Transcend Wireless

10 Industrial Ave,
Suite 3
Mahwah NJ 07430

Phone: 201.684.0055
Fax: 201.684.0066

August 23, 2023

Members of the Siting Council
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

RE: Notice of Exempt Modification
60 Hosley Avenue, Branford, CT 06405
Latitude: 41.283325
Longitude: -72.8494
T-Mobile Site#: CT11024B – Anchor

Dear Ms. Bachman:

T-Mobile currently maintains nine (9) antennas at the 150-foot level of the existing 150-foot monopole at 60 Hosley Avenue in Branford, CT. The 150-foot monopole and property are owned by National Railroad Passenger Corporation (Amtrak). T-Mobile now intends to remove six (6) existing antennas and replace with (3) 2500 MHz antennas. The new antennas will be installed at the same 150-foot level of the tower. The new antennas will support 5G services.

Planned Modifications:
Tower:

Remove
(3) AIR 32 Antennas
(6) 1-1/4" Coax Cables
(1) 1-5/8" Hybrid Cable
(3) TMAs

Remove and Replace:
(3) AIR 21 for (3) AIR 6419 2500 MHz Antennas

Install New:
(3) 4460 RRUs
(2) 1-5/8" Hybrid Cables

Existing to Remain:
(3) APXVAARR24_43-U-NA20
(3) Radio 4449 RRU
(2) 1-5/8" Hybrid

Ground:
Add:
5'8" X 3' Concrete Pad Extension
6160 Cabinet
B160 Battery Cabinet

This facility was not originally approved by the Connecticut Siting Council. Per the enclosed correspondence with the Town of Branford, the jurisdiction does not have any records of previous approvals for this facility.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies§ 16- SOj-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.SA. § 16-SOj-73, a copy of this letter is being sent to First Selectman – James Cosgrove, Elected Official, and Harry Smith, Town Planner for the Town of Branford, as well as the owner (Amtrak).

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S;A. § 16-50j-72(b)(2).

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

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

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

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

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

For the foregoing reasons, T-Mobile respectfully submits that the proposed modifications to the above referenced telecommunications facility constitute an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Kyle Richers
Transcend Wireless
Cell: 908-447-4716
Email: krichers@transcendwireless.com

Attachments
cc: James Cosgrove – First Selectman – Town of Branford
Harry Smith - Town Planner – Town of Branford
Amtrak – Owner

Kyle Richers

From: UPS <pkginfo@ups.com>
Sent: Thursday, August 24, 2023 10:19 AM
To: KRICHERS@TRANSCENDWIRELESS.COM
Subject: UPS Delivery Notification, Tracking Number 1ZV257424291916608

Hello, your package has been delivered.

Delivery Date: Thursday, 08/24/2023
Delivery Time: 10:17 AM
Left At: RECEPTION
Signed by: TRISTA

TRANSCEND WIRELESS

Tracking Number:	1ZV257424291916608
Ship To:	TOWN OF BRANFORD 1019 MAIN STREET BRANFORD CENTER, CT 06405 US
Number of Packages:	1
UPS Service:	UPS Ground
Package Weight:	1.0 LBS
Reference Number:	CT11024B UPS ZO

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Read Compass Online

Kyle Richers

From: UPS <pkginfo@ups.com>
Sent: Friday, August 25, 2023 1:19 PM
To: KRICHERS@TRANSCENDWIRELESS.COM
Subject: UPS Delivery Notification, Tracking Number 1ZV257424293562611

Hello, your package has been delivered.

Delivery Date: Friday, 08/25/2023
Delivery Time: 1:17 PM
Left At: RECEPTION
Signed by: MILICI

TRANSCEND WIRELESS

Tracking Number:	1ZV257424293562611
Ship To:	TOWN OF BRANFORD 1019 MAIN STREET BRANFORD, CT 06405 US
Number of Packages:	1
UPS Service:	UPS Ground
Package Weight:	1.0 LBS
Reference Number:	CT11024B CSC EO

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Read Compass Online

Kyle Richers

From: UPS <auto-notify@ups.com>
Sent: Friday, August 25, 2023 7:22 AM
To: krichers@transcendwireless.com
Subject: UPS Exception Notification, Tracking Number 1ZV257424299900217

The status of your package has changed.

Exception Reason:	The receiver is not listed in the building directory. We are attempting to update this information.
Exception Resolution:	The package will be returned to the sender.

At the request of TRANSCEND WIRELESS, this notice alerts you that the status of the shipment listed below has changed.

Signature Required: A signature is required for package delivery

Shipment Details

Tracking Number:	1ZV257424299900217
Ship To:	National Railroad Passenger Corp 60 Massachusetts Avenue Northeast Northeast Washington, DC 20002 US
UPS Service:	UPS GROUND
Package Weight:	1.0 LBS
Reference Number 1:	CT11024B CSC Owner

Discover more about UPS:

80 HOSLEY RD

Location	80 HOSLEY RD	**Mblu**	B07/000 001/ 001.2/ /
Acct#	014552	**Owner**	NATL RAILROAD PASSENGER CRP
Building Name		**Assessment**	$246,600
Appraisal	$352,200	**PID**	12942
Building Count	1		

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2021	$253,100	$99,100	$352,200
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2021	$177,200	$69,400	$246,600

Owner of Record

Owner	NATL RAILROAD PASSENGER CRP	**Sale Price**	$0
Co-Owner		**Certificate**	
Address	60 MASSACHUSETTS AVE N E WASHINGTON, DC 20002	**Book & Page**	0653/0488
		Sale Date	07/21/1998

Ownership History

Ownership History				
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Sale Date**
NATL RAILROAD PASSENGER CRP	$0		0653/0488	07/21/1998
DELLACAMERA FREDERICK A &	$0		0492/0178	

Building Information

Building 1 : Section 1

Year Built:	1991
Living Area:	2,960
Replacement Cost:	$326,980

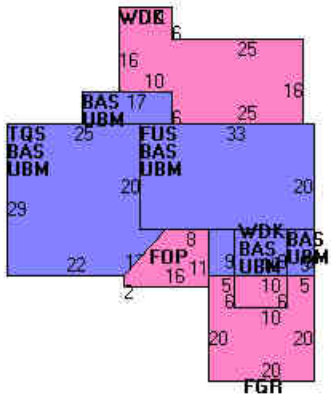
Building Percent Good: 75
Replacement Cost
Less Depreciation: $245,200

Building Attributes	
Field	**Description**
Style:	Contemporary
Model	Residential
Grade:	C +
Stories:	2
Occupancy	1
Exterior Wall 1	Clapboard
Exterior Wall 2	
Roof Structure:	Gable/Hip
Roof Cover	Asphalt
Interior Wall 1	Drywall
Interior Wall 2	
Interior Flr 1	Hardwood
Interior Flr 2	
Heat Fuel	Oil
Heat Type:	Forced Air-Duc
AC Type:	None
Total Bedrooms:	3 Bedrooms
Total Bthrms:	2
Total Half Baths:	1
Total Xtra Fixtrs:	
Total Rooms:	7 Rooms
Bath Style:	Average
Kitchen Style:	Average
Cottage Cmplx	
Cottage Adj	
Num Park	
Fireplaces	
Fndtn Cndtn	
Basement	

Building Photo

(https://images.vgsi.com/photos/BranfordCTPhotos//\00\00\85\47.jpg)

Building Layout



(https://images.vgsi.com/photos/BranfordCTPhotos//Sketches/12942_1294

Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	1,676	1,676
FUS	Upper Story, Finished	660	660
TQS	Three Quarter Story	734	624
FGR	Garage	400	0
FOP	Porch, Open	140	0
UBM	Basement, Unfinished	1,676	0
WDK	Deck, Wood	710	0
		5,996	2,960

Extra Features

Extra Features				Legend
Code	**Description**	**Size**	**Value**	**Bldg #**
FPL3	FIREPLACE 2 ST	1.00 UNITS	$7,500	1

Parcel Information

Use Code	921R
Description	PUB SRV RR MDL01
Deeded Acres	0.61

Land

Land Use

Use Code	921R
Description	PUB SRV RR MDL01
Zone	R5
Neighborhood	0040
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	0.61
Frontage	
Depth	
Assessed Value	$69,400
Appraised Value	$99,100

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
WDK	WOOD DECK			128.00 S.F.	$400	1

Valuation History

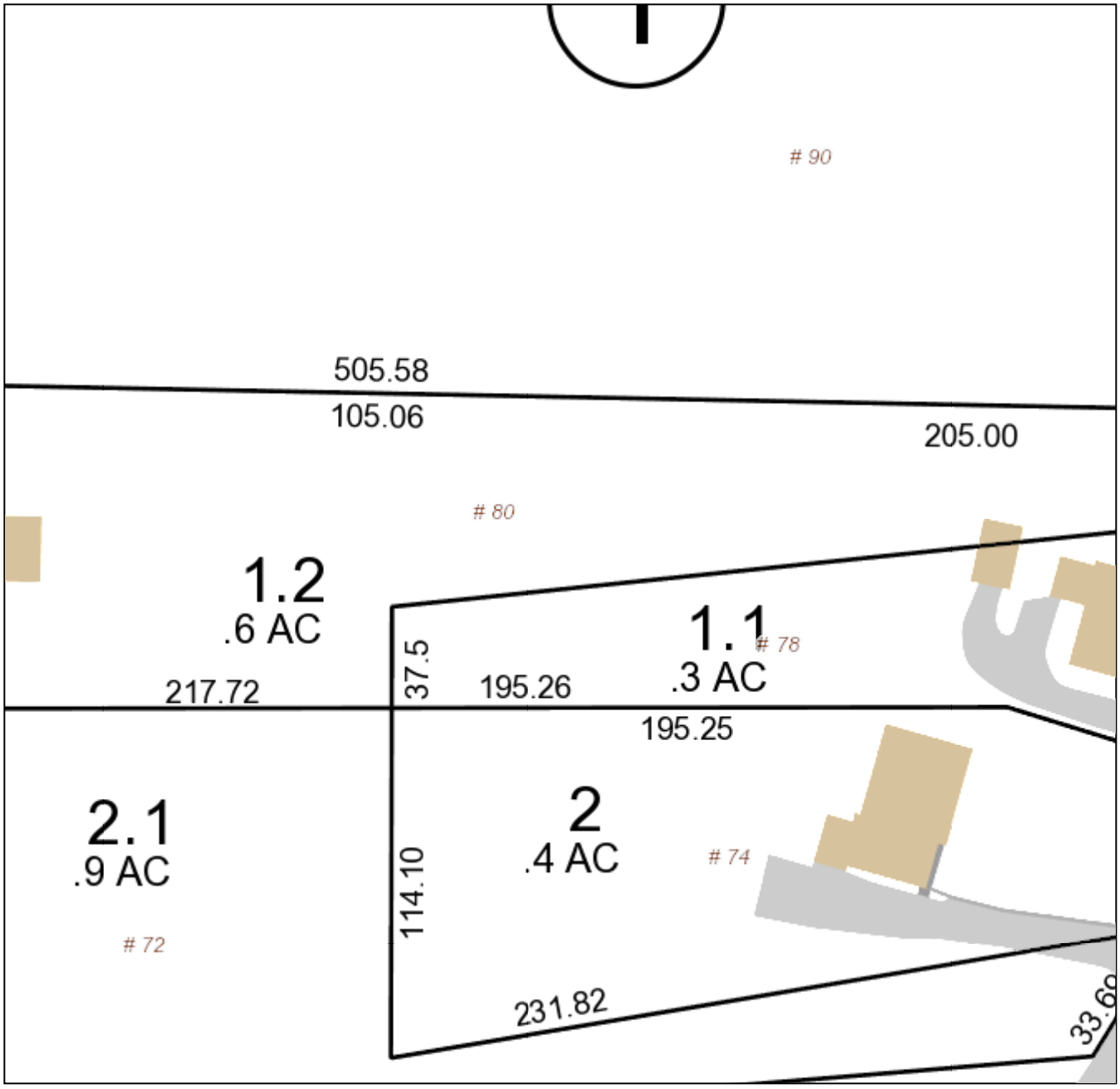
Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2021	$253,100	$99,100	$352,200
2019	$253,100	$99,100	$352,200
2018	$250,500	$99,100	$349,600

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2021	$177,200	$69,400	$246,600
2019	$177,200	$69,400	$246,600
2018	$175,400	$69,400	$244,800

Town of Branford

Geographic Information System (GIS)

Date Printed: 8/23/2023



MAP DISCLAIMER - NOTICE OF LIABILITY

This map is for assessment purposes only. It is not for legal description or conveyances. All information is subject to verification by any user. The Town of Branford and its mapping contractors assume no legal responsibility for the information contained herein.

0 50 Feet

N W E S

Kyle Richers

From: Harry Smith <hsmith@branford-ct.gov>
Sent: Friday, January 4, 2019 2:44 PM
To: Kyle Richers
Cc: Michelle Martin
Subject: RE: T-Mobile Connecticut Siting Council Filing at Hosley Avenue (Amtrak Tower) -- Original Approval (CT11024B)

Yes, please accept this email as confirmation of that.

Harry A. Smith, MCP AICP
Town Planner
Town of Branford
Branford, CT 06405
203-488-1255

From: Kyle Richers [mailto:krichers@transcendwireless.com]
Sent: Friday, January 4, 2019 1:53 PM
To: Harry Smith
Subject: RE: T-Mobile Connecticut Siting Council Filing at Hosley Avenue (Amtrak Tower) -- Original Approval (CT11024B)

Good Afternoon,

I spoke with the office yesterday on this and it was confirmed you were unable to find a record of the approval. Can you confirm this just for our records?

Thanks,

Kyle

From: Richers, Kyle <krichers@transcendwireless.com>
Sent: Friday, December 21, 2018 10:50 AM
To: p-z@branford-ct.gov
Subject: Re: T-Mobile Connecticut Siting Council Filing at Hosley Avenue (Amtrak Tower) -- Original Approval (CT11024B)

Good Morning,

Just wanted to follow up on this. Are you able to look into this? Let me know if you can or can't find anything.

Thanks

On Mon, Dec 17, 2018 at 11:03 AM Kyle Richers <krichers@transcendwireless.com> wrote:

> Good Morning,

I am reaching out on behalf of T-Mobile in reference to their tower site located at 60 Hosley Avenue (also known as 80 Hosley Avenue). We are in the process of preparing a filing to the Connecticut Siting Council for an equipment modification at the site. This tower is on Amtrak property and they are the property owner. For our filing we need to include information on the original approval of the tower. Since this tower was not originally approved by the Siting Council based on their records, I believe the original approval would have stemmed from the Town of Branford. Would you be able to look into whether you have any information on the original approval (type of approval, date, conditions, etc.)? They require this information to be included. The approval would have been from around 1998/1999 and T-Mobile has no record of it. Let me know if you are unable to locate anything and I will note that in our filing that we were unable to locate any record of it.

Thank you for your help.

Kyle Richers

Transcend Wireless

10 Industrial Ave., Suite 3

Mahwah, New Jersey 07430

908-447-4716

krichers@transcendwireless.com

--

Kyle Richers
Transcend Wireless
10 Industrial Ave., Suite 3
Mahwah, NJ 07430
908-447-4716
krichers@transcendwireless.com

T-Mobile

NORTHEAST LLC.

SITE NAME: AMTRAK - BRANFORD

SITE ID NUMBER: CT11024B

SITE ADDRESS: HOSLEY AVENUE
BRANFORD, CT 06406

AMTRAK FILE NO.: 626.33

WORK CATEGORY: RRU & ANTENNA REPLACEMENT, CABINET ADDITION

PROJECT SUMMARY

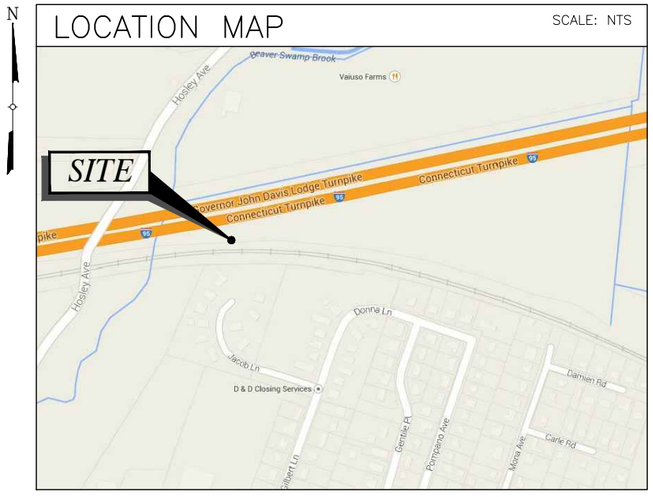
SITE NUMBER:	CT11024B
AMTRAK FILE #:	626.33
MILEPOST:	79.29
SITE NAME:	AMTRAK-BRANFORD
SITE ADDRESS:	60 HOSLEY AVENUE BRANFORD, CT 06406
COUNTY:	MIDDLESEX
PROPERTY OWNER:	AMTRAK (NATIONAL RAILROAD PASSENGER CORPORATION)
APPLICANT:	T-MOBILE NORTHEAST, LLC. 4 SYLVAN WAY PARSIPPANY, NJ 07054 (914) 696-5243
CONTACT: PHONE:	ANDREW STROCK (215) 917-9950
ENGINEER/ SURVEYOR/ STRUCTURAL ENG:	TECTONIC ENGINEERING & SURVEYING CONSULTANTS P.C. 1279 ROUTE 300 NEWBURGH, NY 12550
CONTACT: PHONE:	MIKE PATEL (845) 567-6656 EXT. 2808
LATITUDE: (NAD 83)	41.283325
LONGITUDE: (NAD 83)	-72.8494

SITE DIRECTIONS

HEAD NORTHWEST ON SYLVAN WAY THEN TURN RIGHT ONTO US-202 N AND CONTINUE ONTO LITTLETON RD. TAKE THE RAMP ONTO I-287 N. TAKE THE I-87 S/I-287/NY THRUWAY EXIT TOWARD TAPPAN ZEE BRIDGE/NYC. MERGE ONTO I-287 E/I-87 S. KEEP LEFT AT THE FORK CONTINUING ON I-287 E. MERGE ONTO I-95 N THEN TAKE EXIT 51 TO MERGE ONTO U.S. 1 TOWARD EAST HAVEN/ FRONTAGE RD. TURN LEFT ONTO HOSLEY AVE, DESTINATION WILL BE ON THE LEFT.

LOCATION MAP

SCALE: NTS



SHEET INDEX

SHEET NO	DESCRIPTION	REV NO
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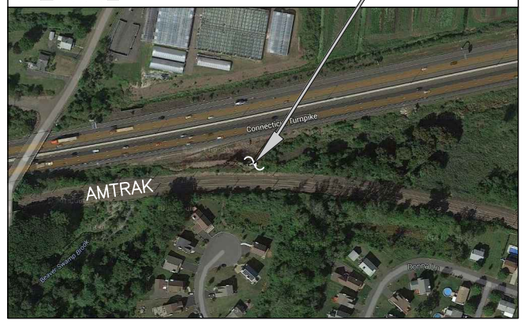
APPROXIMATE LOCATION OF EXIST T-MOBILE SITE

AERIAL



Know what's below. Call before you dig.

RAN TEMPLATE:
67E5A998E Outdoor

0 1 2 3
ORIGINAL SIZE IN INCHES

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.
Tectonic Engineering Consultants, Geologists & Land Surveyors, D.P.C.
70 Pleasant Hill Road — Phone: (845) 534-5959
P.O. Box 37 — (800) 829-6531
Mountainville, NY 10953 — www.tectonicengineering.com
Project Contact Info
1279 Route 300
Newburgh, NY 12550 — Phone: (845) 567-6656

T-Mobile
4 SYLVAN WAY
PARSIPPANY, NJ 07054

PROJECT NUMBER	DESIGNED BY
10481.CT11024B	MP

REV	DATE	REVISION	DRAWN BY
0	12/04/20	FOR APPROVAL	JT
1	05/05/22	PER NEW RFDS	JT
2	07/25/22	PER CLIENT COMMENTS	JT
3	09/01/22	PER CLIENT COMMENTS	JT
4	06/16/23	PER NEW RFDS	TP
5	08/15/23	PER CLIENT COMMENTS	TP

ISSUED BY — DATE

STATE OF CONNECTICUT
ANANDKUMAR PATEL
PEN.0022038
LICENSED
PROFESSIONAL ENGINEER
8/22/23

SITE INFORMATION

CT11024B
AMTRAK-BRANFORD
HOSLEY AVENUE
BRANFORD, CT 06406

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1

GENERAL NOTES

1. ALL APPLICABLE PERMITS MUST BE OBTAINED AND INSURANCE REQUIREMENTS MUST BE MET PRIOR TO CONSTRUCTION.

2. THESE PROJECT DRAWINGS ARE IN ACCORDANCE WITH AMTRAK STANDARDS AND ENGINEERING PRACTICES. PRIOR TO ENTERING AMTRAK'S PROPERTY, THE CONTRACTOR MUST NOTIFY PAUL MARTIN (203) 948-9039.

3. T-MOBILE IS RESPONSIBLE FOR ALL COSTS AND EXPENSES INCURRED BY ANY PARTY IN ASSOCIATION WITH THIS PROJECT. ALL WORK ASSOCIATED WITH THIS PROJECT WILL BE PERFORMED AT T-MOBILE'S SOLE EXPENSE. THIS INCLUDES 1.) AMTRAK'S SAFETY ORIENTATION CLASS, 2.) WIRE AND TRACK OUTAGES DURING CONSTRUCTION, 3.) MODIFICATIONS TO THE CATENARY AND TRANSMISSION SYSTEMS IF REQUIRED, 4) MODIFICATIONS TO CATENARY POLE GUY WIRE ANCHORS IF REQUIRED.

4. UPGRADE OF EXISTING T-MOBILE TELECOMMUNICATIONS FACILITY. THIS PROJECT INVOLVES THE REPLACEMENT OF NINE (9) OF THE EXISTING ANTENNAS WITH NEW ANTENNAS, THE REPLACEMENT OF THE THREE (3) EXISTING RRUs, THE ADDITION OF THREE (3) RRUs. AND (1) PROPOSED FIBER CABLES, AND THE INSTALLATION OF TWO (2) EQUIPMENT CABINETS. NO DIGGING OR SOIL DISTURBANCE WILL OCCUR DURING THE PROJECT. NO MODIFICATIONS TO THE CATENARY AND TRANSMISSION SYSTEMS ARE REQUIRED TO ACCOMMODATE THIS PROJECT.

5. IF MODIFICATIONS TO THE CATENARY AND TRANSMISSION SYSTEMS ARE REQUIRED TO ACCOMMODATE THIS PROJECT, THEN: 1.) A QUALIFIED ELECTRICAL CONSULTANT MUST BE RETAINED (BY T-MOBILE) TO DESIGN OF THE MODIFICATIONS; AND 2.) THE REQUIRED MODIFICATIONS WILL BE PERFORMED AT T-MOBILE'S EXPENSE. UNLESS OTHERWISE DIRECTED BY AMTRAK IN WRITING, ANY SUCH REQUIRED MODIFICATIONS (WHICH SHALL BE PERFORMED AT T-MOBILE'S COST EXPENSE) WILL BE PERFORMED BY AMTRAK'S ELECTRIC TRACTION FORCES.

6. THESE PROJECT DRAWINGS ARE IN COMPLIANCE WITH AED-1; AED-2; CE-4; EP3005-02081A & EP3014-01141A.

7. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE AMTRAK-APPROVED PROJECT DRAWINGS, STATEMENTS OF WORK, PLANS AND SCHEDULES, AND ALL OTHER AMTRAK REQUIREMENTS.

8. NO WORK MAY BE PERFORMED UNTIL AMTRAK ENGINEERING HAS APPROVED T-MOBILE'S SITE/JOB SPECIFIC SAFETY WORK PLAN (SSSWP) AND HAZARD ASSESSMENT FOR THE PROJECT.

9. ONCE AMTRAK APPROVES AN APPLICATION AND THE LICENSE AGREEMENT ISSUED, NO VARIANCE FROM THE PLANS, SPECIFICATIONS, METHODS OF CONSTRUCTION, ETC WILL BE CONSIDERED OR PERMITTED WITHOUT RESUBMISSION OF PLANS TO AND RECEIPT OF APPROVAL FROM AMTRAK

CONTRACTOR OPERATIONS AND SAFETY COORDINATION NOTES

1. BEFORE ENTRY OF PERMITTEE AND/OR CONTRACTORS ONTO RAILROAD'S PROPERTY, A PRE-ENTRY MEETING SHALL BE HELD WITH THE AMTRAK RAILROAD PROTECTION PERSONNEL.

2. CONTRACTORS SHALL CONDUCT THEIR OPERATIONS IN COMPLIANCE WITH ALL RULES, REGULATIONS, AND REQUIREMENTS OF RAILROAD WITH RESPECT TO ANY WORK PERFORMED ON, OVER, UNDER, WITHIN OR ADJACENT TO RAILROAD'S PROPERTY. CONTRACTORS SHALL BE RESPONSIBLE FOR ACQUAINTING THEMSELVES WITH SUCH RULES, REGULATIONS AND REQUIREMENTS. ANY VIOLATION OF RAILROAD'S SAFETY RULES, REGULATIONS, OR REQUIREMENTS SHALL BE GROUNDS FOR THE IMMEDIATE SUSPENSION OF THE CONTRACTOR WORK, AND THE RE-TRAINING OF ALL PERSONNEL, AT THE CONTRACTOR'S EXPENSE.

3. CONTRACTOR SHALL KEEP RAILROAD'S PROPERTY CLEAR OF ALL REFUSE AND DEBRIS FROM ITS OPERATIONS. UPON COMPLETION OF THE WORK, THE CONTRACTOR MUST REMOVE ALL MACHINERY, EQUIPMENT, SURPLUS MATERIALS, FALSE WORK, RUBBISH, TEMPORARY STRUCTURES, AND OTHER ITEMS BELONGING TO THE CONTRACTOR FROM RAILROAD'S PROPERTY.

4. IF TRACKS OR OTHER PROPERTY OF RAILROAD ARE ENDANGERED DURING THE WORK, THE CONTRACTOR SHALL IMMEDIATELY TAKE SUCH STEPS AS MAY BE DIRECTED BY RAILROAD TO RESTORE SAFE CONDITIONS, AND UPON FAILURE OF THE CONTRACTOR TO IMMEDIATELY CARRY OUT SUCH DIRECTION, RAILROAD MAY TAKE WHATEVER STEPS ARE REASONABLY NECESSARY TO RESTORE SAFE CONDITIONS. ALL COSTS AND EXPENSES OF RESTORING SAFE CONDITIONS, AND OF REPAIRING ANY DAMAGE TO RAILROAD'S TRAINS, TRACKS, RIGHT-OF-WAY OR OTHER PROPERTY CAUSED BY THE OPERATIONS OF CONTRACTORS, SHALL BE PAID BY CONTRACTOR.

5. WHENEVER WORK IS PERFORMED IN THE VICINITY OF ELECTRIFIED TRACKS AND/OR HIGH VOLTAGE WIRES, PARTICULAR CARE MUST BE EXERCISED, AND RAILROAD'S REQUIREMENTS REGARDING CLEARANCE TO BE MAINTAINED BETWEEN EQUIPMENT AND TRACKS AND/OR ENERGIZED WIRES, AND OTHERWISE REGARDING WORK IN THE VICINITY OF ELECTRIFIED TRACKS, MUST BE STRICTLY OBSERVED. NO EMPLOYEES OR EQUIPMENT WILL BE PERMITTED TO WORK NEAR OVERHEAD WIRES, EXCEPT WHEN PROTECTED BY A CLASS "A" EMPLOYEE OF THE RAILROAD. THE CONTRACTORS MUST SUPPLY AN ADEQUATE LENGTH OF GROUNDING CABLE (4/0 COPPER WITH APPROVED CLAMPS) FOR EACH PIECE OF EQUIPMENT WORKING NEAR OR ADJACENT TO ANY OVERHEAD WIRE.

6. NO WORK WILL BE PERMITTED WITHIN TWENTY-FIVE (25) FEET OF THE CENTERLINE OF TRACK OR THE ENERGIZED WIRE OR HAVE POTENTIAL OF GETTING WITHIN TWENTY-FIVE (25) FEET OF TRACK WIRE WITHOUT THE APPROVAL OF THE CHIEF ENGINEER'S REPRESENTATIVE. CONTRACTORS SHALL CONDUCT THEIR WORK SO THAT NO PART OF ANY EQUIPMENT OR MATERIAL SHALL FOUL AN ACTIVE TRACK OR OVERHEAD WIRE WITHOUT THE WRITTEN PERMISSION OF THE CHIEF ENGINEER'S REPRESENTATIVE. ANY EQUIPMENT SHALL BE CONSIDERED TO BE FOULING A TRACK OR OVERHEAD WIRE WHEN LOCATED (A) WITHIN FIFTEEN (15) FEET FROM THE CENTERLINE OF THE TRACK OR WITHIN FIFTEEN (15) FEET FROM THE WIRE, OR (B) IN SUCH A POSITION THAT FAILURE OF SAME, WITH OR WITHOUT A LOAD, WOULD BRING IT WITHIN FIFTEEN (15) FEET FROM THE CENTERLINE OF THE TRACK OR WITHIN FIFTEEN (15) FEET FROM THE WIRE AND REQUIRES THE PRESENCE OF THE PROPER RAILROAD PROTECTION PERSONNEL.

7. DURING CONSTRUCTION, JACKING, BORING OR TUNNELING, TRENCHES SHALL BE FENCED, LIGHTED AND OTHERWISE PROTECTED AS DIRECTED BY AMTRAK DESIGNATED FIELD REPRESENTATIVE.

8. CONTRACTORS SHALL SCHEDULE ALL WORK TO BE PERFORMED IN SUCH A MANNER AS NOT TO INTERFERE WITH RAILROAD OPERATIONS. CONTRACTORS SHALL USE ALL NECESSARY CARE AND PRECAUTION TO AVOID ACCIDENTS, DELAY OR INTERFERENCE WITH RAILROAD'S PROPERTY.

9. THROUGHOUT ALL PHASES OF THE PROJECT (INCLUDING DURING PREPARATION FOR CONSTRUCTION OR INSTALLATION ACTIVITIES, DURING CONSTRUCTION OR INSTALLATION ACTIVITIES, AND, DURING CLEAN UP) ACCESS ROADS, ROUTES OR PATHS TO OR ALONG AMTRAK'S RIGHTS-OF-WAY SHALL REMAIN UNOBSTRUCTED AND IF ANY OBSTRUCTION EXISTS IT SHALL NOT BE EXACERBATED.

10. ALL EQUIPMENT TO BE USED IN THE VICINITY OF OPERATING TRACKS SHALL BE IN "CERTIFIED" FIRST-CLASS CONDITION SO AS TO PREVENT FAILURES THAT MIGHT CAUSE DAMAGE TO RAILROAD'S PROPERTY. NO EQUIPMENT SHALL BE PLACED OR PUT INTO OPERATION NEAR OR ADJACENT TO OPERATING TRACKS AND UNDER NO CIRCUMSTANCES SHALL ANY EQUIPMENT OR MATERIALS BE PLACED OR STORED WITHIN TWENTY-FIVE (25) FEET FROM THE CENTERLINE OF AN OUTSIDE TRACK, EXCEPT AS APPROVED BY THE SITE SPECIFIC SAFETY WORK PLAN. TO INSURE COMPLIANCE WITH THIS REQUIREMENT, CONTRACTORS MUST ESTABLISH A TWENTY-FIVE (25) FOOT FOUL LINE PRIOR TO THE START OF WORK BY TAPING OFF THE AREA.

11. NO MATERIAL OR EQUIPMENT SHALL BE STORED ON RAILROAD'S PROPERTY UNLESS APPROVED BY THE SITE SPECIFIC SAFETY WORK PLAN. ANY SUCH STORAGE WILL BE ON THE CONDITION THAT RAILROAD WILL NOT BE LIABLE FOR LOSS OF OR DAMAGE TO SUCH MATERIALS OR EQUIPMENT FROM ANY CAUSE.

12. PRIOR TO ENTERING ONTO AMTRAK'S PROPERTY, EACH EMPLOYEE OF T-MOBILE AND/OR ITS CONTRACTORS THAT IS TO ENTER ONTO AMTRAK'S PROPERTY WITHIN THE 12 MONTH PERIOD PRIOR TO ENTERING ONTO AMTRAK'S PROPERTY, EACH SHALL HAVE COMPLETED AMTRAK'S SAFETY ORIENTATION CLASS. WHILE ON AMTRAK'S PROPERTY, EACH SHALL BE IN POSSESSION OF A VALID, CURRENT AMTRAK SAFETY TRAINING BADGE AND WHILE ON AMTRAK'S PROPERTY, EACH SHALL FOLLOW ALL SAFETY RULES AND PROCEDURES AS DIRECTED BY AMTRAK (INCLUDING AMTRAK'S ON-SITE REPRESENTATIVE).

13. PRIOR TO COMMENCING WORK, T-MOBILE AND/OR ITS CONTRACTORS WILL LOCATE UNDERGROUND UTILITIES AND ANY OTHER FACILITIES (BELONGING TO AMTRAK AND/OR ANY OTHER PARTY. THROUGHOUT THE ENTIRE PROJECT, INCLUDING ALL PHASES OF CONSTRUCTION, EXCAVATION, TRENCHING, AND/OR BORING ACTIVITIES; T-MOBILE AND/OR ITS CONTRACTOR WILL PROTECT ALL SUCH UNDERGROUND UTILITIES AND OTHER FACILITIES. AMTRAK IS NOT A PART OF THE ONE-CALL SYSTEM AND, THEREFORE, T-MOBILE AND/OR ITS CONTRACTORS MUST WORK DIRECTLY WITH AMTRAK TO IDENTIFY AMTRAK'S BURIED UTILITIES AND FACILITIES.

14. T-MOBILE AND/OR ITS CONTRACTOR IS RESPONSIBLE FOR MAKING THE ONE-CALL. AMTRAK IS NOT PART OF THE ONE-CALL SYSTEM AND THEREFORE AMTRAK UTILITIES AND FACILITIES WILL NOT BE LOCATED OR PROTECTED THROUGH THE ONE-CALL SYSTEM. INSTEAD, T-MOBILE AND/OR ITS CONTRACTOR MUST WORK WITH AMTRAK TO IDENTIFY AND PROTECT ALL BURIED UTILITIES AND FACILITIES. T-MOBILE AND/OR ITS CONTRACTOR MUST IDENTIFY AND PROTECT ALL BURIED UTILITIES AND FACILITIES THROUGHOUT THE ENTIRE PROJECT, INCLUDING ALL PHASES OF CONSTRUCTION, EXCAVATION, TRENCHING AND/OR BORING ACTIVITIES.

15. NO CONSTRUCTION, EXCAVATION, TRENCHING AND/OR BORING ACTIVITIES MAY BE PERFORMED IN CLOSE PROXIMITY TO THE AMTRAK DUCT LINE UNLESS MONITORED BY ON-SITE AMTRAK COMMUNICATIONS AND SIGNAL DEPARTMENT PERSONNEL. HAND DIGGING MAY BE REQUIRED, AS DIRECTED BY AMTRAK THROUGH THE ON-SITE AMTRAK COMMUNICATIONS AND SIGNAL SUPPORT PERSONNEL OR OTHERWISE.

16. EQUIPMENT OR PERSONNEL WORKING CLOSER THAN 15 FEET TO THE CENTERLINE OF AN ADJACENT TRACK SHALL BE CONSIDERED AS FOULING THAT TRACK. INSOFAR AS POSSIBLE, ALL OPERATIONS SHALL BE CONDUCTED NO LESS THAN THIS DISTANCE. OPERATIONS CLOSER THAN 15' TO THE CENTERLINE OF A TRACK SHALL BE CONDUCTED ONLY WITH THE PERMISSION OF, AND AS DIRECTED BY A DULY QUALIFIED AMTRAK EMPLOYEE PRESENT AT THE WORKSITE. SPECIAL ARRANGEMENTS MUST BE MADE AT LEAST 21 WORKING DAYS IN ADVANCE OF THE WORK, WHERE FOULING OF TRACK OR STRUCTURES IS REQUIRED FOR ACCESS. THESE OPERATIONS REQUIRE THE PRIOR APPROVAL OF AMTRAK. CROSSING OF TRACKS AT GRADE BY EQUIPMENT AND PERSONNEL IS PROHIBITED, EXCEPT BY PRIOR ARRANGEMENT WITH, AND AS DIRECTED BY AMTRAK.

17. IF ASBESTOS OR OTHER HAZARDOUS MATERIAL IS ENCOUNTERED T-MOBILE SHALL IMMEDIATELY NOTIFY AMTRAK AND ALL WORK UNDER THIS PROJECT SHALL CEASE UNTIL AMTRAK HAS APPROVED (IN WRITING) A PLAN FOR T-MOBILE TO ADDRESS (AT T-MOBILE'S OWN COSTS AND EXPENSE) THE MATERIAL THROUGH THE SERVICES OF AN AMTRAK-APPROVED, LICENSED INSPECTOR/MONITORING CONTRACTOR.

18. AMTRAK C&S PERSONNEL MUST FIELD-VERIFY THAT THERE IS NO SIGNAL EQUIPMENT IN THE WAY OF THE PROJECT AND THAT SIGNAL PREVIEW IS NOT BEING OBSTRUCTED.

19. IF WORK SHALL BE DONE ON AMTRAK PROPERTY THAT INVOLVES HEAVY TRUCKS, EQUIPMENT, OR MACHINERY ALONG THE RIGHT OF WAY, DUCT LINES AND PULL BOXES SHALL BE INSPECTED TO INSURE THEY CAN WITHHOLD THE APPROPRIATE WEIGHT.

LIFT NOTES:

1. THE LIFT PLANS AND THE SOW OUTLINE A COMPLETE PROCEDURE, TIME SCHEDULE, THE ORDER OF LIFTS AND A MANEUVERING ENVELOPE REFLECTING THE AREA ALLOWED FOR THE EQUIPMENT TO REPOSITION IF DESIRED IS INCLUDED.

2. THIS LIFT PLAN IS IN COMPLIANCE WITH SECTION 01142A OF EP-3014 AND THE DOCUMENT CAPTIONED "AMTRAK ELECTRIFIED TERRITORY EQUIPMENT BONDING AND GROUNDING", ATTACHED TO THE SOW. THE CONTRACTOR AND THE OPERATOR ARE RESPONSIBLE FOR ADHERENCE TO ALL BONDING AND GROUNDING REQUIREMENTS. SUBSTITUTIONS TO THE MATERIALS LISTED ARE PROHIBITED

3. UNLESS OTHERWISE APPROVED BY AMTRAK IN WRITING, THE EQUIPMENT SHALL BE POSITIONED SO THAT THE BOOM IS NOT PERPENDICULAR TO THE TRACK, WHILE ALSO MAINTAINING ALL OTHER SAFETY REQUIREMENTS (INCLUDING CLEARANCES, ETC.), AND THE BOOM SHALL BE MECHANICALLY RESTRICTED TO PREVENT IT FROM ENCROACHING UPON AMTRAK'S INFRASTRUCTURE (WHICH INCLUDES, WITHOUT LIMITATION, ANY TRACK AND/OR CATENARY STRUCTURES) ANY MORE THAN WHAT IS ABSOLUTELY NECESSARY FOR THE IMPLEMENTATION OF THE WORK OUTLINED IN THESE PLANS. IDEALLY THE BOOM WILL BE RESTRICTED TO THE 180-DEGREE SEMI-CIRCLE AWAY FROM ALL TRACKS.

4. FINAL EQUIPMENT LOCATION WILL BE WITHIN THE RESTRICTED MANEUVERING ENVELOPE AS OUTLINED IN THIS APPROVED LIFT PLAN.

5. CONTRACTOR TO VERIFY ALL DIMENSIONS AND SITE CONDITIONS PRIOR TO COMMENCING WORK.

6. THE NOTES HEREIN ARE OFFERED FOR INFORMATION AND GUIDANCE AND ARE NOT TO BE TAKEN TO INFER THE ENGINEER IS IN ANY WAY INVOLVED IN OR IS RESPONSIBLE FOR THE ACTUAL LIFT IN THE FIELD.

7. DO NOT OPERATE IN WINDS OVER 20 MPH.

8. OPERATIONS TO BE CONDUCTED IN ACCORDANCE WITH OSHA AND AMTRAK REGULATIONS AND ALL OTHER APPLICABLE RULES AND CODES.

9. SWING PATH OF BOOM SHALL NOT BE OVER ADJACENT BUILDINGS, WORKERS OR OCCUPIED VEHICLES WHILE LIFTING LOADS.

10. BARRICADES SHALL BE INSTALLED AROUND THE LIFT ZONE AND ANY SWING AREAS AS NECESSARY TO ENSURE OTHERS NOT INVOLVED IN THE LIFT PROCESS DO NOT ENTER INTO THOSE AREAS.

11. THE TOTAL ESTIMATED DURATION OF LIFT ACTIVITIES ON SITE IS TWO EVENTS LASTING (8) EIGHT HOURS.

12. CHECK ALL OF THE PARTS OF THE EQUIPMENT EACH NEW WORK SHIFT, INCLUDING ALL OF THE CABLES, EQUIPMENT PARTS AND ENGINE PARTS.

13. THE EQUIPMENT OPERATOR MUST CONFIRM THE HAND SIGNALS THAT WILL BE USED DURING THE LIFT WITH THE SUPPORT GROUND CREW PRIOR TO THE START OF ANY LIFT.

14. ALWAYS INSPECT THE AREA PRIOR TO LIFTING A LOAD TO MAKE SURE THERE ARE NO PEOPLE BELOW.

15. NO SIDE PULLS ALLOWED WHEN PERFORMING A LIFT.

16. EQUIPMENT OPERATOR TO KEEP THE GUY CABLES IN VIEW TO MAKE SURE THEY'RE NOT HIT IN ANY WAY. HIGH VISIBILITY RIBBON SHOULD BE INSTALLED TEMPORARILY TO ASSIST IN KEEPING TRACK OF THE GUY WIRE LOCATIONS.

17. ALL EQUIPMENT TO BE USED IN THE VICINITY OF OPERATING TRACKS SHALL BE IN "CERTIFIED" FIRST-CLASS CONDITION SO AS TO PREVENT FAILURES THAT MIGHT CAUSE DELAY TO TRAINS OR DAMAGE TO RAILROAD'S PROPERTY. NO EQUIPMENT SHALL BE PLACED NEAR OR PUT INTO OPERATION NEAR OR ADJACENT TO OPERATING TRACKS WITHOUT FIRST OBTAINING PERMISSION FROM THE CHIEF ENGINEER'S REPRESENTATIVE. UNDER NO CIRCUMSTANCES SHALL ANY EQUIPMENT OR MATERIALS BE PLACED OR STORED WITHIN TWENTY-FIVE (25) – FEET FROM THE CENTERLINE OF AN OUTSIDE TRACK, EXCEPT AS APPROVED BY THE SITE SPECIFIC SAFETY WORK PLAN.

18. NO MATERIAL OR EQUIPMENT SHALL BE STORED ON RAILROAD'S PROPERTY WITHOUT FIRST HAVING OBTAINED PERMISSION FROM THE CHIEF ENGINEER. ANY SUCH STORAGE WILL BE ON THE CONDITION THAT RAILROAD WILL NOT BE LIABLE FOR LOSS OF OR DAMAGE TO SUCH MATERIALS OR EQUIPMENT FROM ANY CAUSE.

19. PERMITTEE AND/OR CONTRACTORS SHALL KEEP RAILROAD'S PROPERTY CLEAR OF ALL REFUSE AND DEBRIS FROM ITS OPERATIONS, UPON COMPLETION OF THE WORK, PERMITTEE AND/OR CONTRACTORS SHALL REMOVE FROM RAILROAD'S PROPERTY ALL MACHINERY, EQUIPMENT, SURPLUS MATERIALS, FALSEWORK, RUBBISH, TEMPORARY STRUCTURES, AND OTHER PROPERTY OF THE PERMITTEE AND/OR CONTRACTORS AND SHALL LEAVE RAILROAD'S PROPERTY IN A CONDITION SATISFACTORY TO THE CHIEF ENGINEER.

20. THIS LIFT PLAN INCLUDES THE DESIRED LOCATION OF THE EQUIPMENT, THE OPERATING RADII, AND STAGING/DISPOSAL AREAS. ALL ITEMS HAVE BEEN DIMENSIONED FOR LOCATING THE ELEMENTS IN THE FIELD.

21. THE EQUIPMENT IS CAPABLE OF PICKING 150% OF THE LOAD, WHILE MAINTAINING NORMAL, RECOMMENDED FACTORS OF SAFETY. THE ADEQUACY OF THE EQUIPMENT FOR THE PROPOSED PICK SHALL BE DETERMINED BY USING THE MANUFACTURER'S PUBLISHED LOAD RATING CHARTS AND NOT THE MAXIMUM CAPACITY IF THE BOOM.

22. THE LIFT PLAN OUTLINES THE EXISTING OBSTRUCTIONS AND THE PROPOSED SWING BEING USED FOR THE LIFT. "WALKING" OF LOAD USING TWO PIECES OF EQUIPMENT WILL NOT BE PERMITTED, RATHER, MULTIPLE PICKS AND REPOSITIONING OF THE EQUIPMENT MAY BE PERMITTED TO GET THE LOAD TO THE NEEDED LOCATION FOR THE FINAL PICK, IF NECESSARY.

23. IF THERE ARE OVERHEAD POWER LINES PRESENT. ALL AERIAL WORK WILL BE PERFORMED WITH THE POWER LINES DE-ENERGIZED. NO WORK WILL BE PERFORMED AROUND OR NEAR THE POWER LINES WITHOUT AN AMTRAK E.T. LINEMAN'S AUTHORIZATION.

RAN TEMPLATE:
67E5A998E Outdoor

0 1 2 3
ORIGINAL SIZE IN INCHES

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Mountainville, NY 10953 — www.tectonicengineering.com
Project Contact Info
1279 Route 300
Newburgh, NY 12550 — Phone: (845) 567-6656

T-Mobile
4 SYLVAN WAY
PARSIPPANY, NJ 07054

PROJECT NUMBER: 10481.CT11024B
DESIGNED BY: MP

REV	DATE	REVISION	DRAWN BY
0	12/04/20	FOR APPROVAL	JT
1	05/05/22	PER NEW RFDS	JT
2	07/25/22	PER CLIENT COMMENTS	JT
3	09/01/22	PER CLIENT COMMENTS	JT
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STATE OF CONNECTICUT
MANOJKUMAR PATEL
PEN.0022038
LICENSED
PROFESSIONAL ENGINEER
8/22/23

SITE INFORMATION
CT11024B
AMTRAK-BRANFORD
HOSLEY AVENUE
BRANFORD, CT 06406

SHEET TITLE
NOTES

SHEET NUMBER
T-2

CONCRETE AND REINFORCING NOTES:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318 AND THE SPECIFICATION CAST–IN–PLACE CONCRETE.
2. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS, UNLESS NOTED OTHERWISE.
3. REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 60, DEFORMED UNLESS NOTED OTHERWISE. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A 185 WELDED STEEL WIRE FABRIC UNLESS NOTED OTHERWISE. SPLICES SHALL BE CLASS "B" AND ALL HOOKS SHALL BE STANDARD, UNO.
4. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS: CONCRETE CAST AGAINST EARTH: 3 IN. CONCRETE EXPOSED TO EARTH OR WEATHER:

   #6 AND LARGER: 2 IN.

   #5 AND SMALLER & WWF: 1 1/2 IN.

   CONCRETE NOT EXPOSED TO EARTH OR WEATHER OR NOT CAST AGAINST THE GROUND:

   SLAB AND WALL: 3/4 IN.

   BEAMS AND COLUMNS: 1 1/2 IN.
5. A 3/4" CHAMFER SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNO, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.
6. INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR, SHALL BE PER MANUFACTURERS WRITTEN RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR ENGINEERING APPROVAL WHEN DRILLING HOLES IN CONCRETE.
7. WELDING OF REINFORCING STEEL IS SPECIFICALLY PROHIBITED.

RAN TEMPLATE:
67E5A998E Outdoor

0 1 2 3
ORIGINAL SIZE IN INCHES

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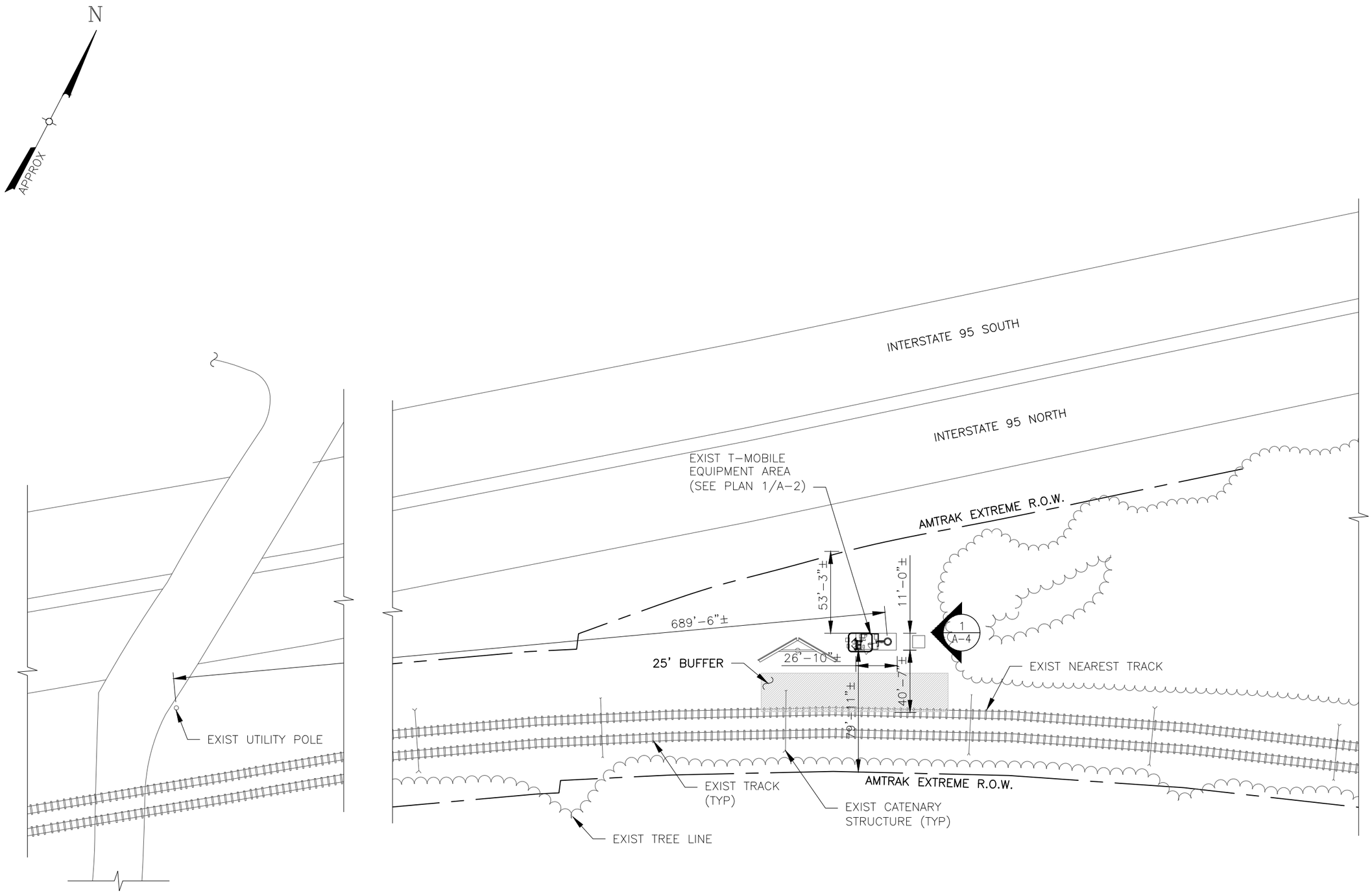
SHEET NUMBER
T–2



1/A-1 SITE PLAN

SCALE: 1/64" = 1'-0"

RAN TEMPLATE:
67E5A998E Outdoor

0 1 2 3
ORIGINAL SIZE IN INCHES

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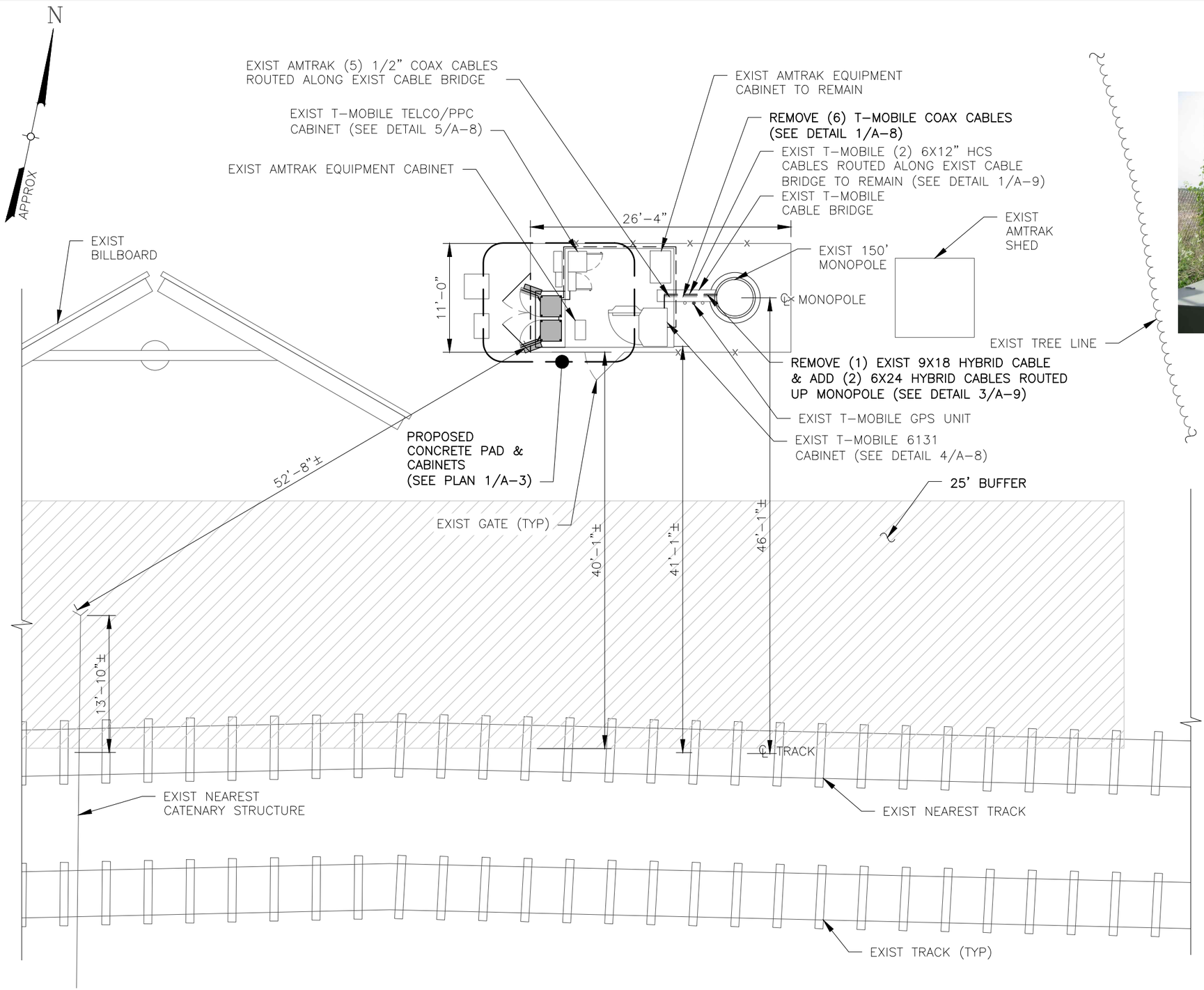
HOSLEY AVENUE
BRANFORD, CT 06406

SHEET TITLE

SITE PLAN

SHEET NUMBER

A-1



1 / A-2 EQUIPMENT PLAN

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

2 / A-2 PHOTO

SCALE: N.T.S.

RAN TEMPLATE:
67E5A998E Outdoor

0 1 2 3
ORIGINAL SIZE IN INCHES

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AMTRAK-BRANFORD
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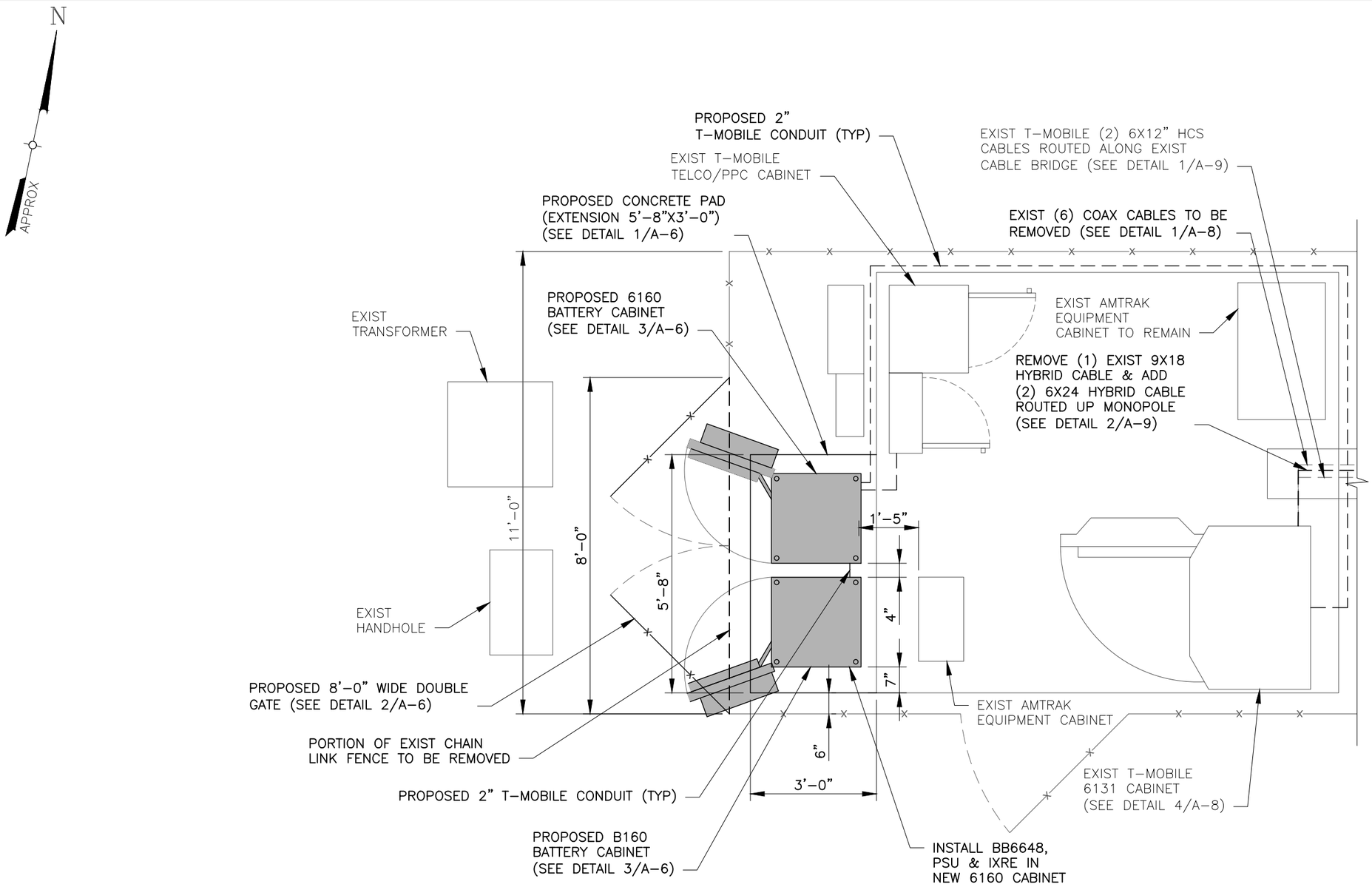
BRANFORD, CT 06406

SHEET TITLE

EQUIPMENT PLAN & PHOTO

SHEET NUMBER

A-2



1 / A-3 ENLARGED EQUIPMENT PLAN

SCALE: 3/8" = 1'-0'

RAN TEMPLATE:
67E5A998E Outdoor

0 1 2 3
ORIGINAL SIZE IN INCHES

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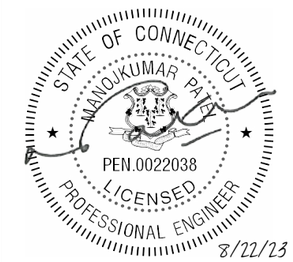

SITE INFORMATION
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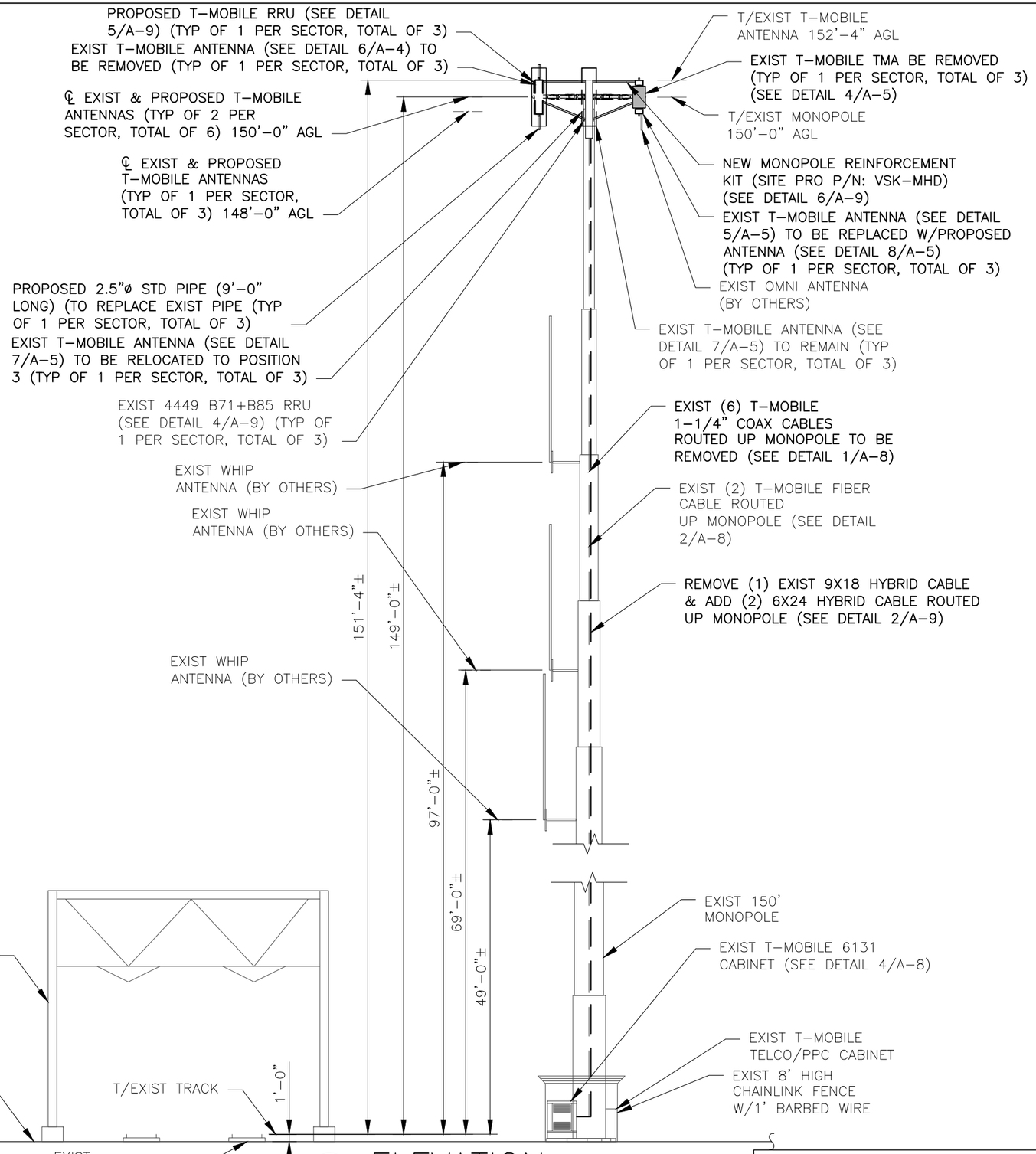
BRANFORD, CT 06406

SHEET TITLE
ENLARGED EQUIPMENT PLAN

SHEET NUMBER
A-3



1 / A-4 ELEVATION

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

2 / A-4 PHOTO

SCALE: N.T.S.

