HISTORIC PRESERVATION COMMISSION

Marc Elrich
County Executive

Robert K. Sutton
Chairman

Date: January 19, 2023

MEMORANDUM

TO: Mitra Pedoeem
Department of Permitting Services
FROM: Dan Bruechert
Historic Preservation Section
Maryland-National Capital Park & Planning Commission
SUBJECT: Historic Area Work Permit #1015296 - Telecommunications Equipment

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The Montgomery County Historic Preservation Commission (HPC) has reviewed the attached application for a Historic Area Work Permit (HAWP). This application was **Approved** by the HPC Staff.

The HPC staff has reviewed and stamped the attached construction drawings**.**

THE BUILDING PERMIT FOR THIS PROJECT SHALL BE ISSUED CONDITIONAL UPON ADHERENCE TO THE ABOVE APPROVED HAWP CONDITIONS AND MAY REQUIRE APPROVAL BY DPS OR ANOTHER LOCAL OFFICE BEFORE WORK CAN BEGIN.

Applicant: New Cingular Wireless
Address: 7150 Standard Dr., Hanover

This HAWP approval is subject to the general condition that the applicant will obtain all other applicable Montgomery County or local government agency permits. After the issuance of these permits, the applicant must contact this Historic Preservation Office if any changes to the approved plan are made. Once work is complete the applicant will contact Dan Bruechert at 301.563.3400 or dan.bruechert@montgomeryplanning.org to schedule a follow-up site visit.

FA# 10072888 USID#3939

TULIP AVE

PROJECT DESCRIPTION

AT&T WIRELESS PROPOSES TO MODIFY AN EXISTING WIRELESS INSTALLATION. THE SCOPE WILL CONSIST OF THE FOLLOWING:

ROOFTOP SOW

- DECOM (4) EXISTING 1-5/8" COAX AND LEAVE IN-PLACE
- DECOM (2) EXISTING 7/8" COAX AND LEAVE IN-PLACE
- REMOVE (3) EXISTING KATHREIN 742 264 ANTENNAS
- REMOVE (E) TMAS/DIPLEXERS IN POS. 1
- USE EXISTING SPARE 6 AWG DC TRUNKS

- INSTALL (3) PROPOSED AEQK ANTENNAS IN POS. 1
- INSTALL (3) PROPOSED AEQU ANTENNAS IN POS. 1

GROUND SOW

- DECOM EXISTING UMTS
- REMOVE EXISTING 9412 CABINET
- RELOCATE EVERYTHING INSIDE THE EXISTING 9412 C… THE PROPOSED FLX21-V2 CABINET

- INSTALL (1) PROPOSED 48V RECTIFIER IN (E) NETSURE…
- INSTALL (4) PROPOSED DEKA FAHRENHEIT HT170ET B… INSTALL (1) PROPOSED FLX21-V2 CABINET
- INSTALL (1) PROPOSED FSM4 INSIDE PROPOSED FLX2… CABINET
- INSTALL (1) PROPOSED 100A BREAKER
- INSTALL (6) PROPOSED 40A BREAKERS
- INSTALL (2) PROPOSED 30A BREAKERS

- NO SITE/CIVIL WORK

APPROVED

Montgomery County

Historic Preservation Commission

REVIEWED

By Dan.Bruechert at 2:37 pm, Jan 19, 2023

at&t

5G NR 1SR CBAND ROOFTOP

SITE INFORMATION

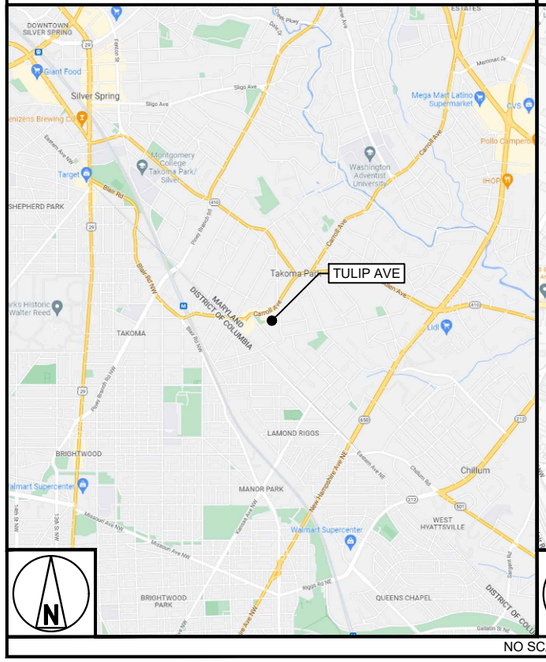
LANDLORD:	TAKOMA TOWER LP
LANDLORD SITE NUMBER:	N/A
SITE NAME:	TULIP AVE
USID NUMBER:	3939
FA NUMBER:	10072888
SITE ADDRESS:	7051 CARROL STREET TAKOMA PARK, MD 20912
COUNTY:	MONTGOMERY
LATITUDE (NAD 83):	N 38° 58' 29.089" (38.974747)
LONGITUDE (NAD 83):	W 77° 00' 37.573" (-77.010437)
RAD CENTER:	107', 115' & 129' AGL
SITE ACQUISITION CONTACT:	ANDREW CAPACI Andrew.Capaci@jacobs.com
RF ENGINEER:	SANDEEP GUPTA AA913P@att.com
C&E MANAGER:	STEVEN SAFIRE SS0091@att.com
JURISDICTION:	MONTGOMERY COUNTY
APPLICANT/LESSEE:	AT&T 7150 STANDARD DRIVE SUITE A HANOVER, MD 21076

CONTACT INFORMATION

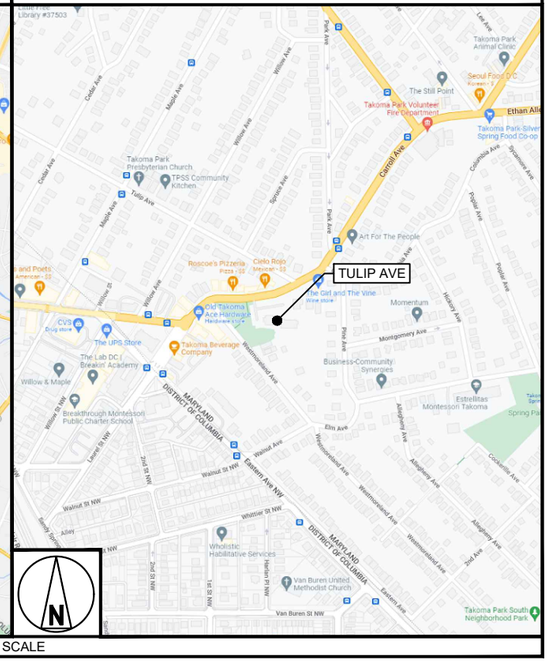
ENGINEER:	JACOBS TELECOMMUNICATIONS, INC. 7150 STANDARD DRIVE, SUITE B HANOVER, MD 21076
CONTACT:	LEAH WOODLY
PHONE:	443.230.4400x113

LOCATION MAPS

VICINITY MAP



LOCAL MAP



NO SCALE

DRIVING DIRECTIONS

DIRECTIONS FROM AT&T OFFICE: START OUT FROM 7150 STANDARD DR, HANOVER MD HEAD SOUTHWEST TOWARD STANDARD DR. TURN LEFT TOWARD STANDARD DR. TURN RIGHT ONTO STANDARD DR. TURN LEFT ONTO PARKWAY DR. TURN RIGHT ONTO PARK CIR DR. TURN LEFT ONTO COCA COLA DR. SLIGHT RIGHT TO MERGE ONTO MD-100 W TOWARD ELLICOTT CITY MERGE ONTO MD-100 W TAKE THE EXIT ONTO I-95 S TOWARD WASHINGTON TAKE EXIT 27 W TO MERGE ONTO I-495 W TOWARD SILVER SPRING TAKE EXIT 28B TO MERGE ONTO MD-650 S/NEW HAMPSHIRE AVE TOWARD TAKOMA PARK MERGE ONTO MD-650 S/NEW HAMPSHIRE AVE. SLIGHT RIGHT TOWARD MD-320 S/PINEY BRANCH RD. MERGE ONTO MD-320 S/PINEY BRANCH RD. TURN LEFT ONTO CARROLL AVE. TURN LEFT,TURN LEFT DESTINATION WILL BE ON THE RIGHT.

ENGINEERING

2015 INTERNATIONAL BUILDING CODE OR LATEST EDITION
2014 NATIONAL ELECTRIC CODE OR LATEST EDITION
TIA-222-H OR LATEST EDITION

GENERAL NOTES

THE FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. A TECHNICIAN WILL VISIT THE SITE AS REQUIRED FOR ROUTINE MAINTENANCE. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT DISTURBANCE OR EFFECT ON DRAINAGE; NO SANITARY SEWER SERVICE, POTABLE WATER, OR TRASH DISPOSAL IS REQUIRED AND NO COMMERCIAL SIGNAGE IS PROPOSED.

RFDS

RFDS ID: 4445171 DATE UPDATED 02/25/22.

APPROVALS

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

AT&T RF: _____ DATE: _____

AT&T OPERATIONS: _____ DATE: _____

AT&T SITE AQ: _____ DATE: _____

OCI: _____ DATE: _____

TOWER/PROPERTY OWNER: _____ DATE: _____

MUNICIPAL: _____ DATE: _____

DRAWING INDEX

SHEET NO:	SHEET TITLE
T-1	TITLE SHEET
C-1	ROOFTOP PLAN
C-2	SITE DETAILS
C-3	RF SIGNAGE AND MITIGRATION
S-1	GROUND EQUIPMENT LAYOUT
S-2	SITE ELEVATION
S-3	EXISTING & PROPOSED ANTENNA LAYOUT
E-1	POWER ANALYSIS
E-2	DC TRUNK CABLE CALCULATOR
E-3	GROUNDING DETAILS
RF-1	ANTENNA CHART AND PLUMBING DIAGRAM
RF-2	COLOR CODE CHART
RF-3	LTE RET NAMING CONVENTION

UNDERGROUND SERVICE ALERT

MISS UTILITY

811

48 HOURS BEFORE YOU DIG

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HANOVER, MD 21076
443.230.4400x113

PROFESSIONAL CERTIFICATION.
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NUMBER 55911, EXPIRATION DATE 04/14/24

STATE OF MARYLAND
WENSEN JIANG
55911
PROFESSIONAL ENGINEER

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

APPROVALS

LANDLORD _____

LEASING _____

R.F. _____

ZONING _____

CONSTRUCTION _____

A & E _____

PROJECT NO: EP4TURWL

DRAWN BY: CRO

CHECKED BY: LW

SUBMITTALS

4	11/01/22	PERMITTING COMMENTS
3	09/27/22	JX COMMENTS
2	08/23/22	ISSUED
1	06/13/22	REVISION
0	06/01/22	ISSUED
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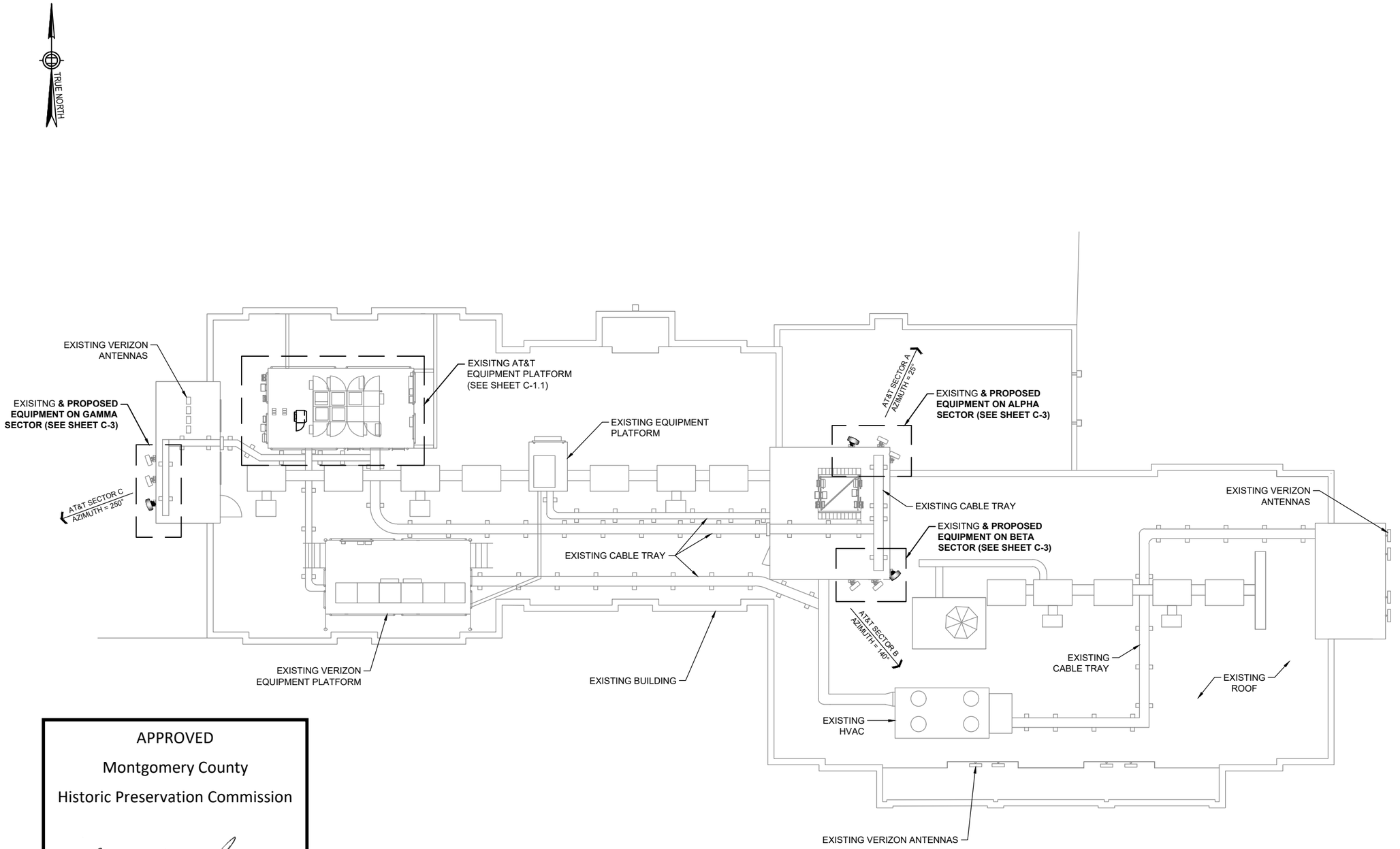
FA# 10072888
USID# 3939
TULIP AVE

7051 CARROL STREET
TAKOMA PARK, MD 20912

TITLE SHEET

T-1



APPROVED

Montgomery County

Historic Preservation Commission

REVIEWED

By Dan.Bruechert at 2:37 pm, Jan 19, 2023

1 **ROOFTOP PLAN**

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

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STATE OF MARYLAND · WENSEN JIANG · 55911 · PROFESSIONAL ENGINEER

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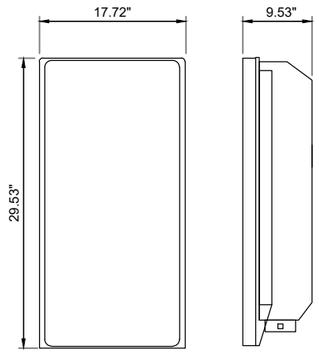
TAKOMA PARK, MD 20912

ROOFTOP PLAN

C-1

MANUFACTURER: NOKIA
MODEL NO.: AEQK AIRSCALE MAA 64T64R 192AE n77 200w
TECHNOLOGY: 5G CBAND
DIMENSIONS (HxWxD): 29.53" x 17.72" x 9.53"
WEIGHT (lbs): <99.21
POWER SUPPLY: DC -40.5V TO -57V
TEMP. W/O SOLAR LOAD: -40°C TO 55°C

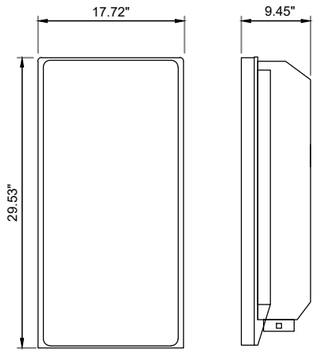
NOTE: ALL NEW ANTENNAS WILL BE PAINTED TO MATCH.



1 AEQK AIRSCALE MAA 64T64R 192AE n77 200w — SCALE: NTS

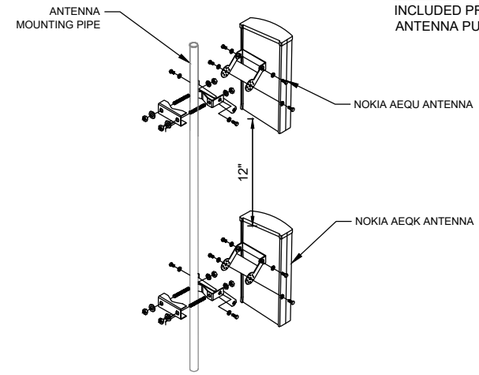
MANUFACTURER: NOKIA
MODEL NO.: AEQU AIRSCALE MAA 64T64R 192AE n77 200w
TECHNOLOGY: 5G DOD
DIMENSIONS (HxWxD): 29.53" x 17.72" x 9.45"
WEIGHT (lbs): <99.21
POWER SUPPLY: DC -40.5V TO -57V
TEMP. W/O SOLAR LOAD: -40°C TO 55°C

NOTE: ALL NEW ANTENNAS WILL BE PAINTED TO MATCH.

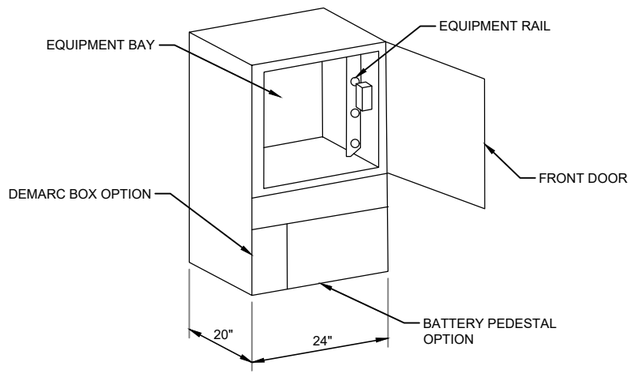


2 AEQU AIRSCALE MAA 64T64R 192AE n77 200w — SCALE: NTS

NOTE:
INCLUDED PRODUCTS WITH ANTENNA PURCHASE



3 CBAND MOUNTING DETAIL — SCALE: NTS



4 FLEX21-V2 CABINET — SCALE: NTS

5 DETAIL NOT USED — SCALE: NTS

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Montgomery County
Historic Preservation Commission

REVIEWED
By Dan.Bruechert at 2:38 pm, Jan 19, 2023

6 DETAIL NOT USED — SCALE: NTS

7 DETAIL NOT USED — SCALE: NTS

8 DETAIL NOT USED — SCALE: NTS

9 DETAIL NOT USED — SCALE: NTS

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WENSEN JIANG
55911
PROFESSIONAL ENGINEER
[illegible]/22

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APPROVALS

LANDLORD _____
LEASING _____
R.F. _____
ZONING _____
CONSTRUCTION _____
A & E _____

PROJECT NO: EP4TURWL

DRAWN BY: CRO

CHECKED BY: LW

SUBMITTALS

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3	09/27/22	JX COMMENTS
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FA# 10072888
USID# 3939
TULIP AVE

7051 CARROL STREET
TAKOMA PARK, MD 20912

SITE DETAILS

C-2

Signage and barriers are the primary means of mitigating access to accessible areas of exposure. Below is a summary of existing and recommended signage at this AT&T facility.

Existing Signage and Barriers (AT&T Sectors)										
Location	Information	Notice	Notice 2	Caution	Caution 2	Caution 2B	Caution 2C	Warning	Warning 2	Barriers
PH Ladder	0	0	0	0	1	0	0	0	0	0
Alpha	0	0	0	0	3	0	0	0	0	0
Beta	0	0	0	0	3	0	0	0	0	0
Gamma	0	0	0	0	2	0	0	0	0	0

Recommended Signage and Barriers (AT&T Sectors) – Actions that MUST be Taken						
Location	Notice 2	Caution 2	Caution 2B	Caution 2C	Warning 2	Barriers
PH Ladder	0	0	0	0	0	0
Alpha	0	0	0	0	0	0
Beta	0	12	0	0	0	X
Gamma	0	0	0	0	0	0

Final Compliant Configuration (AT&T Sectors) – All Mitigation Items that MUST be in Place										
Location	Information	Notice	Notice 2	Caution	Caution 2	Caution 2B	Caution 2C	Warning	Warning 2	Barriers
PH Ladder	0	0	0	0	0	0	0	0	0	0
Alpha	0	0	0	0	3	0	0	0	0	0
Beta	0	0	0	0	15	0	0	0	0	X
Gamma	0	0	0	0	2	0	0	0	0	0

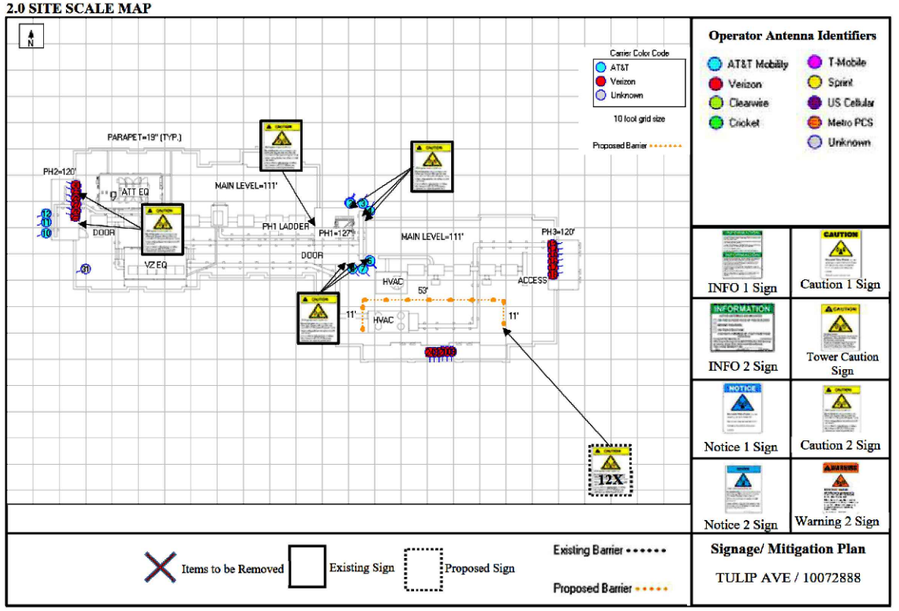
Beta:

- Install a 75' barrier (11'x53'x11' segments) with an estimated (12) stanchions. Install (12) Caution 2 signs on the barrier.

Notes:

- Ensure all barriers are at least 6' away from any unprotected roof edges.
- The existing Caution 2 sign on PH1 ladder is not required and can be removed.
- The existing Caution 2 signs on Gamma sector are not required. However, they are not recommended to be removed to account for future carrier adds.

2.0 SITE SCALE MAP



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CHECKED BY:	LW

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RF SIGNAGE AND MITIGATION

C-3

APPROVED

Montgomery County

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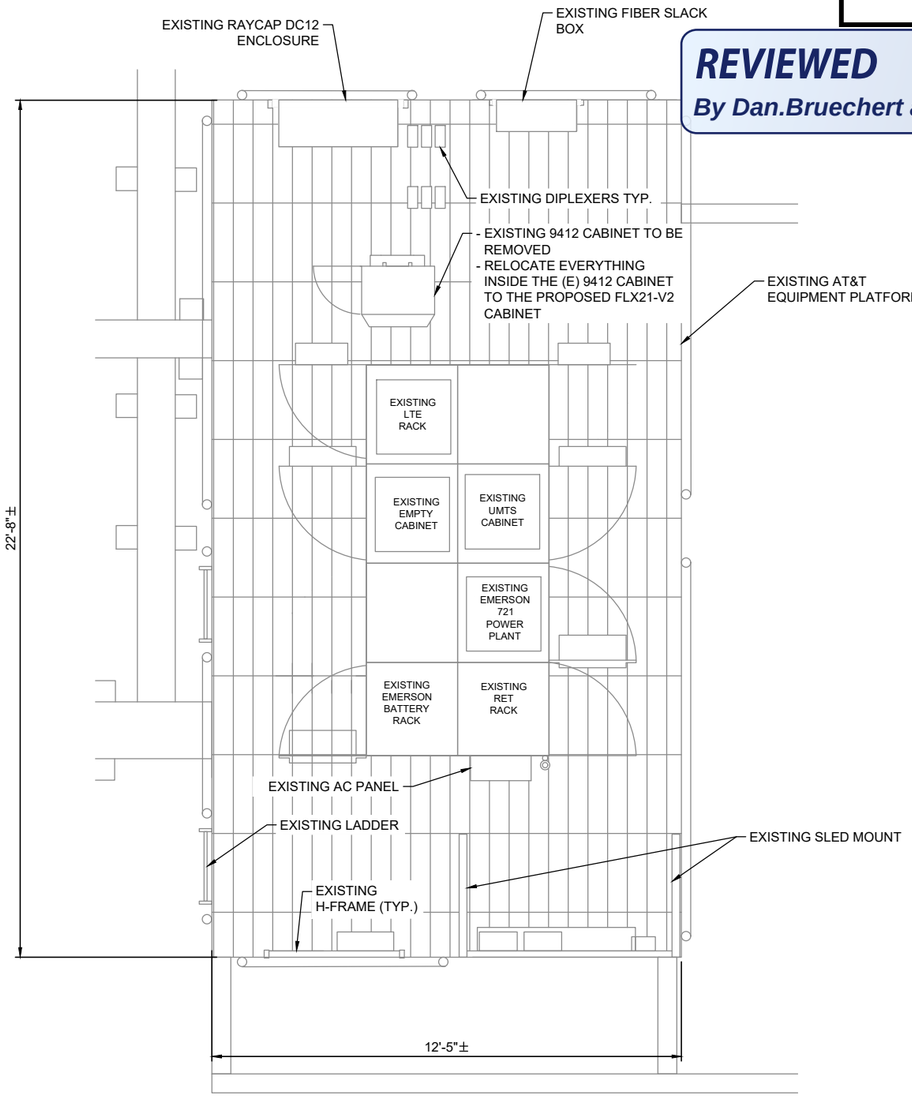
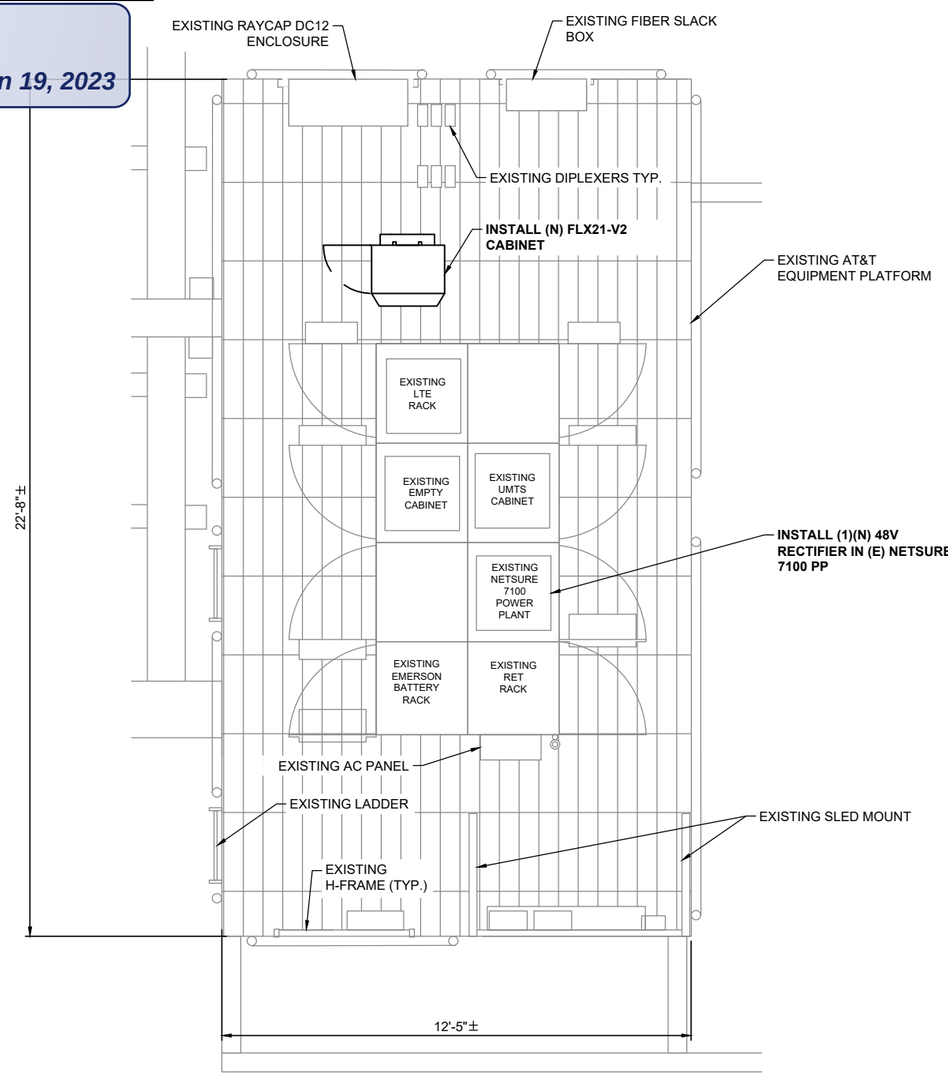
GROUND SCOPE OF WORK:

- DECOM (E) UMTS
- REMOVE (E) 9412 CABINET

- INSTALL (1)(N) 48V RECTIFIER IN (E) NETSURE 7100 PP
- INSTALL (4)(N) DEKA FAHRENHEIT HT170ET BATTERIES IN (E) BATTERY RACK
- INSTALL (N) FLX21-V2 CABINET
- RELOCATE EVERYTHING INSIDE THE (E) 9412 CABINET TO THE (N) FLX21-V2 CABINET
- INSTALL (N) FSM4 INSIDE (N) FLX21-V2 CABINET
- INSTALL (1)(N) 100A BREAKER FOR (N) FLX21-V2 CABINET
- INSTALL (3)(N) 40A BREAKERS FOR (N) AEQK
- INSTALL (3)(N) 40A BREAKERS FOR (N) AEQU
- INSTALL (2)(N) 30A BREAKERS FOR (E) FSM4 CHASSIS (CBAND)



1 **EXISTING EQUIPMENT PLAN**



2 **PROPOSED EQUIPMENT PLAN**

SCALE:
1/2" = 1'-0"

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TAKOMA PARK, MD 20912

GROUND EQUIPMENT LAYOUT

S-1

APPROVED

Montgomery County

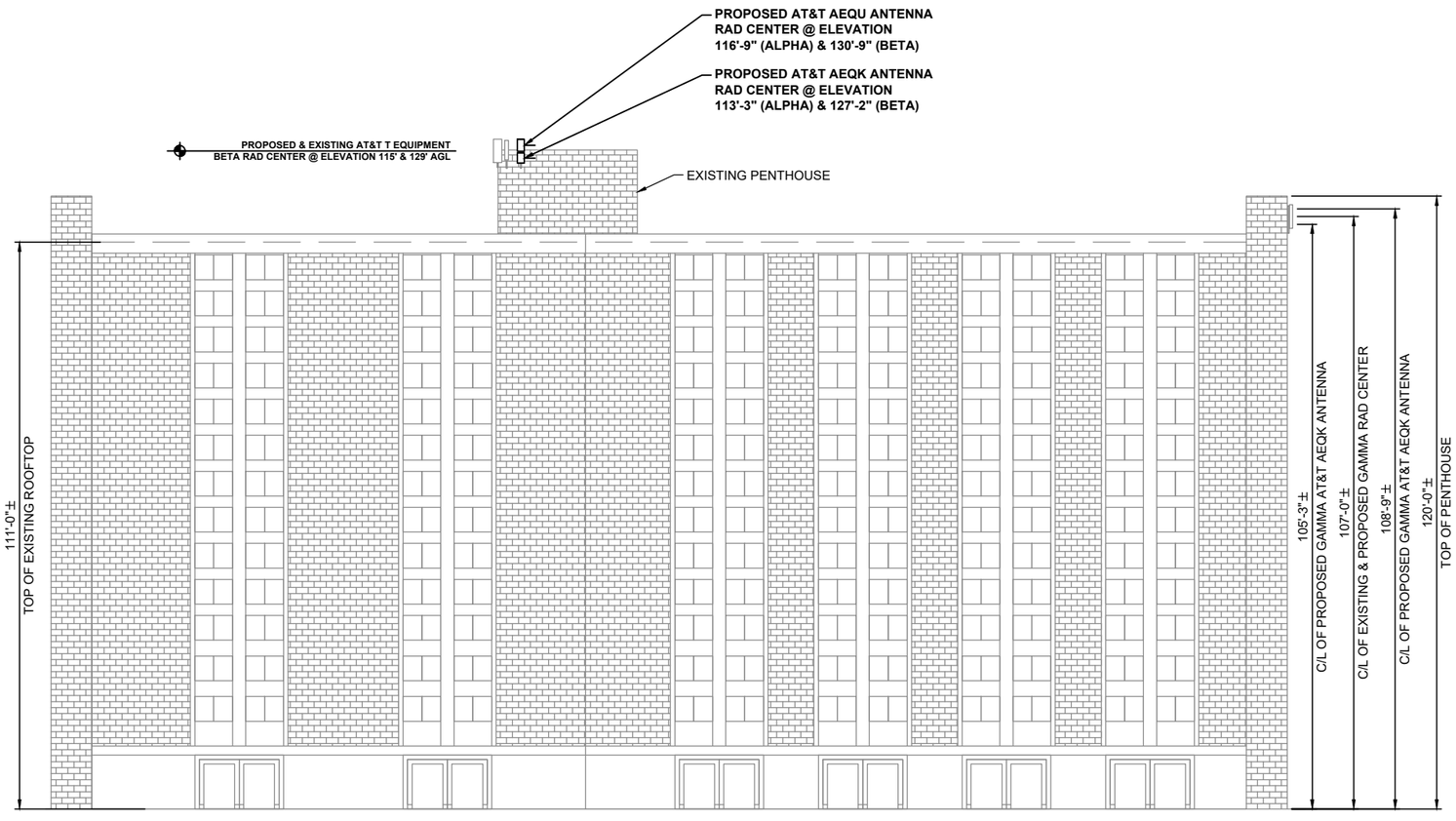
Historic Preservation Commission

REVIEWED

By Dan.Bruechert at 2:38 pm, Jan 19, 2023

NOTES:

1. EXISTING TOWER INFORMATION IS PROVIDED FOR REFERENCE ONLY. JACOBS TELECOMMUNICATIONS, INC. IS NOT RESPONSIBLE FOR THE ANALYSIS/DESIGN OF THE EXISTING TOWER, ITS CONNECTIONS & FOUNDATIONS. A STRUCTURAL ANALYSIS OF THE EXISTING TOWER AND FOUNDATIONS PERFORMED BY OTHERS. CONTRACTOR SHALL REFER TO THE LATEST STRUCTURAL ANALYSIS REPORT. MODIFICATIONS TO THE TOWER OR FOUNDATION THAT ARE NEEDED MUST BE PERFORMED PRIOR TO THE INSTALLATION OF THE EQUIPMENT SHOWN ON THE DRAWINGS.
2. CONTRACTOR SHALL VERIFY THE EXISTING ANTENNA CENTERLINE HEIGHT ABOVE GROUND LEVEL. PROPOSED ANTENNA CENTERLINE SHALL MATCH EXISTING.



1 **SITE ELEVATION** SCALE: N.T.S.

NOTES:

1. ALL CABLES SHALL BE GROUNDED WITH COAXIAL CABLE GROUNDING KITS. FOLLOW THE MANUFACTURER'S RECOMMENDATIONS.
   A. GROUNDING AT THE ANTENNA LEVEL.
   B. GROUNDING AT MID LEVEL, TOWERS WHICH ARE OVER 200', ADDITIONAL CABLE ROUNDING REQUIRED.
   C. GROUNDING AT BASE OF TOWER PRIOR TO TURNING HORIZONTAL.
   D. GROUNDING OUTSIDE THE EQUIPMENT SHELTER AT ENTRY PORT.
   E. GROUNDING INSIDE THE EQUIPMENT SHELTER AT THE ENTRY PORT.
2. ALL PROPOSED GROUNDING BAR DOWNLEADS ARE TO BE TERMINATED TO THE EXISTING ADJACENT GROUNDING BAR DOWNLEADS A MINIMUM DISTANCE OF 4'-0" BELOW GROUNDING BAR. TERMINATIONS MAY BE EXOTHERMIC OR COMPRESSION.
3. ALL CONNECTIONS FOR HANGERS, SUPPORTS, BRACING, ETC. SHALL BE INSTALLED PER TOWER MANUFACTURER'S SPECIFICATION & RECOMMENDATIONS.

ANTENNA MOUNTING NOTES:

1. DESIGN AND CONSTRUCTION OF ANTENNA SUPPORTS SHALL CONFORM TO CURRENT ANSI/EIA/TIA-222 "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES" OR APPLICABLE LOCAL CODES. DESIGN WIND LOADING OBTAINED FROM ANSI/TIA-222-G, OR THE LATEST VERSION.
2. ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS OTHERWISE NOTED.
3. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC-COATING (HOT-DIP) ON IRON AND STEEL HARDWARE", UNLESS OTHERWISE NOTED.
4. DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED BY COLD GALVANIZING IN ACCORDANCE WITH ASTM A780.
5. ALL ANTENNA MOUNTS SHALL BE INSTALLED WITH LOCK NUTS, DOUBLE NUTS AND SHALL BE TORQUED TO MANUFACTURER'S RECOMMENDATIONS.
6. MULTI PORT ANTENNAS: TERMINATE UNUSED ANTENNA PORTS WITH CONNECTOR CAP & WEATHERPROOF THOROUGHLY. JUMPERS FROM THE TMA'S MUST TERMINATE TO OPPOSITE POLARIZATION'S IN EACH SECTOR.

COAXIAL ANTENNA CABLE NOTES:

1. ALL JUMPERS TO THE ANTENNAS FROM THE MAIN TRANSMISSION LINE WILL BE 1/2" DIA. LDF AND SHALL NOT EXCEED 6'-0".
2. ALL COAXIAL CABLE WILL BE SECURED TO THE DESIGNED SUPPORT STRUCTURE, IN AN APPROVED MANNER, AT DISTANCES NOT TO EXCEED 4'-0" O.C.

FIBER & POWER CABLE MOUNTING NOTES:

1. CABLE TO BE SUPPORTED USING 1/2" SNAP-INS (PIM RATED)(SNAPTEK POLYMERS OR EQUIVALENT) OR 1/2" BUTTERFLY HANGERS (PIM RATED)(SNAPTEK POLYMERS OR EQUIVALENT) OR ENGINEER APPROVED EQUAL..
2. CABLE TO BE SUPPORTED EVERY 3'.
3. ALL SNAP-INS, RUBBER CABLE INSERTS, AND MOUNTING HARDWARE FOR FIBER AND DC CABLES SHALL BE SUPPLIED FROM ROSENBERGER.
4. RRUS TO BE INSTALLED WITHIN 16.4' (5.0 METERS) OF THE SURGE SUPPRESSOR. (CONTRACTOR TO FIELD VERIFY).

TORQUE REQUIREMENTS:

1. ALL RF CONNECTIONS SHALL BE TIGHTENED BY A TORQUE WRENCH.
2. ALL RF CONNECTIONS, GROUNDING HARDWARE AND ANTENNA HARDWARE SHALL HAVE A TORQUE MARK INSTALLED IN A CONTINUOUS STRAIGHT LINE FROM BOTH SIDES OF THE CONNECTION.
   A. RF CONNECTION BOTH SIDES OF THE CONNECTOR.
   B. GROUNDING AND ANTENNA HARDWARE ON THE NUT SIDE STARTING FROM THE THREADS TO THE SOLID SURFACE. EXAMPLE OF SOLID SURFACE: GROUND BAR, ANTENNA BRACKET METAL.
3. ALL 8M ANTENNA HARDWARE SHALL BE TIGHTENED TO 9 LB-FT (12 NM).
4. ALL 12M ANTENNA HARDWARE SHALL BE TIGHTENED TO 43 LB-FT (58 NM).
5. ALL GROUNDING HARDWARE SHALL TIGHTENED UNTIL THE LOCK WASHER COLLAPSES AND THE GROUND IS NO LONGER LOOSE.
6. ALL DIN TYPE CONNECTIONS ARE TO BE TORQUED TO 18-22 LB-FT (24.4 - 29.8 NM).
7. ALL N TYPE CONNECTIONS ARE TO BE TORQUED TO 15-20 LB-IN (1.7 - 2.3 NM).

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PROFESSIONAL CERTIFICATION.
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NUMBER 55911, EXPIRATION DATE 04/14/24.

