Ice Wind Members (150 Deg)) (Continued)

	Member Label	Direction	Start Magnitude[k/ft....	End Magnitude[k/ft.F....	Start Location[ft.%]	End Location[ft.%]
11	M14	Z	.004	.004	0	%100
12	M15	Z	.002	.002	0	%100
13	M16	Z	.001	.001	0	%100
14	M17	Z	0	0	0	%100
15	M18	Z	.003	.003	0	%100
16	M19	Z	.002	.002	0	%100
17	M20	Z	0	0	0	%100
18	M21	Z	.003	.003	0	%100
19	F	Z	.003	.003	0	%13.1
20	C	Z	.003	.003	0	%13.1
21	I	Z	.003	.003	0	%13.1
22	F	Z	.003	.003	%86.9	%100
23	E	Z	.003	.003	0	%100
24	C	Z	.003	.003	%86.9	%100
25	B	Z	.003	.003	0	%100
26	I	Z	.003	.003	%86.9	%100
27	H	Z	.003	.003	0	%100
28	M1	X	.001	.001	0	%100
29	M5	X	.002	.002	0	%100
30	M6	X	0	0	0	%100
31	M7	X	.002	.002	0	%100
32	M8	X	.001	.001	0	%100
33	M9	X	0	0	0	%100
34	M10	X	.002	.002	0	%100
35	M11	X	.002	.002	0	%100
36	M12	X	0	0	0	%100
37	M13	X	.002	.002	0	%100
38	M14	X	.002	.002	0	%100
39	M15	X	.001	.001	0	%100
40	M16	X	0	0	0	%100
41	M17	X	0	0	0	%100
42	M18	X	.002	.002	0	%100
43	M19	X	.001	.001	0	%100
44	M20	X	0	0	0	%100
45	M21	X	.002	.002	0	%100
46	F	X	.002	.002	0	%13.1
47	A	X	.002	.002	0	%100
48	C	X	.002	.002	0	%100
49	I	X	.002	.002	0	%13.1
50	F	X	.002	.002	%86.9	%100
51	E	X	.002	.002	0	%100
52	B	X	.002	.002	0	%100
53	I	X	.002	.002	%86.9	%100
54	H	X	.002	.002	0	%100

Member Distributed Loads (BLC 48 : BLC 1 Transient Area Loads)

	Member Label	Direction	Start Magnitude[k/ft....	End Magnitude[k/ft.F....	Start Location[ft.%]	End Location[ft.%]
1	M7	Y	-.006	-.006	0	2.1
2	M8	Y	-.009	-.006	0	2.1
3	M12	Y	-.005	-.005	.216	1.216
4	M14	Y	-.055	-.055	2.536	2.875
5	M17	Y	-.008	-.008	.467	2.333
6	M17	Y	-.008	-.008	2.333	4.2
7	M10	Y	-.005	-.005	.451	1.451
8	M15	Y	-.053	-.053	2.524	2.875
9	M18	Y	-.008	-.008	.467	2.333



Member Distributed Loads (BLC 48 : BLC 1 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[k/ft....	End Magnitude[k/ft.F....	Start Location[ft.%]	End Location[ft.%]
10	M18	Y	-0.08	-0.08	2.333	4.2
11	M20	Y	-0.06	-0.08	.9	3
12	M21	Y	-0.03	-0.08	.9	3
13	M9	Y	-0.06	-0.08	0	2.1
14	M11	Y	-0.05	-0.05	.216	1.216
15	M13	Y	-0.08	-0.08	.467	2.333
16	M13	Y	-0.08	-0.08	2.333	4.2
17	M16	Y	-0.55	-0.55	2.536	2.875
18	M19	Y	-0.06	-0.06	.9	3

Member Distributed Loads (BLC 49 : BLC 2 Transient Area Loads)

	Member Label	Direction	Start Magnitude[k/ft....	End Magnitude[k/ft.F....	Start Location[ft.%]	End Location[ft.%]
1	M7	Y	-0.07	-0.07	0	2.1
2	M8	Y	-0.11	-0.07	0	2.1
3	M12	Y	-0.06	-0.06	.216	1.216
4	M14	Y	-0.7	-0.7	2.536	2.875
5	M17	Y	-0.1	-0.1	.467	2.333
6	M17	Y	-0.1	-0.1	2.333	4.2
7	M10	Y	-0.06	-0.06	.451	1.451
8	M15	Y	-0.68	-0.68	2.524	2.875
9	M18	Y	-0.1	-0.1	.467	2.333
10	M18	Y	-0.1	-0.1	2.333	4.2
11	M20	Y	-0.08	-0.1	.9	3
12	M21	Y	-0.04	-0.1	.9	3
13	M9	Y	-0.08	-0.1	0	2.1
14	M11	Y	-0.06	-0.06	.216	1.216
15	M13	Y	-0.1	-0.1	.467	2.333
16	M13	Y	-0.1	-0.1	2.333	4.2
17	M16	Y	-0.7	-0.7	2.536	2.875
18	M19	Y	-0.07	-0.07	.9	3

