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

July 9, 2020

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

RE: **Notice of Exempt Modification for T-Mobile:**
876325 - T-Mobile Site ID: CT11062B
92 Weston Street, Hartford, CT 06103
Latitude: 41° 47′ 12.30″ / Longitude: -72° 39′ 44.42″

Dear Ms. Bachman:

T-Mobile currently maintains nine (9) antennas at the 76-foot mount on the existing 110-foot Monopole Tower, located at 92 Weston Street, Hartford, CT. The tower is owned by Crown Castle and the property is owned by Freeport Realty V LLC. T-Mobile now intends to replace three (3) existing antennas with three (3) new 600/700 MHz antennas. The new antennas will be installed at the 76-ft level of the tower.

Planned Modifications:
Tower:

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

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

Install New:
(1) 1 5/8" Hybrid Fiber Line

Existing to Remain:
(6) Coax
(1) Hybrids
(3) AIR21_B2A_B4P Antenna 1900/2100 MHz
(3) AIR32_B66A_B2A Antenna 1900/2100 MHz
(3) TMA

Ground:
Upgrade to existing ground cabinet. (Internally)

The facility was approved by the City of Hartford on November 26, 1996. Communications Towers were a permitted use as of right in the underlying Industrial Zone and a Building Permit was issued, therefore

there were no conditions that could feasibly be violated by this modification, including total facility height or mountain restrictions. This modification therefore complies with the approval.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Mr. Luke Bronin, Mayor for the City of Hartford, Aimee Chambers, Director of Planning, Crown Castle as the tower owner, and Freeport Realty V LLC, the property owner.

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

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

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

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

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

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

Sincerely,

Anne Marie Zsamba
Site Acquisition Specialist
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065
(201) 236-9224
AnneMarie.Zsamba@crowncastle.com

Attachments

cc:

Luke Bronin, Mayor *(via email only to luke.bronin@hartford.gov)*
City of Hartford
550 Main Street, Room 200
Hartford, CT 06103

Aimee Chambers, Director of Planning *(via email only to aimee.chambers@hartford.gov)*
City of Hartford
250 Constitution Plaza, 4th Floor
Hartford, CT 06103

Freeport Realty V LLC, Property Owner
337 Freeport Street
Boston, MA 02122

Crown Castle, Tower Owner

ORIGIN ID:ONHA (585) 445-5896
RICHARD ZAJAC
CROWN CASTLE
629 KAYLEIGH DR

WEBSTER, NY 14580
UNITED STATES US

SHIP DATE: 09JUL20
ACTWGT: 1.00 LB
CAD: 104924194/INET4220

BILL SENDER

TO **FREEPORT REALTY V LLC**
337 FREEPORT STREET

BOSTON MA 02122
(201) 236-9224 REF: 1734.7680
INV:
PO: DEPT:

56BJ2/17B7/FE4A

FedEx Express

J201120042401uv

FRI - 10 JUL 10:30A
PRIORITY OVERNIGHT

TRK# 0201 **7709 1164 1048**

XE BVYA

02122
MA-US **BOS**

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

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

From: Zsamba, Anne Marie
To: "luke.bronin@hartford.gov"
Subject: Notice of Exempt Modification - T-Mobile - 92 Weston Street
Date: Thursday, July 9, 2020 12:07:00 PM
Attachments: EM-T-MOBILE-CT11062B-92 WESTON STREET HARTFORD-876325_notice.pdf

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Dear Mayor Bronin:

Attached please find T-Mobile's exempt modification application that is being submitted to the Connecticut Siting Council, today July 9, 2020.

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

Best,
Anne Marie Zsamba

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

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

From:	Zsamba, Anne Marie
To:	"aimee.chambers@hartford.gov"
Subject:	Notice of Exempt Modification - T-Mobile - 92 Weston Street
Date:	Thursday, July 9, 2020 12:07:00 PM
Attachments:	EM-T-MOBILE-CT11062B-92 WESTON STREET HARTFORD-876325_notice.pdf

Dear Panning Director Chambers:

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Best,
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T: (201) 236-9224
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CROWN CASTLE
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065
CrownCastle.com

Exhibit A

Original Facility Approval

CT03XC064

BUILDING PERMIT

DEPARTMENT OF LICENSES & INSPECTIONS
CITY OF HARTFORD

Appl. Nbr.964013 Permit Nbr. 964785 E

THE APPLICANT NAMED BELOW IS HEREBY GRANTED PERMISSION TO PERFORM WORK AS DESCRIBED HEREIN AT:

0000 0092 WESTON ST

FLOOR: 0 0 0 CONDO:

IN ACCORDANCE WITH THE APPLICATION AND PLANS APPROVED BY THE DEPARTMENT OF LICENSES AND INSPECTIONS.

Joseph Hewes Date 11/26/96
Building Official

OWNER: WESTON SQUARE ASSOCIATES
ADDRESS: ONE HARTFORD SQUARE
NEW BRITAIN, CT 06051

APPLICANT: MIKE EVANCHICK
SPRINT SPECTRUM LP
9 BARNES INDUSTRIAL RD
WALLINGFORD, CT 06492

294-5600

ESTIMATED COST: $ 98000.

Application Date: 10/08/96 Fee: 1568.00

DESCRIPTION OF JOB:
INSTALLATION OF 110 FT MONOPOLE WITH 6 ANTENNAS AND ASSOCIATED INFRASTRUCTURE.

PARCEL ID.: NOT FOUND

Exhibit B

Property Card

Unofficial Property Record Card - Hartford, CT

General Property Data

Parcel ID	286-173-007	**Account Number**	
Prior Parcel ID			
Property Owner	FREEPORT REALTY V LLC	**Property Location**	92 WESTON ST
		Property Use	WAREHOUSE
Mailing Address	337 FREEPORT ST	**Most Recent Sale Date**	9/20/2019
		Legal Reference	07527-0278
City	BOSTON	**Grantor**	NEPREO INC
Mailing State	MA Zip 02122	**Sale Price**	0
ParcelZoning	ID-1	**Land Area**	187,335.000 acres

Current Property Assessment

Card 1 Value	Building Value 0	Xtra Features Value 0	Land Value 0	Total Value 0

Building Description

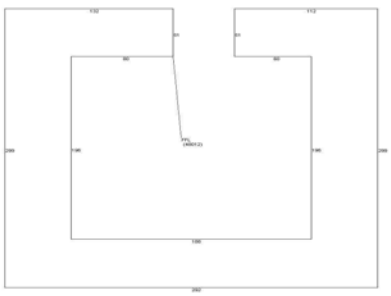
Building Style	OFFICE/WHS	**Foundation Type**	Concrete	**Flooring Type**	COMBINATION
# of Living Units	0	**Frame Type**	Steel	**Basement Floor**	N/A
Year Built	1978	**Roof Structure**	FLAT	**Heating Type**	Warm Air
Building Grade	Average	**Roof Cover**	Metal	**Heating Fuel**	Gas
Building Condition	N/A	**Siding**	Brick	**Air Conditioning**	30%
Finished Area (SF)	N/A	**Interior Walls**	DRYWALL	**# of Bsmt Garages**	0
Number Rooms	0	**# of Bedrooms**	0	**# of Full Baths**	0
# of 3/4 Baths	0	**# of 1/2 Baths**	0	**# of Other Fixtures**	0

Legal Description

Narrative Description of Property

This property contains 187,335.000 acres of land mainly classified as WAREHOUSE with a(n) OFFICE/WHS style building, built about 1978 , having Brick exterior and Metal roof cover, with 0 commercial unit(s) and 0 residential unit(s), 0 room(s), 0 bedroom(s), 0 bath(s), 0 half bath(s).

Property Images

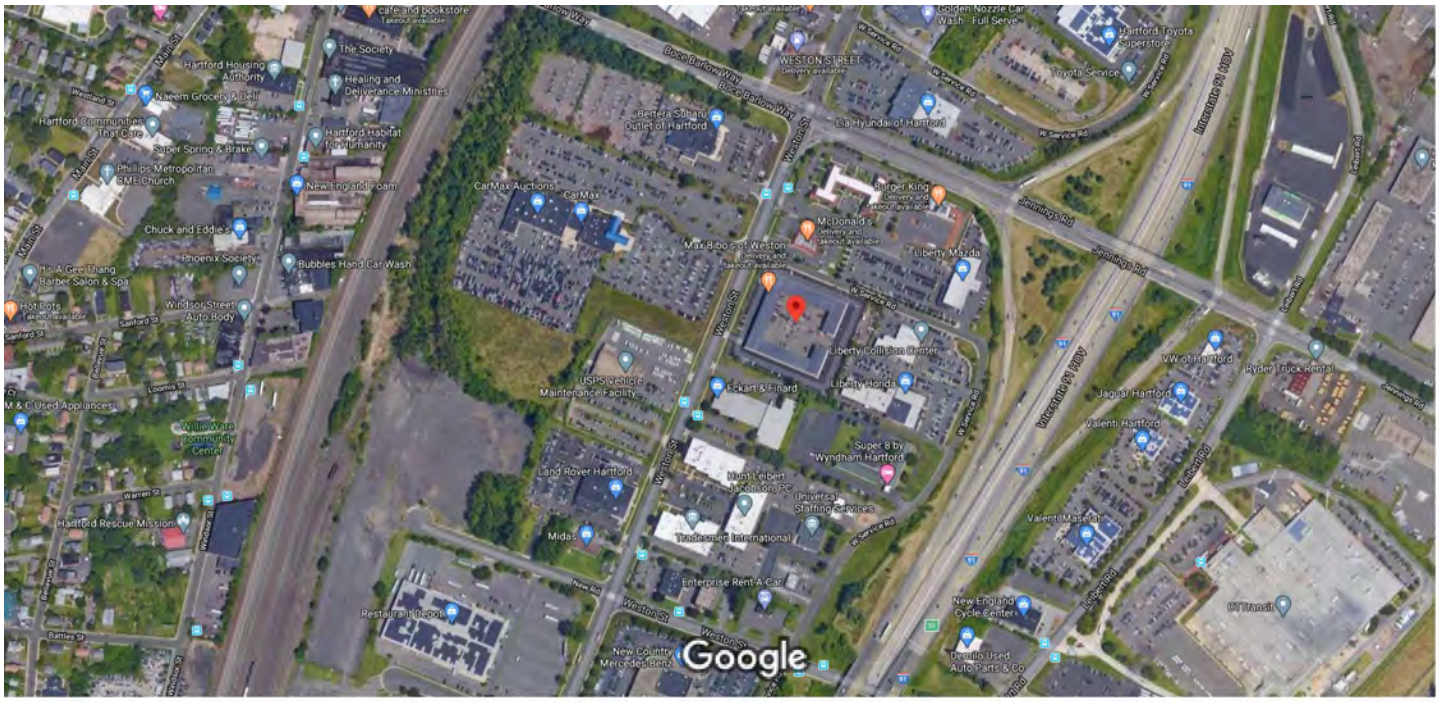


Disclaimer: This information is believed to be correct but is subject to change and is not warranteed.

Google Maps

41°47'12.3"N 72°39'44.4"W

Crown Castle - tower location



Imagery ©2020 Maxar Technologies, U.S. Geological Survey, USDA Farm Service Agency, Map data ©2020 200 ft

41°47'12.3"N 72°39'44.4"W

41.786750, -72.662339

Directions Save Nearby Send to your phone Share

92 Weston St, Hartford, CT 06120

Q8PQ+M3 Hartford, Connecticut

Exhibit C

Construction Drawings

T-MOBILE SITE NUMBER: CT11062B
T-MOBILE SITE NAME: WINDSOR/ I-91/ X35
SITE TYPE: MONOPOLE
TOWER HEIGHT: 110'-0"

BUSINESS UNIT #: 876325
SITE ADDRESS: 92 WESTON STREET HARTFORD, CT 06103-1217
COUNTY: HARTFORD
JURISDICTION: CITY OF HARTFORD

T-MOBILE L600 SITE CONFIGURATION: 67D92DB OUTDOOR

SITE INFORMATION

CROWN CASTLE USA INC. SITE NAME:	WESTON SQUARE
SITE ADDRESS:	92 WESTON STREET HARTFORD, CT 06103-1217
COUNTY:	HARTFORD
MAP/PARCEL #:	HRFD-000286-000173-000007
AREA OF CONSTRUCTION:	EXISTING
LATITUDE:	41° 47' 12.30"
LONGITUDE:	-72° 39' 44.42"
LAT/LONG TYPE:	NAD83
GROUND ELEVATION:	18 FT.
CURRENT ZONING:	ID-1
JURISDICTION:	CITY OF HARTFORD
OCCUPANCY CLASSIFICATION:	U
TYPE OF CONSTRUCTION:	IIB
A.D.A. COMPLIANCE:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION
PROPERTY OWNER:	NEPREO INC 20 WEST BOROUGH DRIVE WEST HARTFORD, CT 06107
TOWER OWNER:	GLOBAL SIGNAL ACQUISITIONS II LLC 2000 CORPORATE DRIVE CANONSBURG, PA 15317
CARRIER/APPLICANT:	T-MOBILE 12920 SE 38TH STREET BELLEVUE, WA 98006
CROWN CASTLE USA INC. APPLICATION ID:	494411
ELECTRIC PROVIDER:	NORTHEAST UTILITIES (800) 286-2000
TELCO PROVIDER:	LIGHTOWER (866) 518-5635

PROJECT TEAM

A&E FIRM:	CROWN CASTLE USA INC. 2000 CORPORATE DRIVE CANONSBURG, PA 15317 CROWNAE.APPROVAL@CROWNCASTLE.COM
CROWN CASTLE USA INC. DISTRICT CONTACTS:	3 CORPORATE PARK DRIVE, SUITE 101 CLIFTON PARK, NY 12065
	TRICIA PELON - PROJECT MANAGER (518) 373-3507
	JASON D'AMICO - CONSTRUCTION MANAGER (860) 209-0104
	ALLISON SQUIRES - A&E SPECIALIST ALLISON.SQUIRES.CONTRACTOR@CROWNCASTLE.COM (518) 373-3523

DRAWING INDEX

SHEET #	SHEET DESCRIPTION
T-1	TITLE SHEET
T-2	GENERAL NOTES
C-1	SITE PLAN AND ENLARGED SITE PLAN
C-2	FINAL ELEVATION AND ANTENNA PLANS
C-3	ANTENNA AND CABLE SCHEDULE
C-4	PLUMBING DIAGRAM
C-5	EQUIPMENT SPECIFICATIONS
G-1	ANTENNA GROUNDING DIAGRAM
G-2	GROUNDING DETAILS
G-3	GROUNDING DETAILS

ALL DRAWINGS CONTAINED HEREIN ARE FORMATTED FOR 11x17. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

APPROVALS

APPROVAL	SIGNATURE	DATE
PROPERTY OWNER OR REP.		
LAND USE PLANNER		
T-MOBILE		
OPERATIONS		
RF		
NETWORK		
BACKHAUL		
CONSTRUCTION MANAGER		

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

LOCATION MAP

APPLICABLE CODES/REFERENCE DOCUMENTS

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

CODE TYPE	CODE
BUILDING	2018 CT STATE BUILDING CODE/2015 IBC W/ CT AMENDMENTS
MECHANICAL	2018 CT STATE BUILDING CODE/2015 IMC W/ CT AMENDMENTS
ELECTRICAL	2018 CT STATE BUILDING CODE/2017 NEC W/ CT AMENDMENTS

REFERENCE DOCUMENTS:

STRUCTURAL ANALYSIS: BLACK & VEATCH CORP DATED JULY 18, 2019

MOUNT ANALYSIS: B+T GROUP DATED JUNE 5, 2020

PROJECT DESCRIPTION

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

TOWER SCOPE OF WORK:
- REMOVE (3) ANTENNAS
- REMOVE (3) RRUs
- INSTALL (3) ANTENNAS
- INSTALL (3) RRUs
- INSTALL (1) 1-5/8" HYBRID CABLE

GROUND SCOPE OF WORK:
- INSTALL (1) BB 6630

DESIGN PACKAGE BASED ON THE APPLICATION ID: 494411 REVISION: 0

DESIGN PACKAGE BASED ON THE RFDS REVISION: 5.1 DATE: 05/02/19

NOTE:
PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE CROWN NOC AT (800) 788-7011 & CROWN CONSTRUCTION MANAGER

CALL CONNECTICUT ONE CALL (800) 922-4455 CBYD.COM CALL 2 WORKING DAYS BEFORE YOU DIG

T-Mobile
12920 SE 38TH STREET
BELLEVUE, WA 98006

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

T-MOBILE SITE NUMBER:
CT11062B

BU #: **876325**
WESTON SQUARE

92 WESTON STREET
HARTFORD, CT 06103-1217

EXISTING 110'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	08/13/19	TG	CONSTRUCTION	YB/JL
1	05/29/20	TG	CONSTRUCTION	JL
2	06/10/20	TG	CONSTRUCTION	JL

DocuSigned by: Justin Lavette 3B40B5B2470410...

STATE OF CONNECTICUT — JUSTIN LAVETTE — No. 31965 — LICENSED PROFESSIONAL ENGINEER

6/10/2020 9:47:32 PM EDT

Crown Castle USA Inc. Certificate of Registration #PEC.0001101

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

SHEET NUMBER: T-1

REVISION: 2

SITE WORK GENERAL NOTES:

1. THE SUBCONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
2. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY CONTRACTOR. EXTREME CAUTION SHOULD BE USED BY THE SUBCONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES, SUBCONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING AND EXCAVATION.
3. ALL SITE WORK TO COMPLY WITH QAS-STD-10068 "INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON CROWN CASTLE USA INC. TOWER SITE" AND LATEST VERSION OF TIA 1019 "STANDARD FOR INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS."
4. ALL SITE WORK SHALL BE AS INDICATED ON THE STAMPED CONSTRUCTION DRAWINGS AND PROJECT SPECIFICATIONS.
5. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
6. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF CONTRACTOR, OWNER AND/OR LOCAL UTILITIES.
7. THE SUBCONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE.
8. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE BTS EQUIPMENT AND TOWER AREAS.
9. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
10. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
11. THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION AS SPECIFIED ON THE PROJECT SPECIFICATIONS.
12. SUBCONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
13. NOTICE TO PROCEED– NO WORK TO COMMENCE PRIOR TO COMPANY'S WRITTEN NOTICE TO PROCEED AND THE ISSUANCE OF A PURCHASE ORDER.
14. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN AND SHALL MEET ANSI/ASSE A10.48 (LATEST EDITION); FEDERAL, STATE, AND LOCAL REGULATIONS; AND ANY APPLICABLE INDUSTRY CONSENSUS STANDARDS RELATED TO THE CONSTRUCTION ACTIVITIES BEING PERFORMED. ALL RIGGING PLANS SHALL ADHERE TO ANSI/ASSE A10.48 (LATEST EDITION) AND CROWN CASTLE USA INC. STANDARD STANDARD CED-STD-10253 INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION TO CERTIFY THE SUPPORTING STRUCTURE(S) IN ACCORDANCE WITH THE ANSI/TIA-322 (LATEST EDITION).

STRUCTURAL STEEL NOTES:

1. ALL STEEL WORK SHALL BE PAINTED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND IN ACCORDANCE WITH ASTM A36 UNLESS OTHERWISE NOTED.
2. BOLTED CONNECTIONS SHALL BE ASTM A325 BEARING TYPE (3/4"ø) CONNECTIONS AND SHALL HAVE MINIMUM OF TWO BOLTS UNLESS NOTED OTHERWISE.
3. NON-STRUCTURAL CONNECTIONS FOR STEEL GRATING MAY USE 5/8"ø ASTM A307 BOLTS UNLESS NOTED OTHERWISE.
4. INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR, SHALL BE PER MANUFACTURER'S RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR CONTRACTOR APPROVAL WHEN DRILLING HOLES IN CONCRETE. SPECIAL INSPECTIONS, REQUIRED BY GOVERNING CODES, SHALL BE PERFORMED IN ORDER TO MAINTAIN MANUFACTURER'S MAXIMUM ALLOWABLE LOADS.

CONCRETE AND REINFORCING STEEL NOTES:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST-IN-PLACE CONCRETE.
2. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS, UNLESS NOTED OTHERWISE. SLAB FOUNDATION DESIGN ASSUMING ALLOWABLE SOIL BEARING PRESSURE OF 2000 PSF.
3. REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60, DEFORMED UNLESS NOTED OTHERWISE. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185 WELDED STEEL WIRE FABRIC UNLESS NOTED OTHERWISE. SPLICES SHALL BE CLASS "B" AND ALL HOOKS SHALL BE STANDARD, UNO.
4. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:

   CONCRETE CAST AGAINST EARTH.....3 IN.
   CONCRETE EXPOSED TO EARTH OR WEATHER:
   #6 AND LARGER.....2 IN.
   #5 AND SMALLER & WWF.....1 1/2 IN.
   CONCRETE NOT EXPOSED TO EARTH OR WEATHER OR NOT CAST AGAINST THE GROUND:
   SLAB AND WALLS.....3/4 IN.
   BEAMS AND COLUMNS.....1 1/2 IN.
5. A CHAMFER 3/4" SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNLESS NOTED OTHERWISE. IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

MASONRY NOTES:

1. HOLLOW CONCRETE MASONRY UNITS SHALL MEET A.S.T.M. SPECIFICATION C90, GRADE N, TYPE 1. THE SPECIFIED DESIGN COMPRESSIVE STRENGTH OF CONCRETE MASONRY (f'm) SHALL BE 1500 PSI.
2. MORTAR SHALL MEET THE PROPERTY SPECIFICATION OF A.S.T.M. C270 TYP. "S" MORTAR AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 2000 PSI.
3. GROUT SHALL MEET A.S.T.M. SPECIFICATION C475 AND HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 2000 PSI.
4. CONCRETE MASONRY SHALL BE LAID IN RUNNING (COMMON) BOND.
5. WALL SHALL RECEIVE TEMPORARY BRACING. TEMPORARY BRACING SHALL NOT BE REMOVED UNTIL GROUT IS FULLY CURED.

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
   CONTRACTOR–
   SUBCONTRACTOR– GENERAL CONTRACTOR (CONSTRUCTION)
   CARRIER– T-MOBILE
   TOWER OWNER– CROWN CASTLE USA INC.
   OEM– ORIGINAL EQUIPMENT MANUFACTURER
2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR AND CROWN CASTLE USA INC.
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
4. DRAWINGS PROVIDED HERE ARE NOT TO SCALE AND ARE INTENDED TO SHOW OUTLINE ONLY.
5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.
7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
8. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY THE CONTRACTOR AND CROWN CASTLE USA INC. PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWINGS.
10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.

ABBREVIATIONS AND SYMBOLS:

ABBREVIATIONS:

AGL	ABOVE GRADE LEVEL
BTS	BASE TRANSCEIVER STATION
(E)	EXISTING
MIN.	MINIMUM
REF	REFERENCE
RF	RADIO FREQUENCY
T.B.D.	TO BE DETERMINED
T.B.R.	TO BE RESOLVED
TYP	TYPICAL
REQ	REQUIRED
EGR	EQUIPMENT GROUND RING
AWG	AMERICAN WIRE GAUGE
MGB	MASTER GROUND BAR
EG	EQUIPMENT GROUND
BCW	BARE COPPER WIRE
SIAD	SMART INTEGRATED ACCESS DEVICE
GEN	GENERATOR
IGR	INTERIOR GROUND RING (HALO)
RBS	RADIO BASE STATION

SYMBOLS:

- SOLID GROUND BUS BAR
- SOLID NEUTRAL BUS BAR
- SUPPLEMENTAL GROUND CONDUCTOR
- 2-POLE THERMAL-MAGNETIC CIRCUIT BREAKER
- SINGLE-POLE THERMAL-MAGNETIC CIRCUIT BREAKER
- CHEMICAL GROUND ROD
- TEST WELL
- DISCONNECT SWITCH
- METER
- EXOTHERMIC WELD (CADWELD) (UNLESS OTHERWISE NOTED)
- MECHANICAL CONNECTION
- GROUNDING WIRE

ELECTRICAL INSTALLATION NOTES:

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.
2. CONDUIT ROUTINGS ARE SCHEMATIC. SUBCONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED AND TRIP HAZARDS ARE ELIMINATED.
3. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC. HILTI EPOXY ANCHORS ARE REQUIRED BY CROWN CASTLE USA INC.
4. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.
5. CABLES SHALL NOT BE ROUTED THROUGH LADDER-STYLE CABLE TRAY RUNGS.
6. EACH END OF EVERY POWER, POWER PHASE CONDUCTOR (I.E., HOTS), GROUNDING AND T1 CONDUCTOR AND CABLE SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2" PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC AND OSHA.
7. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH PLASTIC TAPE PER COLOR SCHEDULE. ALL EQUIPMENT SHALL BE LABELED WITH THEIR VOLTAGE RATING, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING AND BRANCH CIRCUIT ID NUMBERS (I.E. PANEL BOARD AND CIRCUIT ID'S).
8. PANEL BOARDS (ID NUMBERS) AND INTERNAL CIRCUIT BREAKERS (CIRCUIT ID NUMBERS) SHALL BE CLEARLY LABELED WITH PLASTIC LABELS.
9. ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.
10. POWER, CONTROL AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE CONDUCTOR (#14 AWG OR LARGER), 600 V, OIL RESISTANT THHN OR THWN-2, CLASS B STRANDED COPPER CABLE RATED FOR 90° C (WET & DRY) OPERATION LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED UNLESS OTHERWISE SPECIFIED.
11. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE CONDUCTOR (#6 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN-2 GREEN INSULATION CLASS B STRANDED COPPER CABLE RATED FOR 90° C (WET AND DRY) OPERATION LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED UNLESS OTHERWISE SPECIFIED.
12. POWER AND CONTROL WIRING, NOT IN TUBING OR CONDUIT, SHALL BE MULTI-CONDUCTOR, TYPE TC CABLE (#14 AWG OR LARGER), 600 V, OIL RESISTANT THHN OR THWN-2, CLASS B STRANDED COPPER CABLE RATED FOR 90° C (WET AND DRY) OPERATION WITH OUTER JACKET LISTED OR LABELED FOR THE LOCATION USED UNLESS OTHERWISE SPECIFIED.
13. ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP-STYLE, COMPRESSION WIRE LUGS AND WIRE NUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRE NUTS SHALL BE RATED FOR OPERATION AT NO LESS THAN 75° C (90° C IF AVAILABLE).
14. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.
15. ELECTRICAL METALLIC TUBING (EMT) OR RIGID NONMETALLIC CONDUIT (I.E. RIGID PVC SCHEDULE 40 OR RIGID PVC SCHEDULE 80 FOR LOCATIONS SUBJECT TO PHYSICAL DAMAGE) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
16. ELECTRICAL METALLIC TUBING (EMT), ELECTRICAL NONMETALLIC TUBING (ENT) OR RIGID NONMETALLIC CONDUIT (RIGID PVC, SCHEDULE 40) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
17. SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE GRADE PVC CONDUIT.
18. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
19. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SET SCREW FITTINGS ARE NOT ACCEPTABLE.
20. CABINETS, BOXES AND WIRE WAYS SHALL BE LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.
21. WIREWAYS SHALL BE EPOXY-COATED (GRAY) AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARDS; SHALL BE PANDUIT TYPE E (OR EQUAL); AND RATED NEMA 1 (OR BETTER).
22. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON-PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER. PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED FLUSH TO FINISH GRADE TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHIN ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.
23. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES AND PULL BOXES SHALL BE GALVANIZED OR EPOXY-COATED SHEET STEEL; SHALL MEET OR EXCEED UL 50 AND RATED NEMA 1 (OR BETTER) INDOORS OR NEMA 3R (OR BETTER) OUTDOORS.
24. METAL RECEPTACLE, SWITCH AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY-COATED OR NON-CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1; AND RATED NEMA 1 (OR BETTER) INDOORS OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
25. NONMETALLIC RECEPTACLE, SWITCH AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2; AND RATED NEMA 1 (OR BETTER) INDOORS OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
26. THE SUBCONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CONTRACTOR BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
27. THE SUBCONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD LIFE AND PROPERTY.
28. INSTALL PLASTIC LABEL ON THE METER CENTER TO SHOW "T-MOBILE".
29. ALL CONDUITS THAT ARE INSTALLED ARE TO HAVE A METERED MULE TAPE PULL CORD INSTALLED.

GREENFIELD GROUNDING NOTES:

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

NEC INSULATOR COLOR CODE

DESCRIPTION	PHASE/CODE LETTER	WIRE COLOR
240/120 1Ø	LEG 1	BLACK
	LEG 2	RED
AC NEUTRAL	N	WHITE
GROUND (EGC)	G	GREEN
VDC POS	+	*RED-POLARITY MARK AT TERMINATION
VDC NEG	–	*BLACK-POLARITY MARK AT TERMINATION
240V OR 208V, 3Ø	PHASE A	BLACK
	PHASE B	RED(ORG. IF HI LEG)
	PHASE C	BLUE
480V, 3Ø	PHASE A	BROWN
	PHASE B	ORANGE OR PURPLE
	PHASE C	YELLOW

* SEE NEC 210.5(C)(1) AND (2)

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

T-MOBILE SITE NUMBER:
CT11062B

BU #: **876325**
WESTON SQUARE

92 WESTON STREET
HARTFORD, CT 06103-1217

EXISTING 110'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	08/13/19	TG	CONSTRUCTION	YB/JL
1	05/29/20	TG	CONSTRUCTION	JL
2	06/10/20	TG	CONSTRUCTION	JL

DocuSigned by:
Justin Lavette
3B40B5B247D41D...

STATE OF CONNECTICUT
JUSTIN LAVETTE
No. 31965
LICENSED PROFESSIONAL ENGINEER

6/10/2020 9:47:32 PM EDT

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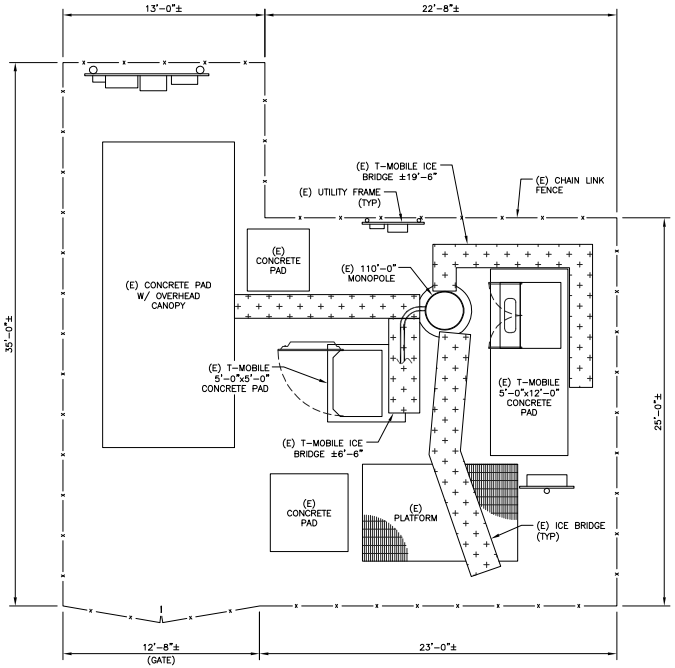
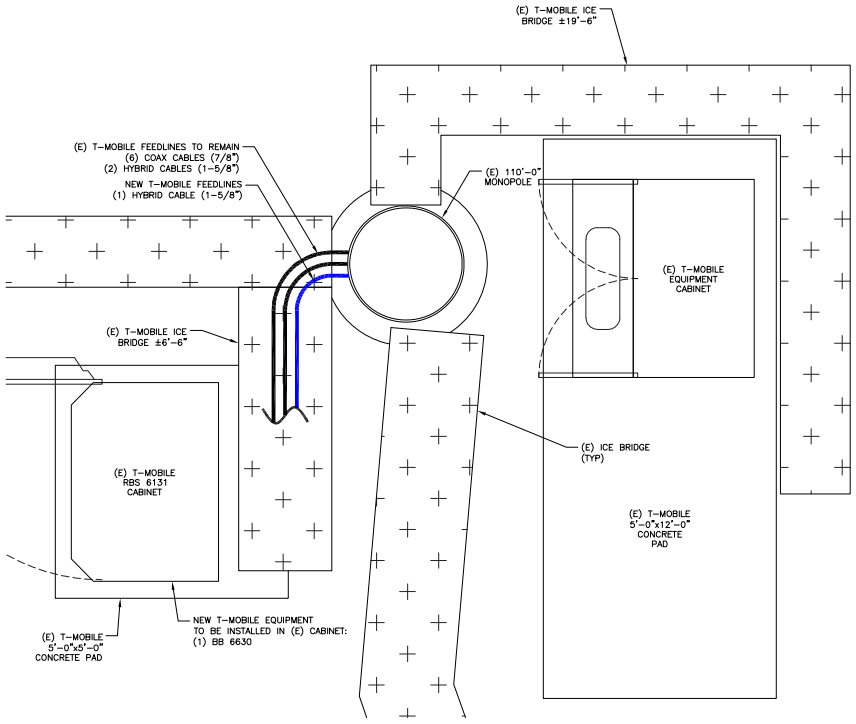
SHEET NUMBER: T-2

REVISION: 2



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

N



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

N

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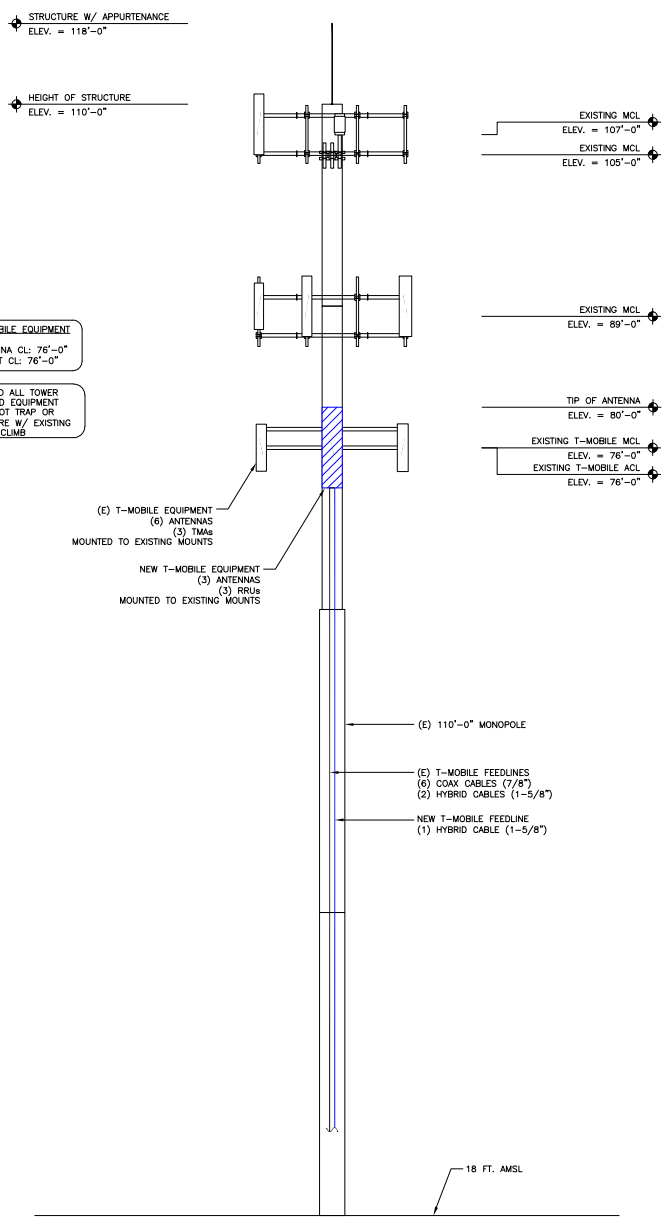
SHEET NUMBER: C-1
REVISION: 2



1 FINAL ELEVATION
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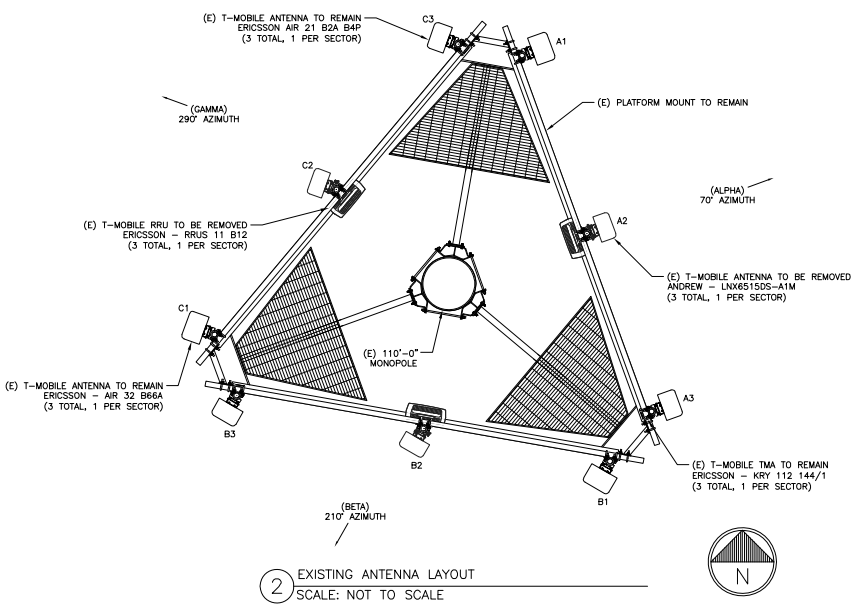
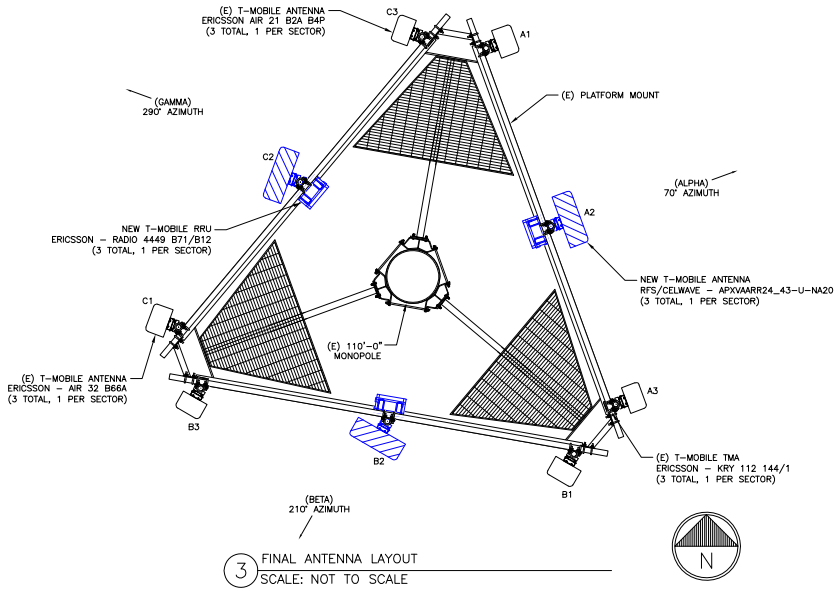


2 EXISTING ANTENNA LAYOUT
SCALE: NOT TO SCALE



3 FINAL ANTENNA LAYOUT
SCALE: NOT TO SCALE

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SHEET NUMBER: C-2
REVISION: 2

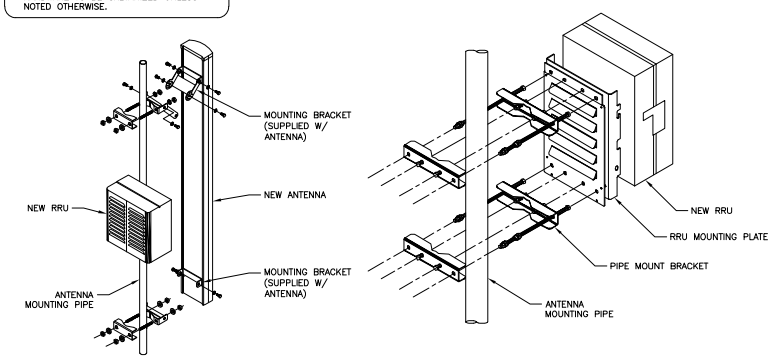
ANTENNA SCHEDULE										
SECTOR	POS.	TECHNOLOGY	RAD CENTER	AZIMUTH	ANTENNA MANUFACTURER	ANTENNA MODEL	MECH. TILT	ELECT. TILT	TOWER MOUNTED EQUIPMENT	FEEDLINE TYPE
ALPHA	A1	LTE AWS LTE PCS	76'-0"	70°	ERICSSON	AIR 32 B66A/B2A	0°	4°/4°/4°/4°	–	HYBRID
ALPHA	A2	LTE 600/700	76'-0"	70°	RFS/CELWAVE	APXVAARR24_43-U-NA20	0°	2°	(1) ERICSSON – RADIO 4449 B71/B12	HYBRID
ALPHA	A3	GSM PCS UMTS AWS	76'-0"	70°	ERICSSON	AIR 21 B2A/B4P	0°	4°/4°	(1) ERICSSON – KRY 112 489/2	COAX
BETA	B1	LTE AWS LTE PCS	76'-0"	210°	ERICSSON	AIR 32 B66A/B2A	0°	4°/4°/4°/4°	–	HYBRID
BETA	B2	LTE 600/700	76'-0"	210°	RFS/CELWAVE	APXVAARR24_43-U-NA20	0°	2°	(1) ERICSSON – RADIO 4449 B71/B12	HYBRID
BETA	B3	GSM PCS UMTS AWS	76'-0"	210°	ERICSSON	AIR 21 B2A/B4P	0°	4°/4°	(1) ERICSSON – KRY 112 489/2	COAX
GAMMA	C1	LTE AWS LTE PCS	76'-0"	290°	ERICSSON	AIR 32 B66A/B2A	0°	4°/4°/4°/4°	–	HYBRID
GAMMA	C2	LTE 600/700	76'-0"	290°	RFS/CELWAVE	APXVAARR24_43-U-NA20	0°	2°	(1) ERICSSON – RADIO 4449 B71/B12	HYBRID
GAMMA	C3	GSM PCS UMTS AWS	76'-0"	290°	ERICSSON	AIR 21 B2A/B4P	0°	4°/4°	(1) ERICSSON – KRY 112 489/2	COAX

CABLE SCHEDULE			
STATUS	CABLE TYPE	SIZE	QUANTITY
EXISTING	COAX	7/8"	6
EXISTING	HYBRID	1-5/8"	2
NEW	HYBRID	1-5/8"	1
CABLE QUANTITY			9

1 ANTENNA AND CABLE SCHEDULE
SCALE: NOT TO SCALE

INSTALLER NOTES:

1. COMPLY WITH MANUFACTURERS INSTRUCTIONS TO ENSURE THAT ALL RRHs RECEIVE ELECTRICAL POWER WITHIN 24 HOURS OF BEING REMOVED FROM THE MANUFACTURER'S PACKAGING.
2. DO NOT OPEN RRH PACKAGES IN THE RAIN.
3. ALL PIPES, BRACKETS, AND MISCELLANEOUS HARDWARE TO BE GALVANIZED UNLESS NOTED OTHERWISE.



2 ANTENNA WITH RRH MOUNTING DETAIL
SCALE: NOT TO SCALE

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CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
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T-MOBILE SITE NUMBER:
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BU #: **876325**
WESTON SQUARE

92 WESTON STREET
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DocuSigned by:
Justin Lavette
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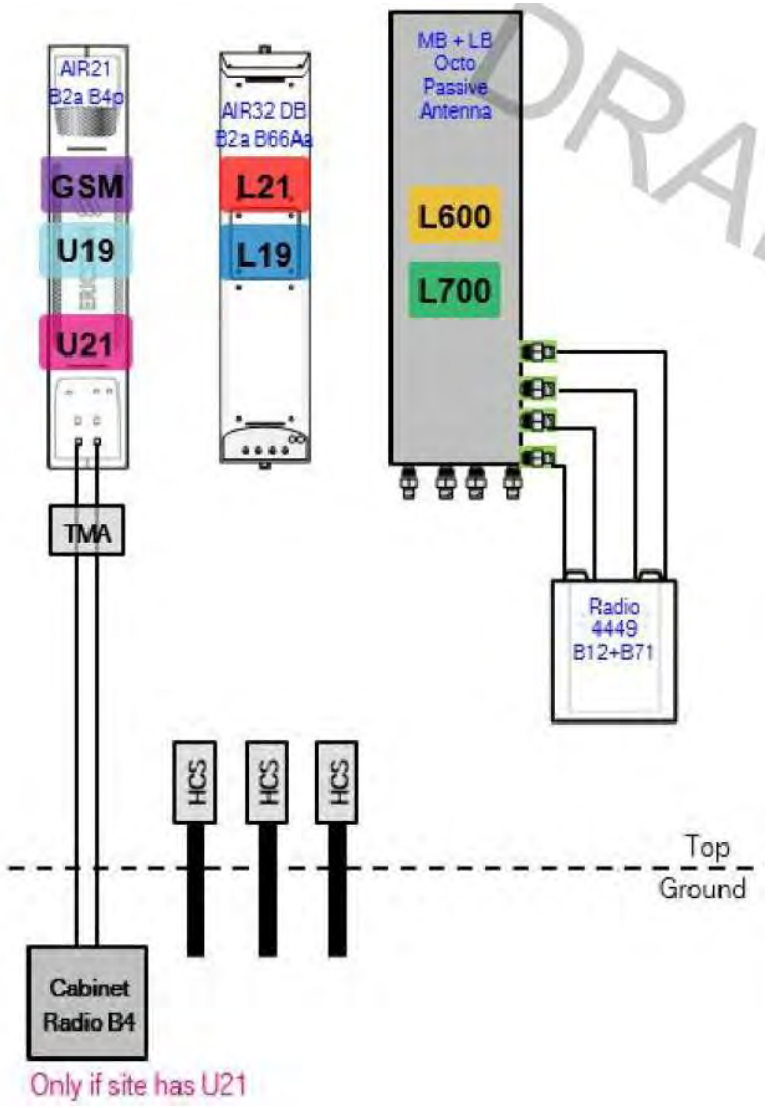
SHEET NUMBER: C-3
REVISION: 2



1 PLUMBING DIAGRAM
SCALE: NOT TO SCALE

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DocuSigned by:
Justin Lavallee
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STATE OF CONNECTICUT
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No. 31965
LICENSED PROFESSIONAL ENGINEER

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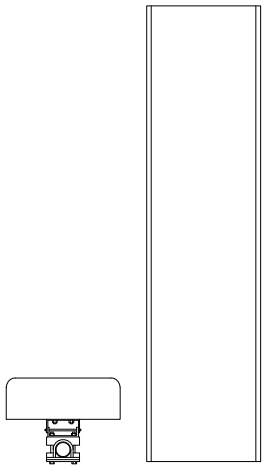
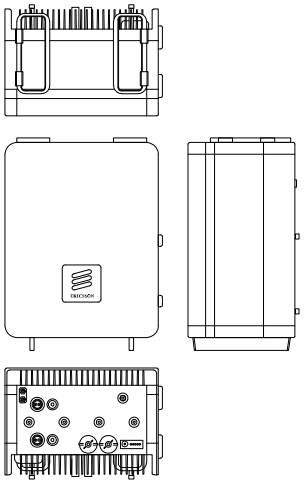
IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SHEET NUMBER: C-4
REVISION: 2



RFS/CELWAVE – APXVAARR24_43-U-NA20
WEIGHT (WITHOUT MOUNTING HARDWARE): 128.0 LBS
SIZE (HxWxD): 95.9x24.0x8.7 IN.