STATE OF MARYLAND
WENSEN JIANG
55911
PROFESSIONAL ENGINEER
11/1/22

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

APPROVALS

LANDLORD _____

LEASING _____

R.F. _____

ZONING _____

CONSTRUCTION _____

A & E _____

PROJECT NO: EP4TURWL

DRAWN BY: CRO

CHECKED BY: LW

SUBMITTALS

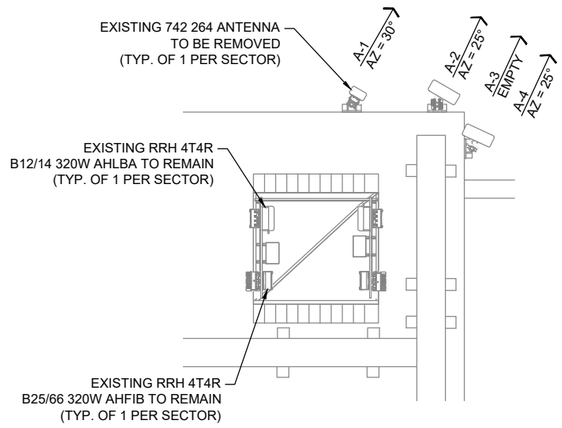
4	11/01/22	PERMITTING COMMENTS
3	09/27/22	JX COMMENTS
2	08/23/22	ISSUED
1	06/13/22	REVISION
0	06/01/22	ISSUED
B	06/01/22	REVISION
A	04/27/22	ISSUED FOR REVIEW

FA# 10072888
USID# 3939
TULIP AVE

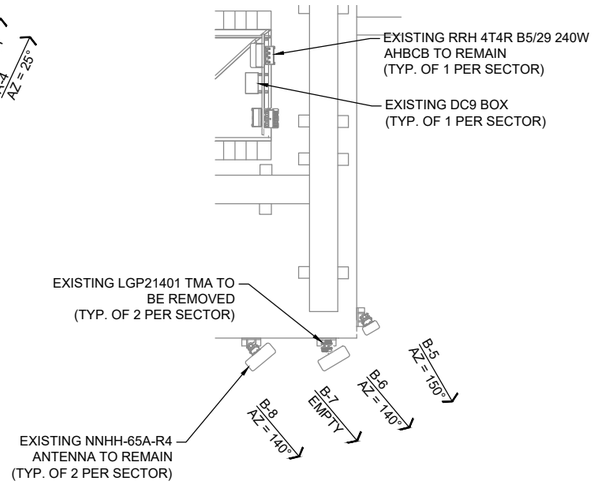
7051 CARROL STREET
TAKOMA PARK, MD 20912

SITE ELEVATION

S-2



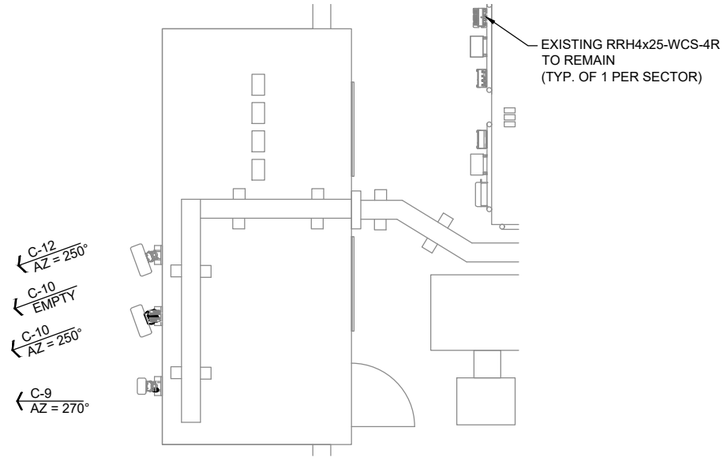
ELEVATION 115'



ELEVATION 129'

NOTES:

1. CONTRACTOR TO VERIFY FINAL RF CONFIGURATION AND NOTIFY CARRIER AND ENGINEER W/ ANY DISCREPANCIES PRIOR TO THE INSTALLATION.
2. CONTRACTOR SHALL NOT EXCEED MOUNTING MORE THAN (2) RRHS PER ANTENNA MOUNTING PIPE - RELOCATE TO AN ADJACENT ANTENNA MOUNTING PIPE AS NEEDED.
3. CONTRACTOR SHALL REFER TO THE TOWER EQUIPMENT INSTALLATION MOUNT STRUCTURAL ANALYSIS REPORT; SITE NUMBER: N/A; SITE NAME: TULIP AVE; FA LOCATION: 10072888 ; ISSUED BY JACOBS TELECOMMUNICATIONS, INC. ON XX/XX/XX. PER THIS ANALYSIS NO MODIFICATIONS ARE REQUIRED FOR THE PROPOSED EQUIPMENT. CONTRACTOR SHALL CONFIRM ALL MOUNT MEMBERS AND PROPOSED APPURTENANCES ARE INSTALLED IN ACCORDANCE WITH THIS REPORT.

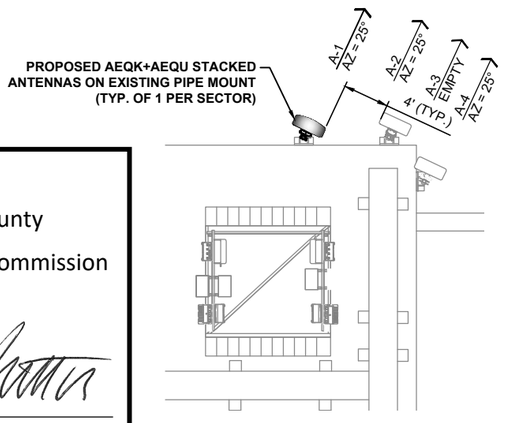


ELEVATION 107'

1 EXISTING ANTENNA LAYOUT

SCALE: 1/4" = 1'-0"

NOTE: ALL NEW ANTENNAS WILL BE PAINTED TO MATCH.



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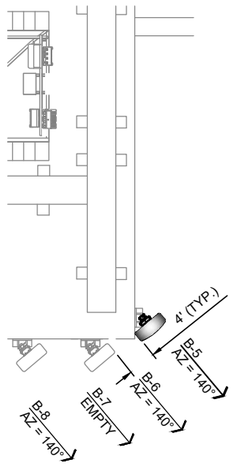
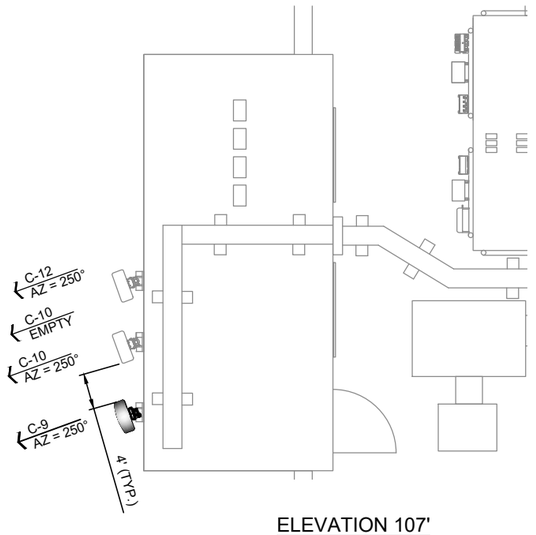


ELEVATION 129'

TOWER SCOPE OF WORK:

- DECOM (4)(E) 1-5/8" COAX AND LEAVE IN-PLACE
- DECOM (2)(E) 7/8" COAX AND LEAVE IN-PLACE
- REMOVE (E) KATHREIN 742 264 ANTENNA IN POS 1 (ALL SECTORS)
- REMOVE (E) TMAS/DIPLEXERS IN POS 1 (ALL SECTORS)
- INSTALL (N) AEQK IN POS 1 (1 PER SECTOR)
- INSTALL (N) AEQU STACKED ON TOP OF AEQK IN POS 1 (1 PER SECTOR)
- USE (E) SPARE 6 AWG DC TRUNKS FOR (N) AEQK AND (N) AEQU



ELEVATION 107'

APPROVED

Montgomery County

Historic Preservation Commission

REVIEWED

By Dan.Bruechert at 2:38 pm, Jan 19, 2023

2 PROPOSED ANTENNA LAYOUT

SCALE: 1/4" = 1'-0"

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STATE OF MARYLAND · WENSEN JIANG · 55911 · PROFESSIONAL ENGINEER

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APPROVALS

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FA# 10072888
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TULIP AVE

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TAKOMA PARK, MD 20912

EXISTING & PROPOSED ANTENNA LAYOUT

S-3

SITE DATA INPUT WORKSHEET - INDOOR SITE POWER ESTIMATE TOOL

Region:	NE
Market:	WASHINGTON D.C./MARYLAND
FA:	10072888
USID:	3939
Location Name:	TULIP AVE
Date Calc Completed:	1/28/2022
Completed By:	MHL
PACE JOB ID:	MRWSH048703, MRWSH048684
Job Description:	5G NR 1SR Cband
Field Notes:	

-48V PRIMARY VOLTAGE DC PLANT SPECIFIED				
+24VDC EQUIPMENT LOAD:	120 WATTS	=	5AMPS	at +24V
-48VDC EQUIPMENT LOAD:	16750 WATTS	=	311 AMPS	at -48V
4 AMPS (176 Watts) AT PRIMARY 48V REQUIRED TO SUPPORT 24V DC CONVERTER SYSTEM				
TOTAL PRIMARY 48V LOAD:	16926 WATTS	=	314 AMPS	at -48V

(DC PLANT CONFIGURATION CAN BE REVIEWED ON DC PLANT WORKSHEET)	
DC PLANT: Vertiv STD -48VDC NetSure 7100 Plant 1000A	
-48V RECTIFIERS REQUIRED (N+1):	11
-48V RECTIFIER SLOTS:	22
CONV. TYPE: UNIVERSAL SLOTS - RIGHT 3 RECT SLOTS/SHELF CAN BE USED FOR CONV	
+24V CONVERTERS REQUIRED:	2
+24V CONVERTER SLOTS:	9
ESTIMATED BATTERY RESERVE TIME	
6 164 AH 48V STRINGS = 4.54 HOURS	(4 HOUR MINIMUM BATTERY RESERVE)

ESTIMATED SITE MAX. AC LOAD (AMPS):	104.29 AMPS
ESTIMATE 200A SERVICE SUFFICIENT	
SITE GENERATOR CAPACITY REQUIRED:	17 KW
ON SITE GENERATOR CAPACITY:	0 KW
(NO ON-SITE GENERATOR)	
RECOMMENDED ENVIRO SYSTEM:	3-TONS COOLING
SPECIFIED ENVIROMENTAL SYSTEM:	0-TONS
ESTIMATE EXISTING HVAC NOT SUFFICIENT	

STEP 1: ENTER QUANTITIES OF EQUIPMENT & DC OPERATING VOLTAGE:

STEP 2: ENTER DC PLANT TYPE FROM DROP-DOWN MENU:

("GENERIC" +24V or -48V DC PLANT CAN BE SELECTED FOR ANY MANUFACTURER'S DC PLANT)

Vertiv STD -48VDC NetSure 7100 Plant 1000A

-48V PRIMARY DC PLANT SPECIFIED

(DC PLANT CONFIGURATION CAN BE REVIEWED ON DC PLANT WORKSHEET)

STEP 2A: THIS STEP ONLY SHOWN IF "GENERIC" DC PLANT PLANT TYPE HAS BEEN SELECTED:

STEP 2B: THIS STEP ONLY SHOWN IF TYCO GPS2424 DC PLANT PLANT TYPE HAS BEEN SELECTED:

STEP 3: DO YOU WANT TO CONFIGURE A STANDARD STAND-ALONE DC CONVERTER SYSTEM? N

NOTE: IF YOU SELECT "Y" ANY INTEGRATED DC PLANT CONVERTER OPTIONS WILL BE BYPASSED

STEP 4: ENTER INDOOR SITE BUILDING/SHELTER DATA:

(Square footage used for interior AC lighting LOAD calculation)

SELECT SITE ENCLOSURE TYPE & SIZE: OTHER

SPECIFY TOTAL FLOOR SPACE (SQUARE FEET): 0

STEP 5: ENTER SITE HVAC SYSTEM DATA:

	Type	Size	QTY
SPECIFY INDIVIDUAL Cooling UNIT/CNTLR:			
SPECIFY INDIVIDUAL Cooling UNIT/CNTLR:			
SPECIFY INDIVIDUAL Cooling UNIT/CNTLR:			
SPECIFY INDIVIDUAL Cooling UNIT/CNTLR:			
SPECIFY INDIVIDUAL Cooling UNIT/CNTLR:			
SPECIFY INDIVIDUAL Cooling UNIT/CNTLR:			

PLEASE SELECT A VALID CONFIGURATION

ARE THERE SITE HVAC HEATING UNITS? N

TOTAL SPECIFIED SITE HVAC: 0-TONS ESTIMATED HVAC REQUIREMENT: 3-TONS COOLING

SPECIFIED HVAC NOT SUFFICIENT

IF Smrt_Cntrl w/ Gen Cntrl IS SELECTED USER NEEDS TO VERIFY GENERATOR RUN ALARM IS WIRED THROUGH SMART CONTROLLER.
DC LOADS FOR SHELTER ENVIROMENTAL SYSTEMS ARE AUTOMATICLY ADDED TO THE DC PLANT LOAD

STEP 6: ENTER SITE STATIONARY GENERATOR DATA:

DOES SITE HAVE A STATIONARY GENERATOR? N

ESTIMATED CAPACITY REQUIRED: 17 KW (NO SITE GENERATOR)

STEP 7: ENTER SITE BATTERY CONFIGURATION DATA:

SELECT SINGLE STRING BATTERY CAPACITY (AH): 164

SPECIFY TOTAL QUANTITY OF BATTERY STRINGS: 6

TOTAL SITE BATTERY CAPACITY (AH): 984

NOTE: NON-STANDARD BATTERY CAPACITY HAS BEEN SPECIFIED

NOTE: 12 VOLT MONOBLOCK BATTERIES - 4 batteries per -48V String

ESTIMATED BATTERY RESERVE TIME: 4.54 HOURS (NO SITE GENSET)

- SITES WITH STATIONARY GENSETS
  - Equipped with Vertiv DC Plant (NEQ.20068) equipped with 200 amp Battery disconnect breakers shall receive no greater than 2 shelves of 180 AH batteries.
  - All other locations with legacy DC plants (typically equipped with battery disconnect breakers <200 amps) shall receive no greater than 3 shelves of 180 AH batteries
- ALL SITES WITHOUT A STATIOINARY GENSET
  - Shall be engineered with 4 hours of battery reserve.

SITE POWER CALCULATION TOOL - VERSION 5.24 -July 7, 2021 R. BADGERO

ANY QUESTIONS PLEASE CONTACT RICK BADGERO (RB6620@ATT.COM)

NOTE: LOAD VALUES FOR ANY EQUIPMENT CAN BE USER SPECIFIED ON THE POWER CONSUMPTION WORKSHEET - USER CHANGES TO DEFAULT LOAD VALUES ARE HIGHLIGHTED IN BRIGHT YELLOW

QTY	Ericsson	VOLTAGE	WATTS
	UMTS 3G EQUIPMENT		
0	Ericsson RBS3206 NodeB 3S1C - 1 CAB	48	0
0	Ericsson RBS3206 NodeB 3S2C - 1 CAB	48	0
	NON-OBIF Ericsson 3rd, 4th & 5th Carrier		
0	Ericsson RBS3206 NodeB 3S3C - 2 CAB	48	0
0	Ericsson RBS3206 NodeB 3S4C - 2 CAB	48	0
0	Ericsson RBS3206 NodeB 3S5C - 3 CAB	48	0
	OBIF Ericsson 3rd, 4th & 5th Carrier		
0	Ericsson RBS3206 NodeB 3S3C - 1 CAB	24	0
	(Select RRUS from section below)		
0	Ericsson RBS3206 NodeB 3S4C - 1 CAB	24	0
	(Select RRUS from section below)		
0	Ericsson RBS3206 NodeB 3S4C - 1 CAB	24	0
	(Select RRUS from section below)		
0	Ericsson RBS3206 NodeB 3S5C - 2 CAB	24	0
	(Select RRUS from section below)		
0	Ericsson 3303 MICRO NodeB	24	0
0	Ericsson RBS3418 Distributed NodeB MU	48	0
0	(FUTURE)		0
0	(FUTURE)		0
	LTE 4G & Multi-Std EQUIPMENT		
0	Ericsson LTE IRBS6601 BBU - 1 DUL	48	0
0	Ericsson LTE RBS6601 BBU - 2 DUL	48	0
0	Ericsson W/CDMA RBS6601 - 1 DUW	48	0
0	Ericsson LTE RBS6601 BBU - 1DUS	48	0
0	Ericsson LTE RBS6601 BBU - 2DUS	48	0
0	Ericsson XMU	48	0
0	Ericsson LTE RBS5216	48	0
0	P614 PIM Card	48	0
0	6630 BBU Card	48	0
0	6648 BBU Card	48	0
0	6675 BBU Card	48	0
0	(FUTURE)		0
0	(FUTURE)		0

QTY	IN/OUT	Radio Heads	VOLTAGE	WATTS
0		RRUS 11	48	0
0		RRUS12 + A2	48	0
0		RRUS 32 B66	48	0
0		RRUS 32 B30	48	0
0		RRUS 32 B2	48	0
0		RRU 4415 B25	48	0
0		RRUS 4415 B30	48	0
0		RRU 4426 B66	48	0
0		RRU 4478 B14	48	0
0		RRU 4478 B5	48	0
0		RRUS E2 B29	48	0
0		RRUS 4449 B5/B12	48	0
0		RRUS 8843 B2/B66	48	0
0		RRUS 2203 B2, B5	48	0
0		RRUS 2205 B46	48	0
0		AIR 3246 B25, B66	48	0
0		AIR 5331 radio	48	0
0		AIR 1281 radio	48	0
0		AIR 1641 B25/B66	48	0
0		LPRU 4410 B5/B12	48	0
0		LPRU 4420 B25/B66	48	0
0		RRUS 2203 B14	48	0
0		AIR 6488 B48	48	0
0		AIR 6449 B77	48	0
0		RRU 8863 B77	48	0
0		(FUTURE)		0
0		(FUTURE)		0
0		(FUTURE)		0
0		(FUTURE)		0
0		(FUTURE)		0
0		(FUTURE)		0
0		(FUTURE)		0
0		(FUTURE)		0
0		(FUTURE)		0
0		(FUTURE)		0
0		(FUTURE)		0

QTY	ALU-Nokia	VOLTAGE	WATTS
	UMTS 3G EQUIPMENT		
0	A-LU MACRO NodeB (3S1C - 40W)	24	0
0	A-LU MACRO NodeB (3S2C - 40W)	24	0
0	A-LU MACRO NodeB (3S3C - 40W)	24	0
0	A-LU MACRO NodeB (3S4C - 40W)	24	0
0	A-LU MACRO NodeB (3S5C - 40W - 2 CAB)	24	0
0	A-LU MICRO NodeB	24	0
0	A-LU 9396 d2U Distributed NodeB MU	48	0
0	A-LU 9396 d4U Distributed NodeB MU	48	0
0	(FUTURE)		0
0	(FUTURE)		0
	LTE 4G & Multi-Std EQUIPMENT		
0	A-LU 9926 LTE BBU (w/max. 3 eCEM-u)	48	0
1	Nokia FSM-4 Chassis (LTE)	48	998
1	Nokia FSM-4 Chassis (5G)	48	1307
0	(FUTURE)		0
0	(FUTURE)		0
0	(FUTURE)		0
0	(FUTURE)		0
0	(FUTURE)		0
0	(FUTURE)		0

QTY	IN/OUT	Radio Heads	VOLTAGE	WATTS
0		2X40 (L7)	48	0
0		2x40 (B29)	48	0
0		2X60 (U8)	48	0
0		2X60 (U9)	48	0
0		2X60 B66 (L2)	48	0
0		2X60 (L8)	48	0
0		2X60 (L9)	48	0
3	OUT	4X25 B30 (L3)	48	1440
0		2X60 B4 (L9)	48	0
0		4X30 B25 (L9)	48	0
0		4X45 B66a (L2)	48	0
0		Flexi B14 FRBI	48	0
0		AirScale B5 AHCA	48	0
0		AirScale B30 AHNA	48	0
0		AirScale (Micro) B25 AHFB	48	0
0		AirScale (Micro) B66 AHIB	48	0
3	OUT	AirScale Dual Band B25/66 AHFIB	48	2880
3	OUT	AirScale Dual Band B12/14 AHLBA	48	2880
3	OUT	AirScale Dual Band B5/29 AHBCB	48	2040
0		AirScale AAS 39 GHz AEWB	48	0
0		AirScale TribandB12/B14/B29 AHLBBA	48	0
3	OUT	AirScale Band 77 AEQK	48	2235
0		AirScale Band 77 AZQW	48	0
0		(FUTURE)		0
0		(FUTURE)		0
0		(FUTURE)		0
0		(FUTURE)		0

QTY	TX RF AMP (MCPA or SCPA) EQPT.	VOLTAGE	WATTS
0	Andrew (12 module mcpa FRAME)	24	0
0	Andrew 135 Watt Module	24	0
0	(FUTURE)		0
0	Powerwave 12 module mcpa FRAME)	24	0
0	Powerwave 90 Watt Module	24	0
0	Powerwave 120 Watt Module	24	0
0	Powerwave 180 Watt Module	24	0
0	(FUTURE)		0
0	CCI 125 Watt DAB SCPA Module	24	0
0	CCI 125 Watt DAC SCPA Module	24	0
0	(FUTURE)		0

QTY	ANCILLARY CELL SITE EQUIPMENT	VOLTAGE	WATTS
1	A-LU 7705 SIAD	48	80
0	(FUTURE)		0
0	A-LU MPR-9500 MW Service Switch - MSS	48	0
0	A-Lu MPR-9500 MW Outdoor Unit - ODU	48	0
0	A-Lu MPR-9500 MW MPT-HL (Indoor)	48	0
0	(FUTURE)	48	0
0	Cisco MWR-2941 SIAD	48	0
0	Cisco SIAD ASR-901	48	0
0	Cisco 15310 EOS (SONET) MUX	48	0
0	Cisco 15454 MSP (MW Ring Config.)	48	0
0	(FUTURE)		0
0	Tru-Position LMU (E911)	48	0
1	GENERIC Ethernet NID	24	60
0	GENERIC Hydrogen Detector	48	0
1	GENERIC RET Controller	24	60
0	GENERIC RXAIT	48	0
0	GENERIC Smoke Detector	48	0
0	GENERIC TMA System	48	0
0	GENERIC Tower Lighting (DC)	48	0
0	NG480	48	0
0	Cisco 2911	48	0
0	(FUTURE)		0
0	FLX-12 Cabinet	48	0
0	FLX-16 Cabinet	48	0
1	FLX-21 Cabinet	48	655
0	(FUTURE)		0
0	(FUTURE)		0
0	(FUTURE)		0
0	(FUTURE)		0
0	(FUTURE)		0

(CUSTOM DC LOADS DEFINED ON POWER CONSUMPTION WORKSHEET)

QTY	IN/OUT	USER SPECIFIED DC EQUIPMENT	VOLTAGE	WATTS
0		9412 Cabinet	48	0
3	OUT	AirScale Band 77 AEQU	48	2235
0			48	0
0			48	0
0			48	0
0			48	0
0			48	0
0			48	0
0			48	0
0			48	0
0			48	0
0			48	0
0			48	0
0			48	0
0			48	0
		TOTAL USER SPECIFIED WATTS:		2235
		TOTAL +24V (27V) AMPS:	0	
		TOTAL -48V (54V) AMPS:	41.4	

(CUSTOM AC LOADS DEFINED ON POWER CONSUMPTION WORKSHEET)

QTY	USER SPECIFIED AC EQUIPMENT	VOLTAGE	KVA
0			0
0			0
0			0
0			0
0			0
0			0
0			0
0			0
0			0
0			0
	TOTAL USER SPECIFIED KVA:		0
	TOTAL 120VAC AMPS:	0	
	TOTAL 240VAC AMPS:	0	

APPROVED

Montgomery County

Historic Preservation Commission

REVIEWED

By Dan.Bruechert at 2:38 pm, Jan 19, 2023

1 POWER ANALYSIS

SCALE: N.T.S.

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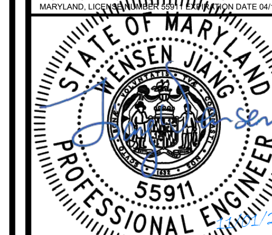
HANOVER, MD 21076
443.230.4400x113

PROFESSIONAL CERTIFICATION:
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NUMBER 55911 EXPIRATION DATE 04/14/24



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APPROVALS

LANDLORD ____
LEASING ____
R.F. ____
ZONING ____
CONSTRUCTION ____
A & E ____

PROJECT NO:	EP4TURWL
DRAWN BY:	CRO
CHECKED BY:	LW

SUBMITTALS

4	11/01/22	PERMITTING COMMENTS
3	09/27/22	JX COMMENTS
2	08/23/22	ISSUED
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FA# 10072888
USID# 3939
TULIP AVE

7051 CARROL STREET
TAKOMA PARK, MD 20912

POWER ANALYSIS

E-1

Model: NetSure 721T1100 - 582127000 w/26 position Panels | Metric | Fill in the yellow highlighted cells as appropriate. See definitions for each cell on the Notes tab. | Yes | Up-converters on Allocation

Number of Radio Types: 2 | No | Fixed Generator Onsite | TOTAL # OF POWER EXTEND CONVERTERS= 0 | = CB,Fuse, or End of Panel | = Do Not Use

Cells that become highlighted in red indicate that the voltage at the RRU falls below the Minimum RRU Operating Voltage and the RRU will not operate. A cell that reads "INVALID" indicates that the loss in the cable would exceed the power rating of the RRU and the calculation cannot be performed.

Radio Type #1: Converters per trunk feed: 0

Select Installation type	#Unstacked - Stacked
Trunk Cable Length - one-way	560 ft
Trunk Cable Size (AWG - 4, 6, 8)	6
Jumper Cable Length - one-way	15 ft
Jumper Cable Size (AWG - 8, 10, or 12)	8
Total Quantity of RRU Trunk Feeds	3
Radio - Nokia - AirScale AEQK B77	
RRU Trunk Feed Peak DC Input Power (W)	931

ADDITIONAL TRUNK CABLE INFO

NOTE: No Converter(s) are needed because the voltage drop without converters is OK. See detailed information to the right.

RRU Trunk Feed Busy Hour Input Power (W)	605
Minimum Source Voltage (V)	52
Converter Output Voltage (V)	58
Minimum RRU Operating Voltage (VDC)	40
Peak Power Rating of Power Extend Conv (W)	1000
Total Cable loop length	1150 ft
Cable Resistance (Ohms)	0.5129

	without Converter	with Converter
RRU Voltage (VDC) at Min Source Voltage and Peak Power	40.09	48.07
RRU Trunk Feed Current (A) at Min Source Voltage and Peak Power	23.22	19.37
Source Power (W) per RRU Trunk Feed at Min Source V and Peak RRU Power	1207.6	1123.4
Total Source Power (W) at Min Source Voltage and Peak RRU Power	3622.9	3370.3
Peak Power System Current (A) Required for RRUs	69.7	66.1
Qty of Power Extend Converters Req'd per RRU Trunk Feed	N/A	0
Qty of Power Extend Converters Req'd per Site	N/A	0
# of Total Bullet Positions Required	N/A	0

	without Converter	with Converter
RRU Voltage (VDC) at Min Source Voltage and Busy Hour	45.12	52.04
RRU Trunk Feed Current (A) at Min Source Voltage and Busy Hour	13.41	11.63
Source Power (W) at Min Source V and Busy Hour per RRU Trunk Feed	697.4	674.5
Total Source Power (W) at Min Source Voltage and Busy Hour	2092.2	2023.6

Power Extend Converter Average Power Level Above which a Space is required Between Each 4 Units (W)	250
Power Extend Converter Average Power Level Above which a Space is required Between Each 3 Units (W)	475
Power Extend Converter Average Power Level Above which a Space is required Between Each 2 Units (W)	525
Power Extend Converter Average Power Level Above which a Space is required Between Each Unit (W)	650

Radio Type #2: Converters per trunk feed: 0

Select Installation type	#Unstacked - Stacked
Trunk Cable Length - one-way	560 ft
Trunk Cable Size (AWG - 4, 6, 8)	6
Jumper Cable Length - one-way	15 ft
Jumper Cable Size (AWG - 8, 10, or 12)	8
Total Quantity of RRU Trunk Feeds	3
Radio - (other) - (enter power level)	
RRU Trunk Feed Peak DC Input Power (W)	931

ADDITIONAL TRUNK CABLE INFO

NOTE: No Converter(s) are needed because the voltage drop without converters is OK. See detailed information to the right.

RRU Trunk Feed Busy Hour Input Power (W)	605
Minimum Source Voltage (V)	52
Converter Output Voltage (V)	58
Minimum RRU Operating Voltage (VDC)	40
Peak Power Rating of Power Extend Conv (W)	1000
Total Cable loop length	1150 ft
Cable Resistance (Ohms)	0.5129

	without Converter	with Converter
RRU Voltage (VDC) at Min Source Voltage and Peak Power	40.09	48.07
RRU Trunk Feed Current (A) at Min Source Voltage and Peak Power	23.22	19.37
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Qty of Power Extend Converters Req'd per RRU Trunk Feed	N/A	0
Qty of Power Extend Converters Req'd per Site	N/A	0
# of Total Bullet Positions Required	N/A	0

	without Converter	with Converter
RRU Voltage (VDC) at Min Source Voltage and Busy Hour	45.12	52.04
RRU Trunk Feed Current (A) at Min Source Voltage and Busy Hour	13.41	11.63
Source Power (W) at Min Source V and Busy Hour per RRU Trunk Feed	697.4	674.5
Total Source Power (W) at Min Source Voltage and Busy Hour	2092.2	2023.6

Power Extend Converter Average Power Level Above which a Space is required Between Each 4 Units (W)	250
Power Extend Converter Average Power Level Above which a Space is required Between Each 3 Units (W)	475
Power Extend Converter Average Power Level Above which a Space is required Between Each 2 Units (W)	525
Power Extend Converter Average Power Level Above which a Space is required Between Each Unit (W)	650

APPROVED
Montgomery County
Historic Preservation Commission

REVIEWED
By Dan.Bruechert at 2:38 pm, Jan 19, 2023

1 **DC TRUNK CABLE CALCULATOR** SCALE: N.T.S.

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STATE OF MARYLAND · WENSEN JIANG · 55911 · PROFESSIONAL ENGINEER · 11/01/22

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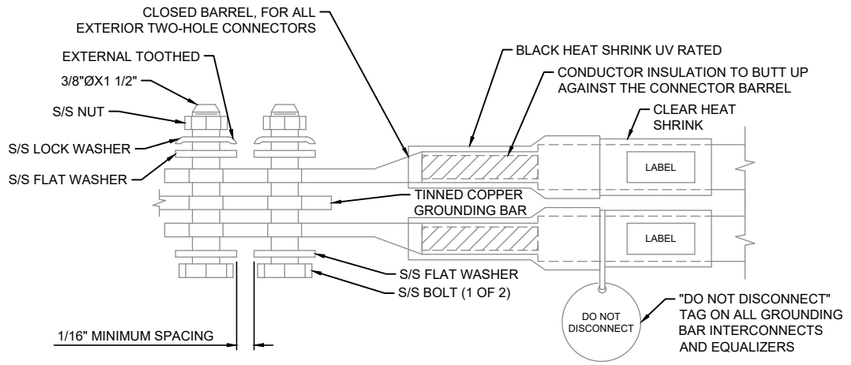
FA# 10072888
USID# 3939
TULIP AVE
7051 CARROL STREET
TAKOMA PARK, MD 20912

DC TRUNK CABLE CALCULATOR

E-2

NOTES:

1. EXOTHERMIC WELD (2) TWO, #2 AWG BARE TINNED SOLID COPPER CONDUCTORS TO GROUNDING BAR. ROUTE CONDUCTORS TO BURIED GROUNDING RING AND PROVIDE PARALLEL EXOTHERMIC WELD.
2. ALL GROUNDING BARS SHALL BE STAMPED IN TO THE METAL "IF STOLEN DO NOT RECYCLE." THE CONTRACTOR SHALL USE PERMANENT MARKER TO DRAW THE LINES BETWEEN EACH SECTION AND LABEL EACH SECTION ("P", "A", "N", "I") WITH 1" HIGH LETTERS.
3. ALL HARDWARE SHALL BE STAINLESS STEEL 3/8" DIAMETER OR LARGER. ALL HARDWARE 18-8 STAINLESS STEEL INCLUDING LOCK WASHERS, COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING.
4. FOR GROUND BOND TO STEEL ONLY: INSERT A CADMIUM FLAT WASHER BETWEEN LUG AND STEEL, COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING.
5. DO NOT INSTALL CABLE GROUNDING KIT AT A BEND AND ALWAYS DIRECT GROUNDING CONDUCTOR DOWN TO GROUNDING BUS.
6. NUT & WASHER SHALL BE PLACED ON THE FRONT SIDE OF THE GROUNDING BAR AND BOLTED ON THE BACK SIDE. INSTALL BLACK HEAT-SHRINKING TUBE, 600 VOLT INSULATION, ON ALL GROUNDING TERMINATIONS. THE INTENT IS TO WEATHERPROOF THE COMPRESSION CONNECTION.
7. SUPPLIED AND INSTALLED BY CONTRACTOR.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ADDITIONAL GROUNDING BAR AS REQUIRED, PROVIDING 50% SPARE CONNECTION POINTS.
9. ENSURE THE WIRE INSULATION TERMINATION IS WITHIN 1/8" OF THE BARREL (NO SHINERS).

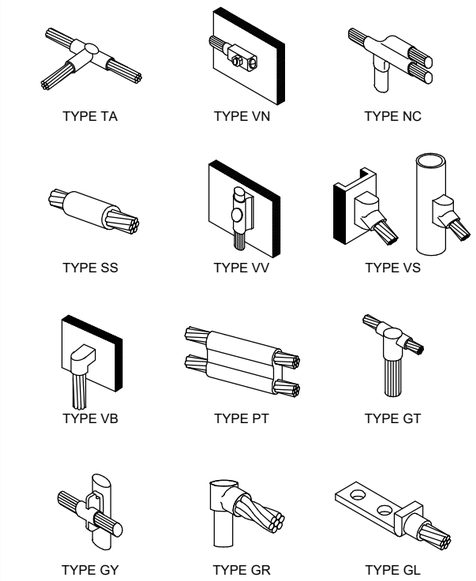


1 EXTERIOR TWO HOLE LUG DETAIL — SCALE: N.T.S.

GROUNDING NOTES:

1. TOWER GROUNDING BAR: EXTEND (2) #2 AWG TINNED CU WIRE FROM BURIED GROUND RING UP TO THE TOWER GROUND BAR AND MAKE A MECHANICAL CONNECTION. SECURE GROUND BAR DIRECTLY TO TOWER WITH STAINLESS STEEL MOUNTING MATERIAL.
2. ANTENNA GROUNDING BAR: ANDREW CORPORATION PART #UGBKIT-0424-T MOUNT GROUND BAR DIRECTLY TO TOWER. SECURE TO TOWER WITH STAINLESS STEEL MOUNTING MATERIAL.
3. GROUNDING BAR: LOCATED CLOSE TO GRADE LOCK BOX TESSCO PART #351546: INSTALL PER MANUFACTURER GUIDELINES.
4. EXOTHERMIC OR COMPRESSION CONNECTION FOR PIPE MOUNT TO ANTENNA ROUTE CONDUCTOR TO NEAREST GROUNDING BAR SO THE GROUNDING CONDUCTORS PROVIDE A STRAIGHT DOWNWARD PATH TO GROUND. USE #2 AWG SOLID TINNED COPPER CONDUCTOR. GROUNDING CONNECTION SHALL BE LOCATED AT THE TOP 2" OF PIPE.
5. ALL GROUNDING CONDUCTORS SHALL BE #2 AWG COPPER TINNED UNLESS NOTED OTHERWISE.
6. ALL GROUNDING CONDUCTORS SHALL PROVIDE A STRAIGHT DOWNWARD PATH TO GROUND WITH GRADUAL BEND AS REQUIRED. GROUND WIRES SHALL NOT BE LOOPED OR SHARPLY BENT.
7. KOPR-SHIELD ANTI-OXIDATION COMPOUND SHALL BE USED ON ALL COMPRESSION GROUNDING CONNECTIONS.
8. ALL EXOTHERMIC CONNECTIONS SHALL BE INSTALLED UTILIZING THE PROPER CONNECTION/MOLD AND MATERIALS FOR THE PARTICULAR APPLICATION.
9. ALL BOLTED GROUNDING CONNECTIONS SHALL BE INSTALLED WITH AN EXTERNAL TOOTHED LOCK WASHER. GROUNDING BUS BARS MAY HAVE PRE-PUNCHED HOLES OR TAPPED HOLES. ALL HARDWARE SHALL BE SECURITY TORQUE HARDWARE 3/8" STAINLESS STEEL.
10. EXTERNAL GROUNDING CONDUCTOR SHALL NOT BE INSTALLED OR ROUTED THROUGH HOLES IN ANY METAL OBJECTS, CONDUITS, OR SUPPORTS TO PRECLUDE ESTABLISHING A MAGNETIC CHOKE POINT.
11. PLASTIC CLIPS SHALL BE USED TO FASTEN AND SUPPORT GROUNDING CONDUCTORS. FERROUS METAL CLIPS WHICH COMPLETELY SURROUND THE GROUNDING CONDUCTOR SHALL NOT BE USED.
12. IF COAX ON ICE BRIDGE IS MORE THAT 6' FROM THE GROUND BAR AT THE BASE OF THE TOWER, A SECOND GROUND BAR WILL BE NEEDED AT THE END OF THE ICE BRIDGE RUN TO GROUND THE COAX GROUND KIT AND THE IN-LINE SURGE ARRESTORS (SURGE ARRESTORS INSTALLED BY LUCENT ONLY HAVE 6' GROUND TAILS).
13. CONTRACTOR SHALL REPAIR/PLACE EXISTING GROUNDING SYSTEM COMPONENTS DAMAGED DURING CONSTRUCTION AT THE CONTRACTORS EXPENSE.
14. DO NOT ALLOW THE COPPER CONDUCTOR TO TOUCH THE GALVANIZED GUY WIRE AT THE CONNECTION POINT OR AT ANY OTHER POINT. NO EXOTHERMICALLY WELDED CONNECTION SHALL BE MADE TO THE GUY WIRE.
15. CONTRACTOR SHALL VERIFY EXISTING SECTOR GROUNDING CONDITION AND GROUND THE PROPOSED EQUIPMENT IN THE SAME MANNER. A PROPOSED SECTOR GROUND BAR SHALL BE INSTALLED IF REQUIRED.

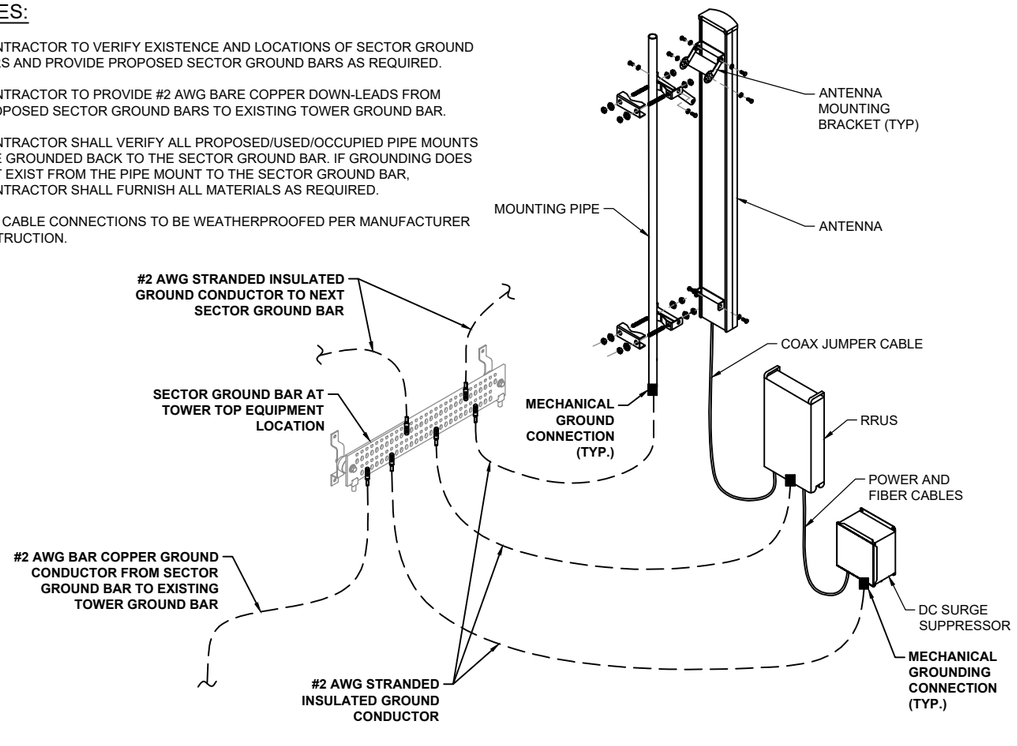
2 GROUNDING BAR DETAIL — SCALE: N.T.S.



3 GROUNDING DETAILS — SCALE: N.T.S.

NOTES:

1. CONTRACTOR TO VERIFY EXISTENCE AND LOCATIONS OF SECTOR GROUND BARS AND PROVIDE PROPOSED SECTOR GROUND BARS AS REQUIRED.
2. CONTRACTOR TO PROVIDE #2 AWG BARE COPPER DOWN-LEADS FROM PROPOSED SECTOR GROUND BARS TO EXISTING TOWER GROUND BAR.
3. CONTRACTOR SHALL VERIFY ALL PROPOSED/USED/OCCUPIED PIPE MOUNTS ARE GROUNDED BACK TO THE SECTOR GROUND BAR. IF GROUNDING DOES NOT EXIST FROM THE PIPE MOUNT TO THE SECTOR GROUND BAR, CONTRACTOR SHALL FURNISH ALL MATERIALS AS REQUIRED.
4. ALL CABLE CONNECTIONS TO BE WEATHERPROOFED PER MANUFACTURER INSTRUCTION.