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	DistributedArea(Me... Surface(...
1	Dead	None		-1			12	3
2	Ice Dead	None					12	27
3	Full Wind Antenna (0 Deg)	None					15	
4	Full Wind Antenna (30 Deg)	None					33	
5	Full Wind Antenna (60 Deg)	None					33	
6	Full Wind Antenna (90 Deg)	None					33	
7	Full Wind Antenna (120 Deg)	None					32	
8	Full Wind Antenna (150 Deg)	None					33	
9	Full Wind Members (0 Deg)	None						54
10	Full Wind Members (30 Deg)	None						54
11	Full Wind Members (60 Deg)	None						54
12	Full Wind Members (90 Deg)	None						54
13	Full Wind Members (120 Deg)	None						54
14	Full Wind Members (150 Deg)	None						54
15	Ice Wind Antenna (0 Deg)	None					15	
16	Ice Wind Antenna (30 Deg)	None					33	
17	Ice Wind Antenna (60 Deg)	None					33	
18	Ice Wind Antenna (90 Deg)	None					33	
19	Ice Wind Antenna (120 Deg)	None					32	
20	Ice Wind Antenna (150 Deg)	None					32	
21	Ice Wind Members (0 Deg)	None						54
22	Ice Wind Members (30 Deg)	None						54



Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	DistributedArea(Me... Surface(...	
23	Ice Wind Members (60 Deg)	None						54	
24	Ice Wind Members (90 Deg)	None						54	
25	Ice Wind Members (120 Deg)	None						54	
26	Ice Wind Members (150 Deg)	None						54	
27	Seismic Antenna (0 Deg)	None					12		
28	Seismic Antenna (90 Deg)	None					12		
29	Seismic Members (0 Deg)	None		-042	-104				
30	Seismic Members (30 Deg)	None	.052	-042	-.09				
31	Seismic Members (60 Deg)	None	.09	-042	-.052				
32	Seismic Members (90 Deg)	None	.104	-042	-6.401e-...				
33	Seismic Members (120 Deg)	None	.09	-042	.052				
34	Seismic Members (150 Deg)	None	.052	-042	.09				
35	Seismic Members (180 Deg)	None	1.28e-17	-042	.104				
36	Seismic Members (210 Deg)	None	-.052	-042	.09				
37	Seismic Members (240 Deg)	None	-.09	-042	.052				
38	Seismic Members (270 Deg)	None	-.104	-042	1.92e-17				
39	Seismic Members (300 Deg)	None	-.09	-042	-.052				
40	Seismic Members (330 Deg)	None	-.052	-042	-.09				
41	Seismic Vertical Antennas	None					12		
42	Man 1 (500 lbs)	None				1			
43	Man 2 (500 lbs)	None				1			
44	Man 3 (500 lbs)	None				1			
45	Man 4 (250 lbs)	None				1			
46	Man 5 (250 lbs)	None				1			
47	Man 6 (250 lbs)	None				1			
48	BLC 1 Transient Area Loads	None						18	
49	BLC 2 Transient Area Loads	None						18	

Load Combinations

	Description	S...	PDelta	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...								
1	1.4D	Yes	Y		1	1.4																																					
2	1.2D + 1.0W 0°	Yes	Y		1	1.2	3	1	9	1																																	
3	1.2D + 1.0W 30°	Yes	Y		1	1.2	4	1	10	1																																	
4	1.2D + 1.0W 60°	Yes	Y		1	1.2	5	1	11	1																																	
5	1.2D + 1.0W 90°	Yes	Y		1	1.2	6	1	12	1																																	
6	1.2D + 1.0W 120°	Yes	Y		1	1.2	7	1	13	1																																	
7	1.2D + 1.0W 150°	Yes	Y		1	1.2	8	1	14	1																																	
8	1.2D + 1.0W 180°	Yes	Y		1	1.2	3	-1	9	-1																																	
9	1.2D + 1.0W 210°	Yes	Y		1	1.2	4	-1	10	-1																																	
10	1.2D + 1.0W 240°	Yes	Y		1	1.2	5	-1	11	-1																																	
11	1.2D + 1.0W 270°	Yes	Y		1	1.2	6	-1	12	-1																																	
12	1.2D + 1.0W 300°	Yes	Y		1	1.2	7	-1	13	-1																																	
13	1.2D + 1.0W 330°	Yes	Y		1	1.2	8	-1	14	-1																																	
14	1.2D + 1.0Di + 1.0Wi 0°	Yes	Y		1	1.2	2	1	15	1	21	1																															
15	1.2D + 1.0Di + 1.0Wi 30°	Yes	Y		1	1.2	2	1	16	1	22	1																															
16	1.2D + 1.0Di + 1.0Wi 60°	Yes	Y		1	1.2	2	1	17	1	23	1																															
17	1.2D + 1.0Di + 1.0Wi 90°	Yes	Y		1	1.2	2	1	18	1	24	1																															
18	1.2D + 1.0Di + 1.0Wi 120°	Yes	Y		1	1.2	2	1	19	1	25	1																															
19	1.2D + 1.0Di + 1.0Wi 150°	Yes	Y		1	1.2	2	1	20	1	26	1																															
20	1.2D + 1.0Di + 1.0Wi 180°	Yes	Y		1	1.2	2	1	15	-1	21	-1																															
21	1.2D + 1.0Di + 1.0Wi 210°	Yes	Y		1	1.2	2	1	16	-1	22	-1																															
22	1.2D + 1.0Di + 1.0Wi 240°	Yes	Y		1	1.2	2	1	17	-1	23	-1																															
23	1.2D + 1.0Di + 1.0Wi 270°	Yes	Y		1	1.2	2	1	18	-1	24	-1																															
24	1.2D + 1.0Di + 1.0Wi 300°	Yes	Y		1	1.2	2	1	19	-1	25	-1																															
25	1.2D + 1.0Di + 1.0Wi 330°	Yes	Y		1	1.2	2	1	20	-1	26	-1																															