1 RFS/CELWAVE – APXVAARR24_43-U-NA20
SCALE: NOT TO SCALE



ERICSSON – RADIO 4449 B71/B12
WEIGHT: 70.0 LBS
SIZE (HxWxD): 18.0x13.2x9.4 IN.

2 ERICSSON – RADIO 4449 B71/B12
SCALE: NOT TO SCALE

3 NOT USED
SCALE: NOT TO SCALE

4 NOT USED
SCALE: NOT TO SCALE

5 NOT USED
SCALE: NOT TO SCALE

6 NOT USED
SCALE: NOT TO SCALE

T-Mobile
12920 SE 38TH STREET
BELLEVUE, WA 98006

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

T-MOBILE SITE NUMBER:
CT11062B

BU #: **876325**
WESTON SQUARE

92 WESTON STREET
HARTFORD, CT 06103-1217

EXISTING 110'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	08/13/19	TG	CONSTRUCTION	YB/JL
1	05/29/20	TG	CONSTRUCTION	JL
2	06/10/20	TG	CONSTRUCTION	JL

DocuSigned by:
Justin Lavette
3B40058247C41D...

STATE OF CONNECTICUT
JUSTIN PAUL LAVETTE
No. 31965
LICENSED
PROFESSIONAL ENGINEER

6/10/2020 9:14:37:32 PM EDT

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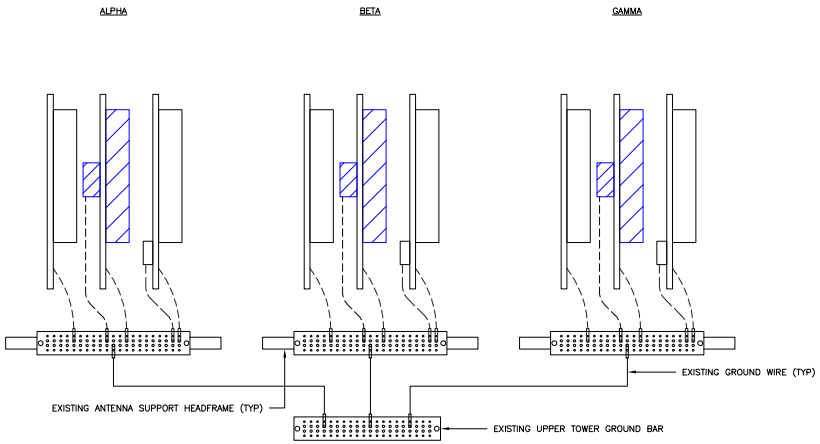
SHEET NUMBER: C-5

REVISION: 2



1 ANTENNA GROUNDING DIAGRAM
SCALE: NOT TO SCALE

T-Mobile
12920 SE 38TH STREET
BELLEVUE, WA 98006

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

T-MOBILE SITE NUMBER:
CT11062B

BU #: **876325**
WESTON SQUARE

92 WESTON STREET
HARTFORD, CT 06103-1217

EXISTING 110'-0" MONOPOLE

ISSUED FOR:

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1	05/29/20	TG	CONSTRUCTION	JL
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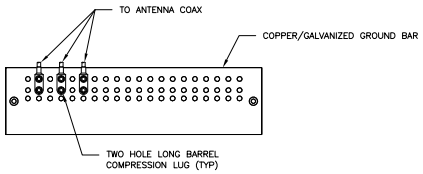
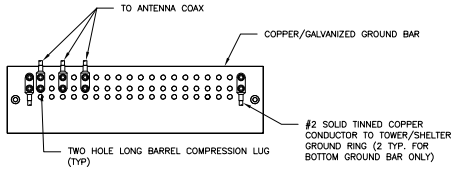
SHEET NUMBER: G-1
REVISION: 2



NOTES:

1. DOUBLING UP "OR STACKING" OF CONNECTIONS IS NOT PERMITTED.
2. EXTERIOR ANTIOXIDANT JOINT COMPOUND TO BE USED ON ALL EXTERIOR CONNECTIONS.
3. GROUND BAR SHALL NOT BE ISOLATED FROM TOWER. MOUNT DIRECTLY TO TOWER STEEL.

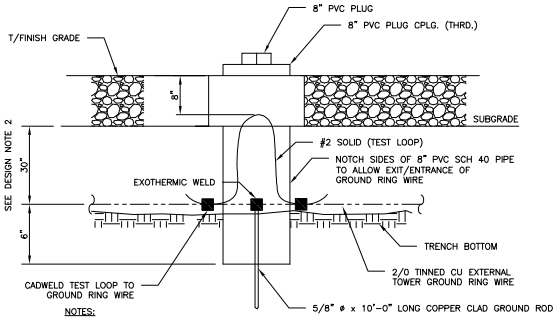
1 ANTENNA GROUND BAR DETAIL
SCALE: NOT TO SCALE



NOTES:

1. EXTERIOR ANTIOXIDANT JOINT COMPOUND TO BE USED ON ALL EXTERIOR CONNECTIONS.
2. GROUND BAR SHALL NOT BE ISOLATED FROM TOWER. MOUNT DIRECTLY TO TOWER STEEL (TOWER ONLY).
3. GROUND BAR SHALL BE ISOLATED FROM BUILDING OR SHELTER.

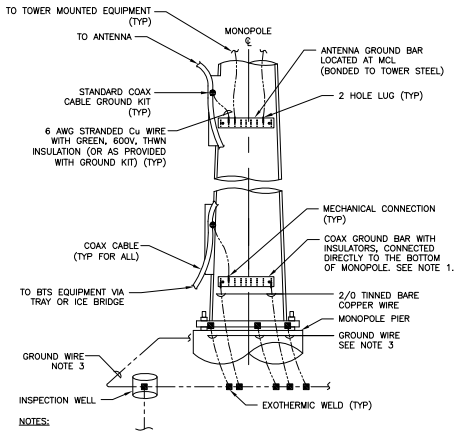
2 TOWER/SHELTER GROUND BAR DETAIL
SCALE: NOT TO SCALE



NOTES:

1. GROUND ROD SHALL BE DRIVEN VERTICALLY, NOT TO EXCEED 45 DEGREES FROM THE VERTICAL
2. GROUND WIRE SHALL BE MIN. 30" BELOW GRADE OR 6" BELOW FROST LINE. (WHICH EVER IS GREATER) AS PER N.E.C. ARTICLE 250-50(D)

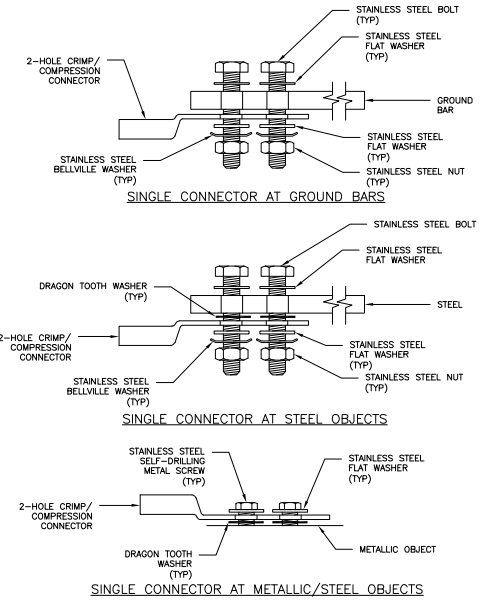
3 INSPECTION WELL DETAIL
SCALE: NOT TO SCALE



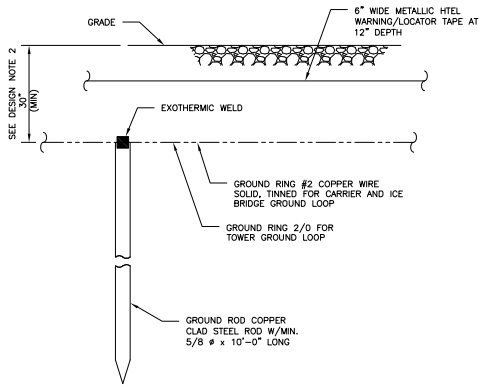
NOTES:

1. NUMBER OF GROUNDING BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, ANTENNA LOCATIONS AND CONNECTION ORIENTATION. COAXIAL CABLES EXCEEDING 200 FEET ON THE TOWER SHALL HAVE GROUND KITS AT THE MIDPOINT. PROVIDE AS REQUIRED.
2. ONLY MECHANICAL CONNECTIONS ARE ALLOWED TO BE MADE TO CROWN CASTLE USA INC. TOWERS. ALL MECHANICAL CONNECTIONS SHALL BE TREATED WITH AN ANTI-OXIDANT COATING.
3. ALL TOWER GROUNDING SYSTEMS SHALL COMPLY WITH THE REQUIREMENTS OF THE RECOGNIZED EDITION OF ANSI/TIA 222 AND NFPA 780.

4 TYPICAL ANTENNA CABLE GROUNDING
SCALE: NOT TO SCALE



5 HARDWARE DETAIL FOR EXTERIOR CONNECTIONS
SCALE: NOT TO SCALE



NOTES:

1. GROUND ROD SHALL BE DRIVEN VERTICALLY, NOT TO EXCEED 45 DEGREES FROM THE VERTICAL
2. GROUND WIRE SHALL BE MIN. 30" BELOW GRADE OR 6" BELOW FROST LINE. (WHICH EVER IS GREATER) AS PER N.E.C. ARTICLE 250-50(D)

6 GROUND ROD DETAIL
SCALE: NOT TO SCALE

T-Mobile
12920 SE 38TH STREET
BELLEVUE, WA 98006

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

T-MOBILE SITE NUMBER:
CT11062B

BU #: **876325**
WESTON SQUARE

92 WESTON STREET
HARTFORD, CT 06103-1217

EXISTING 110'-0" MONOPOLE

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REV	DATE	DRWN	DESCRIPTION	DES./QA
0	08/13/19	TG	CONSTRUCTION	YB/JL
1	05/29/20	TG	CONSTRUCTION	JL
2	06/10/20	TG	CONSTRUCTION	JL

DocuSigned by:
Justin Lavette
3B4085B2470410...

STATE OF CONNECTICUT
JUSTIN P. LAVETTE
No. 31965
LICENSED PROFESSIONAL ENGINEER

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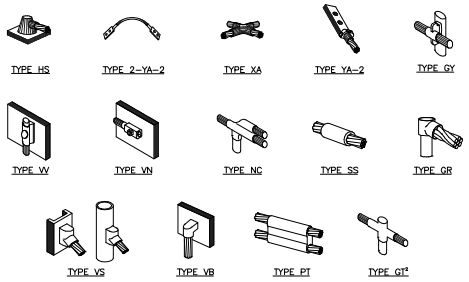
REVISION: 2

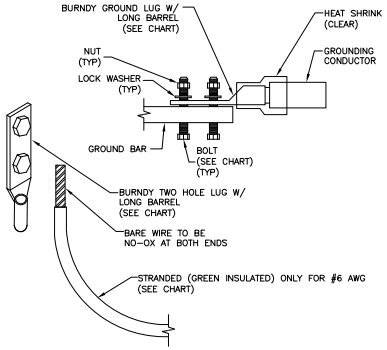


NOTE:

1. ERICO EXOTHERMIC "MOLD TYPES" SHOWN HERE ARE EXAMPLES. CONSULT WITH CONSTRUCTION MANAGER FOR SPECIFIC MOLDS TO BE USED FOR THIS PROJECT.
2. MOLD TYPE ONLY TO BE USED BELOW GRADE WHEN CONNECTING GROUND RING TO GROUND ROD.

1 CADWELD GROUNDING CONNECTIONS
SCALE: NOT TO SCALE

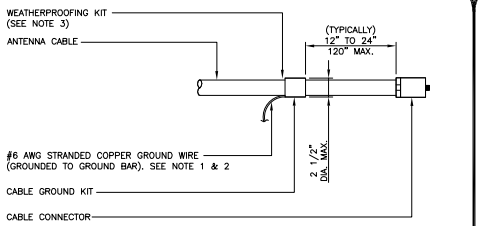
WIRE SIZE	BURNDY LUG	BOLT SIZE
#6 AWG GREEN INSULATED	YA6C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG SOLID TINNED	YA3C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG STRANDED	YA2C-2TC38	3/8" - 16 NC S 2 BOLT
#2/0 AWG STRANDED	YA26-2TC38	3/8" - 16 NC S 2 BOLT
#4/0 AWG STRANDED	YA28-2N	1/2" - 16 NC S 2 BOLT



NOTES:

1. ALL GROUNDING LUGS ARE TO BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS. ALL HARDWARE BOLTS, NUTS, LOCK WASHERS SHALL BE STAINLESS STEEL. ALL HARDWARE ARE TO BE AS FOLLOWS: BOLT, FLAT WASHER,GROUND BAR, GROUND LUG, FLAT WASHER AND NUT.

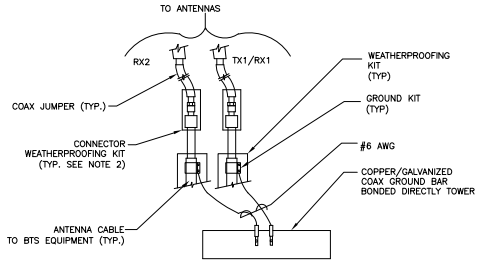
2 MECHANICAL LUG CONNECTION
SCALE: NOT TO SCALE



NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2. GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
3. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT, COLD SHRINK SHALL NOT BE USED.

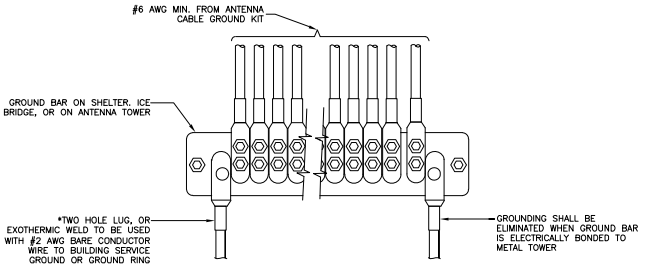
3 CABLE GROUND KIT CONNECTION
SCALE: NOT TO SCALE



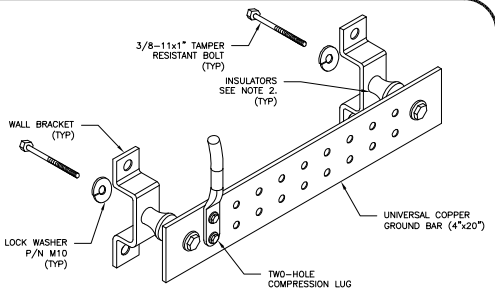
NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO ANTENNA GROUND BAR.
2. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT. COLD SHRINK SHALL NOT BE USED.

4 GROUND CABLE CONNECTION
SCALE: NOT TO SCALE



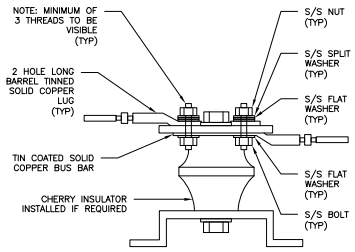
5 GROUNDWIRE INSTALLATION
SCALE: NOT TO SCALE



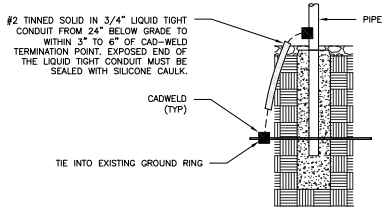
NOTES:

1. DOWN LEAD (HOME RUN) CONDUCTORS ARE NOT TO BE INSTALLED ON CROWN CASTLE USA INC. TOWER, PER THE GROUNDING DOWN CONDUCTOR POLICY QAS-STD-10091. NO MODIFICATION OR DRILLING TO TOWER STEEL IS ALLOWED IN ANY FORM OR FASHION, CAD-WELDING ON THE TOWER AND/OR IN THE AIR ARE NOT PERMITTED.
2. OMIT INSULATOR WHEN MOUNTING TO TOWER STEEL OR PLATFORM STEEL USE INSULATORS WHEN ATTACHING TO BUILDING OR SHELTERS.

6 GROUND BAR DETAIL
SCALE: NOT TO SCALE



7 LUG DETAIL
SCALE: NOT TO SCALE



8 TRANSITIONING GROUND DETAIL
SCALE: NOT TO SCALE

T-Mobile
12920 SE 38TH STREET
BELLEVUE, WA 98006

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

T-MOBILE SITE NUMBER:
CT11062B

BU #: **876325**
WESTON SQUARE

92 WESTON STREET
HARTFORD, CT 06103-1217

EXISTING 110'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	08/13/19	TG	CONSTRUCTION	YR/JL
1	05/29/20	TG	CONSTRUCTION	JL
2	06/10/20	TG	CONSTRUCTION	JL

DocuSigned by:
Justin Lavette
3B40058247041D...

STATE OF CONNECTICUT
JUSTIN P. LAVETTE
No. 31965
LICENSED PROFESSIONAL ENGINEER

6/10/2020 9:47:32 PM EDT

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REVISION: 2

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EnvelopeId Stamping: Enabled		Canonsburg, PA 15317
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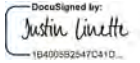
Justin Linette		Sent: 6/10/2020 3:46:09 PM
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Crown Castle International Corp.		Signed: 6/10/2020 4:37:32 PM
Security Level: Email, Account Authentication (None)	Signature Adoption: Pre-selected Style Using IP Address: 64.213.130.12	

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Agent Delivery Events	Status	Timestamp

Intermediary Delivery Events	Status	Timestamp

Certified Delivery Events	Status	Timestamp

Carbon Copy Events	Status	Timestamp

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Notary Events	Signature	Timestamp

Envelope Summary Events	Status	Timestamps
Envelope Sent	Hashed/Encrypted	6/10/2020 3:46:09 PM
Certified Delivered	Security Checked	6/10/2020 4:35:55 PM
Signing Complete	Security Checked	6/10/2020 4:37:32 PM
Completed	Security Checked	6/10/2020 4:37:32 PM

Payment Events	Status	Timestamps

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Parties agreed to: Justin Linette

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To contact us by email, send messages to: esignature@CrownCastle.com
To contact us by paper mail, send correspondence to
Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317

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Mobile Signing:	Apple iOS 7.0 or above; Android 4.0 or above
PDF Reader:	Acrobat® Reader or similar software may be required to view and print PDF files
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Enabled Security Settings:	Allow per session cookies

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Exhibit D

Structural Analysis Report

Date: **July 18, 2019**

Darcy Tarr
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277

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

Subject:	**Structural Analysis Report**	
Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CT11062B
	Carrier Site Name:	Windsor/ I-91/ X35
Crown Castle Designation:	**Crown Castle BU Number:**	876325
	Crown Castle Site Name:	WESTON SQUARE
	Crown Castle JDE Job Number:	576711
	Crown Castle Work Order Number:	1750414
	Crown Castle Order Number:	494411 Rev. 0
Engineering Firm Designation:	**Black & Veatch Corp. Project Number:**	400087
Site Data:	**92 Weston Street, Hartford, Hartford County, CT** **Latitude *41° 47' 12.3"*, Longitude *-72° 39' 44.42"*** **110 Foot - Monopole Tower**	

Dear Darcy Tarr,

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

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

LC7: Proposed Equipment Configuration **Sufficient Capacity – 98.2%**

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

Structural analysis prepared by: Passapong Phiwphong

Respectfully submitted by:

Josh J Riley, P.E.
Professional Engineer

07/18/2019

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 110 ft Monopole tower designed by Rohn Industries, Inc.

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

The tower has been modified per reinforcement drawings prepared by B&T Engineering, Inc., in December of 2008. Reinforcement consists of addition of reinforcement plates from 0.5' – 10.5', additional anchor rods, and base plate stiffeners. Refer to Post Modification Inspection Report by B&T Engineering, Inc. in November of 2009. This modification has been considered effective in this analysis.

The tower was later modified per reinforcement drawings prepared by Paul J. Ford and Company, in May of 2012. Reinforcement consists of addition of reinforcement plates from 30.5' – 40.5', and bridge stiffeners at 30'. Refer to Modification Inspection Report by Tower Engineering Professionals, Inc. in October of 2012. This modification has been considered effective in this analysis.

The tower was later modified per reinforcement drawings prepared by Paul J. Ford and Company, in February of 2013. Reinforcement consists of addition of reinforcement plates from 6' – 21' and transition stiffeners. Refer to Modification Inspection Report by Tower Engineering Professionals, Inc. in August of 2013. This modification has been considered effective in this analysis.

The tower was later modified per reinforcement drawings prepared by Paul J. Ford and Company, in February of 2017. Reinforcement consists of addition of reinforcement plates from 4.5' – 26.5', jump plates at 30', and additional foundation reinforcement. Refer to Modification Inspection Report by Engineered Tower Solutions, Pllc. in August of 2017. This modification has been considered effective in this analysis.

2) ANALYSIS CRITERIA

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

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
76.0	76.0	1	cci tower mounts	Handrail Kit [NA 507-1]	3 6	1-5/8 7/8
		1	cci tower mounts	Platform Mount [LP 303-1]		
		3	ericsson	AIR 32 B2a/B66Aa w/ Mount Pipe		
		3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe		
		3	ericsson	KRY 112 144/1		
		3	ericsson	RADIO 4449 B12/B71		
		3	rfs celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe		

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
107.0	108.0	3	alcatel lucent	TD-RRH8x20-25	1 3	5/8 1-1/4
		3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe		
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe		
	107.0	1	cci tower mounts	T-Arm Mount [TA 702-3]		
105.0	108.0	3	alcatel lucent	800MHz 2X50W RRH W/FILTER	-	-
		3	alcatel lucent	PCS 1900MHz 4x45W-65MHz		
	107.0	3	rfs celwave	IBC1900BB-1		
		3	rfs celwave	IBC1900HG-2A		
	105.0	1	cci tower mounts	Side Arm Mount [SO 102-3]		
89.0		3	cci antennas	HPA-65R-BUU-H6 w/ Mount Pipe	12 4 2 2	1-5/8 3/4 3/8 2” conduit
		3	ericsson	RRUS 11 B12		
		3	ericsson	RRUS 32		
		3	ericsson	RRUS 32 B2		
		3	ericsson	RRUS 32 B66		
		3	powerwave technologies	7750.00 w/ Mount Pipe		
		6	powerwave technologies	LGP21401		
		3	quintel technology	QS66512-2 w/ Mount Pipe		
		2	raycap	DC6-48-60-18-8F		
	89.0	1	cci tower mounts	Platform Mount [LP 502-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH Engineering, Inc.	2192540	CCISITES
4-POST-MODIFICATION INSPECTION	B&T Engineering, Inc	2561266	CCISITES
4-POST-MODIFICATION INSPECTION	Tower Engineering Professionals, Inc.	3355603	CCISITES
4-POST-MODIFICATION INSPECTION	Tower Engineering Professionals, Inc.	4075332	CCISITES
4-POST-MODIFICATION INSPECTION	Engineered Tower Solution, PLLC	6996864	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Rohn Industries, Inc.	1615433	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Rohn Industries, Inc.	1615400	CCISITES

Document	Remarks	Reference	Source
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	B&T Engineering, Inc	2356066	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Paul J. Ford and Company	3187227	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Paul J. Ford and Company	3667858	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Paul J. Ford and Company	6702634	CCISITES

3.1) Analysis Method

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

tnxTower was used to determine the loads on the modified structure. Additional calculations were performed to determine the stresses in the pole and in the reinforcing elements. These calculations are presented in Appendix C.

3.2) Assumptions

1) Tower and structures were built and maintained in accordance with the manufacturer's specifications.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
3) The existing base plate grout was considered in this analysis. Grout must be maintained and inspected periodically and must be replaced if damaged or cracked. Refer to Crown Castle document ENG-PRC-10012, Base Plate Grout Repair.
4) Base and flange plate design methodology of the manufacturer have been reviewed and found to be an acceptable means of designing to resist the full capacity of the bolts and shaft.
5) 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.
6) This analysis was performed under the assumption that all information provided to Black & Veatch is current and correct. This is to include site data, appurtenance loading, tower/foundation details, and geotechnical data. The loading on the structure is based on CAD level drawings and carrier orders provided by the owner. If any of this information is not current and correct, this report should be considered obsolete and further analysis will be required.

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

4) ANALYSIS RESULTS

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

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
110 - 105	Pole	TP24x24x0.25	Pole	1.6%	Pass
105 - 100	Pole	TP24x24x0.25	Pole	6.6%	Pass
100 - 95	Pole	TP24x24x0.25	Pole	11.4%	Pass
95 - 90	Pole	TP24x24x0.25	Pole	16.5%	Pass
90 - 85	Pole	TP24x24x0.375	Pole	18.2%	Pass

85 - 80	Pole	TP24x24x0.375	Pole	26.1%	Pass
80 - 75	Pole	TP24x24x0.375	Pole	35.3%	Pass
75 - 70	Pole	TP24x24x0.375	Pole	46.8%	Pass
70 - 65	Pole	TP24x24x0.375	Pole	58.6%	Pass
65 - 60	Pole	TP24x24x0.375	Pole	70.8%	Pass
60 - 55	Pole	TP30x30x0.375	Pole	55.2%	Pass
55 - 50	Pole	TP30x30x0.375	Pole	63.8%	Pass
50 - 45	Pole	TP30x30x0.375	Pole	72.6%	Pass
45 - 40	Pole	TP30x30x0.375	Pole	81.5%	Pass
40 - 39.33	Pole	TP30x30x0.375	Pole	82.8%	Pass
39.33 - 39.08	Pole + Reinf.	TP30x30x0.4875	Pole	65.0%	Pass
39.08 - 34.08	Pole + Reinf.	TP30x30x0.4875	Pole	72.3%	Pass
34.08 - 30	Pole + Reinf.	TP30x30x0.4875	Pole	78.5%	Pass
30 - 29.75	Pole	TP30x30x0.5	Pole	73.2%	Pass
29.75 - 25	Pole	TP30x30x0.5	Pole	80.0%	Pass
25 - 24.75	Pole + Reinf.	TP30x30x0.5563	Pole	72.4%	Pass
24.75 - 19.75	Pole + Reinf.	TP30x30x0.5563	Pole	79.0%	Pass
19.75 - 18.58	Pole + Reinf.	TP30x30x0.5563	Pole	80.6%	Pass
18.58 - 18.33	Pole + Reinf.	TP30x30x0.7	Pole	70.1%	Pass
18.33 - 13.33	Pole + Reinf.	TP30x30x0.7	Pole	76.1%	Pass
13.33 - 8.42	Pole + Reinf.	TP30x30x0.7	Pole	82.1%	Pass
8.42 - 8.07	Pole + Reinf.	TP30x30x0.8625	Pole	63.3%	Pass
8.07 - 7.83	Pole + Reinf.	TP30x30x0.8625	Pole	63.5%	Pass
7.83 - 6	Pole + Reinf.	TP30x30x0.8625	Pole	65.3%	Pass
6 - 5.75	Pole + Reinf.	TP30x30x0.8	Pole	70.1%	Pass
5.75 - 2	Pole + Reinf.	TP30x30x0.8	Pole	74.0%	Pass
2 - 1.75	Pole + Reinf.	TP30x30x1.35	Reinf. 5 Weldment	70.1%	Pass
1.75 - 0	Pole + Reinf.	TP30x30x1.4	Reinf. 1 Weldment	67.0%	Pass
				Summary	
			Pole	82.8%	Pass
			Reinforcement	73.1%	Pass
			Overall	82.8%	Pass

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

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Flange Bolts	90	9.3	Pass
	Flange Plate		16.5	
1,2	Flange Bolts	60	43.5	Pass
	Flange Plate		70.8	
1	Flange Bolts	30	0.0	Pass
	Flange Plate		1.0	Pass

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
	Jump plate		41.8	Pass
	Bridge Stiffeners		49.3	Pass
1	Anchor Rods (Original)	0	67.4	Pass
	Anchor Rods (Existing Modification)		98.2	Pass
	Base Plate		60.7	Pass
	Stiffener		68.8	Pass
1	Base Foundation	0	77.9	Pass
	Base Foundation Soil Interaction		23.7	Pass

Structure Rating (max from all components) =	98.2%

Notes:
1) See additional documentation in “Appendix C – Additional Calculations” for calculations supporting the % capacity. Rating per TIA-222-H Section 15.5.
2) Base/Flange plates are assumed to have the same capacity as their respective splice bolts or shaft.

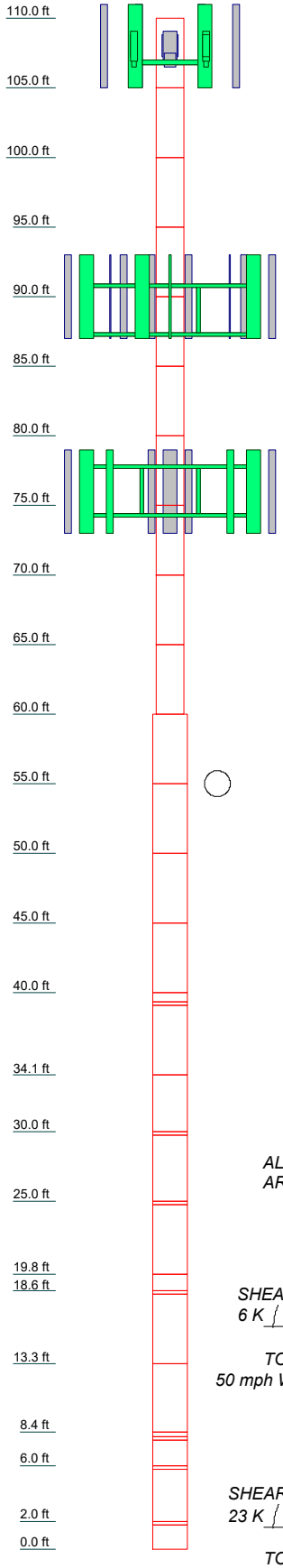
4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT

Section	Size	Length (ft)	Grade	Weight (K)
1	P24x0.25	5.00	A53-B-42	0.3
2	P24x0.25	5.00		0.3
3	P24x0.25	5.00		0.3
4	P24x0.25	5.00		0.3
5	P24x0.375	5.00		0.5
6	P24x0.375	5.00		0.5
7	P24x0.375	5.00		0.5
8	P24x0.375	5.00		0.5
9	P24x0.375	5.00		0.5
10	P24x0.375	5.00		0.5
11	P30x0.375	5.00		0.6
12	P30x0.375	5.00		0.6
13	P30x0.375	5.00		0.6
14	P30x0.375	5.00		0.6
15				
16				
17	P30x0.487	5.00		0.7
18				0.6
19		0.25		0.0
20		4.75		0.7
21		0.25		0.1
22		5.00		1.1
23				0.3
24				
25	P30x0.7	5.00		1.4
26	P30x0.7	4.91		1.4
27				
28				
29				0.1
30		0.25		0.0
31		3.75		0.9
32				0.1
33		1.75		0.6
				15.3



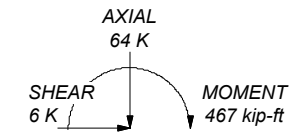
MATERIAL STRENGTH

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

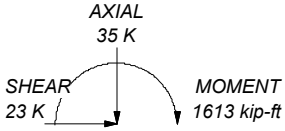
TOWER DESIGN NOTES

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

ALL REACTIONS ARE FACTORED



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



TORQUE 1 kip-ft
REACTIONS - 125 mph WIND

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Overland Park, KS 66211
Phone: (913) 458-2000
FAX: (913) 458-8136

Job: ***WESTON SQUARE (BU# 876325)***			
Project: ***400087 (876325.1750414)***			
Client: Crown Castle	Drawn by: vib70985	App'd:	
Code: TIA-222-H	Date: 07/18/19	Scale: NTS	
Path: C:\Users\vib70985\Documents\Verify\876325\876325.1750414 Structural Analysis - Modified.eri		Dwg No. E-1	

Tower Input Data

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

1) Tower is located in Hartford County, Connecticut.
2) Tower base elevation above sea level: 10.00 ft.
3) Basic wind speed of 125 mph.
4) Risk Category II.
5) Exposure Category C.
6) Simplified Topographic Factor Procedure for wind speed-up calculations is used.
7) Topographic Category: 1.
8) Crest Height: 0.00 ft.
9) Nominal ice thickness of 2.0000 in.
10) Ice thickness is considered to increase with height.
11) Ice density of 56 pcf.
12) A wind speed of 50 mph is used in combination with ice.
13) Temperature drop of 50 °F.
14) Deflections calculated using a wind speed of 60 mph.
15) TIA-222-H Annex S.
16) A non-linear (P-delta) analysis was used.
17) Pressures are calculated at each section.
18) Stress ratio used in pole design is 1.05.
19) Tower analysis based on target reliabilities in accordance with Annex S.
20) Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
21) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Pole Section Geometry

Section	*Elevation*	*Section Length*	*Pole Size*	*Pole Grade*	*Socket Length*
	ft	*ft*			*ft*
L1	110.00-105.00	5.00	P24x0.25	A53-B-42 (42 ksi)	
L2	105.00-100.00	5.00	P24x0.25	A53-B-42 (42 ksi)	

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L3	100.00-95.00	5.00	P24x0.25	A53-B-42 (42 ksi)	
L4	95.00-90.00	5.00	P24x0.25	A53-B-42 (42 ksi)	
L5	90.00-85.00	5.00	P24x0.375	A53-B-42 (42 ksi)	
L6	85.00-80.00	5.00	P24x0.375	A53-B-42 (42 ksi)	
L7	80.00-75.00	5.00	P24x0.375	A53-B-42 (42 ksi)	
L8	75.00-70.00	5.00	P24x0.375	A53-B-42 (42 ksi)	
L9	70.00-65.00	5.00	P24x0.375	A53-B-42 (42 ksi)	
L10	65.00-60.00	5.00	P24x0.375	A53-B-42 (42 ksi)	
L11	60.00-55.00	5.00	P30x0.375	A53-B-42 (42 ksi)	
L12	55.00-50.00	5.00	P30x0.375	A53-B-42 (42 ksi)	
L13	50.00-45.00	5.00	P30x0.375	A53-B-42 (42 ksi)	
L14	45.00-40.00	5.00	P30x0.375	A53-B-42 (42 ksi)	
L15	40.00-39.33	0.67	P30x0.375	A53-B-42 (42 ksi)	
L16	39.33-39.08	0.25	P30x0.4875	A53-B-42 (42 ksi)	
L17	39.08-34.08	5.00	P30x0.4875	A53-B-42 (42 ksi)	
L18	34.08-30.00	4.08	P30x0.4875	A53-B-42 (42 ksi)	
L19	30.00-29.75	0.25	P30x0.5	A53-B-42 (42 ksi)	
L20	29.75-25.00	4.75	P30x0.5	A53-B-42 (42 ksi)	
L21	25.00-24.75	0.25	P30x0.55625	A53-B-42 (42 ksi)	
L22	24.75-19.75	5.00	P30x0.55625	A53-B-42 (42 ksi)	
L23	19.75-18.58	1.17	P30x0.55625	A53-B-42 (42 ksi)	
L24	18.58-18.33	0.25	P30x0.7	A53-B-42 (42 ksi)	
L25	18.33-13.33	5.00	P30x0.7	A53-B-42 (42 ksi)	
L26	13.33-8.42	4.91	P30x0.7	A53-B-42 (42 ksi)	
L27	8.42-8.07	0.35	P30x0.8625	A53-B-42 (42 ksi)	
L28	8.07-7.83	0.24	P30x0.8625	A53-B-42 (42 ksi)	
L29	7.83-6.00	1.83	P30x0.8625	A53-B-42 (42 ksi)	
L30	6.00-5.75	0.25	P30x0.8	A53-B-42 (42 ksi)	
L31	5.75-2.00	3.75	P30x0.8	A53-B-42 (42 ksi)	
L32	2.00-1.75	0.25	P30x1.35	A53-B-42 (42 ksi)	
L33	1.75-0.00	1.75	P30x1.4	A53-B-42 (42 ksi)	

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 110.00-105.00				1	1	1			
L2 105.00-100.00				1	1	1			
L3 100.00-95.00				1	1	1			
L4 95.00-90.00				1	1	1			
L5 90.00-85.00				1	1	1			
L6 85.00-80.00				1	1	1			
L7 80.00-75.00				1	1	1			
L8 75.00-70.00				1	1	1			
L9 70.00-65.00				1	1	1			
L10 65.00-60.00				1	1	1			
L11 60.00-55.00				1	1	1			
L12 55.00-50.00				1	1	1			
L13 50.00-45.00				1	1	1			
L14 45.00-40.00				1	1	1			
L15 40.00-39.33				1	1	1			
L16 39.33-39.08				1	1	0.965972			
L17 39.08-34.08				1	1	0.965972			
L18 34.08-30.00				1	1	0.965972			
L19 30.00-29.75				1	1	1			
L20 29.75-25.00				1	1	1			
L21 25.00-24.75				1	1	1.25043			
L22 24.75-19.75				1	1	1.25043			
L23 19.75-18.58				1	1	1.25043			
L24 18.58-18.33				1	1	1.26158			
L25 18.33-13.33				1	1	1.26158			
L26 13.33-8.42				1	1	1.26158			
L27 8.42-8.07				1	1	1.10116			
L28 8.07-7.83				1	1	1.10116			
L29 7.83-6.00				1	1	1.10116			
L30 6.00-5.75				1	1	0.939375			
L31 5.75-2.00				1	1	0.939375			
L32 2.00-1.75				1	1	0.855398			
L33 1.75-0.00				1	1	0.82629			

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)	110.00 - 8.00	1	1	0.000 0.013	0.3750		0.22
LDF7-50A(1-5/8)	C	No	Surface Ar (CaAa)	89.00 - 0.00	3	3	0.150 0.350	1.9800		0.82
2" innerduct conduit	C	No	Surface Ar (CaAa)	89.00 - 0.00	1	1	0.050 0.120	2.0000		0.20
FB-L98B-034-XXX(3/8)	C	No	Surface Ar (CaAa)	89.00 - 0.00	1	1	0.050 0.064	0.0000		0.06
WR-VG86ST-BRD(3/4)	C	No	Surface Ar (CaAa)	89.00 - 0.00	2	2	0.050 0.110	0.0000		0.58
** 74' **										
810921-001(7/8)	A	No	Surface Ar (CaAa)	74.00 - 0.00	6	3	-0.390 -0.280	1.1120		0.40
(1) HCS 6X12 4AWG(1-5/8) + (1) MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	A	No	Surface Ar (CaAa)	74.00 - 0.00	2	2	-0.500 -0.390	1.6600		2.40
HCS 6X12 4AWG(1-5/8)	A	No	Surface Ar (CaAa)	74.00 - 0.00	1	1	-0.280 -0.220	1.6600		2.40
MOD 2008										
Aero Channel MP305	A	No	Surface Af (CaAa)	10.50 - 0.50	1	1	0.000 0.000	5.3125	14.8400	0.00
Aero Channel MP305	B	No	Surface Af (CaAa)	10.50 - 0.50	1	1	0.000 0.000	5.3125	14.8400	0.00
Aero Channel MP305	C	No	Surface Af (CaAa)	10.50 - 0.50	1	1	0.000 0.000	5.3125	14.8400	0.00
Aero Channel MP305	C	No	Surface Af (CaAa)	10.50 - 0.50	1	1	0.000 0.000	5.3125	14.8400	0.00
MOD 2012										
Aero Channel MP303	A	No	Surface Af (CaAa)	40.50 - 30.50	1	1	0.000 0.000	4.0625	11.2600	0.00
Aero Channel MP303	B	No	Surface Af (CaAa)	40.50 - 30.50	1	1	0.000 0.000	4.0625	11.2600	0.00
Aero Channel MP303	C	No	Surface Af (CaAa)	40.50 - 30.50	1	1	0.000 0.000	4.0625	11.2600	0.00
MOD 2013										
Aero Channel MP305	A	No	Surface Af (CaAa)	21.00 - 6.00	1	1	0.000 0.000	5.3125	14.8400	0.00
Aero Channel MP305	B	No	Surface Af (CaAa)	21.00 - 6.00	1	1	0.000 0.000	5.3125	14.8400	0.00
Aero Channel MP305	C	No	Surface Af (CaAa)	21.00 - 6.00	1	1	0.000 0.000	5.3125	14.8400	0.00
MOD 2017										
CCI-SFP-045100	A	No	Surface Af (CaAa)	26.50 - 4.50	1	1	0.000 0.000	4.5000	11.0000	0.00
CCI-SFP-045100	B	No	Surface Af (CaAa)	26.50 - 4.50	1	1	0.000 0.000	4.5000	11.0000	0.00
CCI-SFP-045100	C	No	Surface Af (CaAa)	26.50 - 4.50	1	1	0.000 0.000	4.5000	11.0000	0.00
CCI-SFP-045100	C	No	Surface Af (CaAa)	26.50 - 4.50	1	1	0.000 0.000	4.5000	11.0000	0.00
****										

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
**107' **									
HB114-1-08U4-M5J(1-1/4)	C	No	No	Inside Pole	107.00 - 0.00	3	No Ice 1/2" Ice	0.00 0.00	1.08 1.08

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
							1" Ice	0.00	1.08
							2" Ice	0.00	1.08
HB058-M12-XXXF(5/8)	C	No	No	Inside Pole	107.00 - 0.00	1	No Ice	0.00	0.24
							1/2" Ice	0.00	0.24
							1" Ice	0.00	0.24
							2" Ice	0.00	0.24
** 89' **									
LDF7-50A(1-5/8)	C	No	No	Inside Pole	89.00 - 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
2" innerduct conduit	C	No	No	Inside Pole	89.00 - 0.00	1	No Ice	0.00	0.20
							1/2" Ice	0.00	0.20
							1" Ice	0.00	0.20
							2" Ice	0.00	0.20
WR-VG86ST-BRD(3/4)	C	No	No	Inside Pole	89.00 - 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
FB-L98B-034-XXX(3/8)	C	No	No	Inside Pole	89.00 - 0.00	1	No Ice	0.00	0.06
							1/2" Ice	0.00	0.06
							1" Ice	0.00	0.06
							2" Ice	0.00	0.06
****									

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	110.00-105.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.188	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.01
L2	105.00-100.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.188	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.02
L3	100.00-95.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.188	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.02
L4	95.00-90.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.188	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.02
L5	90.00-85.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.188	0.000	0.00
		C	0.000	0.000	3.176	0.000	0.07
L6	85.00-80.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.188	0.000	0.00
		C	0.000	0.000	3.970	0.000	0.08
L7	80.00-75.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.188	0.000	0.00
		C	0.000	0.000	3.970	0.000	0.08
L8	75.00-70.00	A	0.000	0.000	3.326	0.000	0.04
		B	0.000	0.000	0.188	0.000	0.00
		C	0.000	0.000	3.970	0.000	0.08
L9	70.00-65.00	A	0.000	0.000	4.158	0.000	0.05
		B	0.000	0.000	0.188	0.000	0.00
		C	0.000	0.000	3.970	0.000	0.08
L10	65.00-60.00	A	0.000	0.000	4.158	0.000	0.05
		B	0.000	0.000	0.188	0.000	0.00
		C	0.000	0.000	3.970	0.000	0.08
L11	60.00-55.00	A	0.000	0.000	4.158	0.000	0.05
		B	0.000	0.000	0.188	0.000	0.00
		C	0.000	0.000	3.970	0.000	0.08
L12	55.00-50.00	A	0.000	0.000	4.158	0.000	0.05
		B	0.000	0.000	0.188	0.000	0.00
		C	0.000	0.000	3.970	0.000	0.08