4 TYPICAL ANTENNA GROUNDING SCHEMATIC — SCALE: N.T.S.

APPROVED

Montgomery County

Historic Preservation Commission

REVIEWED

By Dan.Bruechert at 2:38 pm, Jan 19, 2023

5 DETAIL NOT USED — SCALE: N.T.S.

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STATE OF MARYLAND · WENSEN JIANG · 55911 · PROFESSIONAL ENGINEER · 1/19/'23

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CHECKED BY: LW

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GROUNDING DETAILS

E-3

APPROVED

Montgomery County

Historic Preservation Commission

REVIEWED

By Dan.Bruechert at 2:38 pm, Jan 19, 2023

AT&T CABLING:

(9) ANTENNAS
(12) RRHS
(2) WCS FILTERS
(3) DC9 BOXES
(8) 1-5/8" COAX
(4) 7/8" COAX
(9) 0.96" DC TRUNKS (6 AWG)
(3) 0.4" FIBER TRUNKS (24 PAIR)

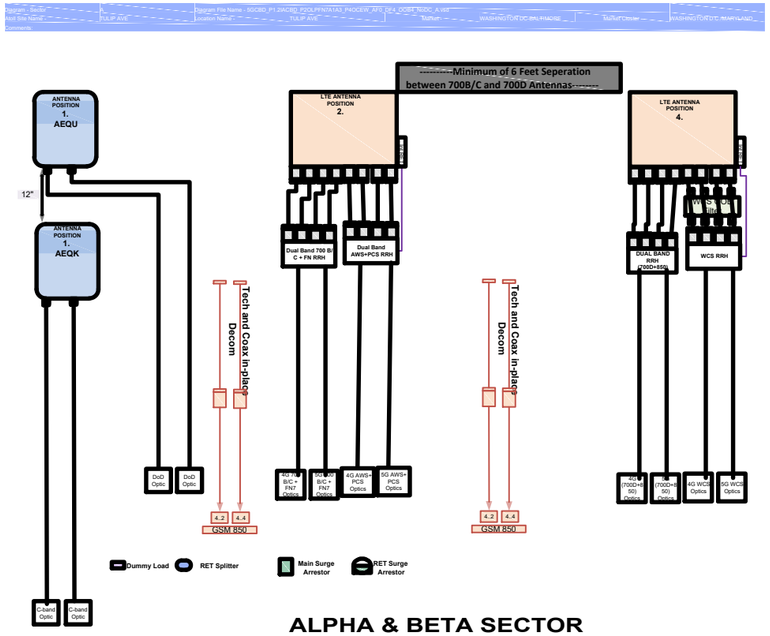
RFDS ID: 4445171

ANTENNA POSITION	ANTENNA MODEL	ANTENNA MAKE	AZIMUTH	RAD CENTER FT. AGL.	TMAS, RRHS & DIPLEXERS	COAXIAL FEEDER	
					MODEL	SIZE	LENGTH
#1	**AEQK+AEQU STACKED (71.0"x17.7"x9.5") (198.4 LBS)**	**NOKIA**	**25°**	**AEQU: 116'-9" AEQK: 113'-2"**	-	**SHARED FIBER**	**60'**
#2	NNHH-65A-R4 (55.1"x19.6"x7.8") (68.3 LBS)	COMMSCOPE	25°	115'	(1) RRH 4T4R B12/14 320W AHLBA (1) RRH 4T4R B25/66 320W AHFIB	SHARED FIBER	60'
#3	-	-	-	-	-	-	-
#4	NNHH-65A-R4 (55.1"x19.6"x7.8") (68.3 LBS)	COMMSCOPE	25°	115'	(1) RRH 4T4R B5/29 240W AHBCB (1) RRH4x25-WCS-4R	SHARED FIBER	60'
#5	**AEQK+AEQU STACKED (71.0"x17.7"x9.5") (198.4 LBS)**	**NOKIA**	**140°**	**AEQU: 130'-9" AEQK: 127'-2"**	-	**SHARED FIBER**	**130'**
#6	NNHH-65A-R4 (55.1"x19.6"x7.8") (68.3 LBS)	COMMSCOPE	140°	129'	(1) RRH 4T4R B12/14 320W AHLBA (1) RRH 4T4R B25/66 320W AHFIB	SHARED FIBER	130'
#7	-	-	-	-	-	-	-
#8	NNHH-65A-R4 (55.1"x19.6"x7.8") (68.3 LBS)	COMMSCOPE	140°	129'	(1) RRH 4T4R B5/29 240W AHBCB (1) RRH4x25-WCS-4R	SHARED FIBER	130'
#9	**AEQK+AEQU STACKED (71.0"x17.7"x9.5") (198.4 LBS)**	**NOKIA**	**250°**	**AEQU: 108'-9" AEQK: 105'-2"**	-	**SHARED FIBER**	**130'**
#10	NNHH-65A-R4 (55.1"x19.6"x7.8") (68.3 LBS)	COMMSCOPE	250°	107'	(1) RRH 4T4R B12/14 320W AHLBA (1) RRH 4T4R B25/66 320W AHFIB	SHARED FIBER	130'
#11	-	-	-	-	-	-	-
#12	NNHH-65A-R4 (55.1"x19.6"x7.8") (68.3 LBS)	COMMSCOPE	250°	107'	(1) RRH 4T4R B5/29 240W AHBCB (1) RRH4x25-WCS-4R	SHARED FIBER	130'

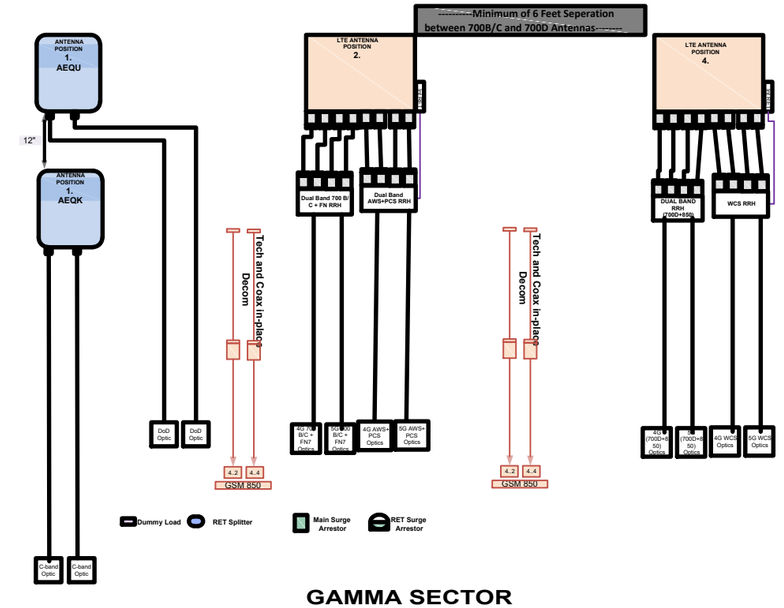
NOTES:

1. VERIFY ANTENNA DIMENSIONS WITH MANUFACTURER.
2. ALL NEW ANTENNAS SHALL RECEIVE ANTENNA MOUNTING KIT FOR 2 TO 4.5 O.D. MAST (QTY. 2)
3. ALL NEW ANTENNAS SHALL RECEIVE A LOCKING TILT MOUNT KIT 0-13 DEGREES DOWNTILT ANGLE
4. VERIFY FINAL ANTENNA MODEL WITH CURRENT VERSION OF THE AT&T RFDS.

1 **ANTENNA CHART** SCALE: N.T.S.



ALPHA & BETA SECTOR



GAMMA SECTOR

NOTES:

1. CONTRACTOR TO VERIFY FINAL RF CONFIGURATION AND NOTIFY CARRIER AND ENGINEER WITH ANY DISCREPANCIES PRIOR TO THE INSTALLATION.
2. PLUMBING DIAGRAM SHOWN IS BASED ON APPROVED FINAL RFDS ID: 4445171 DATED ON 02/25/22.

2 **RF EQUIPMENT SCHEMATIC** SCALE: N.T.S.

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ANTENNA CHART & PLUMBING DIAGRAM

RF-1

AT&T COAX AND JUMPER COLOR CODE CHART FOR WV-VA SITES

Color Code for Hard-Line Coax to Antennas					
Sector	Coax Line	A1	A2	A3	A4
Alpha	1st Line	1 Green	2 Green	3 Green &	4 Green&
Alpha	2nd Line	1 Green	2 Green	3 Green	4 Green
		1 Brown	1 Brown	1 Brown	1 Brown
Sector	Coax Line	B1	B2	B3	B4
Beta	1st Line	1 Blue	2 Blue	3 Blue &	4 Blue&
Beta	2nd Line	Blue &	2 Blue	3 Blue	4 Blue
		Brown	Brown	1 Brown	1 Brown
Sector	Coax Line	G1	G2	G3	G4
Gamma	1st Line	White	White	3 White	4 White
Gamma	2nd Line	White	White	3 White &	4 White &
		Brown	Brown	1 Brown	1 Brown

*Note: Pipe 1 is to the left if you are standing behind the antennas in this sector.

*Note: Pipe 1 is to the left if you are standing behind the antennas in this sector.

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Color Code for Jumpers from Antenna to TMAs/Diplexers or RRH -or- from Antenna to Hard-Line Coax													
Sector	Technology	Frequency	TX/RX	1st Band	2nd Band	3rd Band	4th Band	5th Band	6th Band	7th Band	8th Band	9th Band	Notes
A1-1	LTE	700 D/E	TXM/RXM	Green	Gray	Orange							
A1-2	LTE	700 D/E	TXD1/RXD1	Green	Gray	Orange	Brown						
A1-3	LTE	WCS	TXM/RXM	Green	Gray	Red							
A1-4	LTE	WCS	TXD1/RXD1	Green	Gray	Red	Brown						
A1-5	LTE	WCS	TXD2/RXD2	Green	Gray	Red	Brown	Brown					
A1-6	LTE	WCS	TXD3/RXD3	Green	Gray	Red	Brown	Brown	Brown				
A2-1	UMTS/GSM	850	TXM/RXM	Green	Green	Yellow	Orange						
A2-2	UMTS/GSM	850	TXD1/RXD1	Green	Green	Yellow	Orange	Brown					
A2-3	UMTS/GSM	1900	TXM/RXM	Green	Green	Yellow	Violet						
A2-4	UMTS/GSM	1900	TXD1/RXD1	Green	Green	Yellow	Violet	Brown					
A2-5	UMTS/LTE	1900	TXD2/RXD2	Green	Green	Yellow	Violet	Brown	Brown				
A2-6	UMTS/LTE	1900	TXD3/RXD3	Green	Green	Yellow	Violet	Brown	Brown	Brown			
A3-1	UMTS	850	TXM/RXM	Green	Green	Green	Yellow	Orange					
A3-2	UMTS	850	TXD1/RXD1	Green	Green	Green	Yellow	Orange	Brown				
A3-3	UMTS/LTE	1900	TXM/RXM	Green	Green	Green	Yellow	Violet					
A3-4	UMTS/LTE	1900	TXD1/RXD1	Green	Green	Green	Yellow	Violet	Brown				
A3-5	UMTS/LTE	1900	TXD2/RXD2	Green	Green	Green	Yellow	Violet	Brown	Brown			
A3-6	UMTS/LTE	1900	TXD3/RXD3	Green	Green	Green	Yellow	Violet	Brown	Brown	Brown		
A4-1	LTE	700	TXM/RXM	Green	Green	Green	Green	Gray	Orange				
A4-2	LTE	700	TXD1/RXD1	Green	Green	Green	Green	Gray	Orange	Brown			
A4-3	LTE	2100	TXM/RXM	Green	Green	Green	Green	Gray	Violet				
A4-4	LTE	2100	TXD1/RXD1	Green	Green	Green	Green	Gray	Violet	Brown			
A4-5	LTE	2100	TXD2/RXD2	Green	Green	Green	Green	Gray	Violet	Brown	Brown		
A4-6	LTE	2100	TXD3/RXD3	Green	Green	Green	Green	Gray	Violet	Brown	Brown	Brown	
B1-1	LTE	700 D/E	TXM/RXM	Blue	Gray	Orange							
B1-2	LTE	700 D/E	TXD1/RXD1	Blue	Gray	Orange	Brown						
B1-3	LTE	WCS	TXM/RXM	Blue	Gray	Red							
B1-4	LTE	WCS	TXD1/RXD1	Blue	Gray	Red	Brown						
B1-5	LTE	WCS	TXD2/RXD2	Blue	Gray	Red	Brown	Brown					
B1-6	LTE	WCS	TXD3/RXD3	Blue	Gray	Red	Brown	Brown	Brown				
B2-1	UMTS/GSM	850	TXM/RXM	Blue	Blue	Yellow	Orange						
B2-2	UMTS/GSM	850	TXD1/RXD1	Blue	Blue	Yellow	Orange	Brown					
B2-3	UMTS/GSM	1900	TXM/RXM	Blue	Blue	Yellow	Violet						
B2-4	UMTS/GSM	1900	TXD1/RXD1	Blue	Blue	Yellow	Violet	Brown					
B2-5	UMTS/LTE	1900	TXD2/RXD2	Blue	Blue	Yellow	Violet	Brown	Brown				
B2-6	UMTS/LTE	1900	TXD3/RXD3	Blue	Blue	Yellow	Violet	Brown	Brown	Brown			
B3-1	UMTS	850	TXM/RXM	Blue	Blue	Blue	Yellow	Orange					
B3-2	UMTS	850	TXD1/RXD1	Blue	Blue	Blue	Yellow	Orange	Brown				
B3-3	UMTS/LTE	1900	TXM/RXM	Blue	Blue	Blue	Yellow	Violet					
B3-4	UMTS/LTE	1900	TXD1/RXD1	Blue	Blue	Blue	Yellow	Violet	Brown				
B3-5	UMTS/LTE	1900	TXD2/RXD2	Blue	Blue	Blue	Yellow	Violet	Brown	Brown			
B3-6	UMTS/LTE	1900	TXD3/RXD3	Blue	Blue	Blue	Yellow	Violet	Brown	Brown	Brown		
B4-1	LTE	700	TXM/RXM	Blue	Blue	Blue	Blue	Gray	Orange				
B4-2	LTE	700	TXD1/RXD1	Blue	Blue	Blue	Blue	Gray	Orange	Brown			
B4-3	LTE	2100	TXM/RXM	Blue	Blue	Blue	Blue	Gray	Violet				
B4-4	LTE	2100	TXD1/RXD1	Blue	Blue	Blue	Blue	Gray	Violet	Brown			
B4-5	LTE	2100	TXD2/RXD2	Blue	Blue	Blue	Blue	Gray	Violet	Brown	Brown		
B4-6	LTE	2100	TXD3/RXD3	Blue	Blue	Blue	Blue	Gray	Violet	Brown	Brown	Brown	
G1-1	LTE	700 D/E	TXM/RXM	White	Gray	Orange							
G1-2	LTE	700 D/E	TXD1/RXD1	White	Gray	Orange	Brown						
G1-3	LTE	WCS	TXM/RXM	White	Gray	Red							
G1-4	LTE	WCS	TXD1/RXD1	White	Gray	Red	Brown						
G1-5	LTE	WCS	TXD2/RXD2	White	Gray	Red	Brown	Brown					
G1-6	LTE	WCS	TXD3/RXD3	White	Gray	Red	Brown	Brown	Brown				
G2-1	UMTS/GSM	850	TXM/RXM	White	White	Yellow	Orange						
G2-2	UMTS/GSM	850	TXD1/RXD1	White	White	Yellow	Orange	Brown					
G2-3	UMTS/GSM	1900	TXM/RXM	White	White	Yellow	Violet						
G2-4	UMTS/GSM	1900	TXD1/RXD1	White	White	Yellow	Violet	Brown					
G2-5	UMTS/LTE	1900	TXD2/RXD2	White	White	Yellow	Violet	Brown	Brown				
G2-6	UMTS/LTE	1900	TXD3/RXD3	White	White	Yellow	Violet	Brown	Brown	Brown			
G3-1	UMTS	850	TXM/RXM	White	White	White	Yellow	Orange					
G3-2	UMTS	850	TXD1/RXD1	White	White	White	Yellow	Orange	Brown				
G3-3	UMTS/LTE	1900	TXM/RXM	White	White	White	Yellow	Violet					
G3-4	UMTS/LTE	1900	TXD1/RXD1	White	White	White	Yellow	Violet	Brown				
G3-5	UMTS/LTE	1900	TXD2/RXD2	White	White	White	Yellow	Violet	Brown	Brown			
G3-6	UMTS/LTE	1900	TXD3/RXD3	White	White	White	Yellow	Violet	Brown	Brown	Brown		
G4-1	LTE	700	TXM/RXM	White	White	White	White	Gray	Orange				
G4-2	LTE	700	TXD1/RXD1	White	White	White	White	Gray	Orange	Brown			
G4-3	LTE	2100	TXM/RXM	White	White	White	White	Gray	Violet				
G4-4	LTE	2100	TXD1/RXD1	White	White	White	White	Gray	Violet	Brown			
G4-5	LTE	2100	TXD2/RXD2	White	White	White	White	Gray	Violet	Brown	Brown		
G4-6	LTE	2100	TXD3/RXD3	White	White	White	White	Gray	Violet	Brown	Brown	Brown	

Base Color	
Sector A	Green
Sector B	Blue
Sector C	White

Technology Color	
LTE	Gray
UMTS	Yellow
GSM	Black

Frequency Color	
700/850	Orange
WCS	Red
1900/2100	Violet

Type Color	
Main (M)	White
Diversity (D)	Brown

Jumpers from TMA to Antenna/Diplexer to Equipment: ORANGE band to note Low-Side frequencies VIOLET band to note High-Side frequencies YELLOW band to note UMTS GRAY band to note LTE

FIBER TRUNK IN COLOR CODE:	
1ST=	1 GRAY
2ND=	2 GRAY

DC POWER TRUNK COLOR CODE:		
1ST=	1 WHITE	/ 1 BLUE
2ND=	2 WHITE	/ 1 BLUE
3RD=	3 WHITE	/ 1BLUE
4TH=	4 WHITE	/ 1 BLUE

APPROVED

Montgomery County

Historic Preservation Commission

REVIEWED

By Dan.Bruechert at 2:38 pm, Jan 19, 2023

1 **COLOR CODE CHART**

SCALE: N.T.S.

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ZONING _____

CONSTRUCTION _____

A & E _____

PROJECT NO: EP4TURWL

DRAWN BY: CRO

CHECKED BY: LW

SUBMITTALS

4	11/01/22	PERMITTING COMMENTS
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1	06/13/22	REVISION
0	06/01/22	ISSUED
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FA# 10072888
USID# 3939
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7051 CARROL STREET
TAKOMA PARK, MD 20912

COLOR CODE CHART

RF-2

Field	Length	Description
USID	6	Six characters that defined the sites USID. USID's less than 6 characters in length are preceded with 0's (zeros) (example:003831)
CellId1	1	Allowed Value: Description A: Alpha B: Beta C: Gamma
CellId2	1	D: Delta E: Epsilon F: Zeta
CellId3	1	-: No Transmitter connected to this port
AntPos	1	Allowed Value: Description 1: Antenna Position 1 on this face 2: Antenna Position 2 on this face : Antenna Position x on this face : Antenna Position x on this face 9: Antenna Position 9 on this face -: Antenna Position unknown
FreqBand	1	Allowed Value: Description 2: 2100 MHz (AWS1) only 3: 2300 MHz (WCS) only 6: Band 66 (AWS3) only 7: 700 MHz B & C Band only 8: 850 MHz only 9: 1900 MHz (PCS) A: 2100 MHz (AWS1) & Band 66 (AWS3) combined B: 1900 MHz (PCS) & Band 66 (AWS3) combined C: 2100 MHz (AWS1) & Band 66 (AWS3) & 2300 MHz (WCS) combined D: 1900 MHz (PCS) & 2100 MHz (AWS1) combined E: 2300 MHz (WCS) & Band 66 (AWS3) combined F: 1900 MHz (PCS) & 2300 MHz (WCS) combined G: 1900 MHz (PCS) & 2100 MHz (AWS1) & Band 66 (AWS3) combined H: 2100 MHz (AWS1) & 2300 MHz (WCS) combined I: 1900 MHz (PCS) & 2300 MHz (WCS) & Band 66 (AWS3) combined J: 1900 MHz (PCS) & 2100 MHz (AWS1) & 2300 MHz (WCS) combined K: 700 MHz B & C Band & 850 MHz combined M: 1900 MHz (PCS) & 2100 MHz (AWS1) & Band 66 (AWS3) & 2300 MHz (WCS) combined P: upper 700 MHz - Band 14 (FirstNet) Q: 700 MHz D & E Band only R: 700 MHz B & C & Band 14 (FirstNet) & 850 MHz combined S: 700 MHz B & C & 700 MHz D & E & 850 MHz combined T: Tri-Band: Band 12 (700 MHz B&C), Band 14 (FirstNet), and Band 29 (700 MHz D&E) U: 700 MHz B & C & 700 MHz D & E & Band 14 (FirstNet) & 850 MHz combined W: 700 MHz D & E & Band 14 (FirstNet) combined X: 700 MHz B & C & Band 14 (FirstNet) combined Y: 700 MHz D & E & 850 MHz combined Z: Band 14 (FirstNet) & 850 MHz combined -: No Frequency Assigned "not-in-use"

Field	Length	Description
Tech	1	Allowed Value: Technology / Technology Combination F: License protection/FCC compliance/FWLL G: Reserved J: LTE-5G NR K: UMTS-LTE-5G NR L: LTE N: None/Reserved U: UMTS V: UMTS-LTE Y: UMTS-5G NR H: Reserved M: Exception P: Reserved Q: Reserved R: 5G NR S: Reserved T: Reserved

Delimiter	13th character
_	Delimiter
B	Border Control
C	CGSA
W	WCS in combination with other bands
P	License Protection
O	Optimized

Delimiter	14th character
_	Delimiter
Z	Programming Code for RET validated

2.3.1 Dual Broadband Antennas- TYPE 1

Powerwave, Kathrein and older Andrew antennas will be recognized by a RET controller as TYPE1 Antenna Line Devices. These require 2 AISG connections. One connection will be from the AISG source (RRH, TMA, RET Controller or Homerun Cable) to the first RET motor and the second connection will be from RET motor 1 to RET motor 2.

Connections from the RET controller will be made to the male connector of the RET motor. Appropriate daisy chain connection will then have to be made to the next RET motor. Figure 5 below is a Powerwave antenna, but the Kathrein will be very similar in appearance and connection.

For all Type 1 dual broadband antennas, the daisy chain connection should be made and both RET motors should be configured in the OSS, even if the high band RET motor is not to be utilized until future AWS launches.

Dual Broadband Antennas - TYPE 17

Newer Andrew antennas and all KMW antennas will be recognized by RET controllers as TYPE17 Antenna Line Devices since there are multiple ALDs on one bus. These antennas only require one AISG connection since both RET motors are inside the antenna. Connections from the RET controller will be made to the male connector of the RET/AISG Antenna Port. Figure 7 below is an Andrew antenna, but the KMW antenna will be very similar in appearance and connection.

Below is the list of approved RET Type 17 antennas as per 6/29/2011. Andrew will continue to phase out older models which are Type 1 with newer models that will be Type 17.

Vendor	Frequency Band	HBW	Length	Model
Andrew	Dual Broadband	65°	6'	SBNH-1D6565B
Andrew	Dual Broadband	65°	8'	SBNH-1D6565C
Andrew	Dual Broadband	85°	6'	SBNH-1D8585B
Andrew	Dual Broadband	85°	8'	SBNH-1D8585C
KMW	Dual Broadband	65°	4'	AM-X-CD-14-65-00T-RET
KMW	Dual Broadband	65°	6'	AM-X-CD-16-65-00T-RET
KMW	Dual Broadband	65°	8'	AM-X-CD-17-65-00T-RET
KMW	Dual Broadband	85°	4'	NOT AVAILABLE YET
KMW	Dual Broadband	85°	6'	NOT AVAILABLE YET
KMW	Dual Broadband	85°	8'	AM-X-CD-16-85-00T-RET
KMW	Single Broadband	65°	4'	AM-X-CW-14-65-00T-RET
KMW	Single Broadband	65°	6'	AM-X-CW-16-65-00T-RET
KMW	Single Broadband	65°	8'	AM-X-CW-18-65-00T-RET
KMW	Single Broadband	85°	4'	AM-X-CW-13-85-00T-RET
KMW	Single Broadband	85°	6'	AM-X-CW-15-85-00T-RET
KMW	Single Broadband	85°	8'	AM-X-CW-16-85-00T-RET

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REVIEWED

By Dan.Bruechert at 2:39 pm, Jan 19, 2023

1 **LTE RET NAMING CONVENTION**

SCALE: N.T.S.

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CONSTRUCTION _____

A & E _____

PROJECT NO: EP4TURWL

DRAWN BY: CRO

CHECKED BY: LW

SUBMITTALS		
4	11/01/22	PERMITTING COMMENTS
3	09/27/22	JX COMMENTS
2	08/23/22	ISSUED
1	06/13/22	REVISION
0	06/01/22	ISSUED
B	06/01/22	REVISION
A	04/27/22	ISSUED FOR REVIEW

FA# 10072888
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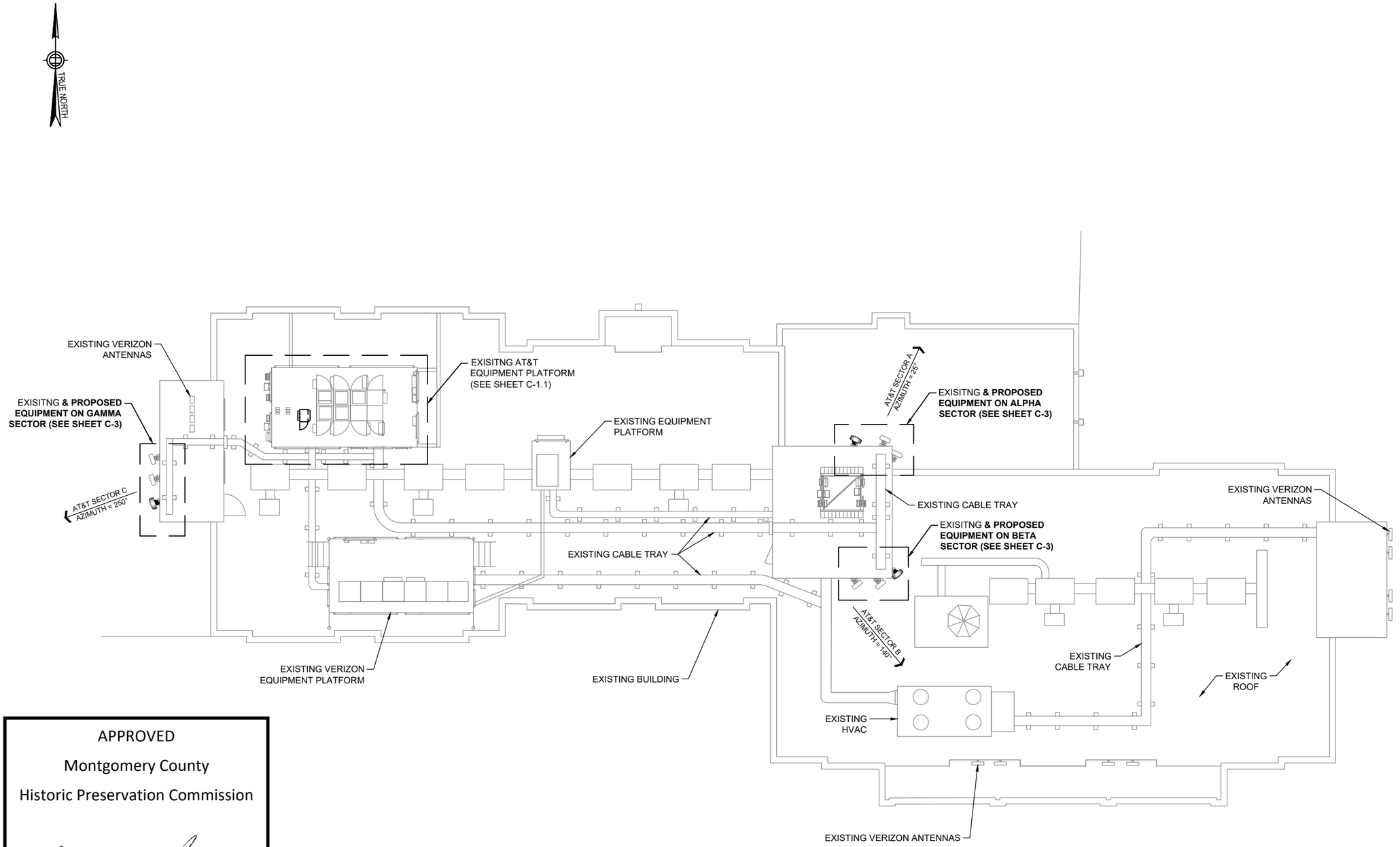
LTE RET NAMING CONVENTION

RF-3



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REVIEWED

By Dan.Bruechert at 2:39 pm, Jan 19, 2023

1 **ROOFTOP PLAN**

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

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USID# 3939
TULIP AVE

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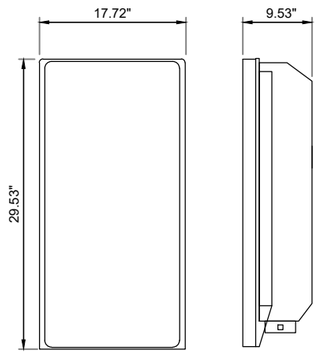
ROOFTOP PLAN

C-1

MANUFACTURER: NOKIA
MODEL NO.: AEQK AIRSCALE MAA 64T64R 192AE n77 200w
TECHNOLOGY: 5G CBAND
DIMENSIONS (HxWxD): 29.53" x 17.72" x 9.53"
WEIGHT (lbs): <99.21
POWER SUPPLY: DC -40.5V TO -57V
TEMP. W/O SOLAR LOAD: -40°C TO 55°C

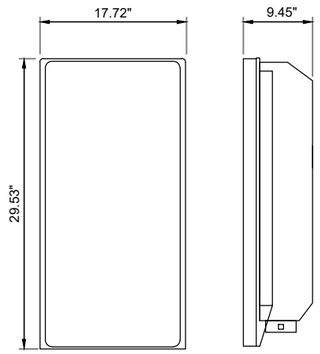
NOTE: ALL NEW ANTENNAS WILL BE PAINTED TO MATCH.



1 AEQK AIRSCALE MAA 64T64R 192AE n77 200w — SCALE: NTS

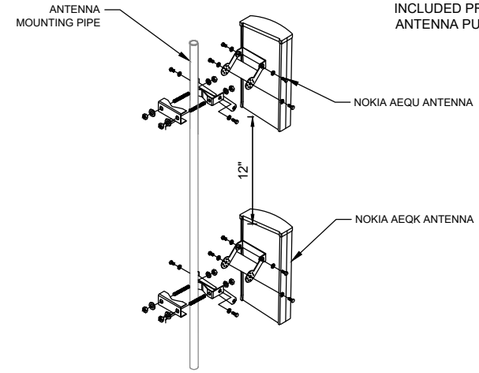
MANUFACTURER: NOKIA
MODEL NO.: AEQU AIRSCALE MAA 64T64R 192AE n77 200w
TECHNOLOGY: 5G DOD
DIMENSIONS (HxWxD): 29.53" x 17.72" x 9.45"
WEIGHT (lbs): <99.21
POWER SUPPLY: DC -40.5V TO -57V
TEMP. W/O SOLAR LOAD: -40°C TO 55°C

NOTE: ALL NEW ANTENNAS WILL BE PAINTED TO MATCH.

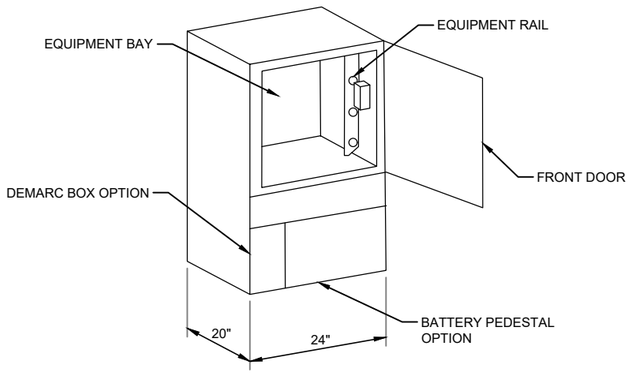


2 AEQU AIRSCALE MAA 64T64R 192AE n77 200w — SCALE: NTS

NOTE:
INCLUDED PRODUCTS WITH ANTENNA PURCHASE



3 CBAND MOUNTING DETAIL — SCALE: NTS



4 FLEX21-V2 CABINET — SCALE: NTS

5 DETAIL NOT USED — SCALE: NTS

6 DETAIL NOT USED — SCALE: NTS

7 DETAIL NOT USED — SCALE: NTS

8 DETAIL NOT USED — SCALE: NTS

9 DETAIL NOT USED — SCALE: NTS

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REVIEWED
By Dan.Bruechert at 2:36 pm, Jan 19, 2023

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PROJECT NO: EP4TURWL

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SUBMITTALS

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FA# 10072888
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TAKOMA PARK, MD 20912

SITE DETAILS

C-2

PASS
(59.7% Capacity)

June 27, 2022

AT&T
Steven Safire
7150 Standard Drive
Hanover, MD 21706

Jacobs Telecommunications, Inc.
5449 Bells Ferry Road
Acworth, GA 30102
470-785-4033
www.jacobs.com

Subject:	**Rooftop Equipment Installation** **Mount Structural Analysis Report – Revision 1**
Carrier Designation:	**5G NR 1SR CBand - Parent Rooftop** **Site Number: 3939** **Site Name: Tulip Ave** **FA Location: 10072888** **PTN: 2251A12NZ6, 2251A12R24**
Building Owner Designation:	**Takoma Tower** **Site ID: NA**
Engineering Firm Designation:	**Jacobs Telecommunications, Inc. Project: EP5TRFWL**
Site Data:	**7051 Carrol Street** **Takoma Park, Montgomery County, MD 20912** **Latitude: N38°58'29.0892"±; Longitude: W77°0'37.5732"±** **Ground Elevation: 282 ft ± NAVD 88; RT: 112 ft ± AGL**

Per your request, we present our structural evaluation of the antenna support frames/ mounts (manufacturer and model unknown) installed at the above referenced structure for the equipment noted in **Table B**. This analysis assumes the existing structure was properly designed and constructed, as well as being well maintained and is structurally sound.

Our work was analyzed in accordance with the structural strength requirements of the ANSI/TIA-222-H-1-2019 Structural Standard for Antenna Supporting Structures and Antennas (industry standard) the 2018 International Building Code (current building code) for the following criteria:

- 113-mph ultimate wind speed per ASCE 7-16 (Risk Category II)
- 40-mph wind speed w/ 1" ice thickness
- Exposure category C with topographic category 1

We trust you find our work satisfactory. Jacobs Telecommunications, Inc. appreciates the opportunity of providing continuing professional services to AT&T. Please do not hesitate to call should you have any questions.

Sincerely,

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 55911, Expiration Date: 4/14/24.

Hayat Bedane
Structural Engineer

Wensen Jiang, PE
Engineer of Record
PE No. 55911

STATE OF MARYLAND · WENSEN JIANG · 55911 · PROFESSIONAL ENGINEER

6/27/22

CONCLUSION / SUMMARY

The proposed appurtenance configuration is to be installed on the existing pipe mounts attached to the building penthouse.

Prior to installation, all rusted and deteriorated hardware is to be inspected – replace inadequate hardware as required. The antennas must be implemented on the antenna pipes such that the tip does not exceed the antenna pipes. All additional equipment (remote radio units) should be installed off the antenna mounts implemented on existing RRH sleds or directly to the wall façade on Unistrut frames.

Additionally, this analysis was completed in review of the appurtenance configuration depicted in the construction drawings such that a worse case analysis consideration for both the positioning sequence and the equipment locations was applied – the final appurtenance configuration should follow the applicable signed construction drawings for installation.

Based on our evaluation and attached calculations, the most critical structural element of the mount analyzed was observed to use no more than **59.7%** of its reduced nominal capacity; therefore, the mount is within an acceptable range to resist the stress caused by the proposed appurtenance configuration and will satisfy all assumed structural strength requirements.

It is recommended that all mounting frame members, attachment connections, and other supporting structures are thoroughly inspected prior to installation of the proposed appurtenance configuration. Any deterioration, localized damage, or distress to the structure should be documented and reported to the engineer. The contractor shall repair all deficiencies prior to installation of the proposed equipment. Additionally, the conclusions expressed herein are based solely on the information contained within the referenced documents.

Therefore, it is our opinion the mounts **are adequate** to safely support the AT&T equipment deployment and are structurally sound for the planned load. Please note that additional engineering review will be required prior to placing any future equipment.

REFERENCES

1. Mount analysis provided by B+T GRP, project no. 142211.002.01, dated 05/12/20.
2. As built provided by B+T GRP, dated 08/12/21.
3. Site walk photos dated 01/19/22.

CODE INTERPRETATIONS

Per Section 1609.1 and 3108.1 of the International Building Code, the determination of lateral loads for antenna supporting structures and antennas shall be determined using the ANSI/TIA-222.

Mount analysis procedures are based on Section 16 of the ANSI/TIA-222-H with any adjustments outlined in the Mount Technical Directive version 14 provided by AT&T. Section 16.4 directs the load combinations that are to be used for a mount analysis – included in this direction are combinations 1, 3, and 4 from Section 2.3.2.

Seismic evaluation required for sites found with Seismic Design Category D or E.

Per Section 16.3 of the ANSI/TIA-222-H, a maintenance load of L_V = 250 lb was considered at the worst-case cantilevered mount horizontal member and a maintenance load of L_M = 500 lb was considered at the worst-case mounting pipe location to determine the maximum member stress. Platform work areas are considered to have a 40 psf live area load.

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Location parameters are determined from the ASCE 7 online Hazard Tool based on ASCE 7-16 per ANSI/TIA-222-H section 2.6.4.

ANALYSIS METHOD

RISA-3D (Version 17.0.1), 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. Selected output from the analysis is included.

A tool internally developed, using Microsoft Excel, by Jacobs was used to calculate wind loading on all appurtenances, dishes, and mount members for various load cases. Selected input from the analysis is included.

This analysis was performed in accordance with the SOW requirements outlined in the Mount Technical Directive version 14 provided by AT&T.

ASSUMPTIONS

The antenna mounting system was properly fabricated, installed and maintained in good condition in accordance with its original design and manufacturer's specifications.

Mounting frame members, attachment connections, and other supporting structures of the mount that cannot be determined by the referenced documents or have not been provided for this analysis, as such, Jacobs assumed typical member sizes based on known industry concepts and mount designs or previous mappings information of similar mount styles. The actual members of the mount could significantly affect the analysis; therefore, upon field verification, if member sizes are found to be different from the assumed typical member sizes, additional analyses may be required.

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.

Member material grades have been assumed as follows, unless noted otherwise:

- Channel, Solid Round, Angle, Plate — ASTM A36 (Gr 36)
- HSS (Rectangular) — ASTM 500 (Gr B - 46)
- Pipe — ASTM A53 (Gr 35)
- Connection Bolts — A325
- U-Bolts — A307

DISCLAIMERS

The scope of this analysis pertains only to the antenna mount system and as such does not include examination of the loads imparted by the antenna mounting system to the tower legs and bracing members. Furthermore, no qualification is made nor implied by this document for the structural members or elements supporting the aforementioned equipment installation.

All previously installed equipment (microwaves, radios, omnis etc.) not represented in the mount loading **Table B** is to be decommissioned and removed from all antenna mounting systems or relocated to a separate detached mounting system. These installation requirements must be implemented as previously described for this assessment to be valid.

This analysis does not incorporate any rigging loads which may occur during this operation. Our analysis only includes a maintenance load as directed by the current code iteration. Nothing should be rigged using the subject antenna mount as the support.

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This antenna mount is not a life support and should not be used as a life supporting system.

RESULTS

Table A: Mount Component Stresses vs. Capacity

Component	Capacity %	Pass / Fail[3]
Antenna Pipe Members	59.7	Pass
Connection Members	43.2	Pass

1 – All sectors are typical.
2 – Rating per TIA-222-H, Section 15.5.
3 – A demand/capacity ration of 1.05 or less is within engineering tolerances and considered acceptable per TIA-222-H Annex S.4.

MOUNT LOADING

Table B: Existing, Proposed and *Reserved* Appurtenance Configuration[1,2]

Elevation (AGL, ft)	Sector	Azimuth	Position[3]	Equipment[4,6]
115	Alpha	25°	1	**(1) Nokia AEQK (Stacked Antenna)**
				(1) Nokia AEQU (Stacked Antenna)
				(1) Raycap DC9-48-60-24-PC16-EV (Surge)
			2	(1) Commscope NNHH-65A-R4 (Antenna)
				(1) Nokia RRH 4T4R B12/14 320W AHLBA (RRH)
				(1) Nokia RRH 4T4R B25/66 320W AHFIB (RRH)
				(1) Raycap DC9-48-60-24-PC16-EV (Surge)
			3	**-**
			4	(1) Commscope NNHH-65A-R4 (Antenna)
				(1) KMW KFTDR00110030 (Filter)
				(1) Nokia RRH 4T4R B5/29 240W AHBCB (RRH)
				(1) ALU RRH4x25-WCS-4R (RRH)
				(1) Raycap DC9-48-60-24-PC16-EV (Surge)
129	Beta	140°	1	**(1) Nokia AEQK (Stacked Antenna)**
				(1) Nokia AEQU (Stacked Antenna)
			2	(1) Commscope NNHH-65A-R4 (Antenna)
				(1) Nokia RRH 4T4R B12/14 320W AHLBA (RRH)
				(1) Nokia RRH 4T4R B25/66 320W AHFIB (RRH)
			3	**-**
			4	(1) Commscope NNHH-65A-R4 (Antenna)
				(1) KMW KFTDR00110030 (Filter)
				(1) Nokia RRH 4T4R B5/29 240W AHBCB (RRH)
				(1) ALU RRH4x25-WCS-4R (RRH)
107	Gamma	250°	1	**(1) Nokia AEQK (Stacked Antenna)**
				(1) Nokia AEQU (Stacked Antenna)
			2	(1) Commscope NNHH-65A-R4 (Antenna)
				(1) Nokia RRH 4T4R B12/14 320W AHLBA (RRH)
				(1) Nokia RRH 4T4R B25/66 320W AHFIB (RRH)
			3	**-**
			4	(1) Commscope NNHH-65A-R4 (Antenna)
				(1) Nokia RRH 4T4R B5/29 240W AHBCB (RRH)
				(1) ALU RRH4x25-WCS-4R (RRH)

1 – Appurtenance Configuration as reflected in AT&T RFDS ID 4445171, updated 2/5/2022.

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2 – The evaluation and analysis is modeled for the worse case loading shown.
3 – Position 1 is defined as right-most mount location when facing structure.
4 – Proposed equipment shown in **bold**.
5 – Cable loading not considered for evaluation and analysis.
6 – Surge locations shown in table match the RFDS; actual surge locations are to the standoff members and evenly distributed between sectors.