Company : MasTec
 Designer : EJM
 Job Number : 18756-MNT1
 Model Name : 876380-O&G WOODBURY

May 16, 2019
 9:34 AM
 Checked By: _____

Load Combinations (Continued)

	Description	S...	PDelta	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	
26	1.2D + 1.5Lm_1 + 1.0W...	Yes	Y		1	1.2	3	.066	9	.066	42	1.5										
27	1.2D + 1.5Lm_1 + 1.0W...	Yes	Y		1	1.2	4	.066	10	.066	42	1.5										
28	1.2D + 1.5Lm_1 + 1.0W...	Yes	Y		1	1.2	5	.066	11	.066	42	1.5										
29	1.2D + 1.5Lm_1 + 1.0W...	Yes	Y		1	1.2	6	.066	12	.066	42	1.5										
30	1.2D + 1.5Lm_1 + 1.0W...	Yes	Y		1	1.2	7	.066	13	.066	42	1.5										
31	1.2D + 1.5Lm_1 + 1.0W...	Yes	Y		1	1.2	8	.066	14	.066	42	1.5										
32	1.2D + 1.5Lm_1 + 1.0W...	Yes	Y		1	1.2	3	-0...	9	-0...	42	1.5										
33	1.2D + 1.5Lm_1 + 1.0W...	Yes	Y		1	1.2	4	-0...	10	-0...	42	1.5										
34	1.2D + 1.5Lm_1 + 1.0W...	Yes	Y		1	1.2	5	-0...	11	-0...	42	1.5										
35	1.2D + 1.5Lm_1 + 1.0W...	Yes	Y		1	1.2	6	-0...	12	-0...	42	1.5										
36	1.2D + 1.5Lm_1 + 1.0W...	Yes	Y		1	1.2	7	-0...	13	-0...	42	1.5										
37	1.2D + 1.5Lm_1 + 1.0W...	Yes	Y		1	1.2	8	-0...	14	-0...	42	1.5										
38	1.2D + 1.5Lm_2 + 1.0W...	Yes	Y		1	1.2	3	.066	9	.066	43	1.5										
39	1.2D + 1.5Lm_2 + 1.0W...	Yes	Y		1	1.2	4	.066	10	.066	43	1.5										
40	1.2D + 1.5Lm_2 + 1.0W...	Yes	Y		1	1.2	5	.066	11	.066	43	1.5										
41	1.2D + 1.5Lm_2 + 1.0W...	Yes	Y		1	1.2	6	.066	12	.066	43	1.5										
42	1.2D + 1.5Lm_2 + 1.0W...	Yes	Y		1	1.2	7	.066	13	.066	43	1.5										
43	1.2D + 1.5Lm_2 + 1.0W...	Yes	Y		1	1.2	8	.066	14	.066	43	1.5										
44	1.2D + 1.5Lm_2 + 1.0W...	Yes	Y		1	1.2	3	-0...	9	-0...	43	1.5										
45	1.2D + 1.5Lm_2 + 1.0W...	Yes	Y		1	1.2	4	-0...	10	-0...	43	1.5										
46	1.2D + 1.5Lm_2 + 1.0W...	Yes	Y		1	1.2	5	-0...	11	-0...	43	1.5										
47	1.2D + 1.5Lm_2 + 1.0W...	Yes	Y		1	1.2	6	-0...	12	-0...	43	1.5										
48	1.2D + 1.5Lm_2 + 1.0W...	Yes	Y		1	1.2	7	-0...	13	-0...	43	1.5										
49	1.2D + 1.5Lm_2 + 1.0W...	Yes	Y		1	1.2	8	-0...	14	-0...	43	1.5										
50	1.2D + 1.5Lm_3 + 1.0W...	Yes	Y		1	1.2	3	.066	9	.066	44	1.5										