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L13	50.00-45.00	A	0.000	0.000	4.158	0.000	0.05
		B	0.000	0.000	0.188	0.000	0.00
		C	0.000	0.000	3.970	0.000	0.08
L14	45.00-40.00	A	0.000	0.000	4.497	0.000	0.05
		B	0.000	0.000	0.526	0.000	0.00
		C	0.000	0.000	4.309	0.000	0.08
L15	40.00-39.33	A	0.000	0.000	1.011	0.000	0.01
		B	0.000	0.000	0.479	0.000	0.00
		C	0.000	0.000	0.986	0.000	0.01
L16	39.33-39.08	A	0.000	0.000	0.377	0.000	0.00
		B	0.000	0.000	0.179	0.000	0.00
		C	0.000	0.000	0.368	0.000	0.00
L17	39.08-34.08	A	0.000	0.000	7.543	0.000	0.05
		B	0.000	0.000	3.573	0.000	0.00
		C	0.000	0.000	7.355	0.000	0.08
L18	34.08-30.00	A	0.000	0.000	5.817	0.000	0.04
		B	0.000	0.000	2.577	0.000	0.00
		C	0.000	0.000	5.663	0.000	0.07
L19	30.00-29.75	A	0.000	0.000	0.208	0.000	0.00
		B	0.000	0.000	0.009	0.000	0.00
		C	0.000	0.000	0.199	0.000	0.00
L20	29.75-25.00	A	0.000	0.000	5.075	0.000	0.05
		B	0.000	0.000	1.303	0.000	0.00
		C	0.000	0.000	6.021	0.000	0.08
L21	25.00-24.75	A	0.000	0.000	0.395	0.000	0.00
		B	0.000	0.000	0.197	0.000	0.00
		C	0.000	0.000	0.574	0.000	0.00
L22	24.75-19.75	A	0.000	0.000	9.015	0.000	0.05
		B	0.000	0.000	5.044	0.000	0.00
		C	0.000	0.000	12.577	0.000	0.08
L23	19.75-18.58	A	0.000	0.000	2.886	0.000	0.01
		B	0.000	0.000	1.957	0.000	0.00
		C	0.000	0.000	3.720	0.000	0.02
L24	18.58-18.33	A	0.000	0.000	0.617	0.000	0.00
		B	0.000	0.000	0.418	0.000	0.00
		C	0.000	0.000	0.795	0.000	0.00
L25	18.33-13.33	A	0.000	0.000	12.335	0.000	0.05
		B	0.000	0.000	8.365	0.000	0.00
		C	0.000	0.000	15.897	0.000	0.08
L26	13.33-8.42	A	0.000	0.000	13.832	0.000	0.05
		B	0.000	0.000	9.933	0.000	0.00
		C	0.000	0.000	19.048	0.000	0.08
L27	8.42-8.07	A	0.000	0.000	1.153	0.000	0.00
		B	0.000	0.000	0.875	0.000	0.00
		C	0.000	0.000	1.691	0.000	0.01
L28	8.07-7.83	A	0.000	0.000	0.790	0.000	0.00
		B	0.000	0.000	0.593	0.000	0.00
		C	0.000	0.000	1.160	0.000	0.00
L29	7.83-6.00	A	0.000	0.000	6.027	0.000	0.02
		B	0.000	0.000	4.505	0.000	0.00
		C	0.000	0.000	8.843	0.000	0.03
L30	6.00-5.75	A	0.000	0.000	0.602	0.000	0.00
		B	0.000	0.000	0.394	0.000	0.00
		C	0.000	0.000	0.987	0.000	0.00
L31	5.75-2.00	A	0.000	0.000	7.155	0.000	0.04
		B	0.000	0.000	4.036	0.000	0.00
		C	0.000	0.000	11.050	0.000	0.06
L32	2.00-1.75	A	0.000	0.000	0.414	0.000	0.00
		B	0.000	0.000	0.207	0.000	0.00
		C	0.000	0.000	0.612	0.000	0.00
L33	1.75-0.00	A	0.000	0.000	2.488	0.000	0.02
		B	0.000	0.000	1.033	0.000	0.00
		C	0.000	0.000	3.455	0.000	0.03

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	110.00-105.00	A	1.913	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	2.101	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.01
L2	105.00-100.00	A	1.904	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	2.092	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.02
L3	100.00-95.00	A	1.895	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	2.082	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.02
L4	95.00-90.00	A	1.885	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	2.072	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.02
L5	90.00-85.00	A	1.874	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	2.062	0.000	0.03
		C		0.000	0.000	10.517	0.000	0.20
L6	85.00-80.00	A	1.863	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	2.051	0.000	0.03
		C		0.000	0.000	13.097	0.000	0.24
L7	80.00-75.00	A	1.852	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	2.039	0.000	0.03
		C		0.000	0.000	13.044	0.000	0.24
L8	75.00-70.00	A	1.839	0.000	0.000	9.142	0.000	0.16
		B		0.000	0.000	2.027	0.000	0.03
		C		0.000	0.000	12.989	0.000	0.24
L9	70.00-65.00	A	1.826	0.000	0.000	11.381	0.000	0.20
		B		0.000	0.000	2.014	0.000	0.03
		C		0.000	0.000	12.930	0.000	0.24
L10	65.00-60.00	A	1.812	0.000	0.000	11.332	0.000	0.20
		B		0.000	0.000	2.000	0.000	0.03
		C		0.000	0.000	12.867	0.000	0.24
L11	60.00-55.00	A	1.797	0.000	0.000	11.280	0.000	0.19
		B		0.000	0.000	1.985	0.000	0.02
		C		0.000	0.000	12.799	0.000	0.23
L12	55.00-50.00	A	1.781	0.000	0.000	11.223	0.000	0.19
		B		0.000	0.000	1.968	0.000	0.02
		C		0.000	0.000	12.726	0.000	0.23
L13	50.00-45.00	A	1.763	0.000	0.000	11.161	0.000	0.19
		B		0.000	0.000	1.951	0.000	0.02
		C		0.000	0.000	12.646	0.000	0.23
L14	45.00-40.00	A	1.744	0.000	0.000	11.538	0.000	0.19
		B		0.000	0.000	2.376	0.000	0.03
		C		0.000	0.000	13.004	0.000	0.23
L15	40.00-39.33	A	1.732	0.000	0.000	2.077	0.000	0.03
		B		0.000	0.000	0.853	0.000	0.01
		C		0.000	0.000	2.271	0.000	0.04
L16	39.33-39.08	A	1.730	0.000	0.000	0.774	0.000	0.01
		B		0.000	0.000	0.318	0.000	0.00
		C		0.000	0.000	0.847	0.000	0.01
L17	39.08-34.08	A	1.718	0.000	0.000	15.441	0.000	0.24
		B		0.000	0.000	6.345	0.000	0.08
		C		0.000	0.000	16.881	0.000	0.28
L18	34.08-30.00	A	1.695	0.000	0.000	12.083	0.000	0.19
		B		0.000	0.000	4.707	0.000	0.06
		C		0.000	0.000	13.240	0.000	0.22
L19	30.00-29.75	A	1.683	0.000	0.000	0.544	0.000	0.01
		B		0.000	0.000	0.094	0.000	0.00
		C		0.000	0.000	0.614	0.000	0.01
L20	29.75-25.00	A	1.669	0.000	0.000	11.914	0.000	0.19
		B		0.000	0.000	3.389	0.000	0.04
		C		0.000	0.000	14.861	0.000	0.24
L21	25.00-24.75	A	1.653	0.000	0.000	0.809	0.000	0.01
		B		0.000	0.000	0.362	0.000	0.00
		C		0.000	0.000	1.148	0.000	0.02
L22	24.75-19.75	A	1.634	0.000	0.000	17.539	0.000	0.25
		B		0.000	0.000	8.651	0.000	0.09
		C		0.000	0.000	24.280	0.000	0.34

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L23	19.75-18.58	A	1.610	0.000	0.000	5.090	0.000	0.07
		B		0.000	0.000	3.025	0.000	0.03
		C		0.000	0.000	6.656	0.000	0.09
L24	18.58-18.33	A	1.604	0.000	0.000	1.086	0.000	0.01
		B		0.000	0.000	0.646	0.000	0.01
		C		0.000	0.000	1.420	0.000	0.02
L25	18.33-13.33	A	1.580	0.000	0.000	21.601	0.000	0.29
		B		0.000	0.000	12.849	0.000	0.14
		C		0.000	0.000	28.232	0.000	0.38
L26	13.33-8.42	A	1.521	0.000	0.000	22.988	0.000	0.30
		B		0.000	0.000	14.537	0.000	0.15
		C		0.000	0.000	31.449	0.000	0.41
L27	8.42-8.07	A	1.480	0.000	0.000	1.823	0.000	0.02
		B		0.000	0.000	1.227	0.000	0.01
		C		0.000	0.000	2.618	0.000	0.03
L28	8.07-7.83	A	1.474	0.000	0.000	1.248	0.000	0.02
		B		0.000	0.000	0.784	0.000	0.01
		C		0.000	0.000	1.793	0.000	0.02
L29	7.83-6.00	A	1.454	0.000	0.000	9.477	0.000	0.12
		B		0.000	0.000	5.788	0.000	0.06
		C		0.000	0.000	13.614	0.000	0.17
L30	6.00-5.75	A	1.431	0.000	0.000	1.004	0.000	0.01
		B		0.000	0.000	0.505	0.000	0.01
		C		0.000	0.000	1.567	0.000	0.02
L31	5.75-2.00	A	1.372	0.000	0.000	12.285	0.000	0.16
		B		0.000	0.000	4.940	0.000	0.05
		C		0.000	0.000	18.046	0.000	0.24
L32	2.00-1.75	A	1.276	0.000	0.000	0.714	0.000	0.01
		B		0.000	0.000	0.241	0.000	0.00
		C		0.000	0.000	1.006	0.000	0.01
L33	1.75-0.00	A	1.182	0.000	0.000	4.390	0.000	0.06
		B		0.000	0.000	1.195	0.000	0.01
		C		0.000	0.000	5.901	0.000	0.08

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	110.00-105.00	0.3223	-0.1803	1.3953	-0.7804
L2	105.00-100.00	0.3223	-0.1803	1.3908	-0.7779
L3	100.00-95.00	0.3223	-0.1803	1.3861	-0.7753
L4	95.00-90.00	0.3223	-0.1803	1.3812	-0.7726
L5	90.00-85.00	-1.6318	3.8286	-0.6643	3.5807
L6	85.00-80.00	-1.9294	4.4391	-0.8979	4.0724
L7	80.00-75.00	-1.9294	4.4391	-0.8994	4.0688
L8	75.00-70.00	-4.1868	3.7736	-2.9677	3.4151
L9	70.00-65.00	-4.4256	3.5633	-3.3101	3.3058
L10	65.00-60.00	-4.4256	3.5633	-3.3107	3.3038
L11	60.00-55.00	-5.1151	4.1178	-3.8518	3.8558
L12	55.00-50.00	-5.1151	4.1178	-3.8517	3.8521
L13	50.00-45.00	-5.1151	4.1178	-3.8515	3.8479
L14	45.00-40.00	-4.8293	3.8877	-3.7583	3.7506
L15	40.00-39.33	-3.2136	2.5870	-3.0863	3.0778
L16	39.33-39.08	-3.2136	2.5870	-3.0861	3.0772
L17	39.08-34.08	-3.2136	2.5870	-3.0848	3.0737
L18	34.08-30.00	-3.3670	2.7105	-3.1596	3.1439
L19	30.00-29.75	-5.1151	4.1178	-3.8507	3.8288
L20	29.75-25.00	-4.0088	4.0653	-3.4093	3.8309
L21	25.00-24.75	-2.2638	3.3211	-2.7109	3.8102
L22	24.75-19.75	-2.0750	3.0442	-2.5527	3.5869
L23	19.75-18.58	-1.6599	2.4351	-2.1720	3.0509
L24	18.58-18.33	-1.6599	2.4351	-2.1711	3.0493
L25	18.33-13.33	-1.6599	2.4351	-2.1674	3.0432
L26	13.33-8.42	-1.4488	2.5892	-1.9597	3.0878
L27	8.42-8.07	-1.2352	2.7452	-1.7344	3.1448
L28	8.07-7.83	-1.2623	2.7642	-1.8942	3.2570

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L29	7.83-6.00	-1.2735	2.7720	-1.9560	3.2987
L30	6.00-5.75	-1.5900	3.4609	-2.3366	3.9456
L31	5.75-2.00	-1.9693	3.4414	-2.7780	3.9955
L32	2.00-1.75	-2.2360	3.4276	-3.0496	4.0074
L33	1.75-0.00	-2.5663	3.3952	-3.3271	4.0073

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

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	1	Safety Line 3/8	105.00 - 110.00	1.0000	1.0000
L2	1	Safety Line 3/8	100.00 - 105.00	1.0000	1.0000
L3	1	Safety Line 3/8	95.00 - 100.00	1.0000	1.0000
L4	1	Safety Line 3/8	90.00 - 95.00	1.0000	1.0000
L5	1	Safety Line 3/8	85.00 - 90.00	1.0000	1.0000
L5	7	LDF7-50A(1-5/8)	85.00 - 89.00	1.0000	1.0000
L5	11	2" innerduct conduit	85.00 - 89.00	1.0000	1.0000
L5	12	FB-L98B-034-XXX(3/8)	85.00 - 89.00	1.0000	1.0000
L5	13	WR-VG86ST-BRD(3/4)	85.00 - 89.00	1.0000	1.0000
L6	1	Safety Line 3/8	80.00 - 85.00	1.0000	1.0000
L6	7	LDF7-50A(1-5/8)	80.00 - 85.00	1.0000	1.0000
L6	11	2" innerduct conduit	80.00 - 85.00	1.0000	1.0000
L6	12	FB-L98B-034-XXX(3/8)	80.00 - 85.00	1.0000	1.0000
L6	13	WR-VG86ST-BRD(3/4)	80.00 - 85.00	1.0000	1.0000
L7	1	Safety Line 3/8	75.00 - 80.00	1.0000	1.0000
L7	7	LDF7-50A(1-5/8)	75.00 - 80.00	1.0000	1.0000
L7	11	2" innerduct conduit	75.00 - 80.00	1.0000	1.0000
L7	12	FB-L98B-034-XXX(3/8)	75.00 - 80.00	1.0000	1.0000
L7	13	WR-VG86ST-BRD(3/4)	75.00 - 80.00	1.0000	1.0000
L8	1	Safety Line 3/8	70.00 - 75.00	1.0000	1.0000
L8	7	LDF7-50A(1-5/8)	70.00 - 75.00	1.0000	1.0000
L8	11	2" innerduct conduit	70.00 - 75.00	1.0000	1.0000
L8	12	FB-L98B-034-XXX(3/8)	70.00 - 75.00	1.0000	1.0000
L8	13	WR-VG86ST-BRD(3/4)	70.00 - 75.00	1.0000	1.0000
L8	15	810921-001(7/8)	70.00 - 74.00	1.0000	1.0000
L8	16	(1) HCS 6X12 4AWG(1-5/8) + (1) MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	70.00 - 74.00	1.0000	1.0000
L8	17	HCS 6X12 4AWG(1-5/8)	70.00 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			74.00		
L9	1	Safety Line 3/8	65.00 - 70.00	1.0000	1.0000
L9	7	LDF7-50A(1-5/8)	65.00 - 70.00	1.0000	1.0000
L9	11	2" innerduct conduit	65.00 - 70.00	1.0000	1.0000
L9	12	FB-L98B-034-XXX(3/8)	65.00 - 70.00	1.0000	1.0000
L9	13	WR-VG86ST-BRD(3/4)	65.00 - 70.00	1.0000	1.0000
L9	15	810921-001(7/8)	65.00 - 70.00	1.0000	1.0000
L9	16	(1) HCS 6X12 4AWG(1-5/8) + (1) MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	65.00 - 70.00	1.0000	1.0000
L9	17	HCS 6X12 4AWG(1-5/8)	65.00 - 70.00	1.0000	1.0000
L10	1	Safety Line 3/8	60.00 - 65.00	1.0000	1.0000
L10	7	LDF7-50A(1-5/8)	60.00 - 65.00	1.0000	1.0000
L10	11	2" innerduct conduit	60.00 - 65.00	1.0000	1.0000
L10	12	FB-L98B-034-XXX(3/8)	60.00 - 65.00	1.0000	1.0000
L10	13	WR-VG86ST-BRD(3/4)	60.00 - 65.00	1.0000	1.0000
L10	15	810921-001(7/8)	60.00 - 65.00	1.0000	1.0000
L10	16	(1) HCS 6X12 4AWG(1-5/8) + (1) MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	60.00 - 65.00	1.0000	1.0000
L10	17	HCS 6X12 4AWG(1-5/8)	60.00 - 65.00	1.0000	1.0000
L11	1	Safety Line 3/8	55.00 - 60.00	1.0000	1.0000
L11	7	LDF7-50A(1-5/8)	55.00 - 60.00	1.0000	1.0000
L11	11	2" innerduct conduit	55.00 - 60.00	1.0000	1.0000
L11	12	FB-L98B-034-XXX(3/8)	55.00 - 60.00	1.0000	1.0000
L11	13	WR-VG86ST-BRD(3/4)	55.00 - 60.00	1.0000	1.0000
L11	15	810921-001(7/8)	55.00 - 60.00	1.0000	1.0000
L11	16	(1) HCS 6X12 4AWG(1-5/8) + (1) MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	55.00 - 60.00	1.0000	1.0000
L11	17	HCS 6X12 4AWG(1-5/8)	55.00 - 60.00	1.0000	1.0000
L12	1	Safety Line 3/8	50.00 - 55.00	1.0000	1.0000
L12	7	LDF7-50A(1-5/8)	50.00 - 55.00	1.0000	1.0000
L12	11	2" innerduct conduit	50.00 - 55.00	1.0000	1.0000
L12	12	FB-L98B-034-XXX(3/8)	50.00 - 55.00	1.0000	1.0000
L12	13	WR-VG86ST-BRD(3/4)	50.00 - 55.00	1.0000	1.0000
L12	15	810921-001(7/8)	50.00 - 55.00	1.0000	1.0000
L12	16	(1) HCS 6X12 4AWG(1-5/8) + (1) MLE HYBRID	50.00 - 55.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
		9POWER/18FIBER RL 2(1-5/8)			
L12	17	HCS 6X12 4AWG(1-5/8)	50.00 - 55.00	1.0000	1.0000
L13	1	Safety Line 3/8	45.00 - 50.00	1.0000	1.0000
L13	7	LDF7-50A(1-5/8)	45.00 - 50.00	1.0000	1.0000
L13	11	2" innerduct conduit	45.00 - 50.00	1.0000	1.0000
L13	12	FB-L98B-034-XXX(3/8)	45.00 - 50.00	1.0000	1.0000
L13	13	WR-VG86ST-BRD(3/4)	45.00 - 50.00	1.0000	1.0000
L13	15	810921-001(7/8)	45.00 - 50.00	1.0000	1.0000
L13	16	(1) HCS 6X12 4AWG(1-5/8) + (1) MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	45.00 - 50.00	1.0000	1.0000
L13	17	HCS 6X12 4AWG(1-5/8)	45.00 - 50.00	1.0000	1.0000
L14	1	Safety Line 3/8	40.00 - 45.00	1.0000	1.0000
L14	7	LDF7-50A(1-5/8)	40.00 - 45.00	1.0000	1.0000
L14	11	2" innerduct conduit	40.00 - 45.00	1.0000	1.0000
L14	12	FB-L98B-034-XXX(3/8)	40.00 - 45.00	1.0000	1.0000
L14	13	WR-VG86ST-BRD(3/4)	40.00 - 45.00	1.0000	1.0000
L14	15	810921-001(7/8)	40.00 - 45.00	1.0000	1.0000
L14	16	(1) HCS 6X12 4AWG(1-5/8) + (1) MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	40.00 - 45.00	1.0000	1.0000
L14	17	HCS 6X12 4AWG(1-5/8)	40.00 - 45.00	1.0000	1.0000
L14	24	Aero Channel MP303	40.00 - 40.50	1.0000	1.0000
L14	25	Aero Channel MP303	40.00 - 40.50	1.0000	1.0000
L14	26	Aero Channel MP303	40.00 - 40.50	1.0000	1.0000
L15	1	Safety Line 3/8	39.33 - 40.00	1.0000	1.0000
L15	7	LDF7-50A(1-5/8)	39.33 - 40.00	1.0000	1.0000
L15	11	2" innerduct conduit	39.33 - 40.00	1.0000	1.0000
L15	12	FB-L98B-034-XXX(3/8)	39.33 - 40.00	1.0000	1.0000
L15	13	WR-VG86ST-BRD(3/4)	39.33 - 40.00	1.0000	1.0000
L15	15	810921-001(7/8)	39.33 - 40.00	1.0000	1.0000
L15	16	(1) HCS 6X12 4AWG(1-5/8) + (1) MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	39.33 - 40.00	1.0000	1.0000
L15	17	HCS 6X12 4AWG(1-5/8)	39.33 - 40.00	1.0000	1.0000
L15	24	Aero Channel MP303	39.33 - 40.00	1.0000	1.0000
L15	25	Aero Channel MP303	39.33 - 40.00	1.0000	1.0000
L15	26	Aero Channel MP303	39.33 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			40.00		
L16	1	Safety Line 3/8	39.08 - 39.33	1.0000	1.0000
L16	7	LDF7-50A(1-5/8)	39.08 - 39.33	1.0000	1.0000
L16	11	2" innerduct conduit	39.08 - 39.33	1.0000	1.0000
L16	12	FB-L98B-034-XXX(3/8)	39.08 - 39.33	1.0000	1.0000
L16	13	WR-VG86ST-BRD(3/4)	39.08 - 39.33	1.0000	1.0000
L16	15	810921-001(7/8)	39.08 - 39.33	1.0000	1.0000
L16	16	(1) HCS 6X12 4AWG(1-5/8) + (1) MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	39.08 - 39.33	1.0000	1.0000
L16	17	HCS 6X12 4AWG(1-5/8)	39.08 - 39.33	1.0000	1.0000
L16	24	Aero Channel MP303	39.08 - 39.33	1.0000	1.0000
L16	25	Aero Channel MP303	39.08 - 39.33	1.0000	1.0000
L16	26	Aero Channel MP303	39.08 - 39.33	1.0000	1.0000
L17	1	Safety Line 3/8	34.08 - 39.08	1.0000	1.0000
L17	7	LDF7-50A(1-5/8)	34.08 - 39.08	1.0000	1.0000
L17	11	2" innerduct conduit	34.08 - 39.08	1.0000	1.0000
L17	12	FB-L98B-034-XXX(3/8)	34.08 - 39.08	1.0000	1.0000
L17	13	WR-VG86ST-BRD(3/4)	34.08 - 39.08	1.0000	1.0000
L17	15	810921-001(7/8)	34.08 - 39.08	1.0000	1.0000
L17	16	(1) HCS 6X12 4AWG(1-5/8) + (1) MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	34.08 - 39.08	1.0000	1.0000
L17	17	HCS 6X12 4AWG(1-5/8)	34.08 - 39.08	1.0000	1.0000
L17	24	Aero Channel MP303	34.08 - 39.08	1.0000	1.0000
L17	25	Aero Channel MP303	34.08 - 39.08	1.0000	1.0000
L17	26	Aero Channel MP303	34.08 - 39.08	1.0000	1.0000
L18	1	Safety Line 3/8	30.00 - 34.08	1.0000	1.0000
L18	7	LDF7-50A(1-5/8)	30.00 - 34.08	1.0000	1.0000
L18	11	2" innerduct conduit	30.00 - 34.08	1.0000	1.0000
L18	12	FB-L98B-034-XXX(3/8)	30.00 - 34.08	1.0000	1.0000
L18	13	WR-VG86ST-BRD(3/4)	30.00 - 34.08	1.0000	1.0000
L18	15	810921-001(7/8)	30.00 - 34.08	1.0000	1.0000
L18	16	(1) HCS 6X12 4AWG(1-5/8) + (1) MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	30.00 - 34.08	1.0000	1.0000
L18	17	HCS 6X12 4AWG(1-5/8)	30.00 - 34.08	1.0000	1.0000
L18	24	Aero Channel MP303	30.50 - 34.08	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L18	25	Aero Channel MP303	30.50 - 34.08	1.0000	1.0000
L18	26	Aero Channel MP303	30.50 - 34.08	1.0000	1.0000
L19	1	Safety Line 3/8	29.75 - 30.00	1.0000	1.0000
L19	7	LDF7-50A(1-5/8)	29.75 - 30.00	1.0000	1.0000
L19	11	2" innerduct conduit	29.75 - 30.00	1.0000	1.0000
L19	12	FB-L98B-034-XXX(3/8)	29.75 - 30.00	1.0000	1.0000
L19	13	WR-VG86ST-BRD(3/4)	29.75 - 30.00	1.0000	1.0000
L19	15	810921-001(7/8)	29.75 - 30.00	1.0000	1.0000
L19	16	(1) HCS 6X12 4AWG(1-5/8) + (1) MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	29.75 - 30.00	1.0000	1.0000
L19	17	HCS 6X12 4AWG(1-5/8)	29.75 - 30.00	1.0000	1.0000
L20	1	Safety Line 3/8	25.00 - 29.75	1.0000	1.0000
L20	7	LDF7-50A(1-5/8)	25.00 - 29.75	1.0000	1.0000
L20	11	2" innerduct conduit	25.00 - 29.75	1.0000	1.0000
L20	12	FB-L98B-034-XXX(3/8)	25.00 - 29.75	1.0000	1.0000
L20	13	WR-VG86ST-BRD(3/4)	25.00 - 29.75	1.0000	1.0000
L20	15	810921-001(7/8)	25.00 - 29.75	1.0000	1.0000
L20	16	(1) HCS 6X12 4AWG(1-5/8) + (1) MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	25.00 - 29.75	1.0000	1.0000
L20	17	HCS 6X12 4AWG(1-5/8)	25.00 - 29.75	1.0000	1.0000
L20	32	CCI-SFP-045100	25.00 - 26.50	1.0000	1.0000
L20	33	CCI-SFP-045100	25.00 - 26.50	1.0000	1.0000
L20	34	CCI-SFP-045100	25.00 - 26.50	1.0000	1.0000
L20	35	CCI-SFP-045100	25.00 - 26.50	1.0000	1.0000
L21	1	Safety Line 3/8	24.75 - 25.00	1.0000	1.0000
L21	7	LDF7-50A(1-5/8)	24.75 - 25.00	1.0000	1.0000
L21	11	2" innerduct conduit	24.75 - 25.00	1.0000	1.0000
L21	12	FB-L98B-034-XXX(3/8)	24.75 - 25.00	1.0000	1.0000
L21	13	WR-VG86ST-BRD(3/4)	24.75 - 25.00	1.0000	1.0000
L21	15	810921-001(7/8)	24.75 - 25.00	1.0000	1.0000
L21	16	(1) HCS 6X12 4AWG(1-5/8) + (1) MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	24.75 - 25.00	1.0000	1.0000
L21	17	HCS 6X12 4AWG(1-5/8)	24.75 - 25.00	1.0000	1.0000
L21	32	CCI-SFP-045100	24.75 - 25.00	1.0000	1.0000
L21	33	CCI-SFP-045100	24.75 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L21	34	CCI-SFP-045100	25.00 24.75 - 25.00	1.0000	1.0000
L21	35	CCI-SFP-045100	24.75 - 25.00	1.0000	1.0000
L22	1	Safety Line 3/8	19.75 - 24.75	1.0000	1.0000
L22	7	LDF7-50A(1-5/8)	19.75 - 24.75	1.0000	1.0000
L22	11	2" innerduct conduit	19.75 - 24.75	1.0000	1.0000
L22	12	FB-L98B-034-XXX(3/8)	19.75 - 24.75	1.0000	1.0000
L22	13	WR-VG86ST-BRD(3/4)	19.75 - 24.75	1.0000	1.0000
L22	15	810921-001(7/8)	19.75 - 24.75	1.0000	1.0000
L22	16	(1) HCS 6X12 4AWG(1-5/8) + (1) MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	19.75 - 24.75	1.0000	1.0000
L22	17	HCS 6X12 4AWG(1-5/8)	19.75 - 24.75	1.0000	1.0000
L22	28	Aero Channel MP305	19.75 - 21.00	1.0000	1.0000
L22	29	Aero Channel MP305	19.75 - 21.00	1.0000	1.0000
L22	30	Aero Channel MP305	19.75 - 21.00	1.0000	1.0000
L22	32	CCI-SFP-045100	19.75 - 24.75	1.0000	1.0000
L22	33	CCI-SFP-045100	19.75 - 24.75	1.0000	1.0000
L22	34	CCI-SFP-045100	19.75 - 24.75	1.0000	1.0000
L22	35	CCI-SFP-045100	19.75 - 24.75	1.0000	1.0000
L23	1	Safety Line 3/8	18.58 - 19.75	1.0000	1.0000
L23	7	LDF7-50A(1-5/8)	18.58 - 19.75	1.0000	1.0000
L23	11	2" innerduct conduit	18.58 - 19.75	1.0000	1.0000
L23	12	FB-L98B-034-XXX(3/8)	18.58 - 19.75	1.0000	1.0000
L23	13	WR-VG86ST-BRD(3/4)	18.58 - 19.75	1.0000	1.0000
L23	15	810921-001(7/8)	18.58 - 19.75	1.0000	1.0000
L23	16	(1) HCS 6X12 4AWG(1-5/8) + (1) MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	18.58 - 19.75	1.0000	1.0000
L23	17	HCS 6X12 4AWG(1-5/8)	18.58 - 19.75	1.0000	1.0000
L23	28	Aero Channel MP305	18.58 - 19.75	1.0000	1.0000
L23	29	Aero Channel MP305	18.58 - 19.75	1.0000	1.0000
L23	30	Aero Channel MP305	18.58 - 19.75	1.0000	1.0000
L23	32	CCI-SFP-045100	18.58 - 19.75	1.0000	1.0000
L23	33	CCI-SFP-045100	18.58 - 19.75	1.0000	1.0000
L23	34	CCI-SFP-045100	18.58 - 19.75	1.0000	1.0000
L23	35	CCI-SFP-045100	18.58 - 19.75	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L24	1	Safety Line 3/8	18.33 - 18.58	1.0000	1.0000
L24	7	LDF7-50A(1-5/8)	18.33 - 18.58	1.0000	1.0000
L24	11	2" innerduct conduit	18.33 - 18.58	1.0000	1.0000
L24	12	FB-L98B-034-XXX(3/8)	18.33 - 18.58	1.0000	1.0000
L24	13	WR-VG86ST-BRD(3/4)	18.33 - 18.58	1.0000	1.0000
L24	15	810921-001(7/8)	18.33 - 18.58	1.0000	1.0000
L24	16	(1) HCS 6X12 4AWG(1-5/8) + (1) MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	18.33 - 18.58	1.0000	1.0000
L24	17	HCS 6X12 4AWG(1-5/8)	18.33 - 18.58	1.0000	1.0000
L24	28	Aero Channel MP305	18.33 - 18.58	1.0000	1.0000
L24	29	Aero Channel MP305	18.33 - 18.58	1.0000	1.0000
L24	30	Aero Channel MP305	18.33 - 18.58	1.0000	1.0000
L24	32	CCI-SFP-045100	18.33 - 18.58	1.0000	1.0000
L24	33	CCI-SFP-045100	18.33 - 18.58	1.0000	1.0000
L24	34	CCI-SFP-045100	18.33 - 18.58	1.0000	1.0000
L24	35	CCI-SFP-045100	18.33 - 18.58	1.0000	1.0000
L25	1	Safety Line 3/8	13.33 - 18.33	1.0000	1.0000
L25	7	LDF7-50A(1-5/8)	13.33 - 18.33	1.0000	1.0000
L25	11	2" innerduct conduit	13.33 - 18.33	1.0000	1.0000
L25	12	FB-L98B-034-XXX(3/8)	13.33 - 18.33	1.0000	1.0000
L25	13	WR-VG86ST-BRD(3/4)	13.33 - 18.33	1.0000	1.0000
L25	15	810921-001(7/8)	13.33 - 18.33	1.0000	1.0000
L25	16	(1) HCS 6X12 4AWG(1-5/8) + (1) MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	13.33 - 18.33	1.0000	1.0000
L25	17	HCS 6X12 4AWG(1-5/8)	13.33 - 18.33	1.0000	1.0000
L25	28	Aero Channel MP305	13.33 - 18.33	1.0000	1.0000
L25	29	Aero Channel MP305	13.33 - 18.33	1.0000	1.0000
L25	30	Aero Channel MP305	13.33 - 18.33	1.0000	1.0000
L25	32	CCI-SFP-045100	13.33 - 18.33	1.0000	1.0000
L25	33	CCI-SFP-045100	13.33 - 18.33	1.0000	1.0000
L25	34	CCI-SFP-045100	13.33 - 18.33	1.0000	1.0000
L25	35	CCI-SFP-045100	13.33 - 18.33	1.0000	1.0000
L26	1	Safety Line 3/8	8.42 - 13.33	1.0000	1.0000
L26	7	LDF7-50A(1-5/8)	8.42 - 13.33	1.0000	1.0000
L26	11	2" innerduct conduit	8.42 - 13.33	1.0000	1.0000
L26	12	FB-L98B-034-XXX(3/8)	8.42 - 13.33	1.0000	1.0000
L26	13	WR-VG86ST-BRD(3/4)	8.42 - 13.33	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L26	15	810921-001(7/8)	8.42 - 13.33	1.0000	1.0000
L26	16	(1) HCS 6X12 4AWG(1-5/8) + (1) MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	8.42 - 13.33	1.0000	1.0000
L26	17	HCS 6X12 4AWG(1-5/8)	8.42 - 13.33	1.0000	1.0000
L26	19	Aero Channel MP305	8.42 - 10.50	1.0000	1.0000
L26	20	Aero Channel MP305	8.42 - 10.50	1.0000	1.0000
L26	21	Aero Channel MP305	8.42 - 10.50	1.0000	1.0000
L26	22	Aero Channel MP305	8.42 - 10.50	1.0000	1.0000
L26	28	Aero Channel MP305	8.42 - 13.33	1.0000	1.0000
L26	29	Aero Channel MP305	8.42 - 13.33	1.0000	1.0000
L26	30	Aero Channel MP305	8.42 - 13.33	1.0000	1.0000
L26	32	CCI-SFP-045100	8.42 - 13.33	1.0000	1.0000
L26	33	CCI-SFP-045100	8.42 - 13.33	1.0000	1.0000
L26	34	CCI-SFP-045100	8.42 - 13.33	1.0000	1.0000
L26	35	CCI-SFP-045100	8.42 - 13.33	1.0000	1.0000
L27	1	Safety Line 3/8	8.07 - 8.42	1.0000	1.0000
L27	7	LDF7-50A(1-5/8)	8.07 - 8.42	1.0000	1.0000
L27	11	2" innerduct conduit	8.07 - 8.42	1.0000	1.0000
L27	12	FB-L98B-034-XXX(3/8)	8.07 - 8.42	1.0000	1.0000
L27	13	WR-VG86ST-BRD(3/4)	8.07 - 8.42	1.0000	1.0000
L27	15	810921-001(7/8)	8.07 - 8.42	1.0000	1.0000
L27	16	(1) HCS 6X12 4AWG(1-5/8) + (1) MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	8.07 - 8.42	1.0000	1.0000
L27	17	HCS 6X12 4AWG(1-5/8)	8.07 - 8.42	1.0000	1.0000
L27	19	Aero Channel MP305	8.07 - 8.42	1.0000	1.0000
L27	20	Aero Channel MP305	8.07 - 8.42	1.0000	1.0000
L27	21	Aero Channel MP305	8.07 - 8.42	1.0000	1.0000
L27	22	Aero Channel MP305	8.07 - 8.42	1.0000	1.0000
L27	28	Aero Channel MP305	8.07 - 8.42	1.0000	1.0000
L27	29	Aero Channel MP305	8.07 - 8.42	1.0000	1.0000
L27	30	Aero Channel MP305	8.07 - 8.42	1.0000	1.0000
L27	32	CCI-SFP-045100	8.07 - 8.42	1.0000	1.0000
L27	33	CCI-SFP-045100	8.07 - 8.42	1.0000	1.0000
L27	34	CCI-SFP-045100	8.07 - 8.42	1.0000	1.0000
L27	35	CCI-SFP-045100	8.07 - 8.42	1.0000	1.0000
L28	1	Safety Line 3/8	8.00 - 8.07	1.0000	1.0000
L28	7	LDF7-50A(1-5/8)	7.83 - 8.07	1.0000	1.0000
L28	11	2" innerduct conduit	7.83 - 8.07	1.0000	1.0000
L28	12	FB-L98B-034-XXX(3/8)	7.83 - 8.07	1.0000	1.0000
L28	13	WR-VG86ST-BRD(3/4)	7.83 - 8.07	1.0000	1.0000
L28	15	810921-001(7/8)	7.83 - 8.07	1.0000	1.0000
L28	16	(1) HCS 6X12 4AWG(1-5/8) + (1) MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	7.83 - 8.07	1.0000	1.0000
L28	17	HCS 6X12 4AWG(1-5/8)	7.83 - 8.07	1.0000	1.0000
L28	19	Aero Channel MP305	7.83 - 8.07	1.0000	1.0000
L28	20	Aero Channel MP305	7.83 - 8.07	1.0000	1.0000
L28	21	Aero Channel MP305	7.83 - 8.07	1.0000	1.0000
L28	22	Aero Channel MP305	7.83 - 8.07	1.0000	1.0000
L28	28	Aero Channel MP305	7.83 - 8.07	1.0000	1.0000
L28	29	Aero Channel MP305	7.83 - 8.07	1.0000	1.0000
L28	30	Aero Channel MP305	7.83 - 8.07	1.0000	1.0000
L28	32	CCI-SFP-045100	7.83 - 8.07	1.0000	1.0000
L28	33	CCI-SFP-045100	7.83 - 8.07	1.0000	1.0000
L28	34	CCI-SFP-045100	7.83 - 8.07	1.0000	1.0000
L28	35	CCI-SFP-045100	7.83 - 8.07	1.0000	1.0000
L29	7	LDF7-50A(1-5/8)	6.00 - 7.83	1.0000	1.0000
L29	11	2" innerduct conduit	6.00 - 7.83	1.0000	1.0000
L29	12	FB-L98B-034-XXX(3/8)	6.00 - 7.83	1.0000	1.0000
L29	13	WR-VG86ST-BRD(3/4)	6.00 - 7.83	1.0000	1.0000
L29	15	810921-001(7/8)	6.00 - 7.83	1.0000	1.0000
L29	16	(1) HCS 6X12 4AWG(1-5/8) + (1) MLE HYBRID 9POWER/18FIBER RL	6.00 - 7.83	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
		2(1-5/8)			
L29	17	HCS 6X12 4AWG(1-5/8)	6.00 - 7.83	1.0000	1.0000
L29	19	Aero Channel MP305	6.00 - 7.83	1.0000	1.0000
L29	20	Aero Channel MP305	6.00 - 7.83	1.0000	1.0000
L29	21	Aero Channel MP305	6.00 - 7.83	1.0000	1.0000
L29	22	Aero Channel MP305	6.00 - 7.83	1.0000	1.0000
L29	28	Aero Channel MP305	6.00 - 7.83	1.0000	1.0000
L29	29	Aero Channel MP305	6.00 - 7.83	1.0000	1.0000
L29	30	Aero Channel MP305	6.00 - 7.83	1.0000	1.0000
L29	32	CCI-SFP-045100	6.00 - 7.83	1.0000	1.0000
L29	33	CCI-SFP-045100	6.00 - 7.83	1.0000	1.0000
L29	34	CCI-SFP-045100	6.00 - 7.83	1.0000	1.0000
L29	35	CCI-SFP-045100	6.00 - 7.83	1.0000	1.0000
L30	7	LDF7-50A(1-5/8)	5.75 - 6.00	1.0000	1.0000
L30	11	2" innerduct conduit	5.75 - 6.00	1.0000	1.0000
L30	12	FB-L98B-034-XXX(3/8)	5.75 - 6.00	1.0000	1.0000
L30	13	WR-VG86ST-BRD(3/4)	5.75 - 6.00	1.0000	1.0000
L30	15	810921-001(7/8)	5.75 - 6.00	1.0000	1.0000
L30	16	(1) HCS 6X12 4AWG(1-5/8) + (1) MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	5.75 - 6.00	1.0000	1.0000
L30	17	HCS 6X12 4AWG(1-5/8)	5.75 - 6.00	1.0000	1.0000
L30	19	Aero Channel MP305	5.75 - 6.00	1.0000	1.0000
L30	20	Aero Channel MP305	5.75 - 6.00	1.0000	1.0000
L30	21	Aero Channel MP305	5.75 - 6.00	1.0000	1.0000
L30	22	Aero Channel MP305	5.75 - 6.00	1.0000	1.0000
L30	32	CCI-SFP-045100	5.75 - 6.00	1.0000	1.0000
L30	33	CCI-SFP-045100	5.75 - 6.00	1.0000	1.0000
L30	34	CCI-SFP-045100	5.75 - 6.00	1.0000	1.0000
L30	35	CCI-SFP-045100	5.75 - 6.00	1.0000	1.0000
L31	7	LDF7-50A(1-5/8)	2.00 - 5.75	1.0000	1.0000
L31	11	2" innerduct conduit	2.00 - 5.75	1.0000	1.0000
L31	12	FB-L98B-034-XXX(3/8)	2.00 - 5.75	1.0000	1.0000
L31	13	WR-VG86ST-BRD(3/4)	2.00 - 5.75	1.0000	1.0000
L31	15	810921-001(7/8)	2.00 - 5.75	1.0000	1.0000
L31	16	(1) HCS 6X12 4AWG(1-5/8) + (1) MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	2.00 - 5.75	1.0000	1.0000
L31	17	HCS 6X12 4AWG(1-5/8)	2.00 - 5.75	1.0000	1.0000
L31	19	Aero Channel MP305	2.00 - 5.75	1.0000	1.0000
L31	20	Aero Channel MP305	2.00 - 5.75	1.0000	1.0000
L31	21	Aero Channel MP305	2.00 - 5.75	1.0000	1.0000
L31	22	Aero Channel MP305	2.00 - 5.75	1.0000	1.0000
L31	32	CCI-SFP-045100	4.50 - 5.75	1.0000	1.0000
L31	33	CCI-SFP-045100	4.50 - 5.75	1.0000	1.0000
L31	34	CCI-SFP-045100	4.50 - 5.75	1.0000	1.0000
L31	35	CCI-SFP-045100	4.50 - 5.75	1.0000	1.0000
L32	7	LDF7-50A(1-5/8)	1.75 - 2.00	1.0000	1.0000
L32	11	2" innerduct conduit	1.75 - 2.00	1.0000	1.0000
L32	12	FB-L98B-034-XXX(3/8)	1.75 - 2.00	1.0000	1.0000
L32	13	WR-VG86ST-BRD(3/4)	1.75 - 2.00	1.0000	1.0000
L32	15	810921-001(7/8)	1.75 - 2.00	1.0000	1.0000
L32	16	(1) HCS 6X12 4AWG(1-5/8) + (1) MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	1.75 - 2.00	1.0000	1.0000
L32	17	HCS 6X12 4AWG(1-5/8)	1.75 - 2.00	1.0000	1.0000
L32	19	Aero Channel MP305	1.75 - 2.00	1.0000	1.0000
L32	20	Aero Channel MP305	1.75 - 2.00	1.0000	1.0000
L32	21	Aero Channel MP305	1.75 - 2.00	1.0000	1.0000
L32	22	Aero Channel MP305	1.75 - 2.00	1.0000	1.0000
L33	7	LDF7-50A(1-5/8)	0.00 - 1.75	1.0000	1.0000
L33	11	2" innerduct conduit	0.00 - 1.75	1.0000	1.0000
L33	12	FB-L98B-034-XXX(3/8)	0.00 - 1.75	1.0000	1.0000
L33	13	WR-VG86ST-BRD(3/4)	0.00 - 1.75	1.0000	1.0000
L33	15	810921-001(7/8)	0.00 - 1.75	1.0000	1.0000
L33	16	(1) HCS 6X12 4AWG(1-	0.00 - 1.75	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
		5/8) + (1) MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)			
L33	17	HCS 6X12 4AWG(1-5/8)	0.00 - 1.75	1.0000	1.0000
L33	19	Aero Channel MP305	0.50 - 1.75	1.0000	1.0000
L33	20	Aero Channel MP305	0.50 - 1.75	1.0000	1.0000
L33	21	Aero Channel MP305	0.50 - 1.75	1.0000	1.0000
L33	22	Aero Channel MP305	0.50 - 1.75	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
T-Arm Mount [TA 702-3]	C	None		0.00	107.00	No Ice	5.64	5.64	0.34
						1/2" Ice	6.55	6.55	0.43
						1" Ice	7.46	7.46	0.52
						2" Ice	9.28	9.28	0.70
APXVTM14-C-120 w/ Mount Pipe	A	From Face	3.00 -2.50 1.00	0.00	107.00	No Ice	4.09	2.86	0.08
						1/2" Ice	4.48	3.23	0.13
						1" Ice	4.88	3.61	0.19
						2" Ice	5.71	4.40	0.33
APXVTM14-C-120 w/ Mount Pipe	B	From Face	3.00 -2.50 1.00	0.00	107.00	No Ice	4.09	2.86	0.08
						1/2" Ice	4.48	3.23	0.13
						1" Ice	4.88	3.61	0.19
						2" Ice	5.71	4.40	0.33
APXVTM14-C-120 w/ Mount Pipe	C	From Face	3.00 -2.50 1.00	0.00	107.00	No Ice	4.09	2.86	0.08
						1/2" Ice	4.48	3.23	0.13
						1" Ice	4.88	3.61	0.19
						2" Ice	5.71	4.40	0.33
APXVSPP18-C-A20 w/ Mount Pipe	A	From Face	3.00 2.50 1.00	0.00	107.00	No Ice	4.60	4.01	0.10
						1/2" Ice	5.05	4.45	0.16
						1" Ice	5.50	4.89	0.23
						2" Ice	6.44	5.82	0.42
APXVSPP18-C-A20 w/ Mount Pipe	B	From Face	3.00 2.50 1.00	0.00	107.00	No Ice	4.60	4.01	0.10
						1/2" Ice	5.05	4.45	0.16
						1" Ice	5.50	4.89	0.23
						2" Ice	6.44	5.82	0.42
APXVSPP18-C-A20 w/ Mount Pipe	C	From Face	3.00 2.50 1.00	0.00	107.00	No Ice	4.60	4.01	0.10
						1/2" Ice	5.05	4.45	0.16
						1" Ice	5.50	4.89	0.23
						2" Ice	6.44	5.82	0.42
TD-RRH8x20-25	A	From Face	3.00 0.00 1.00	0.00	107.00	No Ice	4.05	1.53	0.07
						1/2" Ice	4.30	1.71	0.10
						1" Ice	4.56	1.90	0.13
						2" Ice	5.10	2.30	0.20
TD-RRH8x20-25	B	From Face	3.00 0.00 1.00	0.00	107.00	No Ice	4.05	1.53	0.07
						1/2" Ice	4.30	1.71	0.10
						1" Ice	4.56	1.90	0.13
						2" Ice	5.10	2.30	0.20
TD-RRH8x20-25	C	From Face	3.00 0.00 1.00	0.00	107.00	No Ice	4.05	1.53	0.07
						1/2" Ice	4.30	1.71	0.10
						1" Ice	4.56	1.90	0.13
						2" Ice	5.10	2.30	0.20