ATTACHMENTS

- Mount Model
  - Rendered Graphic
  - Bending Graphic
  - Shear Graphic
  - Member Section Set Graphic
  - Member Label Graphic
- Program Input and Output
  - RISA Input
  - RISA Output
  - RISA Results
- Calculations
  - Input Appurtenance Loading
  - Input Member Loading
  - Input Loading Summary
  - ASCE Hazards Parameter Summary

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Envelope Only Solution

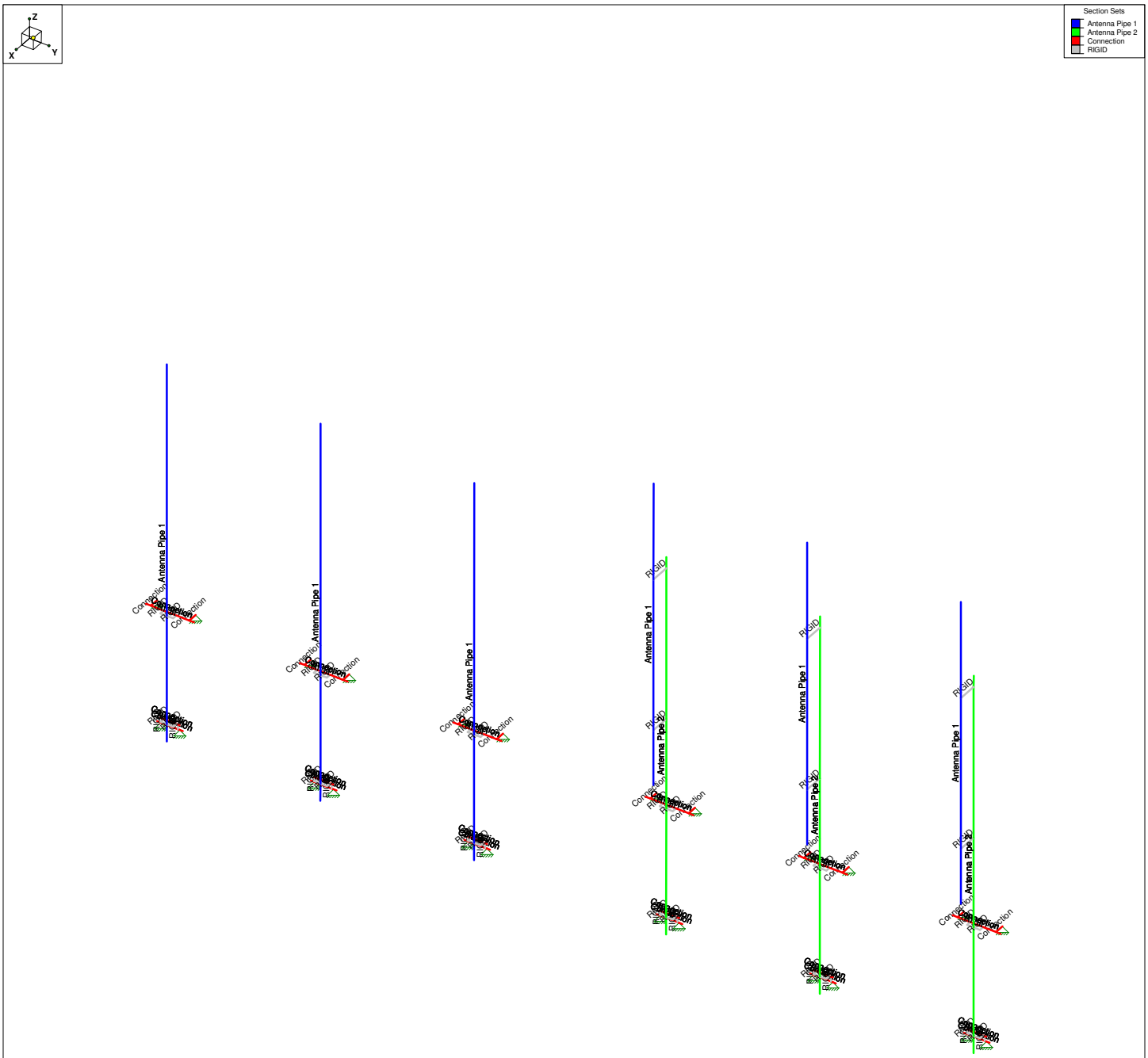
Jacobs Telecommunicatio...	Existing Wall Mount	Page 6
H. Bedane		May 6, 2022 at 10:26 AM
EP5TRFWL - Tulip Ave		Tulip Ave Mount Frame.r3d

Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Jacobs Telecommunicatio...	Existing Wall Mount	Page 7
H. Bedane		May 6, 2022 at 10:26 AM
EP5TRFWL - Tulip Ave		Tulip Ave Mount Frame.r3d

Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

Jacobs Telecommunicatio...	Existing Wall Mount	Page 8
H. Bedane		May 6, 2022 at 10:26 AM
EP5TRFWL - Tulip Ave		Tulip Ave Mount Frame.r3d



Envelope Only Solution

Jacobs Telecommunicatio...	Existing Wall Mount	Page 9
H. Bedane		May 6, 2022 at 10:26 AM
EP5TRFWL - Tulip Ave		Tulip Ave Mount Frame.r3d

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EP5TRFWL - Tulip Ave		Tulip Ave Mount Frame.r3d

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(Me...	Surface(...
1	DEAD LOAD	None			-1		8			
2	DEAD LOAD (ICE)	None					8	9		
3	WIND LOAD (NO ICE) FRONT	None					8	9		
4	WIND LOAD (NO ICE) SIDE	None					8	9		
5	WIND LOAD (ICE) FRONT	None					8	9		
6	WIND LOAD (ICE) SIDE	None					8	9		
7	LIVE LOAD (MAN)	None					6			
8	WIND LOAD (SERVICE) FRONT	None					8	9		
9	WIND LOAD (SERVICE) SIDE	None					8	9		
10	LIVE LOAD (SERVICE)	None					6			
11	SEISMIC LOAD (VERTICAL)	None								
12	SEISMIC LOAD (LATERAL) FRO...	None								
13	SEISMIC LOAD (LATERAL) SIDE	None								
14	SEISMIC LOAD (LATERAL) FRO...	None								
15	SEISMIC LOAD (LATERAL) SIDE	None								

Load Combinations

	Description	S...	P...	S...	B...	Fa...	BLC	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	DEAD LOAD	Yes	Y		1	1.4																		
2	DEAD LOAD + WIND LOAD (NO I...	Yes	Y		1	1.2			3	1	4													
3	DEAD LOAD + WIND LOAD (NO I...	Yes	Y		1	1.2			3	.866	4	.5												
4	DEAD LOAD + WIND LOAD (NO I...	Yes	Y		1	1.2			3	.5	4	.866												
5	DEAD LOAD + WIND LOAD (NO I...	Yes	Y		1	1.2			3		4	1												
6	DEAD LOAD + WIND LOAD (NO I...	Yes	Y		1	1.2			3	-.5	4	.866												
7	DEAD LOAD + WIND LOAD (NO I...	Yes	Y		1	1.2			3	-.8...	4	.5												
8	DEAD LOAD + WIND LOAD (NO I...	Yes	Y		1	1.2			3	-1	4													
9	DEAD LOAD + WIND LOAD (NO I...	Yes	Y		1	1.2			3	-.8...	4	-.5												
10	DEAD LOAD + WIND LOAD (NO I...	Yes	Y		1	1.2			3	-.5	4	-.8...												
11	DEAD LOAD + WIND LOAD (NO I...	Yes	Y		1	1.2			3		4	-1												
12	DEAD LOAD + WIND LOAD (NO I...	Yes	Y		1	1.2			3	.5	4	-.8...												
13	DEAD LOAD + WIND LOAD (NO I...	Yes	Y		1	1.2			3	.866	4	-.5												
14	DEAD LOAD + DEAD LOAD (ICE)...	Yes	Y		1	1.2	2	1					5	1	6									
15	DEAD LOAD + DEAD LOAD (ICE)...	Yes	Y		1	1.2	2	1					5	.866	6	.5								
16	DEAD LOAD + DEAD LOAD (ICE)...	Yes	Y		1	1.2	2	1					5	.5	6	.866								
17	DEAD LOAD + DEAD LOAD (ICE)...	Yes	Y		1	1.2	2	1					5		6	1								
18	DEAD LOAD + DEAD LOAD (ICE)...	Yes	Y		1	1.2	2	1					5	-.5	6	.866								
19	DEAD LOAD + DEAD LOAD (ICE)...	Yes	Y		1	1.2	2	1					5	-.8...	6	.5								
20	DEAD LOAD + DEAD LOAD (ICE)...	Yes	Y		1	1.2	2	1					5	-1	6									
21	DEAD LOAD + DEAD LOAD (ICE)...	Yes	Y		1	1.2	2	1					5	-.8...	6	-.5								
22	DEAD LOAD + DEAD LOAD (ICE)...	Yes	Y		1	1.2	2	1					5	-.5	6	-.8...								
23	DEAD LOAD + DEAD LOAD (ICE)...	Yes	Y		1	1.2	2	1					5		6	-1								
24	DEAD LOAD + DEAD LOAD (ICE)...	Yes	Y		1	1.2	2	1					5	.5	6	-.8...								
25	DEAD LOAD + DEAD LOAD (ICE)...	Yes	Y		1	1.2	2	1					5	.866	6	-.5								
26	DEAD LOAD + LIVE LOAD (MAN)	Yes	Y		1	1.2											7	1.5						
27	DEAD LOAD + LIVE LOAD (SER...	Yes	Y		1	1.2													8	1	9		10	1.5
28	DEAD LOAD + LIVE LOAD (SER...	Yes	Y		1	1.2													8	.866	9	.5	10	1.5
29	DEAD LOAD + LIVE LOAD (SER...	Yes	Y		1	1.2													8	.5	9	.866	10	1.5
30	DEAD LOAD + LIVE LOAD (SER...	Yes	Y		1	1.2													8		9	1	10	1.5
31	DEAD LOAD + LIVE LOAD (SER...	Yes	Y		1	1.2													8	-.5	9	.866	10	1.5
32	DEAD LOAD + LIVE LOAD (SER...	Yes	Y		1	1.2													8	-.8...	9	.5	10	1.5
33	DEAD LOAD + LIVE LOAD (SER...	Yes	Y		1	1.2													8	-1	9		10	1.5
34	DEAD LOAD + LIVE LOAD (SER...	Yes	Y		1	1.2													8	-.8...	9	-.5	10	1.5
35	DEAD LOAD + LIVE LOAD (SER...	Yes	Y		1	1.2													8	-.5	9	-.8...	10	1.5
36	DEAD LOAD + LIVE LOAD (SER...	Yes	Y		1	1.2													8		9	-1	10	1.5

Load Combinations (Continued)

	Description	S...	P...	S...	B...	Fa...	BLC	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
37	DEAD LOAD + LIVE LOAD (SER...	Yes	Y		1	1.2													8	.5	9	-.8...	10	1.5
38	DEAD LOAD + LIVE LOAD (SER...	Yes	Y		1	1.2													8	.866	9	-.5	10	1.5
39	DEAD LOAD + SEISMIC LOAD (V...	Yes	Y		1	1.2	1		11	1	12	1	13		14		15							
40	DEAD LOAD + SEISMIC LOAD (V...	Yes	Y		1	1.2	1		11	1	12	.866	13	.5	14		15							
41	DEAD LOAD + SEISMIC LOAD (V...	Yes	Y		1	1.2	1		11	1	12	.5	13	.866	14		15							
42	DEAD LOAD + SEISMIC LOAD (V...	Yes	Y		1	1.2	1		11	1	12		13	1	14		15							
43	DEAD LOAD + SEISMIC LOAD (V...	Yes	Y		1	1.2	1		11	1	12	-.5	13	.866	14		15							
44	DEAD LOAD + SEISMIC LOAD (V...	Yes	Y		1	1.2	1		11	1	12	-.8...	13	.5	14		15							
45	DEAD LOAD + SEISMIC LOAD (V...	Yes	Y		1	1.2	1		11	1	12	-1	13		14		15							
46	DEAD LOAD + SEISMIC LOAD (V...	Yes	Y		1	1.2	1		11	1	12	-.8...	13	-.5	14		15							
47	DEAD LOAD + SEISMIC LOAD (V...	Yes	Y		1	1.2	1		11	1	12	-.5	13	-.8...	14		15							
48	DEAD LOAD + SEISMIC LOAD (V...	Yes	Y		1	1.2	1		11	1	12		13	-1	14		15							
49	DEAD LOAD + SEISMIC LOAD (V...	Yes	Y		1	1.2	1		11	1	12	.5	13	-.8...	14		15							
50	DEAD LOAD + SEISMIC LOAD (V...	Yes	Y		1	1.2	1		11	1	12	.866	13	-.5	14		15							

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N149	Reaction	Reaction	Reaction			
2	N146	Reaction	Reaction	Reaction			
3	N34	Reaction	Reaction	Reaction			
4	N35	Reaction	Reaction	Reaction			
5	N152	Reaction	Reaction	Reaction			
6	N155	Reaction	Reaction	Reaction			
7	N45	Reaction	Reaction	Reaction			
8	N46	Reaction	Reaction	Reaction			
9	N158	Reaction	Reaction	Reaction			
10	N161	Reaction	Reaction	Reaction			
11	N56	Reaction	Reaction	Reaction			
12	N57	Reaction	Reaction	Reaction			
13	N164	Reaction	Reaction	Reaction			
14	N167	Reaction	Reaction	Reaction			
15	N67	Reaction	Reaction	Reaction			
16	N68	Reaction	Reaction	Reaction			
17	N170	Reaction	Reaction	Reaction			
18	N173	Reaction	Reaction	Reaction			
19	N78	Reaction	Reaction	Reaction			
20	N79	Reaction	Reaction	Reaction			
21	N176	Reaction	Reaction	Reaction			
22	N179	Reaction	Reaction	Reaction			
23	N89	Reaction	Reaction	Reaction			
24	N90	Reaction	Reaction	Reaction			

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Antenna Pipe 1	PIPE_2.0	Column	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
2	Antenna Pipe 2	PIPE_3.0	Column	Pipe	A53 Gr.B	Typical	2.07	2.85	2.85	5.69
3	Connection	L3X3X3	Beam	Single Angle	A36 Gr.36	Typical	1.09	.948	.948	.014

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate...	Section/Shape	Type	Design Li...	Material	Design Rules
1	M1	N1	N22			Antenna Pipe 1	Column	Pipe	A53 Gr.B	Typical
2	M2	N2	N23			Antenna Pipe 1	Column	Pipe	A53 Gr.B	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate...	Section/Shape	Type	Design Li...	Material	Design Rules
3	M3	N3	N24			Antenna Pipe 1	Column	Pipe	A53 Gr.B	Typical
4	M4	N7	N184			Antenna Pipe 1	Column	Pipe	A53 Gr.B	Typical
5	M5	N8	N185			Antenna Pipe 1	Column	Pipe	A53 Gr.B	Typical
6	M6	N9	N186			Antenna Pipe 1	Column	Pipe	A53 Gr.B	Typical
7	M7	N4	N181			Antenna Pipe 2	Column	Pipe	A53 Gr.B	Typical
8	M8	N5	N182			Antenna Pipe 2	Column	Pipe	A53 Gr.B	Typical
9	M9	N6	N183			Antenna Pipe 2	Column	Pipe	A53 Gr.B	Typical
10	M10	N99	N91		270	Connection	Beam	Single A...	A36 Gr.36	Typical
11	M11	N150	N145		90	Connection	Beam	Single A...	A36 Gr.36	Typical
12	M12	N33	N25		180	Connection	Beam	Single A...	A36 Gr.36	Typical
13	M13	N32	N35		90	Connection	Beam	Single A...	A36 Gr.36	Typical
14	M14	N26	N34		180	Connection	Beam	Single A...	A36 Gr.36	Typical
15	M15	N108	N100		270	Connection	Beam	Single A...	A36 Gr.36	Typical
16	M16	N156	N151		90	Connection	Beam	Single A...	A36 Gr.36	Typical
17	M17	N44	N36		180	Connection	Beam	Single A...	A36 Gr.36	Typical
18	M18	N43	N46		90	Connection	Beam	Single A...	A36 Gr.36	Typical
19	M19	N37	N45		180	Connection	Beam	Single A...	A36 Gr.36	Typical
20	M20	N117	N109		270	Connection	Beam	Single A...	A36 Gr.36	Typical
21	M21	N162	N157		90	Connection	Beam	Single A...	A36 Gr.36	Typical
22	M22	N55	N47		180	Connection	Beam	Single A...	A36 Gr.36	Typical
23	M23	N54	N57		90	Connection	Beam	Single A...	A36 Gr.36	Typical
24	M24	N48	N56		180	Connection	Beam	Single A...	A36 Gr.36	Typical
25	M25	N126	N118		270	Connection	Beam	Single A...	A36 Gr.36	Typical
26	M26	N168	N163		90	Connection	Beam	Single A...	A36 Gr.36	Typical
27	M27	N66	N58		180	Connection	Beam	Single A...	A36 Gr.36	Typical
28	M28	N65	N68		90	Connection	Beam	Single A...	A36 Gr.36	Typical
29	M29	N59	N67		180	Connection	Beam	Single A...	A36 Gr.36	Typical
30	M30	N135	N127		270	Connection	Beam	Single A...	A36 Gr.36	Typical
31	M31	N174	N169		90	Connection	Beam	Single A...	A36 Gr.36	Typical
32	M32	N77	N69		180	Connection	Beam	Single A...	A36 Gr.36	Typical
33	M33	N76	N79		90	Connection	Beam	Single A...	A36 Gr.36	Typical
34	M34	N70	N78		180	Connection	Beam	Single A...	A36 Gr.36	Typical
35	M35	N144	N136		270	Connection	Beam	Single A...	A36 Gr.36	Typical
36	M36	N180	N175		90	Connection	Beam	Single A...	A36 Gr.36	Typical
37	M37	N88	N80		180	Connection	Beam	Single A...	A36 Gr.36	Typical
38	M38	N87	N90		90	Connection	Beam	Single A...	A36 Gr.36	Typical
39	M39	N81	N89		180	Connection	Beam	Single A...	A36 Gr.36	Typical
40	M40	N96	N93			RIGID	None	None	RIGID	Typical
41	M41	N93	N94			RIGID	None	None	RIGID	Typical
42	M42	N96	N97			RIGID	None	None	RIGID	Typical
43	M43	N92	N147			RIGID	None	None	RIGID	Typical
44	M44	N98	N148			RIGID	None	None	RIGID	Typical
45	M45	N30	N27			RIGID	None	None	RIGID	Typical
46	M46	N27	N28			RIGID	None	None	RIGID	Typical
47	M47	N30	N31			RIGID	None	None	RIGID	Typical
48	M48	N11	N10			RIGID	None	None	RIGID	Typical
49	M49	N17	N16			RIGID	None	None	RIGID	Typical
50	M50	N13	N12			RIGID	None	None	RIGID	Typical
51	M51	N19	N18			RIGID	None	None	RIGID	Typical
52	M52	N15	N14			RIGID	None	None	RIGID	Typical
53	M53	N21	N20			RIGID	None	None	RIGID	Typical
54	M54	N105	N102			RIGID	None	None	RIGID	Typical
55	M55	N102	N103			RIGID	None	None	RIGID	Typical
56	M56	N105	N106			RIGID	None	None	RIGID	Typical
57	M57	N101	N153			RIGID	None	None	RIGID	Typical
58	M58	N107	N154			RIGID	None	None	RIGID	Typical
59	M59	N41	N38			RIGID	None	None	RIGID	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate...	Section/Shape	Type	Design Li...	Material	Design Rules
60	M60	N38	N39			RIGID	None	None	RIGID	Typical
61	M61	N41	N42			RIGID	None	None	RIGID	Typical
62	M62	N114	N111			RIGID	None	None	RIGID	Typical
63	M63	N111	N112			RIGID	None	None	RIGID	Typical
64	M64	N114	N115			RIGID	None	None	RIGID	Typical
65	M65	N110	N159			RIGID	None	None	RIGID	Typical
66	M66	N116	N160			RIGID	None	None	RIGID	Typical
67	M67	N52	N49			RIGID	None	None	RIGID	Typical
68	M68	N49	N50			RIGID	None	None	RIGID	Typical
69	M69	N52	N53			RIGID	None	None	RIGID	Typical
70	M70	N123	N120			RIGID	None	None	RIGID	Typical
71	M71	N120	N121			RIGID	None	None	RIGID	Typical
72	M72	N123	N124			RIGID	None	None	RIGID	Typical
73	M73	N119	N165			RIGID	None	None	RIGID	Typical
74	M74	N125	N166			RIGID	None	None	RIGID	Typical
75	M75	N63	N60			RIGID	None	None	RIGID	Typical
76	M76	N60	N61			RIGID	None	None	RIGID	Typical
77	M77	N63	N64			RIGID	None	None	RIGID	Typical
78	M78	N132	N129			RIGID	None	None	RIGID	Typical
79	M79	N129	N130			RIGID	None	None	RIGID	Typical
80	M80	N132	N133			RIGID	None	None	RIGID	Typical
81	M81	N128	N171			RIGID	None	None	RIGID	Typical
82	M82	N134	N172			RIGID	None	None	RIGID	Typical
83	M83	N74	N71			RIGID	None	None	RIGID	Typical
84	M84	N71	N72			RIGID	None	None	RIGID	Typical
85	M85	N74	N75			RIGID	None	None	RIGID	Typical
86	M86	N141	N138			RIGID	None	None	RIGID	Typical
87	M87	N138	N139			RIGID	None	None	RIGID	Typical
88	M88	N141	N142			RIGID	None	None	RIGID	Typical
89	M89	N137	N177			RIGID	None	None	RIGID	Typical
90	M90	N143	N178			RIGID	None	None	RIGID	Typical
91	M91	N85	N82			RIGID	None	None	RIGID	Typical
92	M92	N82	N83			RIGID	None	None	RIGID	Typical
93	M93	N85	N86			RIGID	None	None	RIGID	Typical

Hot Rolled Steel Design Parameters

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp to...	Lcomp b...	L-tor...	Kyy	Kzz	Cb	Function
1	M1	Antenna Pipe 1	96	Segment	Segment	Lbyy			2.1	2.1		Lateral
2	M2	Antenna Pipe 1	96	Segment	Segment	Lbyy			2.1	2.1		Lateral
3	M3	Antenna Pipe 1	96	Segment	Segment	Lbyy			2.1	2.1		Lateral
4	M4	Antenna Pipe 1	120	Segment	Segment	Lbyy			2.1	2.1		Lateral
5	M5	Antenna Pipe 1	120	Segment	Segment	Lbyy			2.1	2.1		Lateral
6	M6	Antenna Pipe 1	120	Segment	Segment	Lbyy			2.1	2.1		Lateral
7	M7	Antenna Pipe 2	120	Segment	Segment	Lbyy			2.1	2.1		Lateral
8	M8	Antenna Pipe 2	120	Segment	Segment	Lbyy			2.1	2.1		Lateral
9	M9	Antenna Pipe 2	120	Segment	Segment	Lbyy			2.1	2.1		Lateral
10	M10	Connection	6	Segment	Segment	Lbyy			2.1	2.1		Lateral
11	M11	Connection	8	Segment	Segment	Lbyy			2.1	2.1		Lateral
12	M12	Connection	15	Segment	Segment	Lbyy			2.1	2.1		Lateral
13	M13	Connection	3	Segment	Segment	Lbyy			.8	.8		Lateral
14	M14	Connection	3	Segment	Segment	Lbyy			.8	.8		Lateral
15	M15	Connection	6	Segment	Segment	Lbyy			2.1	2.1		Lateral
16	M16	Connection	8	Segment	Segment	Lbyy			2.1	2.1		Lateral
17	M17	Connection	15	Segment	Segment	Lbyy			2.1	2.1		Lateral
18	M18	Connection	3	Segment	Segment	Lbyy			.8	.8		Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp to...	Lcomp b...	L-tor...	Kyy	Kzz	Cb	Function
19	M19	Connection	3	Segment	Segment	Lbyy			.8	.8		Lateral
20	M20	Connection	6	Segment	Segment	Lbyy			2.1	2.1		Lateral
21	M21	Connection	8	Segment	Segment	Lbyy			2.1	2.1		Lateral
22	M22	Connection	15	Segment	Segment	Lbyy			2.1	2.1		Lateral
23	M23	Connection	3	Segment	Segment	Lbyy			.8	.8		Lateral
24	M24	Connection	3	Segment	Segment	Lbyy			.8	.8		Lateral
25	M25	Connection	6	Segment	Segment	Lbyy			2.1	2.1		Lateral
26	M26	Connection	8	Segment	Segment	Lbyy			2.1	2.1		Lateral
27	M27	Connection	15	Segment	Segment	Lbyy			2.1	2.1		Lateral
28	M28	Connection	3	Segment	Segment	Lbyy			.8	.8		Lateral
29	M29	Connection	3	Segment	Segment	Lbyy			.8	.8		Lateral
30	M30	Connection	6	Segment	Segment	Lbyy			2.1	2.1		Lateral
31	M31	Connection	8	Segment	Segment	Lbyy			2.1	2.1		Lateral
32	M32	Connection	15	Segment	Segment	Lbyy			2.1	2.1		Lateral
33	M33	Connection	3	Segment	Segment	Lbyy			.8	.8		Lateral
34	M34	Connection	3	Segment	Segment	Lbyy			.8	.8		Lateral
35	M35	Connection	6	Segment	Segment	Lbyy			2.1	2.1		Lateral
36	M36	Connection	8	Segment	Segment	Lbyy			2.1	2.1		Lateral
37	M37	Connection	15	Segment	Segment	Lbyy			2.1	2.1		Lateral
38	M38	Connection	3	Segment	Segment	Lbyy			.8	.8		Lateral
39	M39	Connection	3	Segment	Segment	Lbyy			.8	.8		Lateral

Plate Primary Data

Label	A Joint	B Joint	C Joint	D Joint	Material	Thickness[in]
No Data to Print ...						

Member Point Loads (BLC 1 : DEAD LOAD)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	M1	Z	-99.21	28
2	M1	Z	-99.21	70
3	M2	Z	-67.2	48
4	M3	Z	-67.2	48
5	M4	Z	-99.21	28
6	M4	Z	-99.21	70
7	M5	Z	-67.2	48
8	M6	Z	-67.2	48

Member Point Loads (BLC 2 : DEAD LOAD (ICE))

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	M1	Z	-73.3	28
2	M1	Z	-73.1	70
3	M2	Z	-143	48
4	M3	Z	-143	48
5	M4	Z	-73.3	28
6	M4	Z	-73.1	70
7	M5	Z	-143	48
8	M6	Z	-143	48

Member Point Loads (BLC 3 : WIND LOAD (NO ICE) FRONT)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	M1	X	162.7	28
2	M1	X	162.4	70
3	M2	X	339.7	48

Member Point Loads (BLC 3 : WIND LOAD (NO ICE) FRONT) (Continued)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
4	M3	X	339.7	48
5	M4	X	162.7	28
6	M4	X	162.4	70
7	M5	X	339.7	48
8	M6	X	339.7	48

Member Point Loads (BLC 4 : WIND LOAD (NO ICE) SIDE)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	M1	Y	89.5	28
2	M1	Y	89.1	70
3	M2	Y	156.2	48
4	M3	Y	156.2	48
5	M4	Y	89.5	28
6	M4	Y	89.1	70
7	M5	Y	156.2	48
8	M6	Y	156.2	48

Member Point Loads (BLC 5 : WIND LOAD (ICE) FRONT)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	M1	X	24.8	28
2	M1	X	24.8	70
3	M2	X	49.2	48
4	M3	X	49.2	48
5	M4	X	24.8	28
6	M4	X	24.8	70
7	M5	X	49.2	48
8	M6	X	49.2	48

Member Point Loads (BLC 6 : WIND LOAD (ICE) SIDE)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	M1	Y	14.8	28
2	M1	Y	14.7	70
3	M2	Y	25.2	48
4	M3	Y	25.2	48
5	M4	Y	14.8	28
6	M4	Y	14.7	70
7	M5	Y	25.2	48
8	M6	Y	25.2	48

Member Point Loads (BLC 7 : LIVE LOAD (MAN))

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	M1	Z	-250	0
2	M2	Z	-250	0
3	M3	Z	-250	0
4	M4	Z	-250	0
5	M5	Z	-250	0
6	M6	Z	-250	0

Member Point Loads (BLC 8 : WIND LOAD (SERVICE) FRONT)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	M1	X	11.5	28
2	M1	X	11.4	70
3	M2	X	23.9	48
4	M3	X	23.9	48

Member Point Loads (BLC 8 : WIND LOAD (SERVICE) FRONT) (Continued)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
5	M4	X	11.5	28
6	M4	X	11.4	70
7	M5	X	23.9	48
8	M6	X	23.9	48

Member Point Loads (BLC 9 : WIND LOAD (SERVICE) SIDE)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	M1	Y	6.3	28
2	M1	Y	6.3	70
3	M2	Y	11	48
4	M3	Y	11	48
5	M4	Y	6.3	28
6	M4	Y	6.3	70
7	M5	Y	11	48
8	M6	Y	11	48

Member Point Loads (BLC 10 : LIVE LOAD (SERVICE))

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	M1	Z	-250	0
2	M2	Z	-250	0
3	M3	Z	-250	0
4	M4	Z	-250	0
5	M5	Z	-250	0
6	M6	Z	-250	0

Member Distributed Loads (BLC 2 : DEAD LOAD (ICE))

	Member Label	Direction	Start Magnitude[lb/in,F,ksf]	End Magnitude[lb/in,F,ksf]	Start Location[in,%]	End Location[i...
1	M1	Z	-.526	-.526	0	0
2	M2	Z	-.526	-.526	0	0
3	M3	Z	-.526	-.526	0	0
4	M4	Z	-.526	-.526	0	0
5	M5	Z	-.526	-.526	0	0
6	M6	Z	-.526	-.526	0	0
7	M7	Z	-.711	-.711	0	0
8	M8	Z	-.711	-.711	0	0
9	M9	Z	-.711	-.711	0	0

Member Distributed Loads (BLC 3 : WIND LOAD (NO ICE) FRONT)

	Member Label	Direction	Start Magnitude[lb/in,F,ksf]	End Magnitude[lb/in,F,ksf]	Start Location[in,%]	End Location[i...
1	M1	PX	.74	.74	0	0
2	M2	PX	.74	.74	0	0
3	M3	PX	.74	.74	0	0
4	M4	PX	.74	.74	0	0
5	M5	PX	.74	.74	0	0
6	M6	PX	.74	.74	0	0
7	M7	PX	1.089	1.089	0	0
8	M8	PX	1.089	1.089	0	0
9	M9	PX	1.089	1.089	0	0

Member Distributed Loads (BLC 4 : WIND LOAD (NO ICE) SIDE)

	Member Label	Direction	Start Magnitude[lb/in,F,ksf]	End Magnitude[lb/in,F,ksf]	Start Location[in,%]	End Location[i...
1	M1	PY	.74	.74	0	0
2	M2	PY	.74	.74	0	0

Member Distributed Loads (BLC 4 : WIND LOAD (NO ICE) SIDE) (Continued)

	Member Label	Direction	Start Magnitude[lb/in,F,ksf]	End Magnitude[lb/in,F,ksf]	Start Location[in,%]	End Location[i...
3	M3	PY	.74	.74	0	0
4	M4	PY	.74	.74	0	0
5	M5	PY	.74	.74	0	0
6	M6	PY	.74	.74	0	0
7	M7	PY	1.089	1.089	0	0
8	M8	PY	1.089	1.089	0	0
9	M9	PY	1.089	1.089	0	0

Member Distributed Loads (BLC 5 : WIND LOAD (ICE) FRONT)

	Member Label	Direction	Start Magnitude[lb/in,F,ksf]	End Magnitude[lb/in,F,ksf]	Start Location[in,%]	End Location[i...
1	M1	PX	.173	.173	0	0
2	M2	PX	.173	.173	0	0
3	M3	PX	.173	.173	0	0
4	M4	PX	.173	.173	0	0
5	M5	PX	.173	.173	0	0
6	M6	PX	.173	.173	0	0
7	M7	PX	.213	.213	0	0
8	M8	PX	.213	.213	0	0
9	M9	PX	.213	.213	0	0

Member Distributed Loads (BLC 6 : WIND LOAD (ICE) SIDE)

	Member Label	Direction	Start Magnitude[lb/in,F,ksf]	End Magnitude[lb/in,F,ksf]	Start Location[in,%]	End Location[i...
1	M1	PY	.173	.173	0	0
2	M2	PY	.173	.173	0	0
3	M3	PY	.173	.173	0	0
4	M4	PY	.173	.173	0	0
5	M5	PY	.173	.173	0	0
6	M6	PY	.173	.173	0	0
7	M7	PY	.213	.213	0	0
8	M8	PY	.213	.213	0	0
9	M9	PY	.213	.213	0	0

Member Distributed Loads (BLC 8 : WIND LOAD (SERVICE) FRONT)

	Member Label	Direction	Start Magnitude[lb/in,F,ksf]	End Magnitude[lb/in,F,ksf]	Start Location[in,%]	End Location[i...
1	M1	PX	.052	.052	0	0
2	M2	PX	.052	.052	0	0
3	M3	PX	.052	.052	0	0
4	M4	PX	.052	.052	0	0
5	M5	PX	.052	.052	0	0
6	M6	PX	.052	.052	0	0
7	M7	PX	.077	.077	0	0
8	M8	PX	.077	.077	0	0
9	M9	PX	.077	.077	0	0

Member Distributed Loads (BLC 9 : WIND LOAD (SERVICE) SIDE)

	Member Label	Direction	Start Magnitude[lb/in,F,ksf]	End Magnitude[lb/in,F,ksf]	Start Location[in,%]	End Location[i...
1	M1	PY	.052	.052	0	0
2	M2	PY	.052	.052	0	0
3	M3	PY	.052	.052	0	0
4	M4	PY	.052	.052	0	0
5	M5	PY	.052	.052	0	0
6	M6	PY	.052	.052	0	0
7	M7	PY	.077	.077	0	0
8	M8	PY	.077	.077	0	0
9	M9	PY	.077	.077	0	0

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N149	max	396.668	3	355.745	5	1600.949	5	0	50	0	50	0	50
2		min	-338.301	9	-340.325	11	-1220.804	11	0	1	0	1	0	1
3	N146	max	396.662	13	340.325	5	1600.945	11	0	50	0	50	0	50
4		min	-338.296	7	-355.745	11	-1220.802	5	0	1	0	1	0	1
5	N34	max	755.799	7	633.461	12	112.693	7	0	50	0	50	0	50
6		min	-813.776	13	-602.972	6	-126.777	13	0	1	0	1	0	1
7	N35	max	755.843	9	602.961	10	112.705	9	0	50	0	50	0	50
8		min	-813.825	3	-633.45	4	-126.79	3	0	1	0	1	0	1
9	N152	max	387.825	13	318.278	5	1419.051	11	0	50	0	50	0	50
10		min	-362.287	7	-327.328	11	-1202.187	5	0	1	0	1	0	1
11	N155	max	387.83	3	327.328	5	1419.055	5	0	50	0	50	0	50
12		min	-362.292	9	-318.278	11	-1202.189	11	0	1	0	1	0	1
13	N45	max	772.248	7	599.065	12	116.404	7	0	50	0	50	0	50
14		min	-797.404	13	-584.896	6	-125.223	13	0	1	0	1	0	1
15	N46	max	772.295	9	584.886	10	116.416	9	0	50	0	50	0	50
16		min	-797.453	3	-599.055	4	-125.236	3	0	1	0	1	0	1
17	N158	max	387.803	13	318.283	5	1419.073	11	0	50	0	50	0	50
18		min	-362.266	7	-327.333	11	-1202.209	5	0	1	0	1	0	1
19	N161	max	387.809	3	327.333	5	1419.076	5	0	50	0	50	0	50
20		min	-362.272	9	-318.283	11	-1202.211	11	0	1	0	1	0	1
21	N56	max	772.219	7	599.061	12	116.398	7	0	50	0	50	0	50
22		min	-797.373	13	-584.893	6	-125.217	13	0	1	0	1	0	1
23	N57	max	772.266	9	584.883	10	116.411	9	0	50	0	50	0	50
24		min	-797.422	3	-599.051	4	-125.23	3	0	1	0	1	0	1
25	N164	max	169.996	13	130.101	5	750.289	12	0	50	0	50	0	50
26		min	-158.068	7	-142.497	11	-471.462	6	0	1	0	1	0	1
27	N167	max	169.996	3	142.497	5	750.288	4	0	50	0	50	0	50
28		min	-158.068	9	-130.101	11	-471.461	10	0	1	0	1	0	1
29	N67	max	405.76	7	347.233	12	217.743	7	0	50	0	50	0	50
30		min	-417.455	13	-344.837	6	-211.104	13	0	1	0	1	0	1
31	N68	max	405.784	9	344.832	10	217.765	9	0	50	0	50	0	50
32		min	-417.481	3	-347.229	4	-211.125	3	0	1	0	1	0	1
33	N170	max	170.52	13	121.626	5	636.423	12	0	50	0	50	0	50
34		min	-165.656	7	-127.479	11	-508.699	6	0	1	0	1	0	1
35	N173	max	170.521	3	127.48	5	636.423	4	0	50	0	50	0	50
36		min	-165.656	9	-121.626	11	-508.698	10	0	1	0	1	0	1
37	N78	max	413.895	7	331.91	12	218.339	7	0	50	0	50	0	50
38		min	-418.537	13	-330.362	6	-218.182	13	0	1	0	1	0	1
39	N79	max	413.921	9	330.357	10	218.362	9	0	50	0	50	0	50
40		min	-418.564	3	-331.906	4	-218.204	3	0	1	0	1	0	1
41	N176	max	170.52	13	121.626	5	636.423	12	0	50	0	50	0	50
42		min	-165.656	7	-127.479	11	-508.699	6	0	1	0	1	0	1
43	N179	max	170.521	3	127.48	5	636.423	4	0	50	0	50	0	50
44		min	-165.656	9	-121.626	11	-508.698	10	0	1	0	1	0	1
45	N89	max	413.895	7	331.91	12	218.339	7	0	50	0	50	0	50
46		min	-418.537	13	-330.362	6	-218.182	13	0	1	0	1	0	1
47	N90	max	413.921	9	330.357	10	218.361	9	0	50	0	50	0	50
48		min	-418.564	3	-331.905	4	-218.204	3	0	1	0	1	0	1
49	Totals:	max	2880.506	8	1853.507	11	3605.141	27						
50		min	-2880.504	2	-1853.507	5	1355.135	8						

Envelope Member Section Forces

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque...	LC	y-y Moment[k-...	LC	z-z Mo...	LC
1	M1	1	max	375	38	.715	11	.853	8	0	50	0	50	0	50
2			min	0	1	-.715	5	-1.573	27	0	1	0	1	0	1
3		2	max	1030.492	2	21.706	11	27.236	8	.009	11	.02	2	.039	5
4			min	-786.118	8	-21.706	5	-27.312	2	-.009	5	-.022	8	-.039	11
5		3	max	0	50	.025	5	.044	2	0	50	0	50	0	50
6			min	0	1	-.025	11	-.038	8	0	1	0	1	0	1
7	M2	1	max	375	38	.274	36	.075	8	0	50	0	50	0	50
8			min	0	1	-.274	30	-1.132	27	0	1	0	1	0	1
9		2	max	799.001	2	36.141	11	62.066	8	.01	11	.169	2	.042	11
10			min	-663.508	8	-36.141	5	-62.078	2	-.01	5	-.169	8	-.042	5
11		3	max	0	50	.023	5	.044	2	0	50	0	50	0	50
12			min	0	1	-.023	11	-.041	8	0	1	0	1	0	1
13	M3	1	max	375	38	.274	36	.075	8	0	50	0	50	0	50
14			min	0	1	-.274	30	-1.132	27	0	1	0	1	0	1
15		2	max	798.916	2	36.142	11	62.062	8	.01	11	.169	2	.042	11
16			min	-663.427	8	-36.142	5	-62.073	2	-.01	5	-.169	8	-.042	5
17		3	max	0	50	.023	5	.044	2	0	50	0	50	0	50
18			min	0	1	-.023	11	-.041	8	0	1	0	1	0	1
19	M4	1	max	375	38	1.926	11	3.344	8	0	50	0	50	0	50
20			min	0	1	-1.926	5	-3.306	2	0	1	0	1	0	1
21		2	max	514.877	38	135.838	11	210.456	8	0	50	.562	8	.359	5
22			min	139.877	2	-135.838	5	-210.418	2	0	1	-.561	2	-.359	11
23		3	max	0	50	0	11	.004	8	0	50	0	50	0	50
24			min	0	1	0	5	-.003	2	0	1	0	1	0	1
25	M5	1	max	375	38	.646	11	1.258	8	0	50	0	50	0	50
26			min	0	1	-.646	5	-1.25	2	0	1	0	1	0	1
27		2	max	476.465	38	201.258	11	385.37	8	0	50	.457	8	.27	5
28			min	101.465	2	-201.258	5	-385.362	2	0	1	-.457	2	-.27	11
29		3	max	0	50	0	11	.004	8	0	50	0	50	0	50
30			min	0	1	0	5	-.004	2	0	1	0	1	0	1
31	M6	1	max	375	38	.646	11	1.258	8	0	50	0	50	0	50
32			min	0	1	-.646	5	-1.25	2	0	1	0	1	0	1
33		2	max	476.465	38	201.258	11	385.37	8	0	50	.457	8	.27	5
34			min	101.465	2	-201.258	5	-385.362	2	0	1	-.457	2	-.27	11
35		3	max	0	50	0	11	.004	8	0	50	0	50	0	50
36			min	0	1	0	5	-.004	2	0	1	0	1	0	1
37	M7	1	max	0	50	.013	11	.016	8	0	50	0	50	0	50
38			min	0	1	-.013	5	-.018	2	0	1	0	1	0	1
39		2	max	688.687	27	316.796	11	464.332	8	.125	11	1.307	8	.972	5
40			min	313.686	8	-316.796	5	-464.707	2	-.125	5	-1.575	2	-.972	11
41		3	max	0	50	0	11	.004	8	0	50	0	50	0	50
42			min	0	1	0	5	-.004	2	0	1	0	1	0	1
43	M8	1	max	0	50	.012	11	.017	8	0	50	0	50	0	50
44			min	0	1	-.012	5	-.018	2	0	1	0	1	0	1
45		2	max	531.222	33	293.423	11	477.662	8	.114	11	1.45	8	.905	5
46			min	156.222	2	-293.423	5	-477.737	2	-.114	5	-1.558	2	-.905	11
47		3	max	0	50	0	11	.004	8	0	50	0	50	0	50
48			min	0	1	0	5	-.004	2	0	1	0	1	0	1
49	M9	1	max	0	50	.012	11	.017	8	0	50	0	50	0	50
50			min	0	1	-.012	5	-.018	2	0	1	0	1	0	1
51		2	max	531.222	33	293.426	11	477.637	8	.114	11	1.45	8	.905	5
52			min	156.222	2	-293.426	5	-477.711	2	-.114	5	-1.558	2	-.905	11
53		3	max	0	50	0	11	.004	8	0	50	0	50	0	50
54			min	0	1	0	5	-.004	2	0	1	0	1	0	1
55	M10	1	max	0	50	0	50	0	50	0	50	0	50	0	50
56			min	0	1	0	1	0	1	0	1	0	1	0	1
57		2	max	0	8	0	50	0	50	0	50	0	1	0	1