51	1.2D + 1.5Lm_3 + 1.0W...	Yes	Y		1	1.2	4	.066	10	.066	44	1.5										
52	1.2D + 1.5Lm_3 + 1.0W...	Yes	Y		1	1.2	5	.066	11	.066	44	1.5										
53	1.2D + 1.5Lm_3 + 1.0W...	Yes	Y		1	1.2	6	.066	12	.066	44	1.5										
54	1.2D + 1.5Lm_3 + 1.0W...	Yes	Y		1	1.2	7	.066	13	.066	44	1.5										
55	1.2D + 1.5Lm_3 + 1.0W...	Yes	Y		1	1.2	8	.066	14	.066	44	1.5										
56	1.2D + 1.5Lm_3 + 1.0W...	Yes	Y		1	1.2	3	-0...	9	-0...	44	1.5										
57	1.2D + 1.5Lm_3 + 1.0W...	Yes	Y		1	1.2	4	-0...	10	-0...	44	1.5										
58	1.2D + 1.5Lm_3 + 1.0W...	Yes	Y		1	1.2	5	-0...	11	-0...	44	1.5										
59	1.2D + 1.5Lm_3 + 1.0W...	Yes	Y		1	1.2	6	-0...	12	-0...	44	1.5										
60	1.2D + 1.5Lm_3 + 1.0W...	Yes	Y		1	1.2	7	-0...	13	-0...	44	1.5										
61	1.2D + 1.5Lm_3 + 1.0W...	Yes	Y		1	1.2	8	-0...	14	-0...	44	1.5										
62	1.2D + 1.5Lv_1 0°	Yes	Y		1	1.2	45	1.5														
63	1.2D + 1.5Lv_1 30°	Yes	Y		1	1.2	45	1.5														
64	1.2D + 1.5Lv_1 60°	Yes	Y		1	1.2	45	1.5														
65	1.2D + 1.5Lv_1 90°	Yes	Y		1	1.2	45	1.5														
66	1.2D + 1.5Lv_1 120°	Yes	Y		1	1.2	45	1.5														
67	1.2D + 1.5Lv_1 150°	Yes	Y		1	1.2	45	1.5														
68	1.2D + 1.5Lv_1 180°	Yes	Y		1	1.2	45	1.5														
69	1.2D + 1.5Lv_1 210°	Yes	Y		1	1.2	45	1.5														
70	1.2D + 1.5Lv_1 240°	Yes	Y		1	1.2	45	1.5														
71	1.2D + 1.5Lv_1 270°	Yes	Y		1	1.2	45	1.5														
72	1.2D + 1.5Lv_1 300°	Yes	Y		1	1.2	45	1.5														
73	1.2D + 1.5Lv_1 330°	Yes	Y		1	1.2	45	1.5														
74	1.2D + 1.5Lv_2 0°	Yes	Y		1	1.2	46	1.5														
75	1.2D + 1.5Lv_2 30°	Yes	Y		1	1.2	46	1.5														
76	1.2D + 1.5Lv_2 60°	Yes	Y		1	1.2	46	1.5														
77	1.2D + 1.5Lv_2 90°	Yes	Y		1	1.2	46	1.5														
78	1.2D + 1.5Lv_2 120°	Yes	Y		1	1.2	46	1.5														
79	1.2D + 1.5Lv_2 150°	Yes	Y		1	1.2	46	1.5														
80	1.2D + 1.5Lv_2 180°	Yes	Y		1	1.2	46	1.5														
81	1.2D + 1.5Lv_2 210°	Yes	Y		1	1.2	46	1.5														
82	1.2D + 1.5Lv_2 240°	Yes	Y		1	1.2	46	1.5														



Load Combinations (Continued)