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* ft ft ft	*Azimuth Adjustment* °	*Placement* ft		C_AA_A *Front* ft^2	C_AA_A *Side* ft^2	*Weight* K
						2" Ice			
105									
Side Arm Mount [SO 102-3]	C	None		0.00	105.00	No Ice	3.00	3.00	0.08
						1/2" Ice	3.48	3.48	0.11
						1" Ice	3.96	3.96	0.14
						2" Ice	4.92	4.92	0.20
(3) 5' x 2" Pipe Mount	A	From Leg	1.00 0.00 0.00	0.00	105.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.00 1.39 1.70 2.35	1.00 1.39 1.70 2.35	0.03 0.04 0.05 0.08
(3) 5' x 2" Pipe Mount	B	From Leg	1.00 0.00 0.00	0.00	105.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.00 1.39 1.70 2.35	1.00 1.39 1.70 2.35	0.03 0.04 0.05 0.08
(3) 5' x 2" Pipe Mount	C	From Leg	1.00 0.00 0.00	0.00	105.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.00 1.39 1.70 2.35	1.00 1.39 1.70 2.35	0.03 0.04 0.05 0.08
IBC1900BB-1	A	From Leg	2.00 0.00 2.00	0.00	105.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.13 1.27 1.43 1.76	0.53 0.65 0.77 1.04	0.02 0.03 0.04 0.06
IBC1900BB-1	B	From Leg	2.00 0.00 2.00	0.00	105.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.13 1.27 1.43 1.76	0.53 0.65 0.77 1.04	0.02 0.03 0.04 0.06
IBC1900BB-1	C	From Leg	2.00 0.00 2.00	0.00	105.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.13 1.27 1.43 1.76	0.53 0.65 0.77 1.04	0.02 0.03 0.04 0.06
800MHz 2X50W RRH W/FILTER	A	From Leg	2.00 0.00 3.00	0.00	105.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.06 2.24 2.43 2.83	1.93 2.11 2.29 2.68	0.06 0.09 0.11 0.17
800MHz 2X50W RRH W/FILTER	B	From Leg	2.00 0.00 3.00	0.00	105.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.06 2.24 2.43 2.83	1.93 2.11 2.29 2.68	0.06 0.09 0.11 0.17
800MHz 2X50W RRH W/FILTER	C	From Leg	2.00 0.00 3.00	0.00	105.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.06 2.24 2.43 2.83	1.93 2.11 2.29 2.68	0.06 0.09 0.11 0.17
IBC1900HG-2A	A	From Leg	2.00 0.00 2.00	0.00	105.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.97 1.09 1.22 1.51	0.46 0.56 0.66 0.89	0.02 0.03 0.04 0.06
IBC1900HG-2A	B	From Leg	2.00 0.00 2.00	0.00	105.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.97 1.09 1.22 1.51	0.46 0.56 0.66 0.89	0.02 0.03 0.04 0.06
IBC1900HG-2A	C	From Leg	2.00 0.00 2.00	0.00	105.00	No Ice 1/2" Ice	0.97 1.09 1.22	0.46 0.56 0.66	0.02 0.03 0.04

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* ft ft ft	*Azimuth Adjustment* °	*Placement* ft		*C_AA_A Front* ft^2	*C_AA_A Side* ft^2	*Weight* K
						1" Ice	1.51	0.89	0.06
						2" Ice			
PCS 1900MHz 4x45W-65MHz	A	From Leg	2.00 0.00 3.00	0.00	105.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.32 2.53 2.74 3.19	2.24 2.44 2.65 3.09	0.06 0.08 0.11 0.17
PCS 1900MHz 4x45W-65MHz	B	From Leg	2.00 0.00 3.00	0.00	105.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.32 2.53 2.74 3.19	2.24 2.44 2.65 3.09	0.06 0.08 0.11 0.17
PCS 1900MHz 4x45W-65MHz	C	From Leg	2.00 0.00 3.00	0.00	105.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.32 2.53 2.74 3.19	2.24 2.44 2.65 3.09	0.06 0.08 0.11 0.17
89									
Platform Mount [LP 502-1]	C	None		0.00	89.00	No Ice 1/2" Ice 1" Ice 2" Ice	32.35 45.67 58.99 85.63	32.35 45.67 58.99 85.63	0.93 1.19 1.46 2.00
(2) 6' x 2" Mount Pipe	A	From Face	4.00 0.00 1.00	0.00	89.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	0.02 0.03 0.05 0.09
(2) 6' x 2" Mount Pipe	B	From Face	4.00 0.00 1.00	0.00	89.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	0.02 0.03 0.05 0.09
(2) 6' x 2" Mount Pipe	C	From Face	4.00 0.00 1.00	0.00	89.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	0.02 0.03 0.05 0.09
HPA-65R-BUU-H6 w/ Mount Pipe	A	From Face	4.00 -6.00 1.00	0.00	89.00	No Ice 1/2" Ice 1" Ice 2" Ice	9.22 9.98 10.76 12.36	6.25 6.96 7.70 9.22	0.07 0.14 0.22 0.42
HPA-65R-BUU-H6 w/ Mount Pipe	B	From Face	4.00 -6.00 1.00	0.00	89.00	No Ice 1/2" Ice 1" Ice 2" Ice	9.22 9.98 10.76 12.36	6.25 6.96 7.70 9.22	0.07 0.14 0.22 0.42
HPA-65R-BUU-H6 w/ Mount Pipe	C	From Face	4.00 -6.00 1.00	0.00	89.00	No Ice 1/2" Ice 1" Ice 2" Ice	9.22 9.98 10.76 12.36	6.25 6.96 7.70 9.22	0.07 0.14 0.22 0.42
QS66512-2 w/ Mount Pipe	A	From Face	4.00 2.00 1.00	0.00	89.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.04 4.42 4.82 5.63	4.18 4.57 4.97 5.79	0.14 0.21 0.29 0.48
QS66512-2 w/ Mount Pipe	B	From Face	4.00 2.00 1.00	0.00	89.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.04 4.42 4.82 5.63	4.18 4.57 4.97 5.79	0.14 0.21 0.29 0.48
QS66512-2 w/ Mount Pipe	C	From Face	4.00 2.00	0.00	89.00	No Ice 1/2"	4.04 4.42	4.18 4.57	0.14 0.21

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			1.00			Ice	4.82	4.97	0.29
						1" Ice	5.63	5.79	0.48
						2" Ice			
7750.00 w/ Mount Pipe	A	From Face	4.00	0.00	89.00	No Ice	5.75	4.25	0.06
			6.00			1/2"	6.18	5.01	0.10
			1.00			Ice	6.61	5.71	0.16
						1" Ice	7.49	7.16	0.29
						2" Ice			
7750.00 w/ Mount Pipe	B	From Face	4.00	0.00	89.00	No Ice	5.75	4.25	0.06
			6.00			1/2"	6.18	5.01	0.10
			1.00			Ice	6.61	5.71	0.16
						1" Ice	7.49	7.16	0.29
						2" Ice			
7750.00 w/ Mount Pipe	C	From Face	4.00	0.00	89.00	No Ice	5.75	4.25	0.06
			6.00			1/2"	6.18	5.01	0.10
			1.00			Ice	6.61	5.71	0.16
						1" Ice	7.49	7.16	0.29
						2" Ice			
RRUS 32 B66	A	From Face	4.00	0.00	89.00	No Ice	2.74	1.67	0.05
			0.00			1/2"	2.96	1.86	0.07
			1.00			Ice	3.19	2.05	0.10
						1" Ice	3.68	2.46	0.16
						2" Ice			
RRUS 32 B66	B	From Face	4.00	0.00	89.00	No Ice	2.74	1.67	0.05
			0.00			1/2"	2.96	1.86	0.07
			1.00			Ice	3.19	2.05	0.10
						1" Ice	3.68	2.46	0.16
						2" Ice			
RRUS 32 B66	C	From Face	4.00	0.00	89.00	No Ice	2.74	1.67	0.05
			0.00			1/2"	2.96	1.86	0.07
			1.00			Ice	3.19	2.05	0.10
						1" Ice	3.68	2.46	0.16
						2" Ice			
RRUS 32	A	From Face	4.00	0.00	89.00	No Ice	2.86	1.78	0.06
			0.00			1/2"	3.08	1.97	0.08
			1.00			Ice	3.32	2.17	0.10
						1" Ice	3.81	2.58	0.16
						2" Ice			
RRUS 32	B	From Face	4.00	0.00	89.00	No Ice	2.86	1.78	0.06
			0.00			1/2"	3.08	1.97	0.08
			1.00			Ice	3.32	2.17	0.10
						1" Ice	3.81	2.58	0.16
						2" Ice			
RRUS 32	C	From Face	4.00	0.00	89.00	No Ice	2.86	1.78	0.06
			0.00			1/2"	3.08	1.97	0.08
			1.00			Ice	3.32	2.17	0.10
						1" Ice	3.81	2.58	0.16
						2" Ice			
RRUS 32 B2	A	From Face	4.00	0.00	89.00	No Ice	2.73	1.67	0.05
			0.00			1/2"	2.95	1.86	0.07
			1.00			Ice	3.18	2.05	0.10
						1" Ice	3.66	2.46	0.16
						2" Ice			
RRUS 32 B2	B	From Face	4.00	0.00	89.00	No Ice	2.73	1.67	0.05
			0.00			1/2"	2.95	1.86	0.07
			1.00			Ice	3.18	2.05	0.10
						1" Ice	3.66	2.46	0.16
						2" Ice			
RRUS 32 B2	C	From Face	4.00	0.00	89.00	No Ice	2.73	1.67	0.05
			0.00			1/2"	2.95	1.86	0.07
			1.00			Ice	3.18	2.05	0.10
						1" Ice	3.66	2.46	0.16
						2" Ice			
(2) DC6-48-60-18-8F	A	From Face	1.00	0.00	89.00	No Ice	0.92	0.92	0.02
			0.00			1/2"	1.46	1.46	0.04

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			1.00			Ice	1.64	1.64	0.06
						1" Ice	2.04	2.04	0.11
						2" Ice			
RRUS 11 B12	A	From Face	4.00	0.00	89.00	No Ice	2.83	1.18	0.05
			0.00			1/2"	3.04	1.33	0.07
			1.00			Ice	3.26	1.48	0.10
						1" Ice	3.71	1.83	0.15
						2" Ice			
RRUS 11 B12	B	From Face	4.00	0.00	89.00	No Ice	2.83	1.18	0.05
			0.00			1/2"	3.04	1.33	0.07
			1.00			Ice	3.26	1.48	0.10
						1" Ice	3.71	1.83	0.15
						2" Ice			
RRUS 11 B12	C	From Face	4.00	0.00	89.00	No Ice	2.83	1.18	0.05
			0.00			1/2"	3.04	1.33	0.07
			1.00			Ice	3.26	1.48	0.10
						1" Ice	3.71	1.83	0.15
						2" Ice			
(2) LGP21401	A	From Face	4.00	0.00	89.00	No Ice	1.10	0.35	0.01
			0.00			1/2"	1.24	0.44	0.02
			1.00			Ice	1.38	0.54	0.03
						1" Ice	1.69	0.77	0.05
						2" Ice			
(2) LGP21401	B	From Face	4.00	0.00	89.00	No Ice	1.10	0.35	0.01
			0.00			1/2"	1.24	0.44	0.02
			1.00			Ice	1.38	0.54	0.03
						1" Ice	1.69	0.77	0.05
						2" Ice			
(2) LGP21401	B	From Face	4.00	0.00	89.00	No Ice	1.10	0.35	0.01
			0.00			1/2"	1.24	0.44	0.02
			1.00			Ice	1.38	0.54	0.03
						1" Ice	1.69	0.77	0.05
						2" Ice			
74									
Platform Mount [LP 303-1]	C	None		0.00	76.00	No Ice	14.66	14.66	1.25
						1/2"	18.87	18.87	1.48
						Ice	23.08	23.08	1.71
						1" Ice	31.50	31.50	2.18
						2" Ice			
Miscellaneous [NA 507-1]	C	None		0.00	76.00	No Ice	4.80	4.80	0.25
						1/2"	6.70	6.70	0.29
						Ice	8.60	8.60	0.34
						1" Ice	12.40	12.40	0.44
						2" Ice			
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Leg	4.00	0.00	76.00	No Ice	14.69	6.87	0.19
			0.00			1/2"	15.46	7.55	0.31
			0.00			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 Leg	4.00	0.00	76.00	No Ice	14.69	6.87	0.19
			0.00			1/2"	15.46	7.55	0.31
			0.00			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 Leg	4.00	0.00	76.00	No Ice	14.69	6.87	0.19
			0.00			1/2"	15.46	7.55	0.31
			0.00			Ice	16.23	8.25	0.46
						1" Ice	17.82	9.67	0.79
						2" Ice			
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Face	4.00	0.00	76.00	No Ice	6.33	5.64	0.11
			-6.00			1/2"	6.78	6.43	0.17
			0.00			Ice	7.21	7.13	0.23
						1" Ice	8.12	8.59	0.38
						2" Ice			
ERICSSON AIR 21 B2A	B	From Face	4.00	0.00	76.00	No Ice	6.33	5.64	0.11

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
B4P w/ Mount Pipe			-6.00 0.00			1/2" Ice 1" Ice 2" Ice	6.78 7.21 8.12	6.43 7.13 8.59	0.17 0.23 0.38
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Face	4.00 -6.00 0.00	0.00	76.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.33 6.78 7.21 8.12	5.64 6.43 7.13 8.59	0.11 0.17 0.23 0.38
AIR 32 B2a/B66Aa w/ Mount Pipe	A	From Face	4.00 6.00 0.00	0.00	76.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.75 7.20 7.65 8.57	6.07 6.87 7.58 9.06	0.15 0.21 0.28 0.44
AIR 32 B2a/B66Aa w/ Mount Pipe	B	From Face	4.00 6.00 0.00	0.00	76.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.75 7.20 7.65 8.57	6.07 6.87 7.58 9.06	0.15 0.21 0.28 0.44
AIR 32 B2a/B66Aa w/ Mount Pipe	C	From Face	4.00 6.00 0.00	0.00	76.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.75 7.20 7.65 8.57	6.07 6.87 7.58 9.06	0.15 0.21 0.28 0.44
RADIO 4449 B12/B71	A	From Leg	4.00 0.00 0.00	0.00	76.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.65 1.81 1.98 2.34	1.30 1.44 1.60 1.92	0.08 0.09 0.11 0.16
RADIO 4449 B12/B71	B	From Leg	4.00 0.00 0.00	0.00	76.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.65 1.81 1.98 2.34	1.30 1.44 1.60 1.92	0.08 0.09 0.11 0.16
RADIO 4449 B12/B71	C	From Leg	4.00 0.00 0.00	0.00	76.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.65 1.81 1.98 2.34	1.30 1.44 1.60 1.92	0.08 0.09 0.11 0.16
KRY 112 144/1	A	From Face	4.00 0.00 0.00	0.00	76.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.35 0.43 0.51 0.70	0.17 0.23 0.30 0.46	0.01 0.01 0.02 0.03
KRY 112 144/1	B	From Face	4.00 0.00 0.00	0.00	76.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.35 0.43 0.51 0.70	0.17 0.23 0.30 0.46	0.01 0.01 0.02 0.03
KRY 112 144/1	C	From Face	4.00 0.00 0.00	0.00	76.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.35 0.43 0.51 0.70	0.17 0.23 0.30 0.46	0.01 0.01 0.02 0.03
* ***MOD 2012*** Bridge Stiffener 72" x 1.25" x 11"	A	From Face	0.00 0.00 0.00	0.00	30.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.25 2.28 3.34 5.54	7.91 8.49 9.09 10.32	0.27 0.32 0.36 0.45
Bridge Stiffener 72" x 1.25" x 11"	B	From Face	0.00 0.00 0.00	0.00	30.00	No Ice 1/2" Ice 1" Ice	1.25 2.28 3.34 5.54	7.91 8.49 9.09 10.32	0.27 0.32 0.36 0.45

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice			
Bridge Stiffener 72" x 1.25" x 11"	C	From Face	0.00 0.00 0.00	0.00	30.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.25 2.28 3.34 5.54	7.91 8.49 9.09 10.32	0.27 0.32 0.36 0.45
MOD 2017									
Jump Plate 116" x 6" x 1"	A	From Face	0.00 0.00 0.00	0.00	30.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.75 10.30 11.87 15.09	7.79 8.74 9.70 11.66	1.07 1.14 1.19 1.31
Jump Plate 116" x 6" x 1"	B	From Face	0.00 0.00 0.00	0.00	30.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.75 10.30 11.87 15.09	7.79 8.74 9.70 11.66	1.07 1.14 1.19 1.31
Jump Plate 116" x 6" x 1"	C	From Face	0.00 0.00 0.00	0.00	30.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.75 10.30 11.87 15.09	7.79 8.74 9.70 11.66	1.07 1.14 1.19 1.31
*****									

Load Combinations

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

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	110 - 105	Pole	Max Tension	15	0.00	-0.00	0.00
			Max. Compression	26	-4.36	-0.02	0.01
			Max. Mx	8	-1.52	-5.83	0.00
			Max. My	2	-1.52	-0.00	5.83
			Max. Vy	20	-2.12	5.83	0.00
			Max. Vx	14	2.12	-0.00	-5.83
			Max. Torque	16			0.00
L2	105 - 100	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-7.54	-0.05	0.03
			Max. Mx	8	-2.81	-25.72	0.01
			Max. My	14	-2.81	0.00	-25.72
			Max. Vy	20	-3.75	25.71	0.00
			Max. Vx	14	3.75	0.00	-25.72
			Max. Torque	16			0.00
L3	100 - 95	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-8.27	-0.07	0.04
			Max. Mx	8	-3.19	-45.30	0.01
			Max. My	14	-3.19	0.00	-45.30
			Max. Vy	20	-4.08	45.29	0.00
			Max. Vx	14	4.08	0.00	-45.30
			Max. Torque	16			0.00
L4	95 - 90	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-9.00	-0.10	0.06
			Max. Mx	8	-3.58	-66.49	0.01
			Max. My	14	-3.57	0.00	-66.50
			Max. Vy	20	-4.40	66.49	0.00
			Max. Vx	14	4.40	0.00	-66.50
			Max. Torque	16			0.00
L5	90 - 85	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-18.76	-0.23	0.93
			Max. Mx	8	-6.94	-114.71	0.34
			Max. My	2	-6.95	-0.16	114.45
			Max. Vy	20	-10.16	114.66	0.06
			Max. Vx	14	10.07	0.11	-114.04
			Max. Torque	8			0.29
L6	85 - 80	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-19.91	-0.25	0.74
			Max. Mx	8	-7.61	-166.38	0.45
			Max. My	2	-7.61	-0.30	165.58
			Max. Vy	20	-10.51	166.33	-0.09
			Max. Vx	14	10.40	0.25	-165.23
			Max. Torque	8			0.29
L7	80 - 75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-29.30	-0.28	0.56
			Max. Mx	8	-11.75	-223.74	0.56
			Max. My	2	-11.76	-0.43	222.29
			Max. Vy	20	-14.83	223.69	-0.25

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	14	14.70	0.38	-221.99
			Max. Torque	8			0.29
L8	75 - 70	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-30.61	-0.14	0.47
			Max. Mx	20	-12.49	298.66	-0.38
			Max. My	2	-12.49	-0.52	296.61
			Max. Vy	20	-15.14	298.66	-0.38
			Max. Vx	14	15.04	0.56	-296.32
			Max. Torque	8			0.29
L9	70 - 65	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-31.95	0.03	0.41
			Max. Mx	20	-13.26	375.14	-0.51
			Max. My	2	-13.26	-0.60	372.64
			Max. Vy	20	-15.43	375.14	-0.51
			Max. Vx	14	15.39	0.75	-372.35
			Max. Torque	8			0.29
L10	65 - 60	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-33.29	0.20	0.34
			Max. Mx	20	-14.04	452.99	-0.63
			Max. My	2	-14.04	-0.68	450.35
			Max. Vy	20	-15.70	452.99	-0.63
			Max. Vx	14	15.71	0.94	-450.06
			Max. Torque	8			0.29
L11	60 - 55	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-34.83	0.40	0.26
			Max. Mx	20	-14.95	532.34	-0.76
			Max. My	2	-14.94	-0.75	529.84
			Max. Vy	20	-16.03	532.34	-0.76
			Max. Vx	14	16.10	1.14	-529.55
			Max. Torque	8			0.29
L12	55 - 50	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-36.36	0.61	0.18
			Max. Mx	20	-15.86	613.31	-0.88
			Max. My	2	-15.85	-0.82	611.25
			Max. Vy	20	-16.34	613.31	-0.88
			Max. Vx	14	16.47	1.34	-610.96
			Max. Torque	8			0.29
L13	50 - 45	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-37.89	0.81	0.10
			Max. Mx	20	-16.78	695.79	-1.01
			Max. My	2	-16.77	-0.89	694.45
			Max. Vy	20	-16.64	695.79	-1.01
			Max. Vx	14	16.82	1.55	-694.17
			Max. Torque	8			0.29
L14	45 - 40	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-39.42	1.01	0.03
			Max. Mx	20	-17.72	779.69	-1.13
			Max. My	2	-17.71	-0.96	779.34
			Max. Vy	20	-16.91	779.69	-1.13
			Max. Vx	14	17.15	1.75	-779.05
			Max. Torque	8			0.29
L15	40 - 39.33	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-39.65	1.04	0.02
			Max. Mx	20	-17.85	791.03	-1.15
			Max. My	2	-17.84	-0.97	790.83
			Max. Vy	20	-16.95	791.03	-1.15
			Max. Vx	14	17.22	1.77	-790.56
			Max. Torque	8			0.29
L16	39.33 - 39.08	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-39.74	1.05	0.01
			Max. Mx	20	-17.91	795.27	-1.15
			Max. My	2	-17.89	-0.97	795.13
			Max. Vy	20	-16.96	795.27	-1.15
			Max. Vx	14	17.25	1.78	-794.86
			Max. Torque	8			0.29
L17	39.08 - 34.08	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-41.60	1.25	-0.06

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	20	-19.01	880.90	-1.28
			Max. My	14	-18.98	1.98	-882.54
			Max. Vy	20	-17.28	880.90	-1.28
			Max. Vx	14	17.83	1.98	-882.54
			Max. Torque	8			0.29
L18	34.08 - 30	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43.09	1.41	-0.12
			Max. Mx	20	-19.92	951.88	-1.38
			Max. My	14	-19.89	2.15	-956.16
			Max. Vy	20	-17.50	951.88	-1.38
			Max. Vx	14	18.28	2.15	-956.16
			Max. Torque	8			0.29
L19	30 - 29.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-49.07	1.42	-0.13
			Max. Mx	20	-24.79	956.29	-1.39
			Max. My	14	-24.77	2.16	-960.76
			Max. Vy	20	-17.64	956.29	-1.39
			Max. Vx	14	18.41	2.16	-960.76
			Max. Torque	8			0.29
L20	29.75 - 25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-50.76	1.60	-0.21
			Max. Mx	20	-25.91	1040.60	-1.50
			Max. My	14	-25.88	2.35	-1048.75
			Max. Vy	20	-17.85	1040.60	-1.50
			Max. Vx	14	18.65	2.35	-1048.75
			Max. Torque	8			0.29
L21	25 - 24.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-50.88	1.61	-0.22
			Max. Mx	20	-25.99	1045.06	-1.51
			Max. My	14	-25.97	2.36	-1053.41
			Max. Vy	20	-17.85	1045.06	-1.51
			Max. Vx	14	18.67	2.36	-1053.41
			Max. Torque	8			0.29
L22	24.75 - 19.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-53.21	1.80	-0.36
			Max. Mx	20	-27.54	1134.98	-1.63
			Max. My	14	-27.51	2.56	-1147.93
			Max. Vy	20	-18.10	1134.98	-1.63
			Max. Vx	14	19.16	2.56	-1147.93
			Max. Torque	25			0.35
L23	19.75 - 18.58	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-53.79	1.85	-0.39
			Max. Mx	20	-27.90	1156.25	-1.66
			Max. My	14	-27.88	2.60	-1170.39
			Max. Vy	20	-18.25	1156.25	-1.66
			Max. Vx	14	19.27	2.60	-1170.39
			Max. Torque	25			0.36
L24	18.58 - 18.33	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-53.93	1.86	-0.40
			Max. Mx	20	-28.00	1160.81	-1.67
			Max. My	14	-27.98	2.61	-1175.21
			Max. Vy	20	-18.26	1160.81	-1.67
			Max. Vx	14	19.29	2.61	-1175.21
			Max. Torque	25			0.37
L25	18.33 - 13.33	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-56.72	2.04	-0.53
			Max. Mx	20	-29.88	1253.65	-1.79
			Max. My	14	-29.87	2.81	-1272.83
			Max. Vy	20	-18.86	1253.65	-1.79
			Max. Vx	14	19.78	2.81	-1272.83
			Max. Torque	25			0.42
L26	13.33 - 8.42	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-59.52	2.22	-0.69
			Max. Mx	20	-31.74	1347.70	-1.91
			Max. My	14	-31.73	3.00	-1371.02

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	20	-19.45	1347.70	-1.91
			Max. Vx	14	20.25	3.00	-1371.02
			Max. Torque	25			0.48
L27	8.42 - 8.07	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-59.73	2.23	-0.70
			Max. Mx	20	-31.89	1354.51	-1.92
			Max. My	14	-31.88	3.02	-1378.11
			Max. Vy	20	-19.49	1354.51	-1.92
			Max. Vx	14	20.27	3.02	-1378.11
			Max. Torque	25			0.48
L28	8.07 - 7.83	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-59.88	2.24	-0.71
			Max. Mx	20	-31.99	1359.19	-1.93
			Max. My	14	-31.98	3.03	-1382.97
			Max. Vy	20	-19.52	1359.19	-1.93
			Max. Vx	14	20.29	3.03	-1382.97
			Max. Torque	25			0.48
L29	7.83 - 6	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-60.98	2.31	-0.79
			Max. Mx	20	-32.71	1395.15	-1.97
			Max. My	14	-32.70	3.10	-1420.27
			Max. Vy	20	-19.78	1395.15	-1.97
			Max. Vx	14	20.50	3.10	-1420.27
			Max. Torque	25			0.50
L30	6 - 5.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-61.11	2.32	-0.80
			Max. Mx	20	-32.80	1400.10	-1.98
			Max. My	14	-32.80	3.11	-1425.39
			Max. Vy	20	-19.79	1400.10	-1.98
			Max. Vx	14	20.50	3.11	-1425.39
			Max. Torque	25			0.51
L31	5.75 - 2	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-62.83	2.46	-0.91
			Max. Mx	20	-34.03	1475.10	-2.07
			Max. My	14	-34.03	3.26	-1502.81
			Max. Vy	20	-20.21	1475.10	-2.07
			Max. Vx	14	20.81	3.26	-1502.81
			Max. Torque	25			0.56
L32	2 - 1.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-62.98	2.47	-0.91
			Max. Mx	20	-34.16	1480.16	-2.07
			Max. My	14	-34.16	3.27	-1508.01
			Max. Vy	20	-20.22	1480.16	-2.07
			Max. Vx	14	20.82	3.27	-1508.01
			Max. Torque	25			0.56
L33	1.75 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-63.96	2.53	-0.95
			Max. Mx	20	-34.97	1515.72	-2.12
			Max. My	14	-34.97	3.33	-1544.57
			Max. Vy	20	-20.42	1515.72	-2.12
			Max. Vx	14	20.98	3.33	-1544.57
			Max. Torque	25			0.59

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	38	63.96	3.02	5.23
	Max. H_x	21	26.23	20.40	-0.03
	Max. H_z	3	26.23	-0.03	20.36
	Max. M_x	2	1525.55	-0.03	20.36
	Max. M_z	8	1513.87	-20.40	0.03
	Max. Torsion	25	0.59	11.39	19.67
	Min. Vert	17	26.23	9.67	-16.65
	Min. H_x	9	26.23	-20.40	0.03

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Min. H_z	15	26.23	0.03	-20.96
	Min. M_x	14	-1544.57	0.03	-20.96
	Min. M_z	20	-1515.72	20.40	-0.03
	Min. Torsion	13	-0.58	-11.31	-19.53

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	29.15	0.00	0.00	-0.23	0.75	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	34.98	0.03	-20.36	-1525.55	-1.49	-0.00
0.9 Dead+1.0 Wind 0 deg - No Ice	26.23	0.03	-20.36	-1511.05	-1.70	-0.00
1.2 Dead+1.0 Wind 30 deg - No Ice	34.98	9.94	-17.12	-1294.55	-751.88	-0.15
0.9 Dead+1.0 Wind 30 deg - No Ice	26.23	9.94	-17.12	-1282.17	-744.96	-0.15
1.2 Dead+1.0 Wind 60 deg - No Ice	34.98	17.92	-10.32	-761.46	-1322.27	-0.25
0.9 Dead+1.0 Wind 60 deg - No Ice	26.23	17.92	-10.32	-754.21	-1310.03	-0.25
1.2 Dead+1.0 Wind 90 deg - No Ice	34.98	20.40	-0.03	-2.70	-1513.87	-0.06
0.9 Dead+1.0 Wind 90 deg - No Ice	26.23	20.40	-0.03	-2.60	-1499.73	-0.05
1.2 Dead+1.0 Wind 120 deg - No Ice	34.98	16.93	9.72	748.54	-1305.73	-0.25
0.9 Dead+1.0 Wind 120 deg - No Ice	26.23	16.93	9.72	741.48	-1293.51	-0.25
1.2 Dead+1.0 Wind 150 deg - No Ice	34.98	11.31	19.53	1393.04	-806.30	0.58
0.9 Dead+1.0 Wind 150 deg - No Ice	26.23	11.31	19.53	1380.20	-799.05	0.58
1.2 Dead+1.0 Wind 180 deg - No Ice	34.98	-0.03	20.96	1544.57	3.33	0.01
0.9 Dead+1.0 Wind 180 deg - No Ice	26.23	-0.03	20.96	1530.14	3.07	0.01
1.2 Dead+1.0 Wind 210 deg - No Ice	34.98	-9.67	16.65	1286.68	749.52	0.15
0.9 Dead+1.0 Wind 210 deg - No Ice	26.23	-9.67	16.65	1274.46	742.13	0.15
1.2 Dead+1.0 Wind 240 deg - No Ice	34.98	-16.73	9.63	744.13	1295.12	0.26
0.9 Dead+1.0 Wind 240 deg - No Ice	26.23	-16.73	9.63	737.09	1282.52	0.25
1.2 Dead+1.0 Wind 270 deg - No Ice	34.98	-20.40	0.03	2.12	1515.72	0.05
0.9 Dead+1.0 Wind 270 deg - No Ice	26.23	-20.40	0.03	2.17	1501.11	0.05
1.2 Dead+1.0 Wind 300 deg - No Ice	34.98	-18.10	-10.39	-765.37	1335.71	0.25
0.9 Dead+1.0 Wind 300 deg - No Ice	26.23	-18.10	-10.39	-758.09	1322.91	0.24
1.2 Dead+1.0 Wind 330 deg - No Ice	34.98	-11.39	-19.67	-1395.39	809.16	-0.58
0.9 Dead+1.0 Wind 330 deg - No Ice	26.23	-11.39	-19.67	-1382.39	801.44	-0.59
1.2 Dead+1.0 Ice+1.0 Temp	63.96	0.00	0.00	0.95	2.53	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	63.96	0.00	-5.49	-448.53	2.22	-0.00
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	63.96	2.76	-4.75	-388.55	-223.30	-0.06
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	63.96	4.80	-2.77	-224.53	-388.82	-0.10

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	63.96	5.72	-0.00	0.47	-450.68	-0.03
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	63.96	4.74	2.73	225.11	-387.50	-0.10
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	63.96	3.01	5.20	404.75	-230.99	0.18
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	63.96	-0.00	5.50	450.79	3.19	0.00
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	63.96	-2.74	4.73	390.19	228.55	0.06
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	63.96	-4.75	2.73	225.96	393.40	0.10
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	63.96	-5.72	0.00	1.44	456.09	0.03
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	63.96	-4.80	-2.76	-223.68	393.74	0.10
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	63.96	-3.02	-5.23	-403.12	236.56	-0.18
Dead+Wind 0 deg - Service	29.15	0.01	-4.42	-329.41	0.25	-0.00
Dead+Wind 30 deg - Service	29.15	2.16	-3.71	-279.55	-161.69	-0.03
Dead+Wind 60 deg - Service	29.15	3.89	-2.24	-164.51	-284.80	-0.05
Dead+Wind 90 deg - Service	29.15	4.43	-0.01	-0.76	-326.14	-0.01
Dead+Wind 120 deg - Service	29.15	3.67	2.11	161.36	-281.21	-0.05
Dead+Wind 150 deg - Service	29.15	2.45	4.24	300.50	-173.47	0.13
Dead+Wind 180 deg - Service	29.15	-0.01	4.55	333.17	1.29	0.00
Dead+Wind 210 deg - Service	29.15	-2.10	3.61	277.48	162.31	0.03
Dead+Wind 240 deg - Service	29.15	-3.63	2.09	160.40	280.05	0.06
Dead+Wind 270 deg - Service	29.15	-4.43	0.01	0.28	327.67	0.01
Dead+Wind 300 deg - Service	29.15	-3.93	-2.25	-165.36	288.84	0.05
Dead+Wind 330 deg - Service	29.15	-2.47	-4.27	-301.37	175.22	-0.13

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-29.15	0.00	0.00	29.15	0.00	0.000%
2	0.03	-34.98	-20.36	-0.03	34.98	20.36	0.000%
3	0.03	-26.23	-20.36	-0.03	26.23	20.36	0.000%
4	9.94	-34.98	-17.12	-9.94	34.98	17.12	0.000%
5	9.94	-26.23	-17.12	-9.94	26.23	17.12	0.000%
6	17.92	-34.98	-10.32	-17.92	34.98	10.32	0.000%
7	17.92	-26.23	-10.32	-17.92	26.23	10.32	0.000%
8	20.40	-34.98	-0.03	-20.40	34.98	0.03	0.000%
9	20.40	-26.23	-0.03	-20.40	26.23	0.03	0.000%
10	16.93	-34.98	9.72	-16.93	34.98	-9.72	0.000%
11	16.93	-26.23	9.72	-16.93	26.23	-9.72	0.000%
12	11.31	-34.98	19.53	-11.31	34.98	-19.53	0.000%
13	11.31	-26.23	19.53	-11.31	26.23	-19.53	0.000%
14	-0.03	-34.98	20.96	0.03	34.98	-20.96	0.000%
15	-0.03	-26.23	20.96	0.03	26.23	-20.96	0.000%
16	-9.67	-34.98	16.65	9.67	34.98	-16.65	0.000%
17	-9.67	-26.23	16.65	9.67	26.23	-16.65	0.000%
18	-16.73	-34.98	9.63	16.73	34.98	-9.63	0.000%
19	-16.73	-26.23	9.63	16.73	26.23	-9.63	0.000%
20	-20.40	-34.98	0.03	20.40	34.98	-0.03	0.000%
21	-20.40	-26.23	0.03	20.40	26.23	-0.03	0.000%
22	-18.10	-34.98	-10.39	18.10	34.98	10.39	0.000%
23	-18.10	-26.23	-10.39	18.10	26.23	10.39	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
24	-11.39	-34.98	-19.67	11.39	34.98	19.67	0.000%
25	-11.39	-26.23	-19.67	11.39	26.23	19.67	0.000%
26	0.00	-63.96	0.00	0.00	63.96	0.00	0.000%
27	0.00	-63.96	-5.49	-0.00	63.96	5.49	0.000%
28	2.76	-63.96	-4.75	-2.76	63.96	4.75	0.000%
29	4.80	-63.96	-2.77	-4.80	63.96	2.77	0.000%
30	5.72	-63.96	-0.00	-5.72	63.96	0.00	0.000%
31	4.74	-63.96	2.73	-4.74	63.96	-2.73	0.000%
32	3.01	-63.96	5.20	-3.01	63.96	-5.20	0.000%
33	-0.00	-63.96	5.50	0.00	63.96	-5.50	0.000%
34	-2.74	-63.96	4.73	2.74	63.96	-4.73	0.000%
35	-4.75	-63.96	2.73	4.75	63.96	-2.73	0.000%
36	-5.72	-63.96	0.00	5.72	63.96	-0.00	0.000%
37	-4.80	-63.96	-2.76	4.80	63.96	2.76	0.000%
38	-3.02	-63.96	-5.23	3.02	63.96	5.23	0.000%
39	0.01	-29.15	-4.42	-0.01	29.15	4.42	0.000%
40	2.16	-29.15	-3.71	-2.16	29.15	3.71	0.000%
41	3.89	-29.15	-2.24	-3.89	29.15	2.24	0.000%
42	4.43	-29.15	-0.01	-4.43	29.15	0.01	0.000%
43	3.67	-29.15	2.11	-3.67	29.15	-2.11	0.000%
44	2.45	-29.15	4.24	-2.45	29.15	-4.24	0.000%
45	-0.01	-29.15	4.55	0.01	29.15	-4.55	0.000%
46	-2.10	-29.15	3.61	2.10	29.15	-3.61	0.000%
47	-3.63	-29.15	2.09	3.63	29.15	-2.09	0.000%
48	-4.43	-29.15	0.01	4.43	29.15	-0.01	0.000%
49	-3.93	-29.15	-2.25	3.93	29.15	2.25	0.000%
50	-2.47	-29.15	-4.27	2.47	29.15	4.27	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	0.00005171
3	Yes	4	0.00000001	0.00058012
4	Yes	6	0.00000001	0.00007407
5	Yes	5	0.00000001	0.00079993
6	Yes	6	0.00000001	0.00007628
7	Yes	5	0.00000001	0.00082155
8	Yes	5	0.00000001	0.00006885
9	Yes	4	0.00000001	0.00088295
10	Yes	6	0.00000001	0.00007451
11	Yes	5	0.00000001	0.00080442
12	Yes	6	0.00000001	0.00007995
13	Yes	5	0.00000001	0.00085516
14	Yes	5	0.00000001	0.00005245
15	Yes	4	0.00000001	0.00059128
16	Yes	6	0.00000001	0.00007507
17	Yes	5	0.00000001	0.00081128
18	Yes	6	0.00000001	0.00007380
19	Yes	5	0.00000001	0.00079727
20	Yes	5	0.00000001	0.00006037
21	Yes	4	0.00000001	0.00073790
22	Yes	6	0.00000001	0.00007719
23	Yes	5	0.00000001	0.00083016
24	Yes	6	0.00000001	0.00008170
25	Yes	5	0.00000001	0.00087363
26	Yes	4	0.00000001	0.00000001
27	Yes	6	0.00000001	0.00026766
28	Yes	6	0.00000001	0.00029293
29	Yes	6	0.00000001	0.00029361
30	Yes	6	0.00000001	0.00026759
31	Yes	6	0.00000001	0.00029229
32	Yes	6	0.00000001	0.00029911
33	Yes	6	0.00000001	0.00026756
34	Yes	6	0.00000001	0.00029510
35	Yes	6	0.00000001	0.00029549

36	Yes	6	0.00000001	0.00026996
37	Yes	6	0.00000001	0.00029534
38	Yes	6	0.00000001	0.00030160
39	Yes	4	0.00000001	0.00023852
40	Yes	4	0.00000001	0.00061209
41	Yes	4	0.00000001	0.00064919
42	Yes	4	0.00000001	0.00024198
43	Yes	4	0.00000001	0.00061246
44	Yes	4	0.00000001	0.00067256
45	Yes	4	0.00000001	0.00023908
46	Yes	4	0.00000001	0.00063120
47	Yes	4	0.00000001	0.00060770
48	Yes	4	0.00000001	0.00024221
49	Yes	4	0.00000001	0.00066108
50	Yes	4	0.00000001	0.00071025

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	110 - 105	13.2089	50	0.92	0.00
L2	105 - 100	12.2497	50	0.92	0.00
L3	100 - 95	11.2925	50	0.91	0.00
L4	95 - 90	10.3416	50	0.90	0.00
L5	90 - 85	9.4018	50	0.89	0.00
L6	85 - 80	8.4760	50	0.88	0.00
L7	80 - 75	7.5691	50	0.85	0.00
L8	75 - 70	6.6898	50	0.82	0.00
L9	70 - 65	5.8476	50	0.78	0.00
L10	65 - 60	5.0545	50	0.73	0.00
L11	60 - 55	4.3234	50	0.66	0.00
L12	55 - 50	3.6479	50	0.62	0.00
L13	50 - 45	3.0175	50	0.58	0.00
L14	45 - 40	2.4393	50	0.52	0.00
L15	40 - 39.33	1.9207	50	0.46	0.00
L16	39.33 - 39.08	1.8561	50	0.46	0.00
L17	39.08 - 34.08	1.8323	50	0.45	0.00
L18	34.08 - 30	1.3852	50	0.40	0.00
L19	30 - 29.75	1.0640	50	0.35	0.00
L20	29.75 - 25	1.0457	50	0.35	0.00
L21	25 - 24.75	0.7283	50	0.29	0.00
L22	24.75 - 19.75	0.7132	50	0.29	0.00
L23	19.75 - 18.58	0.4464	50	0.22	0.00
L24	18.58 - 18.33	0.3936	50	0.21	0.00
L25	18.33 - 13.33	0.3828	50	0.20	0.00
L26	13.33 - 8.42	0.1972	50	0.15	0.00
L27	8.42 - 8.07	0.0747	50	0.09	0.00
L28	8.07 - 7.83	0.0683	50	0.09	0.00
L29	7.83 - 6	0.0641	50	0.08	0.00
L30	6 - 5.75	0.0362	50	0.06	0.00
L31	5.75 - 2	0.0330	50	0.06	0.00
L32	2 - 1.75	0.0032	50	0.02	0.00
L33	1.75 - 0	0.0024	50	0.01	0.00

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
107.00	T-Arm Mount [TA 702-3]	50	12.6333	0.92	0.00	151419
105.00	Side Arm Mount [SO 102-3]	50	12.2497	0.92	0.00	151419
89.00	Platform Mount [LP 502-1]	50	9.2154	0.89	0.00	20442
76.00	Platform Mount [LP 303-1]	50	6.8630	0.83	0.00	8509
30.00	Bridge Stiffener 72" x 1.25" x 11"	50	1.0640	0.35	0.00	4724

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	110 - 105	61.1300	24	4.24	0.00
L2	105 - 100	56.6925	24	4.24	0.00
L3	100 - 95	52.2642	24	4.22	0.00
L4	95 - 90	47.8651	24	4.19	0.00
L5	90 - 85	43.5172	24	4.13	0.00
L6	85 - 80	39.2337	24	4.06	0.00
L7	80 - 75	35.0378	24	3.96	0.00
L8	75 - 70	30.9686	24	3.82	0.00
L9	70 - 65	27.0709	24	3.63	0.00
L10	65 - 60	23.4003	24	3.38	0.00
L11	60 - 55	20.0160	24	3.08	0.00
L12	55 - 50	16.8887	24	2.89	0.00
L13	50 - 45	13.9701	24	2.68	0.00
L14	45 - 40	11.2934	24	2.43	0.00
L15	40 - 39.33	8.8923	24	2.15	0.00
L16	39.33 - 39.08	8.5933	24	2.11	0.00
L17	39.08 - 34.08	8.4831	24	2.10	0.00
L18	34.08 - 30	6.4131	24	1.85	0.00
L19	30 - 29.75	4.9258	24	1.63	0.00
L20	29.75 - 25	4.8409	24	1.61	0.00
L21	25 - 24.75	3.3714	24	1.34	0.00
L22	24.75 - 19.75	3.3017	24	1.32	0.00
L23	19.75 - 18.58	2.0662	24	1.03	0.00
L24	18.58 - 18.33	1.8219	24	0.96	0.00
L25	18.33 - 13.33	1.7719	24	0.95	0.00
L26	13.33 - 8.42	0.9128	24	0.69	0.00
L27	8.42 - 8.07	0.3458	24	0.41	0.00
L28	8.07 - 7.83	0.3163	24	0.39	0.00
L29	7.83 - 6	0.2968	24	0.38	0.00
L30	6 - 5.75	0.1675	24	0.29	0.00
L31	5.75 - 2	0.1525	24	0.28	0.00
L32	2 - 1.75	0.0148	24	0.07	0.00
L33	1.75 - 0	0.0113	24	0.06	0.00