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque...	LC	y-y Moment[k-...	LC	z-z Mo...	LC
58			min	0	1	0	1	0	1	0	1	0	2	0	2
59		3	max	0	50	0	50	0	50	0	50	0	50	0	50
60			min	0	1	0	1	0	1	0	1	0	1	0	1
61	M11	1	max	0	50	0	50	0	50	0	50	0	50	0	50
62			min	0	1	0	1	0	1	0	1	0	1	0	1
63		2	max	-10.044	2	80.282	5	109.832	11	0	11	0	2	.003	8
64			min	-57.725	33	-80.282	11	-109.833	5	0	5	-.002	8	-.005	2
65		3	max	0	50	0	50	0	50	0	50	0	50	0	50
66			min	0	1	0	1	0	1	0	1	0	1	0	1
67	M12	1	max	0	50	0	50	0	50	0	50	0	50	0	50
68			min	0	1	0	1	0	1	0	1	0	1	0	1
69		2	max	0	2	0	1	0	5	0	50	0	50	0	1
70			min	0	8	0	4	0	11	0	1	0	1	0	2
71		3	max	0	50	0	50	0	50	0	50	0	50	0	50
72			min	0	1	0	1	0	1	0	1	0	1	0	1
73	M13	1	max	755.843	9	633.176	4	115.55	9	0	50	.089	10	.131	4
74			min	-813.825	3	-603.217	10	-123.599	3	0	1	-.093	4	-.125	10
75		2	max	755.843	9	633.176	4	116.107	9	0	50	.044	10	.066	4
76			min	-813.825	3	-603.217	10	-123.042	3	0	1	-.046	4	-.062	10
77		3	max	755.843	9	633.176	4	116.663	9	0	50	0	50	0	50
78			min	-813.825	3	-603.217	10	-122.486	3	0	1	0	1	0	1
79	M14	1	max	755.799	7	115.538	7	633.187	12	0	50	.089	6	.125	6
80			min	-813.776	13	-123.586	13	-603.227	6	0	1	-.093	12	-.131	12
81		2	max	755.799	7	116.094	7	633.187	12	0	50	.044	6	.062	6
82			min	-813.776	13	-123.029	13	-603.227	6	0	1	-.046	12	-.066	12
83		3	max	755.799	7	116.651	7	633.187	12	0	50	0	50	0	50
84			min	-813.776	13	-122.473	13	-603.227	6	0	1	0	1	0	1
85	M15	1	max	0	50	0	50	0	50	0	50	0	50	0	50
86			min	0	1	0	1	0	1	0	1	0	1	0	1
87		2	max	0	8	0	50	0	50	0	50	0	1	0	1
88			min	0	2	0	1	0	1	0	1	0	2	0	2
89		3	max	0	50	0	50	0	50	0	50	0	50	0	50
90			min	0	1	0	1	0	1	0	1	0	1	0	1
91	M16	1	max	0	50	0	50	0	50	0	50	0	50	0	50
92			min	0	1	0	1	0	1	0	1	0	1	0	1
93		2	max	2.575	2	74.5	5	101.951	11	0	11	.001	2	.004	8
94			min	-45.921	33	-74.5	11	-101.951	5	0	5	-.002	8	-.004	2
95		3	max	0	50	0	50	0	50	0	50	0	50	0	50
96			min	0	1	0	1	0	1	0	1	0	1	0	1
97	M17	1	max	0	50	0	50	0	50	0	50	0	50	0	50
98			min	0	1	0	1	0	1	0	1	0	1	0	1
99		2	max	0	2	0	1	0	5	0	50	0	50	0	1
100			min	0	8	0	4	0	11	0	1	0	1	0	2
101		3	max	0	50	0	50	0	50	0	50	0	50	0	50
102			min	0	1	0	1	0	1	0	1	0	1	0	1
103	M18	1	max	772.295	9	598.812	4	119.336	9	0	50	.085	10	.124	4
104			min	-797.453	3	-585.122	10	-122.22	3	0	1	-.087	4	-.122	10
105		2	max	772.295	9	598.812	4	119.892	9	0	50	.043	10	.062	4
106			min	-797.453	3	-585.122	10	-121.664	3	0	1	-.044	4	-.061	10
107		3	max	772.295	9	598.812	4	120.449	9	0	50	0	50	0	50
108			min	-797.453	3	-585.122	10	-121.108	3	0	1	0	1	0	1
109	M19	1	max	772.248	7	119.323	7	598.822	12	0	50	.085	6	.122	6
110			min	-797.404	13	-122.207	13	-585.132	6	0	1	-.087	12	-.124	12
111		2	max	772.248	7	119.88	7	598.822	12	0	50	.043	6	.061	6
112			min	-797.404	13	-121.651	13	-585.132	6	0	1	-.044	12	-.062	12
113		3	max	772.248	7	120.436	7	598.822	12	0	50	0	50	0	50
114			min	-797.404	13	-121.095	13	-585.132	6	0	1	0	1	0	1

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque...	LC	y-y Moment[k-...	LC	z-z Mo...	LC
115	M20	1	max	0	50	0	50	0	50	0	50	0	50	0	50
116			min	0	1	0	1	0	1	0	1	0	1	0	1
117		2	max	0	8	0	50	0	50	0	50	0	1	0	1
118			min	0	2	0	1	0	1	0	1	0	2	0	2
119		3	max	0	50	0	50	0	50	0	50	0	50	0	50
120			min	0	1	0	1	0	1	0	1	0	1	0	1
121	M21	1	max	0	50	0	50	0	50	0	50	0	50	0	50
122			min	0	1	0	1	0	1	0	1	0	1	0	1
123		2	max	2.574	2	74.501	5	101.953	11	0	11	.001	2	.004	8
124			min	-45.921	33	-74.501	11	-101.953	5	0	5	-.002	8	-.004	2
125		3	max	0	50	0	50	0	50	0	50	0	50	0	50
126			min	0	1	0	1	0	1	0	1	0	1	0	1
127	M22	1	max	0	50	0	50	0	50	0	50	0	50	0	50
128			min	0	1	0	1	0	1	0	1	0	1	0	1
129		2	max	0	2	0	1	0	5	0	50	0	50	0	1
130			min	0	8	0	4	0	11	0	1	0	1	0	2
131		3	max	0	50	0	50	0	50	0	50	0	50	0	50
132			min	0	1	0	1	0	1	0	1	0	1	0	1
133	M23	1	max	772.266	9	598.808	4	119.33	9	0	50	.085	10	.124	4
134			min	-797.422	3	-585.119	10	-122.215	3	0	1	-.087	4	-.122	10
135		2	max	772.266	9	598.808	4	119.887	9	0	50	.043	10	.062	4
136			min	-797.422	3	-585.119	10	-121.658	3	0	1	-.044	4	-.061	10
137		3	max	772.266	9	598.808	4	120.443	9	0	50	0	50	0	50
138			min	-797.422	3	-585.119	10	-121.102	3	0	1	0	1	0	1
139	M24	1	max	772.219	7	119.318	7	598.818	12	0	50	.085	6	.122	6
140			min	-797.373	13	-122.202	13	-585.129	6	0	1	-.087	12	-.124	12
141		2	max	772.219	7	119.874	7	598.818	12	0	50	.043	6	.061	6
142			min	-797.373	13	-121.645	13	-585.129	6	0	1	-.044	12	-.062	12
143		3	max	772.219	7	120.43	7	598.818	12	0	50	0	50	0	50
144			min	-797.373	13	-121.089	13	-585.129	6	0	1	0	1	0	1
145	M25	1	max	0	50	0	50	0	50	0	50	0	50	0	50
146			min	0	1	0	1	0	1	0	1	0	1	0	1
147		2	max	0	50	0	50	0	50	0	50	0	1	0	1
148			min	0	1	0	1	0	1	0	1	0	2	0	2
149		3	max	0	50	0	50	0	50	0	50	0	50	0	50
150			min	0	1	0	1	0	1	0	1	0	1	0	1
151	M26	1	max	0	50	0	50	0	50	0	50	0	50	0	50
152			min	0	1	0	1	0	1	0	1	0	1	0	1
153		2	max	-7.029	8	40.029	5	47.429	11	0	11	0	2	.002	8
154			min	-52.837	27	-40.029	11	-47.429	5	0	5	0	33	-.003	2
155		3	max	0	50	0	50	0	50	0	50	0	50	0	50
156			min	0	1	0	1	0	1	0	1	0	1	0	1
157	M27	1	max	0	50	0	50	0	50	0	50	0	50	0	50
158			min	0	1	0	1	0	1	0	1	0	1	0	1
159		2	max	0	50	0	1	0	5	0	50	0	50	0	1
160			min	0	1	0	11	0	11	0	1	0	1	0	2
161		3	max	0	50	0	50	0	50	0	50	0	50	0	50
162			min	0	1	0	1	0	1	0	1	0	1	0	1
163	M28	1	max	405.784	9	347.17	4	220.587	9	0	50	.028	11	.095	3
164			min	-417.481	3	-344.89	10	-208.508	3	0	1	-.031	5	-.097	9
165		2	max	405.784	9	347.17	4	221.144	9	0	50	.014	11	.048	3
166			min	-417.481	3	-344.89	10	-207.952	3	0	1	-.015	5	-.049	9
167		3	max	405.784	9	347.17	4	221.7	9	0	50	0	50	0	50
168			min	-417.481	3	-344.89	10	-207.395	3	0	1	0	1	0	1
169	M29	1	max	405.76	7	220.565	7	347.174	12	0	50	.028	5	.097	7
170			min	-417.455	13	-208.487	13	-344.894	6	0	1	-.031	11	-.095	13
171		2	max	405.76	7	221.122	7	347.174	12	0	50	.014	5	.049	7

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque...	LC	y-y Moment[k-...	LC	z-z Mo...	LC
172			min	-417.455	13	-207.931	13	-344.894	6	0	1	-.015	11	-.048	13
173		3	max	405.76	7	221.678	7	347.174	12	0	50	0	50	0	50
174			min	-417.455	13	-207.375	13	-344.894	6	0	1	0	1	0	1
175	M30	1	max	0	50	0	50	0	50	0	50	0	50	0	50
176			min	0	1	0	1	0	1	0	1	0	1	0	1
177		2	max	0	50	0	50	0	50	0	50	0	1	0	1
178			min	0	1	0	1	0	1	0	1	0	2	0	2
179		3	max	0	50	0	50	0	50	0	50	0	50	0	50
180			min	0	1	0	1	0	1	0	1	0	1	0	1
181	M31	1	max	0	50	0	50	0	50	0	50	0	50	0	50
182			min	0	1	0	1	0	1	0	1	0	1	0	1
183		2	max	5.909	8	36.623	5	43.412	11	0	11	0	2	.002	8
184			min	-40.673	27	-36.623	11	-43.412	5	0	5	0	33	-.002	2
185		3	max	0	50	0	50	0	50	0	50	0	50	0	50
186			min	0	1	0	1	0	1	0	1	0	1	0	1
187	M32	1	max	0	50	0	50	0	50	0	50	0	50	0	50
188			min	0	1	0	1	0	1	0	1	0	1	0	1
189		2	max	0	50	0	1	0	5	0	50	0	50	0	1
190			min	0	1	0	11	0	11	0	1	0	1	0	2
191		3	max	0	50	0	50	0	50	0	50	0	50	0	50
192			min	0	1	0	1	0	1	0	1	0	1	0	1
193	M33	1	max	413.921	9	331.854	4	221.156	9	0	50	.026	11	.096	3
194			min	-418.564	3	-330.409	10	-215.528	3	0	1	-.028	5	-.097	9
195		2	max	413.921	9	331.854	4	221.713	9	0	50	.013	11	.048	3
196			min	-418.564	3	-330.409	10	-214.972	3	0	1	-.014	5	-.048	9
197		3	max	413.921	9	331.854	4	222.269	9	0	50	0	50	0	50
198			min	-418.564	3	-330.409	10	-214.416	3	0	1	0	1	0	1
199	M34	1	max	413.895	7	221.134	7	331.858	12	0	50	.026	5	.097	7
200			min	-418.537	13	-215.506	13	-330.413	6	0	1	-.028	11	-.096	13
201		2	max	413.895	7	221.69	7	331.858	12	0	50	.013	5	.048	7
202			min	-418.537	13	-214.95	13	-330.413	6	0	1	-.014	11	-.048	13
203		3	max	413.895	7	222.247	7	331.858	12	0	50	0	50	0	50
204			min	-418.537	13	-214.394	13	-330.413	6	0	1	0	1	0	1
205	M35	1	max	0	50	0	50	0	50	0	50	0	50	0	50
206			min	0	1	0	1	0	1	0	1	0	1	0	1
207		2	max	0	50	0	50	0	50	0	50	0	1	0	1
208			min	0	1	0	1	0	1	0	1	0	2	0	2
209		3	max	0	50	0	50	0	50	0	50	0	50	0	50
210			min	0	1	0	1	0	1	0	1	0	1	0	1
211	M36	1	max	0	50	0	50	0	50	0	50	0	50	0	50
212			min	0	1	0	1	0	1	0	1	0	1	0	1
213		2	max	5.91	8	36.623	5	43.412	11	0	11	0	2	.002	8
214			min	-40.673	27	-36.623	11	-43.412	5	0	5	0	33	-.002	2
215		3	max	0	50	0	50	0	50	0	50	0	50	0	50
216			min	0	1	0	1	0	1	0	1	0	1	0	1
217	M37	1	max	0	50	0	50	0	50	0	50	0	50	0	50
218			min	0	1	0	1	0	1	0	1	0	1	0	1
219		2	max	0	50	0	1	0	5	0	50	0	50	0	1
220			min	0	1	0	11	0	11	0	1	0	1	0	2
221		3	max	0	50	0	50	0	50	0	50	0	50	0	50
222			min	0	1	0	1	0	1	0	1	0	1	0	1
223	M38	1	max	413.921	9	331.854	4	221.156	9	0	50	.026	11	.096	3
224			min	-418.564	3	-330.409	10	-215.528	3	0	1	-.028	5	-.097	9
225		2	max	413.921	9	331.854	4	221.713	9	0	50	.013	11	.048	3
226			min	-418.564	3	-330.409	10	-214.972	3	0	1	-.014	5	-.048	9
227		3	max	413.921	9	331.854	4	222.269	9	0	50	0	50	0	50
228			min	-418.564	3	-330.409	10	-214.416	3	0	1	0	1	0	1

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque...	LC	y-y Moment[k-...	LC	z-z Mo...	LC
229	M39	1	max	413.895	7	221.134	7	331.858	12	0	50	.026	5	.097	7
230			min	-418.537	13	-215.506	13	-330.413	6	0	1	-.028	11	-.096	13
231		2	max	413.895	7	221.69	7	331.858	12	0	50	.013	5	.048	7
232			min	-418.537	13	-214.95	13	-330.413	6	0	1	-.014	11	-.048	13
233		3	max	413.895	7	222.247	7	331.858	12	0	50	0	50	0	50
234			min	-418.537	13	-214.394	13	-330.413	6	0	1	0	1	0	1
235	M40	1	max	384.287	5	1488.485	5	380.99	2	.182	5	.032	13	.084	11
236			min	-311.784	11	-1113.599	11	-322.233	8	-.143	11	-.037	7	-.101	5
237		2	max	384.287	5	1488.485	5	380.99	2	.182	5	.09	2	-.012	8
238			min	12.835	2	-1488.482	11	-355.428	13	-.182	11	-.085	8	-.349	5
239		3	max	384.286	11	1113.597	5	322.229	8	.143	5	.032	3	.084	5
240			min	-311.783	5	-1488.482	11	-380.987	2	-.182	11	-.037	9	-.101	11
241	M41	1	max	380.987	2	1113.567	5	384.294	11	.101	11	.032	3	.143	5
242			min	-322.229	8	-1488.515	11	-311.782	5	-.084	5	-.037	9	-.182	11
243		2	max	380.987	2	1113.567	5	384.294	11	.101	11	.027	2	.081	4
244			min	-322.229	8	-1488.515	11	-311.782	5	-.084	5	-.027	8	-.097	10
245		3	max	380.987	2	1113.567	5	384.294	11	.101	11	.036	13	.048	2
246			min	-322.229	8	-1488.515	11	-311.782	5	-.084	5	-.032	7	-.04	8
247	M42	1	max	380.991	2	1113.569	11	311.782	11	.084	11	.037	7	.143	11
248			min	-322.233	8	-1488.518	5	-384.294	5	-.101	5	-.032	13	-.182	5
249		2	max	380.991	2	1113.569	11	311.782	11	.084	11	.027	8	.081	12
250			min	-322.233	8	-1488.518	5	-384.294	5	-.101	5	-.027	2	-.097	6
251		3	max	380.991	2	1113.569	11	311.782	11	.084	11	.032	9	.048	2
252			min	-322.233	8	-1488.518	5	-384.294	5	-.101	5	-.036	3	-.04	8
253	M43	1	max	1489.63	11	311.701	5	382.148	2	.023	6	.04	8	.039	11
254			min	-1112.454	5	-384.391	11	-322.543	8	-.026	12	-.048	2	-.038	5
255		2	max	1489.63	11	311.701	5	382.148	2	.023	6	.02	8	.063	11
256			min	-1112.454	5	-384.391	11	-322.543	8	-.026	12	-.024	2	-.057	5
257		3	max	1489.63	11	311.701	5	382.148	2	.023	6	.005	11	.087	11
258			min	-1112.454	5	-384.391	11	-322.543	8	-.026	12	-.005	5	-.077	5
259	M44	1	max	1489.634	5	384.392	5	382.15	2	.026	4	.04	8	.038	11
260			min	-1112.457	11	-311.702	11	-322.545	8	-.023	10	-.048	2	-.039	5
261		2	max	1489.634	5	384.392	5	382.15	2	.026	4	.02	8	.057	11
262			min	-1112.457	11	-311.702	11	-322.545	8	-.023	10	-.024	2	-.063	5
263		3	max	1489.634	5	384.392	5	382.15	2	.026	4	.005	5	.077	11
264			min	-1112.457	11	-311.702	11	-322.545	8	-.023	10	-.005	11	-.087	5
265	M45	1	max	602.961	10	108.169	9	755.828	9	.042	9	.091	7	.043	3
266			min	-633.451	4	-131.359	3	-813.841	3	-.048	3	-.1	13	-.037	9
267		2	max	602.972	6	131.346	13	813.792	13	.048	13	.184	8	.065	3
268			min	-633.461	12	-131.359	3	-813.841	3	-.048	3	-.202	2	-.055	9
269		3	max	602.972	6	131.346	13	813.792	13	.048	13	.091	9	.043	13
270			min	-633.461	12	-108.157	7	-755.784	7	-.042	7	-.1	3	-.037	7
271	M46	1	max	755.799	7	134.27	13	603.007	6	.037	7	.091	9	.048	13
272			min	-813.776	13	-105.833	7	-633.422	12	-.043	13	-.1	3	-.042	7
273		2	max	755.799	7	134.27	13	603.007	6	.037	7	.105	8	.039	13
274			min	-813.776	13	-105.833	7	-633.422	12	-.043	13	-.115	2	-.036	7
275		3	max	755.799	7	134.27	13	603.007	6	.037	7	.123	8	.031	13
276			min	-813.776	13	-105.833	7	-633.422	12	-.043	13	-.135	2	-.029	7
277	M47	1	max	755.843	9	134.282	3	633.411	4	.043	3	.1	13	.048	3
278			min	-813.825	3	-105.845	9	-602.997	10	-.037	9	-.091	7	-.042	9
279		2	max	755.843	9	134.282	3	633.411	4	.043	3	.115	2	.039	3
280			min	-813.825	3	-105.845	9	-602.997	10	-.037	9	-.105	8	-.036	9
281		3	max	755.843	9	134.282	3	633.411	4	.043	3	.135	2	.031	3
282			min	-813.825	3	-105.845	9	-602.997	10	-.037	9	-.123	8	-.029	9
283	M48	1	max	161.316	8	919.741	8	105.184	5	.033	5	.043	11	.343	8
284			min	-187.531	2	-897.567	2	-105.185	11	-.033	11	-.043	5	-.334	2
285		2	max	161.316	8	919.741	8	105.184	5	.033	5	.017	11	.113	8

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque...	LC	y-y Moment[k-...	LC	z-z Mo...	LC
286			min	-187.531	2	-897.567	2	-105.185	11	-.033	11	-.017	5	-.109	2
287		3	max	161.316	8	919.741	8	105.184	5	.033	5	.009	5	.115	2
288			min	-187.531	2	-897.567	2	-105.185	11	-.033	11	-.009	11	-.117	8
289	M49	1	max	234.818	8	1163.198	2	144.472	5	.176	5	.082	11	.766	2
290			min	-208.58	2	-653.338	8	-144.472	11	-.176	11	-.082	5	-.508	8
291		2	max	234.818	8	1163.198	2	144.472	5	.176	5	.046	11	.475	2
292			min	-208.58	2	-653.338	8	-144.472	11	-.176	11	-.046	5	-.345	8
293		3	max	234.818	8	1163.198	2	144.472	5	.176	5	.009	11	.184	2
294			min	-208.58	2	-653.338	8	-144.472	11	-.176	11	-.009	5	-.182	8
295	M50	1	max	211.273	8	736.013	8	113.783	5	.051	11	.047	11	.447	8
296			min	-233.124	2	-726.978	2	-113.78	11	-.051	5	-.047	5	-.443	2
297		2	max	211.273	8	736.013	8	113.783	5	.051	11	.018	11	.263	8
298			min	-233.124	2	-726.978	2	-113.78	11	-.051	5	-.018	5	-.262	2
299		3	max	211.273	8	736.013	8	113.783	5	.051	11	.01	5	.079	8
300			min	-233.124	2	-726.978	2	-113.78	11	-.051	5	-.01	11	-.08	2
301	M51	1	max	199.509	8	834.949	2	113.477	5	.176	5	.067	11	.657	2
302			min	-177.62	2	-627.723	8	-113.476	11	-.176	11	-.067	5	-.553	8
303		2	max	199.509	8	834.949	2	113.477	5	.176	5	.039	11	.448	2
304			min	-177.62	2	-627.723	8	-113.476	11	-.176	11	-.039	5	-.396	8
305		3	max	199.509	8	834.949	2	113.477	5	.176	5	.01	11	.24	2
306			min	-177.62	2	-627.723	8	-113.476	11	-.176	11	-.01	5	-.239	8
307	M52	1	max	211.273	8	735.932	8	113.781	5	.051	11	.047	11	.447	8
308			min	-233.154	2	-726.894	2	-113.779	11	-.051	5	-.047	5	-.443	2
309		2	max	211.273	8	735.932	8	113.781	5	.051	11	.018	11	.263	8
310			min	-233.154	2	-726.894	2	-113.779	11	-.051	5	-.018	5	-.262	2
311		3	max	211.273	8	735.932	8	113.781	5	.051	11	.01	5	.079	8
312			min	-233.154	2	-726.894	2	-113.779	11	-.051	5	-.01	11	-.08	2
313	M53	1	max	199.486	8	834.864	2	113.478	5	.176	5	.067	11	.657	2
314			min	-177.628	2	-627.642	8	-113.477	11	-.176	11	-.067	5	-.553	8
315		2	max	199.486	8	834.864	2	113.478	5	.176	5	.039	11	.448	2
316			min	-177.628	2	-627.642	8	-113.477	11	-.176	11	-.039	5	-.396	8
317		3	max	199.486	8	834.864	2	113.478	5	.176	5	.01	11	.24	2
318			min	-177.628	2	-627.642	8	-113.477	11	-.176	11	-.01	5	-.239	8
319	M54	1	max	343.933	5	1314.478	5	378.461	2	.162	5	.033	13	.081	11
320			min	-301.674	11	-1102.862	11	-352.577	8	-.139	11	-.037	7	-.091	5
321		2	max	343.933	5	1314.478	5	378.461	2	.162	5	.091	2	.147	7
322			min	-3.155	2	-1314.475	11	-352.577	8	-.162	11	-.09	8	-.31	5
323		3	max	343.932	11	1102.86	5	352.574	8	.139	5	.033	3	.081	5
324			min	-301.673	5	-1314.475	11	-378.458	2	-.162	11	-.037	9	-.091	11
325	M55	1	max	378.458	2	1102.833	5	343.937	11	.091	11	.033	3	.139	5
326			min	-352.574	8	-1314.505	11	-301.671	5	-.081	5	-.037	9	-.162	11
327		2	max	378.458	2	1102.833	5	343.937	11	.091	11	.028	2	.08	4
328			min	-352.574	8	-1314.505	11	-301.671	5	-.081	5	-.029	8	-.09	10
329		3	max	378.458	2	1102.833	5	343.937	11	.091	11	.035	13	.047	2
330			min	-352.574	8	-1314.505	11	-301.671	5	-.081	5	-.033	7	-.044	8
331	M56	1	max	378.461	2	1102.835	11	301.671	11	.081	11	.037	7	.139	11
332			min	-352.577	8	-1314.508	5	-343.938	5	-.091	5	-.033	13	-.162	5
333		2	max	378.461	2	1102.835	11	301.671	11	.081	11	.029	8	.08	12
334			min	-352.577	8	-1314.508	5	-343.938	5	-.091	5	-.028	2	-.09	6
335		3	max	378.461	2	1102.835	11	301.671	11	.081	11	.033	9	.047	2
336			min	-352.577	8	-1314.508	5	-343.938	5	-.091	5	-.035	3	-.044	8
337	M57	1	max	1315.618	11	301.598	5	379.315	2	.023	6	.044	8	.036	11
338			min	-1101.721	5	-344.019	11	-352.579	8	-.024	12	-.047	2	-.035	5
339		2	max	1315.618	11	301.598	5	379.315	2	.023	6	.022	8	.057	11
340			min	-1101.721	5	-344.019	11	-352.579	8	-.024	12	-.024	2	-.054	5
341		3	max	1315.618	11	301.598	5	379.315	2	.023	6	.005	11	.079	11
342			min	-1101.721	5	-344.019	11	-352.579	8	-.024	12	-.005	5	-.073	5

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque...	LC	y-y Moment[k-...	LC	z-z Mo...	LC
343	M58	1	max	1315.621	5	344.02	5	379.319	2	.024	4	.044	8	.035	11
344			min	-1101.723	11	-301.599	11	-352.582	8	-.023	10	-.047	2	-.036	5
345		2	max	1315.621	5	344.02	5	379.319	2	.024	4	.022	8	.054	11
346			min	-1101.723	11	-301.599	11	-352.582	8	-.023	10	-.024	2	-.057	5
347		3	max	1315.621	5	344.02	5	379.319	2	.024	4	.005	5	.073	11
348			min	-1101.723	11	-301.599	11	-352.582	8	-.023	10	-.005	11	-.079	5
349	M59	1	max	584.886	10	111.926	9	772.282	9	.044	9	.096	7	.043	3
350			min	-599.055	4	-129.739	3	-797.467	3	-.047	3	-.099	13	-.038	9
351		2	max	584.896	6	129.726	13	797.418	13	.047	13	.196	8	.064	3
352			min	-599.065	12	-129.739	3	-797.467	3	-.047	3	-.204	2	-.056	9
353		3	max	584.896	6	129.726	13	797.418	13	.047	13	.096	9	.043	13
354			min	-599.065	12	-111.913	7	-772.235	7	-.044	7	-.099	3	-.038	7
355	M60	1	max	772.248	7	132.648	13	584.928	6	.038	7	.096	9	.047	13
356			min	-797.404	13	-109.234	7	-599.031	12	-.043	13	-.099	3	-.044	7
357		2	max	772.248	7	132.648	13	584.928	6	.038	7	.112	8	.039	13
358			min	-797.404	13	-109.234	7	-599.031	12	-.043	13	-.116	2	-.037	7
359		3	max	772.248	7	132.648	13	584.928	6	.038	7	.131	8	.03	13
360			min	-797.404	13	-109.234	7	-599.031	12	-.043	13	-.136	2	-.03	7
361	M61	1	max	772.296	9	132.661	3	599.021	4	.043	3	.099	13	.047	3
362			min	-797.453	3	-109.246	9	-584.919	10	-.038	9	-.096	7	-.044	9
363		2	max	772.296	9	132.661	3	599.021	4	.043	3	.116	2	.039	3
364			min	-797.453	3	-109.246	9	-584.919	10	-.038	9	-.112	8	-.037	9
365		3	max	772.296	9	132.661	3	599.021	4	.043	3	.136	2	.03	3
366			min	-797.453	3	-109.246	9	-584.919	10	-.038	9	-.131	8	-.03	9
367	M62	1	max	343.938	5	1314.497	5	378.435	2	.162	5	.033	13	.081	11
368			min	-301.679	11	-1102.882	11	-352.552	8	-.139	11	-.037	7	-.091	5
369		2	max	343.938	5	1314.497	5	349.502	3	.162	5	.091	2	.147	7
370			min	-3.153	2	-1314.494	11	-378.433	2	-.162	11	-.09	8	-.31	5
371		3	max	343.937	11	1102.88	5	352.55	8	.139	5	.033	3	.081	5
372			min	-301.679	5	-1314.494	11	-378.433	2	-.162	11	-.037	9	-.091	11
373	M63	1	max	378.432	2	1102.853	5	343.942	11	.091	11	.033	3	.139	5
374			min	-352.551	8	-1314.524	11	-301.676	5	-.081	5	-.037	9	-.162	11
375		2	max	378.432	2	1102.853	5	343.942	11	.091	11	.028	2	.08	4
376			min	-352.551	8	-1314.524	11	-301.676	5	-.081	5	-.029	8	-.09	10
377		3	max	378.432	2	1102.853	5	343.942	11	.091	11	.035	13	.047	2
378			min	-352.551	8	-1314.524	11	-301.676	5	-.081	5	-.033	7	-.044	8
379	M64	1	max	378.435	2	1102.855	11	301.676	11	.081	11	.037	7	.139	11
380			min	-352.552	8	-1314.527	5	-343.943	5	-.091	5	-.033	13	-.162	5
381		2	max	378.435	2	1102.855	11	301.676	11	.081	11	.029	8	.08	12
382			min	-352.552	8	-1314.527	5	-343.943	5	-.091	5	-.028	2	-.09	6
383		3	max	378.435	2	1102.855	11	301.676	11	.081	11	.033	9	.047	2
384			min	-352.552	8	-1314.527	5	-343.943	5	-.091	5	-.035	3	-.044	8
385	M65	1	max	1315.637	11	301.604	5	379.29	2	.023	6	.044	8	.036	11
386			min	-1101.741	5	-344.024	11	-352.554	8	-.024	12	-.047	2	-.035	5
387		2	max	1315.637	11	301.604	5	379.29	2	.023	6	.022	8	.057	11
388			min	-1101.741	5	-344.024	11	-352.554	8	-.024	12	-.024	2	-.054	5
389		3	max	1315.637	11	301.604	5	379.29	2	.023	6	.005	11	.079	11
390			min	-1101.741	5	-344.024	11	-352.554	8	-.024	12	-.005	5	-.073	5
391	M66	1	max	1315.64	5	344.025	5	379.293	2	.024	4	.044	8	.035	11
392			min	-1101.743	11	-301.604	11	-352.558	8	-.023	10	-.047	2	-.036	5
393		2	max	1315.64	5	344.025	5	379.293	2	.024	4	.022	8	.054	11
394			min	-1101.743	11	-301.604	11	-352.558	8	-.023	10	-.024	2	-.057	5
395		3	max	1315.64	5	344.025	5	379.293	2	.024	4	.005	5	.073	11
396			min	-1101.743	11	-301.604	11	-352.558	8	-.023	10	-.005	11	-.079	5
397	M67	1	max	584.883	10	111.92	9	772.253	9	.044	9	.096	7	.043	3
398			min	-599.051	4	-129.733	3	-797.437	3	-.047	3	-.099	13	-.038	9
399		2	max	584.893	6	129.72	13	797.387	13	.047	13	.196	8	.064	3

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque...	LC	y-y Moment[k-...	LC	z-z Mo...	LC
400			min	-599.061	12	-129.733	3	-797.437	3	-.047	3	-.204	2	-.056	9
401		3	max	584.893	6	129.72	13	797.387	13	.047	13	.096	9	.043	13
402			min	-599.061	12	-111.908	7	-772.206	7	-.044	7	-.099	3	-.038	7
403	M68	1	max	772.219	7	132.641	13	584.925	6	.038	7	.096	9	.047	13
404			min	-797.373	13	-109.229	7	-599.027	12	-.043	13	-.099	3	-.044	7
405		2	max	772.219	7	132.641	13	584.925	6	.038	7	.112	8	.039	13
406			min	-797.373	13	-109.229	7	-599.027	12	-.043	13	-.116	2	-.037	7
407		3	max	772.219	7	132.641	13	584.925	6	.038	7	.131	8	.03	13
408			min	-797.373	13	-109.229	7	-599.027	12	-.043	13	-.136	2	-.03	7
409	M69	1	max	772.266	9	132.654	3	599.017	4	.043	3	.099	13	.047	3
410			min	-797.423	3	-109.241	9	-584.916	10	-.038	9	-.096	7	-.044	9
411		2	max	772.266	9	132.654	3	599.017	4	.043	3	.116	2	.039	3
412			min	-797.423	3	-109.241	9	-584.916	10	-.038	9	-.112	8	-.037	9
413		3	max	772.266	9	132.654	3	599.017	4	.043	3	.136	2	.03	3
414			min	-797.423	3	-109.241	9	-584.916	10	-.038	9	-.131	8	-.03	9
415	M70	1	max	165.313	5	706.581	4	158.955	2	.085	5	.007	13	.035	10
416			min	-107.286	11	-433.02	10	-146.6	8	-.052	11	-.013	7	-.047	5
417		2	max	165.313	5	706.581	4	149.465	3	.085	5	.032	2	.074	7
418			min	9.016	8	-706.581	12	-158.955	2	-.085	11	-.036	8	-.164	12
419		3	max	165.312	11	433.022	6	146.6	8	.052	5	.007	3	.035	6
420			min	-107.286	5	-706.581	12	-158.955	2	-.085	11	-.013	9	-.047	11
421	M71	1	max	158.955	2	433.223	6	165.313	11	.047	11	.007	3	.052	5
422			min	-146.601	8	-706.416	12	-107.285	5	-.035	6	-.013	9	-.085	11
423		2	max	158.955	2	433.223	6	165.313	11	.047	11	.009	13	.026	5
424			min	-146.601	8	-706.416	12	-107.285	5	-.035	6	-.012	7	-.042	11
425		3	max	158.955	2	433.223	6	165.313	11	.047	11	.016	12	.02	2
426			min	-146.601	8	-706.416	12	-107.285	5	-.035	6	-.015	6	-.018	8
427	M72	1	max	158.956	2	433.222	10	107.285	11	.035	10	.013	7	.052	11
428			min	-146.601	8	-706.416	4	-165.314	5	-.047	5	-.007	13	-.085	5
429		2	max	158.956	2	433.222	10	107.285	11	.035	10	.012	9	.026	11
430			min	-146.601	8	-706.416	4	-165.314	5	-.047	5	-.009	3	-.042	5
431		3	max	158.956	2	433.222	10	107.285	11	.035	10	.015	10	.02	2
432			min	-146.601	8	-706.416	4	-165.314	5	-.047	5	-.016	4	-.018	8
433	M73	1	max	707.699	12	107.273	5	160.402	2	.012	6	.018	8	.018	11
434			min	-431.906	6	-165.332	11	-146.367	8	-.012	12	-.02	2	-.018	5
435		2	max	707.699	12	107.273	5	160.402	2	.012	6	.009	8	.028	11
436			min	-431.906	6	-165.332	11	-146.367	8	-.012	12	-.01	2	-.024	5
437		3	max	707.699	12	107.273	5	160.402	2	.012	6	.003	11	.039	11
438			min	-431.906	6	-165.332	11	-146.367	8	-.012	12	-.003	5	-.031	5
439	M74	1	max	707.699	4	165.333	5	160.402	2	.012	4	.018	8	.018	11
440			min	-431.904	10	-107.273	11	-146.367	8	-.012	10	-.02	2	-.018	5
441		2	max	707.699	4	165.333	5	160.402	2	.012	4	.009	8	.024	11
442			min	-431.904	10	-107.273	11	-146.367	8	-.012	10	-.01	2	-.028	5
443		3	max	707.699	4	165.333	5	160.402	2	.012	4	.003	5	.031	11
444			min	-431.904	10	-107.273	11	-146.367	8	-.012	10	-.003	11	-.039	5
445	M75	1	max	344.832	10	213.189	9	405.781	9	.082	9	.047	7	.071	3
446			min	-347.229	4	-215.696	3	-417.484	3	-.079	3	-.05	13	-.072	9
447		2	max	344.837	6	215.677	13	417.458	13	.082	9	.093	8	.107	3
448			min	-347.233	12	-215.696	3	-417.484	3	-.082	7	-.098	2	-.107	9
449		3	max	344.837	6	215.677	13	417.458	13	.079	13	.047	9	.071	13
450			min	-347.233	12	-213.167	7	-405.757	7	-.082	7	-.05	3	-.072	7
451	M76	1	max	405.76	7	218.15	13	344.842	6	.072	7	.047	9	.079	13
452			min	-417.455	13	-210.675	7	-347.227	12	-.071	13	-.05	3	-.082	7
453		2	max	405.76	7	218.15	13	344.842	6	.072	7	.05	9	.066	13
454			min	-417.455	13	-210.675	7	-347.227	12	-.071	13	-.054	3	-.068	7
455		3	max	405.76	7	218.15	13	344.842	6	.072	7	.062	8	.052	13
456			min	-417.455	13	-210.675	7	-347.227	12	-.071	13	-.065	2	-.055	7

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque...	LC	y-y Moment[k-...	LC	z-z Mo...	LC
457	M77	1	max	405.784	9	218.169	3	347.223	4	.071	3	.05	13	.079	3
458			min	-417.481	3	-210.696	9	-344.838	10	-.072	9	-.047	7	-.082	9
459		2	max	405.784	9	218.169	3	347.223	4	.071	3	.054	13	.066	3
460			min	-417.481	3	-210.696	9	-344.838	10	-.072	9	-.05	7	-.068	9
461		3	max	405.784	9	218.169	3	347.223	4	.071	3	.065	2	.052	3
462			min	-417.481	3	-210.696	9	-344.838	10	-.072	9	-.062	8	-.055	9
463	M78	1	max	138.043	5	596.195	4	163.253	2	.07	5	.009	13	.035	10
464			min	-111.063	11	-473.736	10	-157.988	8	-.055	11	-.012	7	-.041	4
465		2	max	138.043	5	596.195	4	157.988	8	.07	5	.035	2	.114	6
466			min	-67.336	7	-596.195	12	-163.253	2	-.07	11	-.037	8	-.14	12
467		3	max	138.042	11	473.737	6	157.988	8	.055	5	.009	3	.035	6
468			min	-111.063	5	-596.195	12	-163.253	2	-.07	11	-.012	9	-.041	12
469	M79	1	max	163.254	2	473.945	6	138.044	11	.041	12	.009	3	.055	5
470			min	-157.988	8	-596.005	12	-111.062	5	-.035	6	-.012	9	-.07	11
471		2	max	163.254	2	473.945	6	138.044	11	.041	12	.01	13	.028	5
472			min	-157.988	8	-596.005	12	-111.062	5	-.035	6	-.011	7	-.035	11
473		3	max	163.254	2	473.945	6	138.044	11	.041	12	.016	13	.021	2
474			min	-157.988	8	-596.005	12	-111.062	5	-.035	6	-.015	7	-.02	8
475	M80	1	max	163.254	2	473.944	10	111.062	11	.035	10	.012	7	.055	11
476			min	-157.989	8	-596.005	4	-138.045	5	-.041	4	-.009	13	-.07	5
477		2	max	163.254	2	473.944	10	111.062	11	.035	10	.011	9	.028	11
478			min	-157.989	8	-596.005	4	-138.045	5	-.041	4	-.01	3	-.035	5
479		3	max	163.254	2	473.944	10	111.062	11	.035	10	.015	9	.021	2
480			min	-157.989	8	-596.005	4	-138.045	5	-.041	4	-.016	3	-.02	8
481	M81	1	max	597.312	12	111.05	5	164.506	2	.011	6	.02	8	.016	11
482			min	-472.621	6	-138.058	11	-157.325	8	-.011	12	-.021	2	-.016	5
483		2	max	597.312	12	111.05	5	164.506	2	.011	6	.01	8	.025	11
484			min	-472.621	6	-138.058	11	-157.325	8	-.011	12	-.01	2	-.023	5
485		3	max	597.312	12	111.05	5	164.506	2	.011	6	.003	11	.034	11
486			min	-472.621	6	-138.058	11	-157.325	8	-.011	12	-.003	5	-.03	5
487	M82	1	max	597.312	4	138.059	5	164.507	2	.011	4	.02	8	.016	11
488			min	-472.62	10	-111.051	11	-157.326	8	-.011	10	-.021	2	-.016	5
489		2	max	597.312	4	138.059	5	164.507	2	.011	4	.01	8	.023	11
490			min	-472.62	10	-111.051	11	-157.326	8	-.011	10	-.01	2	-.025	5
491		3	max	597.312	4	138.059	5	164.507	2	.011	4	.003	5	.03	11
492			min	-472.62	10	-111.051	11	-157.326	8	-.011	10	-.003	11	-.034	5
493	M83	1	max	330.357	10	213.846	9	413.918	9	.082	9	.048	7	.074	3
494			min	-331.905	4	-222.715	3	-418.567	3	-.082	3	-.048	13	-.072	9
495		2	max	330.362	6	222.693	13	418.54	13	.082	13	.099	8	.111	3
496			min	-331.91	12	-222.715	3	-418.567	3	-.082	3	-.1	2	-.107	9
497		3	max	330.362	6	222.693	13	418.54	13	.082	13	.048	9	.074	13
498			min	-331.91	12	-213.823	7	-413.892	7	-.082	7	-.048	3	-.072	7
499	M84	1	max	413.895	7	225.425	13	330.367	6	.072	7	.048	9	.082	13
500			min	-418.537	13	-211.077	7	-331.904	12	-.074	13	-.048	3	-.082	7
501		2	max	413.895	7	225.425	13	330.367	6	.072	7	.052	9	.068	13
502			min	-418.537	13	-211.077	7	-331.904	12	-.074	13	-.053	3	-.069	7
503		3	max	413.895	7	225.425	13	330.367	6	.072	7	.066	8	.054	13
504			min	-418.537	13	-211.077	7	-331.904	12	-.074	13	-.067	2	-.055	7
505	M85	1	max	413.921	9	225.446	3	331.9	4	.074	3	.048	13	.082	3
506			min	-418.564	3	-211.098	9	-330.362	10	-.072	9	-.048	7	-.082	9
507		2	max	413.921	9	225.446	3	331.9	4	.074	3	.053	13	.068	3
508			min	-418.564	3	-211.098	9	-330.362	10	-.072	9	-.052	7	-.069	9
509		3	max	413.921	9	225.446	3	331.9	4	.074	3	.067	2	.054	3
510			min	-418.564	3	-211.098	9	-330.362	10	-.072	9	-.066	8	-.055	9
511	M86	1	max	138.043	5	596.195	4	163.253	2	.07	5	.009	13	.035	10
512			min	-111.063	11	-473.736	10	-157.988	8	-.055	11	-.012	7	-.041	4
513		2	max	138.043	5	596.195	4	157.988	8	.07	5	.035	2	.114	6