Description	S...	PDelta	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	
83	1.2D + 1.5Lv 2 270°	Yes	Y		1	1.2	46	1.5														
84	1.2D + 1.5Lv 2 300°	Yes	Y		1	1.2	46	1.5														
85	1.2D + 1.5Lv 2 330°	Yes	Y		1	1.2	46	1.5														
86	1.2D + 1.5Lv 3 0°	Yes	Y		1	1.2	47	1.5														
87	1.2D + 1.5Lv 3 30°	Yes	Y		1	1.2	47	1.5														
88	1.2D + 1.5Lv 3 60°	Yes	Y		1	1.2	47	1.5														
89	1.2D + 1.5Lv 3 90°	Yes	Y		1	1.2	47	1.5														
90	1.2D + 1.5Lv 3 120°	Yes	Y		1	1.2	47	1.5														
91	1.2D + 1.5Lv 3 150°	Yes	Y		1	1.2	47	1.5														
92	1.2D + 1.5Lv 3 180°	Yes	Y		1	1.2	47	1.5														
93	1.2D + 1.5Lv 3 210°	Yes	Y		1	1.2	47	1.5														
94	1.2D + 1.5Lv 3 240°	Yes	Y		1	1.2	47	1.5														
95	1.2D + 1.5Lv 3 270°	Yes	Y		1	1.2	47	1.5														
96	1.2D + 1.5Lv 3 300°	Yes	Y		1	1.2	47	1.5														
97	1.2D + 1.5Lv 3 330°	Yes	Y		1	1.2	47	1.5														
98	1.2D + 1.0EV + 1.0 EH 0°	Yes	Y		1	1.2	27	1	28		29	1	40	1								
99	1.2D + 1.0EV + 1.0 EH 30°	Yes	Y		1	1.2	27	.866	28	.5	30	1	40	1								
100	1.2D + 1.0EV + 1.0 EH 60°	Yes	Y		1	1.2	27	.5	28	.866	31	1	40	1								
101	1.2D + 1.0EV + 1.0 EH 90°	Yes	Y		1	1.2	27		28	1	32	1	40	1								
102	1.2D + 1.0EV + 1.0 EH 120°	Yes	Y		1	1.2	27	-.5	28	.866	33	1	40	1								
103	1.2D + 1.0EV + 1.0 EH 150°	Yes	Y		1	1.2	27	-.8...	28	.5	34	1	40	1								
104	1.2D + 1.0EV + 1.0 EH 180°	Yes	Y		1	1.2	27	-1	28		35	1	40	1								
105	1.2D + 1.0EV + 1.0 EH 210°	Yes	Y		1	1.2	27	-.8...	28	-.5	36	1	40	1								
106	1.2D + 1.0EV + 1.0 EH 240°	Yes	Y		1	1.2	27	-.5	28	-.8...	37	1	40	1								
107	1.2D + 1.0EV + 1.0 EH 270°	Yes	Y		1	1.2	27		28	-1	38	1	40	1								
108	1.2D + 1.0EV + 1.0 EH 300°	Yes	Y		1	1.2	27	.5	28	-.8...	39	1	40	1								
109	1.2D + 1.0EV + 1.0 EH 330°	Yes	Y		1	1.2	27	.866	28	-.5	40	1	40	1								

Envelope Joint Reactions

Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC	
1	N27	max	.848	13	1.985	46	1.452	13	-3.55	37	2.867	13	-5.95	54
2		min	-.861	7	.429	52	-1.448	7	-1.64	20	-2.871	7	-3.083	47
3	N31	max	1.686	11	1.985	50	.101	2	3.48	50	2.87	5	.141	53
4		min	-1.684	5	.429	32	-.124	8	.774	32	-2.874	11	-.151	35
5	N29	max	.839	9	1.986	30	1.47	3	-.254	38	2.873	9	2.95	29
6		min	-.829	3	.43	48	-1.462	9	-1.858	32	-2.876	3	.68	58
7	Totals:	max	2.557	11	5.588	25	2.459	2						
8		min	-2.557	5	2.118	2	-2.459	8						

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

Member	Shape	Code ...	Loc[ft]	LC	Shear ...	Loc[ft]	Dir	LC	phi*Pnc [k]	phi*Pnt [k]	phi*Mn y...	phi*Mn z...	Cb	Eqn	
1	M1	PIPE 3.0	.418	4.427	21	.132	4.427	48	28.251	65.205	5.749	5.749	1...	H1-1b	
2	M5	PIPE 3.0	.420	8.073	16	.132	8.073	32	28.251	65.205	5.749	5.749	1...	H1-1b	
3	M6	PIPE 3.0	.419	4.427	25	.132	4.427	52	28.251	65.205	5.749	5.749	1...	H1-1b	
4	M7	L2x2x4	.180	3	20	.022	3	z	15	19.394	30.586	.691	1.577	1...	H2-1
5	M8	L2x2x4	.184	3	24	.016	3	y	18	19.394	30.586	.691	1.577	1...	H2-1
6	M9	L2x2x4	.185	3	16	.016	3	y	22	19.394	30.586	.691	1.577	1...	H2-1
7	M10	PL4 x 3/8	.344	.295	13	.170	1.389	y	32	9.928	48.6	.38	4.05	1...	H1-1b
8	M11	PL4 x 3/8	.333	.295	9	.172	1.389	y	52	9.928	48.6	.38	4.05	1...	H1-1b
9	M12	PL4 x 3/8	.319	.295	5	.171	1.389	y	48	9.928	48.6	.38	4.05	1...	H1-1b
10	M13	PL4 x 3/8	.553	2.333	15	.291	.243	y	20	5.065	48.6	.38	3.559	1...	H1-1b
11	M14	HSS4X4X5	.273	0	13	.067	0	y	49	129.158	132.84	15.093	15.093	2...	H1-1b
12	M15	HSS4X4X5	.273	0	3	.067	0	y	33	129.158	132.84	15.093	15.093	2...	H1-1b
13	M16	HSS4X4X5	.273	0	11	.067	0	y	53	129.158	132.84	15.093	15.093	2...	H1-1b