RAN TEMPLATE:
67E5A998E Outdoor

0 1 2 3
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SITE INFORMATION

CT11024B
AMTRAK-BRANFORD
HOSLEY AVENUE
BRANFORD, CT 06406

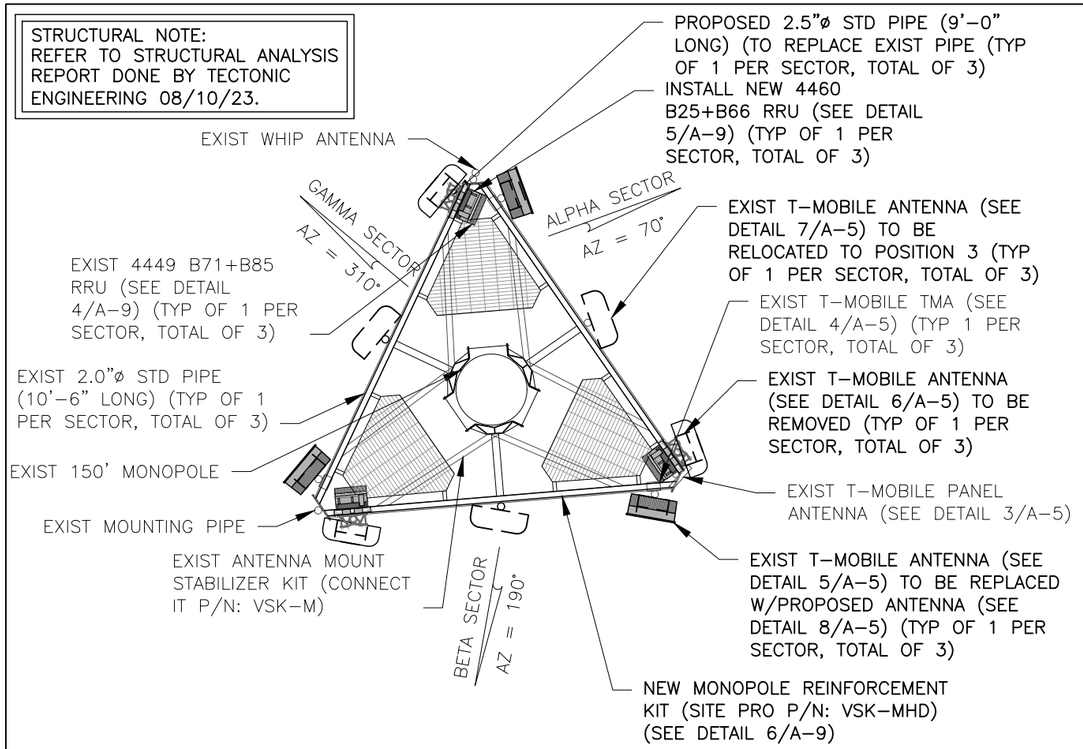
SHEET TITLE

ELEVATION & PHOTO

SHEET NUMBER

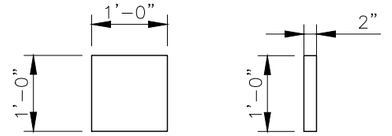
A-4

STRUCTURAL NOTE:
REFER TO STRUCTURAL ANALYSIS REPORT DONE BY TECTONIC ENGINEERING 08/10/23.



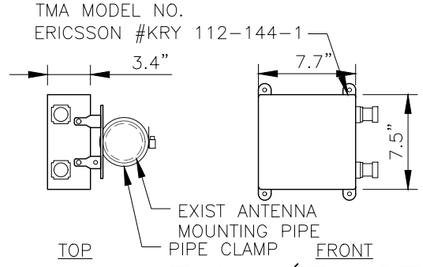
1 / A-5 ANTENNA PLAN
SCALE: 3/8" = 1'-0"

2 / A-5 PHOTO
SCALE: N.T.S.

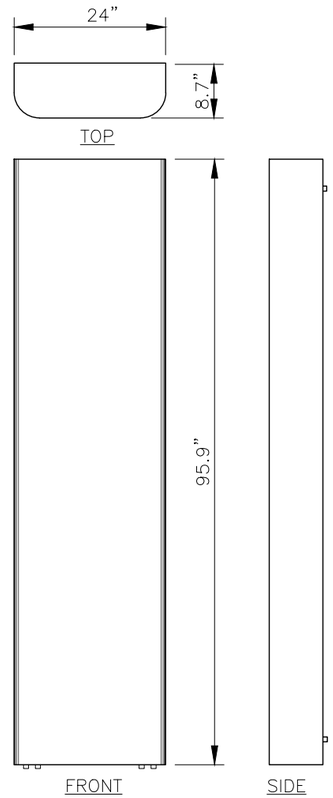


DFPD1-52
-EXIST-

3 / A-5 PANEL ANTENNA (EXIST)
SCALE: 1/2" = 1'-0"

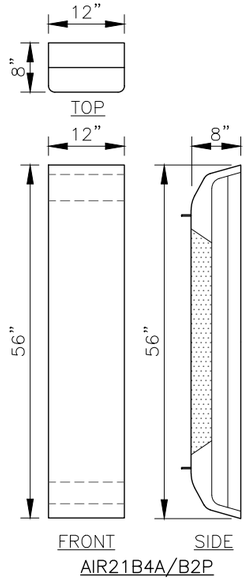


4 / A-5 TMA (EXIST)
SCALE: 1" = 1'-0"



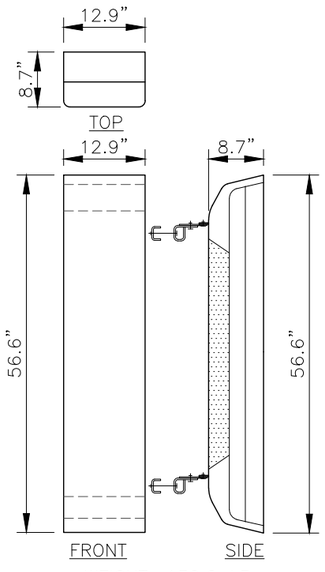
RFS APXVAARR24_43-U-NA20
(WEIGHT: 128 LBS)

7 / A-5 ANTENNA (EXIST)
SCALE: 1/2" = 1'-0"



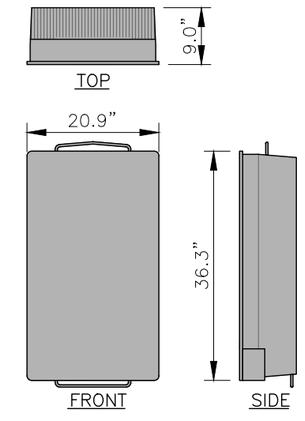
AIR21B4A/B2P
(WEIGHT: 70 LBS)

5 / A-5 ANTENNA (EXIST)
SCALE: 1/2" = 1'-0"



WEIGHT: 132.2 LB
AIR 32 DUAL BAND (DB) B66Aa/B2a

6 / A-5 ANTENNA (EXIST)
SCALE: 1/2" = 1'-0"



AIR6419 B41
WEIGHT: 83.3 LBS

8 / A-5 ANTENNA (PROPOSED)
SCALE: 1/2" = 1'-0"

RAN TEMPLATE:
67E5A998E Outdoor

0 1 2 3
ORIGINAL SIZE IN INCHES

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P.O. Box 37 — (800) 829-6531
Mountainville, NY 10953 — www.tectonicengineering.com
Project Contact Info
1279 Route 300
Newburgh, NY 12550 — Phone: (845) 567-6656

T-Mobile
4 SYLVAN WAY
PARSIPPANY, NJ 07054

PROJECT NUMBER	DESIGNED BY
10481.CT11024B	MP

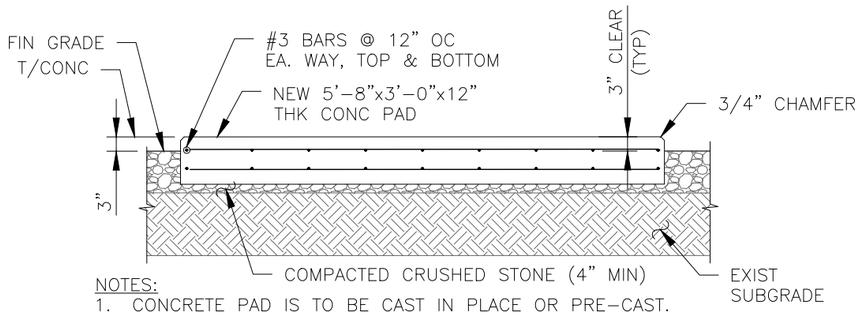
REV	DATE	REVISION	DRAWN BY
0	12/04/20	FOR APPROVAL	JT
1	05/05/22	PER NEW RFDS	JT
2	07/25/22	PER CLIENT COMMENTS	JT
3	09/01/22	PER CLIENT COMMENTS	JT
4	06/16/23	PER NEW RFDS	TP
5	08/15/23	PER CLIENT COMMENTS	TP

ISSUED BY — DATE

SITE INFORMATION
CT11024B
AMTRAK-BRANFORD
HOSLEY AVENUE
BRANFORD, CT 06406

SHEET TITLE
ANTENNA PLAN & DETAILS

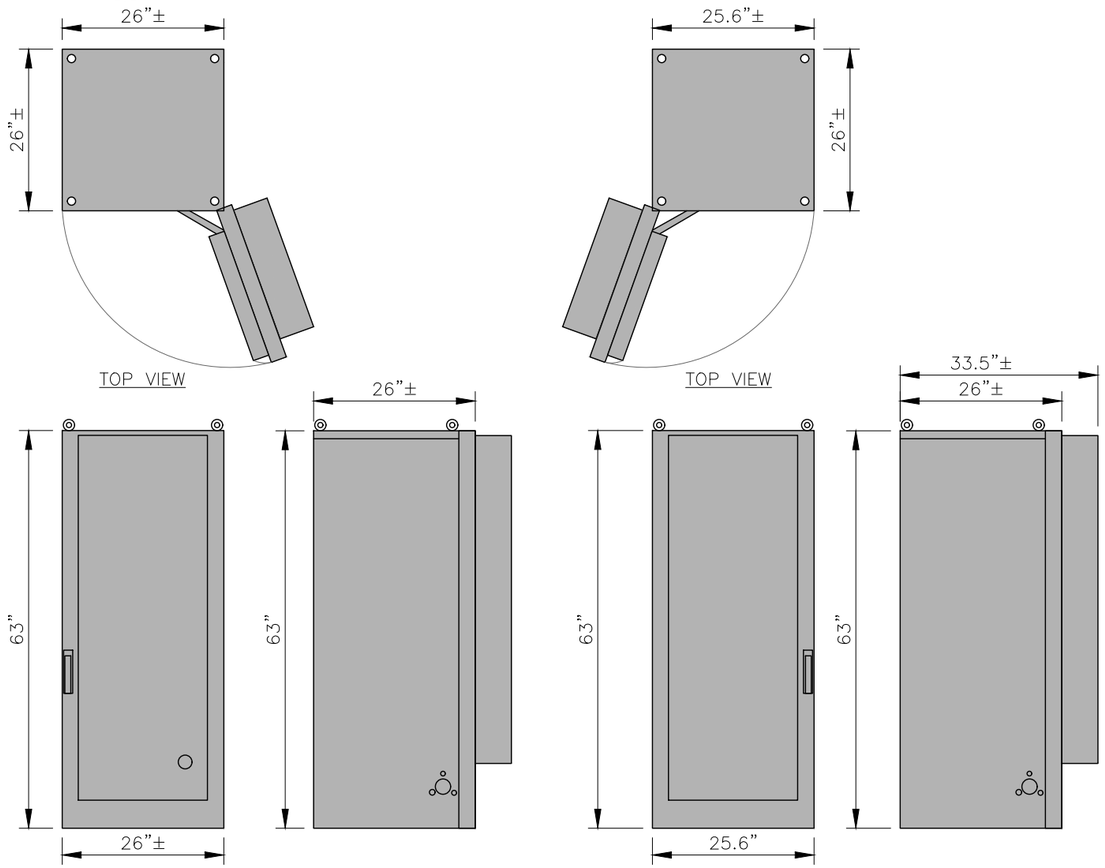
SHEET NUMBER
A-5



NOTES:
1. CONCRETE PAD IS TO BE CAST IN PLACE OR PRE-CAST.
2. USE GALVANIZED HILTI EXPANSION ANCHORS OR APPROVED EQUAL FOR EQUIPMENT ANCHORAGE.
3. FOR SIZE AND LOCATION OF ANCHORS AND OTHER REQUIREMENTS, SEE EQUIPMENT VENDOR DRAWINGS.
4. PLACE NEW CONCRETE SLAB ON MIN. 6" COMPACTED SUB-BASE.

1 / A-6 CONCRETE PAD DETAIL

SCALE: 3/8" = 1'-0'



WEIGHT: 1883 LBS (W/3 BATTERY STRINGS)

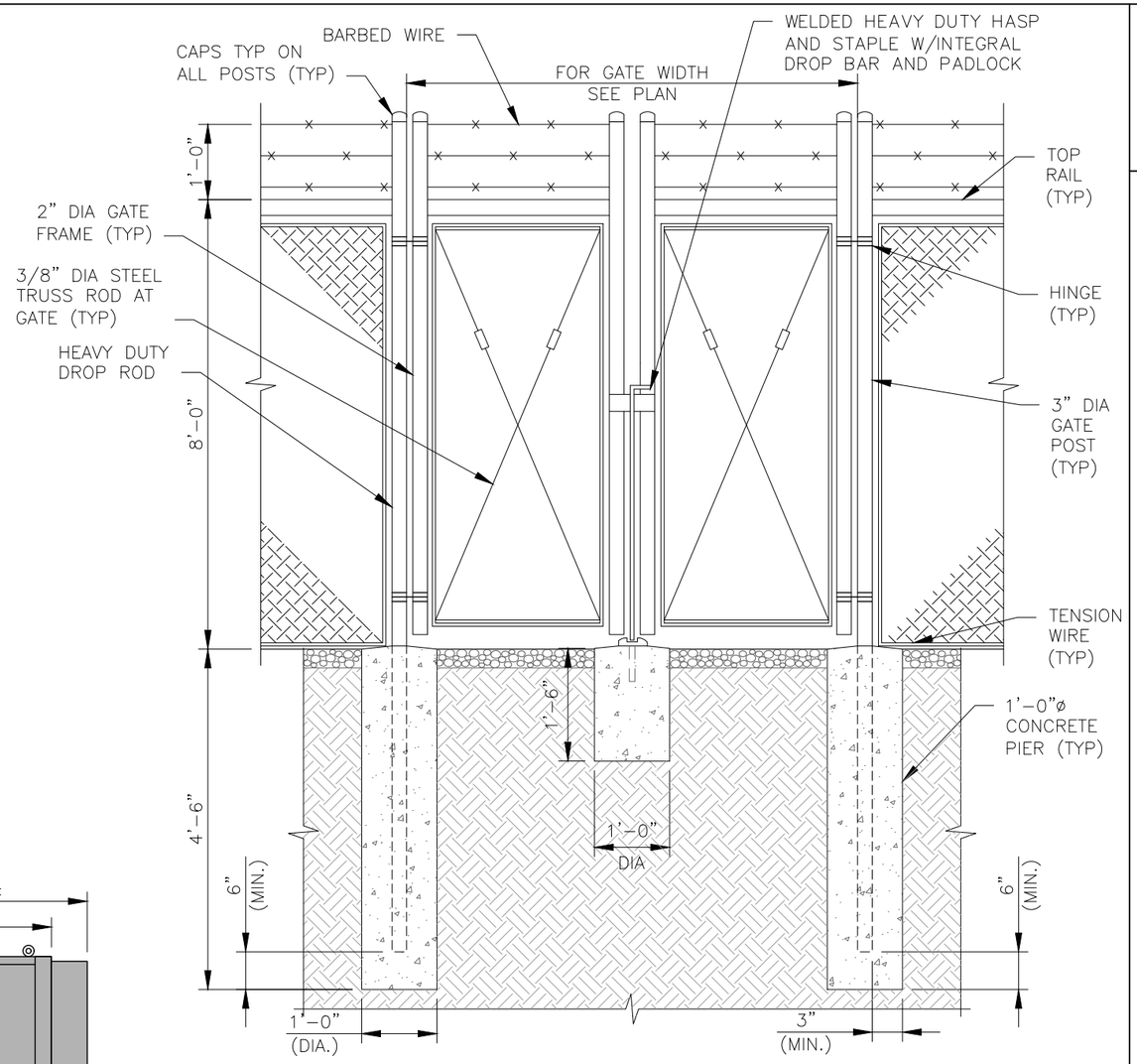
ERICSSON ENCLOSURE B160

WEIGHT: 605 LB (FULLY LOADED)

ERICSSON ENCLOSURE 6160 AC

3 / A-6 EQUIPMENT DETAIL

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



2 / A-6 GATE DETAIL

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

RAN TEMPLATE:
67E5A998E Outdoor

0 1 2 3
ORIGINAL SIZE IN INCHES

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ISSUED BY	DATE

STATE OF CONNECTICUT
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8/22/23

SITE INFORMATION

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AMTRAK-BRANFORD
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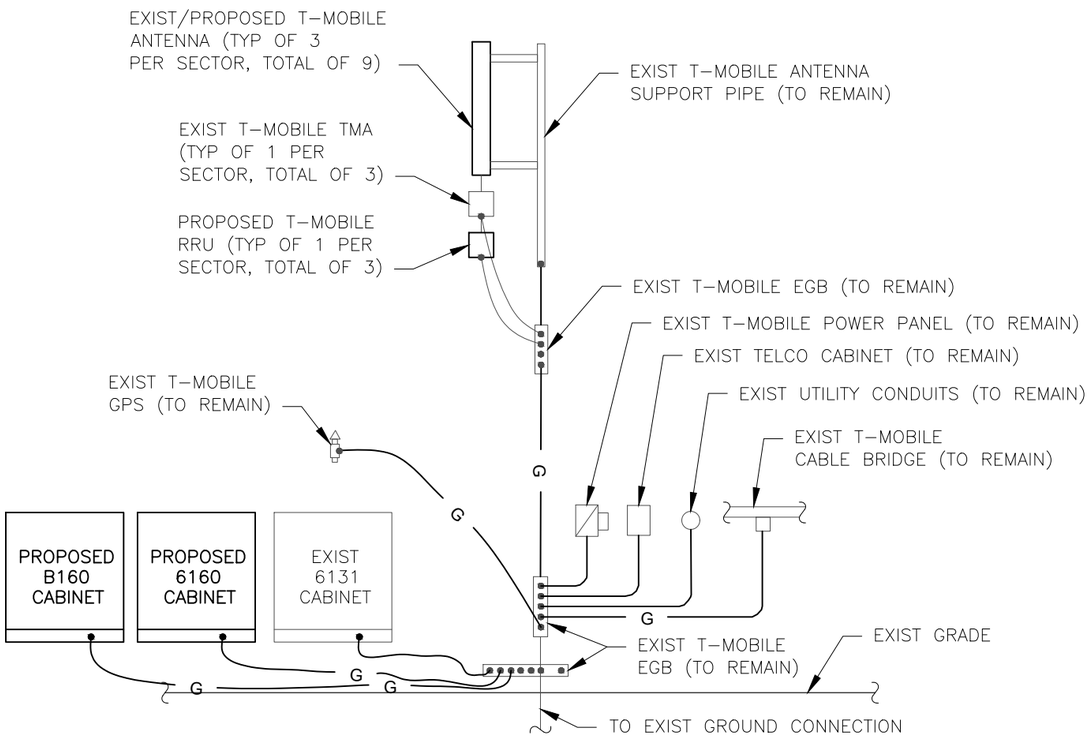
BRANFORD, CT 06406

SHEET TITLE

EQUIPMENT DETAILS

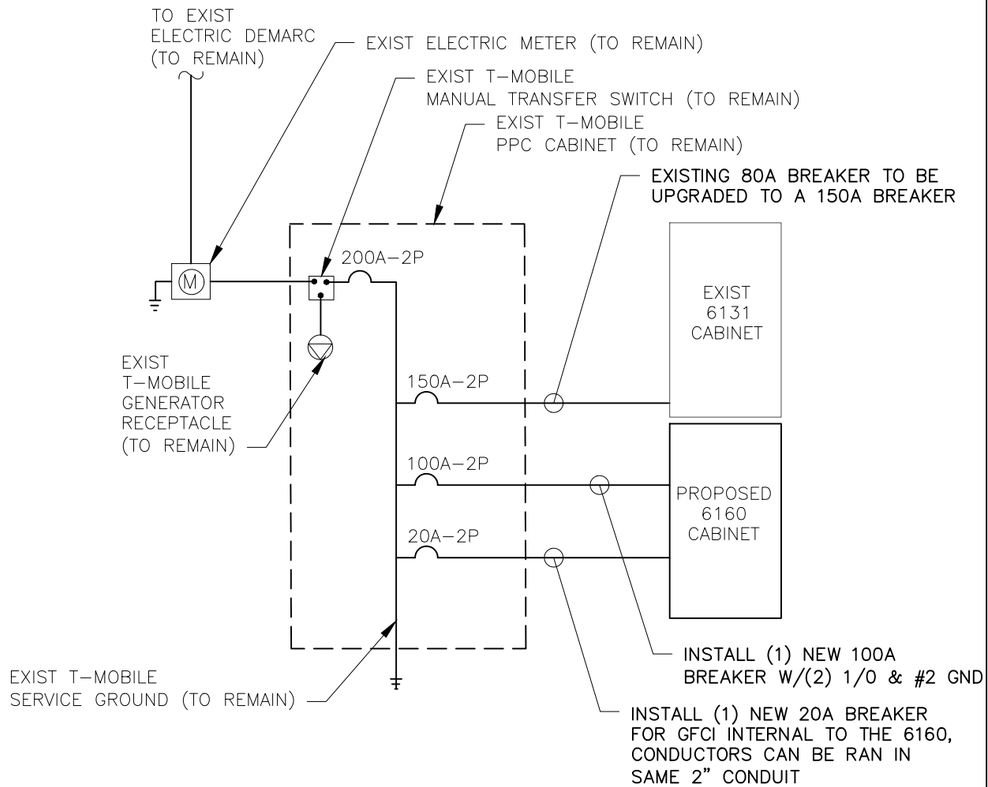
SHEET NUMBER

A-6



1 / A-7 GROUNDING RISER DIAGRAM

SCALE: NTS



2 / A-7 ONE-LINE POWER DIAGRAM

SCALE: NTS

RAN TEMPLATE:
67E5A998E Outdoor

0 1 2 3
ORIGINAL SIZE IN INCHES

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SITE INFORMATION

CT11024B
AMTRAK-BRANFORD
HOSLEY AVENUE
BRANFORD, CT 06406

SHEET TITLE

WIRING DIAGRAM

SHEET NUMBER

A-7

LDF6-50

Description	Type No.
Cable Ordering Information	
Standard Cable	
1-1/4" Standard Cable, Standard Jacket	LDF6-50
Fire Retardant Cable	
1-1/4" Fire Retardant Jacket (CATVR)	LDF6RN-50
Low VSWR and Specialized Cables	
1-1/4" Low VSWR, specify operating band	LDF6P-50-(**)

** Insert suffix number from "Low VSWR Specifications" table, page 515

Characteristics	
Electrical	
Impedance, ohms	50 ± 1
Maximum Frequency, GHz	3.3
Velocity, percent	89
Peak Power Rating, kW	205
dc Resistance, ohms/1000 ft (1000 m)	
Inner	0.22 (0.72)
Outer	0.19 (0.62)
dc Breakdown, volts	9000
Jacket Spark, volts RMS	10000
Capacitance, pF/ft (m)	22.9 (75.1)
Inductance, µH/ft (m)	0.056 (0.184)
Mechanical	
Outer Conductor	Copper
Inner Conductor	Copper
Diameter over Jacket, in (mm)	1.55 (39.4)
Diameter over Copper Outer Conductor, in (mm)	1.41 (35.8)
Diameter Inner Conductor, in (mm)	0.516 (13.1)
Nominal Inside Transverse Dimensions, cm	3.11
Minimum Bending Radius, in (mm)	15 (380)
Number of Bends, minimum (typical)	15 (40)
Bending Moment, lb-ft (N-m)	36 (49)
Cable Weight, lb/ft (kg/m)	0.63 (0.94)
Tensile Strength, lb (kg)	1300 (590)
Flat Plate Crush Strength, lb/in (kg/mm)	125 (2.2)

Attenuation and Average Power

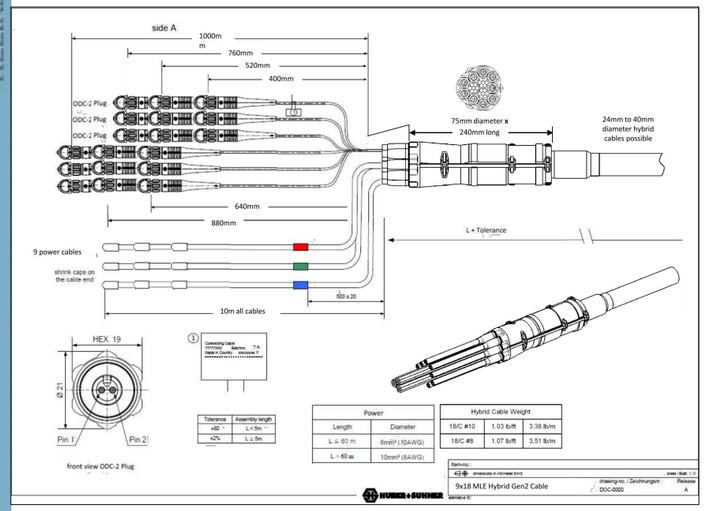
Frequency MHz	Attenuation dB/100 ft	Attenuation dB/100 m	Average Power, kW
0.5	0.017	0.056	175.0
1	0.024	0.079	123.0
1.5	0.030	0.097	101.0
2	0.034	0.112	87.1
10	0.077	0.253	38.6
20	0.110	0.361	27.1
30	0.135	0.444	22.0
50	0.176	0.579	16.9
88	0.237	0.778	12.6
100	0.254	0.832	11.7
108	0.264	0.867	11.3
150	0.314	1.03	9.47
174	0.340	1.12	8.75
200	0.367	1.20	8.12
300	0.457	1.50	6.52
400	0.535	1.76	5.57
450	0.571	1.87	5.22
500	0.606	1.99	4.92
512	0.614	2.01	4.86
600	0.671	2.20	4.44
700	0.732	2.40	4.07
800	0.789	2.59	3.78
824	0.803	2.63	3.71
894	0.841	2.76	3.54
960	0.876	2.87	3.40
1000	0.897	2.94	3.32
1250	1.02	3.35	2.92
1500	1.14	3.73	2.62
1700	1.22	4.02	2.43
1800	1.27	4.16	2.35
2000	1.35	4.43	2.21
2100	1.39	4.56	2.14
2200	1.43	4.69	2.08
2300	1.47	4.82	2.03
3000	1.73	5.68	1.72
3300	1.84	6.02	1.62

Standard Conditions:
For Attenuation, VSWR 1.0, ambient temperature 20°C (68°F).
For Average Power, VSWR 1.0, ambient temperature 40°C (104°F), inner conductor temperature 100°C (212°F); no solar loading.

HELIAX® Coaxial Cables

1 / A–8 COAX CABLE (EXIST)

SCALE: NTS



2 / A–8 FIBER CABLE (EXIST)

SCALE: NTS

AC Model

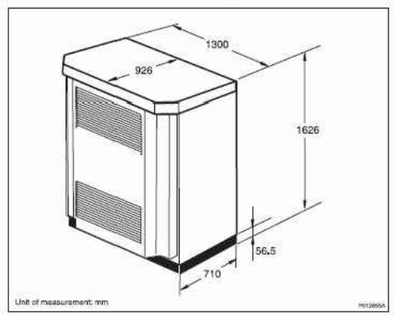
Standard Features – AC Model

- Neutral-ground bonding point
- Manual transfer switch
- Transient Voltage Surge Suppression (TVSS)
- Generator receptacle
- Load center
- Optional telco cabinet

Specifications – AC Model

Enclosure		
Cabinet Dimensions (H x W x D)	59.00" x 24.00" x 10.00"	
Weight	Approx. 150 lbs.	
External Material	Aluminum with polyester powder coat paint	
Mounting	Wall or pad mounted*	
Electrical		
Operating Voltage	240/120, single phase	
Amperage	100 or 200 Amp utility/standby (square D breakers)	
AIC Rating	100 Amp - 10,000 AIC	200 Amp - 22,000 AIC (65,000 with class J fuse)
Manual Transfer Switch	Square D walking beam interlock	
Standby Generator Inlet	100 Amp McGill part #PM4100B12W	200 Amp Appleton part #AR20044RS
Peak Pulse Current Rating	Primary SAD - 20kA at 8/20µs	Secondary MOV - 200kA per phase
Load Center	12 or 24 position, Square D, Type QO breakers 1-60 Amp double pole (AC TVSS)	1-15 Amp single pole (GFI receptacles) 1-10 Amp single pole (auxiliary cabinet cooling fan)

Unit	Dimensions (mm)
Height (including installation frame)	1626
Width	1300
Depth	710
Depth including door	926



3 / A–8 6131 CABINET (EXIST)

SCALE: NTS

4 / A–8 PPC DETAIL (EXIST)

SCALE: NTS

RAN TEMPLATE:
67E5A998E Outdoor

0 1 2 3
ORIGINAL SIZE IN INCHES

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10481.CT11024B	MP

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STATE OF CONNECTICUT
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LICENSED PROFESSIONAL ENGINEER
8/22/23

SITE INFORMATION

CT11024B
AMTRAK–BRANFORD
HOSLEY AVENUE
BRANFORD, CT 06406

SHEET TITLE

SPECIFICATIONS

SHEET NUMBER

A–8

PRODUCT DATASHEET
HB114-U6S12-120-LI

RADIO FREQUENCY SYSTEMS
The Clear Choice®

HYBRIFLEX® RRH Hybrid Cable Solution 6x12, 6AWG Low-Inductance, 1-1/4", Single-Mode Fiber With DLC Connectors

HYBRIFLEX Series

DC Wire Insulator

RFS' HYBRIFLEX Remote Radio Head (RRH) hybrid feeder cabling solution combines optical fiber and DC power for RRHs in a single lightweight aluminum corrugated cable, making it the world's most innovative solution for RRH deployments.

This low-inductance version of HYBRIFLEX allows mobile operators deploying an RRH architecture to deploy >400ft sites without the danger of power-cycling their RRHs due to voltage swings, which could occur in some specific instances. It combines bend-insensitive single-mode fiber (12 pairs of DLC connectors), 6 pairs of low-inductance DC wires and 9 pairs of 18AWG wires used to carry alarm signals. The package also includes a special RFS-designed DC insulating boot, used to properly protect and insulate the DC wires after stripping the jacket, avoiding possible short-circuits while wiring it to the distribution boxes. Standard RFS CELLFLEX® accessories can be used with HYBRIFLEX cable.

FEATURES / BENEFITS

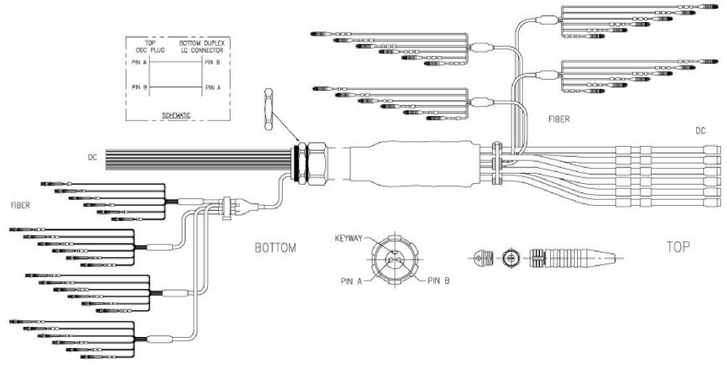
- DC Wire Insulator (Patent pending) – Used at the DC wire connection in distribution boxes, prevents potential short circuits
- Aluminum corrugated armor with outstanding bending characteristics – Minimizes installation time and enables mechanical protection and shielding
- Same accessories as 1-1/4" coaxial cable – Saves installation costs and time
- Outer conductor grounding – Eliminates typical grounding requirements and saves on installation costs
- Lightweight solution and compact design – Decreases tower loading
- Robust cabling – Eliminates need for expensive cable trays and ducts
- Optical fiber and power cables housed in single corrugated cable – Saves CAPEX by standardizing RRH cable installation and reducing installation requirements
- Outdoor, flame-retardant jacket – Ensures long-lasting cable protection

Technical Features

STRUCTURE		
Cable Type		HYBRIFLEX® Low Inductance
Size		1-1/4"
Fire Performance		Flame Retardant
Length	m (ft)	36.57 (120)
MECHANICAL SPECIFICATIONS		
Outer Diameter Nominal	mm (in)	39 (1.54)
Cable Weight	kg/m (lb/ft)	2.52 (1.7)
Minimum Bending Radius, Single Bend	mm (in)	152 (6)
Minimum Bending Radius, Multi Bends	mm (in)	254 (10)
Recommended / Maximum Clamp Spacing	m (ft)	1 / 1.2 (3.25 / 4)
DC POWER CABLE SPECIFICATIONS		
Number of DC Pairs		6
Maximum DC-Resistance Power Cable	Ω/km (Ω/kft)	1.4 (0.42)
Cross Section of Power Cable	mm² (AWG)	13.3 (6)
DC Wire Jacket Material		PVC/Nylon
DC Cable Diameter	mm (in)	9.3 (0.365)
DC Cable Jacket		PVC/Nylon
DC Standards (Meets or Exceeds)		For use in Type RHC per UL 2882,PVC/Nylon,RoHS/REACH Compliant
Break-out length	mm(in)	812.8
DC Cable sealing method		Semi-rigid flame-retarded polyolefin, with hot melt adhesive
Alarm Wire		18 (9 standard pairs), 0.8 mm2 (18), 6 AWG
CABLE JACKET		
UV-Protection individual and External Jacket		Yes
ARMOR SPECIFICATIONS		
Armor Type		Corrugated Aluminum
Maximum DC-Resistance of Armor	Ω/km (Ω/kft)	0.9 (0.27)
Diameter Corrugated Armor	mm (in)	36 (1.42)
F/O CABLE SPECIFICATIONS		
F/O Cable Type		Single-Mode
Number of F/O Pairs		12
Core/Clad	µm	9 /125
Secondary Protection Nominal	µm (in)	900 (0.035)
Single Bending Radius	mm (in)	137 (5.4)
F/O Standards (Meets or Exceeds)		UL Listed Type OFNR (UL1666), RoHS Compliant
Optical Loss	dB/Km	0.5 @ 1310 nm 0.5 @ 1550 nm 0.4
Fiber Termination End 1		DLC Connectors
Fiber Termination End 2		DLC Connectors
FO Break-out length	mm(in)	939.8 +/-50.8 (37 +/-2)
Cable sealing method		Semi-rigid flame-retarded polyolefin, with hot melt adhesive
TESTING AND ENVIRONMENTAL		
Storage Temperature	°C (°F)	-40 to 70 (-40 to 158)
Operation Temperature	°C (°F)	-40 to 65 (-40 to 158)
Installation Temperature	°C (°F)	-20 to 65 (-4 to 149)
Jacket Specifications		UL2582 Type RHC, UL listed
Alarm Wire Standards (Meets or Exceeds)		UL Standard 1063, 1581 VW-1, MTW Oil and Gasoline RES1 SUNRES (Cable meets UL requirements), RoHS/REACH Compliant

HB114-U6S12-120-LI REV: B REV DATE: 7/21/2016 www.rfsworld.com

1 / A–9
FIBER CABLE (EXIST)
SCALE: NTS



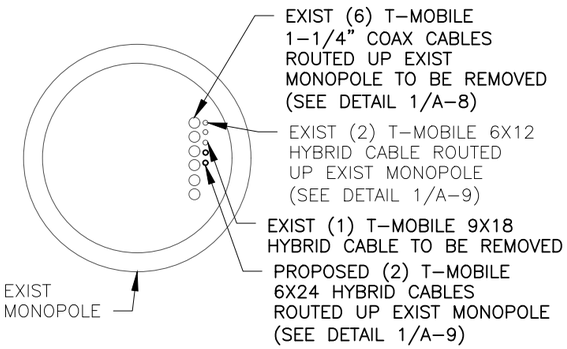
PRE-PACKED HYBRIFLEX KITS FOR QUICK AND EASY FIELD INSTALLS

All Kits include an above cable assembly plus predefined quantities of grounding kit(s) and hoisting grip(s)

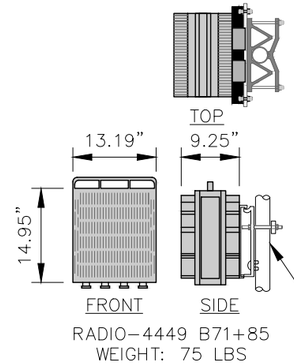
KIT ASSEMBLY LENGTHS

Length (m)	Model Number	Grounding Kit	GK Qty	Hoisting Grip	HG Qty
10	HB158-21U6S24-10M-KIT	GKFORM60-158	3	HOIST1-158L	1
20	HB158-21U6S24-20M-KIT		3		1
30	HB158-21U6S24-30M-KIT		3		1
40	HB158-21U6S24-40M-KIT		3		1
50	HB158-21U6S24-50M-KIT		3		1
60	HB158-21U6S24-60M-KIT		3		2
70	HB158-21U6S24-70M-KIT		4		4
80	HB158-21U6S24-80M-KIT		4		4
90	HB158-21U6S24-90M-KIT		4		4
100	HB158-21U6S24-100M-KIT		5		4
110	HB158-21U6S24-110M-KIT		5		4
120	HB158-21U6S24-120M-KIT		5		4
130	HB158-21U6S24-130M-KIT		6		6

2 / A–9
FIBER CABLE (PROPOSED)
SCALE: NTS

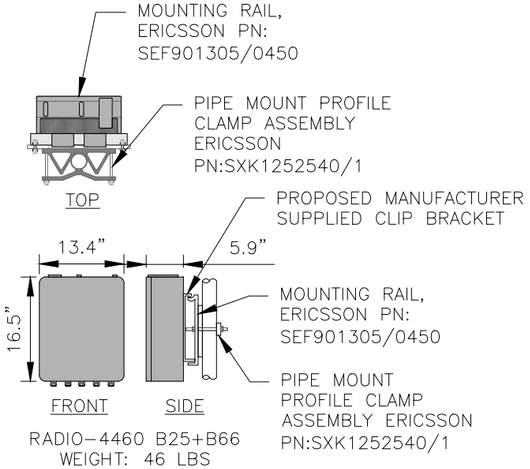


3 / A–9
CABLE MOUNTING DETAIL
SCALE: NTS



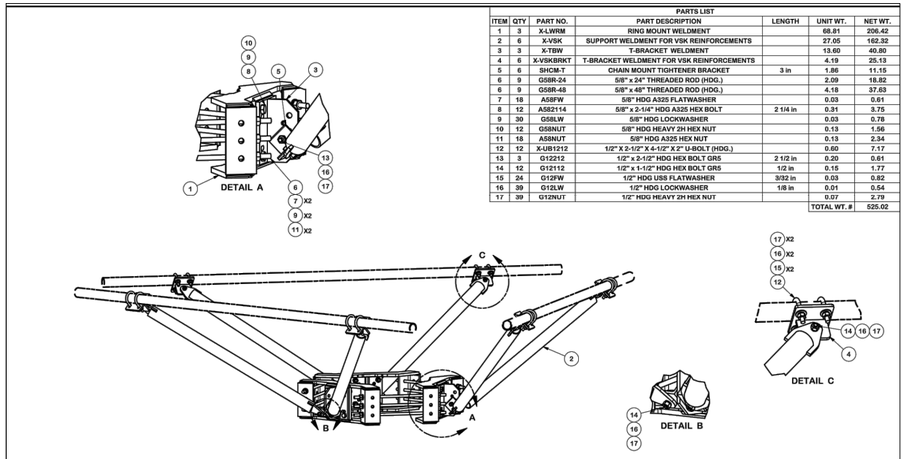
RADIO–4449 B71+85
WEIGHT: 75 LBS

4 / A–9
RRU (EXIST)
SCALE: 1/2" = 1'–0"



RADIO–4460 B25+B66
WEIGHT: 46 LBS

5 / A–9
RRU (PROPOSED)
SCALE: 1/2" = 1'–0"



ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	3	X-LWRM	RING MOUNT WELDMENT		68.81	206.42
2	6	X-VSK	SUPPORT WELDMENT FOR VSK REINFORCEMENTS		27.05	162.32
3	3	X-TBW	T-BRACKET WELDMENT		13.60	40.80
4	6	X-VSKBRKT	T-BRACKET WELDMENT FOR VSK REINFORCEMENTS		4.19	25.13
5	6	SHCM-T	CHAIN MOUNT TIGHTENER BRACKET	3 in	1.86	11.15
6	9	GS8R-24	5/8" x 24" THREADED ROD (HDG.)		2.09	18.82
7	9	GS8R-48	5/8" x 48" THREADED ROD (HDG.)		4.18	37.63
8	18	AS8FW	5/8" HDG A325 FLATWASHER		0.03	0.61
9	12	AS82114	5/8" x 2-1/4" HDG A325 HEX BOLT	2 1/4 in	0.31	3.75
10	30	GS8LW	5/8" HDG LOCKWASHER		0.03	0.78
11	12	GS8NUT	5/8" HDG HEAVY 2H HEX NUT		0.13	1.56
12	18	AS8NUT	5/8" HDG A325 HEX NUT		0.13	2.34
13	12	X-UB1212	1/2" X 2-1/2" X 4-1/2" X 2" U-BOLT (HDG.)		0.60	7.17
14	3	G12212	1/2" x 2-1/2" HDG HEX BOLT GR5	2 1/2 in	0.20	0.61
15	12	G12112	1/2" x 1-1/2" HDG HEX BOLT GR5	1/2 in	0.15	1.77
16	24	G12FW	1/2" HDG USS FLATWASHER	3/32 in	0.03	0.82
17	39	G12LW	1/2" HDG LOCKWASHER	1/8 in	0.01	0.54
18	39	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	2.79
					TOTAL WT. #	525.02

TOLERANCE NOTES

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

PROPRIETARY NOTE:
THE IDEAS AND CONCEPTS CONTAINED IN THIS DRAWING ARE PROPRIETARY INFORMATION OF VALMONT INDUSTRIES AND CONSIDERED A TRADE SECRET. ANY USE OR DISCLOSURE WITHOUT THE CONSENT OF VALMONT INDUSTRIES IS STRICTLY PROHIBITED.

DESCRIPTION		
V-STYLE MONOPOLE REINFORCEMENT KITS		
CPD NO.	DRAWN BY	ENG. APPROVAL
	CEK 8/28/2019	
CLASS / SUB	DRAWING USAGE	CHECKED BY
81 / 01	CUSTOMER	BMC 8/29/2019

SITE PRO 1 — A valmont COMPANY — Engineering Support Team: 1-888-753-7446 — Locations: New York, NY; Atlanta, GA; Sacramento, CA; Plymouth, IN; Solon, OH; Dallas, TX; Tampa, FL

PART NO. VSK-MHD
DWG. NO. VSK-MHD
REV. 1
SHEET 1 OF 1

6 / A–9
VSK–MHD (PROPOSED)
SCALE: 1/2" = 1'–0"

RAN TEMPLATE:
67E5A998E Outdoor

0 1 2 3
ORIGINAL SIZE IN INCHES

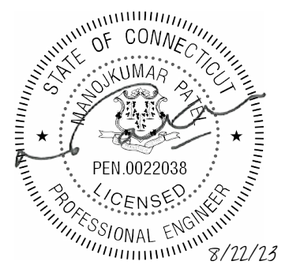
Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.
Tectonic Engineering Consultants, Geologists & Land Surveyors, D.P.C.
70 Pleasant Hill Road — Phone: (845) 534–5959
P.O. Box 37 — (800) 829–6531
Mountainville, NY 10953 — www.tectonicengineering.com
Project Contact Info
1279 Route 300
Newburgh, NY 12550 — Phone: (845) 567–6656

T-Mobile
4 SYLVAN WAY
PARSIPPANY, NJ 07054

PROJECT NUMBER	DESIGNED BY
10481.CT11024B	MP

REV	DATE	REVISION	DRAWN BY
0	12/04/20	FOR APPROVAL	JT
1	05/05/22	PER NEW RFDS	JT
2	07/25/22	PER CLIENT COMMENTS	JT
3	09/01/22	PER CLIENT COMMENTS	JT
4	06/16/23	PER NEW RFDS	TP
5	08/15/23	PER CLIENT COMMENTS	TP

ISSUED BY — DATE



SITE INFORMATION

CT11024B
AMTRAK–BRANFORD
HOSLEY AVENUE
BRANFORD, CT 06406

SHEET TITLE

SPECIFICATIONS

SHEET NUMBER

A–9

ANTENNA DATA

EXIST ANTENNA SPECIFICATIONS

SECTOR	MODEL	ELECTRICAL DOWN TILT	MECHANICAL DOWN TILT	STATUS	CABLE SIZE	CABLE TYPE	AZIMUTH	RADIO
ALPHA	ERICSSON–AIR21 KRC118023	2°	–	EXIST	6x12	HYBRIFLEX	70°	
ALPHA	RFS–APXVARR24_43–U–NA20	2°	0°	EXIST	6x12	–	70°	RRUS11 B12
ALPHA	ERICSSON–AIR32 KRD901146	2°	–	EXIST	6x12	–	70°	
BETA	ERICSSON–AIR21 KRC118023	2°	–	EXIST	6x12	HYBRIFLEX	190°	
BETA	RFS–APXVARR24_43–U–NA20	2°	0°	EXIST	6x12	–	190°	RRUS11 B12
BETA	ERICSSON–AIR32 KRD901146	2°		EXIST	6x12		190°	
GAMMA	ERICSSON–AIR21 KRC118023	2°	–	EXIST	6x12	HYBRIFLEX	310°	
GAMMA	RFS–APXVARR24_43–U–NA20	2°	0°	EXIST	6x12	–	310°	RRUS11 B12
GAMMA	ERICSSON–AIR32 KRD901146	2°	–	EXIST	6x12	–	310°	

NEW ANTENNA SPECIFICATIONS

SECTOR								
ALPHA	AIR 6419 B41	2°	0°	NEW	6x24	HYBRIFLEX	70°	
ALPHA	RFS–APXVARR24_43–U–NA20	0°	0°	EXIST	6x12	–	70°	4449 B71+B85 4460 B25+B66
BETA	AIR 6419 B41	2°	0°	NEW	6x24	HYBRIFLEX	190°	
BETA	RFS–APXVARR24_43–U–NA20	0°	0°	EXIST	6x12	–	190°	4449 B71+B85 4460 B25+B66
GAMMA	AIR 6419 B41	2°	0°	NEW	6x24	HYBRIFLEX	310°	
GAMMA	RFS–APXVARR24_43–U–NA20	0°	0°	EXIST	6x12	–	310°	4449 B71+B85 4460 B25+B66

RAN TEMPLATE:
67E5A998E Outdoor

0 1 2 3
ORIGINAL SIZE IN INCHES

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4 SYLVAN WAY
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PROJECT NUMBER	DESIGNED BY
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REV	DATE	REVISION	DRAWN BY
0	12/04/20	FOR APPROVAL	JT
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4	06/16/23	PER NEW RFDS	TP
5	08/15/23	PER CLIENT COMMENTS	TP

ISSUED BY | DATE

STATE OF CONNECTICUT
MANOJKUMAR PATEL
PEN.0022038
LICENSED
PROFESSIONAL ENGINEER
8/22/23

SITE INFORMATION
CT11024B
AMTRAK–BRANFORD
HOSLEY AVENUE
BRANFORD, CT 06406

SHEET TITLE
ANTENNA SCHEDULE

SHEET NUMBER
A–10

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

Date: **August 10, 2023**

Structural Analysis Report – Revision 3

Tower Owner:	Amtrak (National Railroad Passenger Corporation)
Carrier:	T-Mobile Northeast LLC
Site ID:	CT11024B
Site Name:	Branford/ I-91/ X53/ Jct.
Site Data:	60 Hosley Avenue, Branford, New Haven County, CT Latitude *41° 16' 59.97"*, Longitude *-72° 50' 57.84"* 150 ft Monopole Tower
Tectonic Project Number:	10481.CT11024B

Tectonic Engineering Consultants, Geologists & Land Surveyors, D.P.C., Inc. (Tectonic) is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower.

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

Structure:	**Sufficient Capacity – 86.6%**
Foundation:	**Sufficient Capacity – 37.7%**

This analysis has been performed in accordance with the ANSI/TIA-222-H-1-2019 Standard and utilizes an ultimate 3-second gust wind speed of 125 mph as required by the 2022 Connecticut State Building Code per Appendix P. Exposure Category C with a maximum topographic factor, Kzt, of 1.0 and Structure Class 2 were used in this analysis.

All modifications and equipment proposed in this report shall be installed in accordance with this analysis for the determined available structural capacity to be effective.

We at Tectonic appreciate the opportunity of providing our continuing professional services to you and T-Mobile. If you have any questions or need further assistance on this or any other projects please give us a call.

Structural analysis prepared by / reviewed by: Veronica Elson / Graham Evans

Respectfully submitted by:
Tectonic Engineering Consultants, Geologists & Land Surveyors, D.P.C., Inc.

Edward N. Iamiceli, P.E.
Managing Director - Structural

Project Contact Info

1279 Route 300 | Newburgh, NY 12550
845.567.6656 Tel | 845.567.8703 Fax

tectonicengineering.com
Equal Opportunity Employer

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Analysis Criteria References

1) INTRODUCTION

This tower is a 150 ft Monopole tower designed by PiRod, Inc.and mapped by Vertical Solutions in January of 2015.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	125 mph
Exposure Category:	C
Topographic Factor:	1
Ice Thickness:	1 in
Wind Speed with Ice:	50 mph
Seismic Ss / S1:	0.201 / 0.53
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Carrier Designation	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
150.0	T-Mobile	3	ericsson	AIR 6419 B41	2	6x24 Hybrid	-
		3	ericsson	RADIO 4460 B25+B66			
		3	-	Horizontal Reinforcement			
		3	-	9' x 2.5" STD Pipe			
		3	sitepro1	VSK-MHD			

Table 2 - Existing Equipment Configuration

Mounting Level (ft)	Carrier Designation	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
150.0	T-Mobile	3	ericsson	AIR 32 B66Aa B2a	6	1-1/4	2
		3	ericsson	ERICSSON AIR 21 B2A B4P		9x18 Hybrid	
		3	ericsson	KRY 112 144/1	1		
		3	rfs celwave	APXVAARR24_43-U-NA20	2	6x12 Hybrid	1
		1	tower mount	10' Low Profile Platform			
		3	ericsson	RADIO 4449 B71/B85			
150.0	Amtrak	1	gabriel electronics	DFPD1-52	1	1/2	1
		1	omni antennas	6' x 1.5" Omni Antenna			
98.0		1	celwave	PD220	1	1/2	
		1	tower mount	6' Side Arm			
70.0		1	celwave	PD220	1	1/2	
		1	tower mount	6' Side Arm			
50.0		1	celwave	PD220	1	1/2	
		1	tower mount	6' Side Arm			

Notes:
1) Existing equipment
2) Existing equipment to be removed; not considered in this analysis

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Dated
GEOTECHNICAL EVALUATION REPORT	French & Parrello Associates	6/22/98
ORIGINAL TOWER AND FOUNDATION DRAWINGS	PiRod Inc.	7/23/98
TOWER MAPPING REPORT	Vertical Solutions	1/13/15
STRUCTURAL MODIFICATION ANALYSIS REPORT	Tectonic	6/4/15
POST MODIFICATION INSPECTION REPORT	Tectonic	5/22/17
RFDS	T-Mobile	3/24/23
MOUNT STRUCTURAL ANALYSIS REPORT	Centek Engineering	4/12/23

3.1) Analysis Method

tnxTower (version 8.1.1.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

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

3.2) Assumptions

1) Tower and structures were built and maintained in accordance with the manufacturer's specifications.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
3) The wind area and weight of the existing platform has been estimated based on site specific photos.
4) The existing base plate and flange plates have been adequately designed to carry the full capacity of the unreinforced pole shaft. Therefore, the base plate and flange plate capacity is governed by the pole shaft and/or anchor capacity.

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)*

Section No.	Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
L1	150 - 145	Pole	TP12.75x12.75x0.375	Pole	16.0%	Pass
L2	145 - 140	Pole	TP12.75x12.75x0.375	Pole	32.6%	Pass
L3	140 - 135.667	Pole	TP12.75x12.75x0.375	Pole	47.5%	Pass
L4	135.667 - 135.417	Pole + Reinf.	TP12.75x12.75x0.725	Reinf. 3 Tension Rupture	29.9%	Pass
L5	135.417 - 130.417	Pole + Reinf.	TP12.75x12.75x0.725	Reinf. 3 Tension Rupture	41.2%	Pass
L6	130.417 - 125.417	Pole + Reinf.	TP12.75x12.75x0.725	Reinf. 3 Tension Rupture	53.3%	Pass
L7	125.417 - 120.417	Pole + Reinf.	TP12.75x12.75x0.725	Reinf. 3 Tension Rupture	66.2%	Pass
L8	120.417 - 120	Pole + Reinf.	TP12.75x12.75x0.725	Reinf. 3 Tension Rupture	67.3%	Pass
L9	120 - 119.75	Pole	TP18x18x0.375	Pole	54.5%	Pass
L10	119.75 - 114.75	Pole	TP18x18x0.375	Pole	65.3%	Pass
L11	114.75 - 110.375	Pole	TP18x18x0.375	Pole	75.1%	Pass
L12	110.375 - 110.125	Pole + Reinf.	TP18x18x0.5875	Reinf. 2 Tension Rupture	53.3%	Pass
L13	110.125 - 105.125	Pole + Reinf.	TP18x18x0.5875	Reinf. 2 Tension Rupture	61.6%	Pass
L14	105.125 - 100.125	Pole + Reinf.	TP18x18x0.5875	Reinf. 2 Tension Rupture	70.2%	Pass
L15	100.125 - 100	Pole + Reinf.	TP18x18x0.5875	Reinf. 2 Tension Rupture	70.4%	Pass
L16	100 - 99.75	Pole	TP24x24x0.375	Pole	59.3%	Pass
L17	99.75 - 94.75	Pole	TP24x24x0.375	Pole	67.2%	Pass
L18	94.75 - 89.75	Pole	TP24x24x0.375	Pole	75.1%	Pass
L19	89.75 - 85.25	Pole	TP24x24x0.375	Pole	82.4%	Pass
L20	85.25 - 85	Pole + Reinf.	TP24x24x0.5188	Pole	60.9%	Pass
L21	85 - 80	Pole + Reinf.	TP24x24x0.5188	Pole	67.0%	Pass
L22	80 - 79.75	Pole	TP30x30x0.375	Pole	60.4%	Pass
L23	79.75 - 74.75	Pole	TP30x30x0.375	Pole	66.1%	Pass
L24	74.75 - 69.75	Pole	TP30x30x0.375	Pole	72.2%	Pass
L25	69.75 - 64.75	Pole	TP30x30x0.375	Pole	78.4%	Pass
L26	64.75 - 60	Pole	TP30x30x0.375	Pole	84.4%	Pass
L27	60 - 55	Pole	TP36x36x0.375	Pole	64.6%	Pass
L28	55 - 50	Pole	TP36x36x0.375	Pole	69.4%	Pass
L29	50 - 45	Pole	TP36x36x0.375	Pole	74.7%	Pass
L30	45 - 40	Pole	TP36x36x0.375	Pole	79.9%	Pass
L31	40 - 35	Pole	TP42x42x0.375	Pole	63.8%	Pass
L32	35 - 30	Pole	TP42x42x0.375	Pole	67.9%	Pass
L33	30 - 25	Pole	TP42x42x0.375	Pole	72.1%	Pass
L34	25 - 20	Pole	TP42x42x0.375	Pole	76.5%	Pass
L35	20 - 15	Pole	TP48x48x0.375	Pole	62.8%	Pass
L36	15 - 10	Pole	TP48x48x0.375	Pole	66.3%	Pass
L37	10 - 5	Pole	TP48x48x0.375	Pole	69.9%	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
L38	5 - 0	Pole	TP48x48x0.375	Pole	73.6%	Pass
					Summary	
				Pole	84.4%	Pass
				Reinforcement	70.4%	Pass
				Overall	84.4%	Pass

*Capacity per TIA-222-H Section 15.5

Table 5 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1, 2	Flange Connection	120	55.9	Pass
1, 2	Flange Connection	100	58.4	Pass
1, 2	Flange Connection	80	60.2	Pass
1, 2	Flange Connection	60	86.6	Pass
1, 2	Flange Connection	40	83.6	Pass
1, 2	Flange Connection	20	81.1	Pass
1, 2	Anchor Rods	0	75.6	Pass
1, 2	Base Foundation (Structure)	0	37.7	Pass
1, 2	Base Foundation (Soil Interaction)	0	19.9	Pass

Structure Rating (max from all components) =	**86.6%**

Notes:
1) See additional documentation in “Appendix C – Additional Calculations” for calculations supporting the % capacity consumed.
2) Capacity rating per TIA-222-H Section 15.5

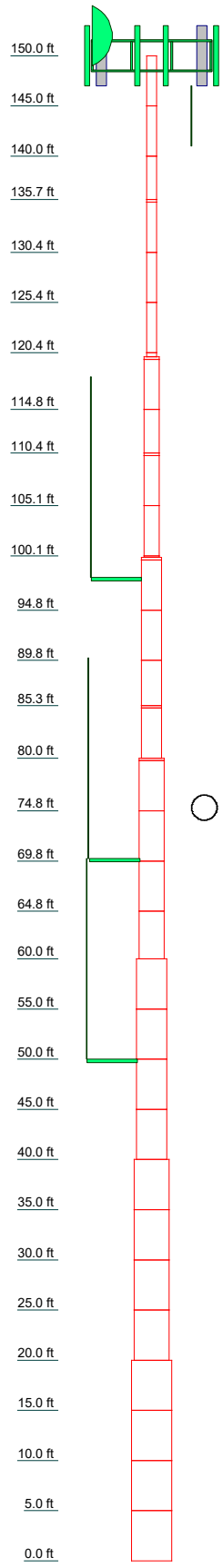
4.1) Results / Conclusions

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

APPENDIX A

TNXTOWER OUTPUT

Section	Size	Length (ft)	Grade	Weight (K)
1	P48x0.375	5.000	A53-B-42	0.2
2	P42x0.375	5.000		0.2
3	P36x0.375	4.333		0.2
4	P30x0.375	5.000		0.4
5	P24x0.375			0.0
6	P18x0.375	5.000		0.4
7	P12x0.375	5.000		0.4
8	P8.625x0.322			0.0
9	P8.625x0.277			0.0
10	P8.625x0.250	5.000		0.4
11	P8.625x0.250	4.375		0.3
12	P8.625x0.250	5.000		0.5
13	P8.625x0.250			0.0
14	P8.625x0.250	5.000		0.5
15	P8.625x0.250			0.0
16	P8.625x0.250			0.0
17	P8.625x0.250	5.000		0.5
18	P24x0.375	5.000		0.5
19	P24x0.375	4.500		0.4
20	P24x0.375			0.0
21	P24x0.375	5.000		0.6
22	P24x0.375			0.0
23	P30x0.375	5.000		0.6
24	P30x0.375	5.000		0.6
25	P30x0.375	5.000		0.6
26	P30x0.375	4.750		0.6
27	P36x0.375	5.000		0.7
28	P36x0.375	5.000		0.7
29	P36x0.375	5.000		0.7
30	P36x0.375	5.000		0.7
31	P42x0.375	5.000		0.8
32	P42x0.375	5.000		0.8
33	P42x0.375	5.000		0.8
34	P42x0.375	5.000		0.8
35	P48x0.375	5.000		1.0
36	P48x0.375	5.000		1.0
37	P48x0.375	5.000		1.0
38	P48x0.375	5.000		1.0
				18.1



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
APXVAARR24_43-U-NA20 w/ 2.5" Mount Pipe	150	SitePro1 VSK-MHD	150
APXVAARR24_43-U-NA20 w/ 2.5" Mount Pipe	150	SitePro1 VSK-MHD	150
APXVAARR24_43-U-NA20 w/ 2.5" Mount Pipe	150	Horizontal Reinforcement	150
RADIO 4449 B71/B85	150	Horizontal Reinforcement	150
RADIO 4449 B71/B85	150	Horizontal Reinforcement	150
RADIO 4449 B71/B85	150	6' x 1.5" Omni Antenna	150
AIR 6419 B41 w/ Mount Pipe	150	DFPD1-52	150
AIR 6419 B41 w/ Mount Pipe	150	6' x 2" STD Pipe	150
AIR 6419 B41 w/ Mount Pipe	150	6' x 2" STD Pipe	150
RADIO 4460 B25+B66	150	6' x 2" STD Pipe	150
RADIO 4460 B25+B66	150	4' x 2" STD Pipe	98
RADIO 4460 B25+B66	150	6' Side Arm	98
6' x 2" STD Pipe	150	PD220	98
6' x 2" STD Pipe	150	4' x 2" STD Pipe	70
6' x 2" STD Pipe	150	6' Side Arm	70
10' Low Profile Platform	150	PD220	70
SitePro1 VSK-MHD	150	4' x 2" STD Pipe	50
		6' Side Arm	50
		PD220	50

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

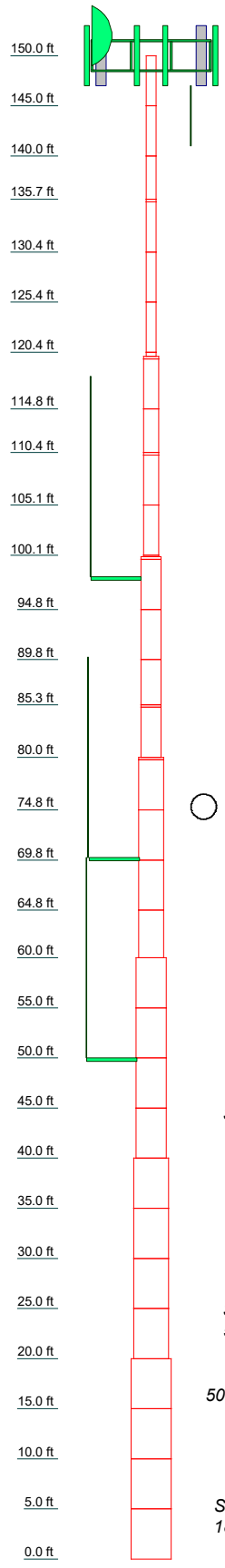
1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 125 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.000 ft

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

Tectonic
1279 Route 300
Newburgh, NY 12550
Phone: (845) 567-6656
FAX: (845) 567-8703

Job: ***10481.CT11024B***		
Project: ***150' Monopole***		
Client: T-Mobile	Drawn by: Veronica Elson	App'd:
Code: TIA-222-H	Date: 06/09/23	Scale: NTS
Path:		Dwg No. E-1

Section	Size	Length (ft)	Grade	Weight (K)
1	P72.75x0.375	5.000	A53-B-42	0.2
2	P72.75x0.375	5.000		0.2
3	P72.75x0.375	4.333		0.2
4	P72.75x0.375	5.000		0.4
5	P72.75x0.375	5.000		0.0
6	P72.75x0.375	5.000		0.4
7	P72.75x0.375	5.000		0.4
8	P72.75x0.375	5.000		0.0
9	P72.75x0.375	5.000		0.0
10	P72.75x0.375	5.000		0.4
11	P72.75x0.375	4.375		0.3
12	P72.75x0.375	5.000		0.0
13	P72.75x0.375	5.000		0.5
14	P72.75x0.375	5.000		0.0
15	P72.75x0.375	5.000		0.5
16	P72.75x0.375	5.000		0.0
17	P72.75x0.375	5.000		0.5
18	P72x0.375	5.000		0.5
19	P72x0.375	5.500		0.4
20	P72x0.375	4.667		0.0
21	P72x0.375	5.000		0.6
22	P72x0.375	5.000		0.0
23	P72x0.375	5.000		0.6
24	P60x0.375	5.000		0.6
25	P60x0.375	5.000		0.6
26	P60x0.375	4.750		0.6
27	P56x0.375	5.000		0.7
28	P56x0.375	5.000		0.7
29	P56x0.375	5.000		0.7
30	P56x0.375	5.000		0.7
31	P42x0.375	5.000		0.8
32	P42x0.375	5.000		0.8
33	P42x0.375	5.000		0.8
34	P42x0.375	5.000		0.8
35	P48x0.375	5.000		1.0
36	P48x0.375	5.000		1.0
37	P48x0.375	5.000		1.0
38	P48x0.375	5.000		1.0
				18.1



MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 125 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.000 ft
8. Seismic loads generated by spreadsheet
9. Seismic calculations are in accordance with TIA-222-H-1
10. TOWER RATING: 84.4%

ALL REACTIONS ARE FACTORED

AXIAL 30 K
SHEAR 1 K *MOMENT 95 kip-ft*
TORQUE 0 kip-ft
SEISMIC

AXIAL 39 K
SHEAR 5 K *MOMENT 482 kip-ft*
TORQUE 3 kip-ft
50 mph WIND - 1.000 in ICE

AXIAL 29 K
SHEAR 18 K *MOMENT 1755 kip-ft*
TORQUE 6 kip-ft
REACTIONS - 125 mph WIND

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

Tectonic
1279 Route 300
Newburgh, NY 12550
Phone: (845) 567-6656
FAX: (845) 567-8703

Job: ***10481.CT11024B***			
Project: ***150' Monopole***			
Client: T-Mobile	Drawn by: Veronica Elson		App'd:
Code: TIA-222-H	Date: 08/10/23		Scale: NTS
Path:			Dwg No. E-1

Tower Input Data

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

- Tower is located in New Haven County, Connecticut.
- Tower base elevation above sea level: 59.000 ft.
- Basic wind speed of 125 mph.
- Risk Category II.
- Exposure Category C.
- Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- Topographic Category: 1.
- Crest Height: 0.000 ft.
- Nominal ice thickness of 1.000 in.
- Ice thickness is considered to increase with height.
- Ice density of 56.000 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50.000 °F.
- Deflections calculated using a wind speed of 60 mph.
- Seismic loads generated by spreadsheet.
- Seismic calculations are in accordance with TIA-222-H-1.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in pole design is 1.05.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Pole Section Geometry

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L1	150.000-145.000	5.000	P12.75x0.375	A53-B-42 (42 ksi)	
L2	145.000-140.000	5.000	P12.75x0.375	A53-B-42 (42 ksi)	
L3	140.000-135.667	4.333	P12.75x0.375	A53-B-42 (42 ksi)	
L4	135.667-135.417	0.250	P12.75x0.725	A53-B-42 (42 ksi)	
L5	135.417-130.417	5.000	P12.75x0.725	A53-B-42 (42 ksi)	
L6	130.417-125.417	5.000	P12.75x0.725	A53-B-42 (42 ksi)	
L7	125.417-120.417	5.000	P12.75x0.725	A53-B-42 (42 ksi)	
L8	120.417-120.000	0.417	P12.75x0.725	A53-B-42 (42 ksi)	
L9	120.000-119.750	0.250	P18x0.375	A53-B-42 (42 ksi)	
L10	119.750-114.750	5.000	P18x0.375	A53-B-42 (42 ksi)	
L11	114.750-110.375	4.375	P18x0.375	A53-B-42 (42 ksi)	
L12	110.375-110.125	0.250	P18x0.5875	A53-B-42 (42 ksi)	
L13	110.125-105.125	5.000	P18x0.5875	A53-B-42 (42 ksi)	
L14	105.125-100.125	5.000	P18x0.5875	A53-B-42 (42 ksi)	
L15	100.125-100.000	0.125	P18x0.5875	A53-B-42 (42 ksi)	
L16	100.000-99.750	0.250	P24x0.375	A53-B-42 (42 ksi)	
L17	99.750-94.750	5.000	P24x0.375	A53-B-42 (42 ksi)	
L18	94.750-89.750	5.000	P24x0.375	A53-B-42 (42 ksi)	
L19	89.750-85.250	4.500	P24x0.375	A53-B-42 (42 ksi)	
L20	85.250-85.000	0.250	P24x0.51875	A53-B-42 (42 ksi)	
L21	85.000-80.000	5.000	P24x0.51875	A53-B-42 (42 ksi)	
L22	80.000-79.750	0.250	P30x0.375	A53-B-42 (42 ksi)	
L23	79.750-74.750	5.000	P30x0.375	A53-B-42 (42 ksi)	
L24	74.750-69.750	5.000	P30x0.375	A53-B-42 (42 ksi)	
L25	69.750-64.750	5.000	P30x0.375	A53-B-42 (42 ksi)	
L26	64.750-60.000	4.750	P30x0.375	A53-B-42 (42 ksi)	
L27	60.000-55.000	5.000	P36x0.375	A53-B-42 (42 ksi)	
L28	55.000-50.000	5.000	P36x0.375	A53-B-42 (42 ksi)	
L29	50.000-45.000	5.000	P36x0.375	A53-B-42 (42 ksi)	
L30	45.000-40.000	5.000	P36x0.375	A53-B-42 (42 ksi)	
L31	40.000-35.000	5.000	P42x0.375	A53-B-42 (42 ksi)	
L32	35.000-30.000	5.000	P42x0.375	A53-B-42 (42 ksi)	
L33	30.000-25.000	5.000	P42x0.375	A53-B-42	

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L34	25.000-20.000	5.000	P42x0.375	(42 ksi) A53-B-42 (42 ksi)	
L35	20.000-15.000	5.000	P48x0.375	A53-B-42 (42 ksi)	
L36	15.000-10.000	5.000	P48x0.375	A53-B-42 (42 ksi)	
L37	10.000-5.000	5.000	P48x0.375	A53-B-42 (42 ksi)	
L38	5.000-0.000	5.000	P48x0.375	A53-B-42 (42 ksi)	

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 150.000-145.000				1	1	1			
L2 145.000-140.000				1	1	1			
L3 140.000-135.667				1	1	1			
L4 135.667-135.417				1	1	0.852135			
L5 135.417-130.417				1	1	0.852135			
L6 130.417-125.417				1	1	0.852135			
L7 125.417-120.417				1	1	0.852135			
L8 120.417-120.000				1	1	0.852135			
L9 120.000-119.750				1	1	1			
L10 119.750-114.750				1	1	1			
L11 114.750-110.375				1	1	1			
L12 110.375-110.125				1	1	0.918662			
L13 110.125-105.125				1	1	0.918662			
L14 105.125-100.125				1	1	0.918662			
L15 100.125-100.000				1	1	0.918662			
L16 100.000-99.750				1	1	1			
L17 99.750-94.750				1	1	1			
L18 94.750-89.750				1	1	1			
L19 89.750-85.250				1	1	1			
L20 85.250-85.000				1	1	0.956232			
L21 85.000-80.000				1	1	0.956232			
L22 80.000-79.750				1	1	1			
L23 79.750-74.750				1	1	1			
L24 74.750-69.750				1	1	1			
L25 69.750-64.750				1	1	1			

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L26 64.750-60.000				1	1	1			
L27 60.000-55.000				1	1	1			
L28 55.000-50.000				1	1	1			
L29 50.000-45.000				1	1	1			
L30 45.000-40.000				1	1	1			
L31 40.000-35.000				1	1	1			
L32 35.000-30.000				1	1	1			
L33 30.000-25.000				1	1	1			
L34 25.000-20.000				1	1	1			
L35 20.000-15.000				1	1	1			
L36 15.000-10.000				1	1	1			
L37 10.000-5.000				1	1	1			
L38 5.000-0.000				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
***										
Climbing Ladder	C	No	Surface Ar (CaAa)	150.000 - 10.500	1	1	0.000 0.000	1.000		7.900
Safety Line 3/8	C	No	Surface Ar (CaAa)	150.000 - 10.500	1	1	0.000 0.000	0.375		0.220
***										
MP3-03 Channel Reinforcement	A	No	Surface Af (CaAa)	136.800 - 119.500	1	1	0.000 0.000	4.000	11.260	0.000
MP3-03 Channel Reinforcement	B	No	Surface Af (CaAa)	136.800 - 119.500	1	1	0.000 0.000	4.000	11.260	0.000
MP3-03 Channel Reinforcement	C	No	Surface Af (CaAa)	136.800 - 119.500	1	1	0.000 0.000	4.000	11.260	0.000
MP3-03 Channel Reinforcement	A	No	Surface Af (CaAa)	111.500 - 101.500	1	1	0.000 0.000	4.000	11.260	0.000
MP3-03 Channel Reinforcement	B	No	Surface Af (CaAa)	111.500 - 101.500	1	1	0.000 0.000	4.000	11.260	0.000
MP3-03 Channel Reinforcement	C	No	Surface Af (CaAa)	111.500 - 101.500	1	1	0.000 0.000	4.000	11.260	0.000
MP3-03 Channel Reinforcement	A	No	Surface Af (CaAa)	86.500 - 79.000	1	1	0.000 0.000	4.000	11.260	0.000
MP3-03 Channel Reinforcement	B	No	Surface Af (CaAa)	86.500 - 79.000	1	1	0.000 0.000	4.000	11.260	0.000
MP3-03 Channel Reinforcement	C	No	Surface Af (CaAa)	86.500 - 79.000	1	1	0.000 0.000	4.000	11.260	0.000
*										

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
6Power/24Fiber (1 5/8)	C	No	No	Inside Pole	150.000 - 0.000	2	No Ice	0.000	2.300
							1/2" Ice	0.000	2.300
							1" Ice	0.000	2.300
MLC Hybrid 6Power/12Fiber(1 1/2) ***	C	No	No	Inside Pole	150.000 - 0.000	2	No Ice	0.000	2.650
							1/2" Ice	0.000	2.650
							1" Ice	0.000	2.650
LDF4-50A(1/2")	C	No	No	Inside Pole	150.000 - 0.000	1	No Ice	0.000	0.150
							1/2" Ice	0.000	0.150
							1" Ice	0.000	0.150
LDF4-50A(1/2")	C	No	No	Inside Pole	98.000 - 0.000	1	No Ice	0.000	0.150
							1/2" Ice	0.000	0.150
							1" Ice	0.000	0.150
LDF4-50A(1/2")	C	No	No	Inside Pole	70.000 - 0.000	1	No Ice	0.000	0.150
							1/2" Ice	0.000	0.150
							1" Ice	0.000	0.150
LDF4-50A(1/2")	C	No	No	Inside Pole	50.000 - 0.000	1	No Ice	0.000	0.150
							1/2" Ice	0.000	0.150
							1" Ice	0.000	0.150
*									

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	150.000-145.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.688	0.000	0.091
L2	145.000-140.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.688	0.000	0.091
L3	140.000-135.667	A	0.000	0.000	0.755	0.000	0.000
		B	0.000	0.000	0.755	0.000	0.000
		C	0.000	0.000	1.351	0.000	0.079
L4	135.667-135.417	A	0.000	0.000	0.167	0.000	0.000
		B	0.000	0.000	0.167	0.000	0.000
		C	0.000	0.000	0.201	0.000	0.005
L5	135.417-130.417	A	0.000	0.000	3.333	0.000	0.000
		B	0.000	0.000	3.333	0.000	0.000
		C	0.000	0.000	4.021	0.000	0.091
L6	130.417-125.417	A	0.000	0.000	3.333	0.000	0.000
		B	0.000	0.000	3.333	0.000	0.000
		C	0.000	0.000	4.021	0.000	0.091
L7	125.417-120.417	A	0.000	0.000	3.333	0.000	0.000
		B	0.000	0.000	3.333	0.000	0.000
		C	0.000	0.000	4.021	0.000	0.091
L8	120.417-120.000	A	0.000	0.000	0.278	0.000	0.000
		B	0.000	0.000	0.278	0.000	0.000
		C	0.000	0.000	0.335	0.000	0.008
L9	120.000-119.750	A	0.000	0.000	0.167	0.000	0.000
		B	0.000	0.000	0.167	0.000	0.000
		C	0.000	0.000	0.201	0.000	0.005
L10	119.750-114.750	A	0.000	0.000	0.167	0.000	0.000
		B	0.000	0.000	0.167	0.000	0.000
		C	0.000	0.000	0.854	0.000	0.091
L11	114.750-110.375	A	0.000	0.000	0.750	0.000	0.000
		B	0.000	0.000	0.750	0.000	0.000
		C	0.000	0.000	1.352	0.000	0.079
L12	110.375-110.125	A	0.000	0.000	0.167	0.000	0.000
		B	0.000	0.000	0.167	0.000	0.000
		C	0.000	0.000	0.201	0.000	0.005

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L13	110.125-105.125	A	0.000	0.000	3.333	0.000	0.000
		B	0.000	0.000	3.333	0.000	0.000
		C	0.000	0.000	4.021	0.000	0.091
L14	105.125-100.125	A	0.000	0.000	2.417	0.000	0.000
		B	0.000	0.000	2.417	0.000	0.000
		C	0.000	0.000	3.104	0.000	0.091
L15	100.125-100.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.017	0.000	0.002
L16	100.000-99.750	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.034	0.000	0.005
L17	99.750-94.750	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.688	0.000	0.091
L18	94.750-89.750	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.688	0.000	0.092
L19	89.750-85.250	A	0.000	0.000	0.776	0.000	0.000
		B	0.000	0.000	0.776	0.000	0.000
		C	0.000	0.000	1.394	0.000	0.082
L20	85.250-85.000	A	0.000	0.000	0.155	0.000	0.000
		B	0.000	0.000	0.155	0.000	0.000
		C	0.000	0.000	0.189	0.000	0.005
L21	85.000-80.000	A	0.000	0.000	3.102	0.000	0.000
		B	0.000	0.000	3.102	0.000	0.000
		C	0.000	0.000	3.790	0.000	0.092
L22	80.000-79.750	A	0.000	0.000	0.155	0.000	0.000
		B	0.000	0.000	0.155	0.000	0.000
		C	0.000	0.000	0.189	0.000	0.005
L23	79.750-74.750	A	0.000	0.000	0.465	0.000	0.000
		B	0.000	0.000	0.465	0.000	0.000
		C	0.000	0.000	1.153	0.000	0.092
L24	74.750-69.750	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.688	0.000	0.092
L25	69.750-64.750	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.688	0.000	0.092
L26	64.750-60.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.653	0.000	0.088
L27	60.000-55.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.688	0.000	0.092
L28	55.000-50.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.688	0.000	0.092
L29	50.000-45.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.688	0.000	0.093
L30	45.000-40.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.688	0.000	0.093
L31	40.000-35.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.688	0.000	0.093
L32	35.000-30.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.688	0.000	0.093
L33	30.000-25.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.688	0.000	0.093
L34	25.000-20.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.688	0.000	0.093
L35	20.000-15.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.688	0.000	0.093

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L36	15.000-10.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.619	0.000	0.089
L37	10.000-5.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.052
L38	5.000-0.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.052

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	150.000-145.000	A	1.162	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	3.011	0.000	0.117
L2	145.000-140.000	A	1.158	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	3.003	0.000	0.117
L3	140.000-135.667	A	1.154	0.000	0.000	1.017	0.000	0.008
		B		0.000	0.000	1.017	0.000	0.008
		C		0.000	0.000	3.612	0.000	0.109
L4	135.667-135.417	A	1.152	0.000	0.000	0.224	0.000	0.002
		B		0.000	0.000	0.224	0.000	0.002
		C		0.000	0.000	0.374	0.000	0.008
L5	135.417-130.417	A	1.149	0.000	0.000	4.483	0.000	0.035
		B		0.000	0.000	4.483	0.000	0.035
		C		0.000	0.000	7.469	0.000	0.152
L6	130.417-125.417	A	1.145	0.000	0.000	4.478	0.000	0.035
		B		0.000	0.000	4.478	0.000	0.035
		C		0.000	0.000	7.456	0.000	0.151
L7	125.417-120.417	A	1.141	0.000	0.000	4.474	0.000	0.035
		B		0.000	0.000	4.474	0.000	0.035
		C		0.000	0.000	7.442	0.000	0.151
L8	120.417-120.000	A	1.138	0.000	0.000	0.373	0.000	0.003
		B		0.000	0.000	0.373	0.000	0.003
		C		0.000	0.000	0.620	0.000	0.013
L9	120.000-119.750	A	1.138	0.000	0.000	0.224	0.000	0.002
		B		0.000	0.000	0.224	0.000	0.002
		C		0.000	0.000	0.372	0.000	0.008
L10	119.750-114.750	A	1.135	0.000	0.000	0.223	0.000	0.002
		B		0.000	0.000	0.223	0.000	0.002
		C		0.000	0.000	3.181	0.000	0.118
L11	114.750-110.375	A	1.131	0.000	0.000	0.922	0.000	0.008
		B		0.000	0.000	0.922	0.000	0.008
		C		0.000	0.000	3.502	0.000	0.109
L12	110.375-110.125	A	1.128	0.000	0.000	0.205	0.000	0.002
		B		0.000	0.000	0.205	0.000	0.002
		C		0.000	0.000	0.352	0.000	0.007
L13	110.125-105.125	A	1.125	0.000	0.000	4.096	0.000	0.034
		B		0.000	0.000	4.096	0.000	0.034
		C		0.000	0.000	7.035	0.000	0.150
L14	105.125-100.125	A	1.120	0.000	0.000	2.968	0.000	0.024
		B		0.000	0.000	2.968	0.000	0.024
		C		0.000	0.000	5.896	0.000	0.140
L15	100.125-100.000	A	1.117	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.073	0.000	0.003
L16	100.000-99.750	A	1.117	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.146	0.000	0.006
L17	99.750-94.750	A	1.114	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	2.916	0.000	0.116

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L18	94.750-89.750	A	1.108	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	2.904	0.000	0.116
L19	89.750-85.250	A	1.102	0.000	0.000	0.926	0.000	0.008
		B		0.000	0.000	0.926	0.000	0.008
		C		0.000	0.000	3.529	0.000	0.112
L20	85.250-85.000	A	1.099	0.000	0.000	0.185	0.000	0.002
		B		0.000	0.000	0.185	0.000	0.002
		C		0.000	0.000	0.329	0.000	0.007
L21	85.000-80.000	A	1.096	0.000	0.000	3.699	0.000	0.033
		B		0.000	0.000	3.699	0.000	0.033
		C		0.000	0.000	6.579	0.000	0.148
L22	80.000-79.750	A	1.092	0.000	0.000	0.185	0.000	0.002
		B		0.000	0.000	0.185	0.000	0.002
		C		0.000	0.000	0.328	0.000	0.007
L23	79.750-74.750	A	1.089	0.000	0.000	0.554	0.000	0.005
		B		0.000	0.000	0.554	0.000	0.005
		C		0.000	0.000	3.419	0.000	0.120
L24	74.750-69.750	A	1.082	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	2.851	0.000	0.115
L25	69.750-64.750	A	1.074	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	2.835	0.000	0.115
L26	64.750-60.000	A	1.066	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	2.678	0.000	0.109
L27	60.000-55.000	A	1.057	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	2.802	0.000	0.115
L28	55.000-50.000	A	1.048	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	2.783	0.000	0.115
L29	50.000-45.000	A	1.037	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	2.762	0.000	0.115
L30	45.000-40.000	A	1.026	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	2.739	0.000	0.115
L31	40.000-35.000	A	1.013	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	2.713	0.000	0.114
L32	35.000-30.000	A	0.998	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	2.684	0.000	0.114
L33	30.000-25.000	A	0.982	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	2.651	0.000	0.113
L34	25.000-20.000	A	0.962	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	2.612	0.000	0.113
L35	20.000-15.000	A	0.939	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	2.565	0.000	0.112
L36	15.000-10.000	A	0.907	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	2.252	0.000	0.105
L37	10.000-5.000	A	0.862	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.052
L38	5.000-0.000	A	0.773	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.052

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L1	150.000-145.000	0.000	1.205	0.000	1.922
L2	145.000-140.000	0.000	1.205	0.000	1.920
L3	140.000-135.667	0.000	0.719	0.000	1.436
L4	135.667-135.417	0.000	0.270	0.000	0.831
L5	135.417-130.417	0.000	0.270	0.000	0.830
L6	130.417-125.417	0.000	0.270	0.000	0.829
L7	125.417-120.417	0.000	0.270	0.000	0.827
L8	120.417-120.000	0.000	0.270	0.000	0.826
L9	120.000-119.750	0.000	0.328	0.000	1.043
L10	119.750-114.750	0.000	1.138	0.000	2.012
L11	114.750-110.375	0.000	0.834	0.000	1.699
L12	110.375-110.125	0.000	0.328	0.000	1.083
L13	110.125-105.125	0.000	0.328	0.000	1.082
L14	105.125-100.125	0.000	0.520	0.000	1.248
L15	100.125-100.000	0.000	1.248	0.000	2.098
L16	100.000-99.750	0.000	1.276	0.000	2.252
L17	99.750-94.750	0.000	1.276	0.000	2.248
L18	94.750-89.750	0.000	1.276	0.000	2.242
L19	89.750-85.250	0.000	0.920	0.000	1.874
L20	85.250-85.000	0.000	0.534	0.000	1.317
L21	85.000-80.000	0.000	0.534	0.000	1.315
L22	80.000-79.750	0.000	0.606	0.000	1.468
L23	79.750-74.750	0.000	1.106	0.000	2.135
L24	74.750-69.750	0.000	1.294	0.000	2.313
L25	69.750-64.750	0.000	1.294	0.000	2.303
L26	64.750-60.000	0.000	1.294	0.000	2.293
L27	60.000-55.000	0.000	1.307	0.000	2.353
L28	55.000-50.000	0.000	1.307	0.000	2.340
L29	50.000-45.000	0.000	1.307	0.000	2.326
L30	45.000-40.000	0.000	1.307	0.000	2.311
L31	40.000-35.000	0.000	1.316	0.000	2.344
L32	35.000-30.000	0.000	1.316	0.000	2.323
L33	30.000-25.000	0.000	1.316	0.000	2.299
L34	25.000-20.000	0.000	1.316	0.000	2.271
L35	20.000-15.000	0.000	1.323	0.000	2.272
L36	15.000-10.000	0.000	1.197	0.000	2.020
L37	10.000-5.000	0.000	0.000	0.000	0.000
L38	5.000-0.000	0.000	0.000	0.000	0.000

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

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	11	Climbing Ladder	145.00 - 150.00	1.0000	1.0000
L1	12	Safety Line 3/8	145.00 - 150.00	1.0000	1.0000
L2	11	Climbing Ladder	140.00 - 145.00	1.0000	1.0000
L2	12	Safety Line 3/8	140.00 - 145.00	1.0000	1.0000
L3	11	Climbing Ladder	135.67 - 140.00	1.0000	1.0000
L3	12	Safety Line 3/8	135.67 - 140.00	1.0000	1.0000
L3	14	MP3-03 Channel Reinforcement	135.67 - 136.80	1.0000	1.0000
L3	15	MP3-03 Channel	135.67 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
		Reinforcement	136.80		
L3	16	MP3-03 Channel Reinforcement	135.67 - 136.80	1.0000	1.0000
L4	11	Climbing Ladder	135.42 - 135.67	1.0000	1.0000
L4	12	Safety Line 3/8	135.42 - 135.67	1.0000	1.0000
L4	14	MP3-03 Channel Reinforcement	135.42 - 135.67	1.0000	1.0000
L4	15	MP3-03 Channel Reinforcement	135.42 - 135.67	1.0000	1.0000
L4	16	MP3-03 Channel Reinforcement	135.42 - 135.67	1.0000	1.0000
L5	11	Climbing Ladder	130.42 - 135.42	1.0000	1.0000
L5	12	Safety Line 3/8	130.42 - 135.42	1.0000	1.0000
L5	14	MP3-03 Channel Reinforcement	130.42 - 135.42	1.0000	1.0000
L5	15	MP3-03 Channel Reinforcement	130.42 - 135.42	1.0000	1.0000
L5	16	MP3-03 Channel Reinforcement	130.42 - 135.42	1.0000	1.0000
L6	11	Climbing Ladder	125.42 - 130.42	1.0000	1.0000
L6	12	Safety Line 3/8	125.42 - 130.42	1.0000	1.0000
L6	14	MP3-03 Channel Reinforcement	125.42 - 130.42	1.0000	1.0000
L6	15	MP3-03 Channel Reinforcement	125.42 - 130.42	1.0000	1.0000
L6	16	MP3-03 Channel Reinforcement	125.42 - 130.42	1.0000	1.0000
L7	11	Climbing Ladder	120.42 - 125.42	1.0000	1.0000
L7	12	Safety Line 3/8	120.42 - 125.42	1.0000	1.0000
L7	14	MP3-03 Channel Reinforcement	120.42 - 125.42	1.0000	1.0000
L7	15	MP3-03 Channel Reinforcement	120.42 - 125.42	1.0000	1.0000
L7	16	MP3-03 Channel Reinforcement	120.42 - 125.42	1.0000	1.0000
L8	11	Climbing Ladder	120.00 - 120.42	1.0000	1.0000
L8	12	Safety Line 3/8	120.00 - 120.42	1.0000	1.0000
L8	14	MP3-03 Channel Reinforcement	120.00 - 120.42	1.0000	1.0000
L8	15	MP3-03 Channel Reinforcement	120.00 - 120.42	1.0000	1.0000
L8	16	MP3-03 Channel Reinforcement	120.00 - 120.42	1.0000	1.0000
L9	11	Climbing Ladder	119.75 - 120.00	1.0000	1.0000
L9	12	Safety Line 3/8	119.75 - 120.00	1.0000	1.0000
L9	14	MP3-03 Channel Reinforcement	119.75 - 120.00	1.0000	1.0000
L9	15	MP3-03 Channel Reinforcement	119.75 - 120.00	1.0000	1.0000
L9	16	MP3-03 Channel Reinforcement	119.75 - 120.00	1.0000	1.0000
L10	11	Climbing Ladder	114.75 - 119.75	1.0000	1.0000
L10	12	Safety Line 3/8	114.75 - 119.75	1.0000	1.0000
L10	14	MP3-03 Channel Reinforcement	119.50 - 119.75	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L10	15	MP3-03 Channel Reinforcement	119.50 - 119.75	1.0000	1.0000
L10	16	MP3-03 Channel Reinforcement	119.50 - 119.75	1.0000	1.0000
L11	11	Climbing Ladder	110.38 - 114.75	1.0000	1.0000
L11	12	Safety Line 3/8	110.38 - 114.75	1.0000	1.0000
L11	17	MP3-03 Channel Reinforcement	110.38 - 111.50	1.0000	1.0000
L11	18	MP3-03 Channel Reinforcement	110.38 - 111.50	1.0000	1.0000
L11	19	MP3-03 Channel Reinforcement	110.38 - 111.50	1.0000	1.0000
L12	11	Climbing Ladder	110.13 - 110.38	1.0000	1.0000
L12	12	Safety Line 3/8	110.13 - 110.38	1.0000	1.0000
L12	17	MP3-03 Channel Reinforcement	110.13 - 110.38	1.0000	1.0000
L12	18	MP3-03 Channel Reinforcement	110.13 - 110.38	1.0000	1.0000
L12	19	MP3-03 Channel Reinforcement	110.13 - 110.38	1.0000	1.0000
L13	11	Climbing Ladder	105.13 - 110.13	1.0000	1.0000
L13	12	Safety Line 3/8	105.13 - 110.13	1.0000	1.0000
L13	17	MP3-03 Channel Reinforcement	105.13 - 110.13	1.0000	1.0000
L13	18	MP3-03 Channel Reinforcement	105.13 - 110.13	1.0000	1.0000
L13	19	MP3-03 Channel Reinforcement	105.13 - 110.13	1.0000	1.0000
L14	11	Climbing Ladder	100.13 - 105.13	1.0000	1.0000
L14	12	Safety Line 3/8	100.13 - 105.13	1.0000	1.0000
L14	17	MP3-03 Channel Reinforcement	101.50 - 105.13	1.0000	1.0000
L14	18	MP3-03 Channel Reinforcement	101.50 - 105.13	1.0000	1.0000
L14	19	MP3-03 Channel Reinforcement	101.50 - 105.13	1.0000	1.0000
L15	11	Climbing Ladder	100.00 - 100.13	1.0000	1.0000
L15	12	Safety Line 3/8	100.00 - 100.13	1.0000	1.0000
L16	11	Climbing Ladder	99.75 - 100.00	1.0000	1.0000
L16	12	Safety Line 3/8	99.75 - 100.00	1.0000	1.0000
L17	11	Climbing Ladder	94.75 - 99.75	1.0000	1.0000
L17	12	Safety Line 3/8	94.75 - 99.75	1.0000	1.0000
L18	11	Climbing Ladder	89.75 - 94.75	1.0000	1.0000
L18	12	Safety Line 3/8	89.75 - 94.75	1.0000	1.0000
L19	11	Climbing Ladder	85.25 - 89.75	1.0000	1.0000
L19	12	Safety Line 3/8	85.25 - 89.75	1.0000	1.0000
L19	20	MP3-03 Channel Reinforcement	85.25 - 86.50	1.0000	1.0000
L19	21	MP3-03 Channel Reinforcement	85.25 - 86.50	1.0000	1.0000
L19	22	MP3-03 Channel	85.25 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
		Reinforcement	86.50		
L20	11	Climbing Ladder	85.00 - 85.25	1.0000	1.0000
L20	12	Safety Line 3/8	85.00 - 85.25	1.0000	1.0000
L20	20	MP3-03 Channel Reinforcement	85.00 - 85.25	1.0000	1.0000
L20	21	MP3-03 Channel Reinforcement	85.00 - 85.25	1.0000	1.0000
L20	22	MP3-03 Channel Reinforcement	85.00 - 85.25	1.0000	1.0000
L21	11	Climbing Ladder	80.00 - 85.00	1.0000	1.0000
L21	12	Safety Line 3/8	80.00 - 85.00	1.0000	1.0000
L21	20	MP3-03 Channel Reinforcement	80.00 - 85.00	1.0000	1.0000
L21	21	MP3-03 Channel Reinforcement	80.00 - 85.00	1.0000	1.0000
L21	22	MP3-03 Channel Reinforcement	80.00 - 85.00	1.0000	1.0000
L22	11	Climbing Ladder	79.75 - 80.00	1.0000	1.0000
L22	12	Safety Line 3/8	79.75 - 80.00	1.0000	1.0000
L22	20	MP3-03 Channel Reinforcement	79.75 - 80.00	1.0000	1.0000
L22	21	MP3-03 Channel Reinforcement	79.75 - 80.00	1.0000	1.0000
L22	22	MP3-03 Channel Reinforcement	79.75 - 80.00	1.0000	1.0000
L23	11	Climbing Ladder	74.75 - 79.75	1.0000	1.0000
L23	12	Safety Line 3/8	74.75 - 79.75	1.0000	1.0000
L23	20	MP3-03 Channel Reinforcement	79.00 - 79.75	1.0000	1.0000
L23	21	MP3-03 Channel Reinforcement	79.00 - 79.75	1.0000	1.0000
L23	22	MP3-03 Channel Reinforcement	79.00 - 79.75	1.0000	1.0000
L24	11	Climbing Ladder	69.75 - 74.75	1.0000	1.0000
L24	12	Safety Line 3/8	69.75 - 74.75	1.0000	1.0000
L25	11	Climbing Ladder	64.75 - 69.75	1.0000	1.0000
L25	12	Safety Line 3/8	64.75 - 69.75	1.0000	1.0000
L26	11	Climbing Ladder	60.00 - 64.75	1.0000	1.0000
L26	12	Safety Line 3/8	60.00 - 64.75	1.0000	1.0000
L27	11	Climbing Ladder	55.00 - 60.00	1.0000	1.0000
L27	12	Safety Line 3/8	55.00 - 60.00	1.0000	1.0000
L28	11	Climbing Ladder	50.00 - 55.00	1.0000	1.0000
L28	12	Safety Line 3/8	50.00 - 55.00	1.0000	1.0000
L29	11	Climbing Ladder	45.00 - 50.00	1.0000	1.0000
L29	12	Safety Line 3/8	45.00 - 50.00	1.0000	1.0000
L30	11	Climbing Ladder	40.00 - 45.00	1.0000	1.0000
L30	12	Safety Line 3/8	40.00 - 45.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L31	11	Climbing Ladder	35.00 - 40.00	1.0000	1.0000
L31	12	Safety Line 3/8	35.00 - 40.00	1.0000	1.0000
L32	11	Climbing Ladder	30.00 - 35.00	1.0000	1.0000
L32	12	Safety Line 3/8	30.00 - 35.00	1.0000	1.0000
L33	11	Climbing Ladder	25.00 - 30.00	1.0000	1.0000
L33	12	Safety Line 3/8	25.00 - 30.00	1.0000	1.0000
L34	11	Climbing Ladder	20.00 - 25.00	1.0000	1.0000
L34	12	Safety Line 3/8	20.00 - 25.00	1.0000	1.0000
L35	11	Climbing Ladder	15.00 - 20.00	1.0000	1.0000
L35	12	Safety Line 3/8	15.00 - 20.00	1.0000	1.0000
L36	11	Climbing Ladder	10.50 - 15.00	1.0000	1.0000
L36	12	Safety Line 3/8	10.50 - 15.00	1.0000	1.0000

Effective Width of Flat Linear Attachments / Feed Lines

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L3	14	MP3-03 Channel Reinforcement	135.67 - 136.80	Manual	1.0000
L3	15	MP3-03 Channel Reinforcement	135.67 - 136.80	Manual	1.0000
L3	16	MP3-03 Channel Reinforcement	135.67 - 136.80	Manual	1.0000
L4	14	MP3-03 Channel Reinforcement	135.42 - 135.67	Manual	1.0000
L4	15	MP3-03 Channel Reinforcement	135.42 - 135.67	Manual	1.0000
L4	16	MP3-03 Channel Reinforcement	135.42 - 135.67	Manual	1.0000
L5	14	MP3-03 Channel Reinforcement	130.42 - 135.42	Manual	1.0000
L5	15	MP3-03 Channel Reinforcement	130.42 - 135.42	Manual	1.0000
L5	16	MP3-03 Channel Reinforcement	130.42 - 135.42	Manual	1.0000
L6	14	MP3-03 Channel Reinforcement	125.42 - 130.42	Manual	1.0000
L6	15	MP3-03 Channel Reinforcement	125.42 - 130.42	Manual	1.0000
L6	16	MP3-03 Channel Reinforcement	125.42 - 130.42	Manual	1.0000
L7	14	MP3-03 Channel Reinforcement	120.42 - 125.42	Manual	1.0000
L7	15	MP3-03 Channel Reinforcement	120.42 - 125.42	Manual	1.0000
L7	16	MP3-03 Channel Reinforcement	120.42 - 125.42	Manual	1.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L8	14	MP3-03 Channel Reinforcement	120.00 - 120.42	Manual	1.0000
L8	15	MP3-03 Channel Reinforcement	120.00 - 120.42	Manual	1.0000
L8	16	MP3-03 Channel Reinforcement	120.00 - 120.42	Manual	1.0000
L9	14	MP3-03 Channel Reinforcement	119.75 - 120.00	Manual	1.0000
L9	15	MP3-03 Channel Reinforcement	119.75 - 120.00	Manual	1.0000
L9	16	MP3-03 Channel Reinforcement	119.75 - 120.00	Manual	1.0000
L10	14	MP3-03 Channel Reinforcement	119.50 - 119.75	Manual	1.0000
L10	15	MP3-03 Channel Reinforcement	119.50 - 119.75	Manual	1.0000
L10	16	MP3-03 Channel Reinforcement	119.50 - 119.75	Manual	1.0000
L11	17	MP3-03 Channel Reinforcement	110.38 - 111.50	Manual	1.0000
L11	18	MP3-03 Channel Reinforcement	110.38 - 111.50	Manual	1.0000
L11	19	MP3-03 Channel Reinforcement	110.38 - 111.50	Manual	1.0000
L12	17	MP3-03 Channel Reinforcement	110.13 - 110.38	Manual	1.0000
L12	18	MP3-03 Channel Reinforcement	110.13 - 110.38	Manual	1.0000
L12	19	MP3-03 Channel Reinforcement	110.13 - 110.38	Manual	1.0000
L13	17	MP3-03 Channel Reinforcement	105.13 - 110.13	Manual	1.0000
L13	18	MP3-03 Channel Reinforcement	105.13 - 110.13	Manual	1.0000
L13	19	MP3-03 Channel Reinforcement	105.13 - 110.13	Manual	1.0000
L14	17	MP3-03 Channel Reinforcement	101.50 - 105.13	Manual	1.0000
L14	18	MP3-03 Channel Reinforcement	101.50 - 105.13	Manual	1.0000
L14	19	MP3-03 Channel Reinforcement	101.50 - 105.13	Manual	1.0000
L19	20	MP3-03 Channel Reinforcement	85.25 - 86.50	Manual	1.0000
L19	21	MP3-03 Channel Reinforcement	85.25 - 86.50	Manual	1.0000
L19	22	MP3-03 Channel Reinforcement	85.25 - 86.50	Manual	1.0000
L20	20	MP3-03 Channel Reinforcement	85.00 - 85.25	Manual	1.0000
L20	21	MP3-03 Channel Reinforcement	85.00 - 85.25	Manual	1.0000
L20	22	MP3-03 Channel Reinforcement	85.00 - 85.25	Manual	1.0000
L21	20	MP3-03 Channel Reinforcement	80.00 - 85.00	Manual	1.0000
L21	21	MP3-03 Channel Reinforcement	80.00 - 85.00	Manual	1.0000
L21	22	MP3-03 Channel Reinforcement	80.00 - 85.00	Manual	1.0000
L22	20	MP3-03 Channel Reinforcement	79.75 - 80.00	Manual	1.0000
L22	21	MP3-03 Channel Reinforcement	79.75 - 80.00	Manual	1.0000
L22	22	MP3-03 Channel Reinforcement	79.75 - 80.00	Manual	1.0000
L23	20	MP3-03 Channel Reinforcement	79.00 - 79.75	Manual	1.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L23	21	MP3-03 Channel Reinforcement	79.00 - 79.75	Manual	1.0000
L23	22	MP3-03 Channel Reinforcement	79.00 - 79.75	Manual	1.0000

User Defined Loads - Seismic

Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
CCISeismic Tower Section 1 - 1	147.500	0.000	0.000	0.011	0.000	0.000	0.021
CCISeismic Tower Section 2 - 1	142.500	0.000	0.000	0.011	0.000	0.000	0.020
CCISeismic Tower Section 3 - 1	137.834	0.000	0.000	0.009	0.000	0.000	0.016
CCISeismic Tower Section 4 - 1	135.542	0.000	0.000	0.001	0.000	0.000	0.001
CCISeismic Tower Section 5 - 1	132.917	0.000	0.000	0.017	0.000	0.000	0.027
CCISeismic Tower Section 6 - 1	127.917	0.000	0.000	0.017	0.000	0.000	0.025
CCISeismic Tower Section 7 - 1	122.917	0.000	0.000	0.017	0.000	0.000	0.023
CCISeismic Tower Section 8 - 1	120.209	0.000	0.000	0.001	0.000	0.000	0.002
CCISeismic Tower Section 9 - 1	119.875	0.000	0.000	0.001	0.000	0.000	0.001
CCISeismic Tower Section 10 - 1	117.250	0.000	0.000	0.015	0.000	0.000	0.019
CCISeismic Tower Section 11 - 1	112.563	0.000	0.000	0.013	0.000	0.000	0.015
CCISeismic Tower Section 12 - 1	110.250	0.000	0.000	0.001	0.000	0.000	0.001
CCISeismic Tower Section 13 - 1	107.625	0.000	0.000	0.021	0.000	0.000	0.023
CCISeismic Tower Section 14 - 1	102.625	0.000	0.000	0.021	0.000	0.000	0.021
CCISeismic Tower Section 15 - 1	100.063	0.000	0.000	0.001	0.000	0.000	0.001
CCISeismic Tower Section 16 - 1	99.875	0.000	0.000	0.001	0.000	0.000	0.001
CCISeismic Tower Section 17 - 1	97.250	0.000	0.000	0.020	0.000	0.000	0.018
CCISeismic Tower Section 18 - 1	92.250	0.000	0.000	0.020	0.000	0.000	0.016
CCISeismic Tower Section 19 - 1	87.500	0.000	0.000	0.018	0.000	0.000	0.013
CCISeismic Tower Section 20 - 1	85.125	0.000	0.000	0.001	0.000	0.000	0.001
CCISeismic Tower Section 21 - 1	82.500	0.000	0.000	0.027	0.000	0.000	0.017
CCISeismic Tower Section 22 - 1	79.875	0.000	0.000	0.001	0.000	0.000	0.001
CCISeismic Tower Section 23 - 1	77.250	0.000	0.000	0.025	0.000	0.000	0.014
CCISeismic Tower Section 24 - 1	72.250	0.000	0.000	0.025	0.000	0.000	0.012
CCISeismic Tower Section 25 - 1	67.250	0.000	0.000	0.025	0.000	0.000	0.011

Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
CCISeismic Tower Section 26 - 1	62.375	0.000	0.000	0.024	0.000	0.000	0.009
CCISeismic Tower Section 27 - 1	57.500	0.000	0.000	0.031	0.000	0.000	0.009
CCISeismic Tower Section 28 - 1	52.500	0.000	0.000	0.031	0.000	0.000	0.008
CCISeismic Tower Section 29 - 1	47.500	0.000	0.000	0.031	0.000	0.000	0.006
CCISeismic Tower Section 30 - 1	42.500	0.000	0.000	0.031	0.000	0.000	0.005
CCISeismic Tower Section 31 - 1	37.500	0.000	0.000	0.036	0.000	0.000	0.005
CCISeismic Tower Section 32 - 1	32.500	0.000	0.000	0.036	0.000	0.000	0.003
CCISeismic Tower Section 33 - 1	27.500	0.000	0.000	0.036	0.000	0.000	0.003
CCISeismic Tower Section 34 - 1	22.500	0.000	0.000	0.036	0.000	0.000	0.002
CCISeismic Tower Section 35 - 1	17.500	0.000	0.000	0.041	0.000	0.000	0.001
CCISeismic Tower Section 36 - 1	12.500	0.000	0.000	0.041	0.000	0.000	0.001
CCISeismic Tower Section 37 - 1	7.500	0.000	0.000	0.041	0.000	0.000	0.000
CCISeismic Tower Section 38 - 1	2.500	0.000	0.000	0.041	0.000	0.000	0.000
CCISeismic rfs celwave APXVAARR24_43-U-NA20 w/ 2.5" Mount Pipe	150.000	0.000	0.000	0.008	0.000	0.000	0.016
CCISeismic rfs celwave APXVAARR24_43-U-NA20 w/ 2.5" Mount Pipe	150.000	0.000	0.000	0.008	0.000	0.000	0.016
CCISeismic rfs celwave APXVAARR24_43-U-NA20 w/ 2.5" Mount Pipe	150.000	0.000	0.000	0.008	0.000	0.000	0.016
CCISeismic ericsson RADIO 4449 B71/B85	150.000	0.000	0.000	0.003	0.000	0.000	0.007
CCISeismic ericsson RADIO 4449 B71/B85	150.000	0.000	0.000	0.003	0.000	0.000	0.007
CCISeismic ericsson RADIO 4449 B71/B85	150.000	0.000	0.000	0.003	0.000	0.000	0.007
CCISeismic ericsson AIR 6419 B41 w/ Mount Pipe	150.000	0.000	0.000	0.005	0.000	0.000	0.010
CCISeismic ericsson AIR 6419 B41 w/ Mount Pipe	150.000	0.000	0.000	0.005	0.000	0.000	0.010
CCISeismic ericsson AIR 6419 B41 w/ Mount Pipe	150.000	0.000	0.000	0.005	0.000	0.000	0.010
CCISeismic ericsson RADIO 4460 B25+B66	150.000	0.000	0.000	0.005	0.000	0.000	0.010
CCISeismic ericsson RADIO 4460 B25+B66	150.000	0.000	0.000	0.005	0.000	0.000	0.010
CCISeismic ericsson RADIO 4460 B25+B66	150.000	0.000	0.000	0.005	0.000	0.000	0.010
CCISeismic mount pipes 6' x 2" STD Pipe	150.000	0.000	0.000	0.001	0.000	0.000	0.002
CCISeismic mount pipes 6' x 2" STD Pipe	150.000	0.000	0.000	0.001	0.000	0.000	0.002
CCISeismic mount pipes 6' x 2" STD Pipe	150.000	0.000	0.000	0.001	0.000	0.000	0.002
CCISeismic 10' Low Profile Platform	150.000	0.000	0.000	0.054	0.000	0.000	0.110
CCISeismic miscl SitePro1 VSK-MHD	150.000	0.000	0.000	0.001	0.000	0.000	0.003
CCISeismic miscl SitePro1 VSK-MHD	150.000	0.000	0.000	0.001	0.000	0.000	0.003
CCISeismic miscl SitePro1 VSK-MHD	150.000	0.000	0.000	0.001	0.000	0.000	0.003
CCISeismic miscl Horizontal	150.000	0.000	0.000	0.001	0.000	0.000	0.003

Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
Reinforcement							
CCISeismic miscl Horizontal Reinforcement	150.000	0.000	0.000	0.001	0.000	0.000	0.003
CCISeismic miscl Horizontal Reinforcement	150.000	0.000	0.000	0.001	0.000	0.000	0.003
CCISeismic omni antennas 6' x 1.5" Omni Antenna	150.000	0.000	0.000	0.001	0.000	0.000	0.002
CCISeismic gabriel electronics DFPD1-52	150.000	0.000	0.000	0.001	0.000	0.000	0.001
CCISeismic mount pipes 6' x 2" STD Pipe	150.000	0.000	0.000	0.001	0.000	0.000	0.002
CCISeismic mount pipes 6' x 2" STD Pipe	150.000	0.000	0.000	0.001	0.000	0.000	0.002
CCISeismic mount pipes 6' x 2" STD Pipe	150.000	0.000	0.000	0.001	0.000	0.000	0.002
CCISeismic mount pipes 4' x 2" STD Pipe	98.000	0.000	0.000	0.001	0.000	0.000	0.001
CCISeismic 6' Side Arm	98.000	0.000	0.000	0.001	0.000	0.000	0.001
CCISeismic celwave PD220	98.000	0.000	0.000	0.001	0.000	0.000	0.001
CCISeismic mount pipes 4' x 2" STD Pipe	70.000	0.000	0.000	0.001	0.000	0.000	0.000
CCISeismic 6' Side Arm	70.000	0.000	0.000	0.001	0.000	0.000	0.001
CCISeismic celwave PD220	70.000	0.000	0.000	0.001	0.000	0.000	0.000
CCISeismic mount pipes 4' x 2" STD Pipe	50.000	0.000	0.000	0.001	0.000	0.000	0.000
CCISeismic 6' Side Arm	50.000	0.000	0.000	0.001	0.000	0.000	0.000
CCISeismic celwave PD220	50.000	0.000	0.000	0.001	0.000	0.000	0.000
CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (140ft to150ft)	145.000	0.000	0.000	0.002	0.000	0.000	0.004
CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (130ft to140ft)	135.000	0.000	0.000	0.002	0.000	0.000	0.003
CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (120ft to130ft)	125.000	0.000	0.000	0.002	0.000	0.000	0.003
CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (110ft to120ft)	115.000	0.000	0.000	0.002	0.000	0.000	0.002
CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (100ft to110ft)	105.000	0.000	0.000	0.002	0.000	0.000	0.002
CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (90ft to100ft)	95.000	0.000	0.000	0.002	0.000	0.000	0.002
CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (80ft to90ft)	85.000	0.000	0.000	0.002	0.000	0.000	0.001
CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (70ft to80ft)	75.000	0.000	0.000	0.002	0.000	0.000	0.001
CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (60ft to70ft)	65.000	0.000	0.000	0.002	0.000	0.000	0.001
CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (50ft to60ft)	55.000	0.000	0.000	0.002	0.000	0.000	0.001
CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (40ft to50ft)	45.000	0.000	0.000	0.002	0.000	0.000	0.000
CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (30ft to40ft)	35.000	0.000	0.000	0.002	0.000	0.000	0.000
CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (20ft to30ft)	25.000	0.000	0.000	0.002	0.000	0.000	0.000
CCISeismic (2) 6Power/24Fiber (1 5/8) From	15.000	0.000	0.000	0.002	0.000	0.000	0.000

Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
0 to 150 (10ft to20ft) CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (0ft to10ft)	5.000	0.000	0.000	0.002	0.000	0.000	0.000
CCISeismic (2) MLC Hybrid 6Power/12Fiber(1 1/2) From 0 to 150 (140ft to150ft)	145.000	0.000	0.000	0.002	0.000	0.000	0.004
CCISeismic (2) MLC Hybrid 6Power/12Fiber(1 1/2) From 0 to 150 (130ft to140ft)	135.000	0.000	0.000	0.002	0.000	0.000	0.004
CCISeismic (2) MLC Hybrid 6Power/12Fiber(1 1/2) From 0 to 150 (120ft to130ft)	125.000	0.000	0.000	0.002	0.000	0.000	0.003
CCISeismic (2) MLC Hybrid 6Power/12Fiber(1 1/2) From 0 to 150 (110ft to120ft)	115.000	0.000	0.000	0.002	0.000	0.000	0.003
CCISeismic (2) MLC Hybrid 6Power/12Fiber(1 1/2) From 0 to 150 (100ft to110ft)	105.000	0.000	0.000	0.002	0.000	0.000	0.002
CCISeismic (2) MLC Hybrid 6Power/12Fiber(1 1/2) From 0 to 150 (90ft to100ft)	95.000	0.000	0.000	0.002	0.000	0.000	0.002
CCISeismic (2) MLC Hybrid 6Power/12Fiber(1 1/2) From 0 to 150 (80ft to90ft)	85.000	0.000	0.000	0.002	0.000	0.000	0.002
CCISeismic (2) MLC Hybrid 6Power/12Fiber(1 1/2) From 0 to 150 (70ft to80ft)	75.000	0.000	0.000	0.002	0.000	0.000	0.001
CCISeismic (2) MLC Hybrid 6Power/12Fiber(1 1/2) From 0 to 150 (60ft to70ft)	65.000	0.000	0.000	0.002	0.000	0.000	0.001
CCISeismic (2) MLC Hybrid 6Power/12Fiber(1 1/2) From 0 to 150 (50ft to60ft)	55.000	0.000	0.000	0.002	0.000	0.000	0.001
CCISeismic (2) MLC Hybrid 6Power/12Fiber(1 1/2) From 0 to 150 (40ft to50ft)	45.000	0.000	0.000	0.002	0.000	0.000	0.000
CCISeismic (2) MLC Hybrid 6Power/12Fiber(1 1/2) From 0 to 150 (30ft to40ft)	35.000	0.000	0.000	0.002	0.000	0.000	0.000
CCISeismic (2) MLC Hybrid 6Power/12Fiber(1 1/2) From 0 to 150 (20ft to30ft)	25.000	0.000	0.000	0.002	0.000	0.000	0.000
CCISeismic (2) MLC Hybrid 6Power/12Fiber(1 1/2) From 0 to 150 (10ft to20ft)	15.000	0.000	0.000	0.002	0.000	0.000	0.000
CCISeismic (2) MLC Hybrid 6Power/12Fiber(1 1/2) From 0 to 150 (0ft to10ft)	5.000	0.000	0.000	0.002	0.000	0.000	0.000
CCISeismic andrew LDF4-50A(1/2") From 0 to 150 (140ft to150ft)	145.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic andrew LDF4-50A(1/2") From 0 to 150 (130ft to140ft)	135.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic andrew LDF4-50A(1/2") From 0 to 150 (120ft to130ft)	125.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic andrew LDF4-50A(1/2") From 0 to 150 (110ft to120ft)	115.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic andrew LDF4-50A(1/2") From 0 to 150 (100ft to110ft)	105.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic andrew LDF4-50A(1/2") From 0 to 150 (90ft to100ft)	95.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic andrew LDF4-	85.000	0.000	0.000	0.000	0.000	0.000	0.000

Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
50A(1/2") From 0 to 150 (80ft to90ft)							
CCISeismic andrew LDF4-50A(1/2") From 0 to 150 (70ft to80ft)	75.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic andrew LDF4-50A(1/2") From 0 to 150 (60ft to70ft)	65.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic andrew LDF4-50A(1/2") From 0 to 150 (50ft to60ft)	55.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic andrew LDF4-50A(1/2") From 0 to 150 (40ft to50ft)	45.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic andrew LDF4-50A(1/2") From 0 to 150 (30ft to40ft)	35.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic andrew LDF4-50A(1/2") From 0 to 150 (20ft to30ft)	25.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic andrew LDF4-50A(1/2") From 0 to 150 (10ft to20ft)	15.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic andrew LDF4-50A(1/2") From 0 to 150 (0ft to10ft)	5.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic andrew LDF4-50A(1/2") From 0 to 98 (90ft to98ft)	94.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic andrew LDF4-50A(1/2") From 0 to 98 (80ft to90ft)	85.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic andrew LDF4-50A(1/2") From 0 to 98 (70ft to80ft)	75.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic andrew LDF4-50A(1/2") From 0 to 98 (60ft to70ft)	65.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic andrew LDF4-50A(1/2") From 0 to 98 (50ft to60ft)	55.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic andrew LDF4-50A(1/2") From 0 to 98 (40ft to50ft)	45.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic andrew LDF4-50A(1/2") From 0 to 98 (30ft to40ft)	35.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic andrew LDF4-50A(1/2") From 0 to 98 (20ft to30ft)	25.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic andrew LDF4-50A(1/2") From 0 to 98 (10ft to20ft)	15.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic andrew LDF4-50A(1/2") From 0 to 98 (0ft to10ft)	5.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic andrew LDF4-50A(1/2") From 0 to 70 (60ft to70ft)	65.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic andrew LDF4-50A(1/2") From 0 to 70 (50ft to60ft)	55.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic andrew LDF4-50A(1/2") From 0 to 70 (40ft to50ft)	45.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic andrew LDF4-50A(1/2") From 0 to 70 (30ft to40ft)	35.000	0.000	0.000	0.000	0.000	0.000	0.000

Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
CCISeismic andrew LDF4-50A(1/2") From 0 to 70 (20ft to30ft)	25.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic andrew LDF4-50A(1/2") From 0 to 70 (10ft to20ft)	15.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic andrew LDF4-50A(1/2") From 0 to 70 (0ft to10ft)	5.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic andrew LDF4-50A(1/2") From 0 to 50 (40ft to50ft)	45.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic andrew LDF4-50A(1/2") From 0 to 50 (30ft to40ft)	35.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic andrew LDF4-50A(1/2") From 0 to 50 (20ft to30ft)	25.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic andrew LDF4-50A(1/2") From 0 to 50 (10ft to20ft)	15.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic andrew LDF4-50A(1/2") From 0 to 50 (0ft to10ft)	5.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic miscl Climbing Ladder From 10.5 to 150 (140ft to150ft)	145.000	0.000	0.000	0.003	0.000	0.000	0.006
CCISeismic miscl Climbing Ladder From 10.5 to 150 (130ft to140ft)	135.000	0.000	0.000	0.003	0.000	0.000	0.006
CCISeismic miscl Climbing Ladder From 10.5 to 150 (120ft to130ft)	125.000	0.000	0.000	0.003	0.000	0.000	0.005
CCISeismic miscl Climbing Ladder From 10.5 to 150 (110ft to120ft)	115.000	0.000	0.000	0.003	0.000	0.000	0.004
CCISeismic miscl Climbing Ladder From 10.5 to 150 (100ft to110ft)	105.000	0.000	0.000	0.003	0.000	0.000	0.003
CCISeismic miscl Climbing Ladder From 10.5 to 150 (90ft to100ft)	95.000	0.000	0.000	0.003	0.000	0.000	0.003
CCISeismic miscl Climbing Ladder From 10.5 to 150 (80ft to90ft)	85.000	0.000	0.000	0.003	0.000	0.000	0.002
CCISeismic miscl Climbing Ladder From 10.5 to 150 (70ft to80ft)	75.000	0.000	0.000	0.003	0.000	0.000	0.002
CCISeismic miscl Climbing Ladder From 10.5 to 150 (60ft to70ft)	65.000	0.000	0.000	0.003	0.000	0.000	0.001
CCISeismic miscl Climbing Ladder From 10.5 to 150 (50ft to60ft)	55.000	0.000	0.000	0.003	0.000	0.000	0.001
CCISeismic miscl Climbing Ladder From 10.5 to 150 (40ft to50ft)	45.000	0.000	0.000	0.003	0.000	0.000	0.001
CCISeismic miscl Climbing Ladder From 10.5 to 150 (30ft to40ft)	35.000	0.000	0.000	0.003	0.000	0.000	0.000
CCISeismic miscl Climbing Ladder From 10.5 to 150 (20ft to30ft)	25.000	0.000	0.000	0.003	0.000	0.000	0.000
CCISeismic miscl Climbing Ladder From 10.5 to 150 (10.5ft to20ft)	15.250	0.000	0.000	0.003	0.000	0.000	0.000
CCISeismic miscl Safety Line 3/8 From 10.5 to 150 (140ft	145.000	0.000	0.000	0.000	0.000	0.000	0.000

Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
to150ft)							
CCISeismic miscl Safety Line 3/8 From 10.5 to 150 (130ft to140ft)	135.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic miscl Safety Line 3/8 From 10.5 to 150 (120ft to130ft)	125.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic miscl Safety Line 3/8 From 10.5 to 150 (110ft to120ft)	115.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic miscl Safety Line 3/8 From 10.5 to 150 (100ft to110ft)	105.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic miscl Safety Line 3/8 From 10.5 to 150 (90ft to100ft)	95.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic miscl Safety Line 3/8 From 10.5 to 150 (80ft to90ft)	85.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic miscl Safety Line 3/8 From 10.5 to 150 (70ft to80ft)	75.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic miscl Safety Line 3/8 From 10.5 to 150 (60ft to70ft)	65.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic miscl Safety Line 3/8 From 10.5 to 150 (50ft to60ft)	55.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic miscl Safety Line 3/8 From 10.5 to 150 (40ft to50ft)	45.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic miscl Safety Line 3/8 From 10.5 to 150 (30ft to40ft)	35.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic miscl Safety Line 3/8 From 10.5 to 150 (20ft to30ft)	25.000	0.000	0.000	0.000	0.000	0.000	0.000
CCISeismic miscl Safety Line 3/8 From 10.5 to 150 (10.5ft to20ft)	15.250	0.000	0.000	0.000	0.000	0.000	0.000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
APXVAARR24_43-U-NA20 w/ 2.5" Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	20.530 21.281 22.018	11.474 13.003 14.354	0.180 0.321 0.473
APXVAARR24_43-U-NA20 w/ 2.5" Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	20.530 21.281 22.018	11.474 13.003 14.354	0.180 0.321 0.473
APXVAARR24_43-U-NA20 w/ 2.5" Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	20.530 21.281 22.018	11.474 13.003 14.354	0.180 0.321 0.473
RADIO 4449 B71/B85	A	From Leg	4.000 0.000	0.000	150.000	No Ice 1/2"	1.644 1.804	1.310 1.455	0.075 0.092

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			-2.000			Ice 1" Ice	1.972	1.608	0.112
RADIO 4449 B71/B85	B	From Leg	4.000 0.000 -2.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	1.644 1.804 1.972	1.310 1.455 1.608	0.075 0.092 0.112
RADIO 4449 B71/B85	C	From Leg	4.000 0.000 -2.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	1.644 1.804 1.972	1.310 1.455 1.608	0.075 0.092 0.112
AIR 6419 B41 w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	7.504 8.340 9.088	4.777 5.852 6.779	0.113 0.177 0.248
AIR 6419 B41 w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	7.504 8.340 9.088	4.777 5.852 6.779	0.113 0.177 0.248
AIR 6419 B41 w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	7.504 8.340 9.088	4.777 5.852 6.779	0.113 0.177 0.248
RADIO 4460 B25+B66	A	From Leg	4.000 0.000 -2.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	2.564 2.764 2.971	1.976 2.156 2.343	0.109 0.134 0.163
RADIO 4460 B25+B66	B	From Leg	4.000 0.000 -2.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	2.564 2.764 2.971	1.976 2.156 2.343	0.109 0.134 0.163
RADIO 4460 B25+B66	C	From Leg	4.000 0.000 -2.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	2.564 2.764 2.971	1.976 2.156 2.343	0.109 0.134 0.163
6' x 2" STD Pipe	A	From Leg	4.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	1.425 1.925 2.294	1.425 1.925 2.294	0.022 0.033 0.048
6' x 2" STD Pipe	B	From Leg	4.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	1.425 1.925 2.294	1.425 1.925 2.294	0.022 0.033 0.048
6' x 2" STD Pipe	C	From Leg	4.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	1.425 1.925 2.294	1.425 1.925 2.294	0.022 0.033 0.048
10' Low Profile Platform	C	None		0.000	150.000	No Ice 1/2" Ice 1" Ice	14.660 18.870 23.080	14.660 18.870 23.080	1.250 1.481 1.713
SitePro1 VSK-MHD	A	From Leg	0.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	2.037 2.931 3.798	2.037 2.931 3.798	0.032 0.047 0.068
SitePro1 VSK-MHD	B	From Leg	0.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	2.037 2.931 3.798	2.037 2.931 3.798	0.032 0.047 0.068
SitePro1 VSK-MHD	C	From Leg	0.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	2.037 2.931 3.798	2.037 2.931 3.798	0.032 0.047 0.068
Horizontal Reinforcement	A	From Leg	4.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice	2.142 3.070 4.015	2.142 3.070 4.015	0.033 0.049 0.071

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice			
Horizontal Reinforcement	B	From Leg	4.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	2.142 3.070 4.015	2.142 3.070 4.015	0.033 0.049 0.071
Horizontal Reinforcement	C	From Leg	4.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	2.142 3.070 4.015	2.142 3.070 4.015	0.033 0.049 0.071
***									
6' x 1.5" Omni Antenna	B	From Leg	4.000 0.000 -6.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	0.900 1.521 2.004	0.900 1.521 2.004	0.020 0.027 0.039
DFPD1-52	C	From Leg	4.000 0.000 2.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	1.452 1.602 1.760	0.563 0.666 0.779	0.014 0.025 0.038
6' x 2" STD Pipe	A	From Leg	4.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	1.425 1.925 2.294	1.425 1.925 2.294	0.022 0.033 0.048
6' x 2" STD Pipe	B	From Leg	4.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	1.425 1.925 2.294	1.425 1.925 2.294	0.022 0.033 0.048
6' x 2" STD Pipe	C	From Leg	4.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	1.425 1.925 2.294	1.425 1.925 2.294	0.022 0.033 0.048
***									
4' x 2" STD Pipe	C	From Leg	6.000 0.000 0.000	0.000	98.000	No Ice 1/2" Ice 1" Ice	0.866 1.111 1.365	0.866 1.111 1.365	0.015 0.022 0.032
6' Side Arm	C	From Leg	3.000 0.000 0.000	0.000	98.000	No Ice 1/2" Ice 1" Ice	1.000 1.250 1.500	1.430 2.050 2.670	0.027 0.038 0.049
PD220	C	From Leg	6.000 0.000 10.000	0.000	98.000	No Ice 1/2" Ice 1" Ice	3.560 7.130 10.700	3.560 7.130 10.700	0.023 0.046 0.069
***									
4' x 2" STD Pipe	C	From Leg	6.000 0.000 0.000	0.000	70.000	No Ice 1/2" Ice 1" Ice	0.866 1.111 1.365	0.866 1.111 1.365	0.015 0.022 0.032
6' Side Arm	C	From Leg	3.000 0.000 0.000	0.000	70.000	No Ice 1/2" Ice 1" Ice	1.000 1.250 1.500	1.430 2.050 2.670	0.027 0.038 0.049
PD220	C	From Leg	6.000 0.000 10.000	0.000	70.000	No Ice 1/2" Ice 1" Ice	3.560 7.130 10.700	3.560 7.130 10.700	0.023 0.046 0.069
***									
4' x 2" STD Pipe	C	From Leg	6.000 0.000 0.000	0.000	50.000	No Ice 1/2" Ice 1" Ice	0.866 1.111 1.365	0.866 1.111 1.365	0.015 0.022 0.032
6' Side Arm	C	From Leg	3.000 0.000 0.000	0.000	50.000	No Ice 1/2" Ice 1" Ice	1.000 1.250 1.500	1.430 2.050 2.670	0.027 0.038 0.049