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
107.00	T-Arm Mount [TA 702-3]	24	58.4671	4.24	0.00	33019
105.00	Side Arm Mount [SO 102-3]	24	56.6925	4.24	0.00	33019
89.00	Platform Mount [LP 502-1]	24	42.6548	4.11	0.00	4458
76.00	Platform Mount [LP 303-1]	24	31.7702	3.85	0.00	1850
30.00	Bridge Stiffener 72" x 1.25" x 11"	24	4.9258	1.63	0.00	1021

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	110 - 105 (1)	P24x0.25	5.00	0.00	0.0	18.6532	-1.52	662.26	0.002
L2	105 - 100 (2)	P24x0.25	5.00	0.00	0.0	18.6532	-2.80	662.26	0.004
L3	100 - 95 (3)	P24x0.25	5.00	0.00	0.0	18.6532	-3.18	662.26	0.005
L4	95 - 90 (4)	P24x0.25	5.00	0.00	0.0	18.6532	-3.57	662.26	0.005

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
L5	90 - 85 (5)	P24x0.375	5.00	0.00	0.0	27.8325	-6.94	1052.07	0.007
L6	85 - 80 (6)	P24x0.375	5.00	0.00	0.0	27.8325	-7.61	1052.07	0.007
L7	80 - 75 (7)	P24x0.375	5.00	0.00	0.0	27.8325	-11.75	1052.07	0.011
L8	75 - 70 (8)	P24x0.375	5.00	0.00	0.0	27.8325	-12.49	1052.07	0.012
L9	70 - 65 (9)	P24x0.375	5.00	0.00	0.0	27.8325	-13.26	1052.07	0.013
L10	65 - 60 (10)	P24x0.375	5.00	0.00	0.0	27.8325	-13.98	1052.07	0.013
L11	60 - 55 (11)	P30x0.375	5.00	0.00	0.0	34.9011	-14.88	1311.06	0.011
L12	55 - 50 (12)	P30x0.375	5.00	0.00	0.0	34.9011	-15.79	1311.06	0.012
L13	50 - 45 (13)	P30x0.375	5.00	0.00	0.0	34.9011	-16.72	1311.06	0.013
L14	45 - 40 (14)	P30x0.375	5.00	0.00	0.0	34.9011	-17.65	1311.06	0.013
L15	40 - 39.33 (15)	P30x0.375	0.67	0.00	0.0	34.9011	-17.78	1311.06	0.014
L16	39.33 - 39.08 (16)	P30x0.4875	0.25	0.00	0.0	45.1992	-17.84	1708.53	0.010
L17	39.08 - 34.08 (17)	P30x0.4875	5.00	0.00	0.0	45.1992	-18.93	1708.53	0.011
L18	34.08 - 30 (18)	P30x0.4875	4.08	0.00	0.0	45.1992	-19.84	1708.53	0.012
L19	30 - 29.75 (19)	P30x0.5	0.25	0.00	0.0	46.3385	-24.72	1751.60	0.014
L20	29.75 - 25 (20)	P30x0.5	4.75	0.00	0.0	46.3385	-25.84	1751.60	0.015
L21	25 - 24.75 (21)	P30x0.55625	0.25	0.00	0.0	51.4533	-25.93	1944.93	0.013
L22	24.75 - 19.75 (22)	P30x0.55625	5.00	0.00	0.0	51.4533	-27.48	1944.93	0.014
L23	19.75 - 18.58 (23)	P30x0.55625	1.17	0.00	0.0	51.4533	-27.84	1944.93	0.014
L24	18.58 - 18.33 (24)	P30x0.7	0.25	0.00	0.0	64.4341	-27.95	2435.61	0.011
L25	18.33 - 13.33 (25)	P30x0.7	5.00	0.00	0.0	64.4341	-29.84	2435.61	0.012
L26	13.33 - 8.42 (26)	P30x0.7	4.91	0.00	0.0	64.4341	-31.72	2435.61	0.013
L27	8.42 - 8.07 (27)	P30x0.8625	0.35	0.00	0.0	78.9517	-31.87	2984.37	0.011
L28	8.07 - 7.83 (28)	P30x0.8625	0.24	0.00	0.0	78.9517	-31.96	2984.37	0.011
L29	7.83 - 6 (29)	P30x0.8625	1.83	0.00	0.0	78.9517	-32.69	2984.37	0.011
L30	6 - 5.75 (30)	P30x0.8	0.25	0.00	0.0	73.3876	-32.79	2774.05	0.012
L31	5.75 - 2 (31)	P30x0.8	3.75	0.00	0.0	73.3876	-34.03	2774.05	0.012
L32	2 - 1.75 (32)	P30x1.35	0.25	0.00	0.0	121.5090	-34.16	4593.04	0.007
L33	1.75 - 0 (33)	P30x1.4	1.75	0.00	0.0	125.7890	-34.97	4754.84	0.007

Pole Bending Design Data

Section No.	Elevation	Size	M_{ux}	ϕM_{nx}	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy}	ϕM_{ny}	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	ft		kip-ft	kip-ft		kip-ft	kip-ft	
L1	110 - 105 (1)	P24x0.25	5.83	396.68	0.015	0.00	396.68	0.000
L2	105 - 100 (2)	P24x0.25	25.75	396.68	0.065	0.00	396.68	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L3	100 - 95 (3)	P24x0.25	45.35	396.68	0.114	0.00	396.68	0.000
L4	95 - 90 (4)	P24x0.25	66.58	396.68	0.168	0.00	396.68	0.000
L5	90 - 85 (5)	P24x0.375	114.80	623.72	0.184	0.00	623.72	0.000
L6	85 - 80 (6)	P24x0.375	166.40	623.72	0.267	0.00	623.72	0.000
L7	80 - 75 (7)	P24x0.375	223.74	623.72	0.359	0.00	623.72	0.000
L8	75 - 70 (8)	P24x0.375	298.66	623.72	0.479	0.00	623.72	0.000
L9	70 - 65 (9)	P24x0.375	375.14	623.72	0.601	0.00	623.72	0.000
L10	65 - 60 (10)	P24x0.375	454.56	623.72	0.729	0.00	623.72	0.000
L11	60 - 55 (11)	P30x0.375	537.64	947.86	0.567	0.00	947.86	0.000
L12	55 - 50 (12)	P30x0.375	622.66	947.86	0.657	0.00	947.86	0.000
L13	50 - 45 (13)	P30x0.375	709.51	947.86	0.749	0.00	947.86	0.000
L14	45 - 40 (14)	P30x0.375	798.08	947.86	0.842	0.00	947.86	0.000
L15	40 - 39.33 (15)	P30x0.375	810.09	947.86	0.855	0.00	947.86	0.000
L16	39.33 - 39.08 (16)	P30x0.4875	814.58	1273.78	0.640	0.00	1273.78	0.000
L17	39.08 - 34.08 (17)	P30x0.4875	906.48	1273.78	0.712	0.00	1273.78	0.000
L18	34.08 - 30 (18)	P30x0.4875	984.10	1273.78	0.773	0.00	1273.78	0.000
L19	30 - 29.75 (19)	P30x0.5	988.97	1311.10	0.754	0.00	1311.10	0.000
L20	29.75 - 25 (20)	P30x0.5	1081.95	1311.10	0.825	0.00	1311.10	0.000
L21	25 - 24.75 (21)	P30x0.55625	1086.88	1481.77	0.734	0.00	1481.77	0.000
L22	24.75 - 19.75 (22)	P30x0.55625	1187.03	1481.77	0.801	0.00	1481.77	0.000
L23	19.75 - 18.58 (23)	P30x0.55625	1210.90	1481.77	0.817	0.00	1481.77	0.000
L24	18.58 - 18.33 (24)	P30x0.7	1216.03	1893.33	0.642	0.00	1893.33	0.000
L25	18.33 - 13.33 (25)	P30x0.7	1320.18	1893.33	0.697	0.00	1893.33	0.000
L26	13.33 - 8.42 (26)	P30x0.7	1425.49	1893.33	0.753	0.00	1893.33	0.000
L27	8.42 - 8.07 (27)	P30x0.8625	1433.11	2307.28	0.621	0.00	2307.28	0.000
L28	8.07 - 7.83 (28)	P30x0.8625	1438.35	2307.28	0.623	0.00	2307.28	0.000
L29	7.83 - 6 (29)	P30x0.8625	1478.54	2307.28	0.641	0.00	2307.28	0.000
L30	6 - 5.75 (30)	P30x0.8	1484.07	2149.19	0.691	0.00	2149.19	0.000
L31	5.75 - 2 (31)	P30x0.8	1567.77	2149.19	0.729	0.00	2149.19	0.000
L32	2 - 1.75 (32)	P30x1.35	1573.40	3493.13	0.450	0.00	3493.13	0.000
L33	1.75 - 0 (33)	P30x1.4	1613.03	3610.08	0.447	0.00	3610.08	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	110 - 105 (1)	P24x0.25	2.13	201.86	0.011	0.00	324.23	0.000
L2	105 - 100 (2)	P24x0.25	3.76	201.86	0.019	0.00	324.23	0.000
L3	100 - 95 (3)	P24x0.25	4.08	201.86	0.020	0.00	324.23	0.000
L4	95 - 90 (4)	P24x0.25	4.41	201.86	0.022	0.00	324.23	0.000
L5	90 - 85 (5)	P24x0.375	10.16	315.62	0.032	0.25	655.57	0.000
L6	85 - 80 (6)	P24x0.375	10.48	315.62	0.033	0.25	655.57	0.000
L7	80 - 75 (7)	P24x0.375	14.83	315.62	0.047	0.29	655.57	0.000
L8	75 - 70 (8)	P24x0.375	15.14	315.62	0.048	0.29	655.57	0.000
L9	70 - 65 (9)	P24x0.375	15.43	315.62	0.049	0.29	655.57	0.000
L10	65 - 60 (10)	P24x0.375	16.42	315.62	0.052	0.12	655.57	0.000
L11	60 - 55 (11)	P30x0.375	16.81	395.78	0.042	0.12	994.73	0.000
L12	55 - 50 (12)	P30x0.375	17.19	395.78	0.043	0.12	994.73	0.000
L13	50 - 45 (13)	P30x0.375	17.55	395.78	0.044	0.12	994.73	0.000
L14	45 - 40 (14)	P30x0.375	17.88	395.78	0.045	0.12	994.73	0.000
L15	40 - 39.33	P30x0.375	17.97	395.78	0.045	0.13	994.73	0.000

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L16	39.33 - 39.08 (15)	P30x0.4875	18.01	512.56	0.035	0.13	1329.93	0.000
L17	39.08 - 34.08 (16)	P30x0.4875	18.74	512.56	0.037	0.21	1329.93	0.000
L18	34.08 - 30 (17)	P30x0.4875	19.31	512.56	0.038	0.28	1329.93	0.000
L19	30 - 29.75 (18)	P30x0.5	19.45	525.48	0.037	0.28	1362.88	0.000
L20	29.75 - 25 (19)	P30x0.5	19.70	525.48	0.037	0.28	1362.88	0.000
L21	25 - 24.75 (20)	P30x0.55625	19.71	583.48	0.034	0.28	1510.43	0.000
L22	24.75 - 19.75 (21)	P30x0.55625	20.34	583.48	0.035	0.35	1510.43	0.000
L23	19.75 - 18.58 (22)	P30x0.55625	20.49	583.48	0.035	0.36	1510.43	0.000
L24	18.58 - 18.33 (23)	P30x0.7	20.51	730.68	0.028	0.36	1882.24	0.000
L25	18.33 - 13.33 (24)	P30x0.7	21.14	730.68	0.029	0.42	1882.24	0.000
L26	13.33 - 8.42 (25)	P30x0.7	21.77	730.68	0.030	0.47	1882.24	0.000
L27	8.42 - 8.07 (26)	P30x0.8625	21.80	895.31	0.024	0.48	2293.54	0.000
L28	8.07 - 7.83 (27)	P30x0.8625	21.83	895.31	0.024	0.48	2293.54	0.000
L29	7.83 - 6 (28)	P30x0.8625	22.11	895.31	0.025	0.50	2293.54	0.000
L30	6 - 5.75 (29)	P30x0.8	22.11	832.22	0.027	0.50	2136.47	0.000
L31	5.75 - 2 (30)	P30x0.8	22.53	832.22	0.027	0.55	2136.47	0.000
L32	2 - 1.75 (31)	P30x1.35	22.54	1377.91	0.016	0.56	3470.77	0.000
L33	1.75 - 0 (32)	P30x1.4	22.75	1426.45	0.016	0.58	3586.77	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	110 - 105 (1)	0.002	0.015	0.000	0.011	0.000	0.017	1.050	4.8.2
L2	105 - 100 (2)	0.004	0.065	0.000	0.019	0.000	0.069	1.050	4.8.2
L3	100 - 95 (3)	0.005	0.114	0.000	0.020	0.000	0.120	1.050	4.8.2
L4	95 - 90 (4)	0.005	0.168	0.000	0.022	0.000	0.174	1.050	4.8.2
L5	90 - 85 (5)	0.007	0.184	0.000	0.032	0.000	0.192	1.050	4.8.2
L6	85 - 80 (6)	0.007	0.267	0.000	0.033	0.000	0.275	1.050	4.8.2
L7	80 - 75 (7)	0.011	0.359	0.000	0.047	0.000	0.372	1.050	4.8.2
L8	75 - 70 (8)	0.012	0.479	0.000	0.048	0.000	0.493	1.050	4.8.2
L9	70 - 65 (9)	0.013	0.601	0.000	0.049	0.000	0.616	1.050	4.8.2
L10	65 - 60 (10)	0.013	0.729	0.000	0.052	0.000	0.745	1.050	4.8.2
L11	60 - 55 (11)	0.011	0.567	0.000	0.042	0.000	0.580	1.050	4.8.2
L12	55 - 50 (12)	0.012	0.657	0.000	0.043	0.000	0.671	1.050	4.8.2
L13	50 - 45 (13)	0.013	0.749	0.000	0.044	0.000	0.763	1.050	4.8.2
L14	45 - 40 (14)	0.013	0.842	0.000	0.045	0.000	0.857	1.050	4.8.2
L15	40 - 39.33 (15)	0.014	0.855	0.000	0.045	0.000	0.870	1.050	4.8.2
L16	39.33 - 39.08 (16)	0.010	0.640	0.000	0.035	0.000	0.651	1.050	4.8.2
L17	39.08 - 34.08 (17)	0.011	0.712	0.000	0.037	0.000	0.724	1.050	4.8.2
L18	34.08 - 30 (18)	0.012	0.773	0.000	0.038	0.000	0.786	1.050	4.8.2
L19	30 - 29.75 (19)	0.014	0.754	0.000	0.037	0.000	0.770	1.050	4.8.2
L20	29.75 - 25 (20)	0.015	0.825	0.000	0.037	0.000	0.841	1.050	4.8.2
L21	25 - 24.75 (21)	0.013	0.734	0.000	0.034	0.000	0.748	1.050	4.8.2

Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L22	24.75 - 19.75 (22)	0.014	0.801	0.000	0.035	0.000	0.816	1.050	4.8.2
L23	19.75 - 18.58 (23)	0.014	0.817	0.000	0.035	0.000	0.833	1.050	4.8.2
L24	18.58 - 18.33 (24)	0.011	0.642	0.000	0.028	0.000	0.655	1.050	4.8.2
L25	18.33 - 13.33 (25)	0.012	0.697	0.000	0.029	0.000	0.710	1.050	4.8.2
L26	13.33 - 8.42 (26)	0.013	0.753	0.000	0.030	0.000	0.767	1.050	4.8.2
L27	8.42 - 8.07 (27)	0.011	0.621	0.000	0.024	0.000	0.632	1.050	4.8.2
L28	8.07 - 7.83 (28)	0.011	0.623	0.000	0.024	0.000	0.635	1.050	4.8.2
L29	7.83 - 6 (29)	0.011	0.641	0.000	0.025	0.000	0.652	1.050	4.8.2
L30	6 - 5.75 (30)	0.012	0.691	0.000	0.027	0.000	0.703	1.050	4.8.2
L31	5.75 - 2 (31)	0.012	0.729	0.000	0.027	0.000	0.742	1.050	4.8.2
L32	2 - 1.75 (32)	0.007	0.450	0.000	0.016	0.000	0.458	1.050	4.8.2
L33	1.75 - 0 (33)	0.007	0.447	0.000	0.016	0.000	0.454	1.050	4.8.2

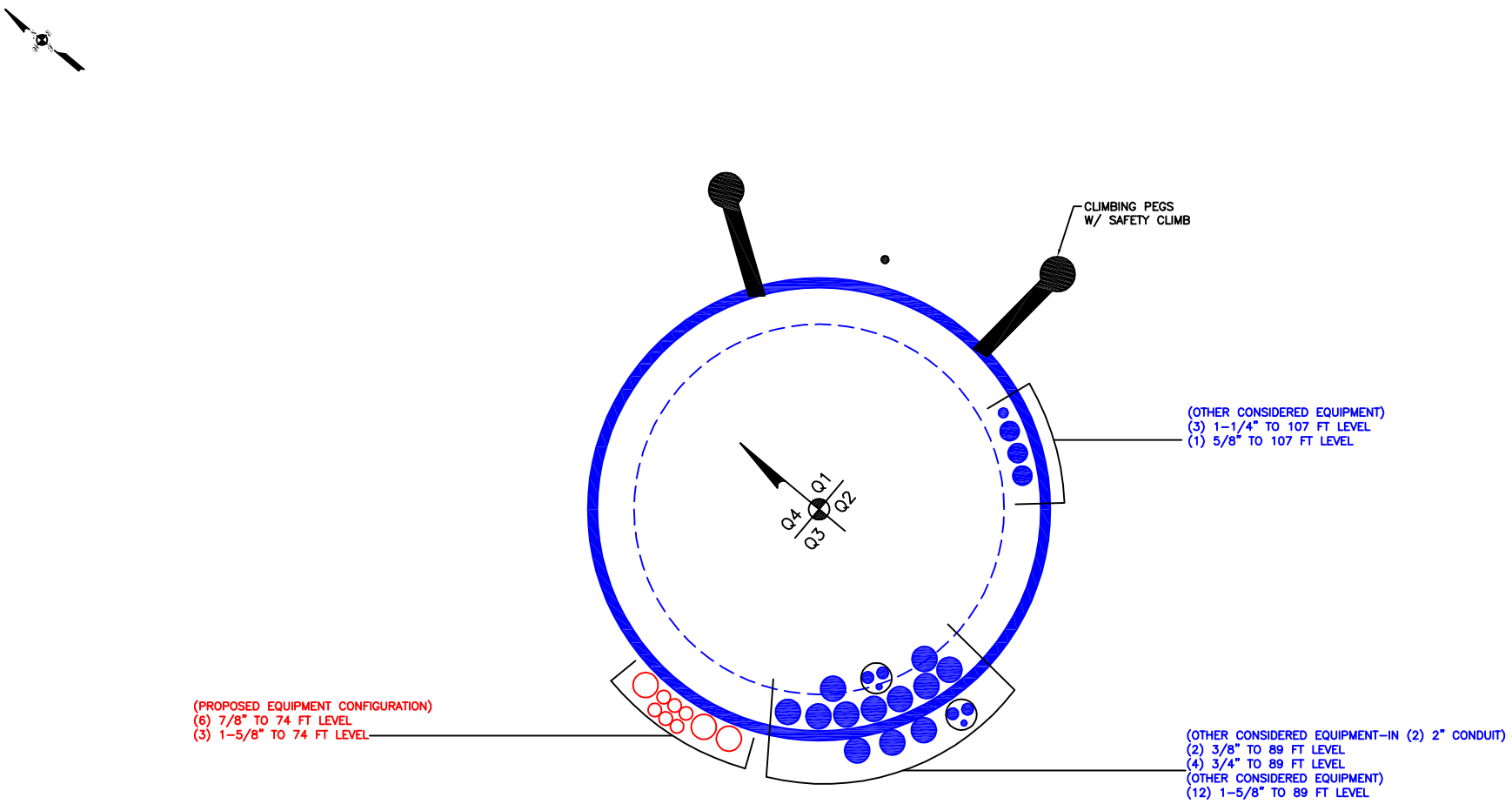
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	110 - 105	Pole	P24x0.25	1	-1.52	695.38	1.6	Pass
L2	105 - 100	Pole	P24x0.25	2	-2.80	695.38	6.6	Pass
L3	100 - 95	Pole	P24x0.25	3	-3.18	695.38	11.4	Pass
L4	95 - 90	Pole	P24x0.25	4	-3.57	695.38	16.5	Pass
L5	90 - 85	Pole	P24x0.375	5	-6.94	1104.67	18.3	Pass
L6	85 - 80	Pole	P24x0.375	6	-7.61	1104.67	26.2	Pass
L7	80 - 75	Pole	P24x0.375	7	-11.75	1104.67	35.4	Pass
L8	75 - 70	Pole	P24x0.375	8	-12.49	1104.67	47.0	Pass
L9	70 - 65	Pole	P24x0.375	9	-13.26	1104.67	58.7	Pass
L10	65 - 60	Pole	P24x0.375	10	-13.98	1104.67	70.9	Pass
L11	60 - 55	Pole	P30x0.375	11	-14.88	1376.61	55.3	Pass
L12	55 - 50	Pole	P30x0.375	12	-15.79	1376.61	63.9	Pass
L13	50 - 45	Pole	P30x0.375	13	-16.72	1376.61	72.7	Pass
L14	45 - 40	Pole	P30x0.375	14	-17.65	1376.61	81.7	Pass
L15	40 - 39.33	Pole	P30x0.375	15	-17.78	1376.61	82.9	Pass
L16	39.33 - 39.08	Pole	P30x0.4875	16	-17.84	1793.96	62.0	Pass
L17	39.08 - 34.08	Pole	P30x0.4875	17	-18.93	1793.96	69.0	Pass
L18	34.08 - 30	Pole	P30x0.4875	18	-19.84	1793.96	74.8	Pass
L19	30 - 29.75	Pole	P30x0.5	19	-24.72	1839.18	73.3	Pass
L20	29.75 - 25	Pole	P30x0.5	20	-25.84	1839.18	80.1	Pass
L21	25 - 24.75	Pole	P30x0.55625	21	-25.93	2042.18	71.2	Pass
L22	24.75 - 19.75	Pole	P30x0.55625	22	-27.48	2042.18	77.8	Pass
L23	19.75 - 18.58	Pole	P30x0.55625	23	-27.84	2042.18	79.3	Pass
L24	18.58 - 18.33	Pole	P30x0.7	24	-27.95	2557.39	62.3	Pass
L25	18.33 - 13.33	Pole	P30x0.7	25	-29.84	2557.39	67.7	Pass
L26	13.33 - 8.42	Pole	P30x0.7	26	-31.72	2557.39	73.0	Pass
L27	8.42 - 8.07	Pole	P30x0.8625	27	-31.87	3133.59	60.2	Pass
L28	8.07 - 7.83	Pole	P30x0.8625	28	-31.96	3133.59	60.4	Pass
L29	7.83 - 6	Pole	P30x0.8625	29	-32.69	3133.59	62.1	Pass
L30	6 - 5.75	Pole	P30x0.8	30	-32.79	2912.75	67.0	Pass
L31	5.75 - 2	Pole	P30x0.8	31	-34.03	2912.75	70.7	Pass
L32	2 - 1.75	Pole	P30x1.35	32	-34.16	4822.69	43.6	Pass
L33	1.75 - 0	Pole	P30x1.4	33	-34.97	4992.58	43.3	Pass
							Summary	
						Pole (L15)	82.9	Pass
						RATING =	**82.9**	**Pass**

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

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 876325 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

CCIpole

per TIA-222- H

Site BU: 876325

Work Order: 1750414

Pole Geometry

	Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
1	110	20		0	24	24	0.25		A53-B-42
2	90	30		0	24.00	24	0.375		A53-B-42
3	60	30		0	30.00	30	0.375		A53-B-42
4	30	30		0	30.00	30	0.5		A53-B-42

Reinforcement Configuration

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	0	8.08	channel	MP3-05 (Bottom Weld	4	45	135	225	315														
2	6	25	plate	CCI-SFP-045100	4	70	110	250	290														
3	8.42	18.58	channel	MP3-05 (1.1875in)	3	0	90	270															
4	30	39.33	channel	MP3-03 (1.1875in)	3	0	120	240															
5	0	2	plate	TS 7"x1.25"	4	15	105	225	345														
6																							
7																							
8																							
9																							
10																							

Reinforcement Details

	B (in)	H (in)	Gross Area (in^2)	Pole Face to Centroid (in)	Bottom Termination Length (in)	Top Termination Length (in)	L_u (in)	Net Area (in^2)	Bolt Hole Size (in)	Reinforcement Material
1	5.33	2.09	5.65	0.79	n/a	29.000	18.000	5.025	1.1875	A572-65
2	4.5	1	4.5	0.5	18.000	18.000	20.000	3.250	1.1875	A572-65
3	5.33	2.09	5.65	0.79	29.000	29.000	18.000	5.025	1.1875	A572-65
4	4.06	1.57	2.92	0.59	14.000	14.000	18.000	2.545	1.1875	A572-65
5	1.25	7	8.75	3.5	n/a	n/a	0.000	8.750	0.0000	A572-65

TNX Geometry Input

Increment (ft): 5

	Section Height (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Tapered Pole Grade	Weight Multiplier
1	110 - 105	5		0	24.000	24.000	0.25	A53-B-42	1.000
2	105 - 100	5		0	24.000	24.000	0.25	A53-B-42	1.000
3	100 - 95	5		0	24.000	24.000	0.25	A53-B-42	1.000
4	95 - 90	5	0	0	24.000	24.000	0.25	A53-B-42	1.000
5	90 - 85	5		0	24.000	24.000	0.375	A53-B-42	1.000
6	85 - 80	5		0	24.000	24.000	0.375	A53-B-42	1.000
7	80 - 75	5		0	24.000	24.000	0.375	A53-B-42	1.000
8	75 - 70	5		0	24.000	24.000	0.375	A53-B-42	1.000
9	70 - 65	5		0	24.000	24.000	0.375	A53-B-42	1.000
10	65 - 60	5	0	0	24.000	24.000	0.375	A53-B-42	1.000
11	60 - 55	5		0	30.000	30.000	0.375	A53-B-42	1.000
12	55 - 50	5		0	30.000	30.000	0.375	A53-B-42	1.000
13	50 - 45	5		0	30.000	30.000	0.375	A53-B-42	1.000
14	45 - 40	5		0	30.000	30.000	0.375	A53-B-42	1.000
15	40 - 39.33	0.67		0	30.000	30.000	0.375	A53-B-42	1.000
16	39.33 - 39.08	0.25		0	30.000	30.000	0.4875	A53-B-42	0.966
17	39.08 - 34.08	5		0	30.000	30.000	0.4875	A53-B-42	0.966
18	34.08 - 30	4.08	0	0	30.000	30.000	0.4875	A53-B-42	0.966
19	30 - 29.75	0.25		0	30.000	30.000	0.5	A53-B-42	1.000
20	29.75 - 25	4.75		0	30.000	30.000	0.5	A53-B-42	1.000
21	25 - 24.75	0.25		0	30.000	30.000	0.55625	A53-B-42	1.250
22	24.75 - 19.75	5		0	30.000	30.000	0.55625	A53-B-42	1.250
23	19.75 - 18.58	1.17		0	30.000	30.000	0.55625	A53-B-42	1.250
24	18.58 - 18.33	0.25		0	30.000	30.000	0.7	A53-B-42	1.262
25	18.33 - 13.33	5		0	30.000	30.000	0.7	A53-B-42	1.262
26	13.33 - 8.42	4.91		0	30.000	30.000	0.7	A53-B-42	1.262
27	8.42 - 8.07	0.35		0	30.000	30.000	0.8625	A53-B-42	1.101
28	8.07 - 7.83	0.24		0	30.000	30.000	0.8625	A53-B-42	1.101
29	7.83 - 6	1.83		0	30.000	30.000	0.8625	A53-B-42	1.101
30	6 - 5.75	0.25		0	30.000	30.000	0.8	A53-B-42	0.939
31	5.75 - 2	3.75		0	30.000	30.000	0.8	A53-B-42	0.939
32	2 - 1.75	0.25		0	30.000	30.000	1.35	A53-B-42	0.855
33	1.75 - 0	1.75		0	30.000	30.000	1.4	A53-B-42	0.826

TNX Section Forces

Increment (ft):	5	TNX Output		
	Section Height (ft)	P_u (K)	M_{ux} (kip-ft)	V_u (K)
1	110 - 105	1.52	5.83	2.13
2	105 - 100	2.80	25.75	3.76
3	100 - 95	3.18	45.35	4.08
4	95 - 90	3.57	66.58	4.41
5	90 - 85	6.94	114.80	10.16
6	85 - 80	7.61	166.39	10.48
7	80 - 75	11.75	223.74	14.83
8	75 - 70	12.49	298.66	15.14
9	70 - 65	13.26	375.14	15.43
10	65 - 60	13.98	454.56	16.42
11	60 - 55	14.88	537.64	16.81
12	55 - 50	15.79	622.66	17.19
13	50 - 45	16.72	709.51	17.55
14	45 - 40	17.65	798.08	17.88
15	40 - 39.33	17.78	810.09	17.97
16	39.33 - 39.08	17.84	814.58	18.01
17	39.08 - 34.08	18.93	906.48	18.74
18	34.08 - 30	19.84	984.10	19.31
19	30 - 29.75	24.72	988.96	19.45
20	29.75 - 25	25.84	1081.95	19.70
21	25 - 24.75	25.93	1086.88	19.71
22	24.75 - 19.75	27.48	1187.02	20.34
23	19.75 - 18.58	27.84	1210.90	20.49
24	18.58 - 18.33	27.95	1216.03	20.51
25	18.33 - 13.33	29.84	1320.17	21.14
26	13.33 - 8.42	31.72	1425.49	21.77
27	8.42 - 8.07	31.87	1433.11	21.80
28	8.07 - 7.83	31.96	1438.35	21.83
29	7.83 - 6	32.69	1478.54	22.11
30	6 - 5.75	32.79	1484.07	22.11
31	5.75 - 2	34.03	1567.77	22.53
32	2 - 1.75	34.16	1573.40	22.54
33	1.75 - 0	34.97	1613.03	22.75

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
110 - 105	Pole	TP24x24x0.25	Pole	1.6%	Pass
105 - 100	Pole	TP24x24x0.25	Pole	6.6%	Pass
100 - 95	Pole	TP24x24x0.25	Pole	11.4%	Pass
95 - 90	Pole	TP24x24x0.25	Pole	16.5%	Pass
90 - 85	Pole	TP24x24x0.375	Pole	18.2%	Pass
85 - 80	Pole	TP24x24x0.375	Pole	26.1%	Pass
80 - 75	Pole	TP24x24x0.375	Pole	35.3%	Pass
75 - 70	Pole	TP24x24x0.375	Pole	46.8%	Pass
70 - 65	Pole	TP24x24x0.375	Pole	58.6%	Pass
65 - 60	Pole	TP24x24x0.375	Pole	70.8%	Pass
60 - 55	Pole	TP30x30x0.375	Pole	55.2%	Pass
55 - 50	Pole	TP30x30x0.375	Pole	63.8%	Pass
50 - 45	Pole	TP30x30x0.375	Pole	72.6%	Pass
45 - 40	Pole	TP30x30x0.375	Pole	81.5%	Pass
40 - 39.33	Pole	TP30x30x0.375	Pole	82.8%	Pass
39.33 - 39.08	Pole + Reinf.	TP30x30x0.4875	Pole	65.0%	Pass
39.08 - 34.08	Pole + Reinf.	TP30x30x0.4875	Pole	72.3%	Pass
34.08 - 30	Pole + Reinf.	TP30x30x0.4875	Pole	78.5%	Pass
30 - 29.75	Pole	TP30x30x0.5	Pole	73.2%	Pass
29.75 - 25	Pole	TP30x30x0.5	Pole	80.0%	Pass
25 - 24.75	Pole + Reinf.	TP30x30x0.5563	Pole	72.4%	Pass
24.75 - 19.75	Pole + Reinf.	TP30x30x0.5563	Pole	79.0%	Pass
19.75 - 18.58	Pole + Reinf.	TP30x30x0.5563	Pole	80.6%	Pass
18.58 - 18.33	Pole + Reinf.	TP30x30x0.7	Pole	70.1%	Pass
18.33 - 13.33	Pole + Reinf.	TP30x30x0.7	Pole	76.1%	Pass
13.33 - 8.42	Pole + Reinf.	TP30x30x0.7	Pole	82.1%	Pass
8.42 - 8.07	Pole + Reinf.	TP30x30x0.8625	Pole	63.3%	Pass
8.07 - 7.83	Pole + Reinf.	TP30x30x0.8625	Pole	63.5%	Pass
7.83 - 6	Pole + Reinf.	TP30x30x0.8625	Pole	65.3%	Pass
6 - 5.75	Pole + Reinf.	TP30x30x0.8	Pole	70.1%	Pass
5.75 - 2	Pole + Reinf.	TP30x30x0.8	Pole	74.0%	Pass
2 - 1.75	Pole + Reinf.	TP30x30x1.35	Reinf. 5 Weldment	70.1%	Pass
1.75 - 0	Pole + Reinf.	TP30x30x1.4	Reinf. 1 Weldment	67.0%	Pass
				Summary	
			Pole	82.8%	Pass
			Reinforcement	73.1%	Pass
			Overall	82.8%	Pass

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in^4)			Area (in^2)			% Capacity*					
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3	R4	R5
110 - 105	1315	n/a	1315	18.65	n/a	18.65	1.6%					
105 - 100	1315	n/a	1315	18.65	n/a	18.65	6.6%					
100 - 95	1315	n/a	1315	18.65	n/a	18.65	11.4%					
95 - 90	1315	n/a	1315	18.65	n/a	18.65	16.5%					
90 - 85	1942	n/a	1942	27.83	n/a	27.83	18.2%					
85 - 80	1942	n/a	1942	27.83	n/a	27.83	26.1%					
80 - 75	1942	n/a	1942	27.83	n/a	27.83	35.3%					
75 - 70	1942	n/a	1942	27.83	n/a	27.83	46.8%					
70 - 65	1942	n/a	1942	27.83	n/a	27.83	58.6%					
65 - 60	1942	n/a	1942	27.83	n/a	27.83	70.8%					
60 - 55	3829	n/a	3829	34.90	n/a	34.90	55.2%					
55 - 50	3829	n/a	3829	34.90	n/a	34.90	63.8%					
50 - 45	3829	n/a	3829	34.90	n/a	34.90	72.6%					
45 - 40	3829	n/a	3829	34.90	n/a	34.90	81.5%					
40 - 39.33	3829	n/a	3829	34.90	n/a	34.90	82.8%					
39.33 - 39.08	3829	1067	4897	34.90	8.76	43.66	65.0%				60.6%	
39.08 - 34.08	3829	1067	4897	34.90	8.76	43.66	72.3%				67.4%	
34.08 - 30	3829	1067	4897	34.90	8.76	43.66	78.5%				73.1%	
30 - 29.75	5042	n/a	5042	46.34	n/a	46.34	73.2%					
29.75 - 25	5042	n/a	5042	46.34	n/a	46.34	80.0%					
25 - 24.75	5042	533	5575	46.34	18.00	64.34	72.4%		56.8%			
24.75 - 19.75	5042	533	5575	46.34	18.00	64.34	79.0%		62.0%			
19.75 - 18.58	5042	533	5575	46.34	18.00	64.34	80.6%		63.2%			
18.58 - 18.33	5098	1832	6930	46.34	34.95	81.29	69.8%		52.2%	57.7%		
18.33 - 13.33	5098	1832	6930	46.34	34.95	81.29	75.7%		56.6%	62.6%		
13.33 - 8.42	5098	1832	6930	46.34	34.95	81.29	81.7%		61.1%	67.6%		
8.42 - 8.07	5042	3365	8407	46.34	40.60	86.94	63.3%	53.1%	54.1%			
8.07 - 7.83	5042	3365	8407	46.34	40.60	86.94	63.5%	53.3%	54.3%			
7.83 - 6	5042	3365	8407	46.34	40.60	86.94	65.3%	54.7%	55.8%			
6 - 5.75	5042	2832	7874	46.34	22.60	68.94	70.1%	66.7%				
5.75 - 2	5042	2832	7874	46.34	22.60	68.94	74.0%	70.5%				
2 - 1.75	5043	7400	12444	46.34	57.60	103.94	47.8%	45.1%				70.1%
1.75 - 0	5062	7856	12918	46.34	57.60	103.94	48.9%	67.0%				64.5%

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

Monopole Flange Plate Connection

Elevation = 90 ft.

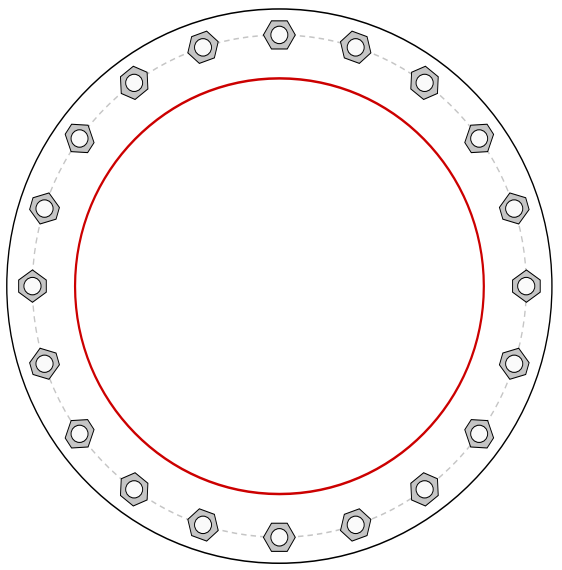
BU #	876325
Site Name	WESTON SQUARE
Order #	494411 Rev.0

TIA-222 Revision	H

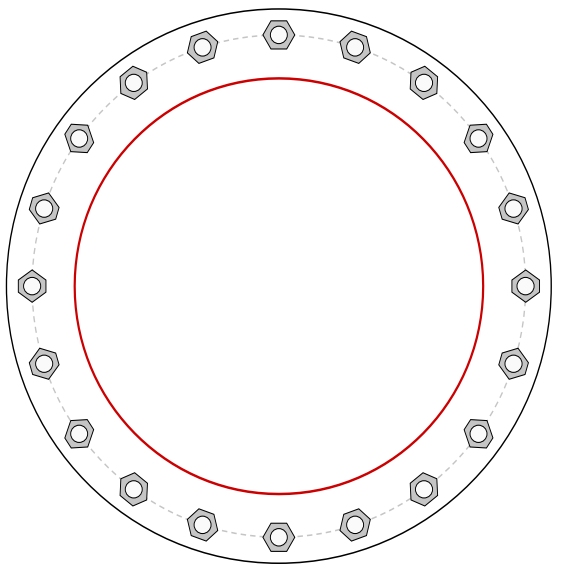
Applied Loads	
Moment (kip-ft)	66.58
Axial Force (kips)	3.57
Shear Force (kips)	4.41

**TIA-222-H Section 15.5 Applied*

Top Plate - External



Bottom Plate - External



Connection Properties

Bolt Data

(20) 1" ø bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 29" BC

Top Plate Data

32" OD x 1.5" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

32" OD x 1.5" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

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

Bottom Pole Data

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

Analysis Results

Bolt Capacity

Max Load (kips)	5.33	
Allowable (kips)	54.54	
Stress Rating:	**9.3%**	**Pass**

Top Plate Capacity

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	**N/A**
Tension Side Stress Rating:	**N/A**

Bottom Plate Capacity

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	**N/A**
Tension Side Stress Rating:	**N/A**

Monopole Flange Plate Connection

Elevation = 60 ft.

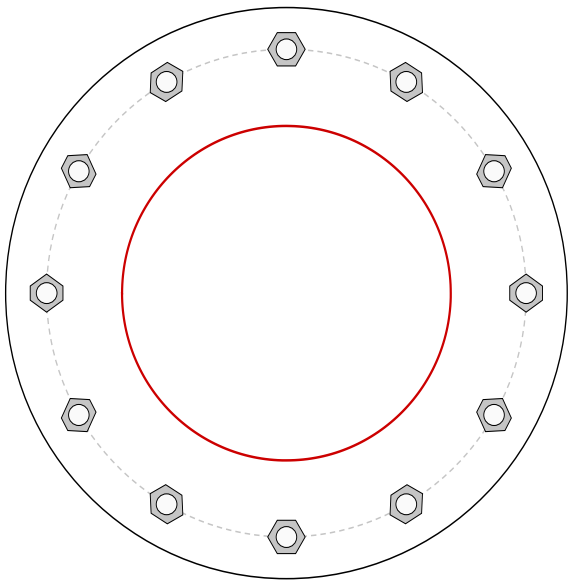
BU #	876325
Site Name	WESTON SQUARE
Order #	494411 Rev.0

TIA-222 Revision	H

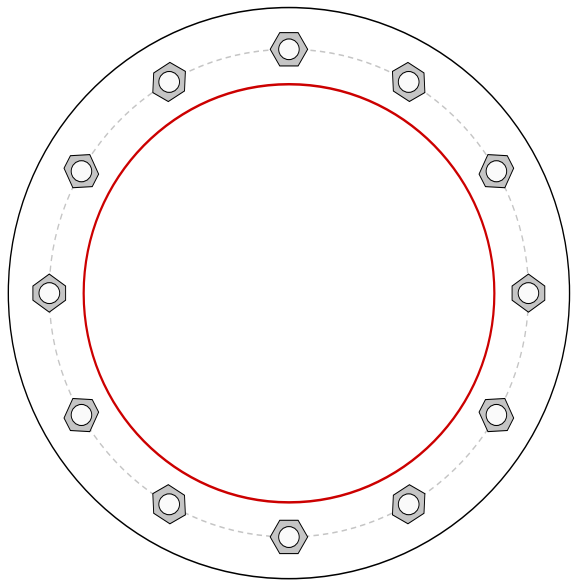
Applied Loads	
Moment (kip-ft)	454.56
Axial Force (kips)	13.98
Shear Force (kips)	16.42

**TIA-222-H Section 15.5 Applied*

Top Plate - External



Bottom Plate - External



Connection Properties

Bolt Data

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

Top Plate Data

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

Top Stiffener Data

N/A

Top Pole Data

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

Bottom Plate Data

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

Bottom Stiffener Data

N/A

Bottom Pole Data

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

Analysis Results

Bolt Capacity

Max Load (kips)	50.75	
Allowable (kips)	111.02	
Stress Rating:	**43.5%**	**Pass**

Top Plate Capacity

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	**N/A**
Tension Side Stress Rating:	**N/A**

Bottom Plate Capacity

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	**N/A**
Tension Side Stress Rating:	**N/A**

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

CROWN CASTLE

Site Data

BU#: *876325*
Site Name: *Weston Square*
Order #: *494411 Rev.0*

Factored Loads at Splice Elevation		
Moment:	563.5	ft-kips
Axial:	0	kips
Shear:	0	kips

Elevation:	30	ft

Splice Bolt Data		
Quantity:	0	
Bolt Diameter:	1.5	in
Bolt Circle:	35	in

Pole Data		
Upper Diam:	30	in
Upper Thickness	0.375	in
Lower Diam:	30	in
Lower Thickness	0.5	in
Pipe Steel (Fy):	42	ksi

Bridge Stiffener Data		
Quantity:	3	
Total Length:	72.0	in
Plate Thickness:	1.250	in
Steel Grade (Fy):	65.0	ksi
Steel Ultimate (Fu):	80.0	ksi
Weld Type:	Fillet (both sides)	
Weld Size:	0.375	in
Weld Strength:	80	ksi
Upper Weld Length:	34	in
Upper Weld, C:	3.37	Table 8-4
Upper Plate Width:	11	in
Lower Weld Length:	32.375	in
Lower Weld, C:	3.322	Table 8-4
Lower Plate Width:	11	in
Gap PL Length:	5.6	in
Gap PL Width:	5.5	in

Stress Increase Factor		
ASIF:	1.000	

Stiffener Results	49.3%	
Maximum Compression:	193.9	kips
Allowable Compression:	393.0	kips
Compression Stress Ratio:	49.3%	
Maximum Tension:	193.9	kips
Allowable Tension:	402.2	kips
Tension Stress Ratio:	48.2%	
Maximum Flexure:	1599.6	in.kips
Allowable Flexure:	12774.2	in.kips
Bending&Shear Stress Ratio:	10.8%	

Weld Results	40.1%	
Upper Weld Eccentric Load:	193.89	kip
Allowable Weld Strength:	515.61	kip
Upper Weld Strength Ratio:	37.6%	
Upper Weld Eccentric Load:	193.89	kip
Allowable Weld Strength:	483.97	kip
Lower Weld Strength Ratio:	40.1%	

Pole Results	24.2%	
Punching Shear Stress:	9.16	kip/in
Allowable Punching Stress:	37.80	kip/in
Punching Shear Stress Ratio:	24.2%	

Loads to Use to Check Flange and Bolts w / CCIPlate		
Moment:	0	ft.kips
Axial:	0.0	kips
Shear:	0.0	kips

Bolted Bridge Stiffeners Reinforcement Check

TIA Rev. H

Description:

This sheet is for the analysis of a reinforced flange connection using existing bolted bridge stiffeners.