Company : MasTec
 Designer : EJM
 Job Number : 18756-MNT1
 Model Name : 876380-O&G WOODBURY

May 16, 2019
 9:34 AM
 Checked By: _____

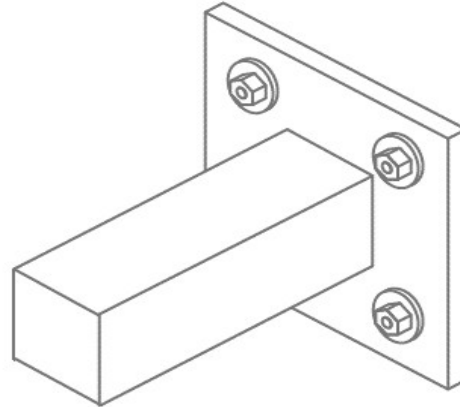
Envelope AISC 14th(360-10): LRFD Steel Code Checks (Continued)

Member	Shape	Code ...	Loc[ft]	LC	Shear ...	Loc[ft]	Dir	LC	phi*Pnc [k]	phi*Pnt [k]	phi*Mn y...	phi*Mn z...	Cb	Egn
14	M17	PL4 x 3/8	.557	2.333	23	.292	.243	y	16	5.065	48.6	.38	3.56	1... H1-1b
15	M18	PL4 x 3/8	.559	2.333	19	.293	.243	y	24	5.065	48.6	.38	3.555	1... H1-1b
16	M19	L2x2x4	.180	0	23	.023	0	y	16	19.394	30.586	.691	1.577	1... H2-1
17	M20	L2x2x4	.181	0	15	.023	0	y	20	19.394	30.586	.691	1.577	1... H2-1
18	M21	L2x2x4	.183	0	20	.015	0	z	14	19.394	30.586	.691	1.577	1... H2-1
19	D	PIPE 2.0	.504	3.125	12	.031	0		12	20.867	32.13	1.872	1.872	1... H1-1b
20	F	PIPE 2.0	.081	3.125	12	.011	3.063		12	20.867	32.13	1.872	1.872	1... H1-1b
21	E	PIPE 2.5	.023	4.5	12	.002	4.5		12	26.137	50.715	3.596	3.596	1... H1-1b
22	A	PIPE 2.0	.503	3.125	8	.031	0		8	20.867	32.13	1.872	1.872	1... H1-1b
23	C	PIPE 2.0	.081	3.125	8	.011	3.063		8	20.867	32.13	1.872	1.872	1... H1-1b
24	B	PIPE 2.5	.023	4.5	7	.002	4.5		7	26.137	50.715	3.596	3.596	1... H1-1b
25	G	PIPE 2.0	.504	3.125	4	.031	0		4	20.867	32.13	1.872	1.872	1... H1-1b
26	I	PIPE 2.0	.081	3.125	4	.011	3.063		4	20.867	32.13	1.872	1.872	1... H1-1b
27	H	PIPE 2.5	.023	4.5	4	.002	4.5		4	26.137	50.715	3.596	3.596	1... H1-1b

APPENDIX D
ADDITIONAL CALCUATIONS

Bolt Calculations:

Bolt Size:	5/8	in
# Bolts:	4	
Plate Width:	10	in
Plate Height:	10	in
Bolt H Gap:	7	in
Bolt V Gap:	7	in
Plate T:	0.625	in
Bolt Grade:	A325N	
$F_{u\text{bolt}}$	120	ksi
r:	4.950	in
J:	98.000	in ⁴ /in ²
Bolt Area, Normal:	0.307	
Bolt Area, Net Tensile:	0.226	in ²



Allowable Shear:	12.4	kip
Allowable Tension:	20.3	kip

Tension Capacity:	17.5%
Shear Capacity:	19.0%
Combined Capacity:	4.3%

Bolt Capacity:	19.0%
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Plate Calculations:

Horizontal Member Height:	4	in
Horizontal Member Width:	4	in
Plate Grade:	A36	
Plate Fy:	36	ksi