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment ° 	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
PD220	C	From Leg	6.000 0.000 10.000	0.000	50.000	No Ice 1/2" Ice 1" Ice	3.560 7.130 10.700	3.560 7.130 10.700	0.023 0.046 0.069

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Comb. No.	Description
51	1.2 Dead+1.0 Ev+1.0 Eh 0 deg
52	0.9 Dead-1.0 Ev+1.0 Eh 0 deg
53	1.2 Dead+1.0 Ev+1.0 Eh 30 deg
54	0.9 Dead-1.0 Ev+1.0 Eh 30 deg
55	1.2 Dead+1.0 Ev+1.0 Eh 60 deg
56	0.9 Dead-1.0 Ev+1.0 Eh 60 deg
57	1.2 Dead+1.0 Ev+1.0 Eh 90 deg
58	0.9 Dead-1.0 Ev+1.0 Eh 90 deg
59	1.2 Dead+1.0 Ev+1.0 Eh 120 deg
60	0.9 Dead-1.0 Ev+1.0 Eh 120 deg
61	1.2 Dead+1.0 Ev+1.0 Eh 150 deg
62	0.9 Dead-1.0 Ev+1.0 Eh 150 deg
63	1.2 Dead+1.0 Ev+1.0 Eh 180 deg
64	0.9 Dead-1.0 Ev+1.0 Eh 180 deg
65	1.2 Dead+1.0 Ev+1.0 Eh 210 deg
66	0.9 Dead-1.0 Ev+1.0 Eh 210 deg
67	1.2 Dead+1.0 Ev+1.0 Eh 240 deg
68	0.9 Dead-1.0 Ev+1.0 Eh 240 deg
69	1.2 Dead+1.0 Ev+1.0 Eh 270 deg
70	0.9 Dead-1.0 Ev+1.0 Eh 270 deg
71	1.2 Dead+1.0 Ev+1.0 Eh 300 deg
72	0.9 Dead-1.0 Ev+1.0 Eh 300 deg
73	1.2 Dead+1.0 Ev+1.0 Eh 330 deg
74	0.9 Dead-1.0 Ev+1.0 Eh 330 deg

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	150 - 145	Pole	Max Tension	63	0.000	-0.000	0.000
			Max. Compression	26	-7.116	-0.001	-0.274
			Max. Mx	8	-3.239	-29.132	0.018
			Max. My	14	-3.250	0.118	-29.053
			Max. Vy	20	-6.173	29.077	-0.240
			Max. Vx	14	6.144	0.118	-29.053
			Max. Torque	6			-0.173
L2	145 - 140	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-7.647	0.006	-0.333
			Max. Mx	8	-3.640	-60.558	0.072
			Max. My	14	-3.651	0.222	-60.354
			Max. Vy	20	-6.399	60.505	-0.375
			Max. Vx	14	6.366	0.222	-60.354
			Max. Torque	6			-0.173
L3	140 - 135.667	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-8.131	0.012	-0.383
			Max. Mx	8	-4.002	-88.708	0.119
			Max. My	14	-4.015	0.313	-88.343
			Max. Vy	20	-6.598	88.657	-0.491
			Max. Vx	14	6.545	0.313	-88.343
			Max. Torque	6			-0.173
L4	135.667 - 135.417	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-8.172	0.012	-0.387
			Max. Mx	8	-4.034	-90.360	0.122
			Max. My	14	-4.048	0.319	-89.983
			Max. Vy	20	-6.622	90.309	-0.498
			Max. Vx	14	6.565	0.319	-89.983
			Max. Torque	6			-0.172
L5	135.417 - 130.417	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-8.985	0.020	-0.445
			Max. Mx	8	-4.589	-124.781	0.177
			Max. My	14	-4.613	0.425	-123.941
			Max. Vy	20	-7.148	124.733	-0.633
			Max. Vx	14	7.008	0.425	-123.941

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Torque	6			-0.172
L6	130.417 - 125.417	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-9.798	0.028	-0.504
			Max. Mx	8	-5.165	-161.776	0.231
			Max. My	14	-5.198	0.532	-160.061
			Max. Vy	20	-7.655	161.731	-0.769
			Max. Vx	14	7.433	0.532	-160.061
			Max. Torque	20			0.175
L7	125.417 - 120.417	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-10.609	0.037	-0.563
			Max. Mx	8	-5.765	-201.241	0.285
			Max. My	14	-5.804	0.640	-198.242
			Max. Vy	20	-8.139	201.199	-0.905
			Max. Vx	14	7.835	0.640	-198.242
			Max. Torque	20			0.178
L8	120.417 - 120	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-10.677	0.037	-0.568
			Max. Mx	8	-5.821	-204.640	0.289
			Max. My	14	-5.860	0.649	-201.516
			Max. Vy	20	-8.174	204.599	-0.916
			Max. Vx	14	7.864	0.649	-201.516
			Max. Torque	20			0.178
L9	120 - 119.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-10.717	0.038	-0.572
			Max. Mx	8	-5.849	-206.686	0.291
			Max. My	14	-5.888	0.655	-203.486
			Max. Vy	20	-8.199	206.645	-0.924
			Max. Vx	14	7.889	0.655	-203.486
			Max. Torque	20			0.178
L10	119.75 - 114.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-11.413	0.047	-0.647
			Max. Mx	8	-6.408	-248.316	0.334
			Max. My	14	-6.444	0.764	-243.612
			Max. Vy	20	-8.458	248.279	-1.071
			Max. Vx	14	8.149	0.764	-243.612
			Max. Torque	20			0.178
L11	114.75 - 110.375	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-12.040	0.056	-0.712
			Max. Mx	8	-6.912	-285.757	0.371
			Max. My	14	-6.945	0.859	-279.736
			Max. Vy	20	-8.668	285.723	-1.200
			Max. Vx	14	8.359	0.859	-279.736
			Max. Torque	20			0.178
L12	110.375 - 110.125	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-12.088	0.057	-0.717
			Max. Mx	8	-6.954	-287.925	0.373
			Max. My	14	-6.987	0.865	-281.830
			Max. Vy	20	-8.688	287.892	-1.207
			Max. Vx	14	8.380	0.865	-281.830
			Max. Torque	20			0.177
L13	110.125 - 105.125	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-13.058	0.067	-0.791
			Max. Mx	8	-7.672	-332.619	0.414
			Max. My	14	-7.701	0.975	-325.081
			Max. Vy	20	-9.195	332.590	-1.354
			Max. Vx	14	8.908	0.975	-325.081
			Max. Torque	20			0.177
L14	105.125 - 100.125	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-13.999	0.078	-0.866
			Max. Mx	8	-8.427	-379.237	0.455
			Max. My	14	-8.435	1.086	-370.860

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	20	-9.463	379.214	-1.502
			Max. Vx	14	9.397	1.086	-370.860
			Max. Torque	20			0.176
L15	100.125 - 100	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-14.021	0.079	-0.869
			Max. Mx	8	-8.452	-380.419	0.456
			Max. My	14	-8.460	1.089	-372.036
			Max. Vy	20	-9.463	380.396	-1.506
			Max. Vx	14	9.397	1.089	-372.036
			Max. Torque	20			0.175
L16	100 - 99.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-14.065	0.080	-0.873
			Max. Mx	8	-8.487	-382.787	0.457
			Max. My	14	-8.494	1.095	-374.389
			Max. Vy	20	-9.480	382.764	-1.514
			Max. Vx	14	9.414	1.095	-374.389
			Max. Torque	20			0.175
L17	99.75 - 94.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-15.113	1.003	-1.492
			Max. Mx	20	-9.241	434.223	-1.793
			Max. My	14	-9.248	1.437	-425.442
			Max. Vy	20	-10.101	434.223	-1.793
			Max. Vx	14	10.047	1.437	-425.442
			Max. Torque	25			1.967
L18	94.75 - 89.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-15.985	1.015	-1.585
			Max. Mx	20	-9.956	485.462	-1.901
			Max. My	14	-9.961	1.497	-476.462
			Max. Vy	20	-10.403	485.462	-1.901
			Max. Vx	14	10.349	1.497	-476.462
			Max. Torque	25			1.966
L19	89.75 - 85.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-16.794	1.025	-1.667
			Max. Mx	20	-10.607	532.826	-1.998
			Max. My	14	-10.612	1.549	-523.633
			Max. Vy	20	-10.660	532.826	-1.998
			Max. Vx	14	10.607	1.549	-523.633
			Max. Torque	25			1.964
L20	85.25 - 85	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-16.852	1.026	-1.672
			Max. Mx	20	-10.659	535.491	-2.003
			Max. My	14	-10.662	1.552	-526.289
			Max. Vy	20	-10.669	535.491	-2.003
			Max. Vx	14	10.632	1.552	-526.289
			Max. Torque	25			1.963
L21	85 - 80	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-17.999	1.037	-1.763
			Max. Mx	20	-11.548	589.628	-2.110
			Max. My	14	-11.534	1.610	-581.033
			Max. Vy	20	-10.991	589.628	-2.110
			Max. Vx	14	11.251	1.610	-581.033
			Max. Torque	25			1.962
L22	80 - 79.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-18.057	1.038	-1.769
			Max. Mx	20	-11.595	592.376	-2.116
			Max. My	14	-11.580	1.613	-583.852
			Max. Vy	20	-11.004	592.376	-2.116
			Max. Vx	14	11.284	1.613	-583.852
			Max. Torque	25			1.961
L23	79.75 - 74.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-19.124	1.049	-1.877
			Max. Mx	20	-12.439	648.319	-2.235
			Max. My	14	-12.424	1.671	-641.256
			Max. Vy	20	-11.377	648.319	-2.235

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	14	11.657	1.671	-641.256
			Max. Torque	25			1.961
L24	74.75 - 69.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-20.347	1.990	-2.522
			Max. Mx	20	-13.358	708.330	-2.541
			Max. My	14	-13.343	2.055	-702.563
			Max. Vy	20	-12.009	708.330	-2.541
			Max. Vx	14	12.301	2.055	-702.563
			Max. Torque	25			3.860
L25	69.75 - 64.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-21.397	2.001	-2.628
			Max. Mx	20	-14.222	769.186	-2.612
			Max. My	14	-14.209	2.065	-764.939
			Max. Vy	20	-12.344	769.186	-2.612
			Max. Vx	14	12.635	2.065	-764.939
			Max. Torque	25			3.859
L26	64.75 - 60	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-22.393	2.010	-2.729
			Max. Mx	20	-15.051	828.498	-2.677
			Max. My	14	-15.038	2.071	-825.699
			Max. Vy	20	-12.644	828.498	-2.677
			Max. Vx	14	12.937	2.071	-825.699
			Max. Torque	25			3.858
L27	60 - 55	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-23.623	2.019	-2.851
			Max. Mx	20	-16.048	892.692	-2.758
			Max. My	14	-16.037	2.077	-891.429
			Max. Vy	20	-13.046	892.692	-2.758
			Max. Vx	14	13.339	2.077	-891.429
			Max. Torque	25			3.856
L28	55 - 50	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-24.850	2.028	-2.972
			Max. Mx	20	-17.048	958.868	-2.838
			Max. My	14	-17.037	2.083	-959.144
			Max. Vy	20	-13.434	958.868	-2.838
			Max. Vx	14	13.727	2.083	-959.144
			Max. Torque	25			3.855
L29	50 - 45	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-26.243	2.983	-3.636
			Max. Mx	20	-18.126	1030.346	-3.090
			Max. My	14	-18.116	2.418	-1032.032
			Max. Vy	20	-14.063	1030.346	-3.090
			Max. Vx	14	14.366	2.418	-1032.032
			Max. Torque	24			5.721
L30	45 - 40	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-27.465	2.983	-3.744
			Max. Mx	20	-19.141	1101.496	-3.123
			Max. My	14	-19.133	2.376	-1104.770
			Max. Vy	20	-14.409	1101.496	-3.123
			Max. Vx	14	14.712	2.376	-1104.770
			Max. Torque	24			5.719
L31	40 - 35	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-28.865	2.983	-3.869
			Max. Mx	20	-20.286	1174.559	-3.168
			Max. My	14	-20.278	2.333	-1179.434
			Max. Vy	20	-14.828	1174.559	-3.168
			Max. Vx	14	15.131	2.333	-1179.434
			Max. Torque	24			5.718
L32	35 - 30	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-30.261	2.983	-3.993
			Max. Mx	20	-21.433	1249.669	-3.213
			Max. My	14	-21.426	2.289	-1256.145
			Max. Vy	20	-15.226	1249.669	-3.213
			Max. Vx	14	15.529	2.289	-1256.145
			Max. Torque	24			5.718
L33	30 - 25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-31.652	2.983	-4.116

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	20	-22.586	1326.705	-3.255
			Max. My	14	-22.580	2.244	-1334.780
			Max. Vy	20	-15.599	1326.705	-3.255
			Max. Vx	14	15.902	2.244	-1334.780
			Max. Torque	24			5.717
L34	25 - 20	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-33.036	2.983	-4.238
			Max. Mx	20	-23.744	1405.530	-3.297
			Max. My	14	-23.739	2.196	-1415.203
			Max. Vy	20	-15.944	1405.530	-3.297
			Max. Vx	14	16.246	2.196	-1415.203
			Max. Torque	24			5.717
L35	20 - 15	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-34.593	2.983	-4.375
			Max. Mx	20	-25.035	1486.199	-3.350
			Max. My	14	-25.032	2.149	-1497.481
			Max. Vy	20	-16.336	1486.199	-3.350
			Max. Vx	14	16.638	2.149	-1497.481
			Max. Torque	24			5.716
L36	15 - 10	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-36.132	2.983	-4.497
			Max. Mx	20	-26.324	1568.786	-3.392
			Max. My	14	-26.321	2.100	-1581.665
			Max. Vy	20	-16.709	1568.786	-3.392
			Max. Vx	14	17.010	2.100	-1581.665
			Max. Torque	24			5.716
L37	10 - 5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-37.598	2.983	-4.497
			Max. Mx	20	-27.573	1653.210	-3.343
			Max. My	14	-27.571	2.050	-1667.594
			Max. Vy	20	-17.072	1653.210	-3.343
			Max. Vx	14	17.373	2.050	-1667.594
			Max. Torque	24			5.716
L38	5 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-39.037	2.983	-4.497
			Max. Mx	20	-28.826	1739.421	-3.293
			Max. My	14	-28.826	1.999	-1755.307
			Max. Vy	20	-17.425	1739.421	-3.293
			Max. Vx	14	17.726	1.999	-1755.307
			Max. Torque	24			5.716

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	39.037	0.000	-0.000
	Max. H_x	21	21.623	17.418	0.010
	Max. H_z	2	28.831	0.010	17.009
	Max. M_x	2	1680.471	0.010	17.009
	Max. M_z	8	1736.934	-17.418	-0.010
	Max. Torsion	24	5.716	8.512	14.744
	Min. Vert	66	20.591	0.360	-0.624
	Min. H_x	8	28.831	-17.418	-0.010
	Min. H_z	14	28.831	-0.010	-17.718
	Min. M_x	14	-1755.307	-0.010	-17.718
	Min. M_z	20	-1739.421	17.418	0.010
	Min. Torsion	12	-5.715	-8.512	-14.744

Tower Mast Reaction Summary

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead Only	24.026	0.000	0.000	2.051	1.008	-0.000
1.2 Dead+1.0 Wind 0 deg - No Ice	28.831	-0.010	-17.009	-1680.471	0.438	-4.860
0.9 Dead+1.0 Wind 0 deg - No Ice	21.623	-0.010	-17.009	-1661.264	0.151	-4.860
1.2 Dead+1.0 Wind 30 deg - No Ice	28.831	8.496	-14.734	-1456.491	-842.040	-2.705
0.9 Dead+1.0 Wind 30 deg - No Ice	21.623	8.496	-14.734	-1439.922	-832.379	-2.707
1.2 Dead+1.0 Wind 60 deg - No Ice	28.831	15.329	-8.850	-874.531	-1517.867	0.170
0.9 Dead+1.0 Wind 60 deg - No Ice	21.623	15.329	-8.850	-864.928	-1500.419	0.167
1.2 Dead+1.0 Wind 90 deg - No Ice	28.831	17.418	0.010	1.732	-1736.934	3.010
0.9 Dead+1.0 Wind 90 deg - No Ice	21.623	17.418	0.010	1.108	-1716.721	3.007
1.2 Dead+1.0 Wind 120 deg - No Ice	28.831	14.726	8.513	843.326	-1456.674	5.030
0.9 Dead+1.0 Wind 120 deg - No Ice	21.623	14.726	8.513	832.769	-1439.778	5.027
1.2 Dead+1.0 Wind 150 deg - No Ice	28.831	8.512	14.744	1460.770	-840.706	5.715
0.9 Dead+1.0 Wind 150 deg - No Ice	21.623	8.512	14.744	1442.918	-831.092	5.714
1.2 Dead+1.0 Wind 180 deg - No Ice	28.831	0.010	17.718	1755.307	1.999	4.869
0.9 Dead+1.0 Wind 180 deg - No Ice	21.623	0.010	17.718	1734.181	1.654	4.869
1.2 Dead+1.0 Wind 210 deg - No Ice	28.831	-8.496	14.734	1461.556	844.499	2.715
0.9 Dead+1.0 Wind 210 deg - No Ice	21.623	-8.496	14.734	1443.670	834.201	2.718
1.2 Dead+1.0 Wind 240 deg - No Ice	28.831	-14.716	8.496	844.691	1459.914	-0.170
0.9 Dead+1.0 Wind 240 deg - No Ice	21.623	-14.716	8.496	834.079	1442.348	-0.167
1.2 Dead+1.0 Wind 270 deg - No Ice	28.831	-17.418	-0.010	3.293	1739.421	-3.021
0.9 Dead+1.0 Wind 270 deg - No Ice	21.623	-17.418	-0.010	2.611	1718.563	-3.018
1.2 Dead+1.0 Wind 300 deg - No Ice	28.831	-15.339	-8.867	-873.211	1519.578	-5.039
0.9 Dead+1.0 Wind 300 deg - No Ice	21.623	-15.339	-8.867	-863.652	1501.516	-5.036
1.2 Dead+1.0 Wind 330 deg - No Ice	28.831	-8.512	-14.744	-1455.749	843.147	-5.716
0.9 Dead+1.0 Wind 330 deg - No Ice	21.623	-8.512	-14.744	-1439.201	832.900	-5.714
1.2 Dead+1.0 Ice+1.0 Temp	39.037	-0.000	0.000	4.497	2.983	-0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	39.037	-0.009	-4.991	-458.914	3.450	-2.139
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	39.037	2.483	-4.319	-396.820	-228.210	-1.196
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	39.037	4.329	-2.499	-228.313	-400.306	0.067
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	39.037	5.094	0.009	4.980	-475.650	1.325
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	39.037	4.317	2.503	236.651	-398.135	2.207
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	39.037	2.499	4.328	406.348	-228.970	2.509
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	39.037	0.009	5.015	471.021	2.575	2.140
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	39.037	-2.483	4.319	405.915	234.240	1.197
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	39.037	-4.308	2.487	235.898	403.730	-0.067
1.2 Dead+1.0 Wind 270	39.037	-5.094	-0.009	4.106	481.685	-1.325

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	39.037	-4.338	-2.515	-229.074	406.776	-2.207
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	39.037	-2.499	-4.328	-397.261	234.995	-2.510
Dead+Wind 0 deg - Service	24.026	-0.002	-3.512	-343.456	0.873	-1.008
Dead+Wind 30 deg - Service	24.026	1.754	-3.042	-297.471	-172.106	-0.562
Dead+Wind 60 deg - Service	24.026	3.165	-1.827	-177.988	-310.883	0.035
Dead+Wind 90 deg - Service	24.026	3.596	0.002	1.937	-355.902	0.625
Dead+Wind 120 deg - Service	24.026	3.040	1.758	174.734	-298.304	1.044
Dead+Wind 150 deg - Service	24.026	1.757	3.044	301.505	-171.833	1.185
Dead+Wind 180 deg - Service	24.026	0.002	3.658	361.991	1.190	1.009
Dead+Wind 210 deg - Service	24.026	-1.754	3.042	301.664	174.170	0.562
Dead+Wind 240 deg - Service	24.026	-3.038	1.754	175.009	300.526	-0.035
Dead+Wind 270 deg - Service	24.026	-3.596	-0.002	2.254	357.967	-0.626
Dead+Wind 300 deg - Service	24.026	-3.167	-1.831	-177.715	312.789	-1.044
Dead+Wind 330 deg - Service	24.026	-1.757	-3.044	-297.314	173.896	-1.185
1.2 Dead+1.0 Ev+1.0 Eh 0 deg	29.863	-0.000	-0.720	-89.498	1.252	-0.000
0.9 Dead-1.0 Ev+1.0 Eh 0 deg	20.591	0.000	-0.720	-88.662	0.924	-0.000
1.2 Dead+1.0 Ev+1.0 Eh 30 deg	29.863	0.360	-0.624	-77.167	-44.769	0.000
0.9 Dead-1.0 Ev+1.0 Eh 30 deg	20.591	0.360	-0.624	-76.532	-44.345	0.000
1.2 Dead+1.0 Ev+1.0 Eh 60 deg	29.863	0.624	-0.360	-43.478	-78.458	0.001
0.9 Dead-1.0 Ev+1.0 Eh 60 deg	20.591	0.624	-0.360	-43.393	-77.483	0.001
1.2 Dead+1.0 Ev+1.0 Eh 90 deg	29.863	0.720	0.000	2.543	-90.790	0.001
0.9 Dead-1.0 Ev+1.0 Eh 90 deg	20.591	0.720	0.000	1.875	-89.613	0.001
1.2 Dead+1.0 Ev+1.0 Eh 120 deg	29.863	0.624	0.360	48.564	-78.458	0.001
0.9 Dead-1.0 Ev+1.0 Eh 120 deg	20.591	0.624	0.360	47.143	-77.483	0.001
1.2 Dead+1.0 Ev+1.0 Eh 150 deg	29.863	0.360	0.624	82.256	-44.770	0.001
0.9 Dead-1.0 Ev+1.0 Eh 150 deg	20.591	0.360	0.624	80.281	-44.344	0.000
1.2 Dead+1.0 Ev+1.0 Eh 180 deg	29.863	-0.000	0.720	94.588	1.252	0.000
0.9 Dead-1.0 Ev+1.0 Eh 180 deg	20.591	0.000	0.720	92.411	0.924	0.000
1.2 Dead+1.0 Ev+1.0 Eh 210 deg	29.863	-0.360	0.624	82.256	47.275	-0.000
0.9 Dead-1.0 Ev+1.0 Eh 210 deg	20.591	-0.360	0.624	80.281	46.192	-0.000
1.2 Dead+1.0 Ev+1.0 Eh 240 deg	29.863	-0.624	0.360	48.566	80.965	-0.001
0.9 Dead-1.0 Ev+1.0 Eh 240 deg	20.591	-0.624	0.360	47.143	79.330	-0.001
1.2 Dead+1.0 Ev+1.0 Eh 270 deg	29.863	-0.720	0.000	2.543	93.297	-0.001
0.9 Dead-1.0 Ev+1.0 Eh 270 deg	20.591	-0.720	0.000	1.875	91.460	-0.001
1.2 Dead+1.0 Ev+1.0 Eh 300 deg	29.863	-0.624	-0.360	-43.478	80.963	-0.001
0.9 Dead-1.0 Ev+1.0 Eh 300 deg	20.591	-0.624	-0.360	-43.393	79.330	-0.001

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.0 Ev+1.0 Eh 330 deg	29.863	-0.360	-0.624	-77.167	47.273	-0.001
0.9 Dead-1.0 Ev+1.0 Eh 330 deg	20.591	-0.360	-0.624	-76.532	46.192	-0.000

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.000	-24.026	0.000	0.000	24.026	-0.000	0.000%
2	-0.010	-28.831	-17.009	0.010	28.831	17.009	0.000%
3	-0.010	-21.623	-17.009	0.010	21.623	17.009	0.000%
4	8.496	-28.831	-14.734	-8.496	28.831	14.734	0.000%
5	8.496	-21.623	-14.734	-8.496	21.623	14.734	0.000%
6	15.329	-28.831	-8.850	-15.329	28.831	8.850	0.000%
7	15.329	-21.623	-8.850	-15.329	21.623	8.850	0.000%
8	17.418	-28.831	0.010	-17.418	28.831	-0.010	0.000%
9	17.418	-21.623	0.010	-17.418	21.623	-0.010	0.000%
10	14.726	-28.831	8.513	-14.726	28.831	-8.513	0.000%
11	14.726	-21.623	8.513	-14.726	21.623	-8.513	0.000%
12	8.512	-28.831	14.744	-8.512	28.831	-14.744	0.000%
13	8.512	-21.623	14.744	-8.512	21.623	-14.744	0.000%
14	0.010	-28.831	17.718	-0.010	28.831	-17.718	0.000%
15	0.010	-21.623	17.718	-0.010	21.623	-17.718	0.000%
16	-8.496	-28.831	14.734	8.496	28.831	-14.734	0.000%
17	-8.496	-21.623	14.734	8.496	21.623	-14.734	0.000%
18	-14.716	-28.831	8.496	14.716	28.831	-8.496	0.000%
19	-14.716	-21.623	8.496	14.716	21.623	-8.496	0.000%
20	-17.418	-28.831	-0.010	17.418	28.831	0.010	0.000%
21	-17.418	-21.623	-0.010	17.418	21.623	0.010	0.000%
22	-15.339	-28.831	-8.867	15.339	28.831	8.867	0.000%
23	-15.339	-21.623	-8.867	15.339	21.623	8.867	0.000%
24	-8.512	-28.831	-14.744	8.512	28.831	14.744	0.000%
25	-8.512	-21.623	-14.744	8.512	21.623	14.744	0.000%
26	0.000	-39.037	0.000	0.000	39.037	-0.000	0.000%
27	-0.009	-39.037	-4.991	0.009	39.037	4.991	0.000%
28	2.483	-39.037	-4.319	-2.483	39.037	4.319	0.000%
29	4.329	-39.037	-2.499	-4.329	39.037	2.499	0.000%
30	5.094	-39.037	0.009	-5.094	39.037	-0.009	0.000%
31	4.317	-39.037	2.503	-4.317	39.037	-2.503	0.000%
32	2.499	-39.037	4.328	-2.499	39.037	-4.328	0.000%
33	0.009	-39.037	5.015	-0.009	39.037	-5.015	0.000%
34	-2.483	-39.037	4.319	2.483	39.037	-4.319	0.000%
35	-4.308	-39.037	2.487	4.308	39.037	-2.487	0.000%
36	-5.094	-39.037	-0.009	5.094	39.037	0.009	0.000%
37	-4.338	-39.037	-2.515	4.338	39.037	2.515	0.000%
38	-2.499	-39.037	-4.328	2.499	39.037	4.328	0.000%
39	-0.002	-24.026	-3.512	0.002	24.026	3.512	0.000%
40	1.754	-24.026	-3.042	-1.754	24.026	3.042	0.000%
41	3.165	-24.026	-1.827	-3.165	24.026	1.827	0.000%
42	3.596	-24.026	0.002	-3.596	24.026	-0.002	0.000%
43	3.040	-24.026	1.758	-3.040	24.026	-1.758	0.000%
44	1.757	-24.026	3.044	-1.757	24.026	-3.044	0.000%
45	0.002	-24.026	3.658	-0.002	24.026	-3.658	0.000%
46	-1.754	-24.026	3.042	1.754	24.026	-3.042	0.000%
47	-3.038	-24.026	1.754	3.038	24.026	-1.754	0.000%
48	-3.596	-24.026	-0.002	3.596	24.026	0.002	0.000%
49	-3.167	-24.026	-1.831	3.167	24.026	1.831	0.000%
50	-1.757	-24.026	-3.044	1.757	24.026	3.044	0.000%
51	0.000	-29.863	-0.720	0.000	29.863	0.720	0.000%
52	0.000	-20.591	-0.720	0.000	20.591	0.720	0.000%
53	0.360	-29.863	-0.624	-0.360	29.863	0.624	0.000%
54	0.360	-20.591	-0.624	-0.360	20.591	0.624	0.000%
55	0.624	-29.863	-0.360	-0.624	29.863	0.360	0.000%
56	0.624	-20.591	-0.360	-0.624	20.591	0.360	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
57	0.720	-29.863	0.000	-0.720	29.863	-0.000	0.000%
58	0.720	-20.591	0.000	-0.720	20.591	-0.000	0.000%
59	0.624	-29.863	0.360	-0.624	29.863	-0.360	0.000%
60	0.624	-20.591	0.360	-0.624	20.591	-0.360	0.000%
61	0.360	-29.863	0.624	-0.360	29.863	-0.624	0.000%
62	0.360	-20.591	0.624	-0.360	20.591	-0.624	0.000%
63	0.000	-29.863	0.720	0.000	29.863	-0.720	0.000%
64	0.000	-20.591	0.720	0.000	20.591	-0.720	0.000%
65	-0.360	-29.863	0.624	0.360	29.863	-0.624	0.000%
66	-0.360	-20.591	0.624	0.360	20.591	-0.624	0.000%
67	-0.624	-29.863	0.360	0.624	29.863	-0.360	0.000%
68	-0.624	-20.591	0.360	0.624	20.591	-0.360	0.000%
69	-0.720	-29.863	0.000	0.720	29.863	-0.000	0.000%
70	-0.720	-20.591	0.000	0.720	20.591	-0.000	0.000%
71	-0.624	-29.863	-0.360	0.624	29.863	0.360	0.000%
72	-0.624	-20.591	-0.360	0.624	20.591	0.360	0.000%
73	-0.360	-29.863	-0.624	0.360	29.863	0.624	0.000%
74	-0.360	-20.591	-0.624	0.360	20.591	0.624	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000462
2	Yes	6	0.00000001	0.00040718
3	Yes	6	0.00000001	0.00013859
4	Yes	7	0.00000001	0.00016143
5	Yes	6	0.00000001	0.00081959
6	Yes	7	0.00000001	0.00017432
7	Yes	6	0.00000001	0.00088152
8	Yes	6	0.00000001	0.00027575
9	Yes	6	0.00000001	0.00009168
10	Yes	7	0.00000001	0.00018746
11	Yes	6	0.00000001	0.00095851
12	Yes	7	0.00000001	0.00015312
13	Yes	6	0.00000001	0.00077556
14	Yes	6	0.00000001	0.00042595
15	Yes	6	0.00000001	0.00014309
16	Yes	7	0.00000001	0.00017862
17	Yes	6	0.00000001	0.00091009
18	Yes	7	0.00000001	0.00017137
19	Yes	6	0.00000001	0.00087089
20	Yes	6	0.00000001	0.00029616
21	Yes	6	0.00000001	0.00009822
22	Yes	7	0.00000001	0.00016044
23	Yes	6	0.00000001	0.00080825
24	Yes	7	0.00000001	0.00018929
25	Yes	6	0.00000001	0.00096902
26	Yes	4	0.00000001	0.00084501
27	Yes	6	0.00000001	0.00085564
28	Yes	7	0.00000001	0.00012814
29	Yes	7	0.00000001	0.00013043
30	Yes	6	0.00000001	0.00085293
31	Yes	7	0.00000001	0.00014627
32	Yes	7	0.00000001	0.00013340
33	Yes	6	0.00000001	0.00088180
34	Yes	7	0.00000001	0.00014113
35	Yes	7	0.00000001	0.00013647
36	Yes	6	0.00000001	0.00086424
37	Yes	7	0.00000001	0.00013212
38	Yes	7	0.00000001	0.00014686
39	Yes	5	0.00000001	0.00029477
40	Yes	5	0.00000001	0.00043409
41	Yes	5	0.00000001	0.00050331
42	Yes	5	0.00000001	0.00020991

43	Yes	5	0.00000001	0.00068764
44	Yes	5	0.00000001	0.00045245
45	Yes	5	0.00000001	0.00030879
46	Yes	5	0.00000001	0.00058546
47	Yes	5	0.00000001	0.00050975
48	Yes	5	0.00000001	0.00021407
49	Yes	5	0.00000001	0.00046355
50	Yes	5	0.00000001	0.00070724
51	Yes	4	0.00000001	0.00026239
52	Yes	4	0.00000001	0.00012868
53	Yes	4	0.00000001	0.00044150
54	Yes	4	0.00000001	0.00025574
55	Yes	4	0.00000001	0.00043819
56	Yes	4	0.00000001	0.00025387
57	Yes	4	0.00000001	0.00026805
58	Yes	4	0.00000001	0.00013083
59	Yes	4	0.00000001	0.00048198
60	Yes	4	0.00000001	0.00027508
61	Yes	4	0.00000001	0.00047390
62	Yes	4	0.00000001	0.00027074
63	Yes	4	0.00000001	0.00027791
64	Yes	4	0.00000001	0.00013432
65	Yes	4	0.00000001	0.00049435
66	Yes	4	0.00000001	0.00028051
67	Yes	4	0.00000001	0.00049798
68	Yes	4	0.00000001	0.00028247
69	Yes	4	0.00000001	0.00027465
70	Yes	4	0.00000001	0.00013322
71	Yes	4	0.00000001	0.00045247
72	Yes	4	0.00000001	0.00026062
73	Yes	4	0.00000001	0.00046044
74	Yes	4	0.00000001	0.00026491

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 145	21.790	48	1.635	0.005
L2	145 - 140	20.084	48	1.620	0.005
L3	140 - 135.667	18.409	48	1.574	0.005
L4	135.667 - 135.417	17.009	48	1.506	0.005
L5	135.417 - 130.417	16.931	48	1.504	0.005
L6	130.417 - 125.417	15.387	48	1.441	0.005
L7	125.417 - 120.417	13.921	48	1.357	0.005
L8	120.417 - 120	12.554	48	1.250	0.005
L9	120 - 119.75	12.446	45	1.240	0.005
L10	119.75 - 114.75	12.381	45	1.237	0.005
L11	114.75 - 110.375	11.137	45	1.155	0.005
L12	110.375 - 110.125	10.123	45	1.070	0.005
L13	110.125 - 105.125	10.067	45	1.067	0.005
L14	105.125 - 100.125	8.994	45	0.993	0.005
L15	100.125 - 100	8.002	45	0.908	0.005
L16	100 - 99.75	7.978	45	0.905	0.005
L17	99.75 - 94.75	7.931	45	0.902	0.005
L18	94.75 - 89.75	7.020	45	0.841	0.005
L19	89.75 - 85.25	6.176	45	0.772	0.004
L20	85.25 - 85	5.481	45	0.703	0.004
L21	85 - 80	5.444	45	0.700	0.004
L22	80 - 79.75	4.742	45	0.639	0.004
L23	79.75 - 74.75	4.709	45	0.637	0.004

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L24	74.75 - 69.75	4.066	45	0.590	0.003
L25	69.75 - 64.75	3.475	45	0.539	0.003
L26	64.75 - 60	2.939	45	0.483	0.003
L27	60 - 55	2.488	45	0.425	0.002
L28	55 - 50	2.062	45	0.387	0.002
L29	50 - 45	1.678	45	0.346	0.002
L30	45 - 40	1.338	45	0.303	0.002
L31	40 - 35	1.045	45	0.256	0.001
L32	35 - 30	0.794	45	0.224	0.001
L33	30 - 25	0.577	45	0.190	0.001
L34	25 - 20	0.396	45	0.155	0.001
L35	20 - 15	0.253	45	0.117	0.001
L36	15 - 10	0.145	45	0.090	0.000
L37	10 - 5	0.066	45	0.062	0.000
L38	5 - 0	0.017	45	0.032	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.000	APXVAARR24_43-U-NA20 w/ 2.5" Mount Pipe	48	21.790	1.635	0.005	9312
147.500	CCISeismic Tower Section 1 - 1	48	20.935	1.629	0.005	9312
145.000	CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (140ft to150ft)	48	20.084	1.620	0.005	9312
142.500	CCISeismic Tower Section 2 - 1	48	19.240	1.603	0.005	6085
137.834	CCISeismic Tower Section 3 - 1	48	17.702	1.538	0.005	4037
135.542	CCISeismic Tower Section 4 - 1	48	16.970	1.505	0.005	4110
135.000	CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (130ft to140ft)	48	16.800	1.499	0.005	4188
132.917	CCISeismic Tower Section 5 - 1	48	16.151	1.475	0.005	4281
127.917	CCISeismic Tower Section 6 - 1	48	14.643	1.401	0.005	3410
125.000	CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (120ft to130ft)	48	13.803	1.349	0.005	2956
122.917	CCISeismic Tower Section 7 - 1	48	13.224	1.309	0.005	2798
120.209	CCISeismic Tower Section 8 - 1	45	12.500	1.245	0.005	2966
119.875	CCISeismic Tower Section 9 - 1	45	12.414	1.238	0.005	3020
117.250	CCISeismic Tower Section 10 - 1	45	11.748	1.200	0.005	3304
115.000	CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (110ft to120ft)	45	11.197	1.160	0.005	3223
112.563	CCISeismic Tower Section 11 - 1	45	10.620	1.109	0.005	3159
110.250	CCISeismic Tower Section 12 - 1	45	10.095	1.068	0.005	3395
107.625	CCISeismic Tower Section 13 - 1	45	9.521	1.031	0.005	3695
105.000	CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (100ft to110ft)	45	8.968	0.991	0.005	3590
102.625	CCISeismic Tower Section 14 - 1	45	8.487	0.952	0.005	3527
100.063	CCISeismic Tower Section 15 - 1	45	7.990	0.906	0.005	3888
99.875	CCISeismic Tower Section 16 - 1	45	7.955	0.904	0.005	3936
98.000	4' x 2" STD Pipe	45	7.605	0.884	0.005	4336
97.250	CCISeismic Tower Section 17 - 1	45	7.468	0.874	0.005	4431
95.000	CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (90ft to100ft)	45	7.064	0.844	0.005	4415
94.000	CCISeismic andrew LDF4-50A(1/2") From 0 to 98 (90ft to98ft)	45	6.889	0.831	0.005	4309
92.250	CCISeismic Tower Section 18 - 1	45	6.589	0.808	0.004	4137
87.500	CCISeismic Tower Section 19 - 1	45	5.821	0.735	0.004	3913
85.125	CCISeismic Tower Section 20 - 1	45	5.463	0.702	0.004	4162

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
85.000	CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (80ft to90ft)	45	5.444	0.700	0.004	4183
82.500	CCISeismic Tower Section 21 - 1	45	5.085	0.668	0.004	4643
79.875	CCISeismic Tower Section 22 - 1	45	4.726	0.638	0.004	5264
77.250	CCISeismic Tower Section 23 - 1	45	4.381	0.614	0.004	5804
75.000	CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (70ft to80ft)	45	4.097	0.593	0.003	5821
72.250	CCISeismic Tower Section 24 - 1	45	3.764	0.565	0.003	5569
70.000	4' x 2" STD Pipe	45	3.503	0.541	0.003	5337
67.250	CCISeismic Tower Section 25 - 1	45	3.199	0.512	0.003	5000
65.000	CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (60ft to70ft)	45	2.965	0.486	0.003	4890
62.375	CCISeismic Tower Section 26 - 1	45	2.707	0.452	0.003	5178
57.500	CCISeismic Tower Section 27 - 1	45	2.269	0.404	0.002	6657
55.000	CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (50ft to60ft)	45	2.062	0.387	0.002	7306
52.500	CCISeismic Tower Section 28 - 1	45	1.865	0.368	0.002	7239
50.000	4' x 2" STD Pipe	45	1.678	0.346	0.002	6779
47.500	CCISeismic Tower Section 29 - 1	45	1.502	0.325	0.002	6399
45.000	CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (40ft to50ft)	45	1.338	0.303	0.002	6305
42.500	CCISeismic Tower Section 30 - 1	45	1.186	0.278	0.002	6616
37.500	CCISeismic Tower Section 31 - 1	45	0.915	0.239	0.001	8146
35.000	CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (30ft to40ft)	45	0.794	0.224	0.001	8799
32.500	CCISeismic Tower Section 32 - 1	45	0.681	0.208	0.001	8732
27.500	CCISeismic Tower Section 33 - 1	45	0.481	0.173	0.001	7864
25.000	CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (20ft to30ft)	45	0.396	0.155	0.001	7774
22.500	CCISeismic Tower Section 34 - 1	45	0.320	0.135	0.001	8126
17.500	CCISeismic Tower Section 35 - 1	45	0.195	0.102	0.000	9675
15.250	CCISeismic miscl Climbing Ladder From 10.5 to 150 (10.5ft to20ft)	45	0.150	0.091	0.000	10324
15.000	CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (10ft to20ft)	45	0.145	0.090	0.000	10375
12.500	CCISeismic Tower Section 36 - 1	45	0.102	0.076	0.000	10507
7.500	CCISeismic Tower Section 37 - 1	45	0.037	0.047	0.000	8823
5.000	CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (0ft to10ft)	45	0.017	0.032	0.000	9315
2.500	CCISeismic Tower Section 38 - 1	45	0.006	0.016	0.000	9315

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 145	105.916	20	7.965	0.026
L2	145 - 140	97.625	20	7.895	0.025
L3	140 - 135.667	89.488	20	7.667	0.024
L4	135.667 - 135.417	82.690	20	7.338	0.024
L5	135.417 - 130.417	82.307	20	7.325	0.024
L6	130.417 - 125.417	74.808	20	7.018	0.024
L7	125.417 - 120.417	67.681	20	6.609	0.024
L8	120.417 - 120	61.036	20	6.090	0.024
L9	120 - 119.75	60.507	20	6.041	0.024
L10	119.75 - 114.75	60.191	20	6.023	0.024
L11	114.75 - 110.375	54.098	20	5.622	0.024
L12	110.375 - 110.125	49.138	20	5.210	0.024
L13	110.125 -	48.866	20	5.194	0.024

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
	105.125				
L14	105.125 - 100.125	43.632	14	4.832	0.024
L15	100.125 - 100	38.821	14	4.417	0.024
L16	100 - 99.75	38.706	14	4.406	0.024
L17	99.75 - 94.75	38.477	14	4.392	0.024
L18	94.75 - 89.75	34.057	14	4.093	0.022
L19	89.75 - 85.25	29.963	14	3.756	0.021
L20	85.25 - 85	26.589	14	3.420	0.019
L21	85 - 80	26.411	14	3.406	0.019
L22	80 - 79.75	23.005	14	3.103	0.017
L23	79.75 - 74.75	22.843	14	3.092	0.017
L24	74.75 - 69.75	19.724	14	2.864	0.016
L25	69.75 - 64.75	16.854	14	2.615	0.016
L26	64.75 - 60	14.258	14	2.342	0.014
L27	60 - 55	12.066	14	2.062	0.012
L28	55 - 50	10.002	14	1.878	0.011
L29	50 - 45	8.137	14	1.681	0.010
L30	45 - 40	6.487	14	1.468	0.008
L31	40 - 35	5.068	14	1.240	0.007
L32	35 - 30	3.849	14	1.087	0.006
L33	30 - 25	2.796	14	0.924	0.005
L34	25 - 20	1.918	14	0.750	0.004
L35	20 - 15	1.228	14	0.566	0.003
L36	15 - 10	0.703	14	0.436	0.002
L37	10 - 5	0.318	14	0.298	0.001
L38	5 - 0	0.081	14	0.153	0.001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.000	APXVAARR24_43-U-NA20 w/ 2.5" Mount Pipe	20	105.916	7.965	0.026	1998
147.500	CCISeismic Tower Section 1 - 1	20	101.761	7.939	0.025	1998
145.000	CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (140ft to150ft)	20	97.625	7.895	0.025	1998
142.500	CCISeismic Tower Section 2 - 1	20	93.527	7.811	0.024	1300
137.834	CCISeismic Tower Section 3 - 1	20	86.053	7.492	0.024	858
135.542	CCISeismic Tower Section 4 - 1	20	82.498	7.332	0.024	872
135.000	CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (130ft to140ft)	20	81.670	7.304	0.024	888
132.917	CCISeismic Tower Section 5 - 1	20	78.518	7.186	0.024	905
127.917	CCISeismic Tower Section 6 - 1	20	71.191	6.824	0.024	719
125.000	CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (120ft to130ft)	20	67.106	6.571	0.024	622
122.917	CCISeismic Tower Section 7 - 1	20	64.290	6.374	0.024	587
120.209	CCISeismic Tower Section 8 - 1	20	60.771	6.063	0.024	621
119.875	CCISeismic Tower Section 9 - 1	20	60.349	6.031	0.024	633
117.250	CCISeismic Tower Section 10 - 1	20	57.093	5.844	0.024	691
115.000	CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (110ft to120ft)	20	54.393	5.646	0.024	673
112.563	CCISeismic Tower Section 11 - 1	20	51.572	5.400	0.024	659
110.250	CCISeismic Tower Section 12 - 1	20	49.002	5.202	0.024	707
107.625	CCISeismic Tower Section 13 - 1	20	46.196	5.019	0.024	768
105.000	CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (100ft to110ft)	14	43.506	4.822	0.024	746
102.625	CCISeismic Tower Section 14 - 1	14	41.173	4.635	0.024	732
100.063	CCISeismic Tower Section 15 - 1	14	38.763	4.411	0.024	806

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
99.875	CCISeismic Tower Section 16 - 1	14	38.591	4.398	0.024	816
98.000	4' x 2" STD Pipe	14	36.896	4.300	0.023	899
97.250	CCISeismic Tower Section 17 - 1	14	36.229	4.254	0.023	919
95.000	CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (90ft to100ft)	14	34.271	4.109	0.023	916
94.000	CCISeismic andrew LDF4-50A(1/2") From 0 to 98 (90ft to98ft)	14	33.421	4.044	0.022	893
92.250	CCISeismic Tower Section 18 - 1	14	31.967	3.931	0.022	857
87.500	CCISeismic Tower Section 19 - 1	14	28.238	3.578	0.020	809
85.125	CCISeismic Tower Section 20 - 1	14	26.500	3.413	0.019	860
85.000	CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (80ft to90ft)	14	26.411	3.406	0.019	865
82.500	CCISeismic Tower Section 21 - 1	14	24.669	3.246	0.018	959
79.875	CCISeismic Tower Section 22 - 1	14	22.924	3.097	0.017	1087
77.250	CCISeismic Tower Section 23 - 1	14	21.254	2.981	0.017	1197
75.000	CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (70ft to80ft)	14	19.874	2.876	0.017	1200
72.250	CCISeismic Tower Section 24 - 1	14	18.257	2.742	0.016	1148
70.000	4' x 2" STD Pipe	14	16.992	2.628	0.016	1101
67.250	CCISeismic Tower Section 25 - 1	14	15.520	2.485	0.015	1031
65.000	CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (60ft to70ft)	14	14.380	2.357	0.014	1008
62.375	CCISeismic Tower Section 26 - 1	14	13.130	2.195	0.013	1067
57.500	CCISeismic Tower Section 27 - 1	14	11.007	1.962	0.011	1371
55.000	CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (50ft to60ft)	14	10.002	1.878	0.011	1505
52.500	CCISeismic Tower Section 28 - 1	14	9.044	1.784	0.010	1493
50.000	4' x 2" STD Pipe	14	8.137	1.681	0.010	1399
47.500	CCISeismic Tower Section 29 - 1	14	7.284	1.577	0.009	1320
45.000	CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (40ft to50ft)	14	6.487	1.468	0.008	1301
42.500	CCISeismic Tower Section 30 - 1	14	5.750	1.349	0.007	1365
37.500	CCISeismic Tower Section 31 - 1	14	4.437	1.158	0.006	1680
35.000	CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (30ft to40ft)	14	3.849	1.087	0.006	1815
32.500	CCISeismic Tower Section 32 - 1	14	3.302	1.008	0.005	1801
27.500	CCISeismic Tower Section 33 - 1	14	2.334	0.839	0.004	1622
25.000	CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (20ft to30ft)	14	1.918	0.750	0.004	1603
22.500	CCISeismic Tower Section 34 - 1	14	1.551	0.655	0.003	1676
17.500	CCISeismic Tower Section 35 - 1	14	0.947	0.497	0.002	1995
15.250	CCISeismic miscl Climbing Ladder From 10.5 to 150 (10.5ft to20ft)	14	0.726	0.442	0.002	2129
15.000	CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (10ft to20ft)	14	0.703	0.436	0.002	2139
12.500	CCISeismic Tower Section 36 - 1	14	0.493	0.369	0.002	2167
7.500	CCISeismic Tower Section 37 - 1	14	0.178	0.226	0.001	1820
5.000	CCISeismic (2) 6Power/24Fiber (1 5/8) From 0 to 150 (0ft to10ft)	14	0.081	0.153	0.001	1921
2.500	CCISeismic Tower Section 38 - 1	14	0.028	0.077	0.000	1921

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	150 - 145 (1)	P12.75x0.375	5.000	0.000	0.0	14.579	-3.258	551.084	0.006

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
L2	145 - 140 (2)	P12.75x0.375	5.000	0.000	0.0	14.579	-3.660	551.084	0.007
L3	140 - 135.667 (3)	P12.75x0.375	4.333	0.000	0.0	14.579	-4.002	551.084	0.007
L4	135.667 - 135.417 (4)	P12.75x0.725	0.250	0.000	0.0	27.389	-4.034	1035.300	0.004
L5	135.417 - 130.417 (5)	P12.75x0.725	5.000	0.000	0.0	27.389	-4.589	1035.300	0.004
L6	130.417 - 125.417 (6)	P12.75x0.725	5.000	0.000	0.0	27.389	-5.165	1035.300	0.005
L7	125.417 - 120.417 (7)	P12.75x0.725	5.000	0.000	0.0	27.389	-5.765	1035.300	0.006
L8	120.417 - 120 (8)	P12.75x0.725	0.417	0.000	0.0	27.389	-5.821	1035.300	0.006
L9	120 - 119.75 (9)	P18x0.375	0.250	0.000	0.0	20.764	-5.849	784.878	0.007
L10	119.75 - 114.75 (10)	P18x0.375	5.000	0.000	0.0	20.764	-6.408	784.878	0.008
L11	114.75 - 110.375 (11)	P18x0.375	4.375	0.000	0.0	20.764	-6.912	784.878	0.009
L12	110.375 - 110.125 (12)	P18x0.5875	0.250	0.000	0.0	32.138	-6.954	1214.820	0.006
L13	110.125 - 105.125 (13)	P18x0.5875	5.000	0.000	0.0	32.138	-7.672	1214.820	0.006
L14	105.125 - 100.125 (14)	P18x0.5875	5.000	0.000	0.0	32.138	-8.427	1214.820	0.007
L15	100.125 - 100 (15)	P18x0.5875	0.125	0.000	0.0	32.138	-8.452	1214.820	0.007
L16	100 - 99.75 (16)	P24x0.375	0.250	0.000	0.0	27.833	-8.487	1052.070	0.008
L17	99.75 - 94.75 (17)	P24x0.375	5.000	0.000	0.0	27.833	-9.241	1052.070	0.009
L18	94.75 - 89.75 (18)	P24x0.375	5.000	0.000	0.0	27.833	-9.956	1052.070	0.009
L19	89.75 - 85.25 (19)	P24x0.375	4.500	0.000	0.0	27.833	-10.607	1052.070	0.010
L20	85.25 - 85 (20)	P24x0.51875	0.250	0.000	0.0	38.267	-10.659	1446.510	0.007
L21	85 - 80 (21)	P24x0.51875	5.000	0.000	0.0	38.267	-11.548	1446.510	0.008
L22	80 - 79.75 (22)	P30x0.375	0.250	0.000	0.0	34.901	-11.595	1311.060	0.009
L23	79.75 - 74.75 (23)	P30x0.375	5.000	0.000	0.0	34.901	-12.439	1311.060	0.009
L24	74.75 - 69.75 (24)	P30x0.375	5.000	0.000	0.0	34.901	-13.358	1311.060	0.010
L25	69.75 - 64.75 (25)	P30x0.375	5.000	0.000	0.0	34.901	-14.222	1311.060	0.011
L26	64.75 - 60 (26)	P30x0.375	4.750	0.000	0.0	34.901	-15.051	1311.060	0.011
L27	60 - 55 (27)	P36x0.375	5.000	0.000	0.0	41.970	-16.048	1490.100	0.011
L28	55 - 50 (28)	P36x0.375	5.000	0.000	0.0	41.970	-17.037	1490.100	0.011
L29	50 - 45 (29)	P36x0.375	5.000	0.000	0.0	41.970	-18.116	1490.100	0.012
L30	45 - 40 (30)	P36x0.375	5.000	0.000	0.0	41.970	-19.133	1490.100	0.013
L31	40 - 35 (31)	P42x0.375	5.000	0.000	0.0	49.038	-20.278	1668.870	0.012
L32	35 - 30 (32)	P42x0.375	5.000	0.000	0.0	49.038	-21.426	1668.870	0.013
L33	30 - 25 (33)	P42x0.375	5.000	0.000	0.0	49.038	-22.580	1668.870	0.014
L34	25 - 20 (34)	P42x0.375	5.000	0.000	0.0	49.038	-23.739	1668.870	0.014
L35	20 - 15 (35)	P48x0.375	5.000	0.000	0.0	56.107	-25.032	1847.490	0.014
L36	15 - 10 (36)	P48x0.375	5.000	0.000	0.0	56.107	-26.321	1847.490	0.014
L37	10 - 5 (37)	P48x0.375	5.000	0.000	0.0	56.107	-27.571	1847.490	0.015
L38	5 - 0 (38)	P48x0.375	5.000	0.000	0.0	56.107	-28.826	1847.490	0.016

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	150 - 145 (1)	P12.75x0.375	29.152	180.952	0.161	0.000	180.952	0.000
L2	145 - 140 (2)	P12.75x0.375	60.557	180.952	0.335	0.000	180.952	0.000
L3	140 - 135.667 (3)	P12.75x0.375	88.708	180.952	0.490	0.000	180.952	0.000
L4	135.667 - 135.417 (4)	P12.75x0.725	90.360	330.632	0.273	0.000	330.632	0.000
L5	135.417 - 130.417 (5)	P12.75x0.725	124.781	330.632	0.377	0.000	330.632	0.000
L6	130.417 - 125.417 (6)	P12.75x0.725	161.776	330.632	0.489	0.000	330.632	0.000
L7	125.417 - 120.417 (7)	P12.75x0.725	201.241	330.632	0.609	0.000	330.632	0.000
L8	120.417 - 120 (8)	P12.75x0.725	204.640	330.632	0.619	0.000	330.632	0.000
L9	120 - 119.75 (9)	P18x0.375	206.687	367.000	0.563	0.000	367.000	0.000
L10	119.75 - 114.75 (10)	P18x0.375	248.317	367.000	0.677	0.000	367.000	0.000
L11	114.75 - 110.375 (11)	P18x0.375	285.757	367.000	0.779	0.000	367.000	0.000
L12	110.375 - 110.125 (12)	P18x0.5875	287.925	561.313	0.513	0.000	561.313	0.000
L13	110.125 - 105.125 (13)	P18x0.5875	332.619	561.313	0.593	0.000	561.313	0.000
L14	105.125 - 100.125 (14)	P18x0.5875	379.238	561.313	0.676	0.000	561.313	0.000
L15	100.125 - 100 (15)	P18x0.5875	380.419	561.313	0.678	0.000	561.313	0.000
L16	100 - 99.75 (16)	P24x0.375	382.787	623.717	0.614	0.000	623.717	0.000
L17	99.75 - 94.75 (17)	P24x0.375	434.227	623.717	0.696	0.000	623.717	0.000
L18	94.75 - 89.75 (18)	P24x0.375	485.466	623.717	0.778	0.000	623.717	0.000
L19	89.75 - 85.25 (19)	P24x0.375	532.830	623.717	0.854	0.000	623.717	0.000
L20	85.25 - 85 (20)	P24x0.51875	535.495	901.117	0.594	0.000	901.117	0.000
L21	85 - 80 (21)	P24x0.51875	589.632	901.117	0.654	0.000	901.117	0.000
L22	80 - 79.75 (22)	P30x0.375	592.380	947.858	0.625	0.000	947.858	0.000
L23	79.75 - 74.75 (23)	P30x0.375	648.322	947.858	0.684	0.000	947.858	0.000
L24	74.75 - 69.75 (24)	P30x0.375	708.335	947.858	0.747	0.000	947.858	0.000
L25	69.75 - 64.75 (25)	P30x0.375	769.190	947.858	0.812	0.000	947.858	0.000
L26	64.75 - 60 (26)	P30x0.375	828.503	947.858	0.874	0.000	947.858	0.000
L27	60 - 55 (27)	P36x0.375	892.700	1338.808	0.667	0.000	1338.808	0.000
L28	55 - 50 (28)	P36x0.375	959.150	1338.808	0.716	0.000	1338.808	0.000
L29	50 - 45 (29)	P36x0.375	1032.033	1338.808	0.771	0.000	1338.808	0.000
L30	45 - 40 (30)	P36x0.375	1104.775	1338.808	0.825	0.000	1338.808	0.000
L31	40 - 35 (31)	P42x0.375	1179.433	1796.558	0.656	0.000	1796.558	0.000
L32	35 - 30 (32)	P42x0.375	1256.150	1796.558	0.699	0.000	1796.558	0.000
L33	30 - 25 (33)	P42x0.375	1334.783	1796.558	0.743	0.000	1796.558	0.000
L34	25 - 20 (34)	P42x0.375	1415.208	1796.558	0.788	0.000	1796.558	0.000
L35	20 - 15 (35)	P48x0.375	1497.483	2321.108	0.645	0.000	2321.108	0.000
L36	15 - 10 (36)	P48x0.375	1581.667	2321.108	0.681	0.000	2321.108	0.000
L37	10 - 5 (37)	P48x0.375	1667.592	2321.108	0.718	0.000	2321.108	0.000
L38	5 - 0 (38)	P48x0.375	1755.308	2321.108	0.756	0.000	2321.108	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	150 - 145 (1)	P12.75x0.375	6.168	165.325	0.037	0.172	179.873	0.001
L2	145 - 140 (2)	P12.75x0.375	6.389	165.325	0.039	0.172	179.873	0.001
L3	140 - 135.667 (3)	P12.75x0.375	6.598	165.325	0.040	0.158	179.873	0.001
L4	135.667 - 135.417 (4)	P12.75x0.725	6.622	310.589	0.021	0.158	328.360	0.000
L5	135.417 - 130.417 (5)	P12.75x0.725	7.148	310.589	0.023	0.161	328.360	0.000
L6	130.417 - 125.417 (6)	P12.75x0.725	7.654	310.589	0.025	0.165	328.360	0.001
L7	125.417 - 120.417 (7)	P12.75x0.725	8.138	310.589	0.026	0.168	328.360	0.001
L8	120.417 - 120 (8)	P12.75x0.725	8.174	310.589	0.026	0.168	328.360	0.001
L9	120 - 119.75 (9)	P18x0.375	8.198	235.463	0.035	0.168	364.865	0.000
L10	119.75 - 114.75 (10)	P18x0.375	8.457	235.463	0.036	0.167	364.865	0.000
L11	114.75 - 110.375 (11)	P18x0.375	8.667	235.463	0.037	0.166	364.865	0.000
L12	110.375 - 110.125 (12)	P18x0.5875	8.687	364.445	0.024	0.166	557.921	0.000
L13	110.125 - 105.125 (13)	P18x0.5875	9.194	364.445	0.025	0.166	557.921	0.000
L14	105.125 - 100.125 (14)	P18x0.5875	9.462	364.445	0.026	0.165	557.921	0.000
L15	100.125 - 100 (15)	P18x0.5875	9.462	364.445	0.026	0.164	557.921	0.000
L16	100 - 99.75 (16)	P24x0.375	9.479	315.621	0.030	0.164	655.568	0.000
L17	99.75 - 94.75 (17)	P24x0.375	10.101	315.621	0.032	1.148	655.568	0.002
L18	94.75 - 89.75 (18)	P24x0.375	10.403	315.621	0.033	1.147	655.568	0.002
L19	89.75 - 85.25 (19)	P24x0.375	10.660	315.621	0.034	1.145	655.568	0.002
L20	85.25 - 85 (20)	P24x0.51875	10.669	433.953	0.025	1.145	895.867	0.001
L21	85 - 80 (21)	P24x0.51875	10.991	433.953	0.025	1.144	895.867	0.001
L22	80 - 79.75 (22)	P30x0.375	11.004	395.779	0.028	1.144	994.725	0.001
L23	79.75 - 74.75 (23)	P30x0.375	11.377	395.779	0.029	1.144	994.725	0.001
L24	74.75 - 69.75 (24)	P30x0.375	12.009	395.779	0.030	2.093	994.725	0.002
L25	69.75 - 64.75 (25)	P30x0.375	12.344	395.779	0.031	2.092	994.725	0.002
L26	64.75 - 60 (26)	P30x0.375	12.644	395.779	0.032	2.091	994.725	0.002
L27	60 - 55 (27)	P36x0.375	13.046	454.187	0.029	2.090	1094.275	0.002
L28	55 - 50 (28)	P36x0.375	13.727	454.187	0.030	3.255	1094.275	0.003
L29	50 - 45 (29)	P36x0.375	14.366	454.187	0.032	4.872	1094.275	0.004
L30	45 - 40 (30)	P36x0.375	14.712	454.187	0.032	4.871	1094.275	0.004
L31	40 - 35 (31)	P42x0.375	15.131	429.271	0.035	4.871	1207.675	0.004
L32	35 - 30 (32)	P42x0.375	15.529	429.271	0.036	4.870	1207.675	0.004
L33	30 - 25 (33)	P42x0.375	15.902	429.271	0.037	4.870	1207.675	0.004
L34	25 - 20 (34)	P42x0.375	16.246	429.271	0.038	4.869	1207.675	0.004
L35	20 - 15 (35)	P48x0.375	16.638	444.343	0.037	4.869	1430.275	0.003
L36	15 - 10 (36)	P48x0.375	17.011	444.343	0.038	4.869	1430.275	0.003
L37	10 - 5 (37)	P48x0.375	17.373	444.343	0.039	4.869	1430.275	0.003
L38	5 - 0 (38)	P48x0.375	17.726	444.343	0.040	4.869	1430.275	0.003

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150 - 145 (1)	0.006	0.161	0.000	0.037	0.001	0.168	1.050	4.8.2
L2	145 - 140 (2)	0.007	0.335	0.000	0.039	0.001	0.343	1.050	4.8.2
L3	140 - 135.667 (3)	0.007	0.490	0.000	0.040	0.001	0.499	1.050	4.8.2
L4	135.667 - 135.417 (4)	0.004	0.273	0.000	0.021	0.000	0.278	1.050	4.8.2
L5	135.417 - 130.417 (5)	0.004	0.377	0.000	0.023	0.000	0.382	1.050	4.8.2
L6	130.417 - 125.417 (6)	0.005	0.489	0.000	0.025	0.001	0.495	1.050	4.8.2
L7	125.417 - 120.417 (7)	0.006	0.609	0.000	0.026	0.001	0.615	1.050	4.8.2
L8	120.417 - 120 (8)	0.006	0.619	0.000	0.026	0.001	0.625	1.050	4.8.2
L9	120 - 119.75 (9)	0.007	0.563	0.000	0.035	0.000	0.572	1.050	4.8.2
L10	119.75 - 114.75 (10)	0.008	0.677	0.000	0.036	0.000	0.686	1.050	4.8.2
L11	114.75 - 110.375 (11)	0.009	0.779	0.000	0.037	0.000	0.789	1.050	4.8.2
L12	110.375 - 110.125 (12)	0.006	0.513	0.000	0.024	0.000	0.519	1.050	4.8.2
L13	110.125 - 105.125 (13)	0.006	0.593	0.000	0.025	0.000	0.600	1.050	4.8.2
L14	105.125 - 100.125 (14)	0.007	0.676	0.000	0.026	0.000	0.683	1.050	4.8.2
L15	100.125 - 100 (15)	0.007	0.678	0.000	0.026	0.000	0.685	1.050	4.8.2
L16	100 - 99.75 (16)	0.008	0.614	0.000	0.030	0.000	0.623	1.050	4.8.2
L17	99.75 - 94.75 (17)	0.009	0.696	0.000	0.032	0.002	0.706	1.050	4.8.2
L18	94.75 - 89.75 (18)	0.009	0.778	0.000	0.033	0.002	0.789	1.050	4.8.2
L19	89.75 - 85.25 (19)	0.010	0.854	0.000	0.034	0.002	0.866	1.050	4.8.2
L20	85.25 - 85 (20)	0.007	0.594	0.000	0.025	0.001	0.602	1.050	4.8.2
L21	85 - 80 (21)	0.008	0.654	0.000	0.025	0.001	0.663	1.050	4.8.2
L22	80 - 79.75 (22)	0.009	0.625	0.000	0.028	0.001	0.635	1.050	4.8.2
L23	79.75 - 74.75 (23)	0.009	0.684	0.000	0.029	0.001	0.694	1.050	4.8.2
L24	74.75 - 69.75 (24)	0.010	0.747	0.000	0.030	0.002	0.759	1.050	4.8.2
L25	69.75 - 64.75 (25)	0.011	0.812	0.000	0.031	0.002	0.823	1.050	4.8.2
L26	64.75 - 60 (26)	0.011	0.874	0.000	0.032	0.002	0.887	1.050	4.8.2
L27	60 - 55 (27)	0.011	0.667	0.000	0.029	0.002	0.678	1.050	4.8.2
L28	55 - 50 (28)	0.011	0.716	0.000	0.030	0.003	0.729	1.050	4.8.2
L29	50 - 45 (29)	0.012	0.771	0.000	0.032	0.004	0.784	1.050	4.8.2
L30	45 - 40 (30)	0.013	0.825	0.000	0.032	0.004	0.839	1.050	4.8.2
L31	40 - 35 (31)	0.012	0.656	0.000	0.035	0.004	0.670	1.050	4.8.2
L32	35 - 30 (32)	0.013	0.699	0.000	0.036	0.004	0.714	1.050	4.8.2
L33	30 - 25 (33)	0.014	0.743	0.000	0.037	0.004	0.758	1.050	4.8.2
L34	25 - 20 (34)	0.014	0.788	0.000	0.038	0.004	0.804	1.050	4.8.2
L35	20 - 15 (35)	0.014	0.645	0.000	0.037	0.003	0.660	1.050	4.8.2
L36	15 - 10 (36)	0.014	0.681	0.000	0.038	0.003	0.697	1.050	4.8.2
L37	10 - 5 (37)	0.015	0.718	0.000	0.039	0.003	0.735	1.050	4.8.2
L38	5 - 0 (38)	0.016	0.756	0.000	0.040	0.003	0.774	1.050	4.8.2

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	150 - 145	Pole	P12.75x0.375	1	-3.258	578.638	16.0	Pass
L2	145 - 140	Pole	P12.75x0.375	2	-3.660	578.638	32.7	Pass
L3	140 - 135.667	Pole	P12.75x0.375	3	-4.002	578.638	47.5	Pass
L4	135.667 - 135.417	Pole	P12.75x0.725	4	-4.034	1087.065	26.4	Pass
L5	135.417 - 130.417	Pole	P12.75x0.725	5	-4.589	1087.065	36.4	Pass
L6	130.417 - 125.417	Pole	P12.75x0.725	6	-5.165	1087.065	47.1	Pass
L7	125.417 - 120.417	Pole	P12.75x0.725	7	-5.765	1087.065	58.6	Pass
L8	120.417 - 120	Pole	P12.75x0.725	8	-5.821	1087.065	59.6	Pass
L9	120 - 119.75	Pole	P18x0.375	9	-5.849	824.122	54.5	Pass
L10	119.75 - 114.75	Pole	P18x0.375	10	-6.408	824.122	65.3	Pass
L11	114.75 - 110.375	Pole	P18x0.375	11	-6.912	824.122	75.1	Pass
L12	110.375 - 110.125	Pole	P18x0.5875	12	-6.954	1275.561	49.5	Pass
L13	110.125 - 105.125	Pole	P18x0.5875	13	-7.672	1275.561	57.1	Pass
L14	105.125 - 100.125	Pole	P18x0.5875	14	-8.427	1275.561	65.1	Pass
L15	100.125 - 100	Pole	P18x0.5875	15	-8.452	1275.561	65.3	Pass
L16	100 - 99.75	Pole	P24x0.375	16	-8.487	1104.673	59.3	Pass
L17	99.75 - 94.75	Pole	P24x0.375	17	-9.241	1104.673	67.2	Pass
L18	94.75 - 89.75	Pole	P24x0.375	18	-9.956	1104.673	75.1	Pass
L19	89.75 - 85.25	Pole	P24x0.375	19	-10.607	1104.673	82.4	Pass
L20	85.25 - 85	Pole	P24x0.51875	20	-10.659	1518.835	57.4	Pass
L21	85 - 80	Pole	P24x0.51875	21	-11.548	1518.835	63.1	Pass
L22	80 - 79.75	Pole	P30x0.375	22	-11.595	1376.613	60.4	Pass
L23	79.75 - 74.75	Pole	P30x0.375	23	-12.439	1376.613	66.1	Pass
L24	74.75 - 69.75	Pole	P30x0.375	24	-13.358	1376.613	72.2	Pass
L25	69.75 - 64.75	Pole	P30x0.375	25	-14.222	1376.613	78.4	Pass
L26	64.75 - 60	Pole	P30x0.375	26	-15.051	1376.613	84.4	Pass
L27	60 - 55	Pole	P36x0.375	27	-16.048	1564.605	64.6	Pass
L28	55 - 50	Pole	P36x0.375	28	-17.037	1564.605	69.4	Pass
L29	50 - 45	Pole	P36x0.375	29	-18.116	1564.605	74.7	Pass
L30	45 - 40	Pole	P36x0.375	30	-19.133	1564.605	79.9	Pass
L31	40 - 35	Pole	P42x0.375	31	-20.278	1752.313	63.8	Pass
L32	35 - 30	Pole	P42x0.375	32	-21.426	1752.313	68.0	Pass
L33	30 - 25	Pole	P42x0.375	33	-22.580	1752.313	72.2	Pass
L34	25 - 20	Pole	P42x0.375	34	-23.739	1752.313	76.5	Pass
L35	20 - 15	Pole	P48x0.375	35	-25.032	1939.864	62.9	Pass
L36	15 - 10	Pole	P48x0.375	36	-26.321	1939.864	66.4	Pass
L37	10 - 5	Pole	P48x0.375	37	-27.571	1939.864	70.0	Pass
L38	5 - 0	Pole	P48x0.375	38	-28.826	1939.864	73.7	Pass
							Summary	
						Pole (L26)	84.4	Pass
						RATING =	**84.4**	**Pass**

APPENDIX B

ADDITIONAL CALCULATIONS

REINFORCEMENT ANALYSIS

Site Name: Branford/I-95/ X53/ Jct.