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque...	LC	y-y Moment[k-...	LC	z-z Mo...	LC
514			min	-67.336	7	-596.195	12	-163.253	2	-.07	11	-.037	8	-.14	12
515		3	max	138.042	11	473.737	6	157.988	8	.055	5	.009	3	.035	6
516			min	-111.063	5	-596.195	12	-163.253	2	-.07	11	-.012	9	-.041	12
517	M87	1	max	163.253	2	473.945	6	138.044	11	.041	12	.009	3	.055	5
518			min	-157.988	8	-596.006	12	-111.062	5	-.035	6	-.012	9	-.07	11
519		2	max	163.253	2	473.945	6	138.044	11	.041	12	.01	13	.028	5
520			min	-157.988	8	-596.006	12	-111.062	5	-.035	6	-.011	7	-.035	11
521		3	max	163.253	2	473.945	6	138.044	11	.041	12	.016	13	.021	2
522			min	-157.988	8	-596.006	12	-111.062	5	-.035	6	-.015	7	-.02	8
523	M88	1	max	163.253	2	473.944	10	111.062	11	.035	10	.012	7	.055	11
524			min	-157.988	8	-596.005	4	-138.044	5	-.041	4	-.009	13	-.07	5
525		2	max	163.253	2	473.944	10	111.062	11	.035	10	.011	9	.028	11
526			min	-157.988	8	-596.005	4	-138.044	5	-.041	4	-.01	3	-.035	5
527		3	max	163.253	2	473.944	10	111.062	11	.035	10	.015	9	.021	2
528			min	-157.988	8	-596.005	4	-138.044	5	-.041	4	-.016	3	-.02	8
529	M89	1	max	597.312	12	111.05	5	164.506	2	.011	6	.02	8	.016	11
530			min	-472.621	6	-138.058	11	-157.325	8	-.011	12	-.021	2	-.016	5
531		2	max	597.312	12	111.05	5	164.506	2	.011	6	.01	8	.025	11
532			min	-472.621	6	-138.058	11	-157.325	8	-.011	12	-.01	2	-.023	5
533		3	max	597.312	12	111.05	5	164.506	2	.011	6	.003	11	.034	11
534			min	-472.621	6	-138.058	11	-157.325	8	-.011	12	-.003	5	-.03	5
535	M90	1	max	597.312	4	138.059	5	164.507	2	.011	4	.02	8	.016	11
536			min	-472.62	10	-111.051	11	-157.325	8	-.011	10	-.021	2	-.016	5
537		2	max	597.312	4	138.059	5	164.507	2	.011	4	.01	8	.023	11
538			min	-472.62	10	-111.051	11	-157.325	8	-.011	10	-.01	2	-.025	5
539		3	max	597.312	4	138.059	5	164.507	2	.011	4	.003	5	.03	11
540			min	-472.62	10	-111.051	11	-157.325	8	-.011	10	-.003	11	-.034	5
541	M91	1	max	330.357	10	213.846	9	413.918	9	.082	9	.048	7	.074	3
542			min	-331.905	4	-222.715	3	-418.567	3	-.082	3	-.048	13	-.072	9
543		2	max	330.362	6	222.693	13	418.54	13	.082	13	.099	8	.111	3
544			min	-331.91	12	-222.715	3	-418.567	3	-.082	3	-.1	2	-.107	9
545		3	max	330.362	6	222.693	13	418.54	13	.082	13	.048	9	.074	13
546			min	-331.91	12	-213.823	7	-413.892	7	-.082	7	-.048	3	-.072	7
547	M92	1	max	413.895	7	225.425	13	330.367	6	.072	7	.048	9	.082	13
548			min	-418.537	13	-211.076	7	-331.904	12	-.074	13	-.048	3	-.082	7
549		2	max	413.895	7	225.425	13	330.367	6	.072	7	.052	9	.068	13
550			min	-418.537	13	-211.076	7	-331.904	12	-.074	13	-.053	3	-.069	7
551		3	max	413.895	7	225.425	13	330.367	6	.072	7	.066	8	.054	13
552			min	-418.537	13	-211.076	7	-331.904	12	-.074	13	-.067	2	-.055	7
553	M93	1	max	413.921	9	225.446	3	331.9	4	.074	3	.048	13	.082	3
554			min	-418.564	3	-211.097	9	-330.362	10	-.072	9	-.048	7	-.082	9
555		2	max	413.921	9	225.446	3	331.9	4	.074	3	.053	13	.068	3
556			min	-418.564	3	-211.097	9	-330.362	10	-.072	9	-.052	7	-.069	9
557		3	max	413.921	9	225.446	3	331.9	4	.074	3	.067	2	.054	3
558			min	-418.564	3	-211.097	9	-330.362	10	-.072	9	-.066	8	-.055	9

Envelope Member Section Stresses

	Member	Sec		Axial[ksi]	LC	y Shear[ksi]	LC	z Shear[ksi]	LC	y-Top[ksi]	LC	y-Bot[...	LC	z-Top[..	LC	z-Bot[...	LC
1	M1	1	max	.368	38	.001	11	.002	8	0	50	0	50	0	50	0	50
2			min	0	1	-.001	5	-.003	27	0	1	0	1	0	1	0	1
3		2	max	1.01	2	.043	11	.053	8	.876	11	.876	5	.444	2	.493	8
4			min	-.771	8	-.043	5	-.054	2	-.876	5	-.876	11	-.493	8	-.444	2
5		3	max	0	50	0	5	0	2	0	50	0	50	0	50	0	50
6			min	0	1	0	11	0	8	0	1	0	1	0	1	0	1
7	M2	1	max	.368	38	0	36	0	8	0	50	0	50	0	50	0	50

Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[ksi]	LC	y Shear[ksi]	LC	z Shear[ksi]	LC	y-Top[ksi]	LC	y-Bot[...	LC	z-Top[..	LC	z-Bot[...	LC
8			min	0	1	0	30	-.002	27	0	1	0	1	0	1	0	1
9		2	max	.783	2	.071	11	.122	8	.946	5	.946	11	3.83	2	3.849	8
10			min	-.65	8	-.071	5	-.122	2	-.946	11	-.946	5	-3.849	8	-3.83	2
11		3	max	0	50	0	5	0	2	0	50	0	50	0	50	0	50
12			min	0	1	0	11	0	8	0	1	0	1	0	1	0	1
13	M3	1	max	.368	38	0	36	0	8	0	50	0	50	0	50	0	50
14			min	0	1	0	30	-.002	27	0	1	0	1	0	1	0	1
15		2	max	.783	2	.071	11	.122	8	.946	5	.946	11	3.83	2	3.849	8
16			min	-.65	8	-.071	5	-.122	2	-.946	11	-.946	5	-3.849	8	-3.83	2
17		3	max	0	50	0	5	0	2	0	50	0	50	0	50	0	50
18			min	0	1	0	11	0	8	0	1	0	1	0	1	0	1
19	M4	1	max	.368	38	.004	11	.007	8	0	50	0	50	0	50	0	50
20			min	0	1	-.004	5	-.006	2	0	1	0	1	0	1	0	1
21		2	max	.505	38	.266	11	.413	8	8.167	11	8.167	5	12.764	8	12.76	2
22			min	.137	2	-.266	5	-.413	2	-8.167	5	-8.167	11	-12.76	2	-12.764	8
23		3	max	0	50	0	11	0	8	0	50	0	50	0	50	0	50
24			min	0	1	0	5	0	2	0	1	0	1	0	1	0	1
25	M5	1	max	.368	38	.001	11	.002	8	0	50	0	50	0	50	0	50
26			min	0	1	-.001	5	-.002	2	0	1	0	1	0	1	0	1
27		2	max	.467	38	.395	11	.756	8	6.147	11	6.147	5	10.387	8	10.386	2
28			min	.099	2	-.395	5	-.756	2	-6.147	5	-6.147	11	-10.386	2	-10.387	8
29		3	max	0	50	0	11	0	8	0	50	0	50	0	50	0	50
30			min	0	1	0	5	0	2	0	1	0	1	0	1	0	1
31	M6	1	max	.368	38	.001	11	.002	8	0	50	0	50	0	50	0	50
32			min	0	1	-.001	5	-.002	2	0	1	0	1	0	1	0	1
33		2	max	.467	38	.395	11	.756	8	6.147	11	6.147	5	10.387	8	10.386	2
34			min	.099	2	-.395	5	-.756	2	-6.147	5	-6.147	11	-10.386	2	-10.387	8
35		3	max	0	50	0	11	0	8	0	50	0	50	0	50	0	50
36			min	0	1	0	5	0	2	0	1	0	1	0	1	0	1
37	M7	1	max	0	50	0	11	0	8	0	50	0	50	0	50	0	50
38			min	0	1	0	5	0	2	0	1	0	1	0	1	0	1
39		2	max	.333	38	.306	11	.449	8	7.164	11	7.164	5	9.628	8	11.605	2
40			min	.152	7	-.306	5	-.449	2	-7.164	5	-7.164	11	-11.605	2	-9.628	8
41		3	max	0	50	0	11	0	8	0	50	0	50	0	50	0	50
42			min	0	1	0	5	0	2	0	1	0	1	0	1	0	1
43	M8	1	max	0	50	0	11	0	8	0	50	0	50	0	50	0	50
44			min	0	1	0	5	0	2	0	1	0	1	0	1	0	1
45		2	max	.257	38	.284	11	.462	8	6.672	11	6.672	5	10.684	8	11.483	2
46			min	.075	2	-.284	5	-.462	2	-6.672	5	-6.672	11	-11.483	2	-10.684	8
47		3	max	0	50	0	11	0	8	0	50	0	50	0	50	0	50
48			min	0	1	0	5	0	2	0	1	0	1	0	1	0	1
49	M9	1	max	0	50	0	11	0	8	0	50	0	50	0	50	0	50
50			min	0	1	0	5	0	2	0	1	0	1	0	1	0	1
51		2	max	.257	38	.284	11	.461	8	6.672	11	6.672	5	10.683	8	11.482	2
52			min	.075	2	-.284	5	-.462	2	-6.672	5	-6.672	11	-11.482	2	-10.683	8
53		3	max	0	50	0	11	0	8	0	50	0	50	0	50	0	50
54			min	0	1	0	5	0	2	0	1	0	1	0	1	0	1
55	M10	1	max	0	50	0	50	0	50	0	50	0	50	0	50	0	50
56			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
57		2	max	0	8	0	50	0	50	0	9	0	1	0	1	0	50
58			min	0	1	0	1	0	1	0	1	0	7	0	2	0	1
59		3	max	0	50	0	50	0	50	0	50	0	50	0	50	0	50
60			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
61	M11	1	max	0	50	0	50	0	50	0	50	0	50	0	50	0	50
62			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
63		2	max	-.009	2	.171	5	.234	11	.076	2	.048	8	.03	2	.066	8
64			min	-.053	33	-.171	11	-.234	5	-.048	8	-.076	2	-.06	8	-.033	2

Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[ksi]	LC	y Shear[ksi]	LC	z Shear[ksi]	LC	y-Top[ksi]	LC	y-Bot[...	LC	z-Top[..	LC	z-Bot[...	LC
65		3	max	0	50	0	50	0	50	0	50	0	50	0	50	0	50
66			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
67	M12	1	max	0	50	0	50	0	50	0	50	0	50	0	50	0	50
68			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
69		2	max	0	13	0	1	0	50	0	9	0	1	0	13	0	1
70			min	0	7	0	2	0	1	0	1	0	7	0	1	0	2
71		3	max	0	50	0	50	0	50	0	50	0	50	0	50	0	50
72			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
73	M13	1	max	.693	9	1.347	4	.246	9	2.02	10	2.126	4	2.954	10	3.412	4
74			min	-.747	3	-1.283	10	-.263	3	-2.126	4	-2.02	10	-3.089	4	-3.263	10
75		2	max	.693	9	1.347	4	.247	9	1.01	10	1.062	4	1.476	10	1.707	4
76			min	-.747	3	-1.283	10	-.262	3	-1.062	4	-1.01	10	-1.545	4	-1.631	10
77		3	max	.693	9	1.347	4	.248	9	0	50	0	50	0	50	0	50
78			min	-.747	3	-1.283	10	-.261	3	0	1	0	1	0	1	0	1
79	M14	1	max	.693	7	.246	7	1.347	12	2.126	12	2.02	6	2.954	6	3.412	12
80			min	-.747	13	-.263	13	-1.283	6	-2.02	6	-2.126	12	-3.089	12	-3.263	6
81		2	max	.693	7	.247	7	1.347	12	1.062	12	1.01	6	1.476	6	1.707	12
82			min	-.747	13	-.262	13	-1.283	6	-1.01	6	-1.062	12	-1.545	12	-1.631	6
83		3	max	.693	7	.248	7	1.347	12	0	50	0	50	0	50	0	50
84			min	-.747	13	-.261	13	-1.283	6	0	1	0	1	0	1	0	1
85	M15	1	max	0	50	0	50	0	50	0	50	0	50	0	50	0	50
86			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
87		2	max	0	8	0	50	0	50	0	9	0	1	0	1	0	50
88			min	0	1	0	1	0	1	0	1	0	7	0	2	0	1
89		3	max	0	50	0	50	0	50	0	50	0	50	0	50	0	50
90			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
91	M16	1	max	0	50	0	50	0	50	0	50	0	50	0	50	0	50
92			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
93		2	max	.002	2	.159	5	.217	11	.072	2	.057	8	.037	2	.062	8
94			min	-.042	33	-.159	11	-.217	5	-.057	8	-.072	2	-.056	8	-.041	2
95		3	max	0	50	0	50	0	50	0	50	0	50	0	50	0	50
96			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
97	M17	1	max	0	50	0	50	0	50	0	50	0	50	0	50	0	50
98			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
99		2	max	0	13	0	1	0	50	0	9	0	1	0	13	0	1
100			min	0	7	0	2	0	1	0	1	0	7	0	1	0	2
101		3	max	0	50	0	50	0	50	0	50	0	50	0	50	0	50
102			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
103	M18	1	max	.709	9	1.274	4	.254	9	1.97	10	2.015	4	2.843	10	3.217	4
104			min	-.732	3	-1.245	10	-.26	3	-2.015	4	-1.97	10	-2.912	4	-3.141	10
105		2	max	.709	9	1.274	4	.255	9	.985	10	1.007	4	1.421	10	1.61	4
106			min	-.732	3	-1.245	10	-.259	3	-1.007	4	-.985	10	-1.457	4	-1.569	10
107		3	max	.709	9	1.274	4	.256	9	0	50	0	50	0	50	0	50
108			min	-.732	3	-1.245	10	-.258	3	0	1	0	1	0	1	0	1
109	M19	1	max	.708	7	.254	7	1.274	12	2.015	12	1.97	6	2.843	6	3.217	12
110			min	-.732	13	-.26	13	-1.245	6	-1.97	6	-2.015	12	-2.912	12	-3.141	6
111		2	max	.708	7	.255	7	1.274	12	1.007	12	.985	6	1.421	6	1.61	12
112			min	-.732	13	-.259	13	-1.245	6	-.985	6	-1.007	12	-1.457	12	-1.569	6
113		3	max	.708	7	.256	7	1.274	12	0	50	0	50	0	50	0	50
114			min	-.732	13	-.258	13	-1.245	6	0	1	0	1	0	1	0	1
115	M20	1	max	0	50	0	50	0	50	0	50	0	50	0	50	0	50
116			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
117		2	max	0	8	0	50	0	50	0	9	0	1	0	1	0	50
118			min	0	1	0	1	0	1	0	1	0	7	0	2	0	1
119		3	max	0	50	0	50	0	50	0	50	0	50	0	50	0	50
120			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
121	M21	1	max	0	50	0	50	0	50	0	50	0	50	0	50	0	50

Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[ksi]	LC	y Shear[ksi]	LC	z Shear[ksi]	LC	y-Top[ksi]	LC	y-Bot[...	LC	z-Top[..	LC	z-Bot[...	LC
122			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
123		2	max	.002	2	.159	5	.217	11	.072	2	.057	8	.037	2	.062	8
124			min	-.042	33	-.159	11	-.217	5	-.057	8	-.072	2	-.056	8	-.041	2
125		3	max	0	50	0	50	0	50	0	50	0	50	0	50	0	50
126			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
127	M22	1	max	0	50	0	50	0	50	0	50	0	50	0	50	0	50
128			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
129		2	max	0	13	0	1	0	50	0	9	0	1	0	13	0	1
130			min	0	7	0	2	0	1	0	1	0	7	0	1	0	2
131		3	max	0	50	0	50	0	50	0	50	0	50	0	50	0	50
132			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
133	M23	1	max	.709	9	1.274	4	.254	9	1.97	10	2.015	4	2.843	10	3.217	4
134			min	-.732	3	-1.245	10	-.26	3	-2.015	4	-1.97	10	-2.912	4	-3.141	10
135		2	max	.709	9	1.274	4	.255	9	.985	10	1.007	4	1.421	10	1.61	4
136			min	-.732	3	-1.245	10	-.259	3	-1.007	4	-.985	10	-1.457	4	-1.569	10
137		3	max	.709	9	1.274	4	.256	9	0	50	0	50	0	50	0	50
138			min	-.732	3	-1.245	10	-.258	3	0	1	0	1	0	1	0	1
139	M24	1	max	.708	7	.254	7	1.274	12	2.015	12	1.97	6	2.843	6	3.217	12
140			min	-.732	13	-.26	13	-1.245	6	-1.97	6	-2.015	12	-2.912	12	-3.141	6
141		2	max	.708	7	.255	7	1.274	12	1.007	12	.985	6	1.421	6	1.61	12
142			min	-.732	13	-.259	13	-1.245	6	-.985	6	-1.007	12	-1.457	12	-1.569	6
143		3	max	.708	7	.256	7	1.274	12	0	50	0	50	0	50	0	50
144			min	-.732	13	-.258	13	-1.245	6	0	1	0	1	0	1	0	1
145	M25	1	max	0	50	0	50	0	50	0	50	0	50	0	50	0	50
146			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
147		2	max	0	50	0	50	0	50	0	9	0	1	0	1	0	50
148			min	0	1	0	1	0	1	0	1	0	7	0	2	0	1
149		3	max	0	50	0	50	0	50	0	50	0	50	0	50	0	50
150			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
151	M26	1	max	0	50	0	50	0	50	0	50	0	50	0	50	0	50
152			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
153		2	max	-.006	8	.085	5	.101	11	.042	2	.026	8	-.008	2	.033	33
154			min	-.048	27	-.085	11	-.101	5	-.026	8	-.042	2	-.03	33	.009	2
155		3	max	0	50	0	50	0	50	0	50	0	50	0	50	0	50
156			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
157	M27	1	max	0	50	0	50	0	50	0	50	0	50	0	50	0	50
158			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
159		2	max	0	50	0	1	0	50	0	13	0	1	0	13	0	1
160			min	0	1	0	2	0	1	0	1	0	2	0	1	0	2
161		3	max	0	50	0	50	0	50	0	50	0	50	0	50	0	50
162			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
163	M28	1	max	.372	9	.739	4	.469	9	1.574	9	1.542	3	.934	11	1.133	5
164			min	-.383	3	-.734	10	-.444	3	-1.542	3	-1.574	9	-1.026	5	-1.031	11
165		2	max	.372	9	.739	4	.471	9	.787	9	.771	3	.466	11	.568	5
166			min	-.383	3	-.734	10	-.442	3	-.771	3	-.787	9	-.514	5	-.515	11
167		3	max	.372	9	.739	4	.472	9	0	50	0	50	0	50	0	50
168			min	-.383	3	-.734	10	-.441	3	0	1	0	1	0	1	0	1
169	M29	1	max	.372	7	.469	7	.739	12	1.542	13	1.574	7	.934	5	1.134	11
170			min	-.383	13	-.444	13	-.734	6	-1.574	7	-1.542	13	-1.026	11	-1.031	5
171		2	max	.372	7	.47	7	.739	12	.771	13	.787	7	.466	5	.568	11
172			min	-.383	13	-.442	13	-.734	6	-.787	7	-.771	13	-.514	11	-.515	5
173		3	max	.372	7	.472	7	.739	12	0	50	0	50	0	50	0	50
174			min	-.383	13	-.441	13	-.734	6	0	1	0	1	0	1	0	1
175	M30	1	max	0	50	0	50	0	50	0	50	0	50	0	50	0	50
176			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
177		2	max	0	50	0	50	0	50	0	9	0	1	0	1	0	50
178			min	0	1	0	1	0	1	0	1	0	7	0	2	0	1

Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[ksi]	LC	y Shear[ksi]	LC	z Shear[ksi]	LC	y-Top[ksi]	LC	y-Bot[...	LC	z-Top[..	LC	z-Bot[...	LC
179		3	max	0	50	0	50	0	50	0	50	0	50	0	50	0	50
180			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
181	M31	1	max	0	50	0	50	0	50	0	50	0	50	0	50	0	50
182			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
183		2	max	.005	8	.078	5	.092	11	.039	2	.032	8	0	2	.026	33
184			min	-.037	27	-.078	11	-.092	5	-.032	8	-.039	2	-.023	33	.001	2
185		3	max	0	50	0	50	0	50	0	50	0	50	0	50	0	50
186			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
187	M32	1	max	0	50	0	50	0	50	0	50	0	50	0	50	0	50
188			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
189		2	max	0	50	0	1	0	50	0	13	0	1	0	13	0	1
190			min	0	1	0	2	0	1	0	1	0	2	0	1	0	2
191		3	max	0	50	0	50	0	50	0	50	0	50	0	50	0	50
192			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
193	M33	1	max	.38	9	.706	4	.471	9	1.568	9	1.553	3	.87	11	1.015	5
194			min	-.384	3	-.703	10	-.459	3	-1.553	3	-1.568	9	-.919	5	-.961	11
195		2	max	.38	9	.706	4	.472	9	.785	9	.776	3	.434	11	.508	5
196			min	-.384	3	-.703	10	-.457	3	-.776	3	-.785	9	-.46	5	-.48	11
197		3	max	.38	9	.706	4	.473	9	0	50	0	50	0	50	0	50
198			min	-.384	3	-.703	10	-.456	3	0	1	0	1	0	1	0	1
199	M34	1	max	.38	7	.47	7	.706	12	1.553	13	1.568	7	.87	5	1.015	11
200			min	-.384	13	-.459	13	-.703	6	-1.568	7	-1.553	13	-.919	11	-.961	5
201		2	max	.38	7	.472	7	.706	12	.776	13	.785	7	.434	5	.508	11
202			min	-.384	13	-.457	13	-.703	6	-.785	7	-.776	13	-.46	11	-.48	5
203		3	max	.38	7	.473	7	.706	12	0	50	0	50	0	50	0	50
204			min	-.384	13	-.456	13	-.703	6	0	1	0	1	0	1	0	1
205	M35	1	max	0	50	0	50	0	50	0	50	0	50	0	50	0	50
206			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
207		2	max	0	50	0	50	0	50	0	9	0	1	0	1	0	50
208			min	0	1	0	1	0	1	0	1	0	7	0	2	0	1
209		3	max	0	50	0	50	0	50	0	50	0	50	0	50	0	50
210			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
211	M36	1	max	0	50	0	50	0	50	0	50	0	50	0	50	0	50
212			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
213		2	max	.005	8	.078	5	.092	11	.039	2	.032	8	0	2	.026	33
214			min	-.037	27	-.078	11	-.092	5	-.032	8	-.039	2	-.023	33	.001	2
215		3	max	0	50	0	50	0	50	0	50	0	50	0	50	0	50
216			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
217	M37	1	max	0	50	0	50	0	50	0	50	0	50	0	50	0	50
218			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
219		2	max	0	50	0	1	0	50	0	13	0	1	0	13	0	1
220			min	0	1	0	2	0	1	0	1	0	2	0	1	0	2
221		3	max	0	50	0	50	0	50	0	50	0	50	0	50	0	50
222			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
223	M38	1	max	.38	9	.706	4	.471	9	1.568	9	1.553	3	.87	11	1.015	5
224			min	-.384	3	-.703	10	-.459	3	-1.553	3	-1.568	9	-.919	5	-.961	11
225		2	max	.38	9	.706	4	.472	9	.785	9	.776	3	.434	11	.508	5
226			min	-.384	3	-.703	10	-.457	3	-.776	3	-.785	9	-.46	5	-.48	11
227		3	max	.38	9	.706	4	.473	9	0	50	0	50	0	50	0	50
228			min	-.384	3	-.703	10	-.456	3	0	1	0	1	0	1	0	1
229	M39	1	max	.38	7	.47	7	.706	12	1.553	13	1.568	7	.87	5	1.015	11
230			min	-.384	13	-.459	13	-.703	6	-1.568	7	-1.553	13	-.919	11	-.961	5
231		2	max	.38	7	.472	7	.706	12	.776	13	.785	7	.434	5	.508	11
232			min	-.384	13	-.457	13	-.703	6	-.785	7	-.776	13	-.46	11	-.48	5
233		3	max	.38	7	.473	7	.706	12	0	50	0	50	0	50	0	50
234			min	-.384	13	-.456	13	-.703	6	0	1	0	1	0	1	0	1
235	M40	1	max	0	5	0	50	0	50	0	50	0	50	0	50	0	50

Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[ksi]	LC	y Shear[ksi]	LC	z Shear[ksi]	LC	y-Top[ksi]	LC	y-Bot[...	LC	z-Top[..	LC	z-Bot[...	LC
236			min	0	11	0	1	0	1	0	1	0	1	0	1	0	1
237		2	max	0	11	0	50	0	50	0	50	0	50	0	50	0	50
238			min	0	2	0	1	0	1	0	1	0	1	0	1	0	1
239		3	max	0	11	0	50	0	50	0	50	0	50	0	50	0	50
240			min	0	5	0	1	0	1	0	1	0	1	0	1	0	1
241	M41	1	max	0	2	0	50	0	50	0	50	0	50	0	50	0	50
242			min	0	8	0	1	0	1	0	1	0	1	0	1	0	1
243		2	max	0	2	0	50	0	50	0	50	0	50	0	50	0	50
244			min	0	8	0	1	0	1	0	1	0	1	0	1	0	1
245		3	max	0	2	0	50	0	50	0	50	0	50	0	50	0	50
246			min	0	8	0	1	0	1	0	1	0	1	0	1	0	1
247	M42	1	max	0	2	0	50	0	50	0	50	0	50	0	50	0	50
248			min	0	8	0	1	0	1	0	1	0	1	0	1	0	1
249		2	max	0	2	0	50	0	50	0	50	0	50	0	50	0	50
250			min	0	8	0	1	0	1	0	1	0	1	0	1	0	1
251		3	max	0	2	0	50	0	50	0	50	0	50	0	50	0	50
252			min	0	8	0	1	0	1	0	1	0	1	0	1	0	1
253	M43	1	max	0	11	0	50	0	50	0	50	0	50	0	50	0	50
254			min	0	5	0	1	0	1	0	1	0	1	0	1	0	1
255		2	max	0	11	0	50	0	50	0	50	0	50	0	50	0	50
256			min	0	5	0	1	0	1	0	1	0	1	0	1	0	1
257		3	max	0	11	0	50	0	50	0	50	0	50	0	50	0	50
258			min	0	5	0	1	0	1	0	1	0	1	0	1	0	1
259	M44	1	max	0	5	0	50	0	50	0	50	0	50	0	50	0	50
260			min	0	11	0	1	0	1	0	1	0	1	0	1	0	1
261		2	max	0	5	0	50	0	50	0	50	0	50	0	50	0	50
262			min	0	11	0	1	0	1	0	1	0	1	0	1	0	1
263		3	max	0	5	0	50	0	50	0	50	0	50	0	50	0	50
264			min	0	11	0	1	0	1	0	1	0	1	0	1	0	1
265	M45	1	max	0	10	0	50	0	50	0	50	0	50	0	50	0	50
266			min	0	4	0	1	0	1	0	1	0	1	0	1	0	1
267		2	max	0	10	0	50	0	50	0	50	0	50	0	50	0	50
268			min	0	4	0	1	0	1	0	1	0	1	0	1	0	1
269		3	max	0	6	0	50	0	50	0	50	0	50	0	50	0	50
270			min	0	12	0	1	0	1	0	1	0	1	0	1	0	1
271	M46	1	max	0	7	0	50	0	50	0	50	0	50	0	50	0	50
272			min	0	13	0	1	0	1	0	1	0	1	0	1	0	1
273		2	max	0	7	0	50	0	50	0	50	0	50	0	50	0	50
274			min	0	13	0	1	0	1	0	1	0	1	0	1	0	1
275		3	max	0	7	0	50	0	50	0	50	0	50	0	50	0	50
276			min	0	13	0	1	0	1	0	1	0	1	0	1	0	1
277	M47	1	max	0	9	0	50	0	50	0	50	0	50	0	50	0	50
278			min	0	3	0	1	0	1	0	1	0	1	0	1	0	1
279		2	max	0	9	0	50	0	50	0	50	0	50	0	50	0	50
280			min	0	3	0	1	0	1	0	1	0	1	0	1	0	1
281		3	max	0	9	0	50	0	50	0	50	0	50	0	50	0	50
282			min	0	3	0	1	0	1	0	1	0	1	0	1	0	1
283	M48	1	max	0	8	0	50	0	50	0	50	0	50	0	50	0	50
284			min	0	2	0	1	0	1	0	1	0	1	0	1	0	1
285		2	max	0	8	0	50	0	50	0	50	0	50	0	50	0	50
286			min	0	2	0	1	0	1	0	1	0	1	0	1	0	1
287		3	max	0	8	0	50	0	50	0	50	0	50	0	50	0	50
288			min	0	2	0	1	0	1	0	1	0	1	0	1	0	1
289	M49	1	max	0	8	0	50	0	50	0	50	0	50	0	50	0	50
290			min	0	2	0	1	0	1	0	1	0	1	0	1	0	1
291		2	max	0	8	0	50	0	50	0	50	0	50	0	50	0	50
292			min	0	2	0	1	0	1	0	1	0	1	0	1	0	1

Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[ksi]	LC	y Shear[ksi]	LC	z Shear[ksi]	LC	y-Top[ksi]	LC	y-Bot[...	LC	z-Top[..	LC	z-Bot[...	LC
293		3	max	0	8	0	50	0	50	0	50	0	50	0	50	0	50
294			min	0	2	0	1	0	1	0	1	0	1	0	1	0	1
295	M50	1	max	0	8	0	50	0	50	0	50	0	50	0	50	0	50
296			min	0	2	0	1	0	1	0	1	0	1	0	1	0	1
297		2	max	0	8	0	50	0	50	0	50	0	50	0	50	0	50
298			min	0	2	0	1	0	1	0	1	0	1	0	1	0	1
299		3	max	0	8	0	50	0	50	0	50	0	50	0	50	0	50
300			min	0	2	0	1	0	1	0	1	0	1	0	1	0	1
301	M51	1	max	0	8	0	50	0	50	0	50	0	50	0	50	0	50
302			min	0	2	0	1	0	1	0	1	0	1	0	1	0	1
303		2	max	0	8	0	50	0	50	0	50	0	50	0	50	0	50
304			min	0	2	0	1	0	1	0	1	0	1	0	1	0	1
305		3	max	0	8	0	50	0	50	0	50	0	50	0	50	0	50
306			min	0	2	0	1	0	1	0	1	0	1	0	1	0	1
307	M52	1	max	0	8	0	50	0	50	0	50	0	50	0	50	0	50
308			min	0	2	0	1	0	1	0	1	0	1	0	1	0	1
309		2	max	0	8	0	50	0	50	0	50	0	50	0	50	0	50
310			min	0	2	0	1	0	1	0	1	0	1	0	1	0	1
311		3	max	0	8	0	50	0	50	0	50	0	50	0	50	0	50
312			min	0	2	0	1	0	1	0	1	0	1	0	1	0	1
313	M53	1	max	0	8	0	50	0	50	0	50	0	50	0	50	0	50
314			min	0	2	0	1	0	1	0	1	0	1	0	1	0	1
315		2	max	0	8	0	50	0	50	0	50	0	50	0	50	0	50
316			min	0	2	0	1	0	1	0	1	0	1	0	1	0	1
317		3	max	0	8	0	50	0	50	0	50	0	50	0	50	0	50
318			min	0	2	0	1	0	1	0	1	0	1	0	1	0	1
319	M54	1	max	0	5	0	50	0	50	0	50	0	50	0	50	0	50
320			min	0	11	0	1	0	1	0	1	0	1	0	1	0	1
321		2	max	0	11	0	50	0	50	0	50	0	50	0	50	0	50
322			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
323		3	max	0	11	0	50	0	50	0	50	0	50	0	50	0	50
324			min	0	5	0	1	0	1	0	1	0	1	0	1	0	1
325	M55	1	max	0	2	0	50	0	50	0	50	0	50	0	50	0	50
326			min	0	8	0	1	0	1	0	1	0	1	0	1	0	1
327		2	max	0	2	0	50	0	50	0	50	0	50	0	50	0	50
328			min	0	8	0	1	0	1	0	1	0	1	0	1	0	1
329		3	max	0	2	0	50	0	50	0	50	0	50	0	50	0	50
330			min	0	8	0	1	0	1	0	1	0	1	0	1	0	1
331	M56	1	max	0	2	0	50	0	50	0	50	0	50	0	50	0	50
332			min	0	8	0	1	0	1	0	1	0	1	0	1	0	1
333		2	max	0	2	0	50	0	50	0	50	0	50	0	50	0	50
334			min	0	8	0	1	0	1	0	1	0	1	0	1	0	1
335		3	max	0	2	0	50	0	50	0	50	0	50	0	50	0	50
336			min	0	8	0	1	0	1	0	1	0	1	0	1	0	1
337	M57	1	max	0	11	0	50	0	50	0	50	0	50	0	50	0	50
338			min	0	5	0	1	0	1	0	1	0	1	0	1	0	1
339		2	max	0	11	0	50	0	50	0	50	0	50	0	50	0	50
340			min	0	5	0	1	0	1	0	1	0	1	0	1	0	1
341		3	max	0	11	0	50	0	50	0	50	0	50	0	50	0	50
342			min	0	5	0	1	0	1	0	1	0	1	0	1	0	1
343	M58	1	max	0	5	0	50	0	50	0	50	0	50	0	50	0	50
344			min	0	11	0	1	0	1	0	1	0	1	0	1	0	1
345		2	max	0	5	0	50	0	50	0	50	0	50	0	50	0	50
346			min	0	11	0	1	0	1	0	1	0	1	0	1	0	1
347		3	max	0	5	0	50	0	50	0	50	0	50	0	50	0	50
348			min	0	11	0	1	0	1	0	1	0	1	0	1	0	1
349	M59	1	max	0	10	0	50	0	50	0	50	0	50	0	50	0	50

Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[ksi]	LC	y Shear[ksi]	LC	z Shear[ksi]	LC	y-Top[ksi]	LC	y-Bot[...	LC	z-Top[..	LC	z-Bot[...	LC
350			min	0	4	0	1	0	1	0	1	0	1	0	1	0	1
351		2	max	0	10	0	50	0	50	0	50	0	50	0	50	0	50
352			min	0	4	0	1	0	1	0	1	0	1	0	1	0	1
353		3	max	0	6	0	50	0	50	0	50	0	50	0	50	0	50
354			min	0	12	0	1	0	1	0	1	0	1	0	1	0	1
355	M60	1	max	0	7	0	50	0	50	0	50	0	50	0	50	0	50
356			min	0	13	0	1	0	1	0	1	0	1	0	1	0	1
357		2	max	0	7	0	50	0	50	0	50	0	50	0	50	0	50
358			min	0	13	0	1	0	1	0	1	0	1	0	1	0	1
359		3	max	0	7	0	50	0	50	0	50	0	50	0	50	0	50
360			min	0	13	0	1	0	1	0	1	0	1	0	1	0	1
361	M61	1	max	0	9	0	50	0	50	0	50	0	50	0	50	0	50
362			min	0	3	0	1	0	1	0	1	0	1	0	1	0	1
363		2	max	0	9	0	50	0	50	0	50	0	50	0	50	0	50
364			min	0	3	0	1	0	1	0	1	0	1	0	1	0	1
365		3	max	0	9	0	50	0	50	0	50	0	50	0	50	0	50
366			min	0	3	0	1	0	1	0	1	0	1	0	1	0	1
367	M62	1	max	0	5	0	50	0	50	0	50	0	50	0	50	0	50
368			min	0	11	0	1	0	1	0	1	0	1	0	1	0	1
369		2	max	0	11	0	50	0	50	0	50	0	50	0	50	0	50
370			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
371		3	max	0	11	0	50	0	50	0	50	0	50	0	50	0	50
372			min	0	5	0	1	0	1	0	1	0	1	0	1	0	1
373	M63	1	max	0	2	0	50	0	50	0	50	0	50	0	50	0	50
374			min	0	8	0	1	0	1	0	1	0	1	0	1	0	1
375		2	max	0	2	0	50	0	50	0	50	0	50	0	50	0	50
376			min	0	8	0	1	0	1	0	1	0	1	0	1	0	1
377		3	max	0	2	0	50	0	50	0	50	0	50	0	50	0	50
378			min	0	8	0	1	0	1	0	1	0	1	0	1	0	1
379	M64	1	max	0	2	0	50	0	50	0	50	0	50	0	50	0	50
380			min	0	8	0	1	0	1	0	1	0	1	0	1	0	1
381		2	max	0	2	0	50	0	50	0	50	0	50	0	50	0	50
382			min	0	8	0	1	0	1	0	1	0	1	0	1	0	1
383		3	max	0	2	0	50	0	50	0	50	0	50	0	50	0	50
384			min	0	8	0	1	0	1	0	1	0	1	0	1	0	1
385	M65	1	max	0	11	0	50	0	50	0	50	0	50	0	50	0	50
386			min	0	5	0	1	0	1	0	1	0	1	0	1	0	1
387		2	max	0	11	0	50	0	50	0	50	0	50	0	50	0	50
388			min	0	5	0	1	0	1	0	1	0	1	0	1	0	1
389		3	max	0	11	0	50	0	50	0	50	0	50	0	50	0	50
390			min	0	5	0	1	0	1	0	1	0	1	0	1	0	1
391	M66	1	max	0	5	0	50	0	50	0	50	0	50	0	50	0	50
392			min	0	11	0	1	0	1	0	1	0	1	0	1	0	1
393		2	max	0	5	0	50	0	50	0	50	0	50	0	50	0	50
394			min	0	11	0	1	0	1	0	1	0	1	0	1	0	1
395		3	max	0	5	0	50	0	50	0	50	0	50	0	50	0	50
396			min	0	11	0	1	0	1	0	1	0	1	0	1	0	1
397	M67	1	max	0	10	0	50	0	50	0	50	0	50	0	50	0	50
398			min	0	4	0	1	0	1	0	1	0	1	0	1	0	1
399		2	max	0	10	0	50	0	50	0	50	0	50	0	50	0	50
400			min	0	4	0	1	0	1	0	1	0	1	0	1	0	1
401		3	max	0	6	0	50	0	50	0	50	0	50	0	50	0	50
402			min	0	12	0	1	0	1	0	1	0	1	0	1	0	1
403	M68	1	max	0	7	0	50	0	50	0	50	0	50	0	50	0	50
404			min	0	13	0	1	0	1	0	1	0	1	0	1	0	1
405		2	max	0	7	0	50	0	50	0	50	0	50	0	50	0	50
406			min	0	13	0	1	0	1	0	1	0	1	0	1	0	1

Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[ksi]	LC	y Shear[ksi]	LC	z Shear[ksi]	LC	y-Top[ksi]	LC	y-Bot[...	LC	z-Top[..	LC	z-Bot[...	LC
407		3	max	0	7	0	50	0	50	0	50	0	50	0	50	0	50
408			min	0	13	0	1	0	1	0	1	0	1	0	1	0	1
409	M69	1	max	0	9	0	50	0	50	0	50	0	50	0	50	0	50
410			min	0	3	0	1	0	1	0	1	0	1	0	1	0	1
411		2	max	0	9	0	50	0	50	0	50	0	50	0	50	0	50
412			min	0	3	0	1	0	1	0	1	0	1	0	1	0	1
413		3	max	0	9	0	50	0	50	0	50	0	50	0	50	0	50
414			min	0	3	0	1	0	1	0	1	0	1	0	1	0	1
415	M70	1	max	0	5	0	50	0	50	0	50	0	50	0	50	0	50
416			min	0	10	0	1	0	1	0	1	0	1	0	1	0	1
417		2	max	0	12	0	50	0	50	0	50	0	50	0	50	0	50
418			min	0	8	0	1	0	1	0	1	0	1	0	1	0	1
419		3	max	0	12	0	50	0	50	0	50	0	50	0	50	0	50
420			min	0	5	0	1	0	1	0	1	0	1	0	1	0	1
421	M71	1	max	0	13	0	50	0	50	0	50	0	50	0	50	0	50
422			min	0	7	0	1	0	1	0	1	0	1	0	1	0	1
423		2	max	0	13	0	50	0	50	0	50	0	50	0	50	0	50
424			min	0	7	0	1	0	1	0	1	0	1	0	1	0	1
425		3	max	0	13	0	50	0	50	0	50	0	50	0	50	0	50
426			min	0	7	0	1	0	1	0	1	0	1	0	1	0	1
427	M72	1	max	0	3	0	50	0	50	0	50	0	50	0	50	0	50
428			min	0	8	0	1	0	1	0	1	0	1	0	1	0	1
429		2	max	0	3	0	50	0	50	0	50	0	50	0	50	0	50
430			min	0	8	0	1	0	1	0	1	0	1	0	1	0	1
431		3	max	0	3	0	50	0	50	0	50	0	50	0	50	0	50
432			min	0	8	0	1	0	1	0	1	0	1	0	1	0	1
433	M73	1	max	0	12	0	50	0	50	0	50	0	50	0	50	0	50
434			min	0	6	0	1	0	1	0	1	0	1	0	1	0	1
435		2	max	0	12	0	50	0	50	0	50	0	50	0	50	0	50
436			min	0	6	0	1	0	1	0	1	0	1	0	1	0	1
437		3	max	0	12	0	50	0	50	0	50	0	50	0	50	0	50
438			min	0	6	0	1	0	1	0	1	0	1	0	1	0	1
439	M74	1	max	0	4	0	50	0	50	0	50	0	50	0	50	0	50
440			min	0	10	0	1	0	1	0	1	0	1	0	1	0	1
441		2	max	0	4	0	50	0	50	0	50	0	50	0	50	0	50
442			min	0	10	0	1	0	1	0	1	0	1	0	1	0	1
443		3	max	0	4	0	50	0	50	0	50	0	50	0	50	0	50
444			min	0	10	0	1	0	1	0	1	0	1	0	1	0	1
445	M75	1	max	0	10	0	50	0	50	0	50	0	50	0	50	0	50
446			min	0	4	0	1	0	1	0	1	0	1	0	1	0	1
447		2	max	0	10	0	50	0	50	0	50	0	50	0	50	0	50
448			min	0	4	0	1	0	1	0	1	0	1	0	1	0	1
449		3	max	0	6	0	50	0	50	0	50	0	50	0	50	0	50
450			min	0	12	0	1	0	1	0	1	0	1	0	1	0	1
451	M76	1	max	0	7	0	50	0	50	0	50	0	50	0	50	0	50
452			min	0	13	0	1	0	1	0	1	0	1	0	1	0	1
453		2	max	0	7	0	50	0	50	0	50	0	50	0	50	0	50
454			min	0	13	0	1	0	1	0	1	0	1	0	1	0	1
455		3	max	0	7	0	50	0	50	0	50	0	50	0	50	0	50
456			min	0	13	0	1	0	1	0	1	0	1	0	1	0	1
457	M77	1	max	0	9	0	50	0	50	0	50	0	50	0	50	0	50
458			min	0	3	0	1	0	1	0	1	0	1	0	1	0	1
459		2	max	0	9	0	50	0	50	0	50	0	50	0	50	0	50
460			min	0	3	0	1	0	1	0	1	0	1	0	1	0	1
461		3	max	0	9	0	50	0	50	0	50	0	50	0	50	0	50
462			min	0	3	0	1	0	1	0	1	0	1	0	1	0	1
463	M78	1	max	0	5	0	50	0	50	0	50	0	50	0	50	0	50

Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[ksi]	LC	y Shear[ksi]	LC	z Shear[ksi]	LC	y-Top[ksi]	LC	y-Bot[...	LC	z-Top[..	LC	z-Bot[...	LC
464			min	0	10	0	1	0	1	0	1	0	1	0	1	0	1
465		2	max	0	12	0	50	0	50	0	50	0	50	0	50	0	50
466			min	0	7	0	1	0	1	0	1	0	1	0	1	0	1
467		3	max	0	12	0	50	0	50	0	50	0	50	0	50	0	50
468			min	0	5	0	1	0	1	0	1	0	1	0	1	0	1
469	M79	1	max	0	2	0	50	0	50	0	50	0	50	0	50	0	50
470			min	0	8	0	1	0	1	0	1	0	1	0	1	0	1
471		2	max	0	2	0	50	0	50	0	50	0	50	0	50	0	50
472			min	0	8	0	1	0	1	0	1	0	1	0	1	0	1
473		3	max	0	2	0	50	0	50	0	50	0	50	0	50	0	50
474			min	0	8	0	1	0	1	0	1	0	1	0	1	0	1
475	M80	1	max	0	2	0	50	0	50	0	50	0	50	0	50	0	50
476			min	0	8	0	1	0	1	0	1	0	1	0	1	0	1
477		2	max	0	2	0	50	0	50	0	50	0	50	0	50	0	50
478			min	0	8	0	1	0	1	0	1	0	1	0	1	0	1
479		3	max	0	2	0	50	0	50	0	50	0	50	0	50	0	50
480			min	0	8	0	1	0	1	0	1	0	1	0	1	0	1
481	M81	1	max	0	12	0	50	0	50	0	50	0	50	0	50	0	50
482			min	0	6	0	1	0	1	0	1	0	1	0	1	0	1
483		2	max	0	12	0	50	0	50	0	50	0	50	0	50	0	50
484			min	0	6	0	1	0	1	0	1	0	1	0	1	0	1
485		3	max	0	12	0	50	0	50	0	50	0	50	0	50	0	50
486			min	0	6	0	1	0	1	0	1	0	1	0	1	0	1
487	M82	1	max	0	4	0	50	0	50	0	50	0	50	0	50	0	50
488			min	0	10	0	1	0	1	0	1	0	1	0	1	0	1
489		2	max	0	4	0	50	0	50	0	50	0	50	0	50	0	50
490			min	0	10	0	1	0	1	0	1	0	1	0	1	0	1
491		3	max	0	4	0	50	0	50	0	50	0	50	0	50	0	50
492			min	0	10	0	1	0	1	0	1	0	1	0	1	0	1
493	M83	1	max	0	10	0	50	0	50	0	50	0	50	0	50	0	50
494			min	0	3	0	1	0	1	0	1	0	1	0	1	0	1
495		2	max	0	10	0	50	0	50	0	50	0	50	0	50	0	50
496			min	0	3	0	1	0	1	0	1	0	1	0	1	0	1
497		3	max	0	7	0	50	0	50	0	50	0	50	0	50	0	50
498			min	0	12	0	1	0	1	0	1	0	1	0	1	0	1
499	M84	1	max	0	7	0	50	0	50	0	50	0	50	0	50	0	50
500			min	0	13	0	1	0	1	0	1	0	1	0	1	0	1
501		2	max	0	7	0	50	0	50	0	50	0	50	0	50	0	50
502			min	0	13	0	1	0	1	0	1	0	1	0	1	0	1
503		3	max	0	7	0	50	0	50	0	50	0	50	0	50	0	50
504			min	0	13	0	1	0	1	0	1	0	1	0	1	0	1
505	M85	1	max	0	9	0	50	0	50	0	50	0	50	0	50	0	50
506			min	0	3	0	1	0	1	0	1	0	1	0	1	0	1
507		2	max	0	9	0	50	0	50	0	50	0	50	0	50	0	50
508			min	0	3	0	1	0	1	0	1	0	1	0	1	0	1
509		3	max	0	9	0	50	0	50	0	50	0	50	0	50	0	50
510			min	0	3	0	1	0	1	0	1	0	1	0	1	0	1
511	M86	1	max	0	5	0	50	0	50	0	50	0	50	0	50	0	50
512			min	0	10	0	1	0	1	0	1	0	1	0	1	0	1
513		2	max	0	12	0	50	0	50	0	50	0	50	0	50	0	50
514			min	0	7	0	1	0	1	0	1	0	1	0	1	0	1
515		3	max	0	12	0	50	0	50	0	50	0	50	0	50	0	50
516			min	0	5	0	1	0	1	0	1	0	1	0	1	0	1
517	M87	1	max	0	2	0	50	0	50	0	50	0	50	0	50	0	50
518			min	0	8	0	1	0	1	0	1	0	1	0	1	0	1
519		2	max	0	2	0	50	0	50	0	50	0	50	0	50	0	50
520			min	0	8	0	1	0	1	0	1	0	1	0	1	0	1

Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[ksi]	LC	y Shear[ksi]	LC	z Shear[ksi]	LC	y-Top[ksi]	LC	y-Bot[...	LC	z-Top[..	LC	z-Bot[...	LC
521		3	max	0	2	0	50	0	50	0	50	0	50	0	50	0	50
522			min	0	8	0	1	0	1	0	1	0	1	0	1	0	1
523	M88	1	max	0	2	0	50	0	50	0	50	0	50	0	50	0	50
524			min	0	8	0	1	0	1	0	1	0	1	0	1	0	1
525		2	max	0	2	0	50	0	50	0	50	0	50	0	50	0	50
526			min	0	8	0	1	0	1	0	1	0	1	0	1	0	1
527		3	max	0	2	0	50	0	50	0	50	0	50	0	50	0	50
528			min	0	8	0	1	0	1	0	1	0	1	0	1	0	1
529	M89	1	max	0	12	0	50	0	50	0	50	0	50	0	50	0	50
530			min	0	6	0	1	0	1	0	1	0	1	0	1	0	1
531		2	max	0	12	0	50	0	50	0	50	0	50	0	50	0	50
532			min	0	6	0	1	0	1	0	1	0	1	0	1	0	1
533		3	max	0	12	0	50	0	50	0	50	0	50	0	50	0	50
534			min	0	6	0	1	0	1	0	1	0	1	0	1	0	1
535	M90	1	max	0	4	0	50	0	50	0	50	0	50	0	50	0	50
536			min	0	10	0	1	0	1	0	1	0	1	0	1	0	1
537		2	max	0	4	0	50	0	50	0	50	0	50	0	50	0	50
538			min	0	10	0	1	0	1	0	1	0	1	0	1	0	1
539		3	max	0	4	0	50	0	50	0	50	0	50	0	50	0	50
540			min	0	10	0	1	0	1	0	1	0	1	0	1	0	1
541	M91	1	max	0	10	0	50	0	50	0	50	0	50	0	50	0	50
542			min	0	3	0	1	0	1	0	1	0	1	0	1	0	1
543		2	max	0	10	0	50	0	50	0	50	0	50	0	50	0	50
544			min	0	3	0	1	0	1	0	1	0	1	0	1	0	1
545		3	max	0	7	0	50	0	50	0	50	0	50	0	50	0	50
546			min	0	12	0	1	0	1	0	1	0	1	0	1	0	1
547	M92	1	max	0	7	0	50	0	50	0	50	0	50	0	50	0	50
548			min	0	13	0	1	0	1	0	1	0	1	0	1	0	1
549		2	max	0	7	0	50	0	50	0	50	0	50	0	50	0	50
550			min	0	13	0	1	0	1	0	1	0	1	0	1	0	1
551		3	max	0	7	0	50	0	50	0	50	0	50	0	50	0	50
552			min	0	13	0	1	0	1	0	1	0	1	0	1	0	1
553	M93	1	max	0	9	0	50	0	50	0	50	0	50	0	50	0	50
554			min	0	3	0	1	0	1	0	1	0	1	0	1	0	1
555		2	max	0	9	0	50	0	50	0	50	0	50	0	50	0	50
556			min	0	3	0	1	0	1	0	1	0	1	0	1	0	1
557		3	max	0	9	0	50	0	50	0	50	0	50	0	50	0	50
558			min	0	3	0	1	0	1	0	1	0	1	0	1	0	1

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

	Member	Shape	Code Check	Loc...	L...	Shea...	Loc.....		L...	phi*Pn...	phi*Pn...	phi*M...	phi*M...	...	Eqn
1	M1	PIPE_2.0	.144	78....	2	.023	78....		13	13787...	32130	1.872	1.872	1	H1-1b
2	M2	PIPE_2.0	.162	78....	2	.022	31....		13	13787...	32130	1.872	1.872	1	H1-1b
3	M3	PIPE_2.0	.162	78....	2	.022	31....		13	13787...	32130	1.872	1.872	1	H1-1b
4	M4	PIPE_2.0	.586	79....	8	.040	79....		8	5018....	32130	1.872	1.872	1	H1-1b
5	M5	PIPE_2.0	.597	79....	8	.041	79....		8	5018....	32130	1.872	1.872	1	H1-1b
6	M6	PIPE_2.0	.597	79....	8	.041	79....		8	5018....	32130	1.872	1.872	1	H1-1b
7	M7	PIPE_3.0	.412	79....	2	.044	80....		12	57075...	65205	5.749	5.749	1	H1-1b
8	M8	PIPE_3.0	.411	79....	2	.042	80....		13	57075...	65205	5.749	5.749	1	H1-1b
9	M9	PIPE_3.0	.411	79....	2	.042	80....		13	57075...	65205	5.749	5.749	1	H1-1b
10	M10	L3X3X3	.083	.98	5	.383	5.4...	z	13	28622...	35316	1.32	2.833	4...	H2-1
11	M11	L3X3X3	.079	1.4...	5	.284	1.0...	z	4	28622...	35316	1.32	2.833	1...	H2-1
12	M12	L3X3X3	.141	13....	12	.293	1.8...	z	3	28482...	35316	1.32	2.833	2...	H2-1
13	M13	L3X3X3	.137	0	4	.058	.092	y	4	28612...	35316	1.32	2.905	1...	H2-1
14	M14	L3X3X3	.138	0	12	.058	.276	z	12	28612...	35316	1.32	2.833	1...	H2-1

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

	Member	Shape	Code Check	Loc...	L...	Shea...	Loc.....	L...	phi*Pn...	phi*Pn...	phi*M...	phi*M...	...	Eqn
15	M15	L3X3X3	.075	.98	5	.372	.551	y	2	28622...	35316	1.32	2.833	4...	H2-1
16	M16	L3X3X3	.071	1.4...	5	.264	1.0...	z	3	28622...	35316	1.32	2.833	1...	H2-1
17	M17	L3X3X3	.134	13....	6	.289	1.5...	z	3	28482...	35316	1.32	2.833	3	H2-1
18	M18	L3X3X3	.132	0	10	.055	.061	y	4	28612...	35316	1.32	2.833	1...	H2-1
19	M19	L3X3X3	.132	0	6	.055	0	z	12	28612...	35316	1.32	2.833	1...	H2-1
20	M20	L3X3X3	.075	.98	5	.372	.551	y	2	28622...	35316	1.32	2.833	4...	H2-1
21	M21	L3X3X3	.071	1.4...	5	.264	1.0...	z	3	28622...	35316	1.32	2.833	1...	H2-1
22	M22	L3X3X3	.134	13....	6	.289	1.5...	z	3	28482...	35316	1.32	2.833	3	H2-1
23	M23	L3X3X3	.132	0	10	.055	0	y	4	28612...	35316	1.32	2.833	1...	H2-1
24	M24	L3X3X3	.132	0	6	.055	1.8...	z	12	28612...	35316	1.32	2.833	1...	H2-1
25	M25	L3X3X3	.038	.98	5	.177	5.4...	z	13	28622...	35316	1.32	2.833	4...	H2-1
26	M26	L3X3X3	.034	1.4...	5	.137	6.9...	z	13	28622...	35316	1.32	2.833	1...	H2-1
27	M27	L3X3X3	.079	5.3...	9	.430	1.5...	z	9	28482...	35316	1.32	2.905	2...	H2-1
28	M28	L3X3X3	.066	0	10	.032	0	y	4	28612...	35316	1.32	2.833	1...	H2-1
29	M29	L3X3X3	.066	0	6	.032	0	z	12	28612...	35316	1.32	2.833	1...	H2-1
30	M30	L3X3X3	.032	.98	5	.172	5.4...	z	13	28622...	35316	1.32	2.833	4...	H2-1
31	M31	L3X3X3	.029	1.4...	5	.128	6.9...	z	13	28622...	35316	1.32	2.833	1...	H2-1
32	M32	L3X3X3	.080	5.3...	9	.432	1.5...	z	9	28482...	35316	1.32	2.905	2...	H2-1
33	M33	L3X3X3	.064	0	10	.030	1.3...	y	4	28612...	35316	1.32	2.833	1...	H2-1
34	M34	L3X3X3	.064	0	6	.030	0	z	12	28612...	35316	1.32	2.833	1...	H2-1
35	M35	L3X3X3	.032	.98	5	.172	5.4...	z	13	28622...	35316	1.32	2.833	4...	H2-1
36	M36	L3X3X3	.029	1.4...	5	.128	6.9...	z	13	28622...	35316	1.32	2.833	1...	H2-1
37	M37	L3X3X3	.080	5.3...	9	.432	1.5...	z	9	28482...	35316	1.32	2.905	2...	H2-1
38	M38	L3X3X3	.064	0	10	.030	0	y	4	28612...	35316	1.32	2.833	1...	H2-1
39	M39	L3X3X3	.064	0	6	.030	.122	z	12	28612...	35316	1.32	2.833	1...	H2-1

Envelope Plate/Shell Principal Stresses

Plate	Sur...	Sigma1 [ksi]	LC	Sigma2 [ksi]	LC	Tau Max [...	LC	Angle [rad]	LC	Von Mises [ksi]	LC
No Data to Print ...											

Jacobs

WIND/ICE/SERVICE LOADING
ANTENNA MOUNTING SYSTEM
ANSI/TIA-222-H

Project Number:	EP5TRFWL
Site Name:	Tulip Ave
Engineer:	H. Bedane
Date:	05/05/2022
Carrier:	AT&T
Reviewed By:	B. Bartlett

Input Data

Front

Manufacturer / Model #	COMMSCOPE NNNH-65A-R4		
Length	55.1	in	
Width	19.6	in	
Depth	7.8	in	
Weight	67.2	lb	
Design Ice Thickness (t_i)	1	in	
Structure Type	B	(S, G, M, B)	
Structure Height (h)	112	ft	
Antenna Centerline (z)	129	ft	
Basic Wind Speed (V)	113	mph	(w/o ice)
Basic Wind Speed (V_i)	40	mph	(w/ ice)
Basic Wind Speed (V_s)	30	mph	(service)
Risk Category	II	(I, II, III, IV)	
Exposure Category	C	(B, C or D)	
Topographic Category	1	(1, 2, 3 or 4)	
Crest Height (H)	0	ft	
Shape	F	(R / F / S)	
Length / Width	2.811		(w/o ice)
Length / Width	2.622		(w/ ice)
C_a	1.214		(w/o ice)
C_a	1.205		(w/ ice)
C_a	1.214		(service)
$(EPA)_A$	8.193	ft^2	(w/o ice)
$(EPA)_A$	9.466	ft^2	(w/ ice)
$(EPA)_A$	8.193	ft^2	(service)
$F_A = q_z G_h (EPA)_A$	339.744	lb	(w/o ice)
$F_A = q_z G_h (EPA)_A$	49.184	lb	(w/ ice)
$F_A = q_z G_h (EPA)_A$	23.946	lb	(service)
Ice Weight	142.991	lb	
Total Weight	210.191	lb	(w/ ice)

Equations

$K_z = 2.01[z/z_g]^{(2/\alpha)}$	1.335		$K_{zmin} \le K_z \le 2.01$
$K_h = e^{[(f)(z)/H]}$	1.000		
$K_{zt} = [1+(K_c K_t)/K_h]^2$	1.000		
$K_{iz} = [z/33]^{(0.10)}$	1.146		$K_{iz} \le 1.4$
$t_{iz} = (t_i)(I)(K_{iz})(K_{zt})^{(0.35)}$	1.146	in	(w/ ice)
$C = (K_{zt}K_zK_e)^{0.5}(V)(D)$	213.278		(w/o ice)
$C = (K_{zt}K_zK_e)^{0.5}(V_i)(D)$	75.497		(w/ ice)
$C = (K_{zt}K_zK_e)^{0.5}(V)(D)$	56.622		(service)
G_h =	1.00		
K_d =	0.95		
K_s =	1.00		
K_a =	0.90		
$K_e = e^{-0.0000362zs}$	1.00		
$q_z = 0.00256K_zK_{zt}K_sK_eK_dV^2$	41.47	psf	(w/o ice)
$q_z = 0.00256K_zK_{zt}K_eK_dV_i^2$	5.20	psf	(w/ ice)
$q_z = 0.00256K_zK_{zt}K_sK_eK_dV_s^2$	2.92	psf	(service)

Position			
	2	x	1
	4	x	1
		x	
		x	

Side

Manufacturer / Model #	COMMSCOPE NNNH-65A-R4		
Length	55.1	in	
Width	19.6	in	
Depth	7.8	in	
Weight	67.2	lb	
Design Ice Thickness (t_i)	1	in	
Structure Type	B	(S, G, M, B)	
Structure Height (h)	112	ft	
Antenna Centerline (z)	129	ft	
Basic Wind Speed (V)	113	mph	(w/o ice)
Basic Wind Speed (V_i)	40	mph	(w/ ice)
Basic Wind Speed (V_s)	30	mph	(service)
Risk Category	II	(I, II, III, IV)	
Exposure Category	C	(B, C or D)	
Topographic Category	1	(1, 2, 3 or 4)	
Crest Height (H)	0	ft	
Shape	F	(R / F / S)	
Length / Width	7.064		(w/o ice)
Length / Width	5.687		(w/ ice)
C_a	1.402		(w/o ice)
C_a	1.342		(w/ ice)
C_a	1.402		(service)
$(EPA)_A$	3.766	ft^2	(w/o ice)
$(EPA)_A$	4.857	ft^2	(w/ ice)
$(EPA)_A$	3.766	ft^2	(service)
$F_A = q_z G_h (EPA)_A$	156.179	lb	(w/o ice)
$F_A = q_z G_h (EPA)_A$	25.236	lb	(w/ ice)
$F_A = q_z G_h (EPA)_A$	11.008	lb	(service)
Ice Weight	142.991	lb	
Total Weight	210.191	lb	(w/ ice)

Equations

$K_z = 2.01[z/z_g]^{(2/\alpha)}$	1.335		$K_{zmin} \le K_z \le 2.01$
$K_h = e^{[(f)(z)/H]}$	1.000		
$K_{zt} = [1+(K_c K_t)/K_h]^2$	1.000		
$K_{iz} = [z/33]^{(0.10)}$	1.146		$K_{iz} \le 1.4$
$t_{iz} = (t_i)(I)(K_{iz})(K_{zt})^{(0.35)}$	1.146	in	(w/ ice)
$C = (K_{zt}K_zK_e)^{0.5}(V)(D)$	84.876		(w/o ice)
$C = (K_{zt}K_zK_e)^{0.5}(V_i)(D)$	30.045		(w/ ice)
$C = (K_{zt}K_zK_e)^{0.5}(V)(D)$	22.533		(service)
G_h =	1.00		
K_d =	0.95		
K_s =	1.00		
K_a =	0.90		
$K_e = e^{-0.0000362zs}$	1.00		
$q_z = 0.00256K_zK_{zt}K_sK_eK_dV^2$	41.467	psf	(w/o ice)
$q_z = 0.00256K_zK_{zt}K_eK_dV_i^2$	5.196	psf	(w/ ice)
$q_z = 0.00256K_zK_{zt}K_sK_eK_dV_s^2$	2.923	psf	(service)

Position			
	2	x	1
	4	x	1
		x	
		x	

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WIND/ICE/SERVICE LOADING
ANTENNA MOUNTING SYSTEM
ANSI/TIA-222-H

Project Number:	EP5TRFWL
Site Name:	Tulip Ave
Engineer:	H. Bedane
Date:	05/05/2022
Carrier:	AT&T
Reviewed By:	B. Bartlett

Input Data

Front

Manufacturer	NOKIA		
Model #	AEQK		
Length	29.53	in	
Width	17.72	in	
Depth	9.53	in	
Weight	99.21	lb	
Design Ice Thickness (t_i)	1	in	
Structure Type	B	(S, G, M, B)	
Structure Height (h)	112	ft	
Antenna Centerline (z)	129	ft	
Basic Wind Speed (V)	113	mph	(w/o ice)
Basic Wind Speed (V_i)	40	mph	(w/ ice)
Basic Wind Speed (V_s)	30	mph	(service)
Risk Category	II	(I, II, III, IV)	
Exposure Category	C	(B, C or D)	
Topographic Category	1	(1, 2, 3 or 4)	
Crest Height (H)	0	ft	
Shape	F	(R / F / S)	
Length / Width	1.666		(w/o ice)
Length / Width	1.590		(w/ ice)
C_a	1.200		(w/o ice)
C_a	1.200		(w/ ice)
C_a	1.200		(service)
$(EPA)_A$	3.925	ft^2	(w/o ice)
$(EPA)_A$	4.776	ft^2	(w/ ice)
$(EPA)_A$	3.925	ft^2	(service)
$F_A = q_z G_h (EPA)_A$	162.740	lb	(w/o ice)
$F_A = q_z G_h (EPA)_A$	24.817	lb	(w/ ice)
$F_A = q_z G_h (EPA)_A$	11.470	lb	(service)
Ice Weight	73.275	lb	
Total Weight	172.485	lb	(w/ ice)

Equations

$K_z = 2.01[z/z_g]^{(2/\alpha)}$	1.335		$K_{zmin} \le K_z \le 2.01$
$K_h = e^{[(f)(z)/H]}$	1.000		
$K_{zt} = [1+(K_c K_t)/K_h]^2$	1.000		
$K_{iz} = [z/33]^{(0.10)}$	1.146		$K_{iz} \le 1.4$
$t_{iz} = (t_i)(I)(K_{iz})(K_{zt})^{(0.35)}$	1.146	in	(w/ ice)
$C = (K_{zt}K_zK_e)^{0.5}(V)(D)$	192.821		(w/o ice)
$C = (K_{zt}K_zK_e)^{0.5}(V_i)(D)$	68.255		(w/ ice)
$C = (K_{zt}K_zK_e)^{0.5}(V)(D)$	51.191		(service)
G_h =	1.00		
K_d =	0.95		
K_s =	1.00		
K_a =	0.90		
$K_e = e^{-0.0000362zs}$	1.00		
$q_z = 0.00256K_zK_{zt}K_sK_eK_dV^2$	41.47	psf	(w/o ice)
$q_z = 0.00256K_zK_{zt}K_eK_dV_i^2$	5.20	psf	(w/ ice)
$q_z = 0.00256K_zK_{zt}K_sK_eK_dV_s^2$	2.92	psf	(service)

Position	1	x	1
		x	
		x	
		x	

Side

Manufacturer	NOKIA		
Model #	AEQK		
Length	29.53	in	
Width	17.72	in	
Depth	9.53	in	
Weight	99.21	lb	
Design Ice Thickness (t_i)	1	in	
Structure Type	B	(S, G, M, B)	
Structure Height (h)	112	ft	
Antenna Centerline (z)	129	ft	
Basic Wind Speed (V)	113	mph	(w/o ice)
Basic Wind Speed (V_i)	40	mph	(w/ ice)
Basic Wind Speed (V_s)	30	mph	(service)
Risk Category	II	(I, II, III, IV)	
Exposure Category	C	(B, C or D)	
Topographic Category	1	(1, 2, 3 or 4)	
Crest Height (H)	0	ft	
Shape	F	(R / F / S)	
Length / Width	3.099		(w/o ice)
Length / Width	2.692		(w/ ice)
C_a	1.227		(w/o ice)
C_a	1.209		(w/ ice)
C_a	1.227		(service)
$(EPA)_A$	2.157	ft^2	(w/o ice)
$(EPA)_A$	2.842	ft^2	(w/ ice)
$(EPA)_A$	2.157	ft^2	(service)
$F_A = q_z G_h (EPA)_A$	89.464	lb	(w/o ice)
$F_A = q_z G_h (EPA)_A$	14.765	lb	(w/ ice)
$F_A = q_z G_h (EPA)_A$	6.306	lb	(service)
Ice Weight	73.275	lb	
Total Weight	172.485	lb	(w/ ice)

Equations

$K_z = 2.01[z/z_g]^{(2/\alpha)}$	1.335		$K_{zmin} \le K_z \le 2.01$
$K_h = e^{[(f)(z)/H]}$	1.000		
$K_{zt} = [1+(K_c K_t)/K_h]^2$	1.000		
$K_{iz} = [z/33]^{(0.10)}$	1.146		$K_{iz} \le 1.4$
$t_{iz} = (t_i)(I)(K_{iz})(K_{zt})^{(0.35)}$	1.146	in	(w/ ice)
$C = (K_{zt}K_zK_e)^{0.5}(V)(D)$	103.701		(w/o ice)
$C = (K_{zt}K_zK_e)^{0.5}(V_i)(D)$	36.708		(w/ ice)
$C = (K_{zt}K_zK_e)^{0.5}(V)(D)$	27.531		(service)
G_h =	1.00		
K_d =	0.95		
K_s =	1.00		
K_a =	0.90		
$K_e = e^{-0.0000362zs}$	1.00		
$q_z = 0.00256K_zK_{zt}K_sK_eK_dV^2$	41.467	psf	(w/o ice)
$q_z = 0.00256K_zK_{zt}K_eK_dV_i^2$	5.196	psf	(w/ ice)
$q_z = 0.00256K_zK_{zt}K_sK_eK_dV_s^2$	2.923	psf	(service)

Position	1	x	1
		x	
		x	
		x	

Jacobs

WIND/ICE/SERVICE LOADING
ANTENNA MOUNTING SYSTEM
ANSI/TIA-222-H

Project Number:	EP5TRFWL
Site Name:	Tulip Ave
Engineer:	H. Bedane
Date:	05/05/2022
Carrier:	AT&T
Reviewed By:	B. Bartlett

Input Data

Front

Manufacturer	NOKIA		
Model #	AEQU		
Length	29.5	in	
Width	17.7	in	
Depth	9.5	in	
Weight	99.21	lb	
Design Ice Thickness (t_i)	1	in	
Structure Type	B	(S, G, M, B)	
Structure Height (h)	112	ft	
Antenna Centerline (z)	129	ft	
Basic Wind Speed (V)	113	mph	(w/o ice)
Basic Wind Speed (V_i)	40	mph	(w/ ice)
Basic Wind Speed (V_s)	30	mph	(service)
Risk Category	II	(I, II, III, IV)	
Exposure Category	C	(B, C or D)	
Topographic Category	1	(1, 2, 3 or 4)	
Crest Height (H)	0	ft	
Shape	F	(R / F / S)	
Length / Width	1.667		(w/o ice)
Length / Width	1.590		(w/ ice)
C_a	1.200		(w/o ice)
C_a	1.200		(w/ ice)
C_a	1.200		(service)
$(EPA)_A$	3.916	ft^2	(w/o ice)
$(EPA)_A$	4.767	ft^2	(w/ ice)
$(EPA)_A$	3.916	ft^2	(service)
$F_A = q_z G_h (EPA)_A$	162.391	lb	(w/o ice)
$F_A = q_z G_h (EPA)_A$	24.769	lb	(w/ ice)
$F_A = q_z G_h (EPA)_A$	11.446	lb	(service)
Ice Weight	73.091	lb	
Total Weight	172.301	lb	(w/ ice)

Equations

$K_z = 2.01[z/z_g]^{(2/\alpha)}$	1.335		$K_{zmin} \le K_z \le 2.01$
$K_h = e^{[(f)(z)/H]}$	1.000		
$K_{zt} = [1+(K_c K_t)/K_h]^2$	1.000		
$K_{iz} = [z/33]^{(0.10)}$	1.146		$K_{iz} \le 1.4$
$t_{iz} = (t_i)(I)(K_{iz})(K_{zt})^{(0.35)}$	1.146	in	(w/ ice)
$C = (K_{zt}K_zK_e)^{0.5}(V)(D)$	192.603		(w/o ice)
$C = (K_{zt}K_zK_e)^{0.5}(V_i)(D)$	68.178		(w/ ice)
$C = (K_{zt}K_zK_e)^{0.5}(V)(D)$	51.134		(service)
G_h =	1.00		
K_d =	0.95		
K_s =	1.00		
K_a =	0.90		
$K_e = e^{-0.0000362zs}$	1.00		
$q_z = 0.00256K_zK_{zt}K_sK_eK_dV^2$	41.47	psf	(w/o ice)
$q_z = 0.00256K_zK_{zt}K_eK_dV_i^2$	5.20	psf	(w/ ice)
$q_z = 0.00256K_zK_{zt}K_sK_eK_dV_s^2$	2.92	psf	(service)

Position	1	x	1
		x	
		x	
		x	

Side

Manufacturer	NOKIA		
Model #	AEQU		
Length	29.5	in	
Width	17.7	in	
Depth	9.5	in	
Weight	99.21	lb	
Design Ice Thickness (t_i)	1	in	
Structure Type	B	(S, G, M, B)	
Structure Height (h)	112	ft	
Antenna Centerline (z)	129	ft	
Basic Wind Speed (V)	113	mph	(w/o ice)
Basic Wind Speed (V_i)	40	mph	(w/ ice)
Basic Wind Speed (V_s)	30	mph	(service)
Risk Category	II	(I, II, III, IV)	
Exposure Category	C	(B, C or D)	
Topographic Category	1	(1, 2, 3 or 4)	
Crest Height (H)	0	ft	
Shape	F	(R / F / S)	
Length / Width	3.105		(w/o ice)
Length / Width	2.696		(w/ ice)
C_a	1.227		(w/o ice)
C_a	1.209		(w/ ice)
C_a	1.227		(service)
$(EPA)_A$	2.149	ft^2	(w/o ice)
$(EPA)_A$	2.832	ft^2	(w/ ice)
$(EPA)_A$	2.149	ft^2	(service)
$F_A = q_z G_h (EPA)_A$	89.113	lb	(w/o ice)
$F_A = q_z G_h (EPA)_A$	14.716	lb	(w/ ice)
$F_A = q_z G_h (EPA)_A$	6.281	lb	(service)
Ice Weight	73.091	lb	
Total Weight	172.301	lb	(w/ ice)

Equations

$K_z = 2.01[z/z_g]^{(2/\alpha)}$	1.335		$K_{zmin} \le K_z \le 2.01$
$K_h = e^{[(f)(z)/H]}$	1.000		
$K_{zt} = [1+(K_c K_t)/K_h]^2$	1.000		
$K_{iz} = [z/33]^{(0.10)}$	1.146		$K_{iz} \le 1.4$
$t_{iz} = (t_i)(I)(K_{iz})(K_{zt})^{(0.35)}$	1.146	in	(w/ ice)
$C = (K_{zt}K_zK_e)^{0.5}(V)(D)$	103.374		(w/o ice)
$C = (K_{zt}K_zK_e)^{0.5}(V_i)(D)$	36.593		(w/ ice)
$C = (K_{zt}K_zK_e)^{0.5}(V)(D)$	27.445		(service)
G_h =	1.00		
K_d =	0.95		
K_s =	1.00		
K_a =	0.90		
$K_e = e^{-0.0000362zs}$	1.00		
$q_z = 0.00256K_zK_{zt}K_sK_eK_dV^2$	41.467	psf	(w/o ice)
$q_z = 0.00256K_zK_{zt}K_eK_dV_i^2$	5.196	psf	(w/ ice)
$q_z = 0.00256K_zK_{zt}K_sK_eK_dV_s^2$	2.923	psf	(service)

Position	1	x	1
		x	
		x	
		x	

Jacobs

WIND/ICE/SERVICE LOADING
ANTENNA MOUNTING SYSTEM
ANSI/TIA-222-H

Project Number:	EP5TRFWL
Site Name:	Tulip Ave
Engineer:	H. Bedane
Date:	05/05/2022
Carrier:	AT&T
Reviewed By:	B. Bartlett

Input Data

Front

Manufacturer	NOKIA		
Model #	AHLBA		
Length	28.7	in	
Width	15.35	in	
Depth	9.45	in	
Weight	101.4	lb	
Design Ice Thickness (t_i)	1	in	
Structure Type	B	(S, G, M, B)	
Structure Height (h)	112	ft	
Antenna Centerline (z)	129	ft	
Basic Wind Speed (V)	113	mph	(w/o ice)
Basic Wind Speed (V_i)	40	mph	(w/ ice)
Basic Wind Speed (V_s)	30	mph	(service)
Risk Category	II	(I, II, III, IV)	
Exposure Category	C	(B, C or D)	
Topographic Category	1	(1, 2, 3 or 4)	
Crest Height (H)	0	ft	
Shape	F	(R / F / S)	
Length / Width	1.870		(w/o ice)
Length / Width	1.757		(w/ ice)
C_a	1.200		(w/o ice)
C_a	1.200		(w/ ice)
C_a	1.200		(service)
$(EPA)_A$	3.304	ft^2	(w/o ice)
$(EPA)_A$	4.101	ft^2	(w/ ice)
$(EPA)_A$	3.304	ft^2	(service)
$F_A = q_z G_h (EPA)_A$	137.011	lb	(w/o ice)
$F_A = q_z G_h (EPA)_A$	21.307	lb	(w/ ice)
$F_A = q_z G_h (EPA)_A$	9.657	lb	(service)
Ice Weight	64.201	lb	
Total Weight	165.601	lb	(w/ ice)

Equations

$K_z = 2.01[z/z_g]^{(2/\alpha)}$	1.335		$K_{zmin} \le K_z \le 2.01$
$K_h = e^{[(f)(z)/H]}$	1.000		
$K_{zt} = [1+(K_c K_t)/K_h]^2$	1.000		
$K_{iz} = [z/33]^{(0.10)}$	1.146		$K_{iz} \le 1.4$
$t_{iz} = (t_i)(I)(K_{iz})(K_{zt})^{(0.35)}$	1.146	in	(w/ ice)
$C = (K_{zt}K_z K_e)^{0.5}(V)(D)$	167.031		(w/o ice)
$C = (K_{zt}K_z K_e)^{0.5}(V_i)(D)$	59.126		(w/ ice)
$C = (K_{zt}K_z K_e)^{0.5}(V)(D)$	44.345		(service)
G_h =	1.00		
K_d =	0.95		
K_s =	1.00		
K_a =	0.90		
$K_e = e^{-0.0000362zs}$	1.00		
$q_z = 0.00256 K_z K_{zt} K_s K_e K_d V^2$	41.47	psf	(w/o ice)
$q_z = 0.00256 K_z K_{zt} K_e K_d V_i^2$	5.20	psf	(w/ ice)
$q_z = 0.00256 K_z K_{zt} K_s K_e K_d V_s^2$	2.92	psf	(service)

Position		x
		x
		x
		x

Side

Manufacturer	NOKIA		
Model #	AHLBA		
Length	28.7	in	
Width	15.35	in	
Depth	9.45	in	
Weight	101.4	lb	
Design Ice Thickness (t_i)	1	in	
Structure Type	B	(S, G, M, B)	
Structure Height (h)	112	ft	
Antenna Centerline (z)	129	ft	
Basic Wind Speed (V)	113	mph	(w/o ice)
Basic Wind Speed (V_i)	40	mph	(w/ ice)
Basic Wind Speed (V_s)	30	mph	(service)
Risk Category	II	(I, II, III, IV)	
Exposure Category	C	(B, C or D)	
Topographic Category	1	(1, 2, 3 or 4)	
Crest Height (H)	0	ft	
Shape	F	(R / F / S)	
Length / Width	3.037		(w/o ice)
Length / Width	2.639		(w/ ice)
C_a	1.224		(w/o ice)
C_a	1.206		(w/ ice)
C_a	1.224		(service)
$(EPA)_A$	2.075	ft^2	(w/o ice)
$(EPA)_A$	2.743	ft^2	(w/ ice)
$(EPA)_A$	2.075	ft^2	(service)
$F_A = q_z G_h (EPA)_A$	86.027	lb	(w/o ice)
$F_A = q_z G_h (EPA)_A$	14.255	lb	(w/ ice)
$F_A = q_z G_h (EPA)_A$	6.063	lb	(service)
Ice Weight	64.201	lb	
Total Weight	165.601	lb	(w/ ice)

Equations

$K_z = 2.01[z/z_g]^{(2/\alpha)}$	1.335		$K_{zmin} \le K_z \le 2.01$
$K_h = e^{[(f)(z)/H]}$	1.000		
$K_{zt} = [1+(K_c K_t)/K_h]^2$	1.000		
$K_{iz} = [z/33]^{(0.10)}$	1.146		$K_{iz} \le 1.4$
$t_{iz} = (t_i)(I)(K_{iz})(K_{zt})^{(0.35)}$	1.146	in	(w/ ice)
$C = (K_{zt}K_z K_e)^{0.5}(V)(D)$	102.830		(w/o ice)
$C = (K_{zt}K_z K_e)^{0.5}(V_i)(D)$	36.400		(w/ ice)
$C = (K_{zt}K_z K_e)^{0.5}(V)(D)$	27.300		(service)
G_h =	1.00		
K_d =	0.95		
K_s =	1.00		
K_a =	0.90		
$K_e = e^{-0.0000362zs}$	1.00		
$q_z = 0.00256 K_z K_{zt} K_s K_e K_d V^2$	41.467	psf	(w/o ice)
$q_z = 0.00256 K_z K_{zt} K_e K_d V_i^2$	5.196	psf	(w/ ice)
$q_z = 0.00256 K_z K_{zt} K_s K_e K_d V_s^2$	2.923	psf	(service)

Position		x
		x
		x
		x

Jacobs

WIND/ICE/SERVICE LOADING
ANTENNA MOUNTING SYSTEM
ANSI/TIA-222-H

Project Number:	EP5TRFWL
Site Name:	Tulip Ave
Engineer:	H. Bedane
Date:	05/05/2022
Carrier:	AT&T
Reviewed By:	B. Bartlett

Input Data

Front

Manufacturer	NOKIA		
Model #	AHFIB		
Length	26.57	in	
Width	12.87	in	
Depth	6.5	in	
Weight	65	lb	
Design Ice Thickness (t_i)	1	in	
Structure Type	B	(S, G, M, B)	
Structure Height (h)	112	ft	
Antenna Centerline (z)	129	ft	
Basic Wind Speed (V)	113	mph	(w/o ice)
Basic Wind Speed (V_i)	40	mph	(w/ ice)
Basic Wind Speed (V_s)	30	mph	(service)
Risk Category	II	(I, II, III, IV)	
Exposure Category	C	(B, C or D)	
Topographic Category	1	(1, 2, 3 or 4)	
Crest Height (H)	0	ft	
Shape	F	(R / F / S)	
Length / Width	2.064		(w/o ice)
Length / Width	1.904		(w/ ice)
C_a	1.200		(w/o ice)
C_a	1.200		(w/ ice)
C_a	1.200		(service)
$(EPA)_A$	2.565	ft^2	(w/o ice)
$(EPA)_A$	3.282	ft^2	(w/ ice)
$(EPA)_A$	2.565	ft^2	(service)
$F_A = q_z G_h (EPA)_A$	106.350	lb	(w/o ice)
$F_A = q_z G_h (EPA)_A$	17.054	lb	(w/ ice)
$F_A = q_z G_h (EPA)_A$	7.496	lb	(service)
Ice Weight	48.253	lb	
Total Weight	113.253	lb	(w/ ice)

Equations

$K_z = 2.01[z/z_g]^{(2/\alpha)}$	1.335		$K_{zmin} \le K_z \le 2.01$
$K_h = e^{[(f)(z)/H]}$	1.000		
$K_{zt} = [1+(K_c K_t)/K_h]^2$	1.000		
$K_{iz} = [z/33]^{(0.10)}$	1.146		$K_{iz} \le 1.4$
$t_{iz} = (t_i)(I)(K_{iz})(K_{zt})^{(0.35)}$	1.146	in	(w/ ice)
$C = (K_{zt}K_zK_e)^{0.5}(V)(D)$	140.045		(w/o ice)
$C = (K_{zt}K_zK_e)^{0.5}(V_i)(D)$	49.574		(w/ ice)
$C = (K_{zt}K_zK_e)^{0.5}(V)(D)$	37.180		(service)
G_h =	1.00		
K_d =	0.95		
K_s =	1.00		
K_a =	0.90		
$K_e = e^{-0.0000362zs}$	1.00		
$q_z = 0.00256K_zK_{zt}K_sK_eK_dV^2$	41.47	psf	(w/o ice)
$q_z = 0.00256K_zK_{zt}K_eK_dV_i^2$	5.20	psf	(w/ ice)
$q_z = 0.00256K_zK_{zt}K_sK_eK_dV_s^2$	2.92	psf	(service)

Position		x
		x
		x
		x

Side

Manufacturer	NOKIA		
Model #	AHFIB		
Length	26.57	in	
Width	12.87	in	
Depth	6.5	in	
Weight	65	lb	
Design Ice Thickness (t_i)	1	in	
Structure Type	B	(S, G, M, B)	
Structure Height (h)	112	ft	
Antenna Centerline (z)	129	ft	
Basic Wind Speed (V)	113	mph	(w/o ice)
Basic Wind Speed (V_i)	40	mph	(w/ ice)
Basic Wind Speed (V_s)	30	mph	(service)
Risk Category	II	(I, II, III, IV)	
Exposure Category	C	(B, C or D)	
Topographic Category	1	(1, 2, 3 or 4)	
Crest Height (H)	0	ft	
Shape	F	(R / F / S)	
Length / Width	4.088		(w/o ice)
Length / Width	3.283		(w/ ice)
C_a	1.271		(w/o ice)
C_a	1.235		(w/ ice)
C_a	1.271		(service)
$(EPA)_A$	1.371	ft^2	(w/o ice)
$(EPA)_A$	1.958	ft^2	(w/ ice)
$(EPA)_A$	1.371	ft^2	(service)
$F_A = q_z G_h (EPA)_A$	56.870	lb	(w/o ice)
$F_A = q_z G_h (EPA)_A$	10.176	lb	(w/ ice)
$F_A = q_z G_h (EPA)_A$	4.008	lb	(service)
Ice Weight	48.253	lb	
Total Weight	113.253	lb	(w/ ice)