$M_x =$	8.916	k*in
$M_z =$	8.955	k*in

$Z_x =$	0.977	in ³
$Z_z =$	0.977	in ³

$\phi M_{py} (X) =$	31.641	k - in
$\phi M_{px} (X) =$	31.641	k - in

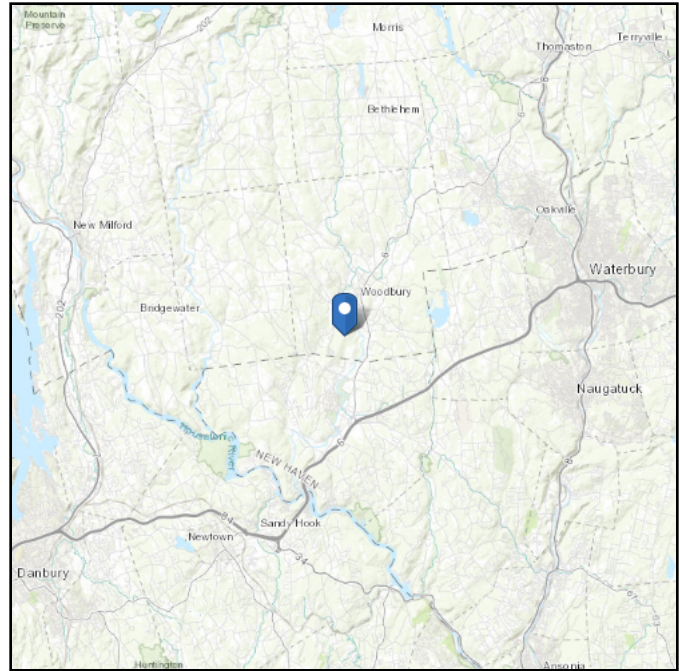
Plate Capacity:	28.3%
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ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 589.96 ft (NAVD 88)
Latitude: 41.522
Longitude: -73.220736



Wind

Results:

Wind Speed:	118 Vmph
10-year MRI	76 Vmph
25-year MRI	85 Vmph
50-year MRI	90 Vmph
100-year MRI	97 Vmph

120mph per CT design criteria

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 May 15 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.

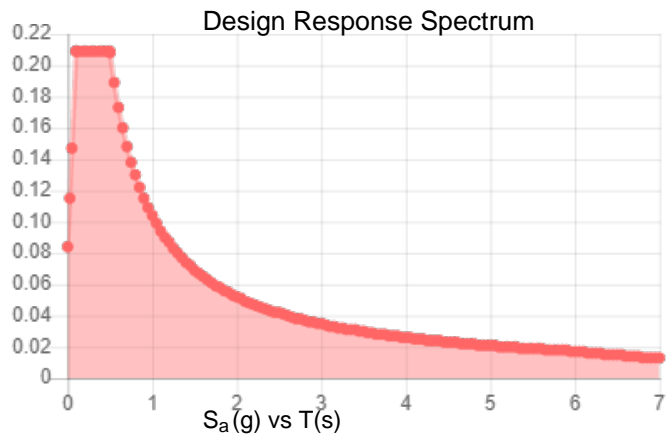
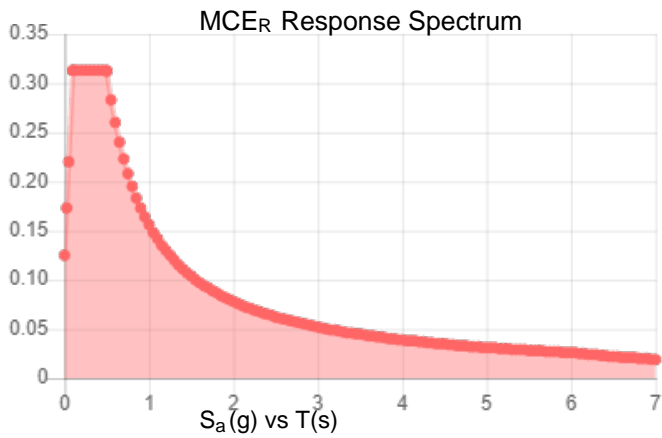
Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

Site Soil Class: D - Stiff Soil

Results:

S_s :	0.196	S_{DS} :	0.209
S_1 :	0.065	S_{D1} :	0.104
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.103
S_{MS} :	0.313	PGA _M :	0.164
S_{M1} :	0.156	F _{PGA} :	1.594
		I_e :	1

Seismic Design Category B



Data Accessed:

Wed May 15 2019

Date Source:

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

Ice

Results:

Ice Thickness: 0.75 in.

Concurrent Temperature: 15 F

Gust Speed: 50 mph

Data Source: Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8

Date Accessed: Wed May 15 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.

The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided "as is" and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

ASCE does not intend, nor should anyone interpret, the results provided by this Tool to replace the sound judgment of a competent professional, having knowledge and experience in the appropriate field(s) of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the contents of this Tool or the ASCE 7 standard.