Assumptions / Notes:

1. *For analysis purposes, load is distributed between flange bolts and existing bridge stiffeners.*
2. *The plastification of the pole is not considered.*
3. *All shear and axial loads are taken by the flange bolts.*

1. PARAMETERS

Flange Elevation: 30'- 0"

1.1 tnxTower Reactions

Apply TIA-222-H Section 15.5? No / Yes

Moment: $M := 420.6kip \cdot ft$

Axial Load: $P := 19.84kip$

Shear Load: $V := 19.31kip$

1.2 Shaft Properties at the Flange

Upper Shaft Diameter: $D_{shaft1} := 30in$

Upper Shaft Thickness: $t_1 := 0.375in$

Lower Shaft Diameter: $D_{shaft2} := 30in$

Lower Shaft Thickness: $t_2 := 0.5in$

Shaft Grade: $Fy_{shaft} := 42ksi$ $Fu_{shaft} := 63ksi$

1.3 Existing Bridge Stiffener Properties

(Verify existing bolted connection for reduced moment.)

Number of Existing Bridge Stiffeners: $N_{exist} := 3$

Existing Bridge Stiffener Grade: $Fy_{Ex} := 65ksi$ $Fu_{Ex} := 80ksi$

Diameter to the centroid of Existing Bridge Stiffeners: $BC_{exist} := 43in$

Thickness of Existing Bridge Stiffeners: $t_{exist} := 1.25in$

Width of Existing Bridge Stiffeners: $w_{exist} := 6in$

Gross Area of One Existing Bridge Stiffener: $A_{g\_exist} := w_{exist} \cdot t_{exist} = 7.5 \cdot in^2$

Moment of Inertia of Existing Bridge Stiffeners: $I_{exist} := \frac{N_{exist} \cdot BC_{exist}^2 \cdot A_{g\_exist}}{8} = 5200.31 \cdot in^4$

Radius of Gyration about x-axis: $r_{x2} := \frac{t_{exist}}{\sqrt{12}} = 0.36 \cdot in$

1.4 Flange Bolt Properties

Number of Flange Bolts: $N_{bolts} := 0$

Diameter of Flange Bolts: 1-1/2"

Bolt Circle of Flange Bolts: $BC_{bolts} := 35in$

Gross Area of One Flange Bolt: $A_{g\_bolts} := \frac{\pi}{4} \cdot D_{bolts}^{2} = 1.77 \cdot in^{2}$

Moment of Inertia of Flange Bolts: $I_{bolts} := \frac{N_{bolts} \cdot BC_{bolts}^{2} \cdot A_{g\_bolts}}{8} = 0 \cdot in^{4}$

1.5 Division of Forces

Total Gross Area: $A_{g\_total} := N_{exist} \cdot A_{g\_exist} + N_{bolts} \cdot A_{g\_bolts} = 22.5 \cdot in^{2}$

Total Moment of Inertia: $I_{total} := I_{exist} + I_{bolts} = 5200.31 \cdot in^{4}$

1.6 Reactions to Existing Bridge Stiffeners

Moment Reaction to Existing Bridge Stiffeners: $M_{exist} := M \cdot \left(\frac{I_{exist}}{I_{total}} \right) = 420.6 \cdot kip \cdot ft$

Axial Reaction to Existing Bridge Stiffeners: $P_{exist} := 0kip$

Shear Reaction to Existing Bridge Stiffeners: $V_{exist} := 0kip$

1.7 Reactions to Flange Bolts

(It is assumed that all shear and axial loads are taken by the flange bolts)

Moment Reaction to Flange Bolts: $M_{bolts} := M \cdot \left(\frac{I_{bolts}}{I_{total}} \right) = 0 \cdot kip \cdot ft$

Axial Reaction to Flange Bolts: $P_{bolts} := P = 19.84 \cdot kip$

Shear Reaction to Flange Bolts: $V_{bolts} := V = 19.31 \cdot kip$

Check Flange Connection in CCIplate with these Reactions

2. Existing Bridge Stiffener Checks

2.1 Maximum Axial Forces in Single Existing Bridge Stiffener

Outer Radius of Bolt Circle:

$$C := \frac{BC_{exist}}{2} = 21.5 \cdot in$$

Critical Compression Bending Stress:

$$P_{comp} := \frac{M_{exist} \cdot C}{I_{exist}} \cdot A_{g\_exist} + \frac{P_{exist}}{N_{exist}} = 156.5 \cdot kip$$

Critical Tension Bending Stress:

$$P_{tens} := \frac{M_{exist} \cdot C}{I_{exist}} \cdot A_{g\_exist} - \frac{P_{exist}}{N_{exist}} = 156.5 \cdot kip$$

2.2 Available Compression Strength

[AISC 15th Edition E3-1]

Resistance Factor:

$$\phi_c := 0.9$$

Unbraced Length:

$$L_u := 14in$$

Effective Length Factor:

$$K := 1.0$$

Effective Length of Member:

$$L_c := K \cdot L_u = 14 \cdot in$$

[AISC 15th Edition E3-2]

Strength of Bridge Stiffener:

$$Fy_{Ex} = 65 \cdot ksi \qquad Fu_{Ex} = 80 \cdot ksi$$

Elastic Buckling Stress:
[AISC 15th Ed., Eq. E3-4]

$$F_e := \frac{\pi^2 \cdot 29000ksi}{\left(\frac{L_c}{r_{x2}}\right)^2} = 190.14 \cdot ksi$$

Determination of Crticial Stress:
[AISC 15th Ed., Eqs. E3-2 and E3-3]

$$F_{cr} := \begin{cases} \left(0.658^{\frac{Fy_{Ex}}{F_e}} \cdot Fy_{Ex}\right) & \text{if } 4.71 \cdot \sqrt{\frac{E}{Fy_{Ex}}} \geq \frac{L_c}{r_{x2}} \\ \left(0.877 \cdot F_e\right) & \text{otherwise} \end{cases}$$

$$F_{cr} = 56.33 \cdot ksi$$

Allowable Compressive Strength:
[AISC 15th Ed., Eqs. J4-6 and E3-1]

$$\phi P_n := \begin{cases} \left(\phi_c \cdot Fy_{Ex} \cdot A_{g\_exist}\right) & \text{if } \frac{L_c}{r_{x2}} \leq 25 \\ \left(\phi_c \cdot F_{cr} \cdot A_{g\_exist}\right) & \text{otherwise} \end{cases}$$

$\phi P_n = 380.26 \cdot kip$

Check Compressive Strength:

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

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

$Capacity_{comp} = 39.2 \cdot \%$

2.3 Available Tension Strength

Gross Section Yield [AISC 15th Edition Ch. D2]

Available Tension Yield Strength:

$$\phi P_{ty} := 0.9 \cdot Fy_{Ex} \cdot A_{g\_exist} = 438.75 \cdot kip$$

Net Section Fracture

Bolt Hole Diameter:

$BH := 1.1875in$

Thickness:

$T := t_{exist} = 1.25 \cdot in$

Net Area:

$$A_{net} := A_{g\_exist} - \left(BH + \frac{1}{16} in \right) \cdot T = 5.94 \cdot in^2$$

Net Area Limitation:

$$A_e := A_{net} = 5.94 \cdot in^2$$

Available Fractile Strength:

$$\phi P_{tr} := 0.75 \cdot Fu_{Ex} \cdot A_e = 356.25 \cdot kip$$

Tension Check

Controlling Mode of Failure:

$$Check_{mode} := \begin{cases} \text{"Fracture Controls"} & \text{if } \frac{P_{tens}}{\phi P_{tr}} > \frac{P_{tens}}{\phi P_{ty}} \\ \text{"Yield Controls"} & \text{otherwise} \end{cases}$$

$Check_{mode} = \text{"Fracture Controls"}$

$$\phi P_{nt} := \begin{cases} \phi P_{tr} & \text{if } Check_{mode} = \text{"Fracture Controls"} \\ \phi P_{ty} & \text{otherwise} \end{cases}$$

Controlling Tension Mode Check:

$$Check_{tension} := \begin{cases} \text{"OK"} & \text{if } Capacity_{tension} \le 100\% \\ \text{"N/G"} & \text{otherwise} \end{cases}$$

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

$Capacity_{tension} = 41.84 \cdot \%$

SUMMARY

tnxTower Reactions: $M = 420.6 \cdot kip \cdot ft$ $P = 19.84 \cdot kip$ $V = 19.31 \cdot kip$

Flange Bolts:

Diameter of Flange Bolts: $D_{bolts} = 1\frac{1}{2} \cdot in$

Bolt Circle of Flange Bolts: $BC_{bolts} = 35 \cdot in$

Loads to Flange Bolts: $M_{bolts} = 0 \cdot kip$ $P = 19.84 \cdot kip$ $V = 19.31 \cdot kip$

See CCIPlate for Flange Bolt and Plate Capacities

Existing Jump Plates:

Moment to Proposed Bridge Stiffeners: $M_{exist} = 420.6\,ft \cdot kip$

Number of Existing Bridge Stiffeners: $N_{exist} = 3$

Thickness: $t_{exist} = 1.25 \cdot in$

Width: $w_{exist} = 6 \cdot in$

Controlling Capacity of Existing Bridge Stiffeners: $Capacity_{exist} = 41.8 \cdot \%$

Monopole Flange Plate Connection

Elevation = 30 ft.

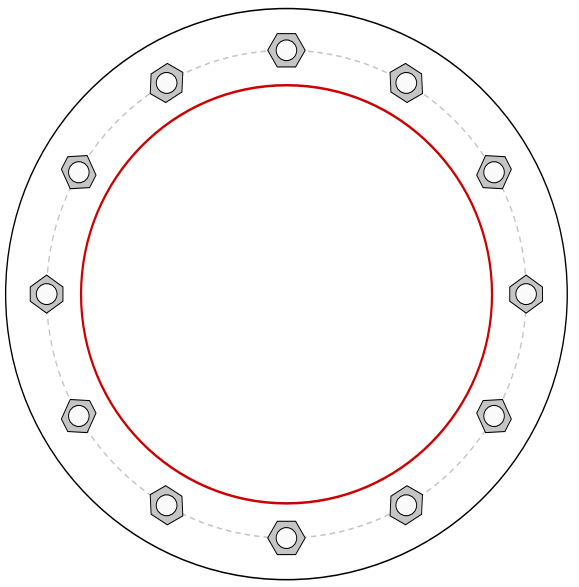
BU #	876325
Site Name	WESTON SQUARE
Order #	494411 Rev.0

TIA-222 Revision	H

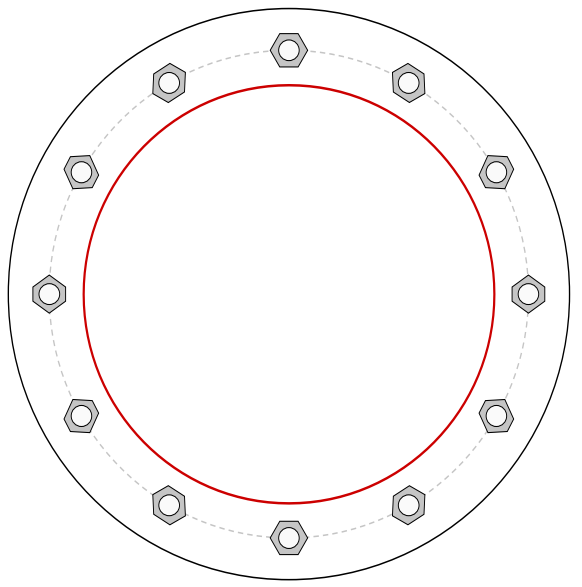
Applied Loads	
Moment (kip-ft)	0.00
Axial Force (kips)	19.84
Shear Force (kips)	19.31

**TIA-222-H Section 15.5 Applied*

Top Plate - External



Bottom Plate - External



Connection Properties

Bolt Data

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

Top Plate Data

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

Top Stiffener Data

N/A

Top Pole Data

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

Bottom Plate Data

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

Bottom Stiffener Data

N/A

Bottom Pole Data

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

Analysis Results

Bolt Capacity

Max Load (kips)	0.00	
Allowable (kips)	111.01	
Stress Rating:	**0.0%**	**Pass**

Top Plate Capacity

Max Stress (ksi):	0.35	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**1.0%**	**Pass**
Tension Side Stress Rating:	**0.0%**	**Pass**

Bottom Plate Capacity

Max Stress (ksi):	0.35	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**1.0%**	**Pass**
Tension Side Stress Rating:	**0.0%**	**Pass**

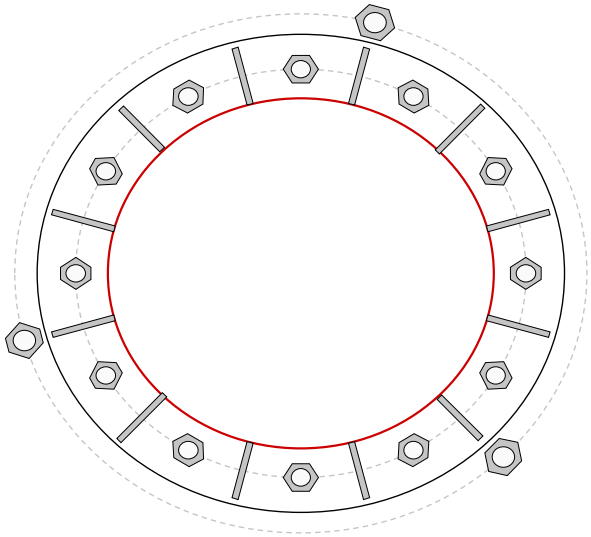
Monopole Base Plate Connection

Site Info	
BU #	876325
Site Name	WESTON SQUARE
Order #	494411 Rev.0

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	0.5

Applied Loads	
Moment (kip-ft)	1613.03
Axial Force (kips)	34.97
Shear Force (kips)	22.75

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

GROUP 1: (12) 1-1/2" ø bolts (A354-BC N; Fy=109 ksi, Fu=125 ksi) on 35" BC
GROUP 2: (3) 1-3/4" ø bolts (R71 N; Fy=120 ksi, Fu=125 ksi) on 44.5" BC

Base Plate Data

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

Stiffener Data

(12) 10"H x 5"W x 0.5"T, Notch: 0.75"
plate: Fy= 65 ksi ; weld: Fy= 70 ksi
horiz. weld: 0.375" fillet
vert. weld: 0.375" fillet

Pole Data

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

Analysis Results

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

GROUP 1:		
Pu_c = 108.46	ϕPn_c = 153.69	**Stress Rating**
Vu = 1.9	ϕVn = 46.11	**67.4%**
Mu = n/a	ϕMn = n/a	**Pass**
GROUP 2:		
Pu_t = 247.45	ϕPn_t = 243.75	**Stress Rating**
Vu = 0	ϕVn = 121.88	**98.2%**
Mu = 0	ϕMn = 108.42	**Pass**

Base Plate Summary

Max Stress (ksi):	20.66	(Roark's Flexural)
Allowable Stress (ksi):	32.4	
Stress Rating:	**60.7%**	**Pass**

Stiffener Summary

Horizontal Weld:	**68.8%**	**Pass**
Vertical Weld:	**37.2%**	**Pass**
Plate Flexure+Shear:	**19.8%**	**Pass**
Plate Tension+Shear:	**41.8%**	**Pass**
Plate Compression:	**53.3%**	**Pass**

Pole Summary

Punching Shear:	**15.4%**	**Pass**

Additional Anchor Rod Calculations:

Base Reactions from tnxTower:

$Moment := 1613.03 \cdot kip \cdot ft$

$Axial := 34.97 \cdot kip$

$Shear := 22.75 \cdot kip$

Apply TIA-222-H Section 15.5? No / Yes

Original Anchor Rod Group:

$N_{existing} := 12$

$BC_{existing} := 35 \cdot in$

$D_{existing} := 1.5 \cdot in$

$A_{existing} := 1.41 in^2$

$Fu_{exisitng} := 125 ksi$

$Fy_{existing} := 109 ksi$

Other Anchor Rod Group:

$N_{gen1} := 0$

$BC_{gen1} := 0 \cdot in$

$D_{gen1} := 0 \cdot in$

$A_{gen1} := 0 \cdot in^2$

$Fu_{gen1} := 0 ksi$

$Fy_{gen1} := 0 ksi$

Existing Anchor Rod Group:

$N_{new} := 3$

$BC_{new} := 44.5 \cdot in$

$D_{new} := 1.75 \cdot in$

$A_{new} := 2.6 \cdot in^2$

$Fu_{rod} := 125 ksi$

$Fy_{rod} := 120 ksi$

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

Anchor Rod Bracket Calculations

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

Bracket Demand Load:
From CCI Plate

$Pu := 247.45 \cdot kip$

Tube Design (Square HSS)

Member Size: 3 XXS PIPE

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

Outside Diameter: $OD_{HSS} := 3.5 \cdot in$

Area: $A_{HSS} := 5.16 \cdot in^2$ $A_{e\_HSS} := 0.75 \cdot A_{HSS} = 3.87 \cdot in^2$

Thickness: $t_{HSS} := 0.6 \cdot in$

Yield Strength: $F_{y\_HSS} := 50 \cdot ksi$ $F_{u\_HSS} := 65 \cdot ksi$

Length: $L_{HSS} := 8.625 \cdot in$

Moment of Inertia: $I_{HSS} := 5.79 \cdot in^4$

Radius of Gyration: $r_{HSS} := 1.06 \cdot in$

Inside Dimension: $ID_{HSS} := OD_{HSS} - 2 \cdot t_{HSS} = 2.3 \cdot in$

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

$\phi_b := 0.75$

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

$$A_{pb} := \frac{Pu}{\phi_b \cdot 1.8 \cdot F_{y\_HSS}} = 3.67 \cdot in^2$$

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

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

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

$\phi_c := 0.9$

$K := 1$

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

$L_c := K \cdot L_{HSS} = 8.63 \cdot in$

$$F_e := \frac{\pi^2 \cdot 29000ksi}{\left(\frac{L_c}{r_{HSS}}\right)^2} = 4323.06 \cdot ksi$$

$$\frac{L_c}{r_{HSS}} = 8.14 \quad < \quad 4.71 \cdot \sqrt{\frac{29000 \cdot ksi}{F_{y\_HSS}}} = 113.43$$

$$\therefore \quad F_{cr} := 0.658^{\frac{F_{y\_HSS}}{F_e}} \cdot F_{y\_HSS} = 49.76 \cdot ksi$$

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

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

$\phi P_{u\_comp} = 232.2 \cdot kip$

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

$Check_{comp} = \text{"N/G"}$

Gusset Plate Design

Gusset Plate width: $w_{plate} := 5.5 \cdot in$

Gusset Plate thickness: $t_{plate} := 1in$

$L_{plate1} := 36in$

$L_{plate2} := 8.625in$

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

$Fu_{plate} := 80ksi$

Pole thickness: $t_{pole} := 0.5in$

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

$A_g := t_{plate} \cdot L_{plate2} = 8.63 \cdot in^2$

$A_{nv} := A_g = 8.63 \cdot in^2$

Shear Yielding

$\phi_v := 1$

$\phi V_{plate} := \phi_v \cdot 0.6 \cdot A_g \cdot Fy_{plate} = 336.37 \cdot kip$

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

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

Shear Rupture

$\phi_v := 0.75$

$\phi V_{plate} := \phi_v \cdot 0.6 \cdot A_{nv} \cdot Fu_{plate} = 310.5 \cdot kip$

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

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

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

Gusset plate thickness: $t_{plate} = 1 \cdot in$

Pole Grade: $Fy_{pole} := 42ksi$ $Fu_{pole} := 63ksi$

Base Plate Grade: $Fy_{base} := 36ksi$ $Fu_{base} := 58ksi$

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

Height of vertical weld from base plate: $H := L_{plate1} = 36 \cdot in$

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

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

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

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

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

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

Check := "OK" if Rating < 100%
"INSUFFICIENT" otherwise

Check = "OK"

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

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

Weld Size (in sixteenths of an inch):

$D_1 := 11.657$ $\quad weldsize_1 := \frac{D_1}{16} = \frac{11657}{16000}$

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

$$ecc_2 := OD_{HSS} - t_{HSS} - \frac{D_{new}}{2} = 2.03 \cdot in$$

Load not in plane with weld group:

$k := 0$

$$a := \frac{ecc_2}{L_{plate2}} = 0.23$$

$C_1 = 1$

$Coeff_1 := 3.374$

$\phi_w := 0.75$

$$D_{min1} := \left(\frac{Pu \cdot in}{\phi_w \cdot Coeff_1 \, C_1 \cdot L_{plate2} \cdot kip} \right) = 11.34$$

$$minweldsize := \frac{D_{min1}}{16} = \frac{5}{7}$$

$$Check_{weld} := \begin{cases} \text{"OK"} & \text{if } D_1 \geq D_{min1} \wedge D_1 \geq Min_{weldsize} \\ \text{"N/G"} & \text{otherwise} \end{cases}$$

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

$\phi Rn_{weld1} := \phi_w \cdot Coeff_1 \, ksi \cdot in \cdot C_1 \cdot D_1 \cdot L_{plate2} = 254.42 \cdot kip$

$$Check_{weld1} := \begin{cases} \text{"OK"} & \text{if } Rating_{weld1} < 100\% \\ \text{"N/G"} & \text{otherwise} \end{cases}$$

$Check_{weld1} = \text{"OK"}$

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

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

$\phi_{sy} := 1.0$

$\phi_{sr} := 0.75$

$ecc_1 := w_{plate} + OD_{HSS} - t_{HSS} - \frac{D_{new}}{2} = 7.52 \cdot in$

$M_1 := Pu \cdot ecc_1 = 1862.06 \cdot kip \cdot in$

$S_1 := \frac{t_{plate} \cdot L_{plate1}^2}{6} = 216 \cdot in^3$

$f_w := \frac{M_1}{S_1} \cdot t_{plate} \cdot 1in = 8.62 \cdot kip$

AISC 15th Ed., Equation J4-3:

$\phi F_{sy} := \phi_{sy} \cdot 0.6 \cdot Fy_{pole} \cdot 2 \cdot t_{pole} \cdot 1in = 25.2 \cdot kip$

AISC 15th Ed., Equation J4-4:

$\phi F_{sr} := \phi_{sr} \cdot 0.6 \cdot Fu_{pole} \cdot 2 \cdot t_{pole} \cdot 1in = 28.35 \cdot kip$

$\phi F_w := \min(\phi F_{sy}, \phi F_{sr}) = 25.2 \cdot kip$

$$Check_{PS1} := \begin{cases} \text{"OK"} & \text{if } Rating_{PS1} < 100\% \\ \text{"N/G"} & \text{otherwise} \end{cases}$$

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

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

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

$ecc_2 := \frac{OD_{HSS}}{2} = 1.75 \cdot in$

$M_2 := Pu \cdot ecc_2 = 433.04 \cdot kip \cdot in$

$S_2 := \frac{t_{plate} \cdot L_{plate2}^2}{6} = 12.4 \cdot in^3$

$f_w := \frac{M_2}{S_2} \cdot t_{plate} \cdot 1in = 34.93 \cdot kip$

AISC 15th Ed., Equation J4-3:

$\phi F_{sy} := \phi_{sy} \cdot 0.6 \cdot F_{y\_HSS} \cdot 2 \cdot t_{HSS} \cdot 1in = 36 \cdot kip$

AISC 15th Ed., Equation J4-4:

$\phi F_{sr} := \phi_{sr} \cdot 0.6 \cdot F_{u\_HSS} \cdot 2 \cdot t_{HSS} \cdot 1in = 35.1 \cdot kip$

$\phi F_w := \min(\phi F_{sy}, \phi F_{sr}) = 35.1 \cdot kip$

$$Check_{PS2} := \begin{cases} \text{"OK"} & \text{if } Rating_{PS2} < 100\% \\ \text{"N/G"} & \text{otherwise} \end{cases}$$

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

Embedment Depth Calculations

Projected Embedment Depth: $L_{em} := 8 \cdot ft$

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

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

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

Epoxy Factor: $\psi_e := 1$

Rebar Size Factor: $\psi_s := 1$

Casting Position Factor: $\psi_t := 1$

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

Pier Diameter: $D_{pier} := 5ft$

Cover: $c_c := 3in$

Rebar Size: $d_s := 9$ $d_b := vlookup(d_s, Rebar, 2) \cdot in = 1.13 \cdot in$

Tie Size: $Tie := 4$

Number of Vertical Rebar: $n := 19$

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

Design Load: $\phi P_{nt} := 0.75 \cdot Fu_{rod} \cdot A_{new} = 243.75 \cdot kip$

Development Length (ACI 318-14 Chapter 25):

$$BC_{rebar} := D_{pier} - 2 \cdot c_c - \frac{Tie \cdot in}{4} - d_b = 51.87 \cdot in$$

$$S_{rebar} := \frac{\pi \cdot BC_{rebar}}{n} = 8.577 \cdot in$$

$$c_b := \min\left(c_c + \frac{Tie}{8}in + \frac{d_b}{2}, S_{rebar} \cdot 0.5\right) = 4.06 \cdot in$$

ACI 318-14, Equation 25.4.2.3a:

$$l_d := \left[\frac{3}{40} \cdot \frac{f_y}{\lambda \cdot \sqrt{f'_c}} \cdot \frac{\psi_t \cdot \psi_e \cdot \psi_s}{\min\left[\left(\frac{c_b + k_{tr}}{d_b}\right), 2.5\right]}\right] \cdot d_b = 37.07 \cdot in$$

Calculate Max Distance Between Rebar and New Anchor Rods:

$$A := \frac{1}{2}\cdot S_{rebar} = 4.288\cdot in$$

$$B := \frac{BC_{rebar}}{2} - \frac{BC_{new}}{2} = 3.686\cdot in$$

$$G := \sqrt{A^2 + B^2} = 5.655\cdot in$$

$$l'_d := l_d + \frac{G}{1.5} + 3in = 3.65\ ft$$

Epoxy Development Length:

Bond Strength:

Epoxy := Hilti Hit Re 500

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

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

$$S_b = 1130\ psi$$

$$L_{be} := \frac{\phi P_{nt}}{\pi\cdot D_{new}\cdot S_b\cdot \phi_{bond}} = 60.36\cdot in$$

Required Embedment Length:

Length of Breaker Tape: $L_{BT} := 0\cdot in$

$$L_{min} := \max\left(L_{be} + L_{BT}, l'_d + 0.25\cdot L_{be}\right) = 5.03\ ft$$

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

Check = "OK"

Anchor Rod Pullout Test:

$$\phi_p := 0.75$$

Is this a CA **DSA** site?

○ Yes
◉ No

$$\text{Pullout} := \begin{cases} \dfrac{\phi_p \cdot Fu_{rod} \cdot A_{new}}{1.6} & \text{if } CA = 0 \\ \left(0.8 \cdot Fy_{rod} \cdot A_{new}\right) & \text{otherwise} \end{cases} = 152 \cdot \text{kip}$$

BU: 876325
WO: 1750414

Done By: PPG
Checked By: JDV
Date: 7/18/2019

Rebar Embedment: (Rev H)

Existing Modification Rebar Input:

Rebar Cage: $R_c := 44.5in$

Rebar Size: (Bar #) $D_s := 10$ $D_b := vlookup(D_s, Rebar, 2) \cdot in = 1.27 \cdot in$

Rebar Yield Strength: $Fy := 60ksi$ Standard Rebar = 60 Ksi

Rebar Area: $A := vlookup(D_s, Rebar, 3) \cdot in^2 = 1.27 \cdot in^2$

Total Embedment Depth: of Added Rebar $L_{em} := 25 \cdot ft$

Ext. Above Grade: (From Drilled Pier Foundation Excel) $L_{ext} := 0.5 \cdot ft$

Rebar Tensile/Compression Capacity: (AISC Tensile Strength Equation D2.a) $\phi P_n := 0.9 \cdot Fy \cdot A = 68.58 \cdot kip$

Existing Rebar Input:

Pier Diameter: $D_{pier} := 5ft$

Number of Original Vertical Rebar: $n := 16$

Original Rebar Size: (Bar #) $d_s := 9$ $d_b := vlookup(d_s, Rebar, 2) \cdot in = 1.13 \cdot in$

Clear Cover: $c_c := 3.436in$

Original Tie Size: (Bar #) $Tie := 4$

Calculate Max Distance Between Modification and Original Rebar:

$$BC_{rebar} := D_{pier} - 2 \cdot c_c - \frac{Tie \cdot in}{4} - d_b = 51 \cdot in$$

$$S_{rebar} := \frac{\pi \cdot BC_{rebar}}{n} = 10.014 \cdot in$$

$$A := \frac{1}{2} \cdot S_{rebar} = 5.01 \cdot in$$

$$B := \frac{BC_{rebar}}{2} - \frac{R_c}{2} = 3.25 \cdot in$$

$$G := \sqrt{A^2 + B^2} = 5.969 \cdot in$$

Epoxy Development Length:

Epoxy := Echem - 3 KSI Concrete

Bond Strength:

$$S_b := \begin{cases} S_{bE3} & \text{if Epoxy} = 0 \\ S_{bE4} & \text{if Epoxy} = 1 \\ S_{bH} & \text{if Epoxy} = 2 \\ S_{bA} & \text{otherwise} \end{cases} = 750\,psi$$

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

$$L_{be} := \frac{\phi P_n}{\pi \cdot D_b \cdot 7500psi \cdot \phi_{bond}} = 3.53 \cdot in$$

Effective Embedment Length:

$$L_{eff} := L_{em} - L_{ext} - \frac{G}{1.5} - \frac{L_{be}}{4} = 24.09\,ft$$

Drilled Pier Foundation

BU # :	876325
Site Name:	WESTON SQUARE
Order Number:	494411 Rev.0

TIA-222 Revison:	H
Tower Type:	Monopole

Applied Loads	Comp.	Uplift
Moment (kip-ft)	1613.03	
Axial Force (kips)	34.97	
Shear Force (kips)	22.75	

Material Properties		
Concrete Strength, f'c:	3	ksi
Rebar Strength, Fy:	60	ksi

Pier Design Data		
Depth	37	ft
Ext. Above Grade	0.5	ft
Pier Section 1		
From 0.5' above grade to 24.09' below grade		
Pier Diameter	5	ft
Rebar Quantity	16	
Rebar Size	9	
Clear Cover to Ties	3	in
Tie Size	4	
Rebar Quantity	3	
Rebar Size	10	
Rebar Cage Diameter	44.5	in
Pier Section 2		
From 24.09' below grade to 37' below grade		
Pier Diameter	5	ft
Rebar Quantity	16	
Rebar Size	9	
Clear Cover to Ties	3	in
Tie Size	4	

Analysis Results		
Soil Lateral Capacity	*Compression*	*Uplift*
$D_{v=0}$ (ft from TOC)	9.06	-
Soil Safety Factor	6.20	-
Max Moment (kip-ft)	1784.94	-
Rating*	*20.4%*	-
Soil Vertical Capacity	*Compression*	*Uplift*
Skin Friction (kips)	408.75	-
End Bearing (kips)	135.00	-
Weight of Concrete (kips)	100.19	-
Total Capacity (kips)	543.75	-
Axial (kips)	135.16	-
Rating*	*23.7%*	-
Reinforced Concrete Capacity	*Compression*	*Uplift*
Critical Depth (ft from TOC)	8.46	-
Critical Moment (kip-ft)	1784.05	-
Critical Moment Capacity	2181.94	-
Rating*	*77.9%*	-

Soil Interaction Rating*	**23.7%**
Structural Foundation Rating*	**77.9%**

Check Limitation	
Apply TIA-222-H Section 15.5:	☑
N/A	☐

Total skin friction resistance taken per geotechnical report by FDH Engineering, Inc. with a 0.75 resistance factor.

*Rating per TIA-222-H Section 15.5

Soil Profile			
Groundwater Depth	15	ft	# of Layers: 8

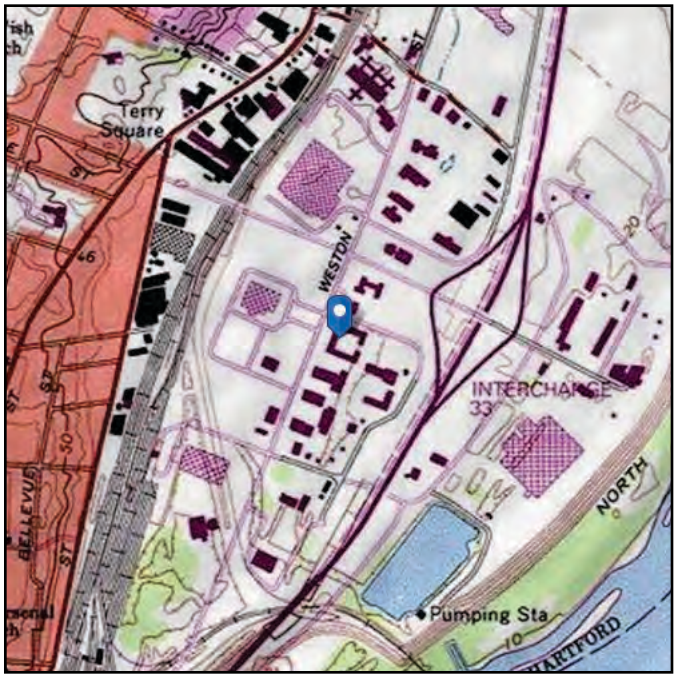
Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ_{soil} (pcf)	$\gamma_{concrete}$ (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	2	2	120	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
2	2	3.333333	1.3333333	110	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
3	3.333333	6	2.6666667	110	150		30	0.000	0.000	0.00	0.00			Cohesionless
4	6	13	7	110	150	0.75		0.413	0.413	0.00	0.00			Cohesive
5	13	15	2	105	150		30	0.000	0.000	0.00	0.00			Cohesionless
6	15	28	13	52.6	87.6		32	0.000	0.000	0.00	0.00			Cohesionless
7	28	33	5	37.6	87.6	0.75		0.41	0.41	0.00	0.00			Cohesive
8	33	37	4	57.6	87.6	1.5		0.83	0.83	0.00	0.00	9.167325		Cohesive

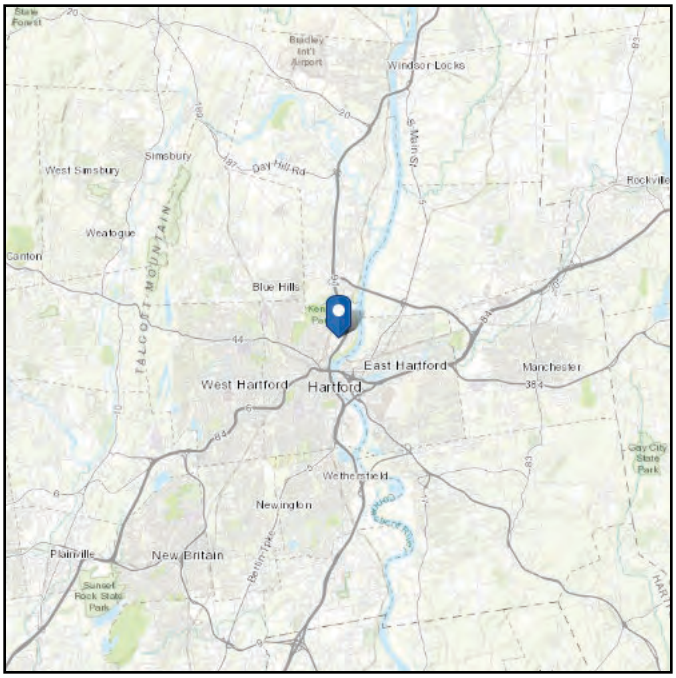
ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 10.46 ft (NAVD 88)
Latitude: 41.78675
Longitude: -72.662339





Wind

Results:

Wind Speed:	122 Vmph
10-year MRI	76 Vmph
25-year MRI	86 Vmph
50-year MRI	92 Vmph
100-year MRI	100 Vmph
Data Source:	ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, incorporating errata of March 12, 2014
Date Accessed:	Wed Jul 17 2019

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

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

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

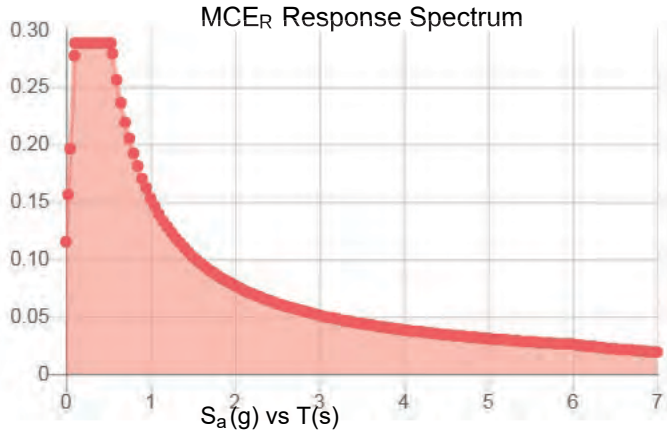
Seismic

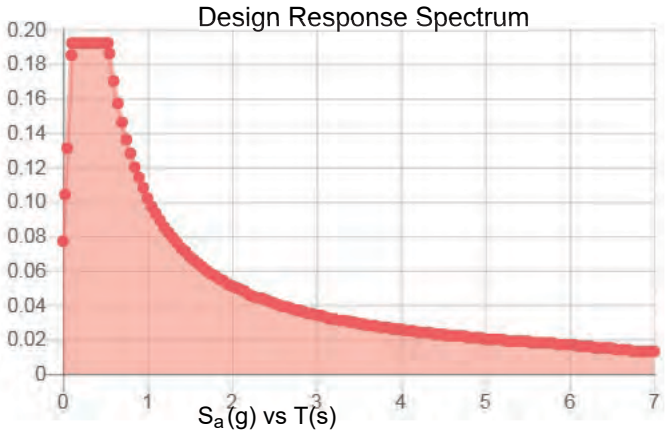
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.18	S_{DS} :	0.192
S_1 :	0.064	S_{D1} :	0.102
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.09
S_{MS} :	0.288	PGA_M :	0.145
S_{M1} :	0.153	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B





Data Accessed: Wed Jul 17 2019

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

Ice

Results:

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

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

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

Exhibit E

Mount Analysis

Date: June 5, 2020

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

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

Subject:	**Mount Analysis Report**	
Carrier Designation:	**T-Mobile Equipment Change-Out**	
	Carrier Site Number:	CT11062B
	Carrier Site Name:	Windsor/ I-91/ X35
Crown Castle Designation:	**Crown Castle BU Number:**	876325
	Crown Castle Site Name:	Weston Square
	Crown Castle JDE Job Number:	576711
	Crown Castle Order Number:	494411, Rev.0
Engineering Firm Designation:	**B+T Group Report Designation:**	136350.002.01
Site Data:	**92 Weston Street, Hartford, CT, Hartford, 06103-1217** **Latitude 41° 47' 12.30" Longitude -72° 39' 44.42"**	
Structure Information:	**Tower Height & Type:**	**110 ft. Monopole**
	Mount Elevation:	**76 ft.**
	Mount Type:	**12.5 ft. Platform Mount**

Dear Mr. Morrow,

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

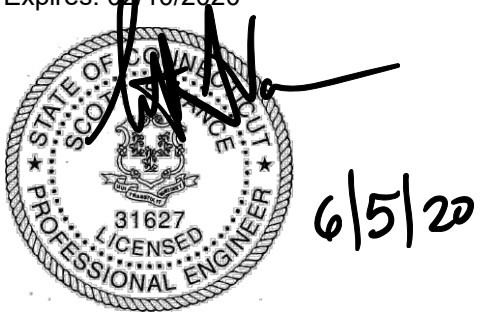
The purpose of the analysis is to determine acceptability of the mount's stress level. Based on our analysis we have determined the stress level to be:

Platform Mount **Sufficient**

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

Mount structural analysis prepared by: Suman Rana, E.I.T

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



6/5/20

Scott S. Vance, P.E.

TABLE OF CONTENTS

1) INTRODUCTION

This is a 12.5' Platform Mount, Mapped by B+T Group.

2) ANALYSIS CRITERIA

Building Code: 2018 CT Building Code (2015 IBC)
TIA-222 Revision: TIA-222-H
Risk Category: II
Ultimate Wind Speed: 125 mph
Exposure Category: C
Topographic Factor at Base: 1
Topographic Factor at Mount: 1
Ice Thickness: 2 in
Wind Speed with Ice: 50 mph
Seismic S_s: 0.18
Seismic S_1: 0.064
Live Loading Wind Speed: 30 mph
Man Live Load at Mid/End-Points: 250 lb.
Man Live Load at Mount Pipes: 500 lb.

Table 1 - Proposed Equipment Configuration

Mount Centerline (ft.)	Antenna Centerline (ft.)	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount / Modification Details
76	76	3	Ericsson	AIR 32 B2A/B66AA	12.5' Platform Mount
		3	RFS/Celwave	APXVAARR24_43-U-NA20	
		3	Ericsson	AIR 21 B2A B4P	
		3	Ericsson	KRY 112 144/1	
		3	Ericsson	RADIO 4449 B12/B71	

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
CCI Order	Existing Loading Proposed Loading	Date: 05/30/2019	Crown Castle
Mount Mapping	B+T Group	Date: 06/24/2019	On File

3.1) Analysis Method

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

A tool internally developed by B+T Group, was used to calculate wind loading on all appurtenances, dishes and mount members for various loading cases. Selected output from the analysis is included in Appendix B "Software Input Calculations".