Equations

$K_z = 2.01[z/z_g]^{(2/\alpha)}$	1.335		$K_{zmin} \le K_z \le 2.01$
$K_h = e^{[(f)(z)/H]}$	1.000		
$K_{zt} = [1+(K_c K_t)/K_h]^2$	1.000		
$K_{iz} = [z/33]^{(0.10)}$	1.146		$K_{iz} \le 1.4$
$t_{iz} = (t_i)(I)(K_{iz})(K_{zt})^{(0.35)}$	1.146	in	(w/ ice)
$C = (K_{zt}K_zK_e)^{0.5}(V)(D)$	70.730		(w/o ice)
$C = (K_{zt}K_zK_e)^{0.5}(V_i)(D)$	25.037		(w/ ice)
$C = (K_{zt}K_zK_e)^{0.5}(V)(D)$	18.778		(service)
G_h =	1.00		
K_d =	0.95		
K_s =	1.00		
K_a =	0.90		
$K_e = e^{-0.0000362zs}$	1.00		
$q_z = 0.00256K_zK_{zt}K_sK_eK_dV^2$	41.467	psf	(w/o ice)
$q_z = 0.00256K_zK_{zt}K_eK_dV_i^2$	5.196	psf	(w/ ice)
$q_z = 0.00256K_zK_{zt}K_sK_eK_dV_s^2$	2.923	psf	(service)

Position		x
		x
		x
		x

Jacobs

WIND/ICE/SERVICE LOADING
ANTENNA MOUNTING SYSTEM
ANSI/TIA-222-H

Project Number:	EP5TRFWL
Site Name:	Tulip Ave
Engineer:	H. Bedane
Date:	05/05/2022
Carrier:	AT&T
Reviewed By:	B. Bartlett

Input Data

Front

Manufacturer	ALCATEL LUCENT		
Model #	RRH4X25-WCS-4R		
Length	31.5	in	
Width	11.8	in	
Depth	8.7	in	
Weight	70	lb	
Design Ice Thickness (t_i)	1	in	
Structure Type	B	(S, G, M, B)	
Structure Height (h)	112	ft	
Antenna Centerline (z)	129	ft	
Basic Wind Speed (V)	113	mph	(w/o ice)
Basic Wind Speed (V_i)	40	mph	(w/ ice)
Basic Wind Speed (V_s)	30	mph	(service)
Risk Category	II	(I, II, III, IV)	
Exposure Category	C	(B, C or D)	
Topographic Category	1	(1, 2, 3 or 4)	
Crest Height (H)	0	ft	
Shape	F	(R / F / S)	
Length / Width	2.669		(w/o ice)
Length / Width	2.398		(w/ ice)
C_a	1.208		(w/o ice)
C_a	1.200		(w/ ice)
C_a	1.208		(service)
$(EPA)_A$	2.805	ft^2	(w/o ice)
$(EPA)_A$	3.572	ft^2	(w/ ice)
$(EPA)_A$	2.805	ft^2	(service)
$F_A = q_z G_h (EPA)_A$	116.326	lb	(w/o ice)
$F_A = q_z G_h (EPA)_A$	18.558	lb	(w/ ice)
$F_A = q_z G_h (EPA)_A$	8.199	lb	(service)
Ice Weight	58.096	lb	
Total Weight	128.096	lb	(w/ ice)

Equations

$K_z = 2.01[z/z_g]^{(2/\alpha)}$	1.335		$K_{zmin} \le K_z \le 2.01$
$K_h = e^{[(f)(z)/H]}$	1.000		
$K_{zt} = [1+(K_c K_t)/K_h]^2$	1.000		
$K_{iz} = [z/33]^{(0.10)}$	1.146		$K_{iz} \le 1.4$
$t_{iz} = (t_i)(I)(K_{iz})(K_{zt})^{(0.35)}$	1.146	in	(w/ ice)
$C = (K_{zt}K_zK_e)^{0.5}(V)(D)$	128.402		(w/o ice)
$C = (K_{zt}K_zK_e)^{0.5}(V_i)(D)$	45.452		(w/ ice)
$C = (K_{zt}K_zK_e)^{0.5}(V)(D)$	34.089		(service)
G_h =	1.00		
K_d =	0.95		
K_s =	1.00		
K_a =	0.90		
$K_e = e^{-0.0000362zs}$	1.00		
$q_z = 0.00256K_zK_{zt}K_sK_eK_dV^2$	41.47	psf	(w/o ice)
$q_z = 0.00256K_zK_{zt}K_eK_dV_i^2$	5.20	psf	(w/ ice)
$q_z = 0.00256K_zK_{zt}K_sK_eK_dV_s^2$	2.92	psf	(service)

Position		x
		x
		x
		x

Side

Manufacturer	ALCATEL LUCENT		
Model #	RRH4X25-WCS-4R		
Length	31.5	in	
Width	11.8	in	
Depth	8.7	in	
Weight	70	lb	
Design Ice Thickness (t_i)	1	in	
Structure Type	B	(S, G, M, B)	
Structure Height (h)	112	ft	
Antenna Centerline (z)	129	ft	
Basic Wind Speed (V)	113	mph	(w/o ice)
Basic Wind Speed (V_i)	40	mph	(w/ ice)
Basic Wind Speed (V_s)	30	mph	(service)
Risk Category	II	(I, II, III, IV)	
Exposure Category	C	(B, C or D)	
Topographic Category	1	(1, 2, 3 or 4)	
Crest Height (H)	0	ft	
Shape	F	(R / F / S)	
Length / Width	3.621		(w/o ice)
Length / Width	3.074		(w/ ice)
C_a	1.250		(w/o ice)
C_a	1.226		(w/ ice)
C_a	1.250		(service)
$(EPA)_A$	2.141	ft^2	(w/o ice)
$(EPA)_A$	2.845	ft^2	(w/ ice)
$(EPA)_A$	2.141	ft^2	(service)
$F_A = q_z G_h (EPA)_A$	88.768	lb	(w/o ice)
$F_A = q_z G_h (EPA)_A$	14.783	lb	(w/ ice)
$F_A = q_z G_h (EPA)_A$	6.257	lb	(service)
Ice Weight	58.096	lb	
Total Weight	128.096	lb	(w/ ice)

Equations

$K_z = 2.01[z/z_g]^{(2/\alpha)}$	1.335		$K_{zmin} \le K_z \le 2.01$
$K_h = e^{[(f)(z)/H]}$	1.000		
$K_{zt} = [1+(K_c K_t)/K_h]^2$	1.000		
$K_{iz} = [z/33]^{(0.10)}$	1.146		$K_{iz} \le 1.4$
$t_{iz} = (t_i)(I)(K_{iz})(K_{zt})^{(0.35)}$	1.146	in	(w/ ice)
$C = (K_{zt}K_zK_e)^{0.5}(V)(D)$	94.669		(w/o ice)
$C = (K_{zt}K_zK_e)^{0.5}(V_i)(D)$	33.511		(w/ ice)
$C = (K_{zt}K_zK_e)^{0.5}(V)(D)$	25.133		(service)
G_h =	1.00		
K_d =	0.95		
K_s =	1.00		
K_a =	0.90		
$K_e = e^{-0.0000362zs}$	1.00		
$q_z = 0.00256K_zK_{zt}K_sK_eK_dV^2$	41.467	psf	(w/o ice)
$q_z = 0.00256K_zK_{zt}K_eK_dV_i^2$	5.196	psf	(w/ ice)
$q_z = 0.00256K_zK_{zt}K_sK_eK_dV_s^2$	2.923	psf	(service)

Position		x
		x
		x
		x

Jacobs

WIND/ICE/SERVICE LOADING
ANTENNA MOUNTING SYSTEM
ANSI/TIA-222-H

Project Number:	EP5TRFWL
Site Name:	Tulip Ave
Engineer:	H. Bedane
Date:	05/05/2022
Carrier:	AT&T
Reviewed By:	B. Bartlett

Input Data

Front

Manufacturer	NOKIA		
Model #	AHBCB		
Length	22.05	in	
Width	12.13	in	
Depth	7.44	in	
Weight	85.98	lb	
Design Ice Thickness (t_i)	1	in	
Structure Type	B	(S, G, M, B)	
Structure Height (h)	112	ft	
Antenna Centerline (z)	129	ft	
Basic Wind Speed (V)	113	mph	(w/o ice)
Basic Wind Speed (V_i)	40	mph	(w/ ice)
Basic Wind Speed (V_s)	30	mph	(service)
Risk Category	II	(I, II, III, IV)	
Exposure Category	C	(B, C or D)	
Topographic Category	1	(1, 2, 3 or 4)	
Crest Height (H)	0	ft	
Shape	F	(R / F / S)	
Length / Width	1.818		(w/o ice)
Length / Width	1.688		(w/ ice)
C_a	1.200		(w/o ice)
C_a	1.200		(w/ ice)
C_a	1.200		(service)
$(EPA)_A$	2.006	ft^2	(w/o ice)
$(EPA)_A$	2.633	ft^2	(w/ ice)
$(EPA)_A$	2.006	ft^2	(service)
$F_A = q_z G_h (EPA)_A$	83.183	lb	(w/o ice)
$F_A = q_z G_h (EPA)_A$	13.681	lb	(w/ ice)
$F_A = q_z G_h (EPA)_A$	5.863	lb	(service)
Ice Weight	39.560	lb	
Total Weight	125.540	lb	(w/ ice)

Equations

$K_z = 2.01[z/z_g]^{(2/\alpha)}$	1.335		$K_{zmin} \le K_z \le 2.01$
$K_h = e^{[(f)(z)/H]}$	1.000		
$K_{zt} = [1+(K_c K_t)/K_h]^2$	1.000		
$K_{iz} = [z/33]^{(0.10)}$	1.146		$K_{iz} \le 1.4$
$t_{iz} = (t_i)(I)(K_{iz})(K_{zt})^{(0.35)}$	1.146	in	(w/ ice)
$C = (K_{zt}K_zK_e)^{0.5}(V)(D)$	131.993		(w/o ice)
$C = (K_{zt}K_zK_e)^{0.5}(V_i)(D)$	46.723		(w/ ice)
$C = (K_{zt}K_zK_e)^{0.5}(V)(D)$	35.042		(service)
G_h =	1.00		
K_d =	0.95		
K_s =	1.00		
K_a =	0.90		
$K_e = e^{-0.0000362zs}$	1.00		
$q_z = 0.00256K_zK_{zt}K_sK_eK_dV^2$	41.47	psf	(w/o ice)
$q_z = 0.00256K_zK_{zt}K_eK_dV_i^2$	5.20	psf	(w/ ice)
$q_z = 0.00256K_zK_{zt}K_sK_eK_dV_s^2$	2.92	psf	(service)

Position		x
		x
		x
		x

Side

Manufacturer	NOKIA		
Model #	AHBCB		
Length	22.05	in	
Width	12.13	in	
Depth	7.44	in	
Weight	85.98	lb	
Design Ice Thickness (t_i)	1	in	
Structure Type	B	(S, G, M, B)	
Structure Height (h)	112	ft	
Antenna Centerline (z)	129	ft	
Basic Wind Speed (V)	113	mph	(w/o ice)
Basic Wind Speed (V_i)	40	mph	(w/ ice)
Basic Wind Speed (V_s)	30	mph	(service)
Risk Category	II	(I, II, III, IV)	
Exposure Category	C	(B, C or D)	
Topographic Category	1	(1, 2, 3 or 4)	
Crest Height (H)	0	ft	
Shape	F	(R / F / S)	
Length / Width	2.964		(w/o ice)
Length / Width	2.501		(w/ ice)
C_a	1.221		(w/o ice)
C_a	1.200		(w/ ice)
C_a	1.221		(service)
$(EPA)_A$	1.252	ft^2	(w/o ice)
$(EPA)_A$	1.777	ft^2	(w/ ice)
$(EPA)_A$	1.252	ft^2	(service)
$F_A = q_z G_h (EPA)_A$	51.897	lb	(w/o ice)
$F_A = q_z G_h (EPA)_A$	9.232	lb	(w/ ice)
$F_A = q_z G_h (EPA)_A$	3.658	lb	(service)
Ice Weight	39.560	lb	
Total Weight	125.540	lb	(w/ ice)

Equations

$K_z = 2.01[z/z_g]^{(2/\alpha)}$	1.335		$K_{zmin} \le K_z \le 2.01$
$K_h = e^{[(f)(z)/H]}$	1.000		
$K_{zt} = [1+(K_c K_t)/K_h]^2$	1.000		
$K_{iz} = [z/33]^{(0.10)}$	1.146		$K_{iz} \le 1.4$
$t_{iz} = (t_i)(I)(K_{iz})(K_{zt})^{(0.35)}$	1.146	in	(w/ ice)
$C = (K_{zt}K_zK_e)^{0.5}(V)(D)$	80.959		(w/o ice)
$C = (K_{zt}K_zK_e)^{0.5}(V_i)(D)$	28.658		(w/ ice)
$C = (K_{zt}K_zK_e)^{0.5}(V)(D)$	21.493		(service)
G_h =	1.00		
K_d =	0.95		
K_s =	1.00		
K_a =	0.90		
$K_e = e^{-0.0000362zs}$	1.00		
$q_z = 0.00256K_zK_{zt}K_sK_eK_dV^2$	41.467	psf	(w/o ice)
$q_z = 0.00256K_zK_{zt}K_eK_dV_i^2$	5.196	psf	(w/ ice)
$q_z = 0.00256K_zK_{zt}K_sK_eK_dV_s^2$	2.923	psf	(service)

Position		x
		x
		x
		x

Jacobs

WIND/ICE/SERVICE LOADING
ANTENNA MOUNTING SYSTEM
ANSI/TIA-222-H

Project Number:	EP5TRFWL
Site Name:	Tulip Ave
Engineer:	H. Bedane
Date:	05/05/2022
Carrier:	AT&T
Reviewed By:	B. Bartlett

Input Data

Front

Manufacturer	RAYCAP		
Model #	DC9-48-60-24-8C-EV		
Length	31.41	in	
Width	10.24	in	
Depth	18.28	in	
Weight	26.2	lb	
Design Ice Thickness (t_i)	1	in	
Structure Type	B	(S, G, M, B)	
Structure Height (h)	112	ft	
Antenna Centerline (z)	129	ft	
Basic Wind Speed (V)	113	mph	(w/o ice)
Basic Wind Speed (V_i)	40	mph	(w/ ice)
Basic Wind Speed (V_s)	30	mph	(service)
Risk Category	II	(I, II, III, IV)	
Exposure Category	C	(B, C or D)	
Topographic Category	1	(1, 2, 3 or 4)	
Crest Height (H)	0	ft	
Shape	F	(R / F / S)	
Length / Width	3.067		(w/o ice)
Length / Width	2.689		(w/ ice)
C_a	1.225		(w/o ice)
C_a	1.208		(w/ ice)
C_a	1.225		(service)
$(EPA)_A$	2.463	ft^2	(w/o ice)
$(EPA)_A$	3.190	ft^2	(w/ ice)
$(EPA)_A$	2.463	ft^2	(service)
$F_A = q_z G_h (EPA)_A$	102.133	lb	(w/o ice)
$F_A = q_z G_h (EPA)_A$	16.575	lb	(w/ ice)
$F_A = q_z G_h (EPA)_A$	7.199	lb	(service)
Ice Weight	80.991	lb	
Total Weight	107.191	lb	(w/ ice)

Equations

$K_z = 2.01[z/z_g]^{(2/\alpha)}$	1.335		$K_{zmin} \le K_z \le 2.01$
$K_h = e^{[(f)(z)/H]}$	1.000		
$K_{zt} = [1+(K_c K_t)/K_h]^2$	1.000		
$K_{iz} = [z/33]^{(0.10)}$	1.146		$K_{iz} \le 1.4$
$t_{iz} = (t_i)(I)(K_{iz})(K_{zt})^{(0.35)}$	1.146	in	(w/ ice)
$C = (K_{zt}K_zK_e)^{0.5}(V)(D)$	111.427		(w/o ice)
$C = (K_{zt}K_zK_e)^{0.5}(V_i)(D)$	39.443		(w/ ice)
$C = (K_{zt}K_zK_e)^{0.5}(V)(D)$	29.582		(service)
G_h =	1.00		
K_d =	0.95		
K_s =	1.00		
K_a =	0.90		
$K_e = e^{-0.0000362zs}$	1.00		
$q_z = 0.00256K_zK_{zt}K_sK_eK_dV^2$	41.47	psf	(w/o ice)
$q_z = 0.00256K_zK_{zt}K_eK_dV_i^2$	5.20	psf	(w/ ice)
$q_z = 0.00256K_zK_{zt}K_sK_eK_dV_s^2$	2.92	psf	(service)

Position		x
		x
		x
		x

Side

Manufacturer	RAYCAP		
Model #	DC9-48-60-24-8C-EV		
Length	31.41	in	
Width	10.24	in	
Depth	18.28	in	
Weight	26.2	lb	
Design Ice Thickness (t_i)	1	in	
Structure Type	B	(S, G, M, B)	
Structure Height (h)	112	ft	
Antenna Centerline (z)	129	ft	
Basic Wind Speed (V)	113	mph	(w/o ice)
Basic Wind Speed (V_i)	40	mph	(w/ ice)
Basic Wind Speed (V_s)	30	mph	(service)
Risk Category	II	(I, II, III, IV)	
Exposure Category	C	(B, C or D)	
Topographic Category	1	(1, 2, 3 or 4)	
Crest Height (H)	0	ft	
Shape	F	(R / F / S)	
Length / Width	1.718		(w/o ice)
Length / Width	1.638		(w/ ice)
C_a	1.200		(w/o ice)
C_a	1.200		(w/ ice)
C_a	1.200		(service)
$(EPA)_A$	4.306	ft^2	(w/o ice)
$(EPA)_A$	5.200	ft^2	(w/ ice)
$(EPA)_A$	4.306	ft^2	(service)
$F_A = q_z G_h (EPA)_A$	178.571	lb	(w/o ice)
$F_A = q_z G_h (EPA)_A$	27.019	lb	(w/ ice)
$F_A = q_z G_h (EPA)_A$	12.586	lb	(service)
Ice Weight	80.991	lb	
Total Weight	107.191	lb	(w/ ice)

Equations

$K_z = 2.01[z/z_g]^{(2/\alpha)}$	1.335		$K_{zmin} \le K_z \le 2.01$
$K_h = e^{[(f)(z)/H]}$	1.000		
$K_{zt} = [1+(K_c K_t)/K_h]^2$	1.000		
$K_{iz} = [z/33]^{(0.10)}$	1.146		$K_{iz} \le 1.4$
$t_{iz} = (t_i)(I)(K_{iz})(K_{zt})^{(0.35)}$	1.146	in	(w/ ice)
$C = (K_{zt}K_zK_e)^{0.5}(V)(D)$	198.914		(w/o ice)
$C = (K_{zt}K_zK_e)^{0.5}(V_i)(D)$	70.412		(w/ ice)
$C = (K_{zt}K_zK_e)^{0.5}(V)(D)$	52.809		(service)
G_h =	1.00		
K_d =	0.95		
K_s =	1.00		
K_a =	0.90		
$K_e = e^{-0.0000362zs}$	1.00		
$q_z = 0.00256K_zK_{zt}K_sK_eK_dV^2$	41.467	psf	(w/o ice)
$q_z = 0.00256K_zK_{zt}K_eK_dV_i^2$	5.196	psf	(w/ ice)
$q_z = 0.00256K_zK_{zt}K_sK_eK_dV_s^2$	2.923	psf	(service)

Position		x
		x
		x
		x

Jacobs

WIND/ICE/SERVICE LOADING
ANTENNA MOUNTING SYSTEM
ANSI/TIA-222-H

Project Number:	EP5TRFWL
Site Name:	Tulip Ave
Engineer:	H. Bedane
Date:	05/05/2022
Carrier:	AT&T
Reviewed By:	B. Bartlett

Input Data

Front

Member Size	Antenna Pipe A Pipe 2.0		
Length	96	in	
Width	2.38	in	
Depth	2.38	in	
Weight	0	lb/ft	
Design Ice Thickness (t_i)	1	in	
Structure Type	B	(S, G, M, B)	
Structure Height (h)	112	ft	
Antenna Centerline (z)	129	ft	
Basic Wind Speed (V)	113	mph	(w/o ice)
Basic Wind Speed (V_i)	40	mph	(w/ ice)
Basic Wind Speed (V_s)	30	mph	(service)
Risk Category	II	(I, II, III, IV)	
Exposure Category	C	(B, C or D)	
Topographic Category	1	(1, 2, 3 or 4)	
Crest Height (H)	0	ft	
Shape	R	(R / F / S)	
Length / Width	40.336		(w/o ice)
Length / Width	21.038		(w/ ice)
C_a	1.200		(w/o ice)
C_a	1.112		(w/ ice)
C_a	1.200		(service)
$(EPA)_A$	1.714	ft^2	(w/o ice)
$(EPA)_A$	3.192	ft^2	(w/ ice)
$(EPA)_A$	1.714	ft^2	(service)
$F_A = q_z G_h (EPA)_A$	0.740	lb/in	(w/o ice)
$F_A = q_z G_h (EPA)_A$	0.173	lb/in	(w/ ice)
$F_A = q_z G_h (EPA)_A$	0.052	lb/in	(service)
Ice Weight	0.526	lb/in	
Weight	0.526	lb/in	(w/ ice)

Equations

$K_z = 2.01[z/z_g]^{(2/\alpha)}$	1.335		$K_{zmin} \le K_z \le 2.01$
$K_h = e^{[(f)(z)/H]}$	1.000		
$K_{zt} = [1+(K_c K_t)/K_h]^2$	1.000		
$K_{iz} = [z/33]^{(0.10)}$	1.146		$K_{iz} \le 1.4$
$t_{iz} = (t_i)(I)(K_{iz})(K_{zt})^{(0.35)}$	1.146	in	(w/ ice)
$C = (K_{zt}K_zK_e)^{0.5}(V)(D)$	25.898		(w/o ice)
$C = (K_{zt}K_zK_e)^{0.5}(V_i)(D)$	9.167		(w/ ice)
$C = (K_{zt}K_zK_e)^{0.5}(V)(D)$	6.876		(service)
G_h =	1.00		
K_d =	0.95		
K_s =	1.00		
K_a =	0.90		
$K_e = e^{-0.0000362zs}$	1.00		
$q_z = 0.00256K_zK_{zt}K_sK_eK_dV^2$	41.47	psf	(w/o ice)
$q_z = 0.00256K_zK_{zt}K_eK_dV_i^2$	5.20	psf	(w/ ice)
$q_z = 0.00256K_zK_{zt}K_sK_eK_dV_s^2$	2.92	psf	(service)
Quantity	6		(18 max)

Side

Member Size	Antenna Pipe A Pipe 2.0		
Length	96	in	
Width	2.38	in	
Depth	2.38	in	
Weight	0	lb/ft	
Design Ice Thickness (t_i)	1	in	
Structure Type	B	(S, G, M, B)	
Structure Height (h)	112	ft	
Antenna Centerline (z)	129	ft	
Basic Wind Speed (V)	113	mph	(w/o ice)
Basic Wind Speed (V_i)	40	mph	(w/ ice)
Basic Wind Speed (V_s)	30	mph	(service)
Risk Category	II	(I, II, III, IV)	
Exposure Category	C	(B, C or D)	
Topographic Category	1	(1, 2, 3 or 4)	
Crest Height (H)	0	ft	
Shape	R	(R / F / S)	
Length / Width	40.336		(w/o ice)
Length / Width	21.038		(w/ ice)
C_a	1.200		(w/o ice)
C_a	1.112		(w/ ice)
C_a	1.200		(service)
$(EPA)_A$	1.714	ft^2	(w/o ice)
$(EPA)_A$	3.192	ft^2	(w/ ice)
$(EPA)_A$	1.714	ft^2	(service)
$F_A = q_z G_h (EPA)_A$	0.740	lb/in	(w/o ice)
$F_A = q_z G_h (EPA)_A$	0.173	lb/in	(w/ ice)
$F_A = q_z G_h (EPA)_A$	0.052	lb/in	(service)
Ice Weight	0.526	lb/in	
Weight	0.526	lb/in	(w/ ice)

Equations

$K_z = 2.01[z/z_g]^{(2/\alpha)}$	1.335		$K_{zmin} \le K_z \le 2.01$
$K_h = e^{[(f)(z)/H]}$	1.000		
$K_{zt} = [1+(K_c K_t)/K_h]^2$	1.000		
$K_{iz} = [z/33]^{(0.10)}$	1.146		$K_{iz} \le 1.4$
$t_{iz} = (t_i)(I)(K_{iz})(K_{zt})^{(0.35)}$	1.146	in	(w/ ice)
$C = (K_{zt}K_zK_e)^{0.5}(V)(D)$	25.898		(w/o ice)
$C = (K_{zt}K_zK_e)^{0.5}(V_i)(D)$	9.167		(w/ ice)
$C = (K_{zt}K_zK_e)^{0.5}(V)(D)$	6.876		(service)
G_h =	1.00		
K_d =	0.95		
K_s =	1.00		
K_a =	0.90		
$K_e = e^{-0.0000362zs}$	1.00		
$q_z = 0.00256K_zK_{zt}K_sK_eK_dV^2$	41.467	psf	(w/o ice)
$q_z = 0.00256K_zK_{zt}K_eK_dV_i^2$	5.196	psf	(w/ ice)
$q_z = 0.00256K_zK_{zt}K_sK_eK_dV_s^2$	2.923	psf	(service)
Quantity	6		(18 max)

Jacobs

WIND/ICE/SERVICE LOADING
ANTENNA MOUNTING SYSTEM
ANSI/TIA-222-H

Project Number:	EP5TRFWL
Site Name:	Tulip Ave
Engineer:	H. Bedane
Date:	05/05/2022
Carrier:	AT&T
Reviewed By:	B. Bartlett

Input Data

Front

Member Size	Antenna Pipe B Pipe 3.0		
Length	120	in	
Width	3.5	in	
Depth	3.5	in	
Weight	0	lb/ft	
Design Ice Thickness (t_i)	1	in	
Structure Type	B	(S, G, M, B)	
Structure Height (h)	112	ft	
Antenna Centerline (z)	129	ft	
Basic Wind Speed (V)	113	mph	(w/o ice)
Basic Wind Speed (V_i)	40	mph	(w/ ice)
Basic Wind Speed (V_s)	30	mph	(service)
Risk Category	II	(I, II, III, IV)	
Exposure Category	C	(B, C or D)	
Topographic Category	1	(1, 2, 3 or 4)	
Crest Height (H)	0	ft	
Shape	R	(R / F / S)	
Length / Width	34.286		(w/o ice)
Length / Width	21.114		(w/ ice)
C_a	1.200		(w/o ice)
C_a	1.114		(w/ ice)
C_a	1.200		(service)
$(EPA)_A$	3.150	ft^2	(w/o ice)
$(EPA)_A$	4.930	ft^2	(w/ ice)
$(EPA)_A$	3.150	ft^2	(service)
$F_A = q_z G_h (EPA)_A$	1.089	lb/in	(w/o ice)
$F_A = q_z G_h (EPA)_A$	0.213	lb/in	(w/ ice)
$F_A = q_z G_h (EPA)_A$	0.077	lb/in	(service)
Ice Weight	0.711	lb/in	
Weight	0.711	lb/in	(w/ ice)

Equations

$K_z = 2.01[z/z_g]^{(2/\alpha)}$	1.335		$K_{zmin} \le K_z \le 2.01$
$K_h = e^{[(f)(z)/H]}$	1.000		
$K_{zt} = [1+(K_c K_t)/K_h]^2$	1.000		
$K_{iz} = [z/33]^{(0.10)}$	1.146		$K_{iz} \le 1.4$
$t_{iz} = (t_i)(I)(K_{iz})(K_{zt})^{(0.35)}$	1.146	in	(w/ ice)
$C = (K_{zt}K_zK_e)^{0.5}(V)(D)$	38.085		(w/o ice)
$C = (K_{zt}K_zK_e)^{0.5}(V_i)(D)$	13.482		(w/ ice)
$C = (K_{zt}K_zK_e)^{0.5}(V)(D)$	10.111		(service)
G_h =	1.00		
K_d =	0.95		
K_s =	1.00		
K_a =	0.90		
$K_e = e^{-0.0000362zs}$	1.00		
$q_z = 0.00256K_zK_{zt}K_sK_eK_dV^2$	41.47	psf	(w/o ice)
$q_z = 0.00256K_zK_{zt}K_eK_dV_i^2$	5.20	psf	(w/ ice)
$q_z = 0.00256K_zK_{zt}K_sK_eK_dV_s^2$	2.92	psf	(service)
Quantity	3		(18 max)

Side

Member Size	Antenna Pipe B Pipe 3.0		
Length	120	in	
Width	3.5	in	
Depth	3.5	in	
Weight	0	lb/ft	
Design Ice Thickness (t_i)	1	in	
Structure Type	B	(S, G, M, B)	
Structure Height (h)	112	ft	
Antenna Centerline (z)	129	ft	
Basic Wind Speed (V)	113	mph	(w/o ice)
Basic Wind Speed (V_i)	40	mph	(w/ ice)
Basic Wind Speed (V_s)	30	mph	(service)
Risk Category	II	(I, II, III, IV)	
Exposure Category	C	(B, C or D)	
Topographic Category	1	(1, 2, 3 or 4)	
Crest Height (H)	0	ft	
Shape	R	(R / F / S)	
Length / Width	34.286		(w/o ice)
Length / Width	21.114		(w/ ice)
C_a	1.200		(w/o ice)
C_a	1.114		(w/ ice)
C_a	1.200		(service)
$(EPA)_A$	3.150	ft^2	(w/o ice)
$(EPA)_A$	4.930	ft^2	(w/ ice)
$(EPA)_A$	3.150	ft^2	(service)
$F_A = q_z G_h (EPA)_A$	1.089	lb/in	(w/o ice)
$F_A = q_z G_h (EPA)_A$	0.213	lb/in	(w/ ice)
$F_A = q_z G_h (EPA)_A$	0.077	lb/in	(service)
Ice Weight	0.711	lb/in	
Weight	0.711	lb/in	(w/ ice)

Equations

$K_z = 2.01[z/z_g]^{(2/\alpha)}$	1.335		$K_{zmin} \le K_z \le 2.01$
$K_h = e^{[(f)(z)/H]}$	1.000		
$K_{zt} = [1+(K_c K_t)/K_h]^2$	1.000		
$K_{iz} = [z/33]^{(0.10)}$	1.146		$K_{iz} \le 1.4$
$t_{iz} = (t_i)(I)(K_{iz})(K_{zt})^{(0.35)}$	1.146	in	(w/ ice)
$C = (K_{zt}K_zK_e)^{0.5}(V)(D)$	38.085		(w/o ice)
$C = (K_{zt}K_zK_e)^{0.5}(V_i)(D)$	13.482		(w/ ice)
$C = (K_{zt}K_zK_e)^{0.5}(V)(D)$	10.111		(service)
G_h =	1.00		
K_d =	0.95		
K_s =	1.00		
K_a =	0.90		
$K_e = e^{-0.0000362zs}$	1.00		
$q_z = 0.00256K_zK_{zt}K_sK_eK_dV^2$	41.467	psf	(w/o ice)
$q_z = 0.00256K_zK_{zt}K_eK_dV_i^2$	5.196	psf	(w/ ice)
$q_z = 0.00256K_zK_{zt}K_sK_eK_dV_s^2$	2.923	psf	(service)
Quantity	3		(18 max)

MODEL	QUANTITY	DEAD LOAD	DEAD LOAD (ICE)	WIND LOAD (NO ICE) FRONT	WIND LOAD (NO ICE) SIDE	WIND LOAD (ICE) FRONT	WIND LOAD (ICE) SIDE	WIND LOAD (SERVICE) FRONT	WIND LOAD (SERVICE) SIDE	SEISMIC LOAD (VERTICAL)	SEISMIC LOAD (LATERAL) FRONT	SEISMIC LOAD (LATERAL) SIDE
AEQK	1	-99.21	-73.3	162.7	89.5	24.8	14.8	11.5	6.3	0.0	0.0	0.0
AEQU	1	-99.21	-73.1	162.4	89.1	24.8	14.7	11.4	6.3	0.0	0.0	0.0
NNHH-65A-R4	1	-67.2	-143.0	339.7	156.2	49.2	25.2	23.9	11.0	0.0	0.0	0.0
NNHH-65A-R4	1	-67.2	-143.0	339.7	156.2	49.2	25.2	23.9	11.0	0.0	0.0	0.0

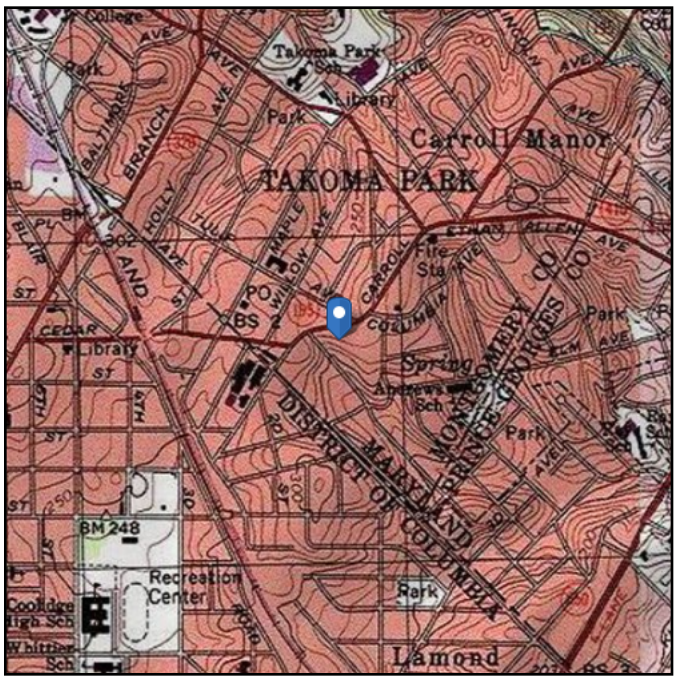
TYPE	QUANTITY	MEMBER	DEAD LOAD (ICE)	WIND LOAD (NO ICE) FRONT	WIND LOAD (NO ICE) SIDE	WIND LOAD (ICE) FRONT	WIND LOAD (ICE) SIDE	WIND LOAD (SERVICE) FRONT	WIND LOAD (SERVICE) SIDE
Antenna Pipe A	1	1	-0.526	0.740	0.740	0.173	0.173	0.052	0.052
Antenna Pipe A	1	2	-0.526	0.740	0.740	0.173	0.173	0.052	0.052
Antenna Pipe A	1	3	-0.526	0.740	0.740	0.173	0.173	0.052	0.052
Antenna Pipe A	1	4	-0.526	0.740	0.740	0.173	0.173	0.052	0.052
Antenna Pipe A	1	5	-0.526	0.740	0.740	0.173	0.173	0.052	0.052
Antenna Pipe A	1	6	-0.526	0.740	0.740	0.173	0.173	0.052	0.052
Antenna Pipe B	1	1	-0.711	1.089	1.089	0.213	0.213	0.077	0.077
Antenna Pipe B	1	2	-0.711	1.089	1.089	0.213	0.213	0.077	0.077
Antenna Pipe B	1	3	-0.711	1.089	1.089	0.213	0.213	0.077	0.077

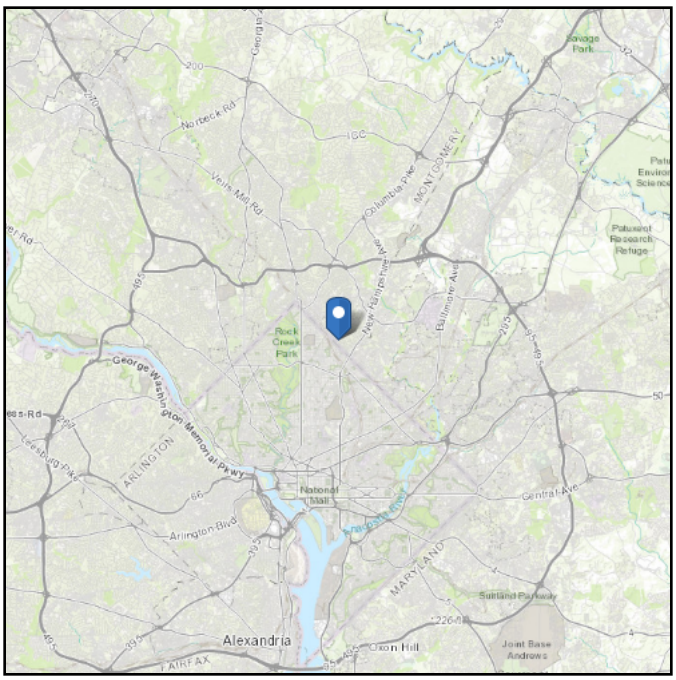
ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-16
Risk Category: II
Soil Class: D - Default (see Section 11.4.3)

Elevation: 282.09 ft (NAVD 88)
Latitude: 38.974747
Longitude: -77.010437





Wind

Results:

Wind Speed	113 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	89 Vmph
100-year MRI	95 Vmph

Data Source: ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed: Thu May 05 2022

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 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is not in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2.

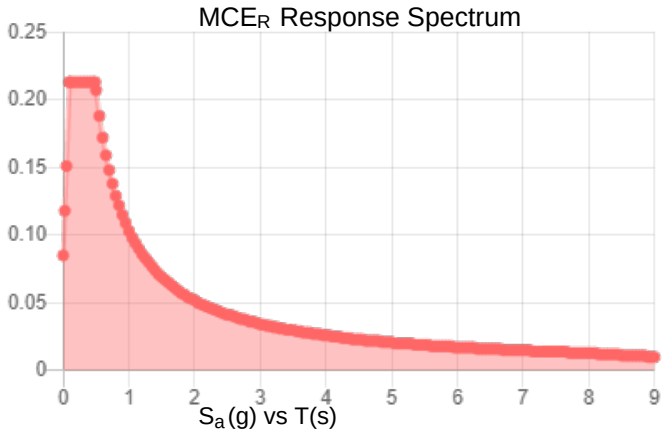
Seismic

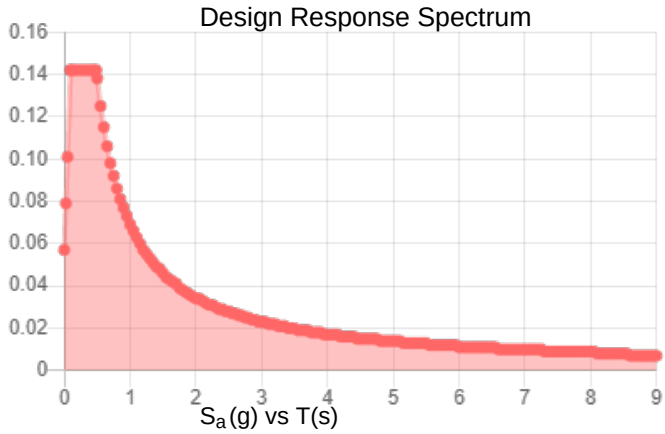
Site Soil Class: D - Default (see Section 11.4.3)

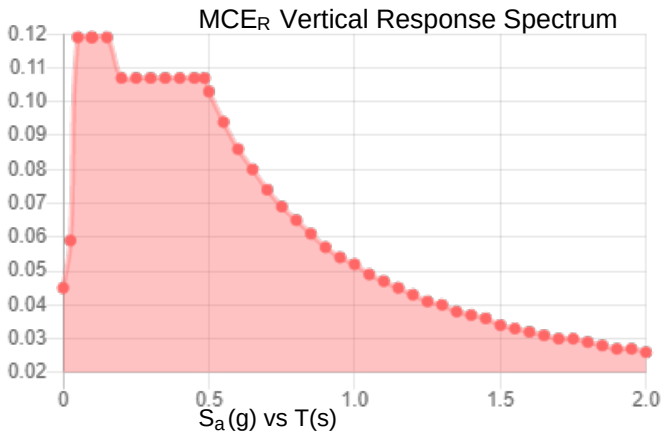
Results:

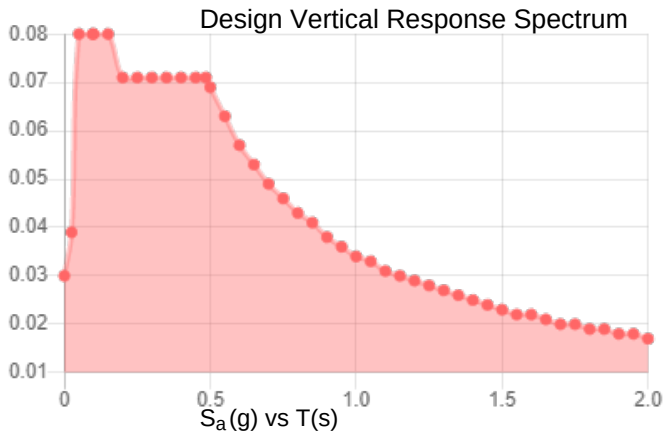
S_S :	0.133	S_{D1} :	0.069
S_1 :	0.043	T_L :	8
F_a :	1.6	PGA :	0.069
F_v :	2.4	PGA_M :	0.11
S_{MS} :	0.213	F_{PGA} :	1.6
S_{M1} :	0.103	I_e :	1
S_{DS} :	0.142	C_v :	0.7

Seismic Design Category B









Data Accessed: **Thu May 05 2022**

Date Source:

USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness:	1.00 in.
Concurrent Temperature:	15 F
Gust Speed	40 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Thu May 05 2022

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 500-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.

Historic Area Work Permit 1015296
7051 Carroll Ave, Takoma Park, MD 20912

Written Scope of Work

Antenna Equipment

- Decom (4) existing 1-5/8” coax and leave in place
- Decom (2) existing 7/8” coax and leave in place
- Remove (3) existing Kathrein 742 264 Antennas
- Remove existing TMA/Diplexers in Pos. 1
- Use existing space 6 AWG DC Trunks

- Install (3) proposed AEQK Antennas in Pos. 1
- Install (3) proposed AEQU Antennas in Pos. 1

Cabinet Equipment

- Decom existing UMTS
- Remove existing 9412 Cabinet
- Relocate everything inside the existing 9412 Cabinet to the proposed FLX21-V2 Cabinet

- Install (1) proposed 48V Rectifier in existing Netsure 7100 PP
- Install (4) proposed DEKA Fahrenheit HT170ET Batteries
- Install (1) proposed FLX21-V2 Cabinet
- Install (1) proposed FSM4 inside proposed FL21-V2 Cabinet
- Install (1) proposed 100A breaker
- Install (6) proposed 40A breakers
- Install (2) proposed 30A breakers