In using this Tool, you expressly assume all risks associated with your use. Under no circumstances shall ASCE or its officers, directors, employees, members, affiliates, or agents be liable to you or any other person for any direct, indirect, special, incidental, or consequential damages arising from or related to your use of, or reliance on, the Tool or any information obtained therein. To the fullest extent permitted by law, you agree to release and hold harmless ASCE from any and all liability of any nature arising out of or resulting from any use of data provided by the ASCE 7 Hazard Tool.

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: CTNH350A

NH350/Global-Woodbury
202 Great Hollow Road
Woodbury, CT 06798

May 20, 2019

Transcom Engineering Project Number: 737001-0025

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	29.67 %

Transcom Engineering, Inc.

Wireless Network Design and Deployment

May 20, 2019

T-MOBILE

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

Emissions Analysis for Site: **CTNH350A – NH350/Global-Woodbury**

Transcom Engineering, Inc (“Transcom”) was directed to analyze the proposed upgrades to the T-MOBILE facility located at **202 Great Hollow Road, Woodbury, 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 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The number of $\mu\text{W}/\text{cm}^2$ 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 ($\mu\text{W}/\text{cm}^2$). The general population exposure limits for the 600 & 700 MHz bands are approximately $400 \mu\text{W}/\text{cm}^2$ and $467 \mu\text{W}/\text{cm}^2$ respectively. The general population exposure limit for the 1900 MHz (PCS) and 2100 MHz (AWS) is $1000 \mu\text{W}/\text{cm}^2$. 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.

Transcom Engineering, Inc.

Wireless Network Design and Deployment

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.

Transcom Engineering, Inc.

Wireless Network Design and Deployment

CALCULATIONS

Calculations were performed for the proposed upgrades to the T-MOBILE antenna facility located at **202 Great Hollow Road, Woodbury, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-MOBILE is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

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

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

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

Table 1: Channel Data Table

Transcom Engineering, Inc.

Wireless Network Design and Deployment

The following antennas listed in *Table 2* were used in the modeling for transmission in the 600, 700 MHz, 1900 MHz (PCS) and 2100 MHz (AWS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	RFS APXV18-206516S-C-A20	87
A	2	RFS APXVAARR24_43-U-NA20	87
B	1	RFS APXV18-206516S-C-A20	87
B	2	RFS APXVAARR24_43-U-NA20	87
C	1	RFS APXV18-206516S-C-A20	87
C	2	RFS APXVAARR24_43-U-NA20	87

Table 2: Antenna Data

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

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Wireless Network Design and Deployment

RESULTS

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

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	RFS APXV18-206516S-C-A20	1900 MHz (PCS)	16.3	5	175	7,465.14	4.09
Antenna A2	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	12.95 / 13.35	4	120	2,443.03	3.18
Sector A Composite MPE%							7.27
Antenna B1	RFS APXV18-206516S-C-A20	1900 MHz (PCS)	16.3	5	175	7,465.14	4.09
Antenna B2	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	12.95 / 13.35	4	120	2,443.03	3.18
Sector B Composite MPE%							7.27
Antenna C1	RFS APXV18-206516S-C-A20	1900 MHz (PCS)	16.3	5	175	7,465.14	4.09
Antenna C2	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	12.95 / 13.35	4	120	2,443.03	3.18
Sector C Composite MPE%							7.27

Table 3: T-MOBILE Emissions Levels

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Wireless Network Design and Deployment

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	7.27 %
Sprint	5.10 %
AT&T	13.07 %
Verizon Wireless	3.50 %
Nextel	0.59 %
CL&P	0.14 %
Site Total MPE %:	29.67 %

Table 4: All Carrier MPE Contributions

T-MOBILE Sector A Total:	7.27 %
T-MOBILE Sector B Total:	7.27 %
T-MOBILE Sector C Total:	7.27 %
Site Total:	29.67 %

Table 5: Site MPE Summary

Transcom Engineering, Inc.

Wireless Network Design and Deployment

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 ($\mu\text{W}/\text{cm}^2$)	Frequency (MHz)	Allowable MPE ($\mu\text{W}/\text{cm}^2$)	Calculated % MPE
T-Mobile 1900 MHz (PCS) LTE	4	1,706.32	87	37.40	1900 MHz (PCS)	1000	3.74%
T-Mobile 1900 MHz (PCS) GSM	1	639.87	87	3.51	1900 MHz (PCS)	1000	0.35%
T-Mobile 600 MHz LTE / 5G NR	2	788.97	87	8.65	600 MHz	400	2.16%
T-Mobile 700 MHz LTE	2	432.54	87	4.74	700 MHz	467	1.02%
						Total:	7.27%

Table 6: T-MOBILE Maximum Sector MPE Power Values

Transcom Engineering, Inc.

Wireless Network Design and Deployment

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:	7.27 %
Sector B:	7.27 %
Sector C:	7.27 %
T-MOBILE Maximum Total (per sector):	7.27 %
Site Total:	29.67 %
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **29.67 %** 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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Sterling, MA 01564