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

3.2) Assumptions

1. The mount was properly fabricated and installed in accordance with its original design and manufacturer's specifications.
2. The mount has been maintained in accordance with the manufacturer's specifications and is free of damage.
3. The configuration of antennas, mounts, and other appurtenances are as specified in Table-1.
4. All mount components have been assumed to be in sufficient condition to carry their full design capacity for the analysis.
5. Mount areas and weights are determined from field measurements, standard material properties, and/or manufacturer product data.
6. Serviceability with respect to antenna twist, tilt, roll or lateral translation is not checked and is left to the carrier or tower owner to ensure conformance.
7. All prior structural modifications, if any are assumed to be correctly installed and fully effective.
8. All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
9. The analysis will be required to be revised if the existing conditions in the field differ from those shown in the above-referenced documents or assumed in this analysis. No allowance was made for any damaged, missing, or rusted members.
10. The following material grades were assumed (Unless Noted Otherwise):
    (a) Connection Bolts : ASTM A325
    (b) Steel Pipe : ASTM A53 (GR. 35)
    (c) HSS (Round) : ASTM 500 (GR. B-42)
    (d) HSS (Rectangular) : ASTM 500 (GR. B-46)
    (e) Channel : ASTM A36 (GR. 36)
    (f) Steel Solid Rod : ASTM A36 (GR. 36)
    (g) Steel Plate : ASTM A36 (GR. 36)
    (h) Steel Angle : ASTM A36 (GR. 36)
    (i) UNISTRUT : ASTM A570 (GR. 33)

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

4) ANALYSIS RESULTS

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

Notes	Component	Critical Member	Centerline (ft.)	% Capacity	Pass / Fail
1,2	Main Horizontals	M32	76	22.5	Pass
	Support Tubes	M35	76	46.7	Pass
	Support Angles	M80	76	21.4	Pass
	Connection Plates	M48	76	53.4	Pass
	Mount Pipes	M71	76	49.1	Pass

Structure Rating (max from all components) =	53.4%

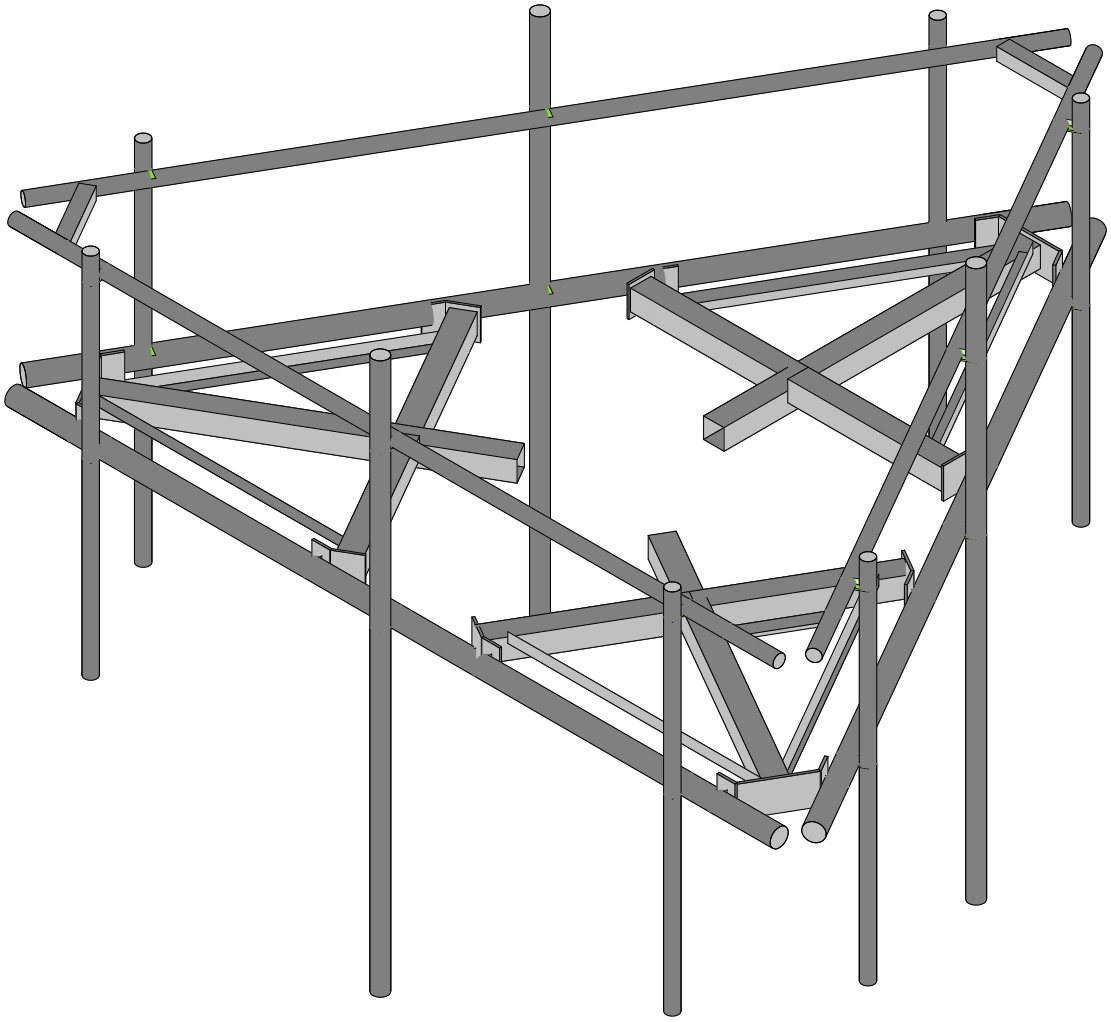
Notes:
1) See additional documentation in "Appendix C - Software Analysis Output" for calculations supporting the % capacity consumed.
2) All sectors are typical

4.1) Recommendations

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

APPENDIX A

WIRE FRAME AND RENDERED MODELS



Envelope Only Solution

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SR		June 25, 2019 at 10:49 AM
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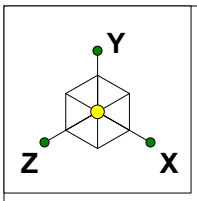

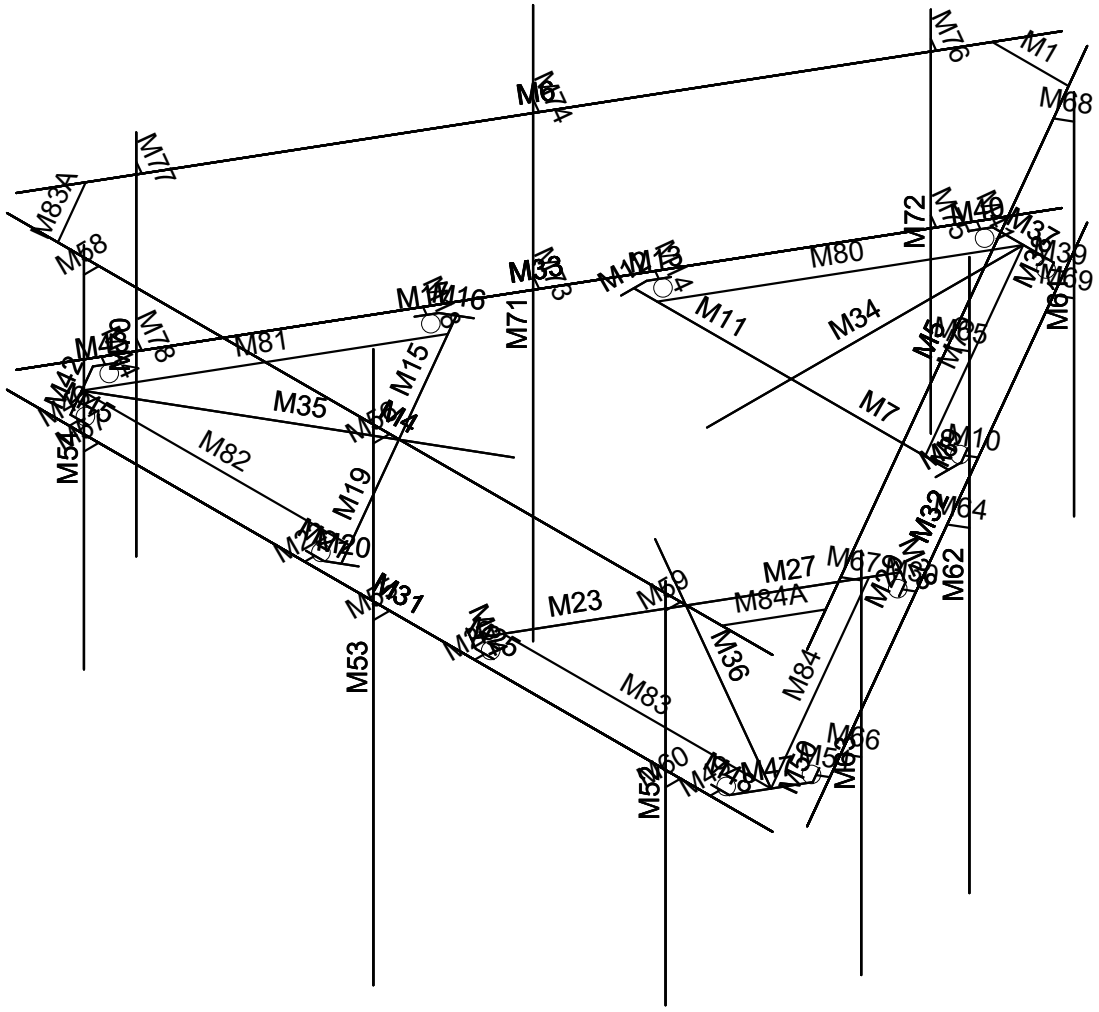

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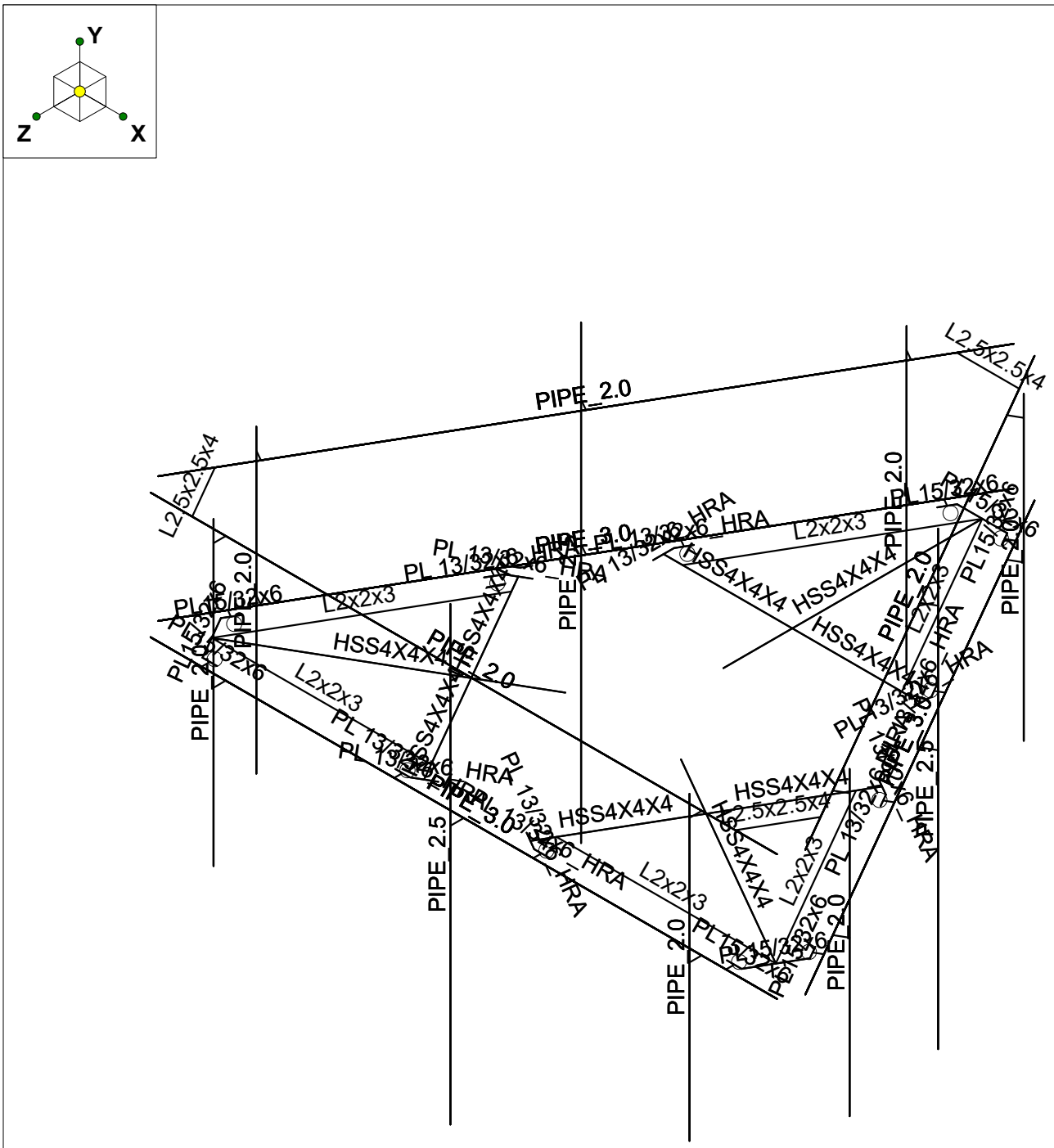

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SR		June 25, 2019 at 10:49 AM
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APPENDIX B

SOFTWARE INPUT CALCULATIONS

PROJECT	**136350.002.01 - WESTON SQ**		**SR**
SUBJECT	**Platform Mount Mount Analysis**		
DATE	**06/05/20**	PAGE	OF

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

Manufacturer	Model	Qty	Aspect Ratio	C_a flat/round	EPA_N*K_a (ft^2)	EPA_T*K_a (ft^2)	$EPA_{N\text{-}Ice}*K_a$ (ft^2)	$EPA_{T\text{-}Ice}*K_a$ (ft^2)	$F_{A\ No\ Ice\ (N)}$	$F_{A\ No\ Ice\ (T)}$	$F_{A\ Ice\ (N)}$	$F_{A\ Ice\ (T)}$
Ericsson	AIR 21 B2A B4P	0.5	4.63	1.29	2.12	1.38	3.10	2.30	0.12	0.09	0.02	0.01
Ericsson	AIR 21 B2A B4P	0.5	4.63	1.29	2.12	1.38	3.10	2.30	0.12	0.09	0.02	0.01
Ericsson	KRY 112 144/1	1	1.17	1.20	0.26	0.13	0.73	0.52	0.01	0.01	0.00	0.00
RFS/CELWAVE	APXVAARR24_43-U-NA20	0.5	4.00	1.27	7.19	2.61	8.88	4.09	0.41	0.18	0.07	0.03
RFS/CELWAVE	APXVAARR24_43-U-NA20	0.5	4.00	1.27	7.19	2.61	8.88	4.09	0.41	0.18	0.07	0.03
Ericsson	RADIO 4449 B12/B71	1	1.13	1.20	1.23	0.86	2.12	1.64	0.07	0.05	0.01	0.01
Ericsson	AIR 32 B2A/B66AA	0.5	4.39	1.28	2.28	1.54	3.29	2.49	0.13	0.10	0.02	0.02
Ericsson	AIR 32 B2A/B66AA	0.5	4.39	1.28	2.28	1.54	3.29	2.49	0.13	0.10	0.02	0.02
Ericsson	AIR 21 B2A B4P	0.5	4.63	1.29	2.12	1.38	3.10	2.30	0.12	0.09	0.02	0.01
Ericsson	AIR 21 B2A B4P	0.5	4.63	1.29	2.12	1.38	3.10	2.30	0.12	0.09	0.02	0.01
Ericsson	KRY 112 144/1	1	1.17	1.20	0.26	0.13	0.73	0.52	0.01	0.01	0.00	0.00
RFS/CELWAVE	APXVAARR24_43-U-NA20	0.5	4.00	1.27	7.19	2.61	8.88	4.09	0.41	0.18	0.07	0.03
RFS/CELWAVE	APXVAARR24_43-U-NA20	0.5	4.00	1.27	7.19	2.61	8.88	4.09	0.41	0.18	0.07	0.03
Ericsson	RADIO 4449 B12/B71	1	1.13	1.20	1.23	0.86	2.12	1.64	0.07	0.05	0.01	0.01
Ericsson	AIR 32 B2A/B66AA	0.5	4.39	1.28	2.28	1.54	3.29	2.49	0.13	0.10	0.02	0.02
Ericsson	AIR 32 B2A/B66AA	0.5	4.39	1.28	2.28	1.54	3.29	2.49	0.13	0.10	0.02	0.02

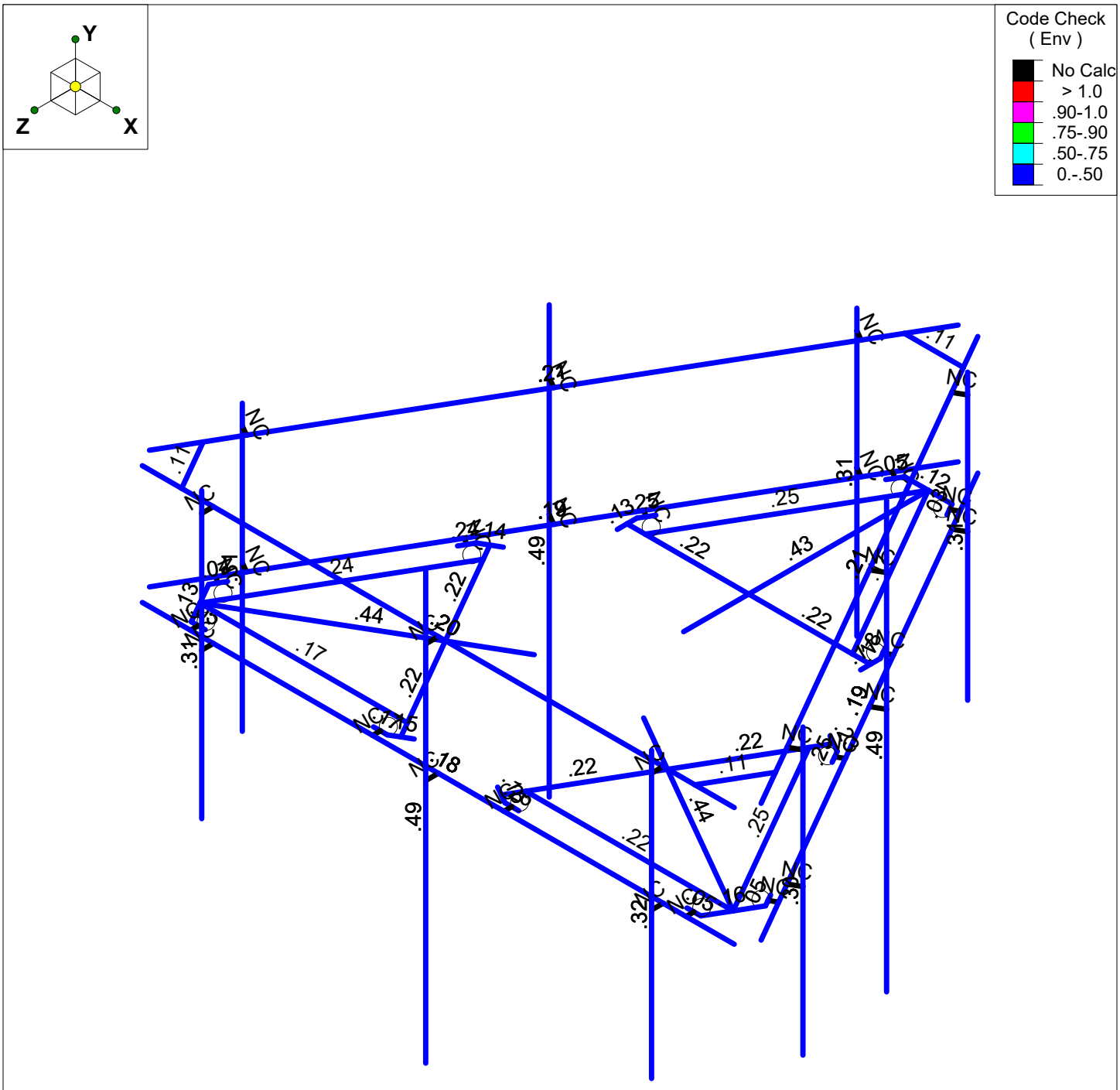
PROJECT	**136350.002.01 - WESTON SQ**		**SR**
SUBJECT	**Platform Mount Mount Analysis**		
DATE	**06/05/20**	PAGE	OF

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

Manufacturer	Model	Qty	Aspect Ratio	C_a flat/round	EPA_N*K_a (ft^2)	EPA_T*K_a (ft^2)	$EPA_{N\text{-}Ice}*K_a$ (ft^2)	$EPA_{T\text{-}Ice}*K_a$ (ft^2)	$F_{A\ No\ Ice\ (N)}$	$F_{A\ No\ Ice\ (T)}$	$F_{A\ Ice\ (N)}$	$F_{A\ Ice\ (T)}$
Ericsson	AIR 21 B2A B4P	0.5	4.63	1.29	2.12	1.38	3.10	2.30	0.00	0.09	0.02	0.01
Ericsson	AIR 21 B2A B4P	0.5	4.63	1.29	2.12	1.38	3.10	2.30	0.00	0.09	0.02	0.01
Ericsson	KRY 112 144/1	1	1.17	1.20	0.26	0.13	0.73	0.52	0.00	0.01	0.00	0.00
RFS/CELWAVE	APXVAARR24_43-U-NA20	0.5	4.00	1.27	7.19	2.61	8.88	4.09	0.00	0.18	0.07	0.03
RFS/CELWAVE	APXVAARR24_43-U-NA20	0.5	4.00	1.27	7.19	2.61	8.88	4.09	0.00	0.18	0.07	0.03
Ericsson	RADIO 4449 B12/B71	1	1.13	1.20	1.23	0.86	2.12	1.64	0.00	0.05	0.01	0.01
Ericsson	AIR 32 B2A/B66AA	0.5	4.39	1.28	2.28	1.54	3.29	2.49	0.00	0.10	0.02	0.02
Ericsson	AIR 32 B2A/B66AA	0.5	4.39	1.28	2.28	1.54	3.29	2.49	0.00	0.10	0.02	0.02

APPENDIX C

SOFTWARE ANALYSIS OUTPUT



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

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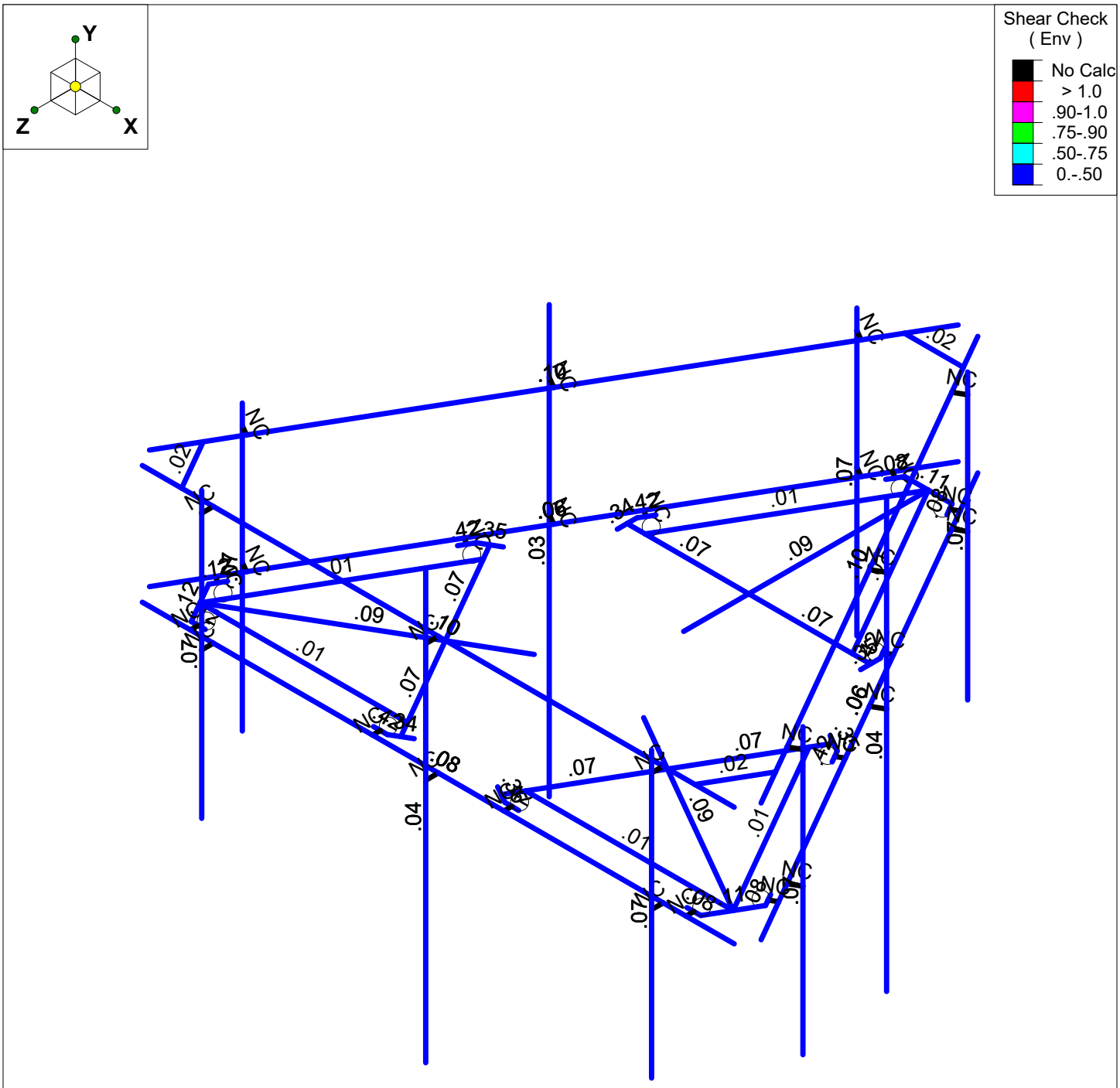

Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

B+T Group	876325 - Weston Square	SK - 5
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Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Handrail	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
2	MF-H1	PIPE_3.0	Beam	Pipe	A53 Gr.B	Typical	2.07	2.85	2.85	5.69
3	F1-ST1	HSS4X4X4	Beam	Tube	A500 Gr.B R...	Typical	3.37	7.8	7.8	12.8
4	F1-CA1	L2x2x3	Beam	Single Angle	A36 Gr.36	Typical	.722	.271	.271	.009
5	F1-C1	PL15/32x6	Beam	RECT	A36 Gr.36	Typical	2.813	.051	8.438	.196
6	MF-P1	PIPE_2.0	Column	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
7	MF-P2	PIPE_2.5	Column	Pipe	A53 Gr.B	Typical	1.61	1.45	1.45	2.89
8	F1-CA2	L2.5x2.5x4	Beam	Single Angle	A36 Gr.36	Typical	1.19	.692	.692	.026
9	F1-C2	PL 13/32x6_HRA	Beam	RECT	A36 Gr.36	Typical	2.438	.034	7.313	.128

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N149	N150		180	F1-CA2	Beam	Single Angle	A36 Gr.36	Typical
2	M4	N8	N9			Handrail	Beam	Pipe	A53 Gr.B	Typical
3	M5	N10	N11			Handrail	Beam	Pipe	A53 Gr.B	Typical
4	M6	N12	N13			Handrail	Beam	Pipe	A53 Gr.B	Typical
5	M7	N20	N14			F1-ST1	Beam	Tube	A500 Gr.B...	Typical
6	M8	N17	N15			F1-C2	Beam	RECT	A36 Gr.36	Typical
7	M9	N16	N17			F1-C2	Beam	RECT	A36 Gr.36	Typical
8	M10	N18	N19			RIGID	None	None	RIGID	Typical
9	M11	N20	N21			F1-ST1	Beam	Tube	A500 Gr.B...	Typical
10	M12	N24	N22			F1-C2	Beam	RECT	A36 Gr.36	Typical
11	M13	N23	N24			F1-C2	Beam	RECT	A36 Gr.36	Typical
12	M14	N25	N26			RIGID	None	None	RIGID	Typical
13	M15	N33	N27			F1-ST1	Beam	Tube	A500 Gr.B...	Typical
14	M16	N30	N28			F1-C2	Beam	RECT	A36 Gr.36	Typical
15	M17	N29	N30			F1-C2	Beam	RECT	A36 Gr.36	Typical
16	M18	N31	N32			RIGID	None	None	RIGID	Typical
17	M19	N33	N34			F1-ST1	Beam	Tube	A500 Gr.B...	Typical
18	M20	N37	N35			F1-C2	Beam	RECT	A36 Gr.36	Typical
19	M21	N36	N37			F1-C2	Beam	RECT	A36 Gr.36	Typical
20	M22	N38	N39			RIGID	None	None	RIGID	Typical
21	M23	N46	N40			F1-ST1	Beam	Tube	A500 Gr.B...	Typical
22	M24	N43	N41			F1-C2	Beam	RECT	A36 Gr.36	Typical
23	M25	N42	N43			F1-C2	Beam	RECT	A36 Gr.36	Typical
24	M26	N44	N45			RIGID	None	None	RIGID	Typical
25	M27	N46	N47			F1-ST1	Beam	Tube	A500 Gr.B...	Typical
26	M28	N50	N48			F1-C2	Beam	RECT	A36 Gr.36	Typical
27	M29	N49	N50			F1-C2	Beam	RECT	A36 Gr.36	Typical
28	M30	N51	N52			RIGID	None	None	RIGID	Typical
29	M31	N53	N54			MF-H1	Beam	Pipe	A53 Gr.B	Typical
30	M32	N55	N56			MF-H1	Beam	Pipe	A53 Gr.B	Typical
31	M33	N57	N58			MF-H1	Beam	Pipe	A53 Gr.B	Typical
32	M34	N59	N141			F1-ST1	Beam	Tube	A500 Gr.B...	Typical
33	M35	N60	N144			F1-ST1	Beam	Tube	A500 Gr.B...	Typical
34	M36	N61	N147			F1-ST1	Beam	Tube	A500 Gr.B...	Typical
35	M37	N66	N62			F1-C1	Beam	RECT	A36 Gr.36	Typical
36	M38	N62	N63			F1-C1	Beam	RECT	A36 Gr.36	Typical
37	M39	N64	N65			RIGID	None	None	RIGID	Typical
38	M40	N66	N67			F1-C1	Beam	RECT	A36 Gr.36	Typical
39	M41	N68	N69			RIGID	None	None	RIGID	Typical
40	M42	N74	N70			F1-C1	Beam	RECT	A36 Gr.36	Typical
41	M43	N70	N71			F1-C1	Beam	RECT	A36 Gr.36	Typical
42	M44	N72	N73			RIGID	None	None	RIGID	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
43	M45	N74	N75			F1-C1	Beam	RECT	A36 Gr.36	Typical
44	M46	N76	N77			RIGID	None	None	RIGID	Typical
45	M47	N82	N78			F1-C1	Beam	RECT	A36 Gr.36	Typical
46	M48	N78	N79			F1-C1	Beam	RECT	A36 Gr.36	Typical
47	M49	N80	N81			RIGID	None	None	RIGID	Typical
48	M50	N82	N83			F1-C1	Beam	RECT	A36 Gr.36	Typical
49	M51	N84	N85			RIGID	None	None	RIGID	Typical
50	M52	N86	N87			MF-P1	Column	Pipe	A53 Gr.B	Typical
51	M53	N88	N89			MF-P2	Column	Pipe	A53 Gr.B	Typical
52	M54	N90	N91			MF-P1	Column	Pipe	A53 Gr.B	Typical
53	M55	N92	N93			RIGID	None	None	RIGID	Typical
54	M56	N94	N95			RIGID	None	None	RIGID	Typical
55	M57	N96	N97			RIGID	None	None	RIGID	Typical
56	M58	N98	N99			RIGID	None	None	RIGID	Typical
57	M59	N100	N101			RIGID	None	None	RIGID	Typical
58	M60	N102	N103			RIGID	None	None	RIGID	Typical
59	M61	N104	N105			MF-P1	Column	Pipe	A53 Gr.B	Typical
60	M62	N106	N107			MF-P2	Column	Pipe	A53 Gr.B	Typical
61	M63	N108	N109			MF-P1	Column	Pipe	A53 Gr.B	Typical
62	M64	N110	N111			RIGID	None	None	RIGID	Typical
63	M65	N112	N113			RIGID	None	None	RIGID	Typical
64	M66	N114	N115			RIGID	None	None	RIGID	Typical
65	M67	N116	N117			RIGID	None	None	RIGID	Typical
66	M68	N118	N119			RIGID	None	None	RIGID	Typical
67	M69	N120	N121			RIGID	None	None	RIGID	Typical
68	M70	N122	N123			MF-P1	Column	Pipe	A53 Gr.B	Typical
69	M71	N124	N125			MF-P2	Column	Pipe	A53 Gr.B	Typical
70	M72	N126	N127			MF-P1	Column	Pipe	A53 Gr.B	Typical
71	M73	N128	N129			RIGID	None	None	RIGID	Typical
72	M74	N130	N131			RIGID	None	None	RIGID	Typical
73	M75	N132	N133			RIGID	None	None	RIGID	Typical
74	M76	N134	N135			RIGID	None	None	RIGID	Typical
75	M77	N136	N137			RIGID	None	None	RIGID	Typical
76	M78	N138	N139			RIGID	None	None	RIGID	Typical
77	M79	N141	N140			F1-CA1	Beam	Single Angle	A36 Gr.36	Typical
78	M80	N141	N142		270	F1-CA1	Beam	Single Angle	A36 Gr.36	Typical
79	M81	N144	N143			F1-CA1	Beam	Single Angle	A36 Gr.36	Typical
80	M82	N144	N145		270	F1-CA1	Beam	Single Angle	A36 Gr.36	Typical
81	M83	N147	N146			F1-CA1	Beam	Single Angle	A36 Gr.36	Typical
82	M84	N147	N148		270	F1-CA1	Beam	Single Angle	A36 Gr.36	Typical
83	M83A	N145A	N146A		180	F1-CA2	Beam	Single Angle	A36 Gr.36	Typical
84	M84A	N147A	N148A		180	F1-CA2	Beam	Single Angle	A36 Gr.36	Typical

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Grav...	Joint	Point	Distribut...	Area(Me...	Surface(...
1	Dead	DL		-1			45		3	
2	0 Wind - No Ice	WLZ					45	54		
3	90 Wind - No Ice	WLX					45	54		
4	0 Wind - Ice	WLZ					45	54		
5	90 Wind - Ice	WLX					45	54		
6	0 Wind - Service	WLZ					45	54		
7	90 Wind - Service	WLX					45	54		
8	Ice	OL1					45	54	3	
9	Live Load a	LL				1				
10	Live Load b	LL				1				

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Grav...	Joint	Point	Distribut...	Area(Me...	Surface(...
11	Live Load c	LL				1				
12	Live Load d	LL								
13	Maint LL 1	LL					1			
14	Maint LL 2	LL					1			
15	Maint LL 3	LL					1			
16	Maint LL 4	LL					1			
17	Maint LL 5	LL					1			
18	Maint LL 6	LL					1			
19	Maint LL 7	LL					1			
20	Maint LL 8	LL					1			
21	Maint LL 9	LL					1			
22	Maint LL 10	LL					1			
23	Maint LL 11	LL					1			
24	Maint LL 12	LL					1			
25	Maint LL 13	LL					1			
26	Maint LL 14	LL					1			
27	Maint LL 15	LL					1			
28	Maint LL 16	LL								
29	Maint LL 17	LL								
30	Maint LL 18	LL								
31	BLC 1 Transient Ar...	None						21		
32	BLC 8 Transient Ar...	None						21		

Load Combinations

	Description	S...	PDelta	S...	B...	Factor	B...	F...	B...	F...	B...	F...	B...	F...	B...	F...	B...	F...	B...	F...	B...	F...	B...	F...	B...	F...
1	1.4 Dead	Y...	Y		1	1.4																				
2	1.2 D + 1.0 - 0 W	Y...	Y		1	1.2	2	1																		
3	1.2 D + 1.0 - 30 W	Y...	Y		1	1.2	2	.8...	3	.5																
4	1.2 D + 1.0 - 60 W	Y...	Y		1	1.2	3	.8...	2	.5																
5	1.2 D + 1.0 - 90 W	Y...	Y		1	1.2	3	1																		
6	1.2 D + 1.0 - 120 W	Y...	Y		1	1.2	3	.8...	2	-.5																
7	1.2 D + 1.0 - 150 W	Y...	Y		1	1.2	2	-....	3	.5																
8	1.2 D + 1.0 - 180 W	Y...	Y		1	1.2	2	-1																		
9	1.2 D + 1.0 - 210 W	Y...	Y		1	1.2	2	-....	3	-.5																
10	1.2 D + 1.0 - 240 W	Y...	Y		1	1.2	3	-....	2	-.5																
11	1.2 D + 1.0 - 270 W	Y...	Y		1	1.2	3	-1																		
12	1.2 D + 1.0 - 300 W	Y...	Y		1	1.2	3	-....	2	.5																
13	1.2 D + 1.0 - 330 W	Y...	Y		1	1.2	2	.8...	3	-.5																
14	1.2 D + 1.0 - 0 W/Ice	Y...	Y		1	1.2	4	1			8	1														
15	1.2 D + 1.0 - 30 W/Ice	Y...	Y		1	1.2	4	.8...	5	.5	8	1														
16	1.2 D + 1.0 - 60 W/Ice	Y...	Y		1	1.2	5	.8...	4	.5	8	1														
17	1.2 D + 1.0 - 90 W/Ice	Y...	Y		1	1.2	5	1			8	1														
18	1.2 D + 1.0 - 120 W/Ice	Y...	Y		1	1.2	5	.8...	4	-.5	8	1														
19	1.2 D + 1.0 - 150 W/Ice	Y...	Y		1	1.2	4	-....	5	.5	8	1														
20	1.2 D + 1.0 - 180 W/Ice	Y...	Y		1	1.2	4	-1			8	1														
21	1.2 D + 1.0 - 210 W/Ice	Y...	Y		1	1.2	4	-....	5	-.5	8	1														
22	1.2 D + 1.0 - 240 W/Ice	Y...	Y		1	1.2	5	-....	4	-.5	8	1														
23	1.2 D + 1.0 - 270 W/Ice	Y...	Y		1	1.2	5	-1			8	1														
24	1.2 D + 1.0 - 300 W/Ice	Y...	Y		1	1.2	5	-....	4	.5	8	1														
25	1.2 D + 1.0 - 330 W/Ice	Y...	Y		1	1.2	4	.8...	5	-.5	8	1														
26	1.2 D + 1.5 LL a + Service - 0 W	Y...	Y		1	1.2	6	1			9	1.5														
27	1.2 D + 1.5 LL a + Service - 30 W	Y...	Y		1	1.2	6	.8...	7	.5	9	1.5														
28	1.2 D + 1.5 LL a + Service - 60 W	Y...	Y		1	1.2	7	.8...	6	.5	9	1.5														
29	1.2 D + 1.5 LL a + Service - 90 W	Y...	Y		1	1.2	7	1			9	1.5														
30	1.2 D + 1.5 LL a + Service - 120 W	Y...	Y		1	1.2	7	.8...	6	-.5	9	1.5														

Load Combinations (Continued)

	Description	S...	PDelta	S..	B..	Factor	B...	F...	B...	F...	B...	F...	B...	F...	B...	F...	B...	F...	B...	F...	B...	F...	B...	F...	B...	F...
31	1.2 D + 1.5 LL a + Service - 150 W	Y...	Y		1	1.2	6	-....	7	.5	9	1.5														
32	1.2 D + 1.5 LL a + Service - 180 W	Y...	Y		1	1.2	6	-1			9	1.5														
33	1.2 D + 1.5 LL a + Service - 210 W	Y...	Y		1	1.2	6	-....	7	-.5	9	1.5														
34	1.2 D + 1.5 LL a + Service - 240 W	Y...	Y		1	1.2	7	-....	6	-.5	9	1.5														
35	1.2 D + 1.5 LL a + Service - 270 W	Y...	Y		1	1.2	7	-1			9	1.5														
36	1.2 D + 1.5 LL a + Service - 300 W	Y...	Y		1	1.2	7	-....	6	.5	9	1.5														
37	1.2 D + 1.5 LL a + Service - 330 W	Y...	Y		1	1.2	6	.8...	7	-.5	9	1.5														
38	1.2 D + 1.5 LL b + Service - 0 W	Y...	Y		1	1.2	6	1			10	1.5														
39	1.2 D + 1.5 LL b + Service - 30 W	Y...	Y		1	1.2	6	.8...	7	.5	10	1.5														
40	1.2 D + 1.5 LL b + Service - 60 W	Y...	Y		1	1.2	7	.8...	6	.5	10	1.5														
41	1.2 D + 1.5 LL b + Service - 90 W	Y...	Y		1	1.2	7	1			10	1.5														
42	1.2 D + 1.5 LL b + Service - 120 W	Y...	Y		1	1.2	7	.8...	6	-.5	10	1.5														
43	1.2 D + 1.5 LL b + Service - 150 W	Y...	Y		1	1.2	6	-....	7	.5	10	1.5														
44	1.2 D + 1.5 LL b + Service - 180 W	Y...	Y		1	1.2	6	-1			10	1.5														
45	1.2 D + 1.5 LL b + Service - 210 W	Y...	Y		1	1.2	6	-....	7	-.5	10	1.5														
46	1.2 D + 1.5 LL b + Service - 240 W	Y...	Y		1	1.2	7	-....	6	-.5	10	1.5														
47	1.2 D + 1.5 LL b + Service - 270 W	Y...	Y		1	1.2	7	-1			10	1.5														
48	1.2 D + 1.5 LL b + Service - 300 W	Y...	Y		1	1.2	7	-....	6	.5	10	1.5														
49	1.2 D + 1.5 LL b + Service - 330 W	Y...	Y		1	1.2	6	.8...	7	-.5	10	1.5														
50	1.2 D + 1.5 LL c + Service - 0 W	Y...	Y		1	1.2	6	1			11	1.5														
51	1.2 D + 1.5 LL c + Service - 30 W	Y...	Y		1	1.2	6	.8...	7	.5	11	1.5														
52	1.2 D + 1.5 LL c + Service - 60 W	Y...	Y		1	1.2	7	.8...	6	.5	11	1.5														
53	1.2 D + 1.5 LL c + Service - 90 W	Y...	Y		1	1.2	7	1			11	1.5														
54	1.2 D + 1.5 LL c + Service - 120 W	Y...	Y		1	1.2	7	.8...	6	-.5	11	1.5														
55	1.2 D + 1.5 LL c + Service - 150 W	Y...	Y		1	1.2	6	-....	7	.5	11	1.5														
56	1.2 D + 1.5 LL c + Service - 180 W	Y...	Y		1	1.2	6	-1			11	1.5														
57	1.2 D + 1.5 LL c + Service - 210 W	Y...	Y		1	1.2	6	-....	7	-.5	11	1.5														
58	1.2 D + 1.5 LL c + Service - 240 W	Y...	Y		1	1.2	7	-....	6	-.5	11	1.5														
59	1.2 D + 1.5 LL c + Service - 270 W	Y...	Y		1	1.2	7	-1			11	1.5														
60	1.2 D + 1.5 LL c + Service - 300 W	Y...	Y		1	1.2	7	-....	6	.5	11	1.5														
61	1.2 D + 1.5 LL c + Service - 330 W	Y...	Y		1	1.2	6	.8...	7	-.5	11	1.5														
62	1.2 D + 1.5 LL d + Service - 0 W	Y...	Y		1	1.2	6	1			12	1.5														
63	1.2 D + 1.5 LL d + Service - 30 W	Y...	Y		1	1.2	6	.8...	7	.5	12	1.5														
64	1.2 D + 1.5 LL d + Service - 60 W	Y...	Y		1	1.2	7	.8...	6	.5	12	1.5														
65	1.2 D + 1.5 LL d + Service - 90 W	Y...	Y		1	1.2	7	1			12	1.5														
66	1.2 D + 1.5 LL d + Service - 120 W	Y...	Y		1	1.2	7	.8...	6	-.5	12	1.5														
67	1.2 D + 1.5 LL d + Service - 150 W	Y...	Y		1	1.2	6	-....	7	.5	12	1.5														
68	1.2 D + 1.5 LL d + Service - 180 W	Y...	Y		1	1.2	6	-1			12	1.5														
69	1.2 D + 1.5 LL d + Service - 210 W	Y...	Y		1	1.2	6	-....	7	-.5	12	1.5														
70	1.2 D + 1.5 LL d + Service - 240 W	Y...	Y		1	1.2	7	-....	6	-.5	12	1.5														
71	1.2 D + 1.5 LL d + Service - 270 W	Y...	Y		1	1.2	7	-1			12	1.5														
72	1.2 D + 1.5 LL d + Service - 300 W	Y...	Y		1	1.2	7	-....	6	.5	12	1.5														
73	1.2 D + 1.5 LL d + Service - 330 W	Y...	Y		1	1.2	6	.8...	7	-.5	12	1.5														
74	1.2 D + 1.5 LL Maint (1)	Y...	Y		1	1.2					13	1.5														
75	1.2 D + 1.5 LL Maint (2)	Y...	Y		1	1.2					14	1.5														
76	1.2 D + 1.5 LL Maint (3)	Y...	Y		1	1.2					15	1.5														
77	1.2 D + 1.5 LL Maint (4)	Y...	Y		1	1.2					16	1.5														
78	1.2 D + 1.5 LL Maint (5)	Y...	Y		1	1.2					17	1.5														
79	1.2 D + 1.5 LL Maint (6)	Y...	Y		1	1.2					18	1.5														
80	1.2 D + 1.5 LL Maint (7)	Y...	Y		1	1.2					19	1.5														
81	1.2 D + 1.5 LL Maint (8)	Y...	Y		1	1.2					20	1.5														
82	1.2 D + 1.5 LL Maint (9)	Y...	Y		1	1.2					21	1.5														
83	1.2 D + 1.5 LL Maint (10)	Y...	Y		1	1.2					22	1.5														
84	1.2 D + 1.5 LL Maint (11)	Y...	Y		1	1.2					23	1.5														
85	1.2 D + 1.5 LL Maint (12)	Y...	Y		1	1.2					24	1.5														
86	1.2 D + 1.5 LL Maint (13)	Y...	Y		1	1.2					25	1.5														
87	1.2 D + 1.5 LL Maint (14)	Y...	Y		1	1.2					26	1.5														

Load Combinations (Continued)

	Description	S...	PDelta	S...	B...	Factor	B...F...	B...F...	B...F...	B...F...	B...F...	B...F...	B...F...	B...F...	B...F...	B...F...	B...F...	B...F...	B...F...	B...F...	B...F...	B...F...
88	1.2 D + 1.5 LL Maint (15)	Y...	Y		1	1.2					27	1.5										
89	1.2 D + 1.5 LL Maint (16)	Y...	Y		1	1.2					28	1.5										
90	1.2 D + 1.5 LL Maint (17)	Y...	Y		1	1.2					29	1.5										
91	1.2 D + 1.5 LL Maint (18)	Y...	Y		1	1.2					30	1.5										

Member Point Loads (BLC 1 : Dead)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M52	Y	-.046	%20
2	M52	Y	-.046	%90
3	M52	Y	-.011	%30
4	M52	Y	0	0
5	M52	Y	0	0
6	M53	Y	-.064	%5
7	M53	Y	-.064	%90
8	M53	Y	-.075	%30
9	M53	Y	0	0
10	M53	Y	0	0
11	M54	Y	-.066	%20
12	M54	Y	-.066	%75
13	M54	Y	0	0
14	M54	Y	0	0
15	M54	Y	0	0
16	M70	Y	-.046	%20
17	M70	Y	-.046	%90
18	M70	Y	-.011	%30
19	M70	Y	0	0
20	M70	Y	0	0
21	M71	Y	-.064	%5
22	M71	Y	-.064	%90
23	M71	Y	-.075	%30
24	M71	Y	0	0
25	M71	Y	0	0
26	M72	Y	-.066	%20
27	M72	Y	-.066	%75
28	M72	Y	0	0
29	M72	Y	0	0
30	M72	Y	0	0
31	M61	Y	-.046	%20
32	M61	Y	-.046	%90
33	M61	Y	-.011	%30
34	M61	Y	0	0
35	M61	Y	0	0
36	M62	Y	-.064	%5
37	M62	Y	-.064	%90
38	M62	Y	-.075	%30
39	M62	Y	0	0
40	M62	Y	0	0
41	M63	Y	-.066	%20
42	M63	Y	-.066	%75
43	M63	Y	0	0
44	M63	Y	0	0
45	M63	Y	0	0