Work Order: 10481.CT11024B

Pole Geometry

	Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
1	150	30		0	12.75	12.75	0.375		A53-B-42
2	120	20		0	18.00	18	0.375		A53-B-42
3	100	20		0	24.00	24	0.375		A53-B-42
4	80	20		0	30.00	30	0.375		A53-B-42
5	60	20		0	36.00	36	0.375		A53-B-42
6	40	20		0	42.00	42	0.375		A53-B-42
7	20	20		0	48.00	48	0.375		A53-B-42

Reinforcement Configuration

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	80	85.25	channel	MP3-03 (1.25in)	3	60	180	300															
2	100	110.375	channel	MP3-03 (1.25in)	3	60	180	300															
3	120	135.667	channel	MP3-03 (1.25in)	3	0	120	240															
4																							
5																							
6																							
7																							
8																							
9																							
10																							

Reinforcement Details

	B (in)	H (in)	Gross Area (in^2)	Pole Face to Centroid (in)	Bottom Termination Type	Bottom Termination Length (in)	Top Termination Type	Top Termination Length (in)	Lu (in)	Net Area (in2)	Bolt Hole Size (in)	Reinforcement Material
1	4.06	1.57	2.92	0.59	PC 8.8 - M20 (100)	14	PC 8.8 - M20 (100)	14.000	18.000	2.526	1.2500	A572-65
2	4.06	1.57	2.92	0.59	PC 8.8 - M20 (100)	14	PC 8.8 - M20 (100)	14.000	18.000	2.526	1.2500	A572-65
3	4.06	1.57	2.92	0.59	PC 8.8 - M20 (100)	14	PC 8.8 - M20 (100)	14.000	18.000	2.526	1.2500	A572-65

Analysis Date: 8/10/2023

TNX Geometry Input

Increment (ft): 5 Export to TNX

	Section Height (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Tapered Pole Grade	Weight Multiplier
1	150 - 145	5		0	12.750	12.750	0.375	A53-B-42	1.000
2	145 - 140	5		0	12.750	12.750	0.375	A53-B-42	1.000
3	140 - 135.667	4.333		0	12.750	12.750	0.375	A53-B-42	1.000
4	135.667 - 135.417	0.25		0	12.750	12.750	0.725	A53-B-42	0.852
5	135.417 - 130.417	5		0	12.750	12.750	0.725	A53-B-42	0.852
6	130.417 - 125.417	5		0	12.750	12.750	0.725	A53-B-42	0.852
7	125.417 - 120.417	5		0	12.750	12.750	0.725	A53-B-42	0.852
8	120.417 - 120	0.417	0	0	12.750	12.750	0.725	A53-B-42	0.852
9	120 - 119.75	0.25		0	18.000	18.000	0.375	A53-B-42	1.000
10	119.75 - 114.75	5		0	18.000	18.000	0.375	A53-B-42	1.000
11	114.75 - 110.375	4.375		0	18.000	18.000	0.375	A53-B-42	1.000
12	110.375 - 110.125	0.25		0	18.000	18.000	0.5875	A53-B-42	0.919
13	110.125 - 105.125	5		0	18.000	18.000	0.5875	A53-B-42	0.919
14	105.125 - 100.125	5		0	18.000	18.000	0.5875	A53-B-42	0.919
15	100.125 - 100	0.125	0	0	18.000	18.000	0.5875	A53-B-42	0.919
16	100 - 99.75	0.25		0	24.000	24.000	0.375	A53-B-42	1.000
17	99.75 - 94.75	5		0	24.000	24.000	0.375	A53-B-42	1.000
18	94.75 - 89.75	5		0	24.000	24.000	0.375	A53-B-42	1.000
19	89.75 - 85.25	4.5		0	24.000	24.000	0.375	A53-B-42	1.000
20	85.25 - 85	0.25		0	24.000	24.000	0.51875	A53-B-42	0.956
21	85 - 80	5	0	0	24.000	24.000	0.51875	A53-B-42	0.956
22	80 - 79.75	0.25		0	30.000	30.000	0.375	A53-B-42	1.000
23	79.75 - 74.75	5		0	30.000	30.000	0.375	A53-B-42	1.000
24	74.75 - 69.75	5		0	30.000	30.000	0.375	A53-B-42	1.000
25	69.75 - 64.75	5		0	30.000	30.000	0.375	A53-B-42	1.000
26	64.75 - 60	4.75	0	0	30.000	30.000	0.375	A53-B-42	1.000
27	60 - 55	5		0	36.000	36.000	0.375	A53-B-42	1.000
28	55 - 50	5		0	36.000	36.000	0.375	A53-B-42	1.000
29	50 - 45	5		0	36.000	36.000	0.375	A53-B-42	1.000
30	45 - 40	5	0	0	36.000	36.000	0.375	A53-B-42	1.000
31	40 - 35	5		0	42.000	42.000	0.375	A53-B-42	1.000
32	35 - 30	5		0	42.000	42.000	0.375	A53-B-42	1.000
33	30 - 25	5		0	42.000	42.000	0.375	A53-B-42	1.000
34	25 - 20	5	0	0	42.000	42.000	0.375	A53-B-42	1.000
35	20 - 15	5		0	48.000	48.000	0.375	A53-B-42	1.000
36	15 - 10	5		0	48.000	48.000	0.375	A53-B-42	1.000
37	10 - 5	5		0	48.000	48.000	0.375	A53-B-42	1.000
38	5 - 0	5		0	48.000	48.000	0.375	A53-B-42	1.000

TNX Section Forces

I□□r□□ □□□□□□□	5	TN□ O□□□□□		
	Section Height (ft)	P_u (K)	M_{ux} (kip-ft)	V_u (K)
1	150 - 145	3.26	29.15	6.17
2	145 - 140	3.64	60.56	6.40
3	140 - 135.667	4.00	88.71	6.60
4	135.667 - 135.417	4.03	90.36	6.62
5	135.417 - 130.417	4.59	124.78	7.15
6	130.417 - 125.417	5.17	161.78	7.65
7	125.417 - 120.417	5.76	201.24	8.14
8	120.417 - 120	5.82	204.64	8.17
9	120 - 119.75	5.85	206.69	8.20
10	119.75 - 114.75	6.41	248.32	8.46
11	114.75 - 110.375	6.91	285.76	8.67
12	110.375 - 110.125	6.95	287.93	8.69
13	110.125 - 105.125	7.67	332.62	9.19
14	105.125 - 100.125	8.43	379.24	9.46
15	100.125 - 100	8.45	380.42	9.46
16	100 - 99.75	8.49	382.79	9.48
17	99.75 - 94.75	9.24	434.23	10.10
18	94.75 - 89.75	9.96	485.47	10.40
19	89.75 - 85.25	10.61	532.83	10.66
20	85.25 - 85	10.66	535.49	10.67
21	85 - 80	11.55	589.63	10.99
22	80 - 79.75	11.60	592.38	11.00
23	79.75 - 74.75	12.44	648.32	11.38
24	74.75 - 69.75	13.36	708.33	12.01
25	69.75 - 64.75	14.22	769.19	12.34
26	64.75 - 60	15.05	828.50	12.64
27	60 - 55	16.05	892.70	13.05
28	55 - 50	17.04	959.15	13.73
29	50 - 45	18.12	1032.03	14.37
30	45 - 40	19.13	1104.77	14.71
31	40 - 35	20.28	1179.44	15.13
32	35 - 30	21.43	1256.15	15.53
33	30 - 25	22.58	1334.78	15.90
34	25 - 20	23.74	1415.20	16.25
35	20 - 15	25.03	1497.48	16.64
36	15 - 10	26.32	1581.67	17.01
37	10 - 5	27.57	1667.60	17.37
38	5 - 0	28.83	1755.31	17.73

Analysis Results

E	C T	S	Cr E	C	
	R		R r		
	R		R r		
	R		R r		
	R		R r		
	R		R r		
	R		R r		
	R		R r		
	R		R r		
	R		R r		
	R				
	R				
				r	
			R r		
			r		

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in^4)			Area (in^2)			% Capacity*			
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3
150 - 145	279	n/a	279	14.58	n/a	14.58				
145 - 140	279	n/a	279	14.58	n/a	14.58				
140 - 135.67	279	n/a	279	14.58	n/a	14.58				
135.67 - 135.42	279	215	495	14.58	8.76	23.34				
135.42 - 130.42	279	215	495	14.58	8.76	23.34				
130.42 - 125.42	279	215	495	14.58	8.76	23.34				
125.42 - 120.42	279	215	495	14.58	8.76	23.34				
120.42 - 120	279	215	495	14.58	8.76	23.34				
120 - 119.75	807	n/a	807	20.76	n/a	20.76				
119.75 - 114.75	807	n/a	807	20.76	n/a	20.76				
114.75 - 110.38	807	n/a	807	20.76	n/a	20.76				
110.38 - 110.13	807	406	1212	20.76	8.76	29.52				
110.13 - 105.13	807	406	1212	20.76	8.76	29.52				
105.13 - 100.13	807	406	1212	20.76	8.76	29.52				
100.13 - 100	807	406	1212	20.76	8.76	29.52				
100 - 99.75	1942	n/a	1942	27.83	n/a	27.83				
99.75 - 94.75	1942	n/a	1942	27.83	n/a	27.83				
94.75 - 89.75	1942	n/a	1942	27.83	n/a	27.83				
89.75 - 85.25	1942	n/a	1942	27.83	n/a	27.83				
85.25 - 85	1942	697	2639	27.83	8.76	36.59				
85 - 80	1942	697	2639	27.83	8.76	36.59				
80 - 79.75	3829	n/a	3829	34.90	n/a	34.90				
79.75 - 74.75	3829	n/a	3829	34.90	n/a	34.90				
74.75 - 69.75	3829	n/a	3829	34.90	n/a	34.90				
69.75 - 64.75	3829	n/a	3829	34.90	n/a	34.90				
64.75 - 60	3829	n/a	3829	34.90	n/a	34.90				
60 - 55	6659	n/a	6659	41.97	n/a	41.97				
55 - 50	6659	n/a	6659	41.97	n/a	41.97				
50 - 45	6659	n/a	6659	41.97	n/a	41.97				
45 - 40	6659	n/a	6659	41.97	n/a	41.97				
40 - 35	10622	n/a	10622	49.04	n/a	49.04				
35 - 30	10622	n/a	10622	49.04	n/a	49.04				
30 - 25	10622	n/a	10622	49.04	n/a	49.04				
25 - 20	10622	n/a	10622	49.04	n/a	49.04				
20 - 15	15908	n/a	15908	56.11	n/a	56.11				
15 - 10	15908	n/a	15908	56.11	n/a	56.11				
10 - 5	15908	n/a	15908	56.11	n/a	56.11				
5 - 0	15908	n/a	15908	56.11	n/a	56.11				

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

W.O.	10481.CT11024B	Report Date:	8/10/2023
Client:	T-Mobile	Revision:	0
Site Name:	Branford/I-95/X53/JCT.	Prepared By:	VE
Owner:	Amtrak		
Site Address:	60 Hosley Avenue		
City, State:	Branford, CT		

MOMENT DISTRIBUTION FOR FLANGE CONNECTION CHECK

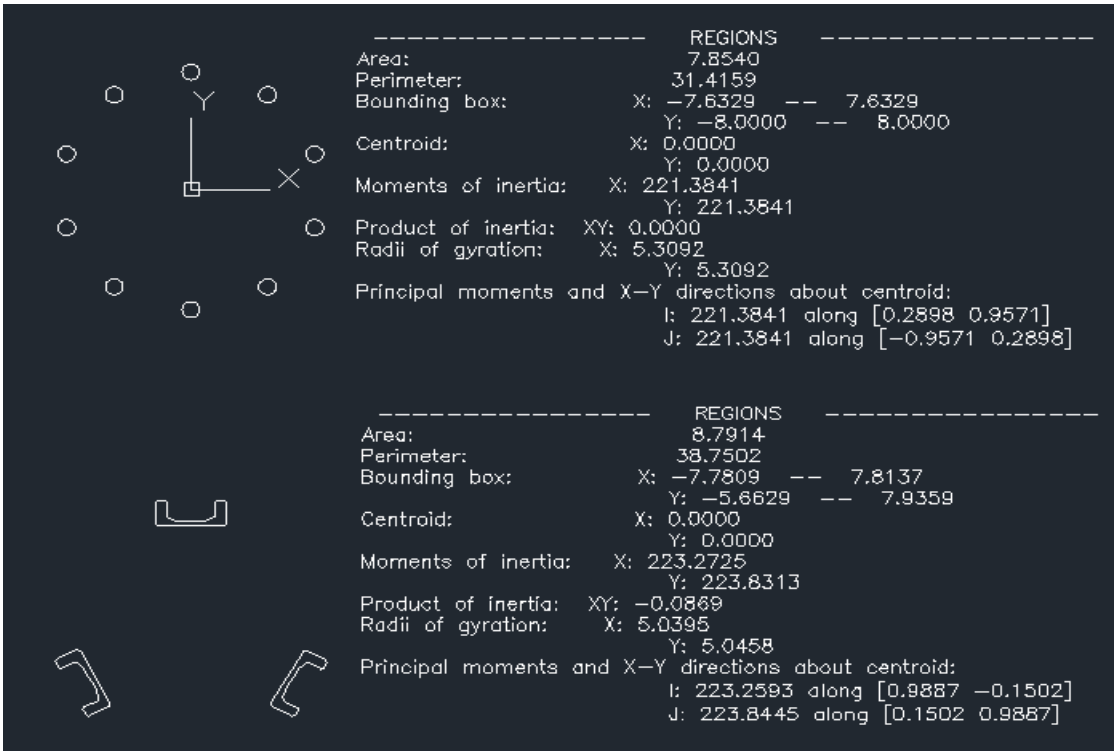
SECTION	120'				
Fy	42	ksi	Reinf. Channel	MP3-03	
Moment @ Base	2459.64	kip-in	Area of Channel	2.92	in^2
			Channel Capacity	144.7	kips
Y_{BOLT} @ Bottom	7.50	in			
Y_{REINF} @ Bottom	7.16	in			

POLE ELEVATION	Moment of Inertia (in^4)		
	Bolts	w/Channel	Channel
Base	221	445	223

Moment distribution within the flange connection bolts and the reinforcing Channels

AT BASE	Ratios of the moments	Approx Moment Distribution (kip-in)	Axial Force in Channel (kips)
Flange connection	0.50	1225	
Reinforcing Channel	0.50	1235	116

Moment resisted by the bolts @ 120' level flange connection = 102.0 kip-ft



W.O.	10481.CT11024B	Report Date:	8/10/2023
Client:	T-Mobile	Revision:	0
Site Name:	Branford/I-95/X53/JCT.	Prepared By:	VE
Owner:	Amtrak		
Site Address:	60 Hosley Avenue		
City, State:	Branford, CT		

MOMENT DISTRIBUTION FOR FLANGE CONNECTION CHECK

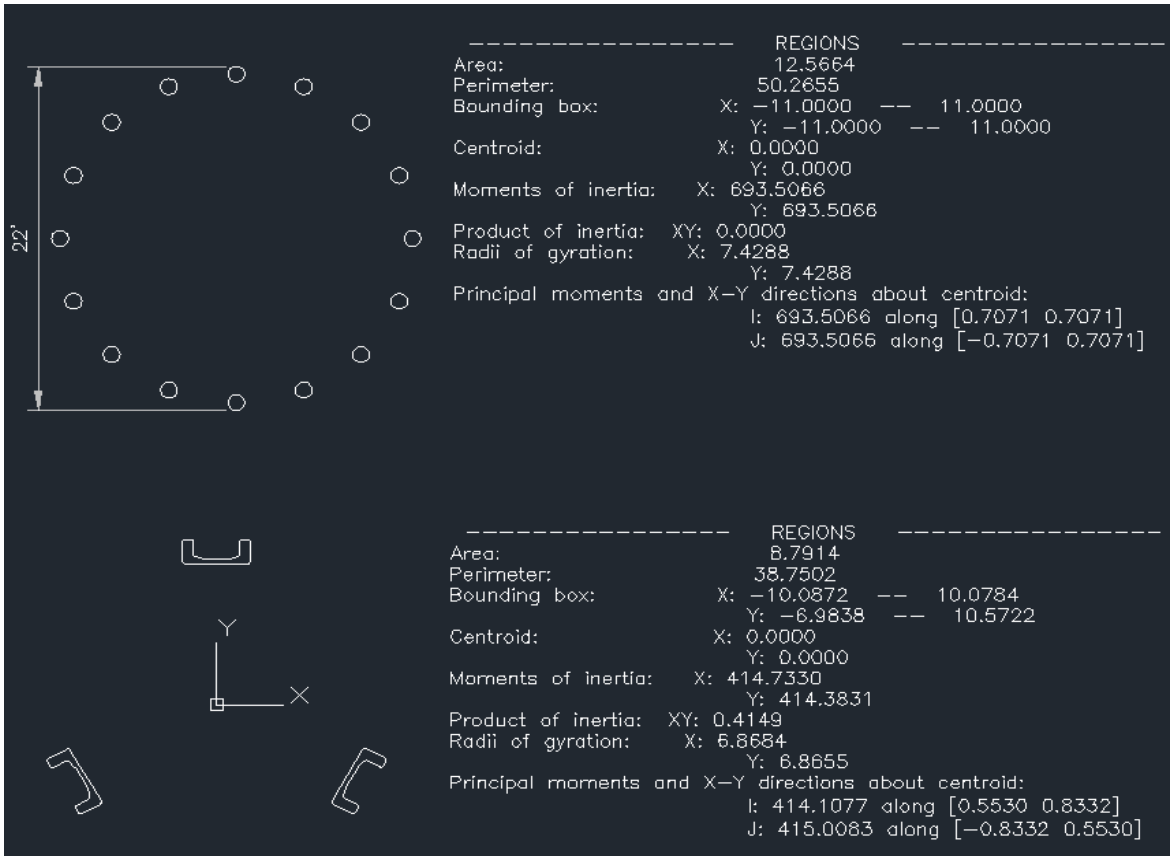
SECTION	100'				
Fy	42	ksi	Reinf. Channel	MP3-03	
Moment @ Base	4565.04	kip-in	Area of Channel	2.92	in^2
			Channel Capacity	144.7	kips
Y_{BOLT} @ Bottom	11.00	in			
Y_{REINF} @ Bottom	9.79	in			

POLE ELEVATION	Moment of Inertia (in^4)		
	Bolts	w/Channel	Channel
Base	694	1108	415

Moment distribution within the flange connection bolts and the reinforcing Channels

AT BASE	Ratios of the moments	Approx Moment Distribution (kip-in)	Axial Force in Channel (kips)
Flange connection	0.63	2857	
Reinforcing Channel	0.37	1708	118

Moment resisted by the bolts @ 100' level flange connection = 238.1 kip-ft



W.O.	10481.CT11024B	Report Date:	8/10/2023
Client:	T-Mobile	Revision:	0
Site Name:	Branford/I-95/X53/JCT.	Prepared By:	VE
Owner:	Amtrak		
Site Address:	60 Hosley Avenue		
City, State:	Branford, CT		

MOMENT DISTRIBUTION FOR FLANGE CONNECTION CHECK

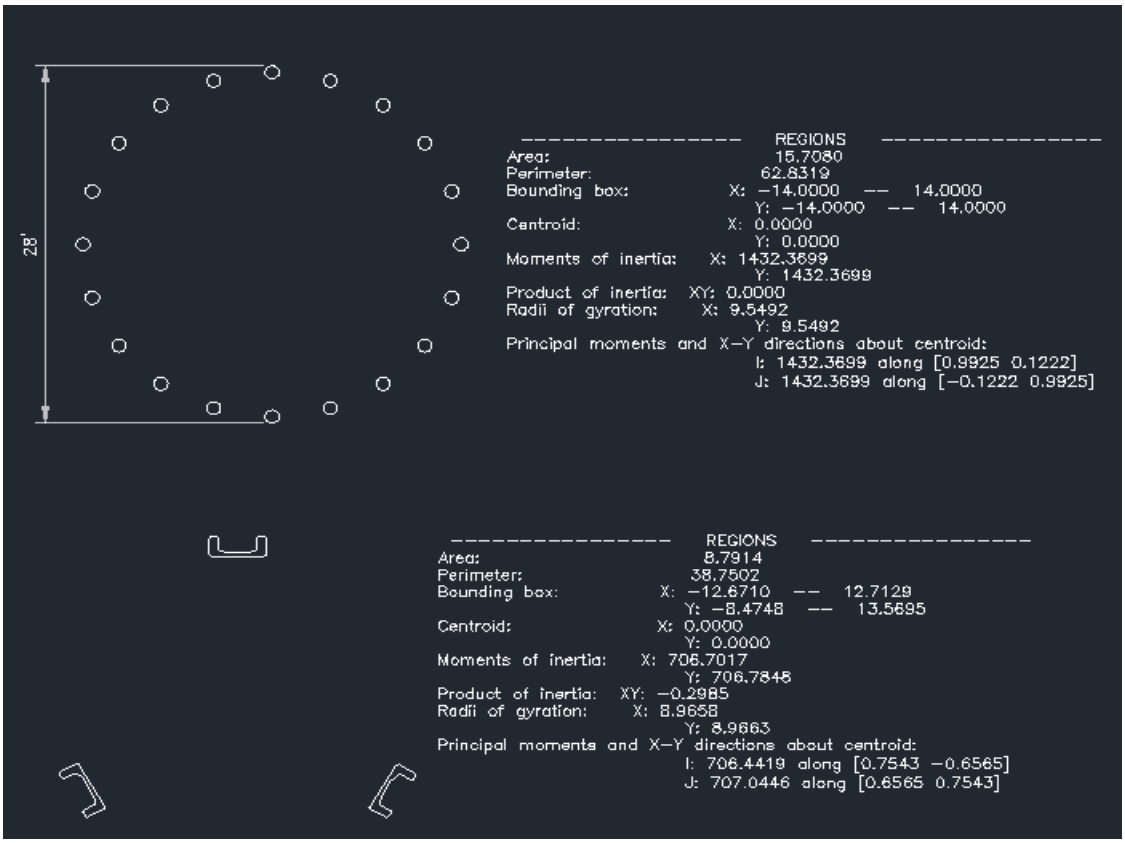
SECTION	80'				
Fy	42	ksi	Reinf. Channel	MP3-03	
Moment @ Base	7075.56	kip-in	Area of Channel	2.92	in^2
			Channel Capacity	144.7	kips
Y_{BOLT} @ Bottom	14.00	in			
Y_{REINF} @ Bottom	12.79	in			

POLE ELEVATION	Moment of Inertia (in^4)		
	Bolts	w/Channel	Channel
Base	1432	2139	707

Moment distribution within the flange connection bolts and the reinforcing Channels

AT BASE	Ratios of the moments	Approx Moment Distribution (kip-in)	Axial Force in Channel (kips)
Flange connection	0.67	4738	
Reinforcing Channel	0.33	2338	123

Moment resisted by the bolts @ 80' level flange connection = 394.8 kip-ft



Monopole Flange Plate Connection

Elevation = 120 ft.

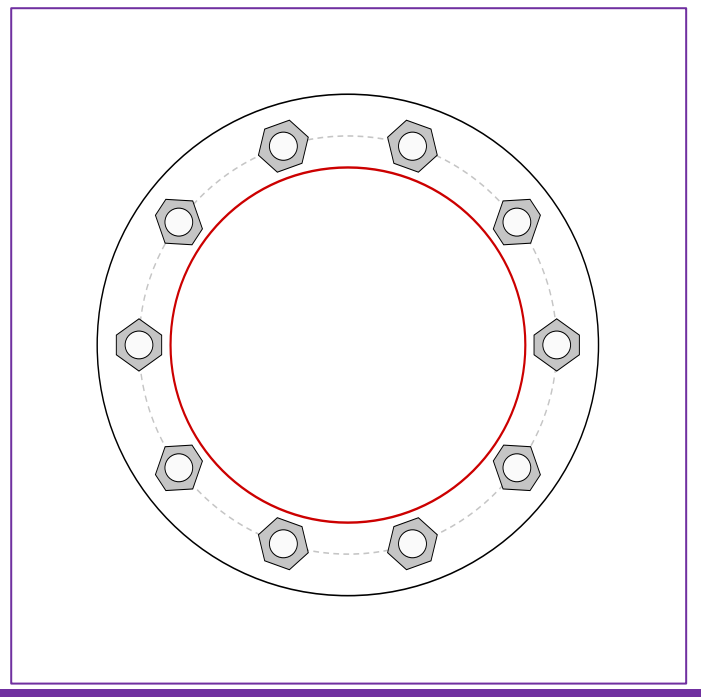
WO #	10481.CT11024B
Site Name	Branford/I-95/X53/Jct.

TIA-222 Revision	H

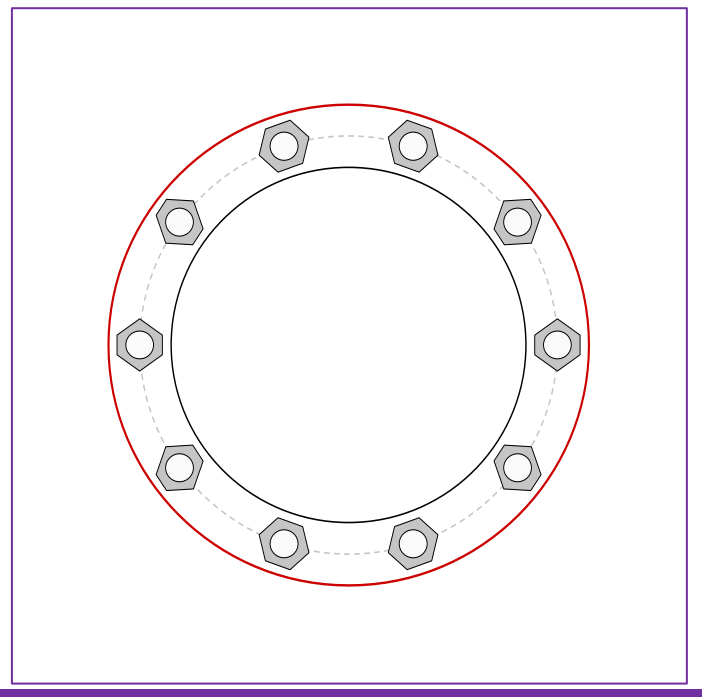
Applied Loads	
Moment (kip-ft)	102.00
Axial Force (kips)	5.82
Shear Force (kips)	8.17

**TIA-222-H Section 15.5 Applied*

Top Plate - External



Bottom Plate - Internal



Connection Properties

Bolt Data

(10) 1" ø bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 15" BC

Top Plate Data

18" OD x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

12.75" ID x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

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

Bottom Pole Data

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

Analysis Results

Bolt Capacity

Max Load (kips)	32.00	
Allowable (kips)	54.53	
Stress Rating:	**55.9%**	**Pass**

Top Plate Capacity

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	**Pirod OK**
Tension Side Stress Rating:	**Pirod OK**

Bottom Plate Capacity

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	**Pirod OK**
Tension Side Stress Rating:	**Pirod OK**

Monopole Flange Plate Connection

Elevation = 100 ft.

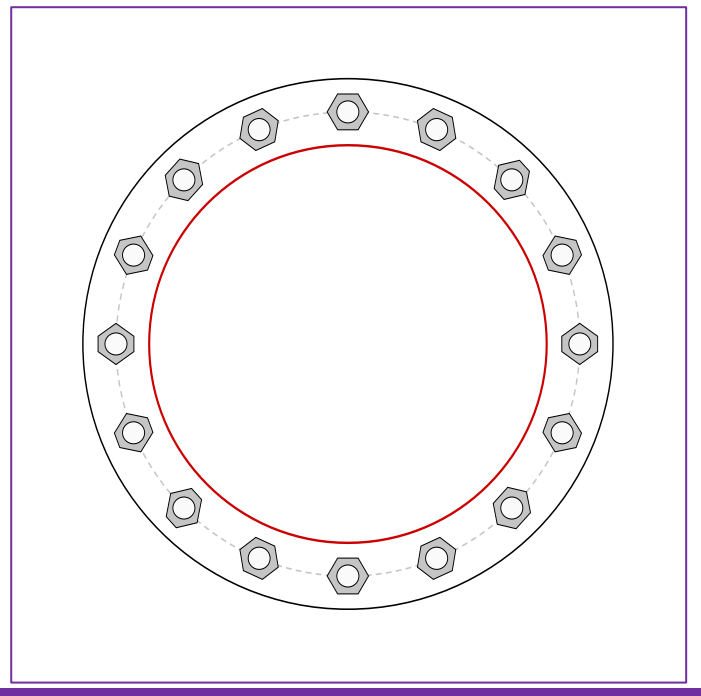
WO #	10481.CT11024B
Site Name	Branford/I-95/X53/Jct.

TIA-222 Revision	H

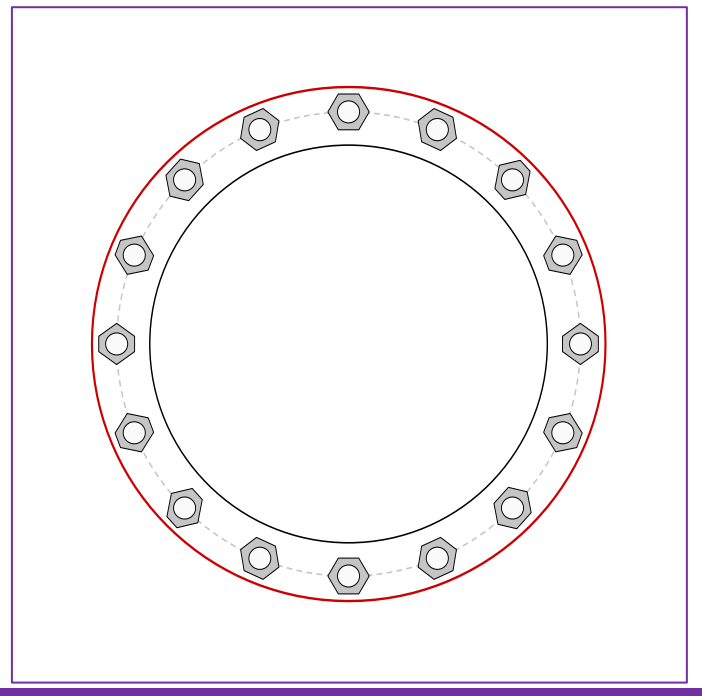
Applied Loads	
Moment (kip-ft)	238.10
Axial Force (kips)	8.45
Shear Force (kips)	9.46

**TIA-222-H Section 15.5 Applied*

Top Plate - External



Bottom Plate - Internal



Connection Properties

Bolt Data

(16) 1" ø bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 21" BC

Top Plate Data

24" OD x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

18" ID x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

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

Bottom Pole Data

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

Analysis Results

Bolt Capacity

Max Load (kips)	33.46	
Allowable (kips)	54.53	
Stress Rating:	**58.4%**	**Pass**

Top Plate Capacity

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	**Pirod OK**
Tension Side Stress Rating:	**Pirod OK**

Bottom Plate Capacity

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	**Pirod OK**
Tension Side Stress Rating:	**Pirod OK**

Monopole Flange Plate Connection

Elevation = 80 ft.

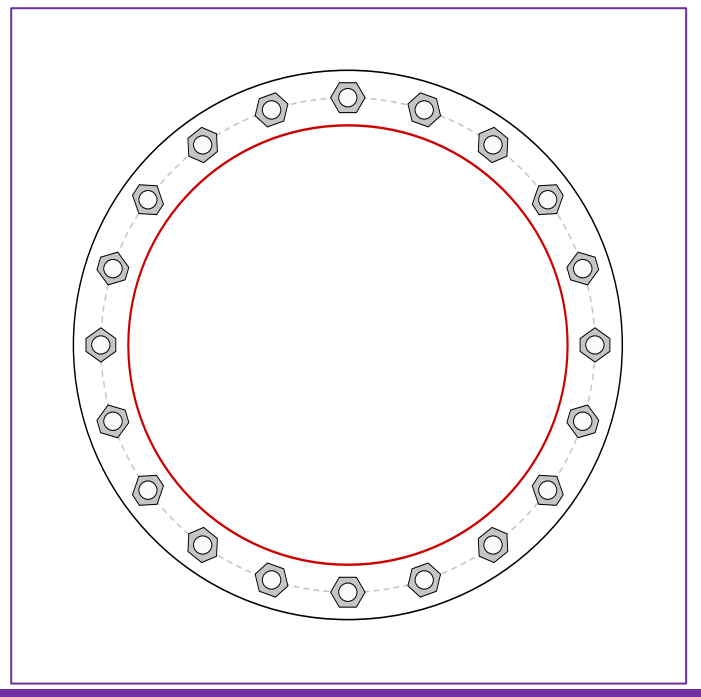
WO #	10481.CT11024B
Site Name	Branford/I-95/X53/Jct.

TIA-222 Revision	H

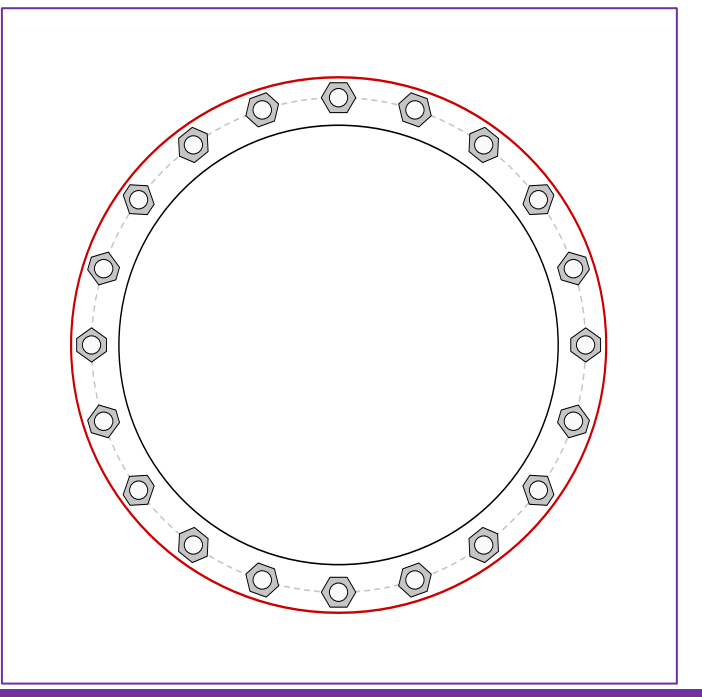
Applied Loads	
Moment (kip-ft)	394.80
Axial Force (kips)	11.55
Shear Force (kips)	10.99

**TIA-222-H Section 15.5 Applied*

Top Plate - External



Bottom Plate - Internal



Connection Properties

Bolt Data

(20) 1" ø bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 27" BC

Top Plate Data

30" OD x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Top Pole Data

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

Bottom Plate Data

24" ID x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Stiffener Data

N/A

Bottom Pole Data

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

Analysis Results

Bolt Capacity

Max Load (kips)	34.50	
Allowable (kips)	54.53	
Stress Rating:	**60.2%**	**Pass**

Top Plate Capacity

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	**Pirod OK**
Tension Side Stress Rating:	**Pirod OK**

Bottom Plate Capacity

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	**Pirod OK**
Tension Side Stress Rating:	**Pirod OK**

Monopole Flange Plate Connection

Elevation = 60 ft.

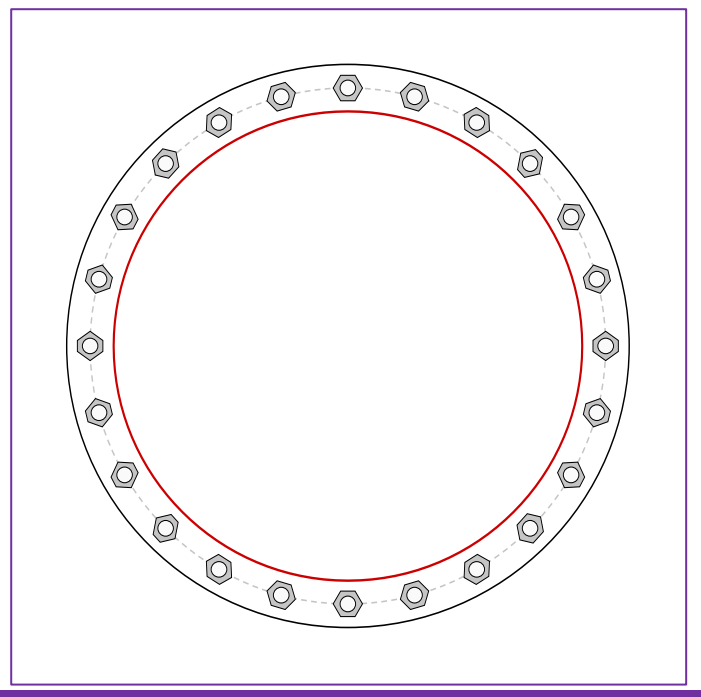
WO #	10481.CT11024B
Site Name	Branford/I-95/X53/Jct.

TIA-222 Revision	H

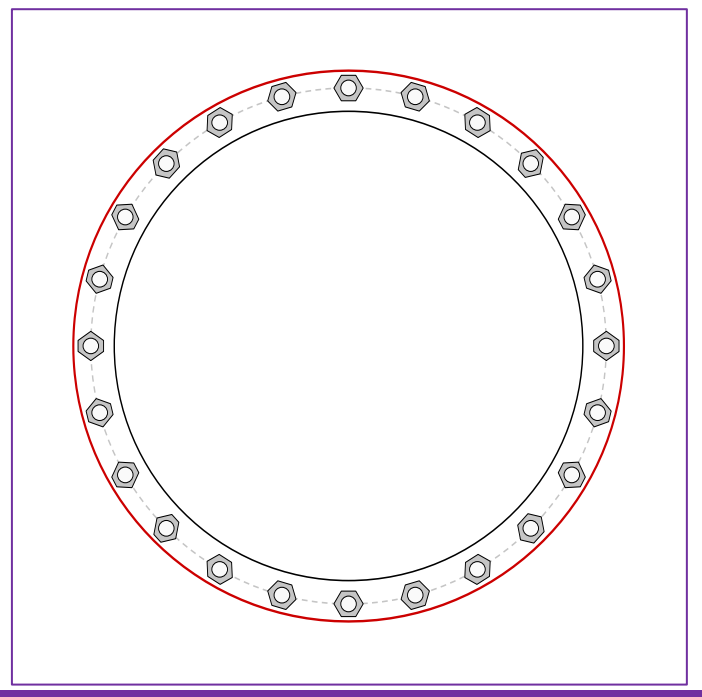
Applied Loads	
Moment (kip-ft)	828.50
Axial Force (kips)	15.05
Shear Force (kips)	12.64

**TIA-222-H Section 15.5 Applied*

Top Plate - External



Bottom Plate - Internal



Connection Properties

Bolt Data

(24) 1" ø bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 33" BC

Top Plate Data

36" OD x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

30" ID x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

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

Bottom Pole Data

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

Analysis Results

Bolt Capacity

Max Load (kips)	49.57	
Allowable (kips)	54.53	
Stress Rating:	**86.6%**	**Pass**

Top Plate Capacity

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	**Pirod OK**
Tension Side Stress Rating:	**Pirod OK**

Bottom Plate Capacity

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	**Pirod OK**
Tension Side Stress Rating:	**Pirod OK**

Monopole Flange Plate Connection

Elevation = 40 ft.

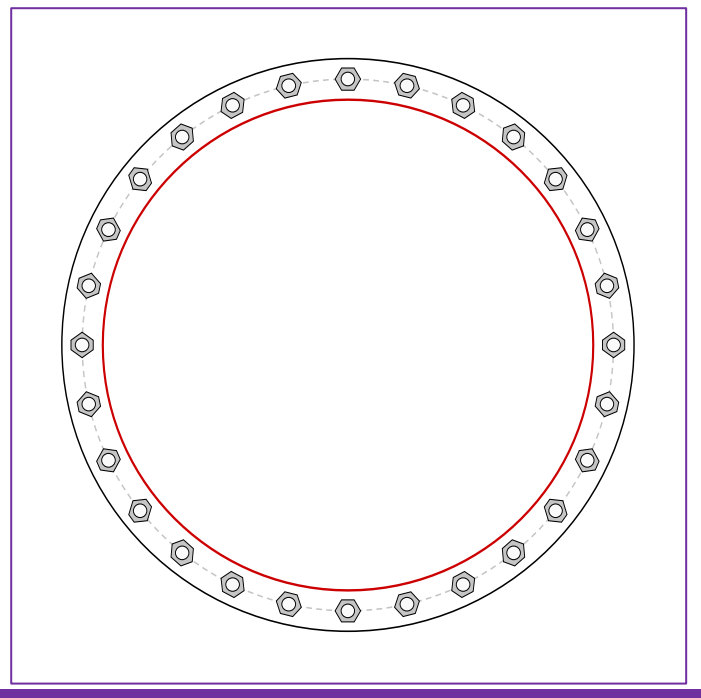
WO #	10481.CT11024B
Site Name	Branford/I-95/X53/Jct.

TIA-222 Revision	H

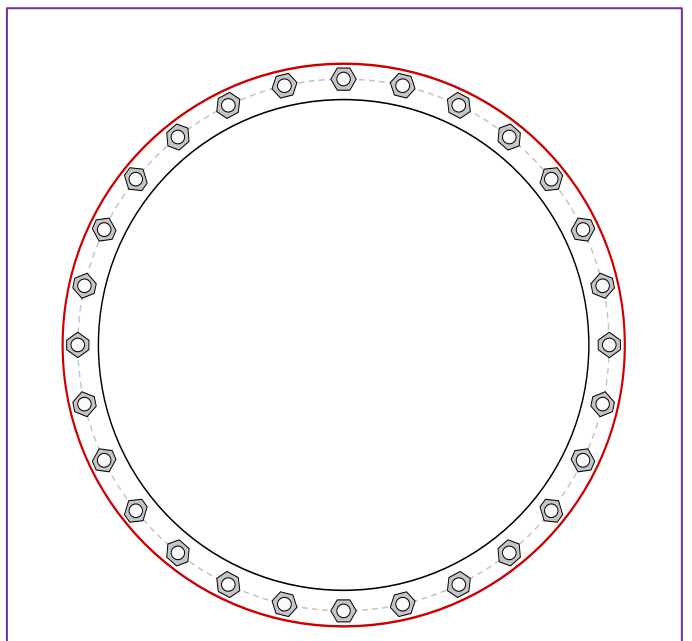
Applied Loads	
Moment (kip-ft)	1104.77
Axial Force (kips)	19.13
Shear Force (kips)	14.71

**TIA-222-H Section 15.5 Applied*

Top Plate - External



Bottom Plate - Internal



Connection Properties

Bolt Data

(28) 1" ø bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 39" BC

Top Plate Data

42" OD x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

36" ID x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

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

Bottom Pole Data

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

Analysis Results

Bolt Capacity

Max Load (kips)	47.87	
Allowable (kips)	54.53	
Stress Rating:	**83.6%**	**Pass**

Top Plate Capacity

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	**Pirod OK**
Tension Side Stress Rating:	**Pirod OK**

Bottom Plate Capacity

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	**Pirod OK**
Tension Side Stress Rating:	**Pirod OK**

Monopole Flange Plate Connection

Elevation = 20 ft.

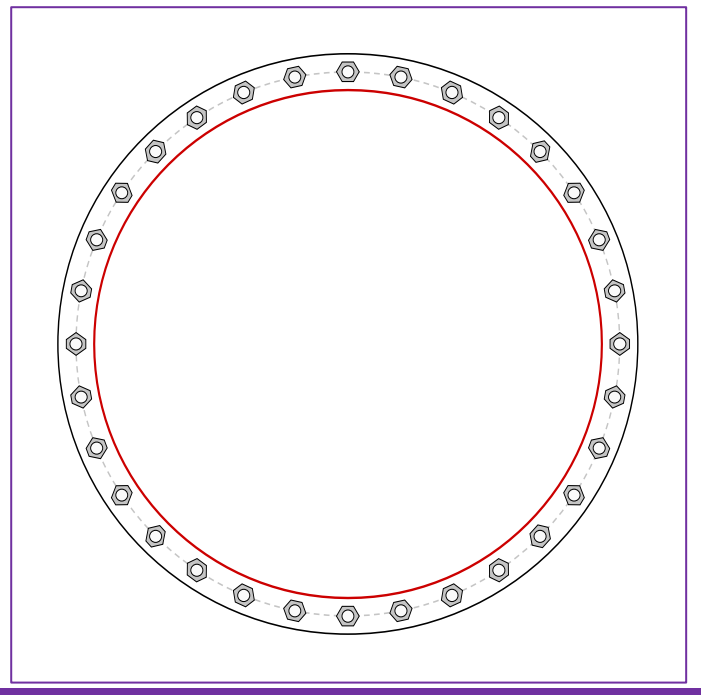
WO #	10481.CT11024B
Site Name	Branford/I-95/X53/Jct.

TIA-222 Revision	H

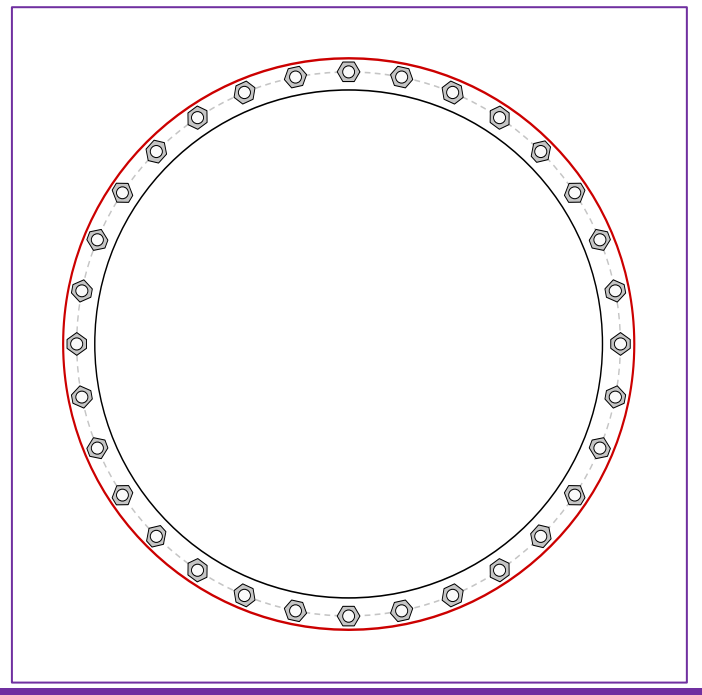
Applied Loads	
Moment (kip-ft)	1415.20
Axial Force (kips)	23.74
Shear Force (kips)	16.25

**TIA-222-H Section 15.5 Applied*

Top Plate - External



Bottom Plate - Internal



Connection Properties

Bolt Data

(32) 1" ø bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 45" BC

Top Plate Data

48" OD x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Top Pole Data

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

Bottom Plate Data

42" ID x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Stiffener Data

N/A

Bottom Pole Data

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

Analysis Results

Bolt Capacity

Max Load (kips)	46.42	
Allowable (kips)	54.53	
Stress Rating:	**81.1%**	**Pass**

Top Plate Capacity

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	**Pirod OK**
Tension Side Stress Rating:	**Pirod OK**

Bottom Plate Capacity

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	**Pirod OK**
Tension Side Stress Rating:	**Pirod OK**

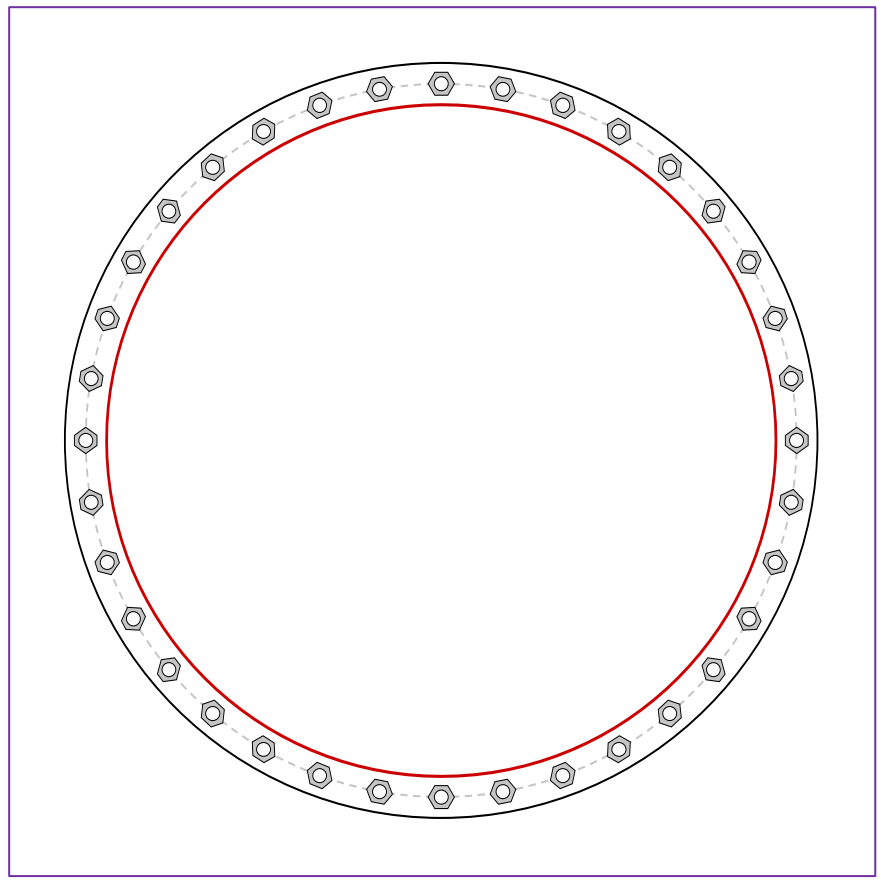
Monopole Base Plate Connection

Site Info	
WO #	10481.CT11024B
Site Name	Branford/I-95/X53/Jct.