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

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

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M52	Z	-.124	%20
2	M52	Z	-.124	%90
3	M52	Z	-.014	%30
4	M52	Z	0	0
5	M52	Z	0	0
6	M53	Z	-.413	%5
7	M53	Z	-.413	%90
8	M53	Z	-.067	%30
9	M53	Z	0	0
10	M53	Z	0	0
11	M54	Z	-.133	%20
12	M54	Z	-.133	%75
13	M54	Z	0	0
14	M54	Z	0	0
15	M54	Z	0	0
16	M70	Z	-.124	%20
17	M70	Z	-.124	%90
18	M70	Z	-.014	%30
19	M70	Z	0	0
20	M70	Z	0	0
21	M71	Z	-.413	%5
22	M71	Z	-.413	%90
23	M71	Z	-.067	%30
24	M71	Z	0	0
25	M71	Z	0	0
26	M72	Z	-.133	%20
27	M72	Z	-.133	%75
28	M72	Z	0	0
29	M72	Z	0	0
30	M72	Z	0	0
31	M61	Z	-.124	%20
32	M61	Z	-.124	%90
33	M61	Z	-.014	%30
34	M61	Z	0	0
35	M61	Z	0	0
36	M62	Z	-.413	%5
37	M62	Z	-.413	%90
38	M62	Z	-.067	%30
39	M62	Z	0	0
40	M62	Z	0	0
41	M63	Z	-.133	%20
42	M63	Z	-.133	%75
43	M63	Z	0	0
44	M63	Z	0	0
45	M63	Z	0	0

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M52	X	-.088	%20
2	M52	X	-.088	%90
3	M52	X	-.007	%30
4	M52	X	0	0
5	M52	X	0	0
6	M53	X	-.181	%5
7	M53	X	-.181	%90
8	M53	X	-.047	%30

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
9	M53	X	0	0
10	M53	X	0	0
11	M54	X	-.096	%20
12	M54	X	-.096	%75
13	M54	X	0	0
14	M54	X	0	0
15	M54	X	0	0
16	M70	X	-.088	%20
17	M70	X	-.088	%90
18	M70	X	-.007	%30
19	M70	X	0	0
20	M70	X	0	0
21	M71	X	-.181	%5
22	M71	X	-.181	%90
23	M71	X	-.047	%30
24	M71	X	0	0
25	M71	X	0	0
26	M72	X	-.096	%20
27	M72	X	-.096	%75
28	M72	X	0	0
29	M72	X	0	0
30	M72	X	0	0
31	M61	X	-.088	%20
32	M61	X	-.088	%90
33	M61	X	-.007	%30
34	M61	X	0	0
35	M61	X	0	0
36	M62	X	-.181	%5
37	M62	X	-.181	%90
38	M62	X	-.047	%30
39	M62	X	0	0
40	M62	X	0	0
41	M63	X	-.096	%20
42	M63	X	-.096	%75
43	M63	X	0	0
44	M63	X	0	0
45	M63	X	0	0

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M52	Z	-.02	%20
2	M52	Z	-.02	%90
3	M52	Z	-.002	%30
4	M52	Z	0	0
5	M52	Z	0	0
6	M53	Z	-.066	%5
7	M53	Z	-.066	%90
8	M53	Z	-.011	%30
9	M53	Z	0	0
10	M53	Z	0	0
11	M54	Z	-.021	%20
12	M54	Z	-.021	%75
13	M54	Z	0	0
14	M54	Z	0	0
15	M54	Z	0	0
16	M70	Z	-.02	%20

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
17	M70	Z	-.02	%90
18	M70	Z	-.002	%30
19	M70	Z	0	0
20	M70	Z	0	0
21	M71	Z	-.066	%5
22	M71	Z	-.066	%90
23	M71	Z	-.011	%30
24	M71	Z	0	0
25	M71	Z	0	0
26	M72	Z	-.021	%20
27	M72	Z	-.021	%75
28	M72	Z	0	0
29	M72	Z	0	0
30	M72	Z	0	0
31	M61	Z	-.02	%20
32	M61	Z	-.02	%90
33	M61	Z	-.002	%30
34	M61	Z	0	0
35	M61	Z	0	0
36	M62	Z	-.066	%5
37	M62	Z	-.066	%90
38	M62	Z	-.011	%30
39	M62	Z	0	0
40	M62	Z	0	0
41	M63	Z	-.021	%20
42	M63	Z	-.021	%75
43	M63	Z	0	0
44	M63	Z	0	0
45	M63	Z	0	0

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M52	X	-.014	%20
2	M52	X	-.014	%90
3	M52	X	-.001	%30
4	M52	X	0	0
5	M52	X	0	0
6	M53	X	-.029	%5
7	M53	X	-.029	%90
8	M53	X	-.007	%30
9	M53	X	0	0
10	M53	X	0	0
11	M54	X	-.015	%20
12	M54	X	-.015	%75
13	M54	X	0	0
14	M54	X	0	0
15	M54	X	0	0
16	M70	X	-.014	%20
17	M70	X	-.014	%90
18	M70	X	-.001	%30
19	M70	X	0	0
20	M70	X	0	0
21	M71	X	-.029	%5
22	M71	X	-.029	%90
23	M71	X	-.007	%30
24	M71	X	0	0

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
25	M71	X	0	0
26	M72	X	-.015	%20
27	M72	X	-.015	%75
28	M72	X	0	0
29	M72	X	0	0
30	M72	X	0	0
31	M61	X	-.014	%20
32	M61	X	-.014	%90
33	M61	X	-.001	%30
34	M61	X	0	0
35	M61	X	0	0
36	M62	X	-.029	%5
37	M62	X	-.029	%90
38	M62	X	-.007	%30
39	M62	X	0	0
40	M62	X	0	0
41	M63	X	-.015	%20
42	M63	X	-.015	%75
43	M63	X	0	0
44	M63	X	0	0
45	M63	X	0	0

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M52	Z	-.007	%20
2	M52	Z	-.007	%90
3	M52	Z	-.0008	%30
4	M52	Z	0	0
5	M52	Z	0	0
6	M53	Z	-.024	%5
7	M53	Z	-.024	%90
8	M53	Z	-.004	%30
9	M53	Z	0	0
10	M53	Z	0	0
11	M54	Z	-.008	%20
12	M54	Z	-.008	%75
13	M54	Z	0	0
14	M54	Z	0	0
15	M54	Z	0	0
16	M70	Z	-.007	%20
17	M70	Z	-.007	%90
18	M70	Z	-.0008	%30
19	M70	Z	0	0
20	M70	Z	0	0
21	M71	Z	-.024	%5
22	M71	Z	-.024	%90
23	M71	Z	-.004	%30
24	M71	Z	0	0
25	M71	Z	0	0
26	M72	Z	-.008	%20
27	M72	Z	-.008	%75
28	M72	Z	0	0
29	M72	Z	0	0
30	M72	Z	0	0
31	M61	Z	-.007	%20
32	M61	Z	-.007	%90

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
33	M61	Z	-.0008	%30
34	M61	Z	0	0
35	M61	Z	0	0
36	M62	Z	-.024	%5
37	M62	Z	-.024	%90
38	M62	Z	-.004	%30
39	M62	Z	0	0
40	M62	Z	0	0
41	M63	Z	-.008	%20
42	M63	Z	-.008	%75
43	M63	Z	0	0
44	M63	Z	0	0
45	M63	Z	0	0

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M52	X	-.005	%20
2	M52	X	-.005	%90
3	M52	X	-.0004	%30
4	M52	X	0	0
5	M52	X	0	0
6	M53	X	-.011	%5
7	M53	X	-.011	%90
8	M53	X	-.003	%30
9	M53	X	0	0
10	M53	X	0	0
11	M54	X	-.005	%20
12	M54	X	-.005	%75
13	M54	X	0	0
14	M54	X	0	0
15	M54	X	0	0
16	M70	X	-.005	%20
17	M70	X	-.005	%90
18	M70	X	-.0004	%30
19	M70	X	0	0
20	M70	X	0	0
21	M71	X	-.011	%5
22	M71	X	-.011	%90
23	M71	X	-.003	%30
24	M71	X	0	0
25	M71	X	0	0
26	M72	X	-.005	%20
27	M72	X	-.005	%75
28	M72	X	0	0
29	M72	X	0	0
30	M72	X	0	0
31	M61	X	-.005	%20
32	M61	X	-.005	%90
33	M61	X	-.0004	%30
34	M61	X	0	0
35	M61	X	0	0
36	M62	X	-.011	%5
37	M62	X	-.011	%90
38	M62	X	-.003	%30
39	M62	X	0	0
40	M62	X	0	0

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
41	M63	X	-.005	%20
42	M63	X	-.005	%75
43	M63	X	0	0
44	M63	X	0	0
45	M63	X	0	0

Member Point Loads (BLC 8 : Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M52	Y	-.103	%20
2	M52	Y	-.103	%90
3	M52	Y	-.014	%30
4	M52	Y	0	0
5	M52	Y	0	0
6	M53	Y	-.294	%5
7	M53	Y	-.294	%90
8	M53	Y	-.06	%30
9	M53	Y	0	0
10	M53	Y	0	0
11	M54	Y	-.111	%20
12	M54	Y	-.111	%75
13	M54	Y	0	0
14	M54	Y	0	0
15	M54	Y	0	0
16	M70	Y	-.103	%20
17	M70	Y	-.103	%90
18	M70	Y	-.014	%30
19	M70	Y	0	0
20	M70	Y	0	0
21	M71	Y	-.294	%5
22	M71	Y	-.294	%90
23	M71	Y	-.06	%30
24	M71	Y	0	0
25	M71	Y	0	0
26	M72	Y	-.111	%20
27	M72	Y	-.111	%75
28	M72	Y	0	0
29	M72	Y	0	0
30	M72	Y	0	0
31	M61	Y	-.103	%20
32	M61	Y	-.103	%90
33	M61	Y	-.014	%30
34	M61	Y	0	0
35	M61	Y	0	0
36	M62	Y	-.294	%5
37	M62	Y	-.294	%90
38	M62	Y	-.06	%30
39	M62	Y	0	0
40	M62	Y	0	0
41	M63	Y	-.111	%20
42	M63	Y	-.111	%75
43	M63	Y	0	0
44	M63	Y	0	0
45	M63	Y	0	0

Member Point Loads (BLC 13 : Maint LL 1)

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

Member Point Loads (BLC 13 : Maint LL 1) (Continued)

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

Member Point Loads (BLC 14 : Maint LL 2)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M31	Y	-.25	%5

Member Point Loads (BLC 15 : Maint LL 3)

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

Member Point Loads (BLC 16 : Maint LL 4)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M33	Y	-.25	%5

Member Point Loads (BLC 17 : Maint LL 5)

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

Member Point Loads (BLC 18 : Maint LL 6)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M32	Y	-.25	%5

Member Point Loads (BLC 19 : Maint LL 7)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M4	Y	-.25	%95

Member Point Loads (BLC 20 : Maint LL 8)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M31	Y	-.25	%95

Member Point Loads (BLC 21 : Maint LL 9)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M6	Y	-.25	%95

Member Point Loads (BLC 22 : Maint LL 10)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M33	Y	-.25	%95

Member Point Loads (BLC 23 : Maint LL 11)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M5	Y	-.25	%95

Member Point Loads (BLC 24 : Maint LL 12)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M32	Y	-.25	%95

Member Point Loads (BLC 25 : Maint LL 13)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M35	Y	-.25	%95

Member Point Loads (BLC 26 : Maint LL 14)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M34	Y	-.25	%95

Member Point Loads (BLC 27 : Maint LL 15)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M36	Y	-.25	%95

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	-.011	-.011	0	0
2	M4	X	-.01	-.01	0	0
3	M5	X	-.01	-.01	0	0
4	M6	X	-.01	-.01	0	0
5	M7	X	-.019	-.019	0	0
6	M8	X	-.025	-.025	0	0
7	M9	X	-.025	-.025	0	0
8	M11	X	-.019	-.019	0	0
9	M12	X	-.025	-.025	0	0
10	M13	X	-.025	-.025	0	0
11	M15	X	-.019	-.019	0	0
12	M16	X	-.025	-.025	0	0
13	M17	X	-.025	-.025	0	0
14	M19	X	-.019	-.019	0	0
15	M20	X	-.025	-.025	0	0
16	M21	X	-.025	-.025	0	0
17	M23	X	-.019	-.019	0	0
18	M24	X	-.025	-.025	0	0
19	M25	X	-.025	-.025	0	0
20	M27	X	-.019	-.019	0	0
21	M28	X	-.025	-.025	0	0
22	M29	X	-.025	-.025	0	0
23	M31	X	-.014	-.014	0	0
24	M32	X	-.014	-.014	0	0
25	M33	X	-.014	-.014	0	0
26	M34	X	-.023	-.023	0	0
27	M35	X	-.023	-.023	0	0
28	M36	X	-.023	-.023	0	0
29	M37	X	-.025	-.025	0	0
30	M38	X	-.025	-.025	0	0
31	M40	X	-.025	-.025	0	0
32	M42	X	-.025	-.025	0	0
33	M43	X	-.025	-.025	0	0
34	M45	X	-.025	-.025	0	0
35	M47	X	-.025	-.025	0	0
36	M48	X	-.025	-.025	0	0
37	M50	X	-.025	-.025	0	0
38	M52	X	-.01	-.01	0	0
39	M53	X	-.012	-.012	0	0
40	M54	X	-.01	-.01	0	0
41	M61	X	-.01	-.01	0	0
42	M62	X	-.012	-.012	0	0
43	M63	X	-.01	-.01	0	0
44	M70	X	-.01	-.01	0	0
45	M71	X	-.012	-.012	0	0
46	M72	X	-.01	-.01	0	0
47	M79	X	-.014	-.014	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
48	M80	X	-.014	-.014	0	0
49	M81	X	-.014	-.014	0	0
50	M82	X	-.014	-.014	0	0
51	M83	X	-.014	-.014	0	0
52	M84	X	-.014	-.014	0	0
53	M83A	X	-.011	-.011	0	0
54	M84A	X	-.011	-.011	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	-.011	-.011	0	0
2	M4	X	-.01	-.01	0	0
3	M5	X	-.01	-.01	0	0
4	M6	X	-.01	-.01	0	0
5	M7	X	-.019	-.019	0	0
6	M8	X	-.025	-.025	0	0
7	M9	X	-.025	-.025	0	0
8	M11	X	-.019	-.019	0	0
9	M12	X	-.025	-.025	0	0
10	M13	X	-.025	-.025	0	0
11	M15	X	-.019	-.019	0	0
12	M16	X	-.025	-.025	0	0
13	M17	X	-.025	-.025	0	0
14	M19	X	-.019	-.019	0	0
15	M20	X	-.025	-.025	0	0
16	M21	X	-.025	-.025	0	0
17	M23	X	-.019	-.019	0	0
18	M24	X	-.025	-.025	0	0
19	M25	X	-.025	-.025	0	0
20	M27	X	-.019	-.019	0	0
21	M28	X	-.025	-.025	0	0
22	M29	X	-.025	-.025	0	0
23	M31	X	-.014	-.014	0	0
24	M32	X	-.014	-.014	0	0
25	M33	X	-.014	-.014	0	0
26	M34	X	-.023	-.023	0	0
27	M35	X	-.023	-.023	0	0
28	M36	X	-.023	-.023	0	0
29	M37	X	-.025	-.025	0	0
30	M38	X	-.025	-.025	0	0
31	M40	X	-.025	-.025	0	0
32	M42	X	-.025	-.025	0	0
33	M43	X	-.025	-.025	0	0
34	M45	X	-.025	-.025	0	0
35	M47	X	-.025	-.025	0	0
36	M48	X	-.025	-.025	0	0
37	M50	X	-.025	-.025	0	0
38	M52	X	-.01	-.01	0	0
39	M53	X	-.012	-.012	0	0
40	M54	X	-.01	-.01	0	0
41	M61	X	-.01	-.01	0	0
42	M62	X	-.012	-.012	0	0
43	M63	X	-.01	-.01	0	0
44	M70	X	-.01	-.01	0	0
45	M71	X	-.012	-.012	0	0
46	M72	X	-.01	-.01	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
47	M79	X	-.014	-.014	0	0
48	M80	X	-.014	-.014	0	0
49	M81	X	-.014	-.014	0	0
50	M82	X	-.014	-.014	0	0
51	M83	X	-.014	-.014	0	0
52	M84	X	-.014	-.014	0	0
53	M83A	X	-.011	-.011	0	0
54	M84A	X	-.011	-.011	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	-.006	-.006	0	0
2	M4	Z	-.002	-.002	0	0
3	M5	Z	-.002	-.002	0	0
4	M6	Z	-.002	-.002	0	0
5	M7	Z	-.007	-.007	0	0
6	M8	Z	-.013	-.013	0	0
7	M9	Z	-.015	-.015	0	0
8	M11	Z	-.007	-.007	0	0
9	M12	Z	-.013	-.013	0	0
10	M13	Z	-.015	-.015	0	0
11	M15	Z	-.007	-.007	0	0
12	M16	Z	-.013	-.013	0	0
13	M17	Z	-.015	-.015	0	0
14	M19	Z	-.007	-.007	0	0
15	M20	Z	-.013	-.013	0	0
16	M21	Z	-.015	-.015	0	0
17	M23	Z	-.007	-.007	0	0
18	M24	Z	-.013	-.013	0	0
19	M25	Z	-.015	-.015	0	0
20	M27	Z	-.007	-.007	0	0
21	M28	Z	-.013	-.013	0	0
22	M29	Z	-.015	-.015	0	0
23	M31	Z	-.003	-.003	0	0
24	M32	Z	-.003	-.003	0	0
25	M33	Z	-.003	-.003	0	0
26	M34	Z	-.008	-.008	0	0
27	M35	Z	-.008	-.008	0	0
28	M36	Z	-.008	-.008	0	0
29	M37	Z	-.009	-.009	0	0
30	M38	Z	-.015	-.015	0	0
31	M40	Z	-.015	-.015	0	0
32	M42	Z	-.009	-.009	0	0
33	M43	Z	-.015	-.015	0	0
34	M45	Z	-.015	-.015	0	0
35	M47	Z	-.009	-.009	0	0
36	M48	Z	-.015	-.015	0	0
37	M50	Z	-.015	-.015	0	0
38	M52	Z	-.002	-.002	0	0
39	M53	Z	-.003	-.003	0	0
40	M54	Z	-.002	-.002	0	0
41	M61	Z	-.002	-.002	0	0
42	M62	Z	-.003	-.003	0	0
43	M63	Z	-.002	-.002	0	0
44	M70	Z	-.002	-.002	0	0
45	M71	Z	-.003	-.003	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
46	M72	Z	-.002	-.002	0	0
47	M79	Z	-.007	-.007	0	0
48	M80	Z	-.007	-.007	0	0
49	M81	Z	-.007	-.007	0	0
50	M82	Z	-.007	-.007	0	0
51	M83	Z	-.007	-.007	0	0
52	M84	Z	-.007	-.007	0	0
53	M83A	Z	-.006	-.006	0	0
54	M84A	Z	-.006	-.006	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	-.006	-.006	0	0
2	M4	X	-.002	-.002	0	0
3	M5	X	-.002	-.002	0	0
4	M6	X	-.002	-.002	0	0
5	M7	X	-.007	-.007	0	0
6	M8	X	-.013	-.013	0	0
7	M9	X	-.015	-.015	0	0
8	M11	X	-.007	-.007	0	0
9	M12	X	-.013	-.013	0	0
10	M13	X	-.015	-.015	0	0
11	M15	X	-.007	-.007	0	0
12	M16	X	-.013	-.013	0	0
13	M17	X	-.015	-.015	0	0
14	M19	X	-.007	-.007	0	0
15	M20	X	-.013	-.013	0	0
16	M21	X	-.015	-.015	0	0
17	M23	X	-.007	-.007	0	0
18	M24	X	-.013	-.013	0	0
19	M25	X	-.015	-.015	0	0
20	M27	X	-.007	-.007	0	0
21	M28	X	-.013	-.013	0	0
22	M29	X	-.015	-.015	0	0
23	M31	X	-.003	-.003	0	0
24	M32	X	-.003	-.003	0	0
25	M33	X	-.003	-.003	0	0
26	M34	X	-.008	-.008	0	0
27	M35	X	-.008	-.008	0	0
28	M36	X	-.008	-.008	0	0
29	M37	X	-.009	-.009	0	0
30	M38	X	-.015	-.015	0	0
31	M40	X	-.015	-.015	0	0
32	M42	X	-.009	-.009	0	0
33	M43	X	-.015	-.015	0	0
34	M45	X	-.015	-.015	0	0
35	M47	X	-.009	-.009	0	0
36	M48	X	-.015	-.015	0	0
37	M50	X	-.015	-.015	0	0
38	M52	X	-.002	-.002	0	0
39	M53	X	-.003	-.003	0	0
40	M54	X	-.002	-.002	0	0
41	M61	X	-.002	-.002	0	0
42	M62	X	-.003	-.003	0	0
43	M63	X	-.002	-.002	0	0
44	M70	X	-.002	-.002	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
45	M71	X	-.003	-.003	0	0
46	M72	X	-.002	-.002	0	0
47	M79	X	-.007	-.007	0	0
48	M80	X	-.007	-.007	0	0
49	M81	X	-.007	-.007	0	0
50	M82	X	-.007	-.007	0	0
51	M83	X	-.007	-.007	0	0
52	M84	X	-.007	-.007	0	0
53	M83A	X	-.006	-.006	0	0
54	M84A	X	-.006	-.006	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	-.0006	-.0006	0	0
2	M4	Z	-.0003	-.0003	0	0
3	M5	Z	-.0003	-.0003	0	0
4	M6	Z	-.0003	-.0003	0	0
5	M7	Z	-.001	-.001	0	0
6	M8	Z	-.001	-.001	0	0
7	M9	Z	-.001	-.001	0	0
8	M11	Z	-.001	-.001	0	0
9	M12	Z	-.001	-.001	0	0
10	M13	Z	-.001	-.001	0	0
11	M15	Z	-.001	-.001	0	0
12	M16	Z	-.001	-.001	0	0
13	M17	Z	-.001	-.001	0	0
14	M19	Z	-.001	-.001	0	0
15	M20	Z	-.001	-.001	0	0
16	M21	Z	-.001	-.001	0	0
17	M23	Z	-.001	-.001	0	0
18	M24	Z	-.001	-.001	0	0
19	M25	Z	-.001	-.001	0	0
20	M27	Z	-.001	-.001	0	0
21	M28	Z	-.001	-.001	0	0
22	M29	Z	-.001	-.001	0	0
23	M31	Z	-.0004	-.0004	0	0
24	M32	Z	-.0004	-.0004	0	0
25	M33	Z	-.0004	-.0004	0	0
26	M34	Z	-.001	-.001	0	0
27	M35	Z	-.001	-.001	0	0
28	M36	Z	-.001	-.001	0	0
29	M37	Z	-.001	-.001	0	0
30	M38	Z	-.001	-.001	0	0
31	M40	Z	-.001	-.001	0	0
32	M42	Z	-.001	-.001	0	0
33	M43	Z	-.001	-.001	0	0
34	M45	Z	-.001	-.001	0	0
35	M47	Z	-.001	-.001	0	0
36	M48	Z	-.001	-.001	0	0
37	M50	Z	-.001	-.001	0	0
38	M52	Z	-.0003	-.0003	0	0
39	M53	Z	-.0003	-.0003	0	0
40	M54	Z	-.0003	-.0003	0	0
41	M61	Z	-.0003	-.0003	0	0
42	M62	Z	-.0003	-.0003	0	0
43	M63	Z	-.0003	-.0003	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
44	M70	Z	-.0003	-.0003	0	0
45	M71	Z	-.0003	-.0003	0	0
46	M72	Z	-.0003	-.0003	0	0
47	M79	Z	-.0008	-.0008	0	0
48	M80	Z	-.0008	-.0008	0	0
49	M81	Z	-.0008	-.0008	0	0
50	M82	Z	-.0008	-.0008	0	0
51	M83	Z	-.0008	-.0008	0	0
52	M84	Z	-.0008	-.0008	0	0
53	M83A	Z	-.0006	-.0006	0	0
54	M84A	Z	-.0006	-.0006	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	-.0006	-.0006	0	0
2	M4	X	-.0003	-.0003	0	0
3	M5	X	-.0003	-.0003	0	0
4	M6	X	-.0003	-.0003	0	0
5	M7	X	-.001	-.001	0	0
6	M8	X	-.001	-.001	0	0
7	M9	X	-.001	-.001	0	0
8	M11	X	-.001	-.001	0	0
9	M12	X	-.001	-.001	0	0
10	M13	X	-.001	-.001	0	0
11	M15	X	-.001	-.001	0	0
12	M16	X	-.001	-.001	0	0
13	M17	X	-.001	-.001	0	0
14	M19	X	-.001	-.001	0	0
15	M20	X	-.001	-.001	0	0
16	M21	X	-.001	-.001	0	0
17	M23	X	-.001	-.001	0	0
18	M24	X	-.001	-.001	0	0
19	M25	X	-.001	-.001	0	0
20	M27	X	-.001	-.001	0	0
21	M28	X	-.001	-.001	0	0
22	M29	X	-.001	-.001	0	0
23	M31	X	-.0004	-.0004	0	0
24	M32	X	-.0004	-.0004	0	0
25	M33	X	-.0004	-.0004	0	0
26	M34	X	-.001	-.001	0	0
27	M35	X	-.001	-.001	0	0
28	M36	X	-.001	-.001	0	0
29	M37	X	-.001	-.001	0	0
30	M38	X	-.001	-.001	0	0
31	M40	X	-.001	-.001	0	0
32	M42	X	-.001	-.001	0	0
33	M43	X	-.001	-.001	0	0
34	M45	X	-.001	-.001	0	0
35	M47	X	-.001	-.001	0	0
36	M48	X	-.001	-.001	0	0
37	M50	X	-.001	-.001	0	0
38	M52	X	-.0003	-.0003	0	0
39	M53	X	-.0003	-.0003	0	0
40	M54	X	-.0003	-.0003	0	0
41	M61	X	-.0003	-.0003	0	0
42	M62	X	-.0003	-.0003	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
43	M63	X	-.0003	-.0003	0	0
44	M70	X	-.0003	-.0003	0	0
45	M71	X	-.0003	-.0003	0	0
46	M72	X	-.0003	-.0003	0	0
47	M79	X	-.0008	-.0008	0	0
48	M80	X	-.0008	-.0008	0	0
49	M81	X	-.0008	-.0008	0	0
50	M82	X	-.0008	-.0008	0	0
51	M83	X	-.0008	-.0008	0	0
52	M84	X	-.0008	-.0008	0	0
53	M83A	X	-.0006	-.0006	0	0
54	M84A	X	-.0006	-.0006	0	0

Member Distributed Loads (BLC 8 : Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.015	-.015	0	0
2	M4	Y	-.012	-.012	0	0
3	M5	Y	-.012	-.012	0	0
4	M6	Y	-.012	-.012	0	0
5	M7	Y	-.021	-.021	0	0
6	M8	Y	-.022	-.022	0	0
7	M9	Y	-.022	-.022	0	0
8	M11	Y	-.021	-.021	0	0
9	M12	Y	-.022	-.022	0	0
10	M13	Y	-.022	-.022	0	0
11	M15	Y	-.021	-.021	0	0
12	M16	Y	-.022	-.022	0	0
13	M17	Y	-.022	-.022	0	0
14	M19	Y	-.021	-.021	0	0
15	M20	Y	-.022	-.022	0	0
16	M21	Y	-.022	-.022	0	0
17	M23	Y	-.021	-.021	0	0
18	M24	Y	-.022	-.022	0	0
19	M25	Y	-.022	-.022	0	0
20	M27	Y	-.021	-.021	0	0
21	M28	Y	-.022	-.022	0	0
22	M29	Y	-.022	-.022	0	0
23	M31	Y	-.015	-.015	0	0
24	M32	Y	-.015	-.015	0	0
25	M33	Y	-.015	-.015	0	0
26	M34	Y	-.021	-.021	0	0
27	M35	Y	-.021	-.021	0	0
28	M36	Y	-.021	-.021	0	0
29	M37	Y	-.022	-.022	0	0
30	M38	Y	-.022	-.022	0	0
31	M40	Y	-.022	-.022	0	0
32	M42	Y	-.022	-.022	0	0
33	M43	Y	-.022	-.022	0	0
34	M45	Y	-.022	-.022	0	0
35	M47	Y	-.022	-.022	0	0
36	M48	Y	-.022	-.022	0	0
37	M50	Y	-.022	-.022	0	0
38	M52	Y	-.012	-.012	0	0
39	M53	Y	-.013	-.013	0	0
40	M54	Y	-.012	-.012	0	0
41	M61	Y	-.012	-.012	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
42	M62	Y	-.013	-.013	0	0
43	M63	Y	-.012	-.012	0	0
44	M70	Y	-.012	-.012	0	0
45	M71	Y	-.013	-.013	0	0
46	M72	Y	-.012	-.012	0	0
47	M79	Y	-.013	-.013	0	0
48	M80	Y	-.013	-.013	0	0
49	M81	Y	-.013	-.013	0	0
50	M82	Y	-.013	-.013	0	0
51	M83	Y	-.013	-.013	0	0
52	M84	Y	-.013	-.013	0	0
53	M83A	Y	-.015	-.015	0	0
54	M84A	Y	-.015	-.015	0	0

Member Distributed Loads (BLC 31 : BLC 1 Transient Area Loads)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M15	Y	-.009	-.009	0	.981
2	M19	Y	-.009	-.009	0	.981
3	M35	Y	-.011	-.011	2.351	4.092
4	M81	Y	-.001	-.005	0	2.189
5	M81	Y	-.005	-.009	2.189	4.378
6	M82	Y	-.001	-.005	0	2.189
7	M82	Y	-.005	-.009	2.189	4.378
8	M7	Y	-.009	-.009	0	.981
9	M11	Y	-.009	-.009	0	.981
10	M34	Y	-.011	-.011	2.352	4.089
11	M79	Y	-.001	-.005	0	2.189
12	M79	Y	-.005	-.009	2.189	4.378
13	M80	Y	-.001	-.005	0	2.189
14	M80	Y	-.005	-.009	2.189	4.378
15	M23	Y	-.009	-.009	0	.981
16	M27	Y	-.009	-.009	0	.981
17	M36	Y	-.011	-.011	2.351	4.092
18	M83	Y	-.001	-.005	0	2.189
19	M83	Y	-.005	-.009	2.189	4.378
20	M84	Y	-.001	-.005	0	2.189
21	M84	Y	-.005	-.009	2.189	4.378

Member Distributed Loads (BLC 32 : BLC 8 Transient Area Loads)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M15	Y	-.01	-.01	0	.981
2	M19	Y	-.01	-.01	0	.981
3	M35	Y	-.012	-.012	2.352	4.089
4	M81	Y	-.001	-.005	0	2.189
5	M81	Y	-.005	-.009	2.189	4.378
6	M82	Y	-.001	-.005	0	2.189
7	M82	Y	-.005	-.009	2.189	4.378
8	M7	Y	-.009	-.009	0	.981
9	M11	Y	-.009	-.009	0	.981
10	M34	Y	-.011	-.011	2.351	4.092
11	M79	Y	-.001	-.005	0	2.189
12	M79	Y	-.005	-.009	2.189	4.378
13	M80	Y	-.001	-.005	0	2.189
14	M80	Y	-.005	-.009	2.189	4.378
15	M23	Y	-.009	-.009	0	.981
16	M27	Y	-.009	-.009	0	.981

Member Distributed Loads (BLC 32 : BLC 8 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
17	M36	Y	-.011	-.011	2.351	4.092
18	M83	Y	-.001	-.005	0	2.189
19	M83	Y	-.005	-.009	2.189	4.378
20	M84	Y	-.001	-.005	0	2.189
21	M84	Y	-.005	-.009	2.189	4.378

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

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/f...
1	N96	L	Y	-.5

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

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/f...
1	N92	L	Y	-.5

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

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/f...
1	N138	L	Y	-.5

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N60	max	2.114	4	3.31	16	1.038	13	-.932	84	1.327	3	-1.306	8
2		min	-2.149	10	.896	8	-1.013	7	-3.375	20	-1.331	9	-5.819	16
3	N59	max	1.178	4	3.305	20	1.911	2	6.668	20	1.389	10	.159	10
4		min	-1.181	10	.854	2	-1.956	8	1.631	2	-1.387	4	-.275	53
5	N61	max	2.593	4	3.308	24	1.601	3	-.919	76	.794	6	5.817	24
6		min	-2.555	10	.973	57	-1.579	9	-3.362	20	-.794	12	1.5	56
7	Totals:	max	5.885	4	9.888	18	4.268	2						
8		min	-5.885	10	3.325	2	-4.268	8						

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

	Member	Shape	Code Check	Loc[ft]	LC	Shear C...	Loc[ft]	Dir	LC	phi*...	phi*...	phi*...	phi*...	...	Eqn
1	M1	L2.5x2.5x4	.114	0	76	.025	1.245	y	76	36.6...	38.5...	1.114	2.537	...	H2-1
2	M4	PIPE_2.0	.203	6.25	23	.101	1.432		74	6.295	32.13	1.872	1.872	...	H1-...
3	M5	PIPE_2.0	.208	6.25	15	.101	1.432		78	6.295	32.13	1.872	1.872	...	H1-...
4	M6	PIPE_2.0	.208	6.25	19	.101	1.432		76	6.295	32.13	1.872	1.872	...	H1-...
5	M7	HSS4X4X4	.220	0	19	.067	0	y	21	135....	139....	16.1...	16.1...	...	H1-...
6	M8	PL 13/32x6_HRA	.108	.208	8	.347	.208	y	15	71.7...	78.9...	.668	9.872	...	H1-...
7	M9	PL 13/32x6_HRA	.176	.146	13	.418	.292	y	21	75.3...	78.9...	.668	9.872	...	H1-...
8	M11	HSS4X4X4	.220	0	21	.067	0	y	19	135....	139....	16.1...	16.1...	...	H1-...
9	M12	PL 13/32x6_HRA	.125	.208	8	.342	.208	y	25	71.7...	78.9...	.668	9.872	...	H1-...
10	M13	PL 13/32x6_HRA	.250	.146	9	.418	.292	y	19	75.3...	78.9...	.668	9.872	...	H1-...
11	M15	HSS4X4X4	.218	0	23	.067	0	y	14	135....	139....	16.1...	16.1...	...	H1-...
12	M16	PL 13/32x6_HRA	.138	.208	5	.350	.208	y	20	71.7...	78.9...	.668	9.872	...	H1-...
13	M17	PL 13/32x6_HRA	.239	.146	10	.419	.292	y	15	75.3...	78.9...	.668	9.872	...	H1-...
14	M19	HSS4X4X4	.219	0	25	.066	0	y	22	135....	139....	16.1...	16.1...	...	H1-...
15	M20	PL 13/32x6_HRA	.151	.208	10	.342	.208	y	15	71.7...	78.9...	.668	9.872	...	H1-...
16	M21	PL 13/32x6_HRA	.166	.146	12	.415	.292	y	21	75.3...	78.9...	.668	9.872	...	H1-...
17	M23	HSS4X4X4	.219	0	15	.066	0	y	19	135....	139....	16.1...	16.1...	...	H1-...
18	M24	PL 13/32x6_HRA	.151	.208	10	.348	.208	y	25	71.7...	78.9...	.668	9.872	...	H1-...
19	M25	PL 13/32x6_HRA	.262	.146	3	.416	.292	y	20	75.3...	78.9...	.668	9.872	...	H1-...
20	M27	HSS4X4X4	.218	0	16	.067	0	y	14	135....	139....	16.1...	16.1...	...	H1-...

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

	Member	Shape	Code Check	Loc[ft]	LC	Shear C...	Loc[ft]	Dir	LC	phi*...	phi*...	phi*...	phi*...	...	Eqn
21	M28	PL 13/32x6_HRA	.225	.208	3	.345	.208	y	20	71.7...	78.9...	.668	9.872	...	H1-...
22	M29	PL 13/32x6_HRA	.255	.146	10	.419	.292	y	14	75.3...	78.9...	.668	9.872	...	H1-...
23	M31	PIPE_3.0	.185	7.552	22	.078	6.25		2	28.2...	65.2...	5.749	5.749	...	H1-...
24	M32	PIPE_3.0	.189	7.552	14	.060	7.552		20	28.2...	65.2...	5.749	5.749	...	H1-...
25	M33	PIPE_3.0	.189	4.948	14	.063	4.948		9	28.2...	65.2...	5.749	5.749	...	H1-...
26	M34	HSS4X4X4	.431	0	23	.089	0	y	17	124....	139....	16.1...	16.1...	...	H1-...
27	M35	HSS4X4X4	.436	0	15	.090	0	y	21	124....	139....	16.1...	16.1...	...	H1-...
28	M36	HSS4X4X4	.436	0	25	.091	0	y	25	124....	139....	16.1...	16.1...	...	H1-...
29	M37	PL15/32x6	.121	.5	9	.111	.5	y	19	60.2...	91.1...	.89	11.3...	...	H1-...
30	M38	PL15/32x6	.034	0	7	.076	0	y	85	87.9...	91.1...	.89	11.3...	...	H1-...
31	M40	PL15/32x6	.046	0	9	.082	0	y	77	87.9...	91.1...	.89	11.3...	...	H1-...
32	M42	PL15/32x6	.126	.5	11	.117	.5	y	33	60.2...	91.1...	.89	11.3...	...	H1-...
33	M43	PL15/32x6	.042	0	11	.117	0	y	51	87.9...	91.1...	.89	11.3...	...	H1-...
34	M45	PL15/32x6	.049	.146	4	.123	0	y	32	87.9...	91.1...	.89	11.3...	...	H1-...
35	M47	PL15/32x6	.159	.5	10	.111	.5	y	25	60.2...	91.1...	.89	11.3...	...	H1-...
36	M48	PL15/32x6	.046	0	3	.076	0	y	81	87.9...	91.1...	.89	11.3...	...	H1-...
37	M50	PL15/32x6	.050	.146	9	.082	0	y	79	87.9...	91.1...	.89	11.3...	...	H1-...
38	M52	PIPE_2.0	.322	2.875	3	.068	2.875		18	20.8...	32.13	1.872	1.872	...	H1-...
39	M53	PIPE_2.5	.491	3.844	8	.040	3.75		3	26.1...	50.7...	3.596	3.596	...	H1-...
40	M54	PIPE_2.0	.308	2.875	24	.068	2.875		21	20.8...	32.13	1.872	1.872	...	H1-...
41	M61	PIPE_2.0	.314	2.875	20	.070	2.875		9	20.8...	32.13	1.872	1.872	...	H1-...
42	M62	PIPE_2.5	.491	3.844	2	.038	3.75		3	26.1...	50.7...	3.596	3.596	...	H1-...
43	M63	PIPE_2.0	.305	2.875	15	.068	2.875		25	20.8...	32.13	1.872	1.872	...	H1-...
44	M70	PIPE_2.0	.307	2.875	25	.069	2.875		15	20.8...	32.13	1.872	1.872	...	H1-...
45	M71	PIPE_2.5	.491	3.844	2	.035	3.75		9	26.1...	50.7...	3.596	3.596	...	H1-...
46	M72	PIPE_2.0	.311	2.875	20	.069	2.875		17	20.8...	32.13	1.872	1.872	...	H1-...
47	M79	L2x2x3	.173	0	25	.013	4.378	y	19	8.942	23.3...	.558	1.227	...	H2-1
48	M80	L2x2x3	.247	4.378	3	.013	4.378	z	21	8.942	23.3...	.558	1.213	...	H2-1
49	M81	L2x2x3	.241	4.378	4	.013	4.378	y	22	8.942	23.3...	.558	1.182	...	H2-1
50	M82	L2x2x3	.169	0	19	.013	4.378	z	14	8.942	23.3...	.558	1.229	...	H2-1
51	M83	L2x2x3	.223	0	9	.013	4.378	y	14	8.942	23.3...	.558	1.236	...	H2-1
52	M84	L2x2x3	.248	4.378	10	.013	4.378	z	17	8.942	23.3...	.558	1.179	...	H2-1
53	M83A	L2.5x2.5x4	.114	0	74	.025	1.245	y	74	36.6...	38.5...	1.114	2.537	...	H2-1
54	M84A	L2.5x2.5x4	.114	0	78	.025	1.245	y	78	36.6...	38.5...	1.114	2.537	...	H2-1

Exhibit F

Power Density/RF Emissions Report

Transcom Engineering, Inc.
Wireless Network Design and Deployment

Radio Frequency Emissions Analysis Report

T-MOBILE Existing Facility

Site ID: CT11062B

Windsor/ I-91/ X35
92 Weston Street
Hartford, CT 06120

June 5, 2019

Transcom Engineering Project Number: 737001-0121

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**28.92 %**

June 5, 2019

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

Emissions Analysis for Site: **CT11062B – Windsor/ I-91/ X35**

Transcom Engineering, Inc ("Transcom") was directed to analyze the proposed upgrades to the T-MOBILE facility located at **92 Weston Street, Hartford, CT**, for the purpose of determining whether the emissions from the Proposed T-MOBILE Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general population may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general population would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 600 & 700 MHz bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$ respectively. The general population exposure limit for the 1900 MHz (PCS) and 2100 MHz (AWS) bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were performed for the proposed upgrades to the T-MOBILE antenna facility located at **92 Weston Street, Hartford, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-MOBILE is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

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

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

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

Table 1: Channel Data Table

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

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	Ericsson AIR32 B66A / B2A	76
A	2	Ericsson AIR21 B2A/B4P	76
A	3	RFS APXVAARR24_43-U-NA20	76
B	1	Ericsson AIR32 B66A / B2A	76
B	2	Ericsson AIR21 B2A/B4P	76
B	3	RFS APXVAARR24_43-U-NA20	76
C	1	Ericsson AIR32 B66A / B2A	76
C	2	Ericsson AIR21 B2A/B4P	76
C	3	RFS APXVAARR24_43-U-NA20	76

Table 2: Antenna Data

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

Cable losses were factored in the calculations for this site. Since all **2100 MHz (AWS) UMTS** radios are ground mounted the following cable loss values were used. For each ground mounted **2100 MHz (AWS) UMTS** radio there was **1.73 dB** of cable loss calculated into the system gains / losses for this site. These values were calculated based upon the manufacturers specifications for **100 feet** of **7/8"** coax.

RESULTS

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

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	Ericsson AIR32 B66A / B2A	1900 MHz (PCS) / 2100 MHz (AWS)	15.85 / 15.85	6	280	10,768.57	7.90
Antenna A2	Ericsson AIR21 B2A/B4P	1900 MHz (PCS) / 2100 MHz (AWS)	15.9 / 15.9	2	55	1,628.43	1.20
Antenna A3	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	12.95 / 13.35	4	120	2,443.03	4.25
						Sector A Composite MPE%	**13.35**
Antenna B1	Ericsson AIR32 B66A / B2A	1900 MHz (PCS) / 2100 MHz (AWS)	15.85 / 15.85	6	280	10,768.57	7.90
Antenna B2	Ericsson AIR21 B2A/B4P	1900 MHz (PCS) / 2100 MHz (AWS)	15.9 / 15.9	2	55	1,628.43	1.20
Antenna B3	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	12.95 / 13.35	4	120	2,443.03	4.25
						Sector B Composite MPE%	**13.35**
Antenna C1	Ericsson AIR32 B66A / B2A	1900 MHz (PCS) / 2100 MHz (AWS)	15.85 / 15.85	6	280	10,768.57	7.90
Antenna C2	Ericsson AIR21 B2A/B4P	1900 MHz (PCS) / 2100 MHz (AWS)	15.9 / 15.9	2	55	1,628.43	1.20
Antenna C3	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	12.95 / 13.35	4	120	2,443.03	4.25
						Sector C Composite MPE%	**13.35**

Table 3: T-MOBILE Emissions Levels

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

Site Composite MPE%	
Carrier	**MPE%**
T-MOBILE – Max Per Sector Value	**13.35 %**
Sprint	5.11 %
AT&T	10.46 %
Site Total MPE %:	**28.92 %**

Table 4: All Carrier MPE Contributions

T-MOBILE Sector A Total:	13.35 %
T-MOBILE Sector B Total:	13.35 %
T-MOBILE Sector C Total:	13.35 %
Site Total:	28.92 %

Table 5: Site MPE Summary

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

T-MOBILE _ Frequency Band / Technology Max Power Values (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile 1900 MHz (PCS) LTE	4	1,538.37	76	45.15	1900 MHz (PCS)	1000	4.51%
T-Mobile 2100 MHz (AWS) LTE	2	2,307.55	76	33.86	2100 MHz (AWS)	1000	3.39%
T-Mobile 1900 MHz (PCS) GSM	1	583.57	76	4.28	1900 MHz (PCS)	1000	0.43%
T-Mobile 2100 MHz (AWS) UMTS	1	1,044.86	76	7.67	2100 MHz (AWS)	1000	0.77%
T-Mobile 600 MHz LTE / 5G NR	2	788.97	76	11.58	600 MHz	400	2.89%
T-Mobile 700 MHz LTE	2	432.54	76	6.35	700 MHz	467	1.36%
						Total:	**13.35%**

Table 6: T-MOBILE Maximum Sector MPE Power Values

Summary

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

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

T-MOBILE Sector	Power Density Value (%)
Sector A:	13.35 %
Sector B:	13.35 %
Sector C:	13.35 %
T-MOBILE Maximum Total (per sector):	13.35 %
Site Total:	28.92 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **28.92 %** 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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