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	□□
I□ □□□□	□

Applied Loads	
Moment (kip-ft)	1755.31
Axial Force (kips)	28.83
Shear Force (kips)	17.73

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

(36) 1" ø bolts (A687 N; Fy=105 ksi, Fu=125 ksi) on 51" BC

Base Plate Data

54" OD x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Stiffener Data

N/A

Pole Data

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

Analysis Results

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

Pu_t = 45.08	ϕPn_t = 56.81	**Stress Rating**
Vu = 0.49	ϕVn = 36.82	**75.6%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	**Pirod OK**

Drilled Pier Foundation

O # :	10481.CT11024B
Site Name:	Branford/I-95/X53/Jct.
Order Number:	
TIA-222 Revison:	H
Tower Type:	Monopole

Applied Loads		
	Comp.	**Uplift**
Moment (kip-ft)	1755.31	
Axial Force (kips)	28.83	
Shear Force (kips)	17.73	

Material Properties		
Concrete Strength, f'c:	4.5	ksi
Rebar Strength, Fy:	60	ksi
Tie Yield Strength, Fyt:	40	ksi

Pier Design Data		
Depth	27.5	ft
Ext. Above Grade	0.5	ft
Pier Section 1		
From 0.5' above grade to 27.5' below grade		
Pier Diameter	5.5	ft
Rebar Quantity	25	
Rebar Size	11	
Clear Cover to Ties	3	in
Tie Size	5	
Tie Spacing	18	in

Rebar & Pier Options

Embedded Pole Inputs

Belled Pier Inputs

Analysis Results		
Soil Lateral Check	*Compression*	*Uplift*
$D_{v=0}$ (ft from TOC)	4.82	-
Soil Safety Factor	6.46	-
Max Moment (kip-ft)	1829.82	-
Rating*	*19.6%*	-
Soil Vertical Check	*Compression*	*Uplift*
Skin Friction (kips)	349.25-	
End Bearing (kips)	213.82	-
Weight of Concrete (kips)	88.61	-
Total Capacity (kips)	563.07	-
Axial (kips)	117.44	-
Rating*	*19.9%*	-
Reinforced Concrete Flexure	*Compression*	*Uplift*
Critical Depth (ft from TOC)	4.80	-
Critical Moment (kip-ft)	1829.82	-
Critical Moment Capacity	4648.04	-
Rating*	*37.5%*	-
Reinforced Concrete Shear	*Compression*	*Uplift*
Critical Depth (ft from TOC)	16.41	-
Critical Shear (kip)	156.17	-
Critical Shear Capacity	395.05	-
Rating*	*37.7%*	-

Structural Foundation Rating*	**37.7%**
Soil Interaction Rating*	**19.9%**

*Rating per TIA-222-H Section 15.5

Soil Profile

Groundwater Depth	10

# of Layers	4

Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ_{soil} (pcf)	$\gamma_{concrete}$ (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	3	3		150			0.000	0.000					Cohesionless
2	3	10	7	125	150	2		1.100	1.100					Cohesive
3	10	17	7	65	87.6	2		1.100	1.100					Cohesive
4	17	27.5	10.5	65	87.6	2		1.100	1.100			12		Cohesive

SEISMIC CALCULATIONS

Location

	Decimal Degrees		Deg	Min	Sec
Lat:	41.283325	+	41	16	59.97
Long:	-72.849400	-	72	50	57.84

Code and Site Parameters

Seismic Design Code:	TIA-222-H-1	
Site Soil:	D (Default)	Default
Risk Category:	II	

USGS Seismic Reference		
S_S:	0.2010	g
S_1:	0.0530	g
T_L:	6	s

Seismic Design Category Determination

Importance Factor, I_e:	1	
Acceleration-based site coefficient, F_a:	1.6000	
Velocity-based site coefficient, F_v:	2.4000	
Design spectral response acceleration short period, S_{DS}:	0.2144	g
Design spectral response acceleration 1 s period, S_{D1}:	0.0848	g
T_s:	0.3955	
Seismic Design Category Based on S_{DS}:	B	
Seismic Design Category Based on S_{D1}:	B	
Seismic Design Category Based on S_1:	N/A	
Controlling Seismic Design Category:	B	

Analysis Date: 8/10/2023

Tower Details

Tower Type:	Stepped Monopole		
Height, h:	150	ft	
Effective Seismic Weight, W:	24.03	kips	
Amplification Factor, A_s:	1.0		2.7.8.1

Seismic Base Shear

Response Modification Factor, R:	1.5		
Discrete Appurtenance Weight in Top 1/3 of Structure, W_u:	3.042	kips	
W_L:	20.98343437	kips	
E:	29000.0	ksi	
g:	386.088	in/s^2	
Average Moment of Inertia, I_{avg}:	5433.797266	in^4	
F_a:	0.314906291	hz	
Approximate Fundamental Period Monopole, T_a:	3.1755	s	2.7.7.1.3.3
Seismic Response Coefficient, C_s	0.1429		2.7.7.1.1
Seismic Response Coefficient Max 1, C_{smax}	0.0178		2.7.7.1.1
Seismic Response Coefficient Max 2, C_{smax}	N/A		2.7.7.1.1
Seismic Response Coefficient Min 1, C_{smin}	0.0300		2.7.7.1.1
Seismic Response Coefficient Min 2, C_{smin}	N/A		2.7.7.1.1
Controlling Seismic Response Coefficient, C_{sc}	0.0300		
Seismic Base Shear, V	0.721	kips	2.7.7.1.1

Vertical Distribution Factors

Period Related Exponent, k:	2.000
Sum of $w_i h_i^k$	184498.60

Tower Section Loads								
Section Number	Length	Top Height	Mid Height, h_x	Section Weight, w_x	$w_x h_x^k$	C_{vx}	F_{xh}	F_{xv}
1 - 1	5.00	150.00	147.50	0.2480	5396.52	0.0292	0.0211	0.0106
2 - 1	5.00	145.00	142.50	0.2480	5036.86	0.0273	0.0197	0.0106
3 - 1	4.33	140.00	137.83	0.2150	4083.74	0.0221	0.0160	0.0092
4 - 1	0.25	135.67	135.54	0.0199	364.76	0.0020	0.0014	0.0009
5 - 1	5.00	135.42	132.92	0.3971	7015.30	0.0380	0.0274	0.0170
6 - 1	5.00	130.42	127.92	0.3971	6497.43	0.0352	0.0254	0.0170
7 - 1	5.00	125.42	122.92	0.3971	5999.41	0.0325	0.0234	0.0170
8 - 1	0.42	120.42	120.21	0.0331	478.54	0.0026	0.0019	0.0014
9 - 1	0.25	120.00	119.88	0.0177	253.83	0.0014	0.0010	0.0008
10 - 1	5.00	119.75	117.25	0.3533	4856.68	0.0263	0.0190	0.0151
11 - 1	4.38	114.75	112.56	0.3091	3916.60	0.0212	0.0153	0.0133
12 - 1	0.25	110.38	110.25	0.0251	305.28	0.0017	0.0012	0.0011
13 - 1	5.00	110.13	107.63	0.5023	5818.41	0.0315	0.0227	0.0215
14 - 1	5.00	105.13	102.63	0.5023	5290.35	0.0287	0.0207	0.0215
15 - 1	0.13	100.13	100.06	0.0126	125.74	0.0007	0.0005	0.0005
16 - 1	0.25	100.00	99.88	0.0237	236.18	0.0013	0.0009	0.0010
17 - 1	5.00	99.75	97.25	0.4735	4478.53	0.0243	0.0175	0.0203
18 - 1	5.00	94.75	92.25	0.4735	4029.85	0.0218	0.0157	0.0203
19 - 1	4.50	89.75	87.50	0.4262	3262.99	0.0177	0.0127	0.0183
20 - 1	0.25	85.25	85.13	0.0311	225.57	0.0012	0.0009	0.0013
21 - 1	5.00	85.00	82.50	0.6226	4237.44	0.0230	0.0166	0.0267
22 - 1	0.25	80.00	79.88	0.0297	189.42	0.0010	0.0007	0.0013
23 - 1	5.00	79.75	77.25	0.5938	3543.56	0.0192	0.0138	0.0255
24 - 1	5.00	74.75	72.25	0.5938	3099.69	0.0168	0.0121	0.0255
25 - 1	5.00	69.75	67.25	0.5938	2685.52	0.0146	0.0105	0.0255
26 - 1	4.75	64.75	62.38	0.5641	2194.76	0.0119	0.0086	0.0242
27 - 1	5.00	60.00	57.50	0.7141	2360.89	0.0128	0.0092	0.0306
28 - 1	5.00	55.00	52.50	0.7141	1968.15	0.0107	0.0077	0.0306
29 - 1	5.00	50.00	47.50	0.7141	1611.12	0.0087	0.0063	0.0306
30 - 1	5.00	45.00	42.50	0.7141	1289.79	0.0070	0.0050	0.0306
31 - 1	5.00	40.00	37.50	0.8343	1173.28	0.0064	0.0046	0.0358
32 - 1	5.00	35.00	32.50	0.8343	881.26	0.0048	0.0034	0.0358
33 - 1	5.00	30.00	27.50	0.8343	630.96	0.0034	0.0025	0.0358
34 - 1	5.00	25.00	22.50	0.8343	422.38	0.0023	0.0017	0.0358
35 - 1	5.00	20.00	17.50	0.9546	292.35	0.0016	0.0011	0.0409
36 - 1	5.00	15.00	12.50	0.9546	149.16	0.0008	0.0006	0.0409
37 - 1	5.00	10.00	7.50	0.9546	53.70	0.0003	0.0002	0.0409
38 - 1	5.00	5.00	2.50	0.9546	5.97	0.0000	0.0000	0.0409
			Sum	18.1155	94461.97			

Discrete Loads						
Name	h_x	w_x	$w_x h_x^k$	C_{vx}	F_{xh}	F_{xv}
rfs celwave APXVAARR24_43-U-NA20 w/ 2.5" Mount Pipe	150.00	0.1800	4050.00	0.0220	0.0158	0.0077
rfs celwave APXVAARR24_43-U-NA20 w/ 2.5" Mount Pipe	150.00	0.1800	4050.00	0.0220	0.0158	0.0077
rfs celwave APXVAARR24_43-U-NA20 w/ 2.5" Mount Pipe	150.00	0.1800	4050.00	0.0220	0.0158	0.0077
ericsson RADIO 4449 B71/B85	150.00	0.0750	1687.50	0.0091	0.0066	0.0032
ericsson RADIO 4449 B71/B85	150.00	0.0750	1687.50	0.0091	0.0066	0.0032
ericsson RADIO 4449 B71/B85	150.00	0.0750	1687.50	0.0091	0.0066	0.0032
ericsson AIR 6419 B41 w/ Mount Pipe	150.00	0.1130	2542.50	0.0138	0.0099	0.0048
ericsson AIR 6419 B41 w/ Mount Pipe	150.00	0.1130	2542.50	0.0138	0.0099	0.0048
ericsson AIR 6419 B41 w/ Mount Pipe	150.00	0.1130	2542.50	0.0138	0.0099	0.0048
ericsson RADIO 4460 B25+B66	150.00	0.1090	2452.50	0.0133	0.0096	0.0047
ericsson RADIO 4460 B25+B66	150.00	0.1090	2452.50	0.0133	0.0096	0.0047
ericsson RADIO 4460 B25+B66	150.00	0.1090	2452.50	0.0133	0.0096	0.0047
mount pipes 6' x 2" STD Pipe	150.00	0.0220	495.00	0.0027	0.0019	0.0009
mount pipes 6' x 2" STD Pipe	150.00	0.0220	495.00	0.0027	0.0019	0.0009
mount pipes 6' x 2" STD Pipe	150.00	0.0220	495.00	0.0027	0.0019	0.0009
10' Low Profile Platform	150.00	1.2500	28125.00	0.1524	0.1099	0.0536
miscl SitePro1 VSK-MHD	150.00	0.0320	720.00	0.0039	0.0028	0.0014
miscl SitePro1 VSK-MHD	150.00	0.0320	720.00	0.0039	0.0028	0.0014
miscl SitePro1 VSK-MHD	150.00	0.0320	720.00	0.0039	0.0028	0.0014
miscl Horizontal Reinforcement	150.00	0.0330	742.50	0.0040	0.0029	0.0014
miscl Horizontal Reinforcement	150.00	0.0330	742.50	0.0040	0.0029	0.0014
miscl Horizontal Reinforcement	150.00	0.0330	742.50	0.0040	0.0029	0.0014
omni antennas 6' x 1.5" Omni Antenna	150.00	0.0200	450.00	0.0024	0.0018	0.0009
gabriel electronics DFPD1-52	150.00	0.0140	315.00	0.0017	0.0012	0.0006
mount pipes 6' x 2" STD Pipe	150.00	0.0220	495.00	0.0027	0.0019	0.0009
mount pipes 6' x 2" STD Pipe	150.00	0.0220	495.00	0.0027	0.0019	0.0009
mount pipes 6' x 2" STD Pipe	150.00	0.0220	495.00	0.0027	0.0019	0.0009
mount pipes 4' x 2" STD Pipe	98.00	0.0150	144.06	0.0008	0.0006	0.0006
6' Side Arm	98.00	0.0270	259.31	0.0014	0.0010	0.0012
celwave PD220	98.00	0.0230	220.89	0.0012	0.0009	0.0010
mount pipes 4' x 2" STD Pipe	70.00	0.0150	73.50	0.0004	0.0003	0.0006
6' Side Arm	70.00	0.0270	132.30	0.0007	0.0005	0.0012
celwave PD220	70.00	0.0230	112.70	0.0006	0.0004	0.0010
mount pipes 4' x 2" STD Pipe	50.00	0.0150	37.50	0.0002	0.0001	0.0006
6' Side Arm	50.00	0.0270	67.50	0.0004	0.0003	0.0012
celwave PD220	50.00	0.0230	57.50	0.0003	0.0002	0.0010
Sum		3.2370	69550.26			

Linear Loads								
Name	Start Height	End Height	h_x	w_x	$w_x h_x^k$	C_{vx}	F_{xh}	F_{xv}
(2) 6Power/24Fiber (1 5/8) From 0 to 150	140.00	150.00	145.00	0.0460	967.15	0.0052	0.0038	0.0020
(2) 6Power/24Fiber (1 5/8) From 0 to 150	130.00	140.00	135.00	0.0460	838.35	0.0045	0.0033	0.0020
(2) 6Power/24Fiber (1 5/8) From 0 to 150	120.00	130.00	125.00	0.0460	718.75	0.0039	0.0028	0.0020
(2) 6Power/24Fiber (1 5/8) From 0 to 150	110.00	120.00	115.00	0.0460	608.35	0.0033	0.0024	0.0020
(2) 6Power/24Fiber (1 5/8) From 0 to 150	100.00	110.00	105.00	0.0460	507.15	0.0027	0.0020	0.0020
(2) 6Power/24Fiber (1 5/8) From 0 to 150	90.00	100.00	95.00	0.0460	415.15	0.0023	0.0016	0.0020
(2) 6Power/24Fiber (1 5/8) From 0 to 150	80.00	90.00	85.00	0.0460	332.35	0.0018	0.0013	0.0020
(2) 6Power/24Fiber (1 5/8) From 0 to 150	70.00	80.00	75.00	0.0460	258.75	0.0014	0.0010	0.0020
(2) 6Power/24Fiber (1 5/8) From 0 to 150	60.00	70.00	65.00	0.0460	194.35	0.0011	0.0008	0.0020
(2) 6Power/24Fiber (1 5/8) From 0 to 150	50.00	60.00	55.00	0.0460	139.15	0.0008	0.0005	0.0020
(2) 6Power/24Fiber (1 5/8) From 0 to 150	40.00	50.00	45.00	0.0460	93.15	0.0005	0.0004	0.0020
(2) 6Power/24Fiber (1 5/8) From 0 to 150	30.00	40.00	35.00	0.0460	56.35	0.0003	0.0002	0.0020
(2) 6Power/24Fiber (1 5/8) From 0 to 150	20.00	30.00	25.00	0.0460	28.75	0.0002	0.0001	0.0020
(2) 6Power/24Fiber (1 5/8) From 0 to 150	10.00	20.00	15.00	0.0460	10.35	0.0001	0.0000	0.0020
(2) 6Power/24Fiber (1 5/8) From 0 to 150	0.00	10.00	5.00	0.0460	1.15	0.0000	0.0000	0.0020
(2) MLC Hybrid 6Power/12Fiber(1 1/2) From 0 to 150	140.00	150.00	145.00	0.0530	1114.33	0.0060	0.0044	0.0023
(2) MLC Hybrid 6Power/12Fiber(1 1/2) From 0 to 150	130.00	140.00	135.00	0.0530	965.93	0.0052	0.0038	0.0023
(2) MLC Hybrid 6Power/12Fiber(1 1/2) From 0 to 150	120.00	130.00	125.00	0.0530	828.13	0.0045	0.0032	0.0023
(2) MLC Hybrid 6Power/12Fiber(1 1/2) From 0 to 150	110.00	120.00	115.00	0.0530	700.93	0.0038	0.0027	0.0023
(2) MLC Hybrid 6Power/12Fiber(1 1/2) From 0 to 150	100.00	110.00	105.00	0.0530	584.33	0.0032	0.0023	0.0023
(2) MLC Hybrid 6Power/12Fiber(1 1/2) From 0 to 150	90.00	100.00	95.00	0.0530	478.33	0.0026	0.0019	0.0023
(2) MLC Hybrid 6Power/12Fiber(1 1/2) From 0 to 150	80.00	90.00	85.00	0.0530	382.93	0.0021	0.0015	0.0023
(2) MLC Hybrid 6Power/12Fiber(1 1/2) From 0 to 150	70.00	80.00	75.00	0.0530	298.13	0.0016	0.0012	0.0023
(2) MLC Hybrid 6Power/12Fiber(1 1/2) From 0 to 150	60.00	70.00	65.00	0.0530	223.93	0.0012	0.0009	0.0023
(2) MLC Hybrid 6Power/12Fiber(1 1/2) From 0 to 150	50.00	60.00	55.00	0.0530	160.33	0.0009	0.0006	0.0023
(2) MLC Hybrid 6Power/12Fiber(1 1/2) From 0 to 150	40.00	50.00	45.00	0.0530	107.33	0.0006	0.0004	0.0023
(2) MLC Hybrid 6Power/12Fiber(1 1/2) From 0 to 150	30.00	40.00	35.00	0.0530	64.93	0.0004	0.0003	0.0023
(2) MLC Hybrid 6Power/12Fiber(1 1/2) From 0 to 150	20.00	30.00	25.00	0.0530	33.13	0.0002	0.0001	0.0023
(2) MLC Hybrid 6Power/12Fiber(1 1/2) From 0 to 150	10.00	20.00	15.00	0.0530	11.93	0.0001	0.0000	0.0023
(2) MLC Hybrid 6Power/12Fiber(1 1/2) From 0 to 150	0.00	10.00	5.00	0.0530	1.33	0.0000	0.0000	0.0023
andrew LDF4-50A(1/2") From 0 to 150	140.00	150.00	145.00	0.0015	31.54	0.0002	0.0001	0.0001
andrew LDF4-50A(1/2") From 0 to 150	130.00	140.00	135.00	0.0015	27.34	0.0001	0.0001	0.0001
andrew LDF4-50A(1/2") From 0 to 150	120.00	130.00	125.00	0.0015	23.44	0.0001	0.0001	0.0001
andrew LDF4-50A(1/2") From 0 to 150	110.00	120.00	115.00	0.0015	19.84	0.0001	0.0001	0.0001
andrew LDF4-50A(1/2") From 0 to 150	100.00	110.00	105.00	0.0015	16.54	0.0001	0.0001	0.0001
andrew LDF4-50A(1/2") From 0 to 150	90.00	100.00	95.00	0.0015	13.54	0.0001	0.0001	0.0001
andrew LDF4-50A(1/2") From 0 to 150	80.00	90.00	85.00	0.0015	10.84	0.0001	0.0000	0.0001
andrew LDF4-50A(1/2") From 0 to 150	70.00	80.00	75.00	0.0015	8.44	0.0000	0.0000	0.0001
andrew LDF4-50A(1/2") From 0 to 150	60.00	70.00	65.00	0.0015	6.34	0.0000	0.0000	0.0001
andrew LDF4-50A(1/2") From 0 to 150	50.00	60.00	55.00	0.0015	4.54	0.0000	0.0000	0.0001
andrew LDF4-50A(1/2") From 0 to 150	40.00	50.00	45.00	0.0015	3.04	0.0000	0.0000	0.0001
andrew LDF4-50A(1/2") From 0 to 150	30.00	40.00	35.00	0.0015	1.84	0.0000	0.0000	0.0001
andrew LDF4-50A(1/2") From 0 to 150	20.00	30.00	25.00	0.0015	0.94	0.0000	0.0000	0.0001
andrew LDF4-50A(1/2") From 0 to 150	10.00	20.00	15.00	0.0015	0.34	0.0000	0.0000	0.0001
andrew LDF4-50A(1/2") From 0 to 150	0.00	10.00	5.00	0.0015	0.04	0.0000	0.0000	0.0001
andrew LDF4-50A(1/2") From 0 to 98	90.00	98.00	94.00	0.0012	10.60	0.0001	0.0000	0.0001
andrew LDF4-50A(1/2") From 0 to 98	80.00	90.00	85.00	0.0015	10.84	0.0001	0.0000	0.0001
andrew LDF4-50A(1/2") From 0 to 98	70.00	80.00	75.00	0.0015	8.44	0.0000	0.0000	0.0001
andrew LDF4-50A(1/2") From 0 to 98	60.00	70.00	65.00	0.0015	6.34	0.0000	0.0000	0.0001
andrew LDF4-50A(1/2") From 0 to 98	50.00	60.00	55.00	0.0015	4.54	0.0000	0.0000	0.0001
andrew LDF4-50A(1/2") From 0 to 98	40.00	50.00	45.00	0.0015	3.04	0.0000	0.0000	0.0001
andrew LDF4-50A(1/2") From 0 to 98	30.00	40.00	35.00	0.0015	1.84	0.0000	0.0000	0.0001
andrew LDF4-50A(1/2") From 0 to 98	20.00	30.00	25.00	0.0015	0.94	0.0000	0.0000	0.0001
andrew LDF4-50A(1/2") From 0 to 98	10.00	20.00	15.00	0.0015	0.34	0.0000	0.0000	0.0001
andrew LDF4-50A(1/2") From 0 to 98	0.00	10.00	5.00	0.0015	0.04	0.0000	0.0000	0.0001
andrew LDF4-50A(1/2") From 0 to 70	60.00	70.00	65.00	0.0015	6.34	0.0000	0.0000	0.0001
andrew LDF4-50A(1/2") From 0 to 70	50.00	60.00	55.00	0.0015	4.54	0.0000	0.0000	0.0001
andrew LDF4-50A(1/2") From 0 to 70	40.00	50.00	45.00	0.0015	3.04	0.0000	0.0000	0.0001
andrew LDF4-50A(1/2") From 0 to 70	30.00	40.00	35.00	0.0015	1.84	0.0000	0.0000	0.0001
andrew LDF4-50A(1/2") From 0 to 70	20.00	30.00	25.00	0.0015	0.94	0.0000	0.0000	0.0001
andrew LDF4-50A(1/2") From 0 to 70	10.00	20.00	15.00	0.0015	0.34	0.0000	0.0000	0.0001
andrew LDF4-50A(1/2") From 0 to 70	0.00	10.00	5.00	0.0015	0.04	0.0000	0.0000	0.0001
andrew LDF4-50A(1/2") From 0 to 50	40.00	50.00	45.00	0.0015	3.04	0.0000	0.0000	0.0001
andrew LDF4-50A(1/2") From 0 to 50	30.00	40.00	35.00	0.0015	1.84	0.0000	0.0000	0.0001
andrew LDF4-50A(1/2") From 0 to 50	20.00	30.00	25.00	0.0015	0.94	0.0000	0.0000	0.0001
andrew LDF4-50A(1/2") From 0 to 50	10.00	20.00	15.00	0.0015	0.34	0.0000	0.0000	0.0001
andrew LDF4-50A(1/2") From 0 to 50	0.00	10.00	5.00	0.0015	0.04	0.0000	0.0000	0.0001
miscl Climbing Ladder From 10.5 to 150	140.00	150.00	145.00	0.0790	1660.98	0.0090	0.0065	0.0034
miscl Climbing Ladder From 10.5 to 150	130.00	140.00	135.00	0.0790	1439.78	0.0078	0.0056	0.0034
miscl Climbing Ladder From 10.5 to 150	120.00	130.00	125.00	0.0790	1234.38	0.0067	0.0048	0.0034
miscl Climbing Ladder From 10.5 to 150	110.00	120.00	115.00	0.0790	1044.78	0.0057	0.0041	0.0034
miscl Climbing Ladder From 10.5 to 150	100.00	110.00	105.00	0.0790	870.98	0.0047	0.0034	0.0034
miscl Climbing Ladder From 10.5 to 150	90.00	100.00	95.00	0.0790	712.98	0.0039	0.0028	0.0034
miscl Climbing Ladder From 10.5 to 150	80.00	90.00	85.00	0.0790	570.78	0.0031	0.0022	0.0034
miscl Climbing Ladder From 10.5 to 150	70.00	80.00	75.00	0.0790	444.38	0.0024	0.0017	0.0034
miscl Climbing Ladder From 10.5 to 150	60.00	70.00	65.00	0.0790	333.78	0.0018	0.0013	0.0034
miscl Climbing Ladder From 10.5 to 150	50.00	60.00	55.00	0.0790	238.98	0.0013	0.0009	0.0034
miscl Climbing Ladder From 10.5 to 150	40.00	50.00	45.00	0.0790	159.98	0.0009	0.0006	0.0034
miscl Climbing Ladder From 10.5 to 150	30.00	40.00	35.00	0.0790	96.78	0.0005	0.0004	0.0034
miscl Climbing Ladder From 10.5 to 150	20.00	30.00	25.00	0.0790	49.38	0.0003	0.0002	0.0034
miscl Climbing Ladder From 10.5 to 150	10.50	20.00	15.25	0.0751	17.45	0.0001	0.0001	0.0032

miscl Safety Line 3/8 From 10.5 to 150	140.00	150.00	145.00	0.0022	46.26	0.0003	0.0002	0.0001
miscl Safety Line 3/8 From 10.5 to 150	130.00	140.00	135.00	0.0022	40.10	0.0002	0.0002	0.0001
miscl Safety Line 3/8 From 10.5 to 150	120.00	130.00	125.00	0.0022	34.38	0.0002	0.0001	0.0001
miscl Safety Line 3/8 From 10.5 to 150	110.00	120.00	115.00	0.0022	29.10	0.0002	0.0001	0.0001
miscl Safety Line 3/8 From 10.5 to 150	100.00	110.00	105.00	0.0022	24.26	0.0001	0.0001	0.0001
miscl Safety Line 3/8 From 10.5 to 150	90.00	100.00	95.00	0.0022	19.86	0.0001	0.0001	0.0001
miscl Safety Line 3/8 From 10.5 to 150	80.00	90.00	85.00	0.0022	15.90	0.0001	0.0001	0.0001
miscl Safety Line 3/8 From 10.5 to 150	70.00	80.00	75.00	0.0022	12.38	0.0001	0.0000	0.0001
miscl Safety Line 3/8 From 10.5 to 150	60.00	70.00	65.00	0.0022	9.30	0.0001	0.0000	0.0001
miscl Safety Line 3/8 From 10.5 to 150	50.00	60.00	55.00	0.0022	6.66	0.0000	0.0000	0.0001
miscl Safety Line 3/8 From 10.5 to 150	40.00	50.00	45.00	0.0022	4.46	0.0000	0.0000	0.0001
miscl Safety Line 3/8 From 10.5 to 150	30.00	40.00	35.00	0.0022	2.70	0.0000	0.0000	0.0001
miscl Safety Line 3/8 From 10.5 to 150	20.00	30.00	25.00	0.0022	1.38	0.0000	0.0000	0.0001
miscl Safety Line 3/8 From 10.5 to 150	10.50	20.00	15.25	0.0021	0.49	0.0000	0.0000	0.0001
			Sum	2.6729	20486.37			

APPENDIX C

GEOTECHNICAL EVALUATION (1998)

FPA

FRENCH & PARRELLO
ASSOCIATES, P.A.
CONSULTING ENGINEERS
Since 1974

670 NORTH BEERS STREET BLDG. #3
HOLMDEL, NEW JERSEY 07733
(732) 888-7700
http://www.fpawww.com
email: fpa@fpawww.com

A-114856

June 10, 1998

Mr. Dave Weinpahl
ARCNET
670 N. Beers Street - Bldg. 2
Holmdel, New Jersey 07733

LAURENCE E. FRENCH, P.E.
ARGO T. PARRELLO, P.E.
JAMES B. HELLER, P.E.
JOSEPH M. EDWARDS, P.E.
SCOTT D. WATKINS, P.E.

Re: Report of Subsurface Exploration
and Geotechnical Evaluation
Amtrak - Branford
Arcnet No. A96.506-624A
Hosley Avenue @ I-95 Milepost 79.4
Branford, CT
FPA No. 98A012ER2 – Revised for 150 Ft. Monopole

Dear Mr. Weinpahl:

INTRODUCTION

Pursuant to your authorization, we have performed a subsurface exploration and geotechnical engineering evaluation in connection with the proposed 150 foot monopole at the above referenced site. The project site is located in the Amtrak right of way at milepost 79.4 near the intersection of Hosley Avenue and I-95,Branford, Connecticut. A Regional Location Plan is presented on Drawing No. 1.

The purpose of our participation on the project at this time was to explore the subsurface conditions in the vicinity of the proposed monopole and to develop geotechnical engineering recommendations toward the design and construction of the pole foundation. Our scope of work has been performed in accordance with the scope of services dated May 6, 1998, and included the advancement of two test borings, engineering evaluation, and the generation of our recommendations.

DESIGN CONSIDERATIONS

It is our understanding that the proposed steel monopole will be approximately 150 feet high. Based on preliminary planning, it is anticipated that the proposed monopole will be founded on a drilled shaft. Design loads for the pole foundation were unavailable at the time this report was prepared.

FPA

SUBSURFACE EXPLORATION

French & Parrello Associates (FPA) performed two test borings on May 28, 1998 to characterize subsurface conditions in the vicinity of the proposed site, as shown on Drawing No. 2 "Site Layout". One boring was advanced to 12 feet in the vicinity of the proposed equipment cabinets and the second was advanced to a depth of 39 feet at the proposed monopole location. The field work was accomplished by a test boring subcontractor while under the full-time technical observation by a representative of FPA. The as-drilled boring locations are presented on Drawing No. 3, "Test Boring Location Plan."

Test boring B-1 was advanced to a depth of 39 feet below grade utilizing mud rotary drilling procedures. Test boring B-2 was advanced to 12 feet utilizing hollow stem auger procedures. Soil samples were obtained by advancing a standard 2-inch diameter split-spoon sampler in accordance with ASTM Test Method D-1586, The Standard Penetration Test. All soil samples were classified in the field using the Burmister Soil Classification System and were returned to our laboratory for further review. The samples will be stored for a period of 30 days from the date of this report. Details of the drilling procedures, as well as sample classifications, groundwater depths, and Standard Penetration Test results are presented on the attached boring logs.

SUBSURFACE CONDITIONS

In general, the soils encountered consisted mainly of glacial till soil which contains varying amounts of silt and clay with varying fractions of sand and gravel to the terminating depth of the boring. The results of the standard penetration test indicates that the encountered soils are in very stiff, to hard state of consistency.

During our subsurface exploration perched water was encountered at a depth of 10 feet to 17 feet and groundwater was encountered at a depth of 35 feet. For a more detailed description of the subsurface soil and groundwater conditions encountered, please refer to the attached boring logs.

FOUNDATION RECOMMENDATIONS

Based upon the results of our subsurface exploration and geotechnical engineering evaluation, it is our opinion that the proposed monopole may be supported on a drilled shaft foundation. Design of the foundation should be performed by an engineer licensed to practice in the State of Connecticut and should conform to all governing regulations. Since the proposed monopole will be supported on a sloped area, the foundation designer should take into account the existing topography when designing the monopole foundation. We recommend that the project specifications be written on a performance basis and that means and methods for installing the foundation be left to the discretion of the contractor. Responsibility for protecting any adjacent

structures during installation should be stipulated to be with the contractor. Due to the fact that the proposed monopole will be constructed adjacent to railroad tracks, we recommend utilizing temporary steel casing during installation.

To facilitate the design of the monopole foundation, we offer the following soil parameters:

	0 – 40 feet
• Total Unit Weight of Soil (γ)	125 pcf
• Buoyant Unit Weight of Soil (γ')	65 pcf
• Angle of Internal Friction (ϕ)	0
• Cohesion (c)	2,000 psf
• Allowable Bearing Pressure	6,000 psf

Care should be taken during construction to preclude disturbance to the adjacent railroad tracks and adjacent billboard.

CLOSING

The recommendations contained herein are contingent upon subsurface conditions remaining consistent with those encountered during our subsurface exploration. It is understood that actual subsurface conditions may vary from those which are encountered at the locations of the test borings. French & Parrello will base interpretations and recommendations upon conditions inferred from the conditions encountered. It should be recognized that any future determination of conditions different than those which were encountered at the sampling locations may significantly impact the interpretation and recommendations provided by French & Parrello. Any such variation of conditions should be brought to the prompt attention of French & Parrello to assess the impact of the variations on the previously provided interpretations and recommendations. French & Parrello will take no responsibility for any interpretation or recommendation others may make based upon subsurface data provided by French & Parrello.

LIMITATIONS

The scope of our work did not include an environmental assessment or investigation for the presence or absence of wetlands. Services performed by FPA for the project have been conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions. No other representation, expressed or implied, and no warranty or guarantee is included or intended in the services provided.

FPA

Should you have any questions or comments, please do not hesitate to contact us.

Very truly yours,

FRENCH & PARRELLO ASSOCIATES, P.A.

R. Ray Mankbadi, P.E.

RRM/clt

R. Ray Mankbadi, P.E.
CT Professional License No. 16547

FRENCH & PARRELLO ASSOCIATES, P.A.
670 North Beers Street, Building No. 3
Holmdel, New Jersey 07733

TEST BORING LOG

BRANFORD – AMTRAK
(FPA No. 98A012CB1)

BORING NO: B-1
SHEET 1 OF 1

DATE STARTED: 5-28-98
DATE FINISHED: 5-28-98

DEPTH OF WATER: DRY
LOCATION: SEE PLAN

GROUND ELEVATION: N/A
GROUND WATER ELEV.: N/A

DRILLING TECHNIQUE: HOLLOW STEM AUGER

DEPTH FEET	SAMPLE DEPTH	SPT BLOW COUNTS (PER 6")	STRATA	DESCRIPTION OF SOIL
	S-1 0-2'	1 - 2 - 4 - 6		S-1 Topsoil - Brown mf **SAND**, some Silt with roots and wood chips.
	S-2 2-4'	6 - 6 - 9 - 12		S-2 Orange, Brown & Grey layered **SILT & CLAY**, trace$^+$ f Sand, with seams of mf Sand, trace$^+$ Silt.
--- 5'---				
	S-3 4-6'	10 - 13 - 17 - 22		S-3 Brown **SILT & CLAY**, with seams of Green mf Sand, trace Silt.
	S-4 6-8'	7 - 10 - 17 - 25		S-4 Grey **CLAY & SILT**.
---10'---	S-5 8-9'5"	11 - 22 - 50/5" - X		S-5 TOP 12": Same as S-4. BOT 12": Orange-Brown **SILT & CLAY**, little$^+$ mf Sand.
	S-6 10-11'6"	27 - 19 - 50/6" - X		S-6 Brown mf **SAND**, trace$^+$ Silt with layer of Grey Silt & Clay, trace$^+$ mf Sand.
---15'---				END OF TEST BORING @ 11'6" DRY
---20'---				
---25'---				
---30'---				
---35'---				
---40'---				

SOILS ENGINEER: R. MANKBADI, P.E.
DRILLING INSPECTOR: C. HILL

CONTRACTOR: CRAIG TEST BORING COMPANY
DRILLER: P. MULLINS

The information shown hereon indicates the subsurface conditions encountered at the specified boring location on the date(s) of drilling. Subsurface Conditions are likely to vary across the project site. Interpretation of the subsurface data shall be at the discretion of the user.

FRENCH & PARRELLO ASSOCIATES, P.A.

670 North Beers Street, Building No. 3
Holmdel, New Jersey 07733

TEST BORING LOG

BRANFORD - AMTRAK
(FPA No. 98A012CB2)

BORING NO: B-2
SHEET 1 OF 1

DATE STARTED: 5-28-98
DATE FINISHED: 5-28-98

DEPTH OF WATER: 10.0' & 35.0'
LOCATION: SEE PLAN

GROUND ELEVATION: N/A
GROUND WATER ELEV.: N/A

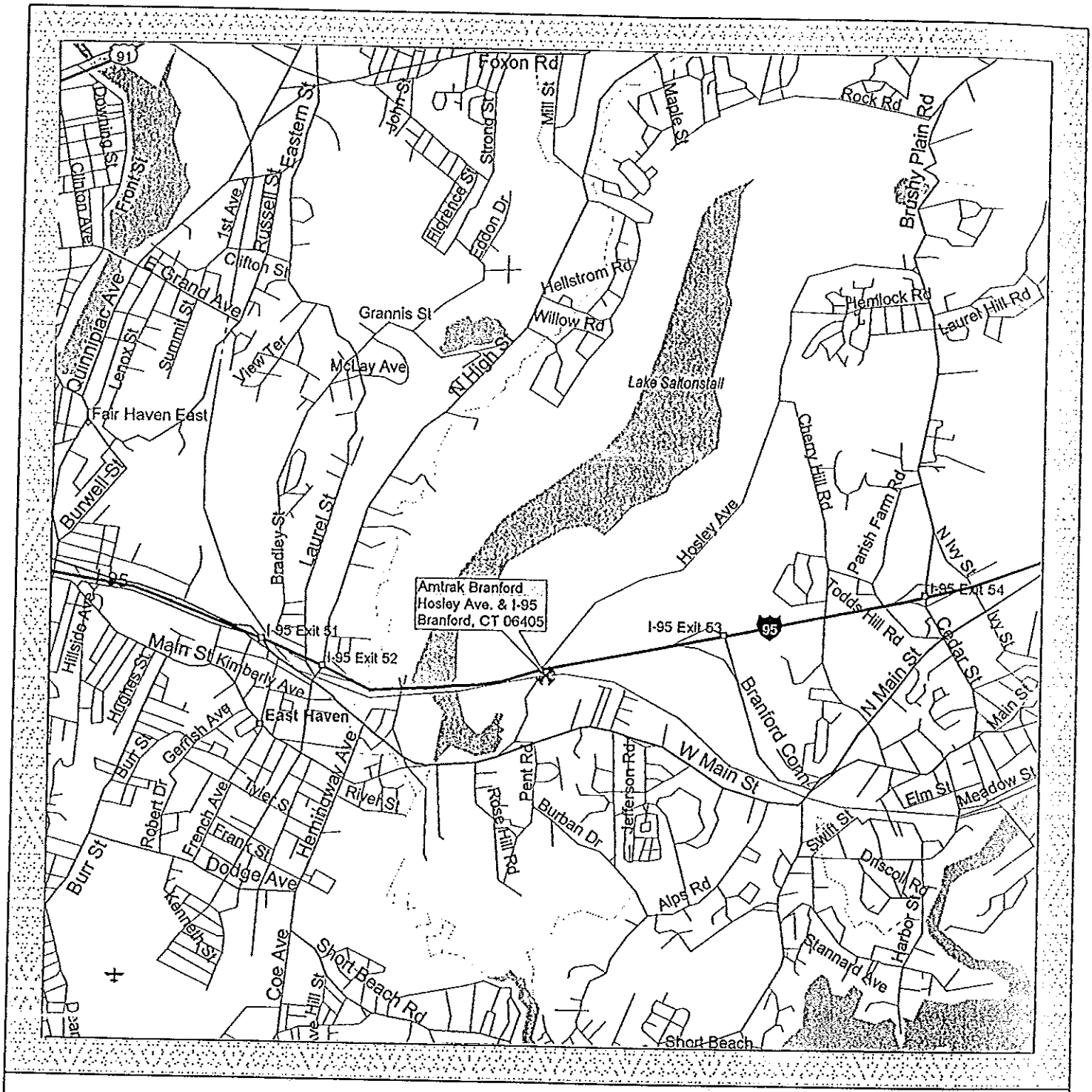
DRILLING TECHNIQUE: HOLLOW STEM AUGER

DEPTH FEET	SAMPLE DEPTH	SPT BLOW COUNTS (PER 6")	STRATA		DESCRIPTION OF SOIL
	S-1 0-2'	1 - 1 - 2 - 3		S-1	Topsoil - Brown mf SAND, some Silt & Clay with roots.
	S-2 2-4'	3 - 5 - 7 - 11		S-2	Brown & Grey SILT & CLAY, little mf Sand.
--- 5'---	S-3 4-4'11"	12 - 50/5" - X - X		S-3	Same as S-2.
	S-4 6-7'3"	12 - 15 - 50/3" - X		S-4	Brown cmf SAND, trace+ Silt, trace+ f Gravel.
	S-5 8-9'6"	12 - 44 - 50/6" - X		S-5	Brown cmf SAND, trace+ Silt, trace f Gravel.
---10'---	S-6 10-12'	16 - 39 - 44 - 29	perched water 10' to 17'	S-6	Greyish Brown mf SAND, little Silt.
---15'---	S-7 15-17'	6 - 13 - 21 - 29		S-7	Reddish Brown SILT & CLAY, trace f Sand.
---20'---	S-8 20-22'	10 - 30 - 36 - 38		S-8	Reddish Brown SILT & CLAY, little mf Gravel, little mf Sand.
---25'---	S-9 25-27'	11 - 23 - 26 - 31		S-9	Dark Brown CLAYEY SILT.
---30'---	S-10 30-30'11"	26 - 50/5" - X - X		S-10	Reddish Brown SILT & CLAY, little mf Sand, trace f Gravel.
---35'---	S-11 35-35'11"	44 - 65/5" - X - X	ground water @ 35'	S-11	Same as S-10. (BOT 6" wet)
	S-12 38 – 38'11"	45 - 50/5" - X - X		S-12	Brown mf SAND, little Silt
---40'---					END OF TEST BORING @ 38'11" Water Table @ 35'

SOILS ENGINEER: R. MANKBADI, P.E.
DRILLING INSPECTOR: C. HILL

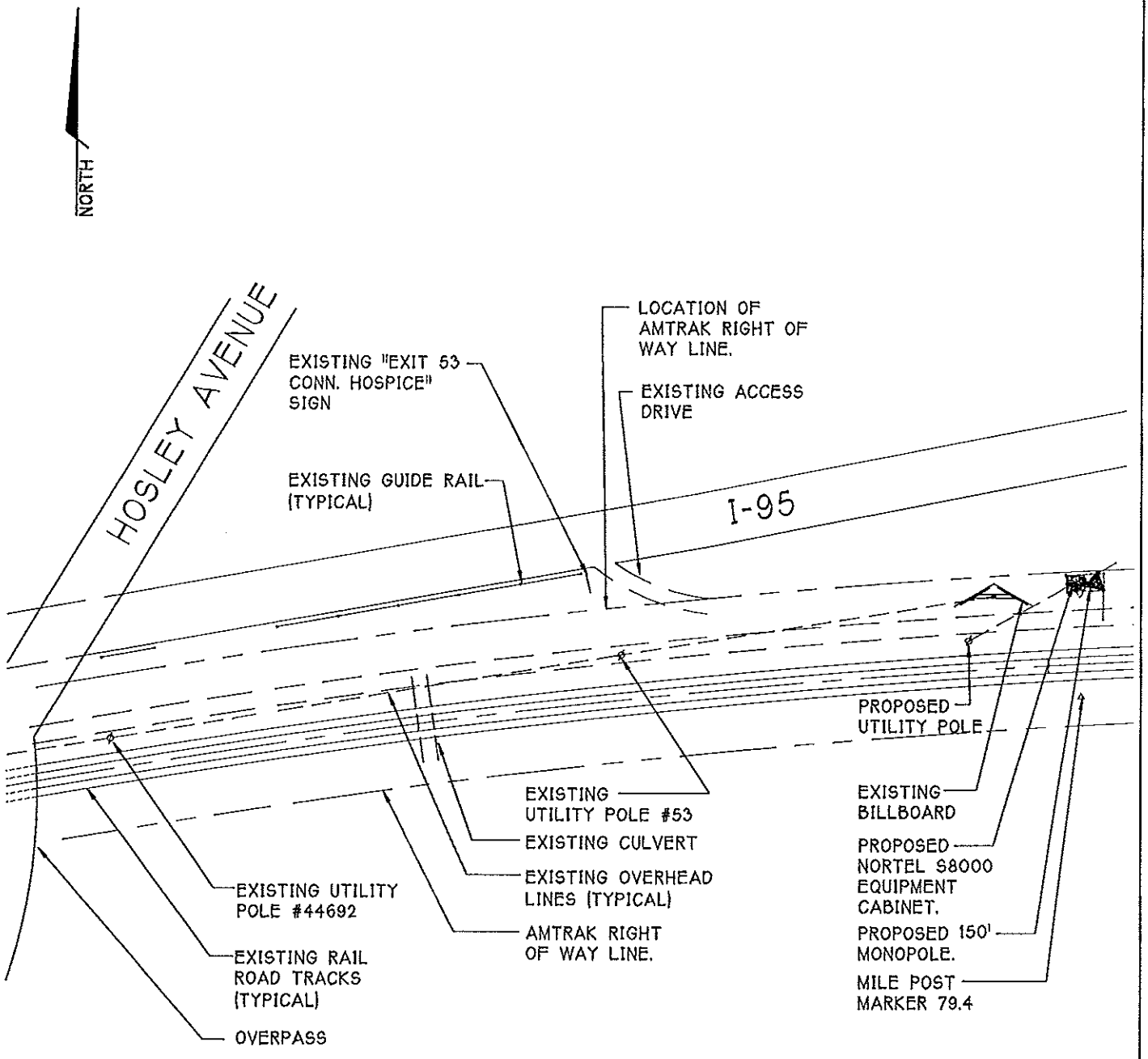
CONTRACTOR: CRAIG TEST BORING COMPANY
DRILLER: P. MULLINS

The information shown hereon indicates the subsurface conditions encountered at the specified boring location on the date(s) of drilling. Subsurface Conditions are likely to vary across the project site. Interpretation of the subsurface data shall be at the discretion of the user.



REGIONAL LOCATION PLAN

FRENCH & PARRELLO ASSOCIATES, P.A. CONSULTING ENGINEERS 670 NORTH BEERS STREET BLDG. #3 HOLMDEL, NEW JERSEY 07733 TEL: (732) 888-7700 FAX: (732) 888-7622	PROJECT: AMTRAK - BRANFORD HOSLEY AVENUE @ I-95 BRANFORD, CT				
DRAWN BY: K.G.	CHECKED BY: J.C.	SCALE: N.T.S.	DATE: 6/3/98	JOB NO.: 98A012E	DRAWING NO.: 1

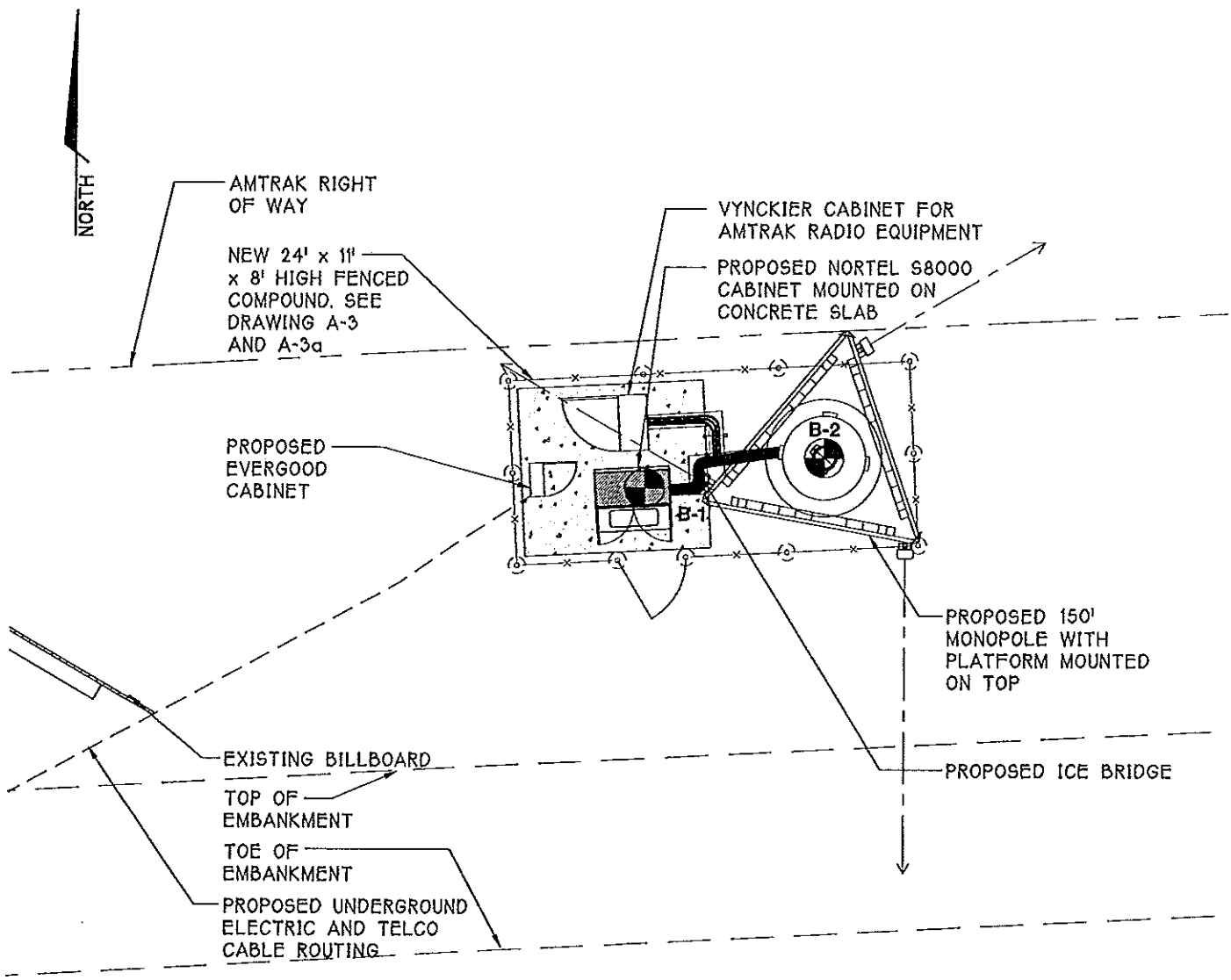


SITE LAYOUT

FRENCH & PARRELLO ASSOCIATES, P.A.
FPA
CONSULTING ENGINEERS
670 NORTH BEERS STREET BLDG. #3 HOLMDEL, NEW JERSEY 07733
TEL: (732) 888-7700 FAX: (732) 888-7622

PROJECT: AMTRAK - BRANFORD
HOSLEY AVENUE @ I-95
BRANFORD, CT

DRAWN BY:	CHECKED BY:	SCALE:	DATE:	JOB NO.:	DRAWING NO.:
K.G.	J.C.	1"=100'-0"	6/3/98	98A012E	2



KEY

APPROXIMATE BORING LOCATION

TEST BORING LOCATION PLAN

FRENCH & PARRELLO ASSOCIATES, P.A.
FPA
CONSULTING ENGINEERS
670 NORTH BEERS STREET BLDG. #3 HOLMDEL, NEW JERSEY 07733
TEL: (732) 888-7700 FAX: (732) 888-7622

PROJECT: AMTRAK - BRANFORD
HOSLEY AVENUE @ I-95
BRANFORD, CT

DRAWN BY:	CHECKED BY:	SCALE:	DATE:	JOB NO.:	DRAWING NO.:
K.G.	J.C.	1" = 10'-0"	6/3/98	98A012E	3

BURMISTER SOIL CLASSIFICATION SYSTEM

A. Cohesionless Soils: Particle Size Definitions

Soil	Fraction	U.S. Standard Sieve	Actual Size
Gravel	course	3 in. to 1 in.	76 mm to 25 mm
	medium	1 in. to 3/8 in.	25 mm to 9.5 mm
	fine	3/8 in. to No. 10	9.5 mm to 2.0 mm
Sand	course	No. 10 to No. 30	2.0 mm to 0.6 mm
	medium	No. 30 to No. 60	0.6 mm to 0.25 mm
	fine	No. 60 to No. 200	0.25 mm to .075 mm
Silt		< No. 200	< 0.075 mm

B. Terms Describing Gradation of Cohesionless Soils

Written Designation	Symbol/ Designation	Defining Proportions
coarse, medium to fine	cmf	all fractions > 10%
coarse to medium	cm	< 10% fine
medium to fine	mf	< 10% coarse
coarse	c	< 10% medium and fine
medium	m	< 10% coarse and fine
fine	f	< 10% coarse and medium

Note: Use (+) for upper limit and (-) for lower limit.

C. Cohesive Soils: Terms Describing Plasticity

Soil	Plasticity Index	Workability	Plasticity Description
SILT	0	--	Non-Plastic
Clayey SILT	1 to 5	1/4 in. thread	Slightly Plastic
SILT & CLAY	5 to 10	1/8 in. thread	Low Plasticity
CLAY & SILT	10 to 20	1/16 in. thread	Medium Plasticity
Silty CLAY	20 to 40	1/32 in. thread	High Plasticity
CLAY	>40	1/64 in. thread	Very High Plasticity

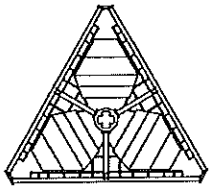
D. Terms Describing Overall Composition of Soil

Written Proportion	Proportion Symbol	Proportion Percent by Weight
and	a	35 to 50
some	s	20 to 35
little	l	10 to 20
trace	t	1 to 10

Note: Use (+) for upper limit and (-) for lower limit.

APPENDIX D

TOWER AND FOUNDATION DRAWINGS (1998)



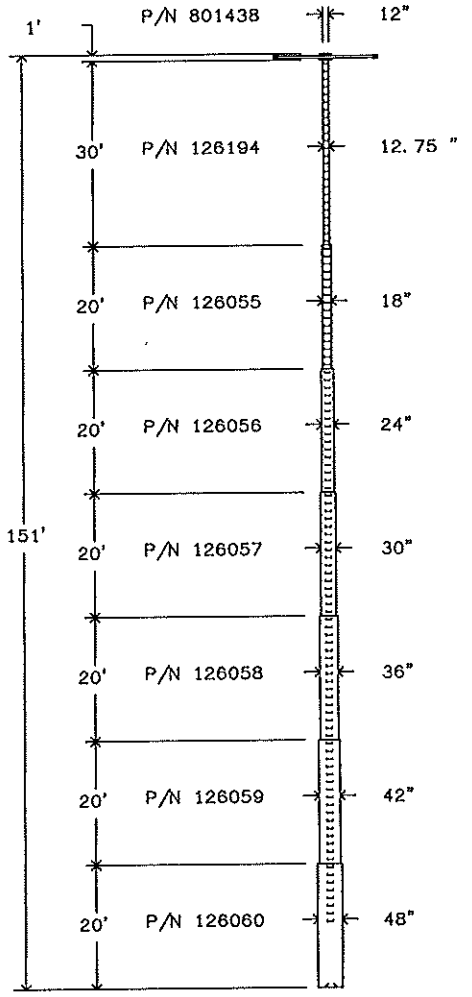
ROTATABLE TOP - TOP VIEW

MONOPOLE SECTION DATA

(ALL BOLTS ARE FOR BOTTOM OF SECTION)

SECTION					CONNECT BOLT			PILOT BOLT		
LENGTH	PART#	SIZE	WALL	WT. *	DIAM	LENGTH	#	DIAM	LENGTH	#
1'	801438	12"	N/A	1020#	1"	4-1/2"	5			
30'	126194	12.75"	0.375"	1739#	1"	4-1/2"	7	1"	5"	3
20'	126055	18"	0.375"	1662#	1"	4-1/2"	13	1"	5"	3
20'	126056	24"	0.375"	2204#	1"	4-1/2"	17	1"	5"	3
20'	126057	30"	0.375"	2747#	1"	4-1/2"	21	1"	5"	3
20'	126058	36"	0.375"	3290#	1"	4-1/2"	25	1"	5"	3
20'	126059	42"	0.375"	3833#	1"	4-1/2"	29	1"	5"	3
20'	126060	48"	0.375"	4376#						

*THE WEIGHTS LISTED ARE THEORETICAL. THE ACTUAL WEIGHTS WILL VARY. ALL WEIGHTS SHOULD BE CONFIRMED IN THE FIELD PRIOR TO ERECTION.



TOP 1' CONSISTS OF ROTATABLE TOP ASSEMBLY. SEE DWG # 127799-B FOR INSTALLATION DETAILS. JAM NUTS NOT REQUIRED.

ALL CONNECTIONS ARE A-325 BOLTS SEE TABLE ABOVE FOR SIZE & QTY.

TYPICAL FLUSH FLANGE CONNECTION

VIEW A

SEE PAGE 2 OF THIS DRAWING FOR OPENING INFORMATION.

SEE PAGE 4 OF THIS DRAWING FOR CONNECTION BOLT TIGHTENING SPECIFICATIONS.

SEE PAGE 9 OF THIS DRAWING FOR BASE SECTION INSTALL.

REMOVABLE CLIMBING RUNGS.

AMTRAK
AMTRAK-BRANFORD, CT
MP48 X 150' ASSEMBLY DRAWING

REV	DESCRIPTION OF REVISIONS	INI	DATE
A	REVISED SECTION SIZE, ADDED ANCHOR BOLT NOTE	KWD	07/23/1998

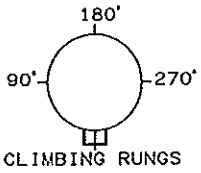
APPROVED/ENG.	KWD	7/23/1998
APPROVED/FOUND.	N/A	
COPYRIGHT 2015		
DRAWN BY	TSD	
ENG. FILE NO.	A-114856-Q-76241	
ARCHIVE		

PIROD INC.
1545 Pidco Dr.
Plymouth, IN 46563-0128
219-936-4221

DRAWING NO. 204007-B
PAGE 1 OF 9

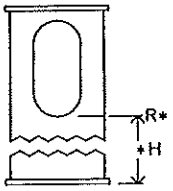
From 76241.DFT - 08/30/98 15:17
Printed from 204007_010A.DWG * 07/23/1998 09:30 @ 02/18/2015 17:25

OPENINGS & BRACKETS WELDED TO POLE				
HEIGHT *H	TYP	DESCRIPTION	ANGL.	ASSEMBLY DRAWING#
148' -11"	13	SAFETY CLIMB BRACKET	0°	
148' -6"	9	4" X 6" PORTHOLE EXITING UP	80°	
148' -6"	9	4" X 6" PORTHOLE EXITING UP	200°	
148' -6"	9	4" X 6" PORTHOLE EXITING UP	320°	
147' -6"	9	4" X 6" PORTHOLE EXITING UP	80°	
147' -6"	9	4" X 6" PORTHOLE EXITING UP	200°	
147' -6"	9	4" X 6" PORTHOLE EXITING UP	320°	
127' -9"	9	4" X 6" PORTHOLE EXITING UP	80°	
127' -9"	9	4" X 6" PORTHOLE EXITING UP	200°	
127' -9"	9	4" X 6" PORTHOLE EXITING UP	320°	
126' -9"	9	4" X 6" PORTHOLE EXITING UP	80°	
126' -9"	9	4" X 6" PORTHOLE EXITING UP	200°	
126' -9"	9	4" X 6" PORTHOLE EXITING UP	320°	
125' -9"	19	PAD EYES FOR FUTURE PLATFORM	SEE>	121975-B
107' -9"	9	4" X 6" PORTHOLE EXITING UP	80°	
107' -9"	9	4" X 6" PORTHOLE EXITING UP	200°	
107' -9"	9	4" X 6" PORTHOLE EXITING UP	320°	
106' -9"	9	4" X 6" PORTHOLE EXITING UP	80°	
106' -9"	9	4" X 6" PORTHOLE EXITING UP	200°	
106' -9"	9	4" X 6" PORTHOLE EXITING UP	320°	
105' -9"	19	PAD EYES FOR FUTURE PLATFORM	SEE>	121975-B
97' -6"	9	4" X 6" PORTHOLE EXITING UP	170°	
69'	9	4" X 6" PORTHOLE EXITING UP	170°	
49'	9	4" X 6" PORTHOLE EXITING UP	170°	
10'	8	TRANS. LINE BRIDGE ATTACH BRACKET	30°	
9' -6"	13	SAFETY CLIMB BRACKET	0°	
7' -6"	2	10" X 25" OVAL PORTHOLE	30°	
6' -11"	7	GROUNDING PLATE	30°	
4'	8	TRANS. LINE BRIDGE ATTACH BRACKET	120°	
4'	8	TRANS. LINE BRIDGE ATTACH BRACKET	210°	
1' -6"	2	10" X 25" OVAL PORTHOLE	120°	
1' -6"	2	10" X 25" OVAL PORTHOLE	210°	
1'	7	GROUNDING PLATE	120°	
1'	7	GROUNDING PLATE	210°	
1'	18	GROUNDING ANGLES (3)	SEE>	131093-B

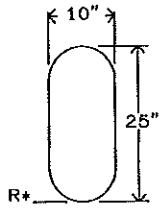


CLIMBING RUNGS

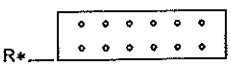
THE ANGLE TO THE OPENING IS MEASURED CLOCKWISE FROM THE CENTER-LINE OF THE CLIMBING RUNGS WHEN LOOKING DOWN.



* THE HEIGHT IN THE TABLE IS THE DISTANCE FROM THE BASE OF THE BOTTOM SECTION OF THE POLE TO THE OPENING REFERENCE (R*) AS SHOWN ON PAGES 2 - 3 OF THIS DRAWING.



TYPE 2 OPENING



GROUNDING PLATE

LINE BRIDGE BRACKET

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MP48 X 150' OPENINGS

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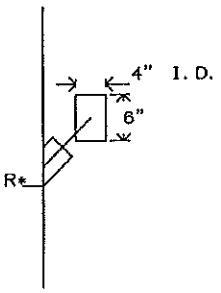
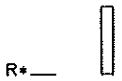
PAGE 2 OF 9



TYPE 9
OPENING



SAFETY CLIMB
BRACKET

FRONT VIEW TOP VIEW

GROUNDING ANGLE

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MP48 X 150' OPENINGS

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PAGE 3 OF 9

GENERAL NOTES

1. TOWER DESIGN CONFORMS TO STANDARD EIA/TIA-222-F FOR 85 MPH BASIC WIND SPEED WITH NO ICE.
   TOWER DESIGN CONFORMS TO STANDARD EIA/TIA-222-F FOR 85 MPH BASIC WIND SPEED WITH 0.50" RADIAL ICE WITH LOAD DUE TO WIND REDUCED BY 25% WHEN CONSIDERED SIMULTANEOUSLY WITH ICE.
2. MATERIAL: (A) SOLID RODS CONFORM TO ASTM A-572 GRADE 50 REQUIREMENTS.
   (B) ANGLES CONFORM TO ASTM A-36 REQUIREMENTS.
   (C) PIPE CONFORMS TO ASTM A-53 TYPE E, GRADE B REQUIREMENTS. (MIN YIELD STRENGTH=42 KSI)
   (D) ALL STEEL PLATES CONFORM TO ASTM A-36 REQUIREMENTS.
3. BASE REACTIONS PER EIA/TIA-222-F FOR 85 MPH BASIC WIND SPEED WITH NO ICE.
   TOTAL WEIGHT= 25.9 KIPS.
   MOMENT= 1489.9 KIP-FT.
   MAXIMUM SHEAR= 15.3 KIPS TOTAL.
4. BASE REACTIONS PER EIA/TIA-222-F FOR 85 MPH BASIC WIND SPEED WITH 0.50" RADIAL ICE:
   TOTAL WEIGHT= 28.7 KIPS.
   MOMENT= 1173.5 KIP-FT.
   MAXIMUM SHEAR= 12.0 KIPS TOTAL.
5. FINISH: HOT DIPPED GALVANIZED AFTER FABRICATION.
6. ANTENNAS: TOP (6) EMSFR65-17-XXDP ANTENNAS MOUNTED ON A LOW PROFILE TOP USING 1-5/8" LINES.
   130' (6) EMSFR65-17-XXDP ANTENNAS MOUNTED ON A LOW PROFILE CLAMP-ON ROTATABLE PLATFORM USING 1-5/8" LINES.
   110' (6) EMSFR65-17-XXDP ANTENNAS MOUNTED ON A LOW PROFILE CLAMP-ON ROTATABLE PLATFORM USING 1-5/8" LINES.
   100' (1) PD220 ANTENNA MOUNTED ON A 4' - 6" SIDE ARM USING 1-5/8" LINE.
   70' (1) PD220 ANTENNA MOUNTED ON A 4' - 6" SIDE ARM USING 1-5/8" LINE.
   50' (1) PD220 ANTENNA MOUNTED ON A 4' - 6" SIDE ARM USING 1-5/8" LINE.
7. INSTALL BASE SECTION WITH MINIMUM OF 2" CLEARANCE ABOVE CONCRETE.
8. MIN. WELDS 5/16" UNLESS OTHERWISE SPECIFIED. ALL WELDING TO CONFORM TO AWS SPECIFICATIONS.
9. ALL BOLTS MUST BE IN PLACE WITH JAM NUTS PRIOR TO ERECTION OF THE STRUCTURE. ALL BOLTS AND NUTS MUST BE IN PLACE AND TIGHTENED BEFORE THE ADJOINING SECTION(S) ARE PLACED.
10. ALL A-325 BOLTS SHALL BE PRE-TENSIONED PER AISC SPECIFICATIONS. REFER TO DRAWING # 123107-A ("BOLT PRE-TENSIONING REQUIREMENTS".)
11. EIA GROUNDING FOR TOWER.
12. OUTSIDE CLIMB RUNGS WITH SAFETY CLIMB.
13. MONOPOLE TO BE PAINTED SLATE GRAY.
14. MONOPOLE REACTIONS WERE NOT RUN WITH A LIGHTNING ROD EXTENDER.
15. ALL ANCHOR BOLTS TO CONFORM TO ASTM - A687 SPECIFICATIONS.

REV	DESCRIPTION OF REVISIONS	INI	DATE
A	REVISED SECTION SIZE, ADDED ANCHOR BOLT NOTE	KWD	07/23/1998

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MP48 X 150' NOTES

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DRAWING NO. 204007-B
PAGE 4 OF 9

FOUNDATION NOTES

1. SOIL AS PER REPORT BY FRENCH & PARRELLO ASSOCIATES, P.A., DATED: 6/10/98 (98A012ER2)
2. CONCRETE TO BE 4500 PSI @ 28 DAYS. REINFORCING BAR TO CONFORM TO ASTM A615 GRADE 60 SPECIFICATIONS. CONCRETE INSTALLATION TO CONFORM TO ACI-318 BUILDING REQUIREMENTS FOR REINFORCED CONCRETE. ALL CONCRETE TO BE PLACED AGAINST UNDISTURBED EARTH FREE OF WATER AND ALL FOREIGN OBJECTS AND MATERIALS. A MINIMUM OF THREE' INCHES OF CONCRETE SHALL COVER ALL REINFORCEMENT. WELDING OF REBAR NOT PERMITTED.
3. A COLD JOINT IS PERMISSIBLE UPON CONSULTATION WITH PIROD. ALL COLD JOINTS SHALL BE COATED WITH BONDING AGENTS PRIOR TO SECOND POUR.
4. ALL REINFORCING STEEL TO BE FORMED INTO A CAGE PRIOR TO SETTING INTO POSITION IN THE EXCAVATED PIER.
5. PERMANENT STEEL CASING SHALL NOT BE USED WITHOUT CONSENT FROM FOUNDATION DESIGNERS.
6. GROUTING OF MONOPOLE BASE IS OPTIONAL. IF GROUT IS 'USED, DRAINAGE MUST BE PROVIDED FROM THE INTERIOR OF THE POLE. REFER TO DRAWING # 118492-B FOR BASE SECTION INSTALLATION.
7. CROWN TOP OF FOUNDATION FOR PROPER DRAINAGE.
8. A TEMPORARY STEEL CASING MAY BE REQUIRED DURING INSTALLATION.

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MP48 X 150' NOTES

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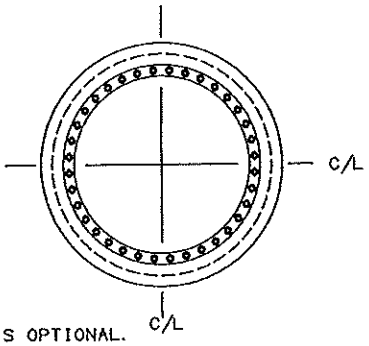
PAGE 5 OF 9

TOP VIEW

TOP AND SIDE VIEWS ARE DRAWN TO DIFFERENT SCALE

BASE FLANGE MUST BE CENTERED IN PIER WITHIN +/- 10% OF PIER DIAMETER

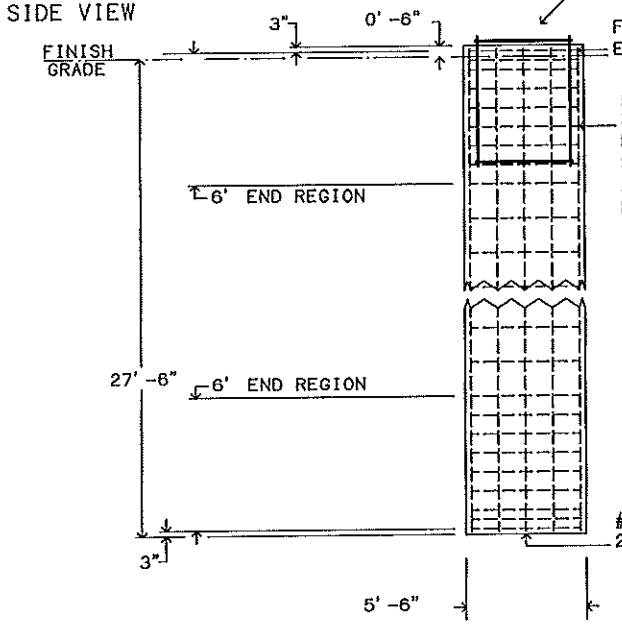


GROUTING OF MONOPOLE BASE IS OPTIONAL. IF GROUT IS USED, DRAINAGE MUST BE PROVIDED FROM THE INTERIOR OF POLE.

CROWN TOP OF FOUNDATION TO FACILITATE DRAINAGE.

FOR ANCHOR STEEL IDENTIFICATION AND PLACEMENT INFORMATION, SEE PAGE 8.
FOR BASE SECTION INSTALLATION, SEE PAGE 9.

SIDE VIEW



FOR DETAIL VIEW OF REBAR CAGE END AREA, SEE PAGE 7. (E)

5 HORIZONTAL TIES - SEE (B) ON PAGE 7.
28 PIECES REQUIRED.
PLACE RINGS AT 0'-11" NOMINAL SPACING WITHIN END REGIONS, AND 1'-6" NOMINAL SPACING IN REMAINDER OF PIER.

#11 VERTICAL REBAR - SEE (A) ON PAGE 7.
25 PIECES REQUIRED , EQUALLY SPACED, TO BE PLACED INSIDE TIES.

TOWER FOUNDATION

24.6 CUBIC YARDS CONCRETE REQUIRED

FOR INSTALLATION SPECIFICATIONS AND ADDITIONAL INFORMATION, SEE PAGE 5 OF THIS DRAWING.

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MP48 X 150' FOUNDATION

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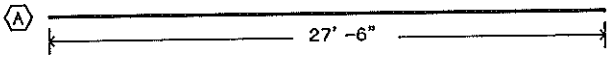
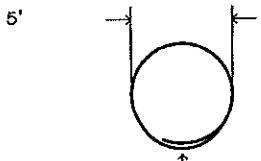


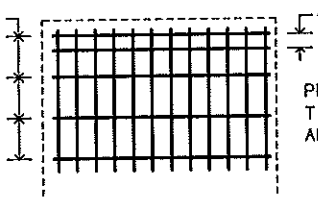
(A) #11 REBAR - 25 PIECES REQ. TOTAL
APPROX WT = 146.1# EACH, 3653# TOTAL



(B) # 5 REBAR - 28 PIECES REQUIRED TOTAL
APPROX UNBENT LENGTH = 17' - 6- 3/8"
APPROX WT = 18.3# EACH, 512# TOTAL

LAP DIMENSION: 1' - 9- 7/8"
PLACE REBAR RINGS SO THAT LAPS ON ADJACENT RINGS ARE 180 DEGREES APART.
SEE PAGE 6 FOR RING PLACEMENT.

PLACE 8 CIRCULAR TIES WITHIN EACH END REGION (TOP AND BOTTOM). PLACE FIRST TIE AT END OF VERTICAL BARS AND CONTINUE SPACING AS SHOWN. SEE PAGE 6 FOR REGION DEFINITION.



DETAIL OF REBAR CAGE END (E)

PLACE AN ADDITIONAL CIRCULAR TIE 4" FROM THE END TIE (TOP AND BOTTOM) AS SHOWN.

REBAR DETAIL

TOTAL APPROX REBAR WEIGHT = 4165#
REINFORCING BAR TO CONFORM TO ASTM A615 GRADE 60 SPECIFICATIONS.

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MP48 X 150' REBAR DETAIL

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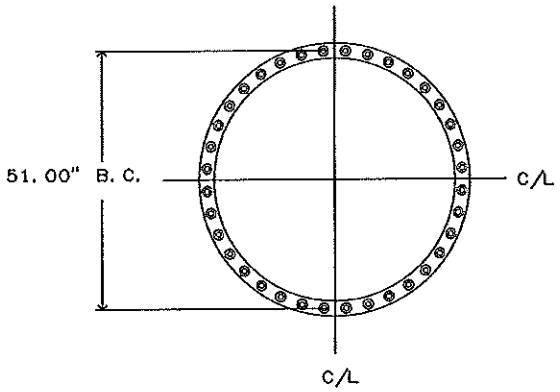
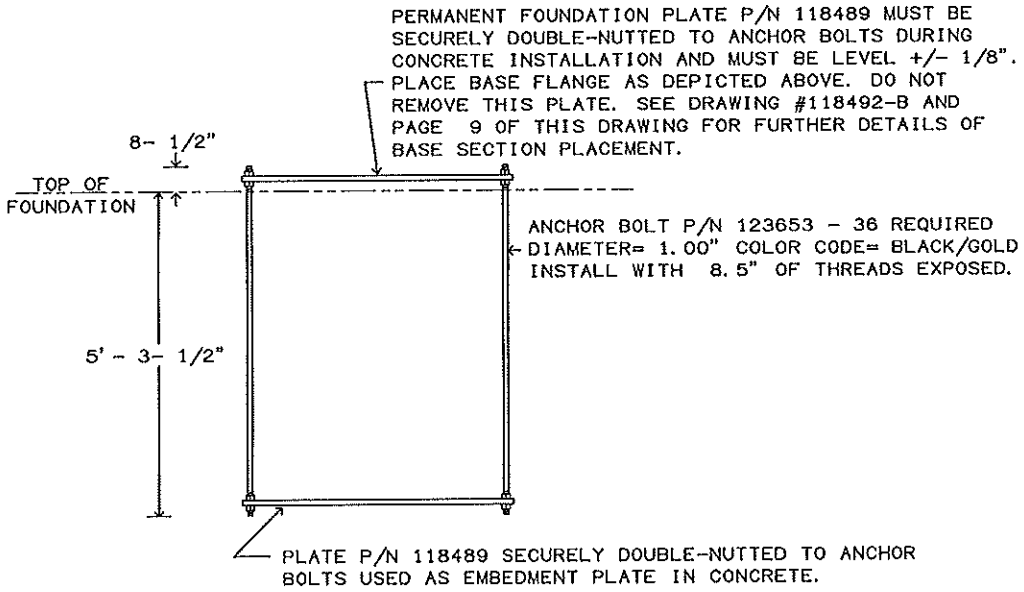
BASE FLANGE MUST BE CENTERED IN PIER
WITHIN +/- 10% OF PIER DIAMETER.



GROUTING OF MONOPOLE BASE IS OPTIONAL.
IF GROUT IS USED, DRAINAGE MUST BE
PROVIDED FROM THE INTERIOR OF POLE.



TOWER ANCHOR STEEL PLACEMENT

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MP48 X 150' ANCHOR STEEL

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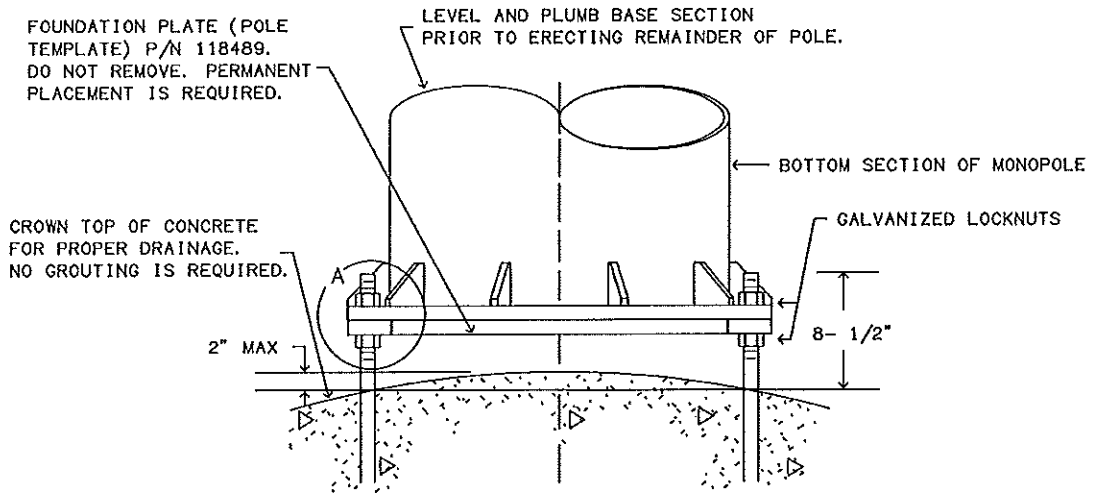

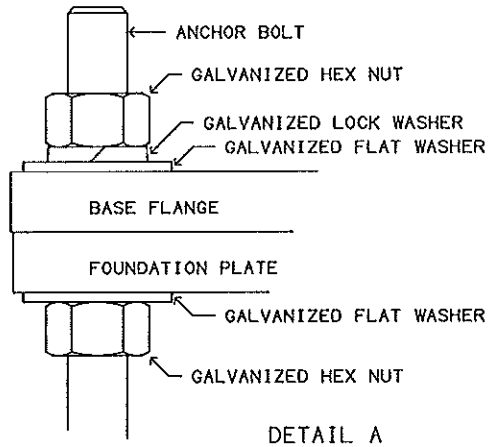

DETAIL A

TOWER BASE SECTION PLACEMENT

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MP48 X 150' BASE SECTION PLACEMENT

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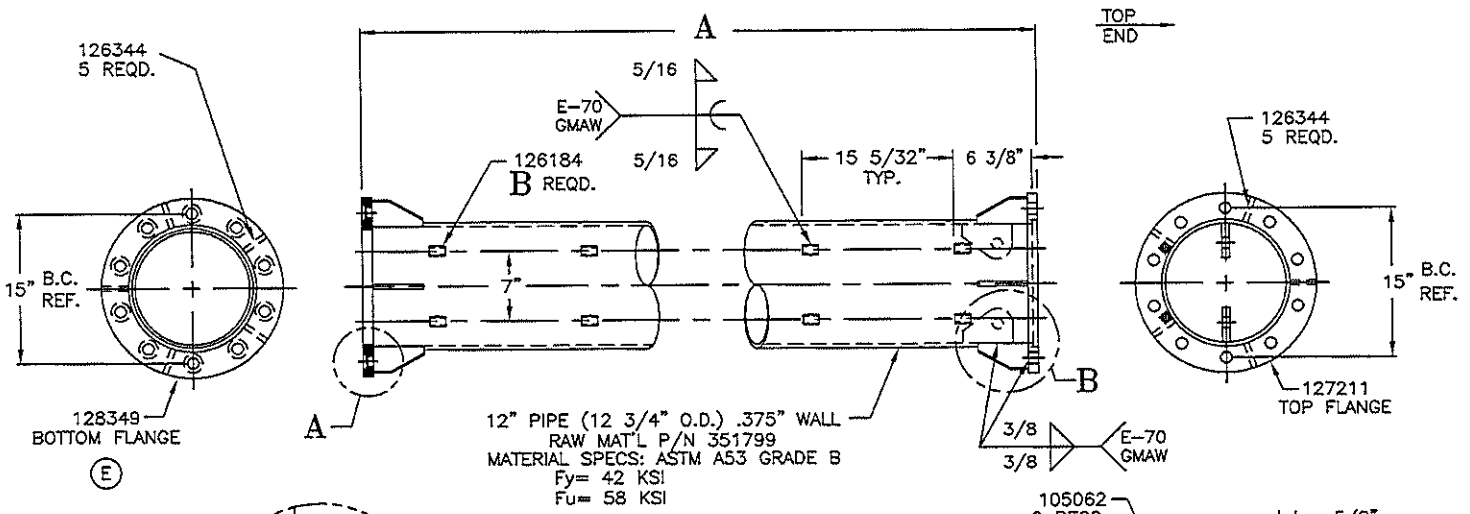
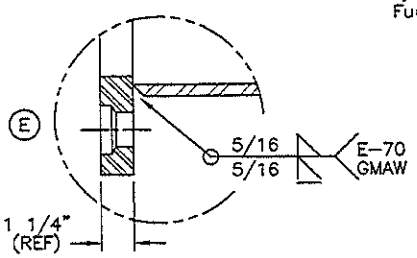
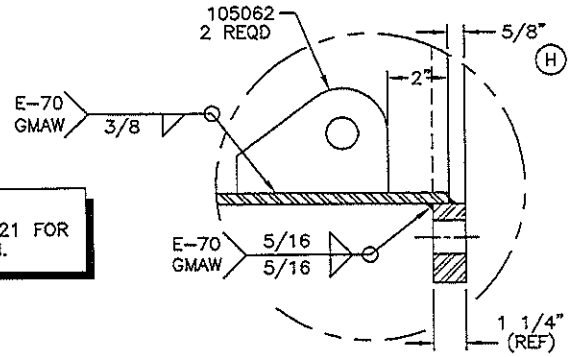




SECTION A

J

NOTE:
REFER TO DWG. 119721 FOR PAD EYE INSTALLATION.



SECTION B

I
H

PART NUMBER	A LENGTH	PIPE LENGTH	B QTY. BUSHINGS	WEIGHT
133620	40'-1 7/8"	40'-0"	64	2,372#
133271	32'-1 7/8"	32'-0"	50	1,846#
126194	30'-1 7/8"	30'-0"	48	1,735#
126276	27'-7 7/8"	27'-6"	44	1,598#
126277	25'-1 7/8"	25'-0"	40	1,461#
126278	22'-7 7/8"	22'-6"	36	1,323#
126178	20'-1 7/8"	20'-0"	32	1,186#

H

PART NUMBER	A LENGTH	PIPE LENGTH	B QTY. BUSHINGS	WEIGHT
126279	17'-7 7/8"	17'-6"	28	1,049#
126280	15'-1 7/8"	15'-0"	24	912#
126281	12'-7 7/8"	12'-6"	20	774#
126282	10'-1 7/8"	10'-0"	16	637#
126283	7'-7 7/8"	7'-6"	12	500#

CHG LET	DESCRIPTION OF REVISIONS	BY	DATE
J	ADDED REF. NOTE	DMF	01/12/99
I	ADDED P/N 133620, DIMENSION CHANGE	CJD	4/30/98
H	ADDED P/N 133271 REVISED DIMENSIONS	DMF	01/29/98
G	REVISED P/N 127345 TO P/N 105062	RCH	4/29/97
F	REMOVED PAGES 2 AND 3	CJD	04/02/97
E	BOTTOM FLANGE CHANGE	CJD	4/23/96

NAME	APPROVED/ ENG.	DR BY	DATE
12" MONOPOLE SECTION EXTERNAL FLANGE WITH REMOVABLE RUNGS	WBR 01/12/99	CJD	8/11/95
APPROVED/ PROD.	SCALE		
KWD 01/12/99	1" = 12"		

FLUSH MOUNT STYLE

PART NO. —

DWG. NO. 126178-B

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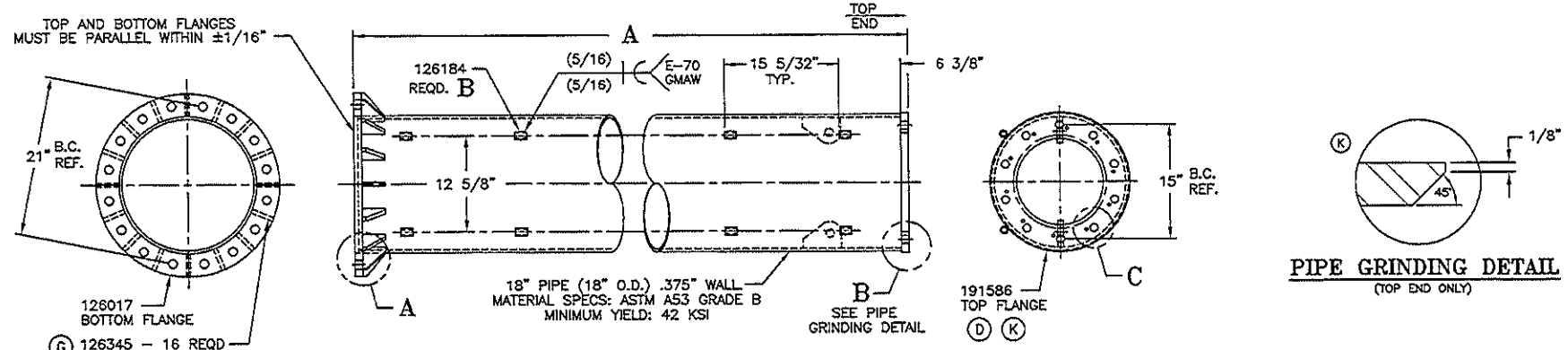
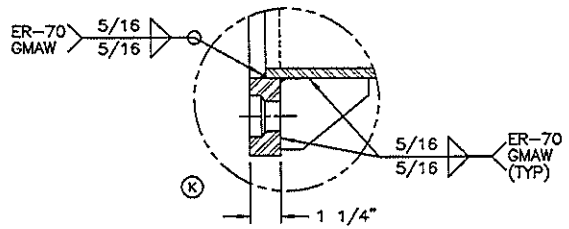
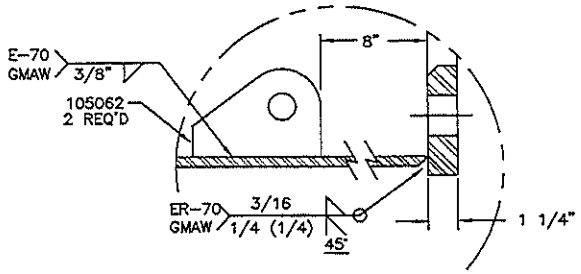




SECTION A



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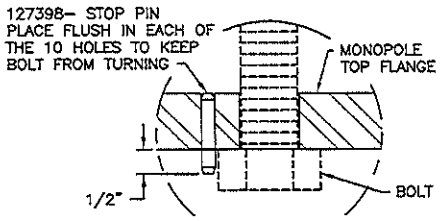

SECTION C

(H)

NOTE:
REFER TO DWG. 119721 FOR PAD EYE INSTALLATION.

	PART NUMBER	A LENGTH	PIPE LENGTH	LENGTH TOLERANCES	B QTY. BUSHINGS	WEIGHT
(F)	133002	40'–1 7/8"	40'–0"	+4 3/4" –2 3/8"	64	3,353#
	126239	30'–1 7/8"	30'–0"	+3 9/16" –1 3/4"	48	2,431#
	126240	27'–7 7/8"	27'–6"	+3 1/4" –1 5/8"	44	2,239#
	126241	25'–1 7/8"	25'–0"	+3" –1 1/2"	40	2,046#
	126242	22'–7 7/8"	22'–6"	+2 11/16" –1 5/16"	36	1,854#
	126055	20'–1 7/8"	20'–0"	+2 3/8" –1 3/16"	32	1,662#

PART NUMBER	A LENGTH	PIPE LENGTH	LENGTH TOLERANCES	B QTY. BUSHINGS	WEIGHT	
126214	17'–5 3/8"	17'–3 1/2"	+2" –1"	28	1,445#	
126243	17'–7 7/8"	17'–6"	+2 1/16" –1"	28	1,496#	
165805	17'–1 7/8"	17'–0"	+2 1/16" –1"	26	1,455#	(J)
126244	15'–1 7/8"	15'–0"	+1 3/4" –7/8"	24	1,277#	
126245	12'–7 7/8"	12'–6"	+1 1/2" –3/4"	20	1,084#	
126246	10'–1 7/8"	10'–0"	+1 3/16" –9/16"	16	892#	
126247	7'–7 7/8"	7'–6"	+7/8" –7/16"	12	700#	

FINISH:
HOT DIP GALVANIZED:

REV.	DESCRIPTION OF REVISIONS	CPD	BY	DATE
K	REVISED WELD SYMBOL TOP FLANGE WAS 128350	3741	TNS	04/13/2005
J	ADDED P/N 165805 & UPDATED BORDER	3089	KWD	05/14/2002
I	NEW BORDER AND REVISED WELD NOTE	2541	TRS	4/10/01
H	ADDED REF. NOTE		DMF	1/12/99
G	REVISED GUSSETS		RCH	5/8/98
F	ADDED P/N 133002		RCH	12/16/97
E	REVISED P/N 127345 TO P/N 105062		RCH	4/29/97
D	TOP FLANGE PART NUMBER CHANGE		CJD	2/13/96

TOLERANCE NOTE:
TOLERANCES ON DIMENSIONS UNLESS OTHERWISE NOTED ARE (PLUS OR MINUS) MACHINING 0.030" AND STRUCTURAL 0.060". BENDS ARE (+ OR –) 1/2 DEGREE.

DESCRIPTION
18" FLUSH MOUNT MONOPOLE SECTION
INTERNAL FLANGE WITH
REMOVABLE RUNGS

valmont STRUCTURES
1–877–467–4763 Plymouth, IN
1–888–860–9191 Salem, OR

DR BY	CPD NO.	DRAWING USAGE
CJD 08/09/1995		SHOP

ENG. APPROVAL	CHECKED BY
WBR 04/18/2005	KWD 04/18/2005

PART NO.

DWG. NO. 126055

PAGE 1 OF 1

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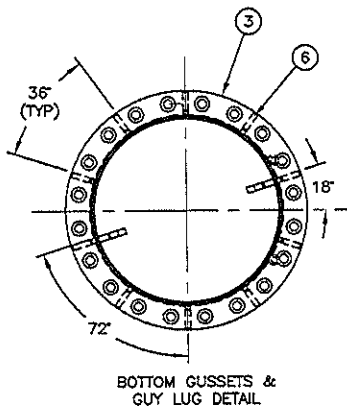
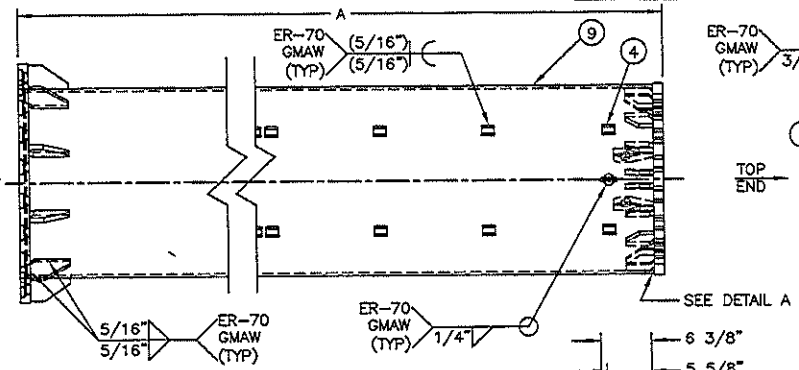
HEAVY STAMP PART NUMBER

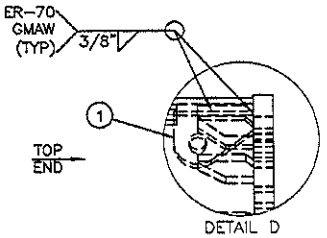
NOTE:
1) ITEM 1 USED IN PLACE OF ITEM 5 AT TOP OF MP.
3) SEE DWG. 131093-B FOR INSTALLATION OF GROUNDING PLATES ON BASE SECTION.

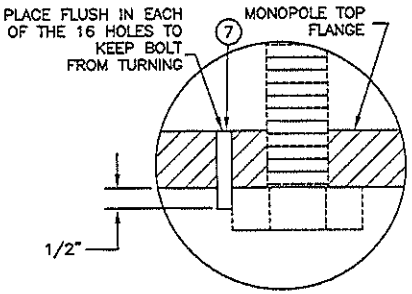
NOTE:
REFER TO DWG. 119721 FOR PAD EYE INSTALLATION.

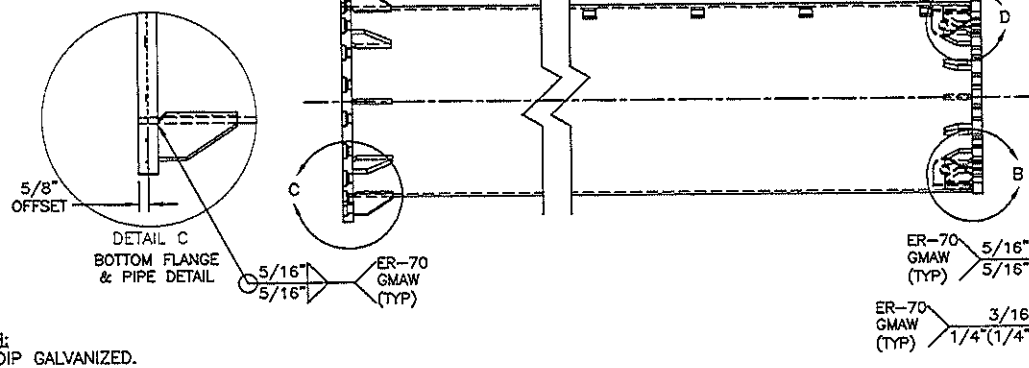
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	2	105062	GUY LUG (1 1/16" DIA. HOLE)	5"	2.71#	5.42#
2	4	119730	#4 PADEYE	2 3/8"	0.51#	2.04#
3	1	126018	24" FLUSH BOTTOM FLANGE FINISHED	30 3/8" DIA.	81.85#	81.85#
4	C	126184	SLEEVE REMOVABLE STEP MOUNTING	1 9/16"	0.44#	
5	14	126342	5/8" THICK MONOPOLE GUSSET	3 1/2"	0.71#	9.94#
6	10	126345	5/8" THICK MONOPOLE GUSSET	5"	1.61#	16.10#
7	16	127398	3/8" STOP PIN FOR MONOPOLE FLANGE	1 3/4"	0.25#	4.00#
8	1	191587	24" MP FLUSH MOUNT TOP FLANGE	24 3/8" DIA.	66.90#	66.90#
9	1	351818	24" O.D. X 0.375" WALL PIPE (API 5L X42)	B		
					TOTAL WT.	D

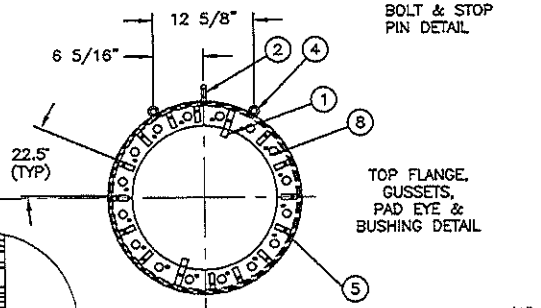


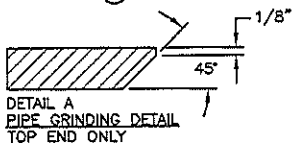












FINISH:
HOT DIP GALVANIZED.

REV.	DESCRIPTION OF REVISIONS	CPD	BY	DATE
M	ROTATED BOTTOM GUSSETS, ADDED FLANGE DETAIL	3840	BTJ	11/14/2006
L	REDRAWN, UPDATED, ADDED P/N 195935	3810	BTJ	10/19/2005
K	REVISED WELD, ADDED CHAMFER,TOP FL.WAS 126009	3741	TNS	04/04/2005
J	ADDED SLEEVE DIMENSION	2724	TRS	08/24/2001
I	ADDED P/N 141114		DLK	05/23/2000
H	ADDED REF. NOTE		DMF	01/12/1999
G	ADDED P/N 136181		RCH	01/12/1999

TOLERANCE NOTE:
TOLERANCES ON DIMENSIONS UNLESS OTHERWISE NOTED ARE (PLUS OR MINUS) MACHINING 0.030" AND STRUCTURAL 0.060". BENDS ARE (+ OR -) 1/2 DEGREE.

DESCRIPTION
24" MONOPOLE SECTION
INTERNAL FLANGE WITH
REMOVEABLE RUNGS

valmont STRUCTURES
1-877-467-4763 Plymouth, IN
1-888-880-9191 Salem, OR

DR BY	CPD NO.	DRAWING USAGE
CJD 05/24/2000		SHOP

ENG. APPROVAL	CHECKED BY
TBC 11/15/2006	KWD 11/15/2006

PART NO. SEE TABLE

DWG. NO. 126056

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HEAVY STAMP
PART NUMBER

PART NUMBER	A LENGTH	B PIPE LENGTH	LENGTH TOLERANCES	C QTY. BUSHINGS	D GALVANIZED WT.
132678	40'-1 7/8"	40'-0"	+4 3/4" -2 3/8"	64	4199.17#
195935	38'-1 7/8"	38'-0"	+4 15/32" -2 15/64"	60	3998.62#
133298	35'-1 7/8"	35'-0"	+4 3/16" -2 3/32"	56	3698.72#
126248	30'-1 7/8"	30'-0"	+3 9/16" -1 3/4"	48	3198.27#
126249	27'-7 7/8"	27'-6"	+3 1/4" -1 5/8"	44	2948.04#
126250	25'-1 7/8"	25'-0"	+3 -1 1/2"	40	2697.82#
126251	22'-7 7/8"	22'-6"	+2 11/16" - 1 5/16"	36	2447.59#
126056	20'-1 7/8"	20'-0"	+2 3/8" -1 3/16"	32	2197.37#
126252	17'-7 7/8"	17'-6"	+2" -1"	28	1947.14#
126253	15'-1 7/8"	15'-0"	+1 3/4" -7/8"	24	1696.92#
126254	12'-7 7/8"	12'-6"	+1 1/2" -3/4"	20	1446.69#
126255	10'-1 7/8"	10'-0"	+1 3/16" -9/16"	16	1196.46#
126256	7'-7 7/8"	7'-6"	+7/8" -7/16"	12	946.24#
136181	6'-1 7/8"	6'-0"	+7/8" -7/16"	10	796.29#
141114	2'-7 7/8"	2'-6"	+9/16" -5/32"	4	445.79#

FINISH:
HOT DIP GALVANIZED.

REV.	DESCRIPTION OF REVISIONS	CPD	BY	DATE
M	ROTATED BOTTOM GUSSETS, ADDED FLANGE DETAIL	3840	BTJ	11/14/2006
L	REDRAWN, UPDATED, ADDED P/N 195935	3810	BTJ	10/19/2005
K	REVISED WELD, ADDED CHAMFER,TOP FL.WAS 126009	3741	TNS	04/04/2005
J	ADDED SLEEVE DIMENSION	2724	TRS	08/24/2001
I	ADDED P/N 141114		DLK	05/23/2000
H	ADDED REF. NOTE		DMF	01/12/1999
G	ADDED P/N 136181		RCH	01/12/1999

TOLERANCE NOTE:
TOLERANCES ON DIMENSIONS UNLESS OTHERWISE NOTED ARE (PLUS OR MINUS) MACHINING 0.030" AND STRUCTURAL 0.060". BENDS ARE (+ OR -) 1/2 DEGREE.

DESCRIPTION
24" MONOPOLE SECTION
INTERNAL FLANGE WITH
REMOVEABLE RUNGS

DR BY	CPD NO.	DRAWING USAGE
CJD 05/24/2000		SHOP

ENG. APPROVAL	CHECKED BY
TBC 11/15/2006	KWD 11/15/2006

valmont STRUCTURES
1-877-467-4763 Plymouth, IN
1-888-880-9191 Salem, OR

PART NO. SEE CHART

DWG. NO. 126056

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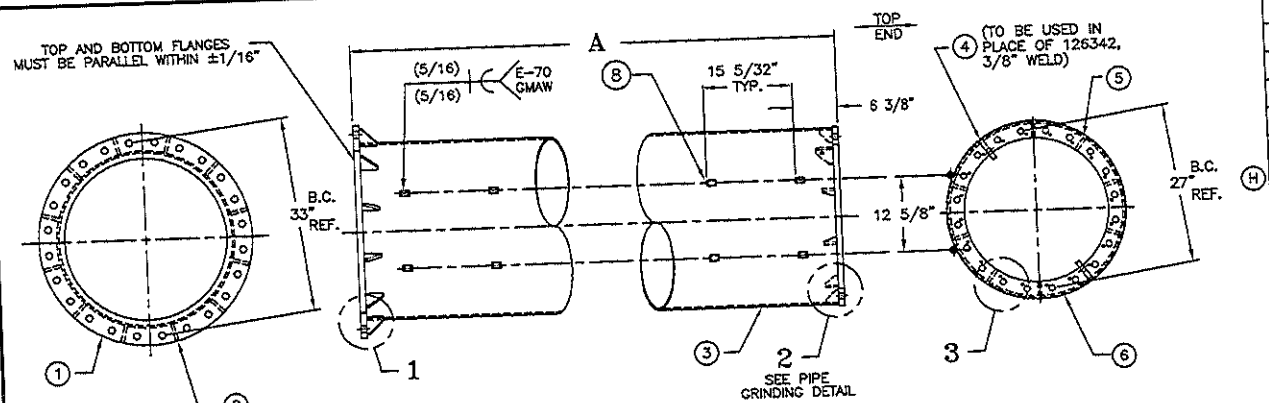
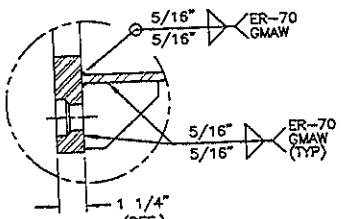
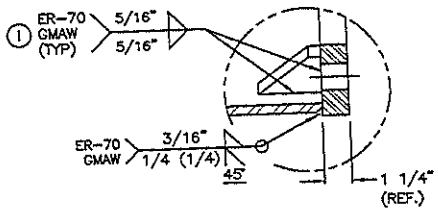


PARTS LIST					
ITEM	QTY.	PART NO.	DESCRIPTION	LENGTH	WEIGHT
1	1	126019	BOTTOM FLANGE		151#
2	12	126345	GUSSET		1.61#
3	1	351819	30" A53 PIPE .375 WALL	SEE PIPE LENGTH	
4	2	105062	GUY LUG		3.00#
5	8	126342	GUSSET		0.71#
6	1	191589	TOP FLANGE		87.2#
7	20	127398	SPRING PINS		0.25#
8	SEE B	126184	BUSHINGS		0.42#



SECTION 1



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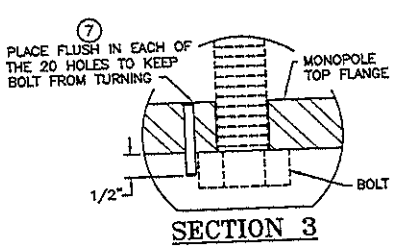

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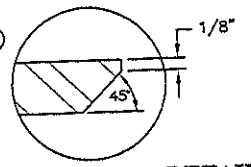

PIPE GRINDING DETAIL
(TOP END ONLY)

NOTE:
REFER TO DWG. 119721 FOR PAD EYE INSTALLATION.

PART NUMBER	A LENGTH	PIPE LENGTH	LENGTH TOLERANCES	B QTY. BUSHINGS	WEIGHT
126261	7'-8 1/2"	7'-6"	+7/8" -7/16"	12	1,168#
G 168294	9'-2 1/2"	9'-0"	+1 3/16" -9/16"	16	1,326#
126260	10'-2 1/2"	10'-0"	+1 3/16" -9/16"	16	1,474#
126259	12'-8 1/2"	12'-6"	+1 1/2" -3/4"	20	1,792#
126258	15'-2 1/2"	15'-0"	+1 3/4" -7/8"	24	2,111#
150445	16'-2 1/2"	16'-0"	1 15/16" -31/32"	26	2240#
126257	17'-8 1/2"	17'-6"	+2 1/16" -1"	28	2,429#

PART NUMBER	A LENGTH	PIPE LENGTH	LENGTH TOLERANCES	B QTY. BUSHINGS	WEIGHT
126057	20'-2 1/2"	20'-0"	+2 3/8" -1 3/16"	32	2,747#
126447	22'-8 1/2"	22'-6"	+2 11/16" -1 5/16"	36	3,066#
126446	25'-2 1/2"	25'-0"	+3" -1 1/2"	40	3,384#
135509	26'-2 1/2"	26'-0"	+3 1/8" -1 9/16"	42	3,504#
126445	27'-8 1/2"	27'-6"	+3 1/4" -1 5/8"	44	3,703#
126444	30'-2 1/2"	30'-0"	+3 9/16" -1 3/4"	48	4,021#

FLUSH MOUNTING STYLE

REV.	DESCRIPTION OF REVISIONS	CPD	BY	DATE
I	REVISED WELD SIZE FROM 3/8" TO 5/16" SECT 2	3718	KWD	06/27/2005
H	REVISED WELD SYMBOLS, TOP FLANGE WAS 126010	3741	TNS	04/13/2005
G	ADDED P/N 168294	3256	KWD	10/08/2002
F	ADDED P/N 150445	2256	DLK	08/04/2000
E	ADDED REF. NOTE		DMF	01/12/1999
D	ADDED P/N 135509		DMF	08/28/1998
C	REVISED GUSSETS		RCH	05/08/1998
B	REVISED P/N 127345 TO P/N 105062		RCH	04/29/1997

TOLERANCE NOTE:
TOLERANCES ON DIMENSIONS UNLESS OTHERWISE NOTED ARE (PLUS OR MINUS) MACHINING 0.030" AND STRUCTURAL 0.060". BENDS ARE (+ OR −) 1/2 DEGREE.

DESCRIPTION
30" MONOPOLE SECTION
INTERNAL FLANGE WITH
REMOVABLE RUNGS

valmont STRUCTURES
1-877-467-4763 Plymouth, IN
1-888-880-9191 Salem, OR

DR BY	CPD NO.	DRAWING USAGE
CJD 08/09/1995		SHOP

ENG. APPROVAL	CHECKED BY
WBR 04/18/2005	KWD 06/27/2005

PART NO.

DWG. NO. 126057

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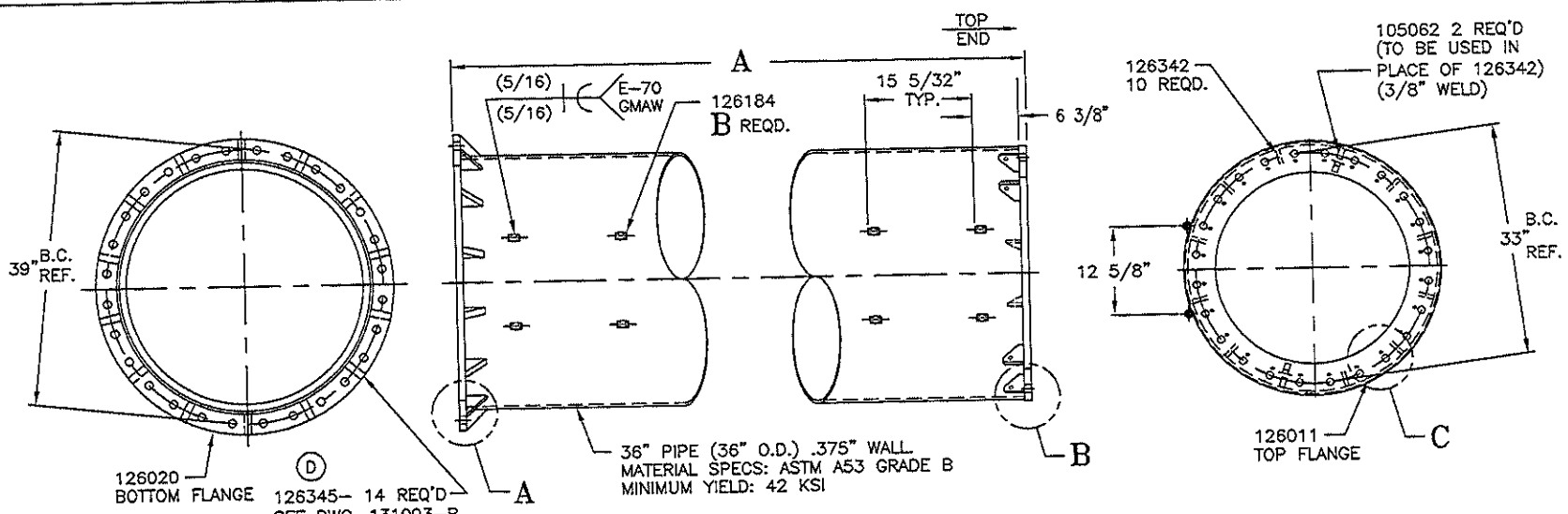

NOTE:
REFER TO DWG. 119721 FOR PAD EYE INSTALLATION.

PART NUMBER	A LENGTH	PIPE LENGTH	B QTY. BUSHINGS	WEIGHT
126058	20'–2 1/2"	20'–0"	32	3,290#
126262	17'–8 1/2"	17'–6"	28	2,909#
126263	15'–2 1/2"	15'–0"	24	2,527#
126264	12'–8 1/2"	12'–6"	20	2,146#
126265	10'–2 1/2"	10'–0"	16	1,765#
126266	7'–8 1/2"	7'–6"	12	1,383#

F

PART NUMBER	A LENGTH	PIPE LENGTH	B QTY. BUSHINGS	WEIGHT
126503	30'–2 1/2"	30'–0"	48	4,816#
126504	27'–8 1/2"	27'–6"	44	4,435#
126505	25'–2 1/2"	25'–0"	40	4,053#
135554	23'–2 1/2"	23'–0"	36	3,743#
126506	22'–8 1/2"	22'–6"	36	3,672#

LET	DESCRIPTION OF REVISIONS	BY	DATE
G	ADDED REF. NOTE	DMF	01/12/99
F	ADDED P/N 135554	RCH	12/15/98
E	REVISED GUSSET ORIENTATION	RCH	09/24/98
D	REVISED GUSSET ORIENTATION	RCH	09/24/98
C	REVISED P/N 127345 TO P/N 105062	RCH	04/29/97
B	WELD / SPRING PIN CHANGES	CJD	02/26/96

NAME	APPROVED/ ENG.	DR BY	DATE
36" MONOPOLE SECTION INTERNAL FLANGE WITH REMOVABLE RUNGS	WBR 01/12/99	CJD	8/9/95
FLUSH MOUNT STYLE	APPROVED/ PROD.	SCALE	
	KWD 01/12/99	3/4" = 12"	

PART NO. SEE CHART

DWG. NO. 126058–B

PIROD INC.
1545 Pidco Dr.
Plymouth, IN 46563–0128
219–936–4221

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CHG LET	DESCRIPTION OF REVISIONS	BY	DATE
G	ADDED REF. NOTE	DMF	01/12/99
F	ADDED P/N'S 135909 AND 135912	RCH	10/12/98
E	REVISED GUSSET ORIENTATION	RCH	09/24/98
D	REVISED GUSSETS	RCH	5/08/98
C	REVISED P/N 127345 TO P/N 105062	RCH	04/29/97
B	ADDED P/N 128862	CDP	6/13/96
A	WELD / SPRING PIN CHANGES	CJD	02/28/96

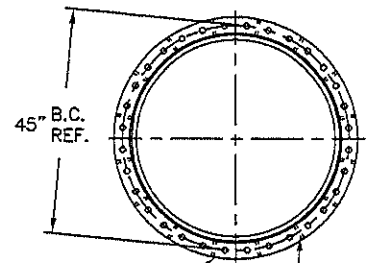
NAME	APPROVED/ ENG.	DR BY	DATE
42" MONOPOLE SECTION INTERNAL FLANGE WITH REMOVABLE RUNGS	WBR 01/12/99	CJD	8/9/95
	APPROVED/ PROD.	SCALE	
	KWD 01/12/99	1/2" = 12"	

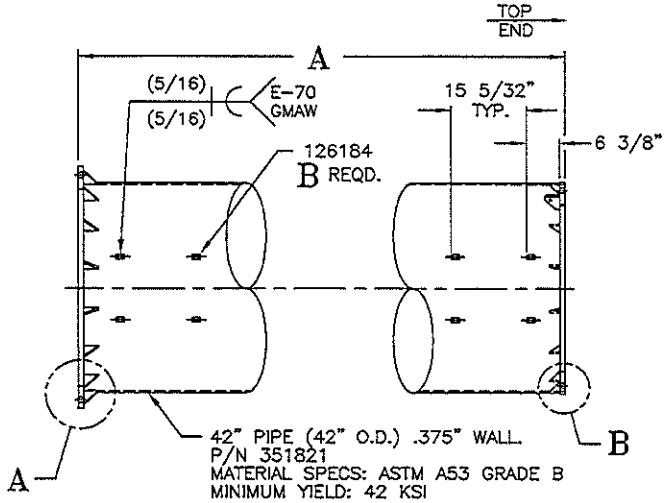
FLUSH MOUNT STYLE

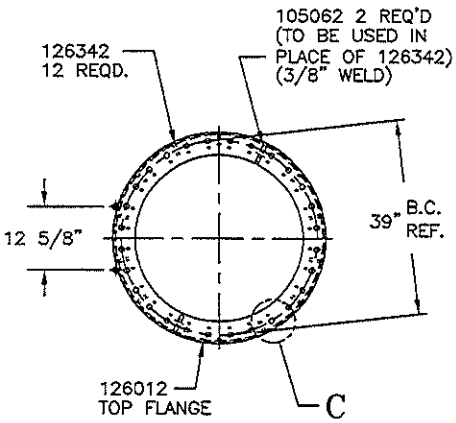
PART NO. SEE CHART

PIROD INC.
1545 Pidco Dr.
Plymouth, IN 46563-0128
219-936-4221

DWG. NO. 126059-B

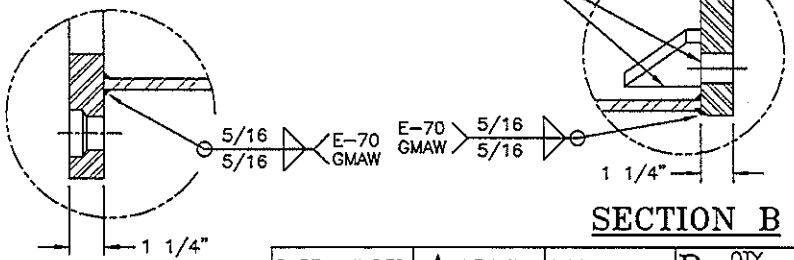






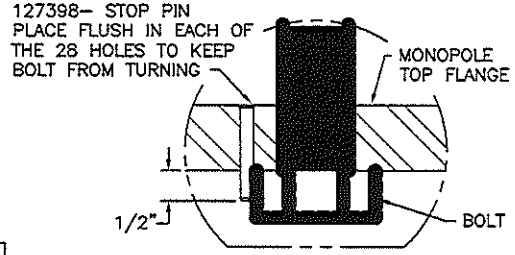
(D) 126345- 16 REQ'D
SEE DWG. 131093-B
FOR INSTALLATION OF GROUNDING PLATES ON BASE SECTIONS.

FOR DETAILED WELD SPECS SEE DRAWING 126453



SECTION A

SECTION B



SECTION C

PART NUMBER	A LENGTH	PIPE LENGTH	B QTY. BUSHINGS	WEIGHT
128862	30'-2 1/2"	30'-0"	48	5,456#
135909	27'-8 1/2"	27'-6"	44	5,038#
135912	25'-2 1/2"	25'-0"	40	4,620#
126059	20'-2 1/2"	20'-0"	32	3,783#
126267	15'-2 1/2"	15'-0"	24	2,947#
126268	10'-2 1/2"	10'-0"	16	2,110#

(G) (F)

NOTE:
REFER TO DWG. 119721 FOR PAD EYE INSTALLATION.

Printed: 02/19/2015 08:04

WRITE P/N IN YELLOW

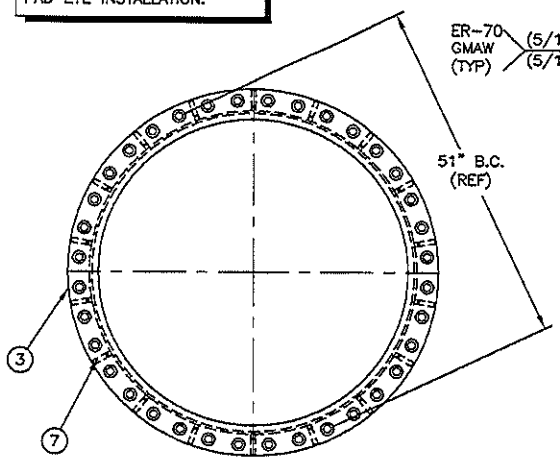
PART NUMBER	A LENGTH	B PIPE LENGTH	C QTY. BUSHINGS	D GALV. WEIGHT
150441	30'-2 1/2"	30'-0"	48	6,517#
163534	27'-2 1/2"	27'-0"	44	5914#
126060	20'-2 1/2"	20'-0"	32	4507#
126269	15'-2 1/2"	15'-0"	24	3502#
126270	10'-2 1/2"	10'-0"	16	2497#

Parts List

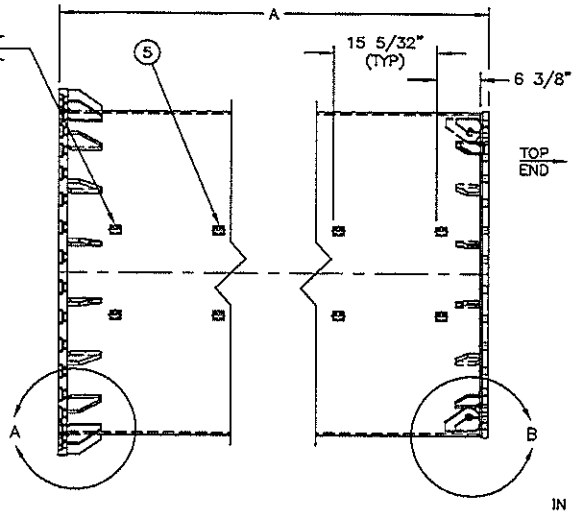
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	2	105062	GUY LUG (1 1/16" HOLE)	5"	2.71#	5.42#
2	10	119730	#4 PAD EYE	2 3/8"	0.51#	5.10#
3	1	126013	48" M.P. FLUSH TOP FLANGE	48 3/8"	208.00	208.00#
4	1	126022	48" FLUSH BOTTOM FLANGE FINISHED	54 3/8"	223.00	223.00#
5	C	126184	BUSHING-- REMOVABLE STEP MOUNTING	1 9/16"	0.44	
6	14	126342	2" X 3 1/2" X 5/8" M/P GUSSET	3 1/2"	0.71	9.94#
7	18	126345	3" X 5" X 5/8" M/P GUSSET	5"	1.61	28.98#
8	32	127398	3/8" SPRING PIN	1 3/4"	0.25	8.00#
9	1	351822	48" O.D. x .375" WALL PIPE (API 5L X42)	B		
					TOTAL WT.	D

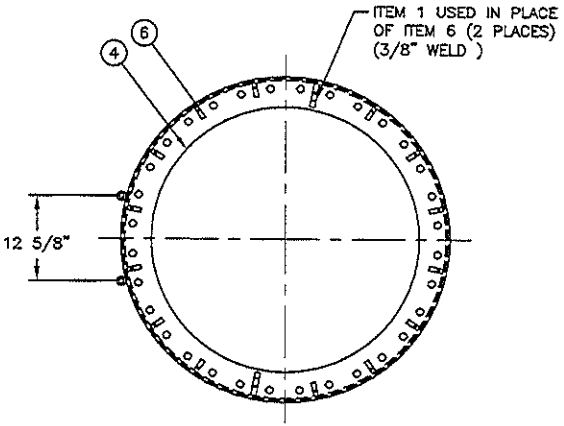
ITEM 2 INFORMATION

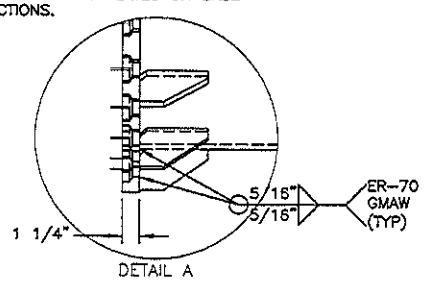
NOTE:
REFER TO DWG. 119721 FOR PAD EYE INSTALLATION.



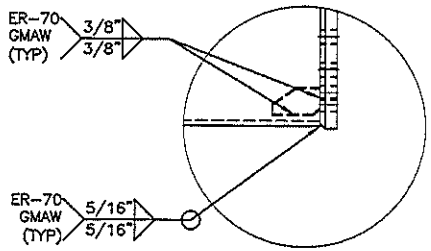
SEE DWG 131093 FOR INSTALLATION OF GROUNDING PLATES ON BASE SECTIONS.



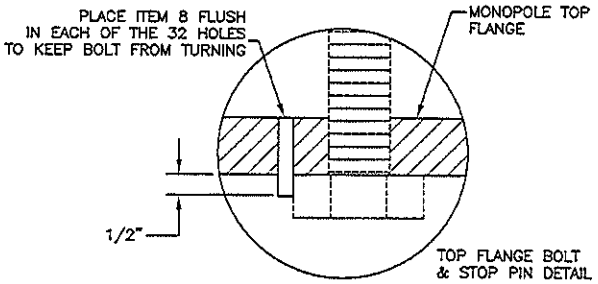




DETAIL A



DETAIL B



TOP FLANGE BOLT & STOP PIN DETAIL

REV.	DESCRIPTION OF REVISIONS	CPD	BY	DATE
H	REDRAWN, ADDED GUSSET TO DETAIL A	3840	BTJ	12/08/2006
G	ADDED P/N 163534	3023	KWD	03/21/2002
F	ADDED P/N 150441	2229	DLK	07/11/2000
E	ADDED REF. NOTE		DMF	01/12/1999
D	REVISED GUSSET ORIENTATION		RCH	09/24/1998
C	REVISED GUSSETS		RCH	05/08/1998
B	REVISED P/N 127345 TO P/N 105062		RCH	04/29/1997
A	WELD/ SPRING PIN CHANGES		CJD	02/28/1996

TOLERANCE NOTE:
TOLERANCES ON DIMENSIONS UNLESS OTHERWISE NOTED ARE (PLUS OR MINUS) MACHINING 0.030" AND STRUCTURAL 0.060". BENDS ARE (+ OR -) 1/2 DEGREE.

DESCRIPTION
48" MONOPOLE SECTION-- INTERNAL FLANGE, REMOVABLE RUNGS-- FLUSH MOUNT STYLE

valmont STRUCTURES
1-877-467-4763 Plymouth, IN
1-888-880-9191 Salem, OR

DR BY	CPD NO.	DRAWING USAGE	PART NO.
CJD 08/09/1995		SHOP	
ENG. APPROVAL	CHECKED BY		DWG. NO.
TBC 12/12/2006	MVC 12/12/2006		126060

PAGE 1 OF 1

APPENDIX E

TOWER MAPPING REPORT (2015)

TOWER ELEVATION PHOTO

PROJECT INFORMATION:

150' SELF-SUPPORTING POLE STRUCTURE

TOWER MAPPING

PROJECT NAME:

AMTRAK-BRANFORD

SITE NUMBER:

CT11024B

Hosley Ave
Branford, CT 06406
(New Haven County)

MAPPING DATE:

01/13/2015

LATITUDE:	N 41° 17' 0.06"	N 41.283349°
LONGITUDE:	W 72° 50' 57.72"	W 72.849368°
GROUND ELEVATION (AMSL):	55-FT	
TOWER MANUFACTURER:	Pirod	
TOWER MODEL OR SERIAL #:	-	
STRUCTURE HEIGHT:	151'-10"	
FCC REGISTRATION:	-	

TABLE OF CONTENTS

PAGE #	DESCRIPTION
1	Title Sheet
2	Compound Plan Sketch
3	Base Plate / Top of Foundation Details
4	Ladder
5-6	Hand Hole Rims
7	Tower Elevation
8	Feedlines
9-12	Appurtenances & Mounts

FIELD AGENTS:

Robert J. Danze
Will C. Hinkle

PLANS PREPARED FOR:

TECTONIC
Practical Solutions, Exceptional Service

36 British American Blvd
Suite 101
Latham, NY 12110
Phone: (518) 783-1630
Fax: (518) 783-1544

PLANS PREPARED BY:

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Cary, NC 27511
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Fax: (919) 321-1768
www.verticalsolutions-inc.com

REV	DATE:	Issued For:
0	1/21/15	Tower Mapping Final Report

SIGNATURE OF CREW LEADER:

VSI #: 141341

DRAWN BY: HLM

CHECKED BY: MRM

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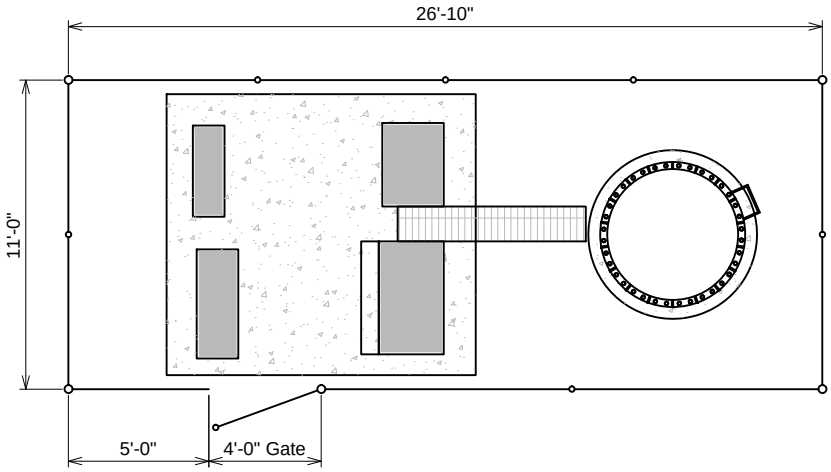
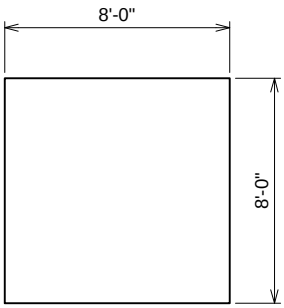
TOWER MAPPING REPORT

Site Name Amtrak-Branford
VSI # 141341
Client# CT11024B
Date 1/21/2015

COMPOUND PLAN SKETCH





Gate Combo	Key
Pedestal # & Location	-
Telephone Company	-
Power Company	-

Carrier	Site ID	Meter #
T-Mobile	CT11024B	26 439 590
-	-	13 992 246
-	-	24 766 2--

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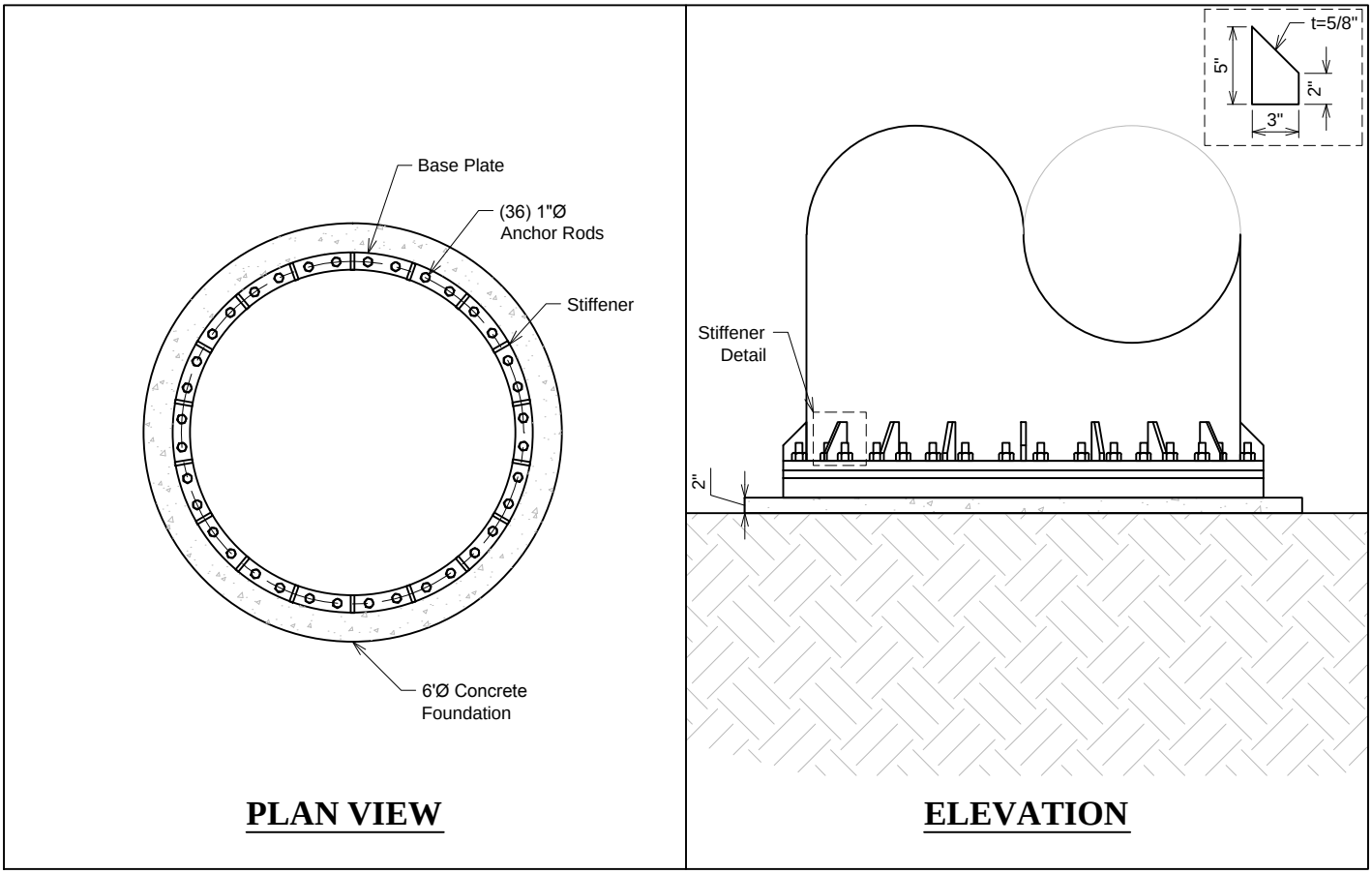
TOWER MAPPING REPORT

Site Name Amtrak-Branford
VSI # 141341
Client# CT11024B
Date 1/21/2015

BASE PLATE / TOP OF FOUNDATION DETAILS



PLAN VIEW **ELEVATION**

Anchor Rod Information		
Qty.	**Size**	**Bolt Circle**
36	1"	51"

Base Plate Information		Stiffener	
Dimensions	**Thickness**	**Qty**	**Dimensions**
54"	1 1/4"	18	See Above

Foundation Information	
Dimensions	**Projection Above Ground**
6'Ø	2"

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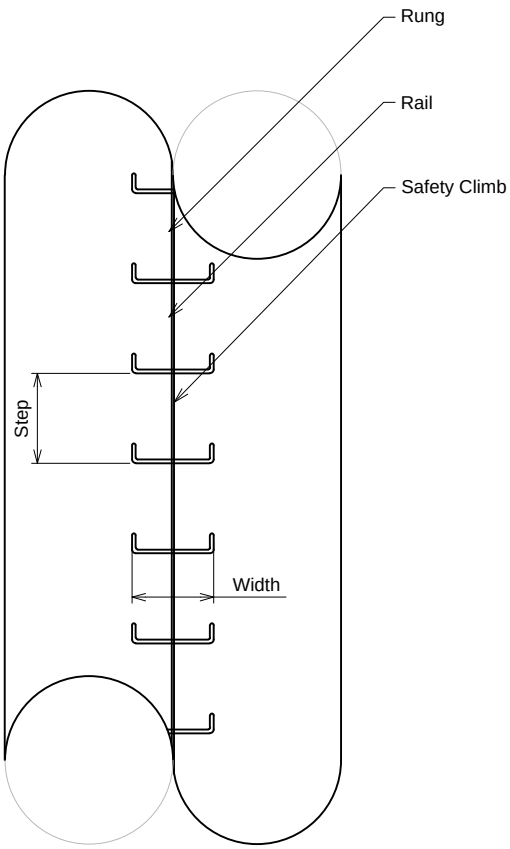
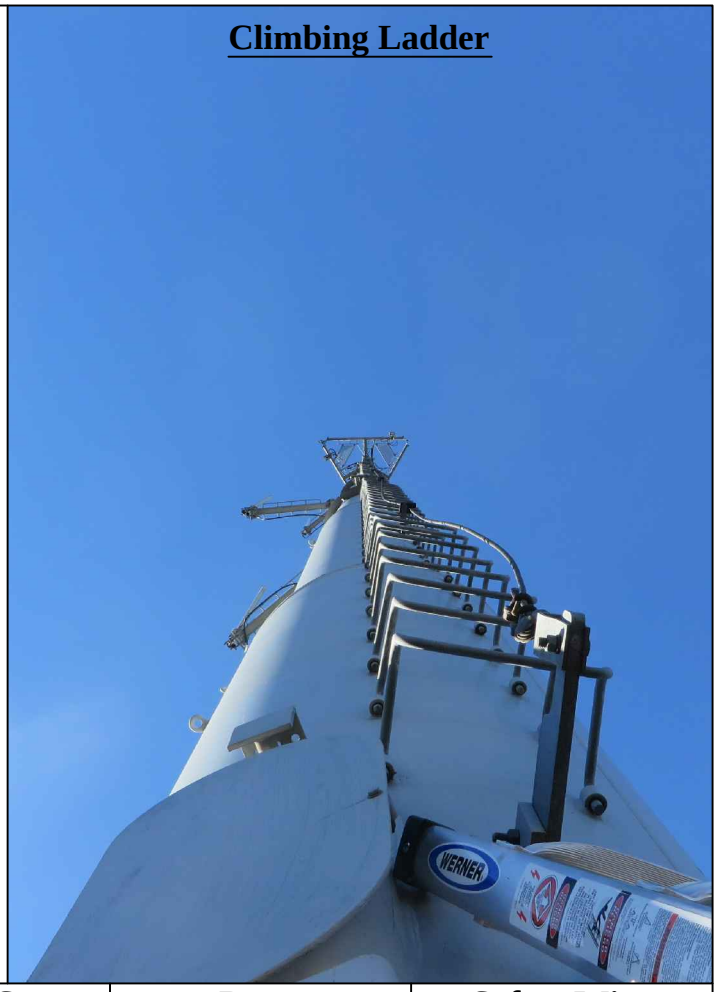
LADDER AND WAVEGUIDE

Climbing Ladder Sketch



Climbing Ladder



Ladder #	Flats #	Height	Width	Step	Rung	Safety Wire
1	-	11'	13"	15"	SR 20/32"Ø	3/8"Ø Stranded

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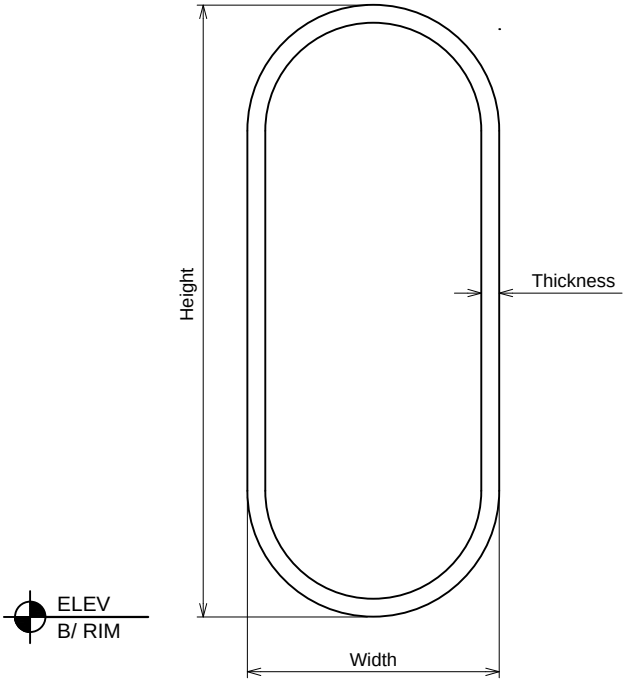
TOWER MAPPING REPORT

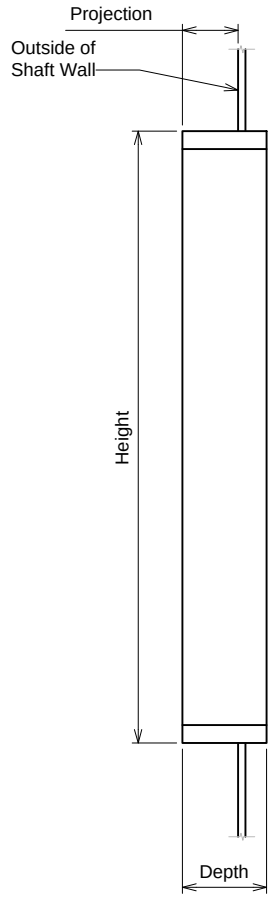
Site Name Amtrak-Branford
VSI # 141341
Client# CT11024B
Date 1/21/2015

HAND HOLE RIMS

Front Elevation



Side Elevation



#	Elevation	Width	Height	Thickness	Depth	Projection	Cardinal Direction	Description
1	16"	13'	26"	1"	6"	4"	S	4'-6" From SC
2	16"	13'	26"	1"	6"	4'-4"	-	7'-0" From SC
3	8'-6"	13'	26"	1"	6"	4'-4"	N	6" From SC
4	50'	4"	10"	1/4"	3"/8"	1"/ 5"	NE, SE, SW	4'-6" From SC
5	70'	4"	9"	1/4"	3"/8"	1"/ 5"	NE, SE, SW	3'-6" From SC
6	90'	4"	9"	1/4"	3"/8"	1"/ 5"	NE, SE, SW	3'-0" From SC

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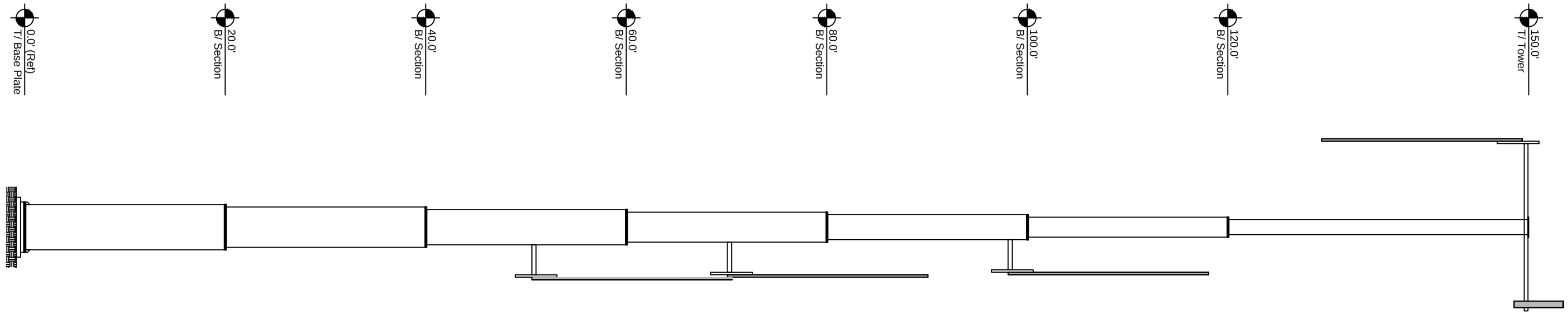
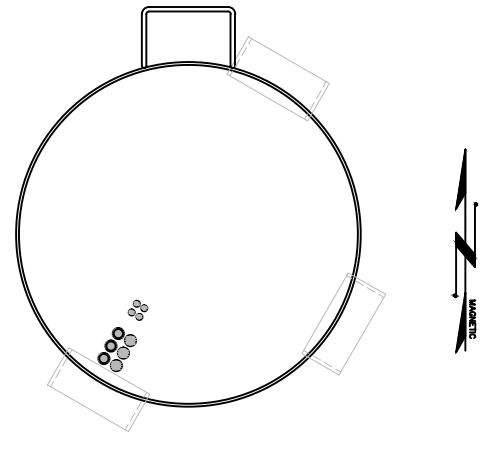
HAND HOLE RIMS CONTINUED

#	Elevation	Width	Height	Thickness	Depth	Projection	Cardinal Direction	Description
7-9	106'-9"	4"	6"/9"	1/4"	3"/8"	1"/ 5"	NE, SE, SW	3'-0" From SC
10-12	107'-9"	4"	6"/9"	1/4"	3"/8"	1"/ 5"	NE, SE, SW	3'-0" From SC
13-15	126'-9"	4"	6"/9"	1/4"	3"/8"	1"/ 5"	NE, SE, SW	3'-0" From SC
16-18	127'-9"	4"	6"/9"	1/4"	3"/8"	1"/ 5"	NE, SE, SW	3'-0" From SC
19-21	147'-7"	4"	6"/9"	1/4"	3"/8"	1"/ 5"	NE, SE, SW	10'-3/4" From SC
22-24	148'-7"	4"	6"/9"	1/4"	3"/8"	1"/ 5"	NE, SE, SW	10'-3/4" From SC

STRUCTURE							
SECTION	01	02	03	04	05	06	07
LENGTH	20'						30'
PiROD PN	-	126059	-	126057	126056	126055	-
NUMBER OF SIDES	ROUND						
DIAMETER	48"	42"	36"	30"	24"	18"	12"
THICKNESS	0.375"	0.375"	0.375"	0.375"	0.375"	0.375"	0.375"
FLANGE BOLTS	-	(32) 1"Ø	(28) 1"Ø	(24) 1"Ø	(20) 1"Ø	(16) 1"Ø	(10) 1"Ø
ANCHOR RODS	(36) 1"Ø	-	-	-	-	-	-



APPURTENANCES								
ELEV.	CARRIER	MOUNT	EQUIPMENT				FEEDLINES	
			QTY.	ANTENNA TYPE	DIMENSIONS	AZIMUTH (±)	QTY.	SIZE
151'	T-Mobile	10'-6" Low Profile Platform	3	EMS / RR901702DP	59" x 8" x 2.8"	30°, 150°, 270°	6	1 1/4
			3	Wireless / TMA	12" x 6" x 4"			
	Amtrak		1	Inverted Omni	6'		1	1/2
	Amtrak		1	Panel	12" x 12" x 3"			
98'	Amtrak	6' Side Arm	1	Omni	20'	N/A	1	1/2
70'	Amtrak	6' Side Arm	1	Omni	20'	N/A	1	1/2
50'	Amtrak	6' Side Arm	1	Omni	20'	N/A	1	1/2



PLAN VIEW
SCALE: N.T.S

X
P. Y

NOTES:
1. X DENOTES APPURTENANCE HEIGHT IN FT. (REF. BASE PLATE)
   Y DENOTES PAGE NUMBER OF MAPPING REPORT TO REFER TO FOR MORE DETAIL.

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TOWER MAPPING REPORT

Site Name Amtrak-Branford
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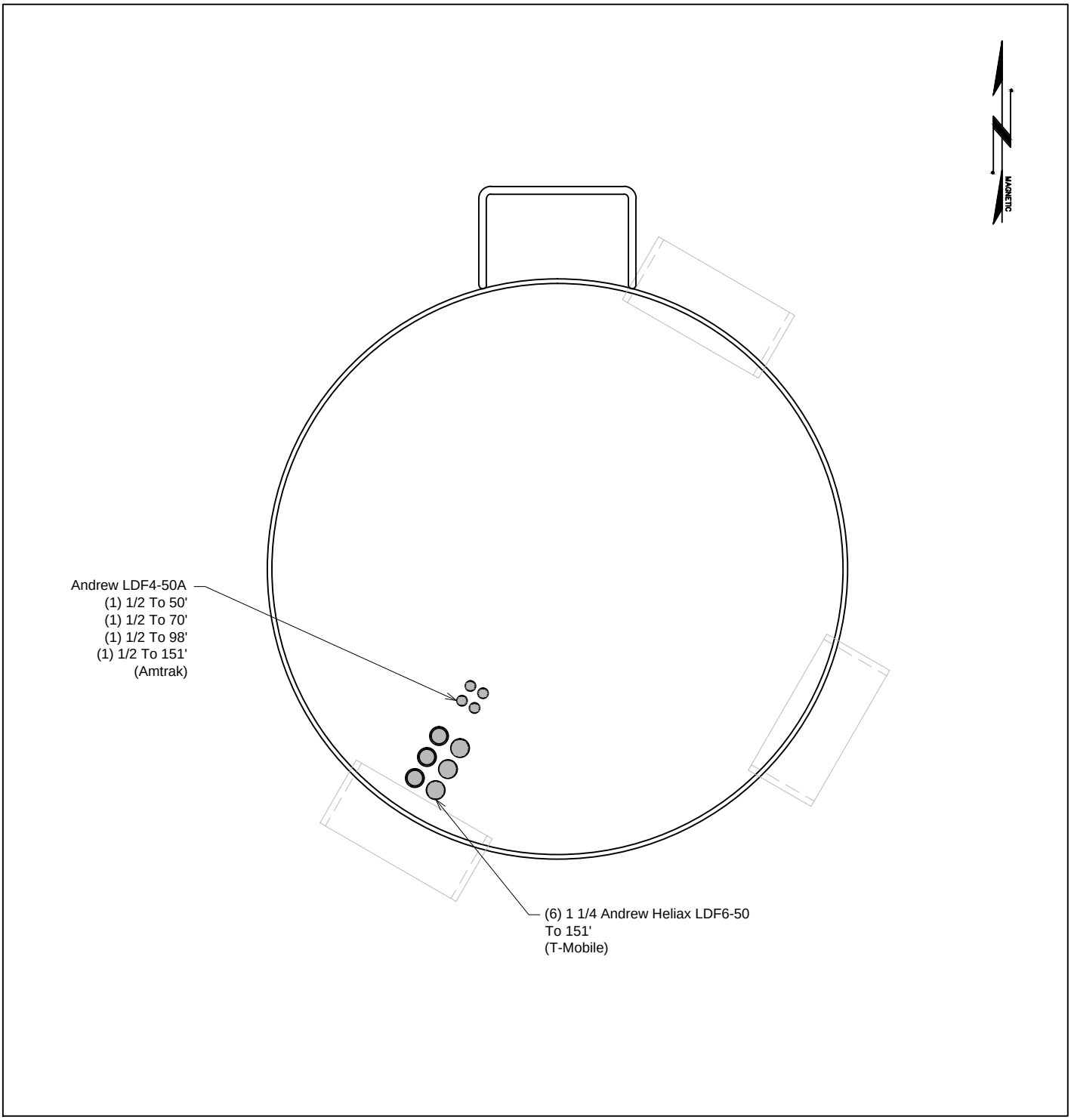
FEEDLINES



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TOWER MAPPING REPORT

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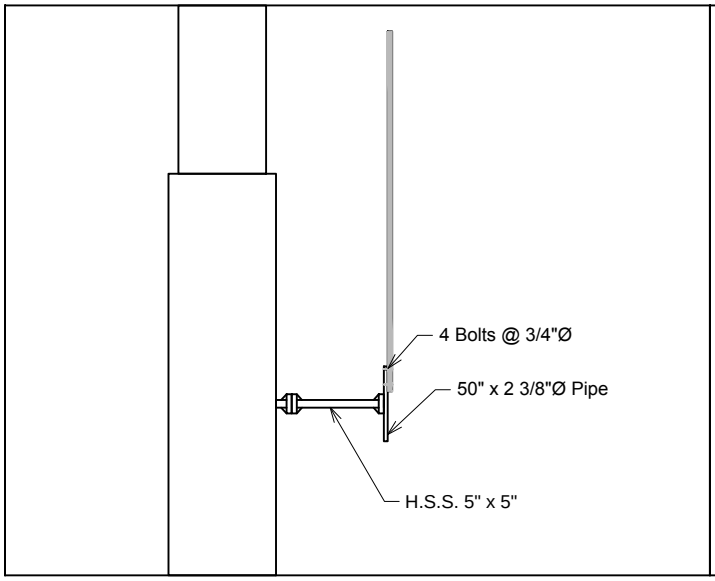
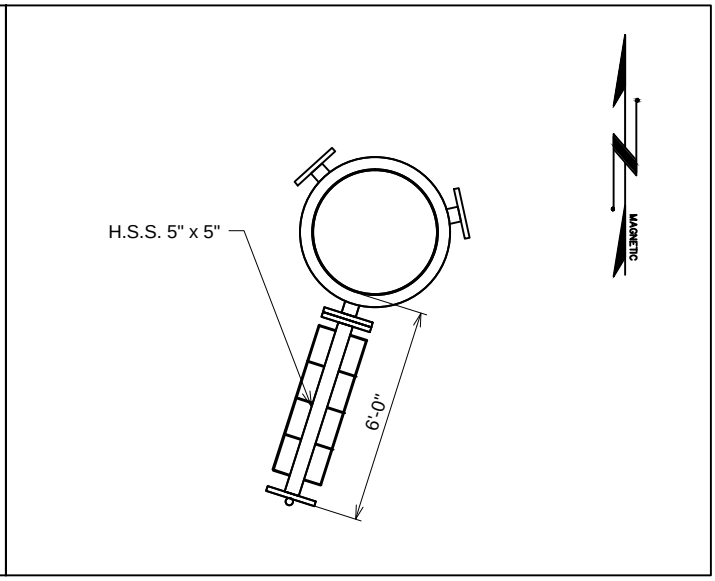
ANTENNA AND MOUNT

Photo From Ground

Photo From Tower



Elevation View



Plan View

Elevation	Carrier	Mount Type	Leg
50'	Amtrak	6' Side Arm	-

Appurtenances			Feedlines	
Type	Dimensions	Azimuth ±	Quantity	Size
Omni	20'		1	1/2

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TOWER MAPPING REPORT

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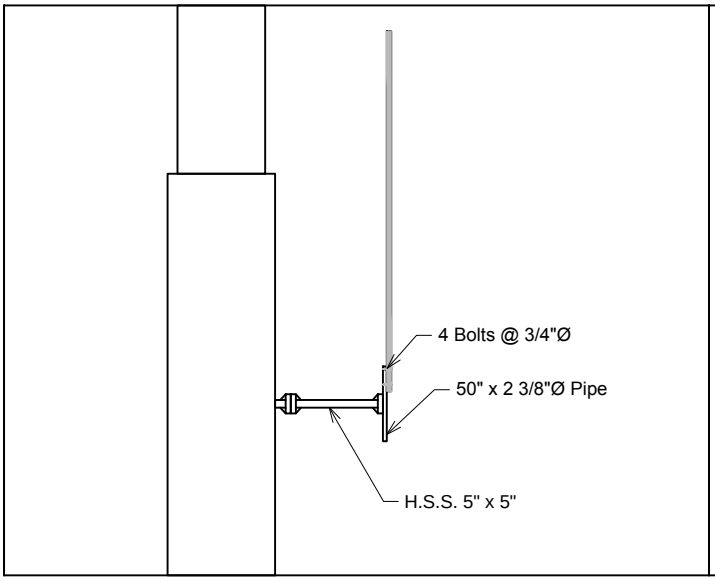
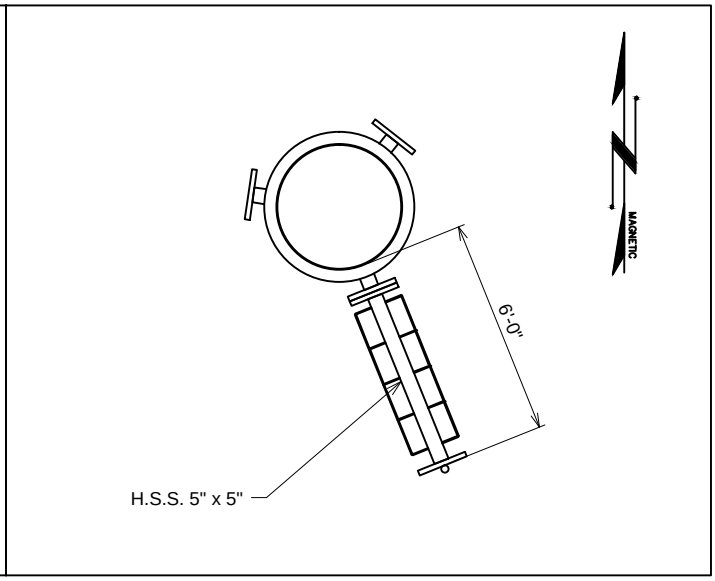
ANTENNA AND MOUNT

Photo From Ground

Photo From Tower



Elevation View



Plan View

Elevation	Carrier	Mount Type	Leg
70'	Amtrak	6' Side Arm	-

Appurtenances			Feedlines	
Type	Dimensions	Azimuth ±	Quantity	Size
Omni	20'		1	1/2

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TOWER MAPPING REPORT

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VSI # 141341
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ANTENNA AND MOUNT

Photo From Ground

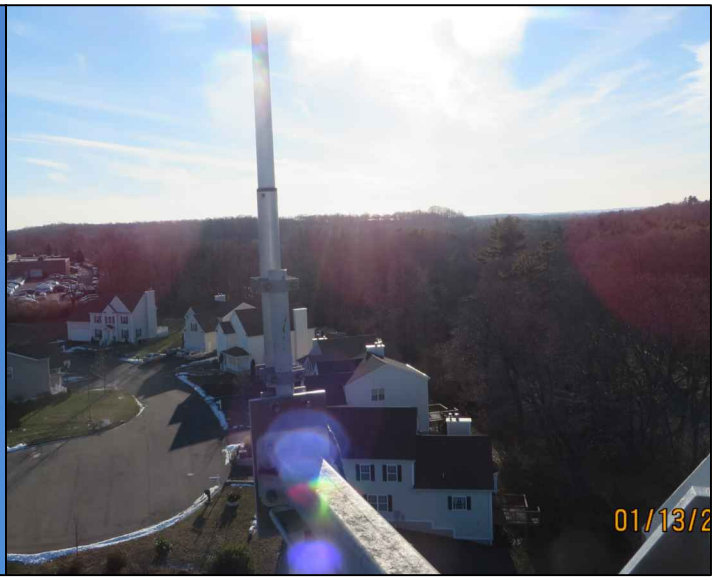
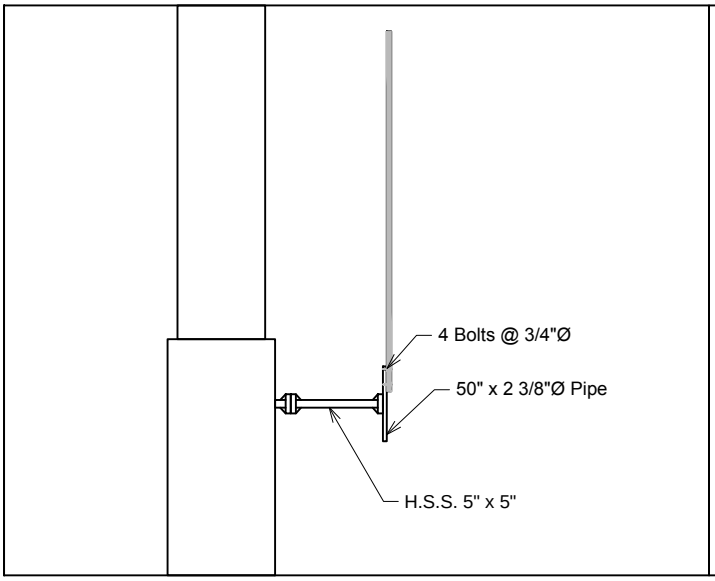
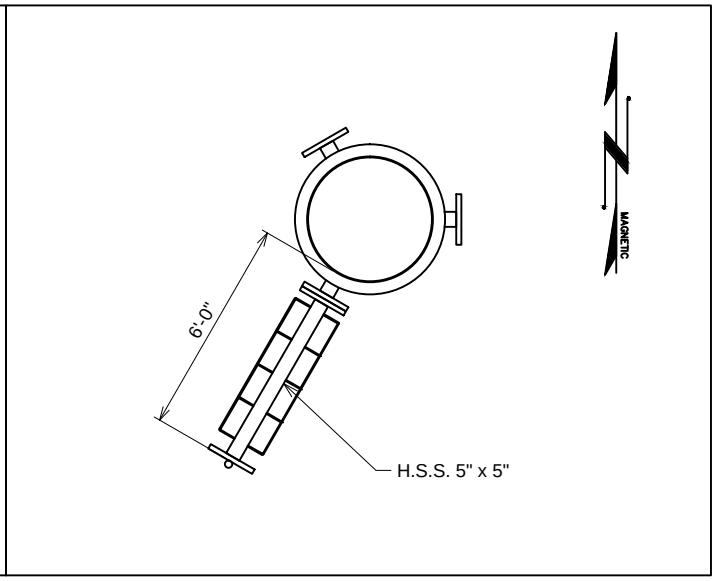


Photo From Tower



Elevation View



Plan View

Elevation	Carrier	Mount Type	Leg
98'	Amtrak	6' Side Arm	-

Appurtenances			Feedlines	
Type	Dimensions	Azimuth ±	Quantity	Size
Omni	20'		1	1/2

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TOWER MAPPING REPORT

Site Name Amtrak-Branford
VSI # 141341
Client# CT11024B
Date 1/21/2015

ANTENNA AND MOUNT

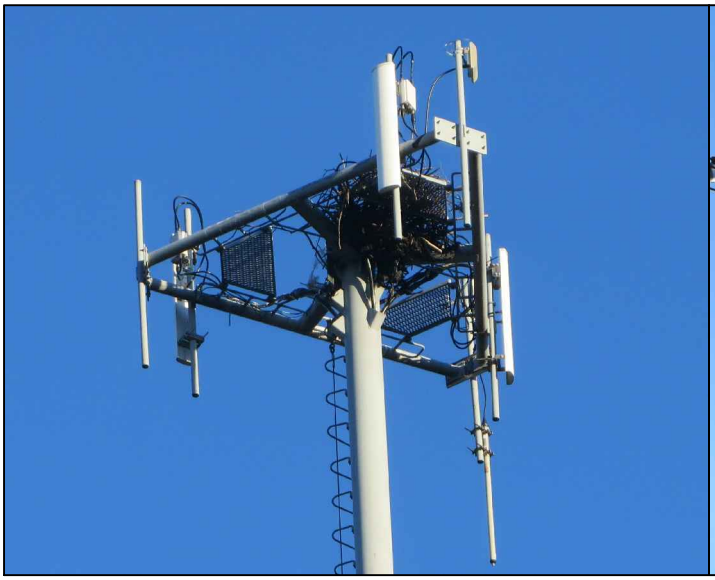
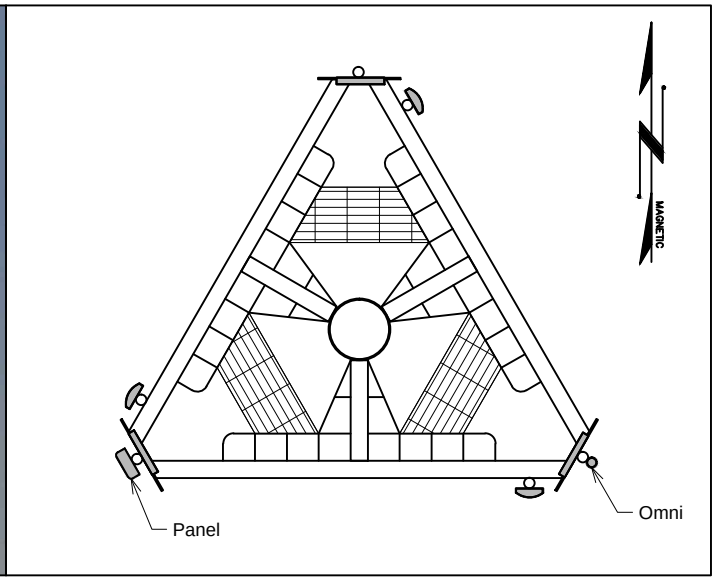


Photo From Ground

Photo From Tower

Antenna Label



Plan View

Elevation	Carrier	Mount Type	Leg
151'	T-Mobile	10'-6" Low Profile Platform	-

Appurtenances			Feedlines	
Type	**Dimensions**	**Azimuth ±**	**Quantity**	**Size**
(3) EMS Wireless/RR901700DP	59" x 8" x 2.8"	30°, 150°, 270°	6	1 1/4
(3) Wireless TMA	12" x 6" x 4"			
Inverted Omni	6'		1	1/2
Panel	12" x 12" x 3"			

APPENDIX F

POST MODIFICATION INSPECTION REPORT (2017)

Andrew Strock
Project Manager – T-Mobile
4 Sylvan Way
Parsippany, NJ 07054

May 22, 2017

RE: TEC. W.O. NO.: 7421.CT11024B
60 HOSLEY AVENUE
BRANFORD, CT 06405
POST MODIFICATION INSPECTION REPORT

Dear Mr. Strock,

At the request of T-Mobile, Tectonic Engineering and Surveying Consultants, P.C. (TECTONIC) is pleased to submit this "Post Modification Inspection Report" for the modification/reinforcement to the subject structure located at the address noted above. The purpose of the report is to confirm that the modifications as installed are in accordance with the documents listed below.

- Structural Analysis Report – Rev 2 (Reinforcement Design) prepared by TECTONIC, W.O#: 6421.CT11024B, dated June 4, 2015.
- Shop drawing "Approved as Noted" – Rev 1, prepared by Aero Solutions Inc., Project #: 589-15-0002, dated February 21, 2017.

A certified inspector from TECTONIC performed a climbing inspection to verify the modification installation on April 26, 2017. A Daily Field Report listing our findings was prepared and attached to this document. Based on our inspection, no deficiencies were noted upon the inspection.

TECTONIC was not present during the construction phase for this project. However, the modifications to the tower are in compliance with the above referenced documents.

Our professional services have been performed using that degree of care and skill ordinarily exercised under similar circumstances by reputable engineers practicing in this or similar situations. The interpretation of the field data is based on sound judgment and experience. However, concealed conditions cannot be

verified beyond the specific points of actual observation, sampling and testing. No other warranty, expressed or implied, is made as to the professional advice included in this report.

Digital Photographs were taken during our inspection, and copies are enclosed herewith for your reference.

Should you have questions, please do not hesitate to contact us.

Sincerely,

TECTONIC

Manojkumar Patel, P.E.
Sr. Project Manager

TECTONIC
Practical Solutions, Exceptional Service

G-04: SIGN-IN SHEET

Project Name: Amtrak - Branford (T-Mobile)	W.O.#: 7421.CT11024B
Location: Branford ct	Date: 26 Apr 17
Sub-Consultant:	Title: SR. Const. Insp.
Name: Frank A Morey JR	

Type of Inspection: Structural

Time Started:	Start Lunch:	End Lunch:	Time Completed:	Total Hours:
800	1200	1230	430	8

Travel Time In Excess of (1) Hour Each Way / Equipment Transport

Travel Time (From Lab To Site)	Travel Time (From Site To Lab)	Total Hours:

☐	Dye Penetrant	☒	Other Tower climbing fall Protect.
☐	Magnetic Particle	☐	Other
☐	Ultrasonic Tesing	☐	Other
☐	Torque Wrench	☐	Other
☐	Nuclear Moisture-Density Gauge	☐	Other
☐	Concrete Coring Equipment	☐	Other
☐	Microwave	☐	Other
☐	Pull-Test Equipment	☐	Other
☐	Adhesion/Cohesion Test	☐	Other

Comments:

Client Verification

Name:	Title:
Signature:	Date:

NYC DOB SPECIAL INSPECTION AGENCY # 106

ACCREDITED

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Practical Solutions, Exceptional Service

G-01: Daily Field Report

Office Location

☐ 70 Pleasant Hill Road Mountainville, NY 10953 P: (845) 534-5959 F: (845) 534-5999	☐ 29-16 40th Avenue Long Island City, NY 11101 P: (718) 391-9200 F: (718) 391-0607	☐ 1344 Silas Deane Highway, Suite 500 Rocky Hill, CT 06067 P: (860) 563-2341 F: (860) 257-4882	■ 280 Little Britain Road Newburgh, NY 12550 P: (845) 563-9081 F: (845) 563-9085
☐ 36 British American Blvd. Suite 101 Latham, NY 12110 P: (518) 783-1630 F: (518) 783-1544	☐ 1279 Route 300 Newburgh, NY 12550 P: (845) 567-6656 F: (845) 567-8703	☐ 8639 Mayland Drive, Suite 102 Richmond, VA 23294 P: (804) 217-8504 F: (804) 270-0593	☐ 6700 Old Collamer Road, Suite 104 East Syracuse, NY 13057 P: (315) 463-5020 F: (315) 463-5194

Project Name:		**Date:**	**Non-Conformance Items**
Location:		**W.O.#:**	Yes ☐ No ■

Client:	**Tectonic Project Manager:**
Owner:	**Tectonic Field Representative:**
Speciality Contractor: ☐ Earth ☐ Concrete ☐ Steel ☐ Other	**General Contractor:**
	General Contractor's Representative:

Contractor Equipment Observed in use:	**Plan and Specifications** By Tectonic Date 13 May 2015 REV 3 Plans & Specs (available)? Yes ☐ No ☐

Visitors:	**Representing:**	**Apr.**	**Dpt.**	**Shop Drawings** Type App. By

Weather: showers pre-climb, cloudy Temp. (°F) 50's	**Samples** Type Qty.
Forms Attached:	
☐ Special/ Progress Inspection Category	Photos ☐ Qty.

Construction Activities: *Indicate Activities Monitored*

On site per client request to perform Ajax bolted connection inspection for connecting the reinforcement channels to an existing monopole, observed the following:

o Meet with Brian Wilson of Tectonic on site with AMTRAK flagman. Received safety brief, discussed scope of work for todays climb. While actively climbing, contractor representative arrived to obtain results of inspection. Brian performed the photo log update. Bolted connections found to be wrench tight with all plies found to be in full contact; contractor stated final tensioning of bolts performed by Turn-of-nut-method.

Follow-up from Prior report: Yes ☐ No ☐ **Date of Prior Report:**

Non-Conformance Corrected:

What, in particular, should be observed, checked, or tested during the next visit?

Notice
The field representative is on site solely to observe operations of the contractor identified, observe conformance with contract documents, and report those operations to the client. The presence and activities of the field representative does not relieve the contractor's obligation to meet contractual requirements. The contractor retains sole responsibility for site safety and the methods and sequences of construction.

☐ This DFR is Preliminary	This preliminary report is provided solely as evidence that field observation was performed. Observation and/or conclusions and/or recommendations conveyed in the final report may vary from and shall take precedence over those indicated in a preliminary report.
☐ This DFR is Final	A final report is the instrument of service. Any conclusions drawn from this report should be discussed with and evaluated by the owner's engineer.

Field Representative:	Frank A. Morey Jr	**Date:**	26 APR 17
Reviewed By:		**Date:**	

NYC DOB SPECIAL INSPECTION AGENCY # 106

ACCREDITED

TECTONIC
Practical Solutions, Exceptional Service

G-01: Daily Field Report

Office Location

☐ 70 Pleasant Hill Road Mountainville, NY 10953 P: (845) 534-5959 F: (845) 534-5999	☐ 29-16 40th Avenue Long Island City, NY 11101 P: (718) 391-9200 F: (718) 391-0607	☐ 1344 Silas Deane Highway, Suite 500 Rocky Hill, CT 06067 P: (860) 563-2341 F: (860) 257-4882	■ 280 Little Britain Road Newburgh, NY 12550 P: (845) 563-9081 F: (845) 563-9085
☐ 36 British American Blvd. Suite 101 Latham, NY 12110 P: (518) 783-1630 F: (518) 783-1544	☐ 1279 Route 300 Newburgh, NY 12550 P: (845) 567-6656 F: (845) 567-8703	☐ 8639 Mayland Drive, Suite 102 Richmond, VA 23294 P: (804) 217-8504 F: (804) 270-0593	☐ 6700 Old Collamer Road, Suite 104 East Syracuse, NY 13057 P: (315) 463-5020 F: (315) 463-5194

Project Name:	T-Mobile AMTRAK-Branford (CT11024B)	**Date:**	26 APR 17
Location:	Branford CT	**W.O.#:**	7421.CT11024
Client:	T-Mobile	**Tectonic Project Manager:**	Brian Wilson
Owner:	AMTRAK	**Tectonic Field Representative:**	Frank A. Morey Jr

Construction Activities: *Indicate Activities Monitored* [CONTINUED]

o ELEV 78'-2" +/- to 85'-7" +/- : Lower elevation bolts at the bridge splice have three thread projection beyond face of nut, with uper level bolts projection of an inch +/-

o All higher elevations: Bolt projection was flush with face of bolt with additional washers added as needed to ensure all plies in full contact.

Reinforcement height is 78'-2" to 136'-10" +/-, reinforcement bolted connections assessed full height as accessible from the climbing rungs / Cable fall protection. As built condition is in compliance with applicable drawings.

■ This DFR is Preliminary	This preliminary report is provided solely as evidence that field observation was performed. Observation and/or conclusions and/or recommendations conveyed in the final report may vary from and shall take precedence over those indicated in a preliminary report.
☐ This DFR is Final	A final report is the instrument of service. Any conclusions drawn from this report should be discussed with and evaluated by the owner's engineer.

Field Representative:	Frank A. Morey Jr	**Date:**	26 APR 17
Reviewed By:		**Date:**	

<click to Submit for processing>

*NOTE:
1. ALL ELEVATIONS ARE RECORDED FROM THE TOP OF THE BASE PLATE.
2. ALL PORT HOLE ELEVATIONS ARE RECORDED UP TO BOTTOM OF PORT HOLES.
3. ~~FIELD DRILL ALL FOOTPAD'S USED FOR ANCHOR ROD BRACKET.~~
4. TRIM SHIMS TO FIT WHERE REQUIRED.
5. A FIELD LAYOUT IS REQUIRED TO ASSURE THE FITMENT OF REINFORCEMENT PRIOR TO ANY WORK ON TOWER AND WRITTEN NOTICE THAT THE PARTS FIT PER THE REINFORCEMENT DRAWINGS MUST BE RECIEVED BY AERO SOLUTIONS WITHIN 24 HOURS OF MATERIAL DELIVERY.
6. THIS IS A SUPPLEMENTAL ASSEMBLY DRAWING IN ADDITION TO PERMIT DRAWINGS. FULL SCOPE OF WORK MAY EXCEED THAN SHOWN IN THIS DRAWING.

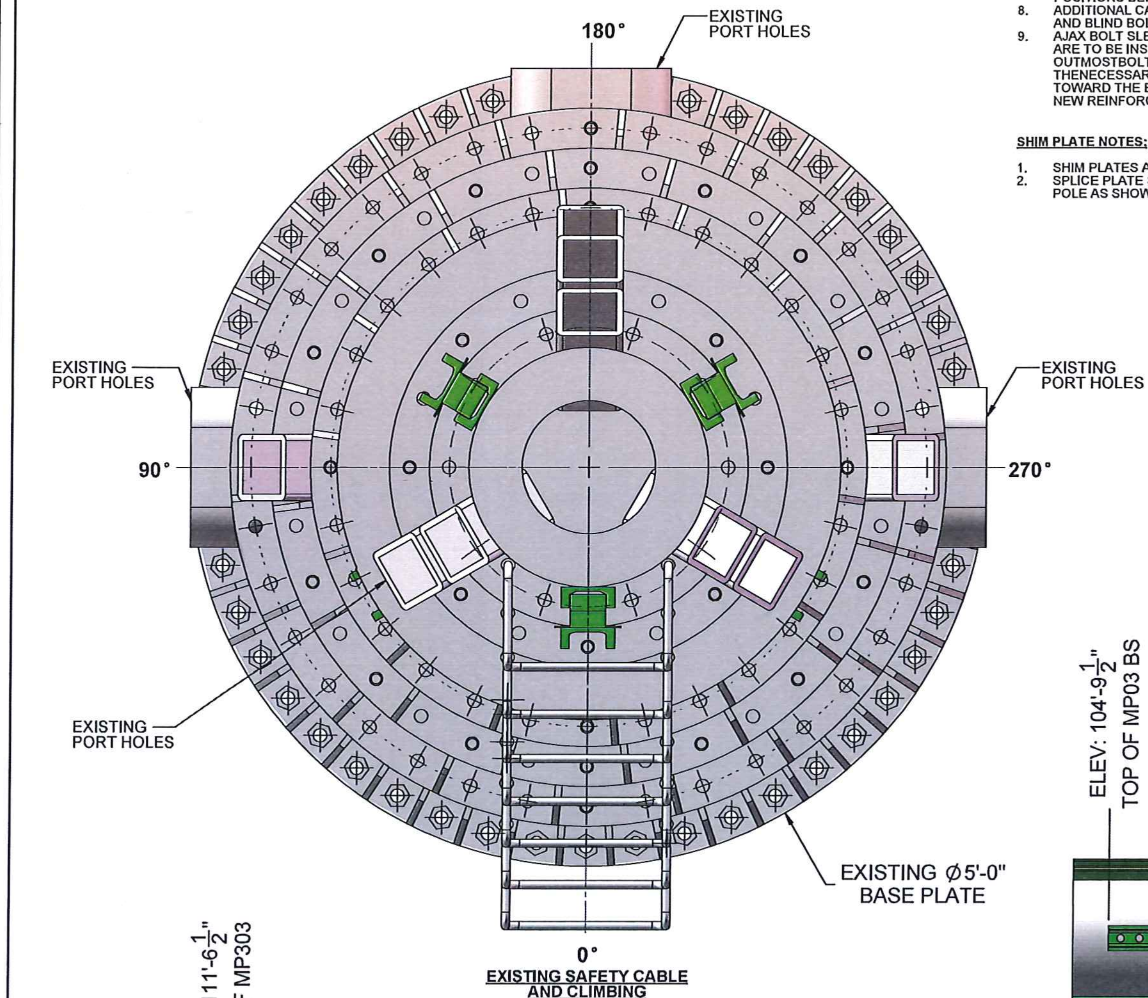
AJAX NOTES FOR MP3 SERIES;

1. INSTALL POLE-MAX CHANNEL SYSTEM AT (3) LOCATIONS PER PLAN VIEW .
2. USE AJAX BOLT SIZE NOTED W/ CORRECT SLEEVE LENGTHS PER NOTES IN ELEVATION VIEW.
3. ALL HOLES DRILLED IN POLE TO BE 1 3/16" DIA AND SOLVENT CLEANED AND TOUCHED UP W/ ZRC ZINC RICH PAINT.
4. SLIP-JOINTS TO BE JACKED TOGETHER USING 6 TON COME-A-LONGS PRIOR TO MOUNTING CHANNELS.
5. AJAX BOLTS SHALL BE PRETENSIONED USING TURN-OF-NUT METHOD IN ACCORDANCE WITH "SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH STRENGTH BOLTS," DATED DECEMBER 31, 2009, BY RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS. MATCH MARKING OF THE CONNECTIONS IS REQUIRED FOR FINAL INSPECTION. REFERENCE QAP-45 AERO SOLUTIONS AJAX INSTALLATION.
6. APPLY A NON-OIL BASED LUBRICANT TO EACH AJAX NUT BEFORE INSTALLING TO PREVENT SEIZING AND GALLING OF THREADS.
7. ALL CHANNELS AND CHANNEL WELDMENTS ARE STAMPED WITH PART NUMBER NEAR ONE END, CAREFULLY NOTE POSITIONS BEFORE MOUNTING.
8. ADDITIONAL CARE MUST BE USED AT SPLICE CONNECTIONS TO INSURE ALIGNMENT OF SPLICE PLATES AND BLIND BOLTS IN CHANNELS.
9. AJAX BOLT SLEEVES HAVE BEEN SIZED TO ENGAGE THE POLE SHAFT AND NEW REINFORCEMENT. THE SLEEVES ARE TO BE INSERTED FIRMLY AGAINST SPLIT WASHER INSIDE POLE AND HAVE A 1/8" TO 1/4" GAP BETWEEN THE OUTMOSTBOLTING SURFACE AND THE OUTERMOST SURFACE OF THE SLEEVE. THE CONTRACTOR SHALL INCORPORATE THENECESSARY MEASURES TO INSURE THAT THE SLEEVES DO NOT SLIDE FORWARD AND THEY REMAIN POSITIONED TOWARD THE BACKSIDE OF THE HOLE ENGAGING BOTH SIDES OF THE SHEAR PLANE BETWEEN THE POLE SHAFT AND THE NEW REINFORCEMENT.

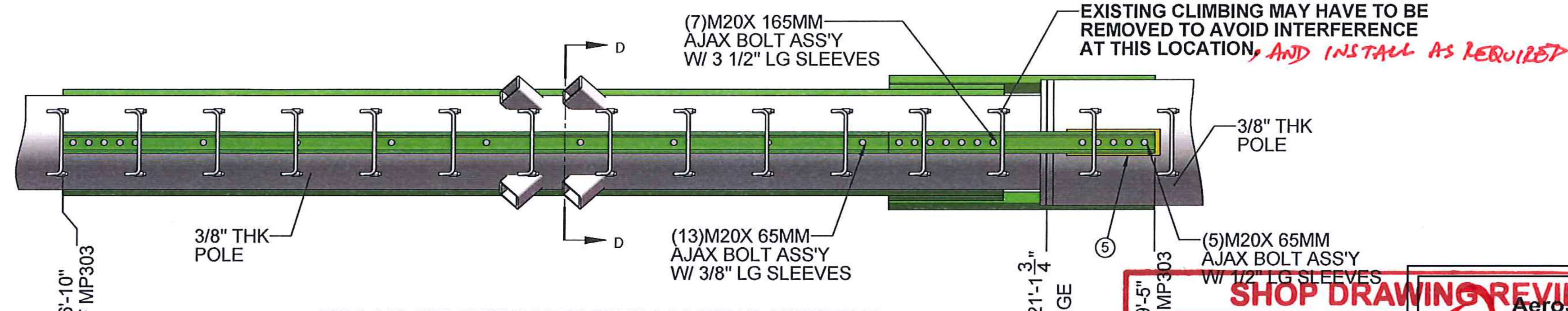
SHIM PLATE NOTES;

1. SHIM PLATES ARE TO BE USED BELOW SLIP-JOINTS AS NOTED IN ELEVATION VIEW.
2. SPLICE PLATE SHIMS ARE TO BE USED IN LOWER HALF OF SPLICE CONNECTION TO KEEP CHANNEL FLUSH WITH POLE AS SHOWN IN TYPICAL SPLICE SECTION DETAIL.

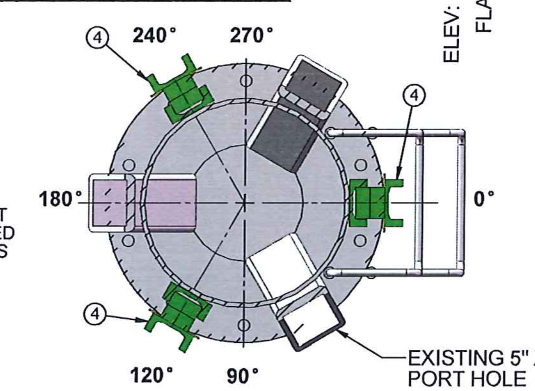
ITEM NO	QTY.	PART NUMBER	DESCRIPTION	MATERIAL	WT EA.	EXT. WT.
1	3	MP303-10NSI	MP303 NO SPLICE INDEPENDENT X 10' 0" LG	A572-GR65	98	294
2	3	MP303-BS-NSI	MP303 BRIDGE STIFFENER NSI	A572-GR.65	110	330
3	3	MP303- MP303- 05 BS-NSI	MP303-MP303 BRIDGE STIFFENER NSI 5' LG	A 572 GR65	127	381
4	3	MP303-MP303-15 BS-NSI	MP303-MP303 BRIDGE STIFFENER NSI 15' LG	A 572 GR65	228	684
5	6	MP303NSI-SSP-12	NSI STD SHIM PLATE 1/8" THK X 5" X 1'-6" LG	A36	3.03	18.18
6	132	M20 X 65MM	AJAX BOLT ASSEMBLY 65 MM LONG	GALV.	1	132
7	42	M20 X 165MM	AJAX BOLT ASSEMBLY 165 MM LONG	GALV.	1	42
8	102	PC8.8-380	SLEEVE 1.14" O.D. X .80 I.D. X 3/8" LG	A519 (GALVILITE)	0.06	6.12
9	30	PC8.8-500	SLEEVE 1.14" O.D. X .80 I.D. X 1/2" LG	A519 (GALVILITE)	0.07	2.1
10	42	PC8.8-350	SLEEVE 1.14" O.D. X .80 I.D. X 3 1/2" LG	A519 (GALVILITE)	0.52	21.84
					TOTAL WT.	1911.24



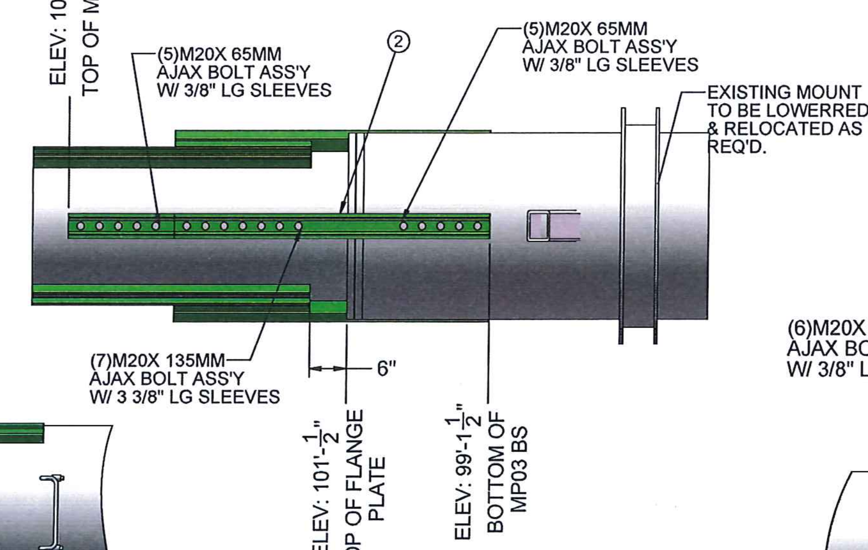
PLAN VIEW

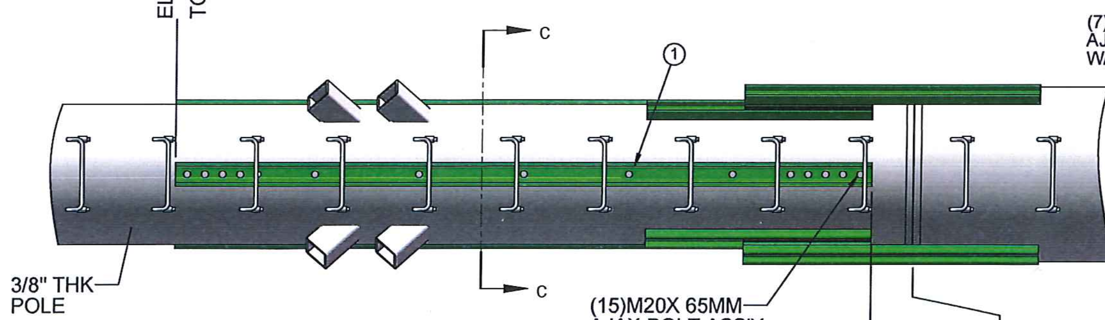


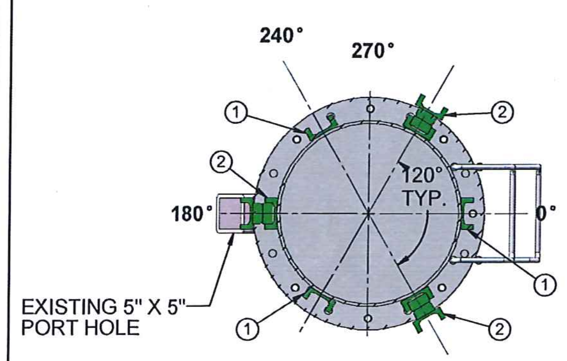
TYPILCAL MP3 REINFORCEMENT (3) LOCATIONS SYMMETRIC.



SECTION D-D

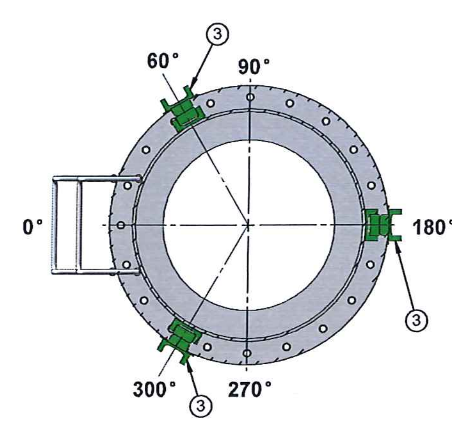




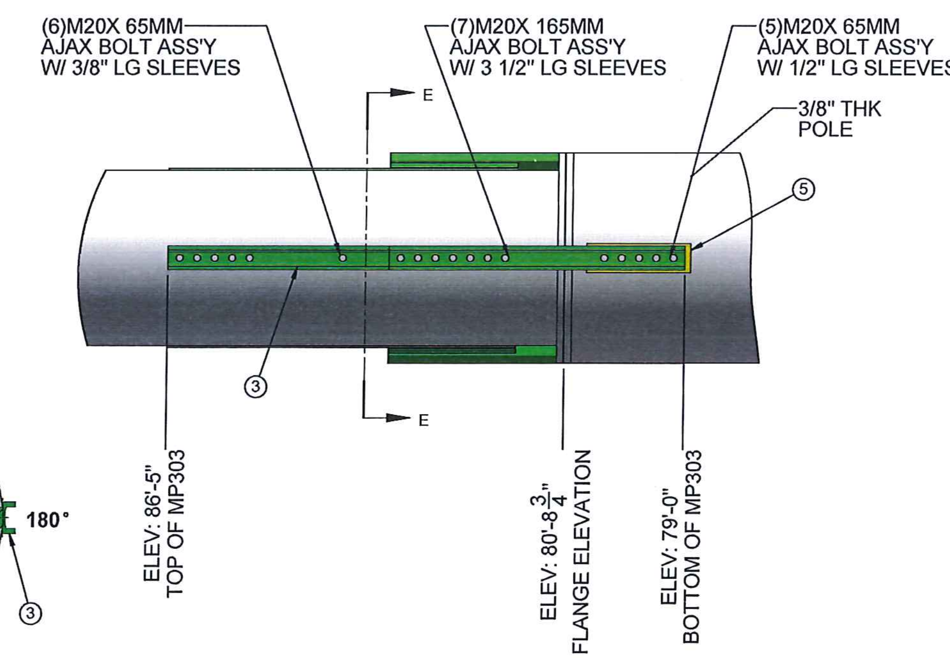


SECTION C-C

TYPILCAL MP3 REINFORCEMENT (3) LOCATIONS SYMMETRIC.



SECTION E-E



TYPILCAL MP3 REINFORCEMENT (3) LOCATIONS SYMMETRIC.

SHOP DRAWING REVIEW

- [ ] Approved
- [x] Approved as Noted
- [ ] Revise & Resubmit
- [ ] Rejected

Approval is only for general conformance with the design concept of the Project and the information given in the Contract Documents. Contractor is responsible for dimensions to be confirmed and correlated at the job site; information that pertains solely to the fabrication process or to the means and methods of construction; coordination of the work of all trades; and performing all work in a safe and satisfactory manner. This approval does not modify Contractor's duty to comply with the Contract Documents.

Reviewed by: VINOD RAMESH

Date: 02/22/17 W.O. #: 6421·CT11024B

TECTONIC Engineering Consultants P.C.

AeroSolutions LLC
Optimizing Your Tower Infrastructure
Aero Solutions LLC
5555 Central Pkwy, Ste.100
Boulder, CO, 80301
720-304-6882
www.aerosolutionsllc.com

ENGINEER of RECORD SEAL

AERO PROJECT#	589-15-0002
DATE	1/18/2016
DRAWN BY	AS
CHECKED BY	AERO

PROJECT INFORMATION

CT11024B

AMTRACK BRANFORD

60 HOUSLEY AVE
BRANFORD, CT 06405

TECTONIC
Practical Solutions, Exceptional Service

T-Mobile

REVISIONS				
REV.	DESCRIPTION	DATE	REV BY	APPR BY
00	INITIAL RELEASE	1/18/2016	AS	TECTONIC
01	WELDED BS REPLACED WITH BOLTED BS	2/21/2017	AS	TECTONIC

SHEET NUMBER
S-2

CT11024B REINFORCEMENT – PMI

Photo 1: Partial Monopole Elevation

Photo 2: Reinforcement Channel w/Bridge Stiffeners from approximately 121' to 136'

Photo 3: Reinforcement Channel w/Bridge Stiffeners from approximately 99' to 111'

Photo 4: Reinforcement Channel w/Bridge Stiffeners from approximately 79’ to 86’

APPENDIX G

ANALYSIS CRITERIA REFERENCES

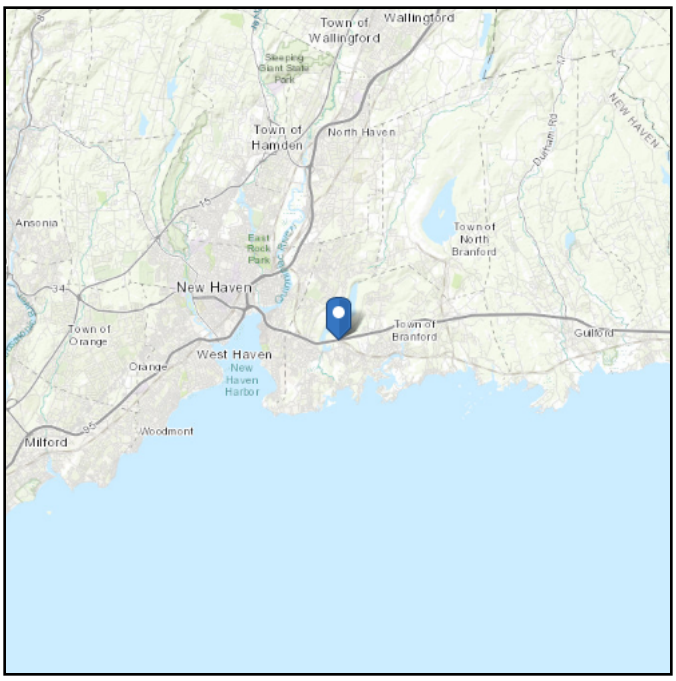
Appendix P Municipality — Specific Structural Design Parameters

Municipality	Basic Design Wind Speeds, V (mph)				Allowable Stress Design Wind Speeds, V_{asd} (mph)				Ground Snow Load p_g (psf)	MCE Ground Accelerations		Wind-Borne Debris Region[1]		Hurricane-Prone Region
	Risk Cat. I	Risk Cat. II	Risk Cat. III	Risk Cat. IV	Risk Cat. I	Risk Cat. II	Risk Cat. III	Risk Cat. IV		S_s (g)	S_1 (g)	Risk Cat. III Occup. I-2	Risk Cat. IV	
Andover	110	120	130	135	85	93	101	105	30	0.193	0.055			Yes
Ansonia	110	120	130	135	85	93	101	105	30	0.202	0.054			Yes
Ashford	110	120	130	135	85	93	101	105	35	0.181	0.055			Yes
Avon	110	120	125	130	85	93	97	101	35	0.180	0.054			Yes
Barkamsted	110	115	125	130	85	89	97	101	35	0.170	0.054			
Beacon Falls	110	120	130	135	85	93	101	105	30	0.199	0.054			Yes
Berlin	110	120	130	135	85	93	101	105	30	0.201	0.055			Yes
Bethany	110	120	130	135	85	93	101	105	30	0.199	0.054			Yes
Bethel	110	120	125	130	85	93	97	101	30	0.223	0.056			Yes
Bethlehem	110	120	125	130	85	93	97	101	35	0.186	0.054			Yes
Bloomfield	110	120	130	135	85	93	101	105	30	0.182	0.055			Yes
Bolton	110	120	130	135	85	93	101	105	30	0.191	0.055			Yes
Bozrah	115	125	135	140	89	97	105	108	30	0.197	0.054			Yes
Branford	115	125	135	135	89	97	105	105	30	0.201	0.053	Type B	Type B	Yes
Bridgeport	110	120	130	135	85	93	101	105	30	0.211	0.054		Type B	Yes
Bridgewater	110	120	125	130	85	93	97	101	35	0.201	0.055			
Bristol	110	120	130	130	85	93	101	101	35	0.188	0.054			Yes
Brookfield	110	120	125	130	85	93	97	101	30	0.210	0.055			Yes
Brooklyn	115	125	135	135	89	97	105	105	35	0.184	0.054			Yes
Burlington	110	120	125	130	85	93	97	101	35	0.180	0.054			Yes
Canaan	105	115	125	130	81	89	97	101	40	0.166	0.054			
Canterbury	115	125	135	140	89	97	105	108	30	0.187	0.054			Yes
Canton	110	120	125	130	85	93	97	101	35	0.177	0.054			Yes
Chaplin	115	125	130	135	89	97	101	105	35	0.184	0.055			Yes
Cheshire	110	120	130	135	85	93	101	105	30	0.200	0.055			Yes
Chester	115	125	135	140	89	97	105	108	30	0.213	0.055			Yes

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard:	ASCE/SEI 7-16	**Latitude:**	41.283325
Risk Category:	II	**Longitude:**	-72.8494
Soil Class:	D - Default (see Section 11.4.3)	**Elevation:**	59.02468877855376 ft (NAVD 88)



Seismic

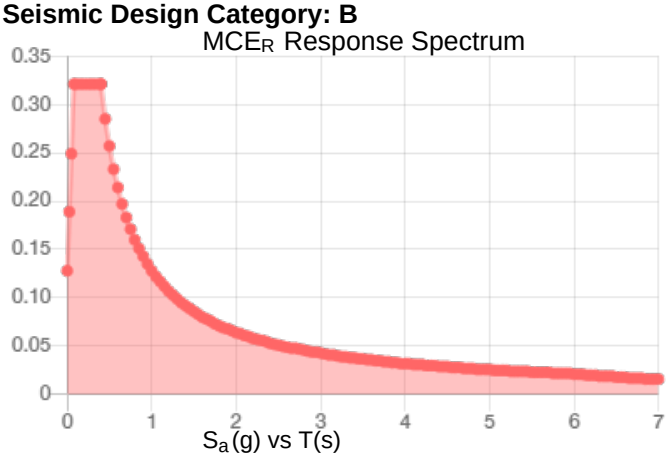
D - Default (see Section 11.4.3)

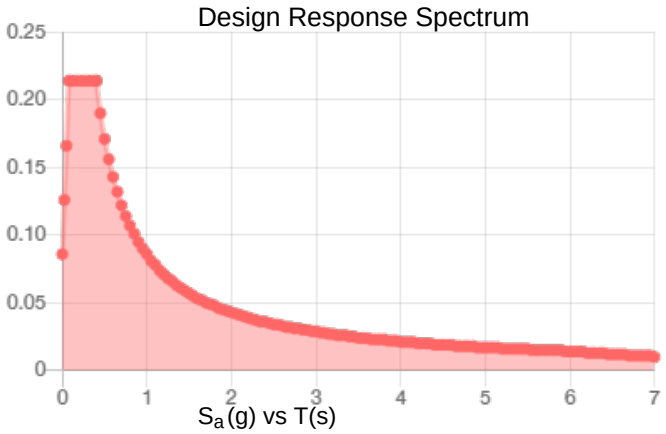
Site Soil Class:

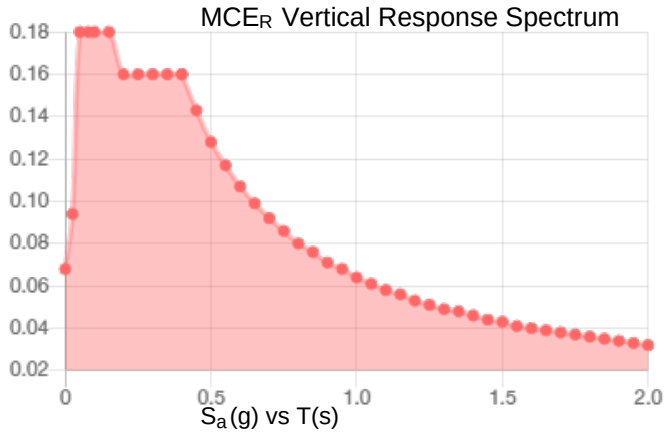
Results:

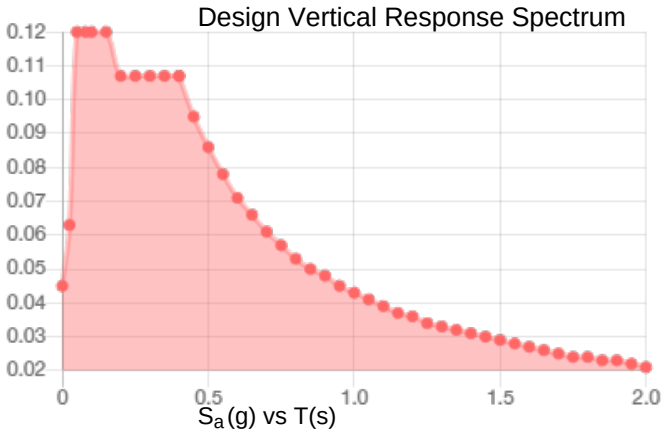
S_S :	0.201	S_{D1} :	0.086
S_1 :	0.053	T_L :	6
F_a :	1.6	PGA :	0.112
F_v :	2.4	PGA_M :	0.177
S_{MS} :	0.321	F_{PGA} :	1.576
S_{M1} :	0.128	I_e :	1
S_{DS} :	0.214	C_v :	0.701

Seismic Design Category: B









Data Accessed: **Thu Jun 08 2023**

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	50 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Thu Jun 08 2023

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.

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

Antenna Mount Analysis

T-Mobile Site Ref.: CT11024B

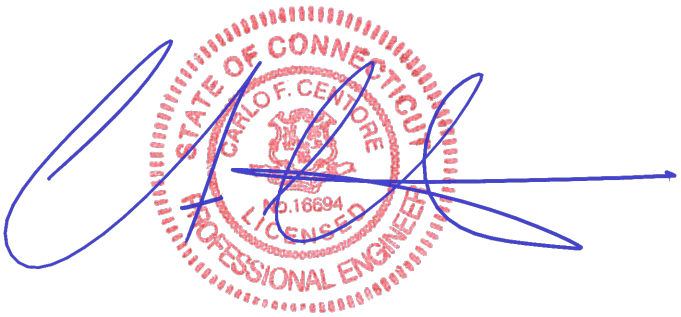
60 Holsey Avenue
Branford, CT

Centek Project No. 20074.79

~~Date: August 27, 2020~~

~~Rev 1: March 18, 2022~~

Rev 2: July 3, 2023



Prepared for:

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

T a b l e o f C o n t e n t s

SECTION □□ RE□ORT

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SECTION □– CALCULATIONS

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SECTION □– RE□ERENCE MATERIAL □□□□□□□□□d□d □□ □□□□r□□□r□□

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  □□□ □□□R□□ □□□□ □□□ □□ □□□□□□□□□□□□□D□□□D M□□ □□□□□□□

Introduction

[illegible]

[illegible]

Primary Assumptions Used in the Analysis

- [illegible] cture's theoretical capacity not including any assessment of the [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- All members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM [illegible]
- [illegible]

Antenna and Equipment Summary

Location	Antenna and Equipment	Radio Cabinet Equipment	Mount Type
[redacted]	[redacted]	[redacted]	[redacted]

[redacted]

Analysis

[redacted]

Design Loading

[redacted] "Minimum Design Loads for Buildings and Other Structures".

[redacted]	[redacted]	*Appendix P of the 2022 CT State Building Code*
[redacted]	[redacted]	*Annex B of TIA-222-H*
[redacted]	[redacted]	*2021 IBC; Table 1604.05*
[redacted]	[redacted]	*ASCE 7-16; Section 26.7.2*
[redacted]	[redacted]	*Identified within SAR design calculations*

Reference Standards

[redacted]

[redacted] *Specification for Structural Steel Buildings.*

Results

[illegible]

[illegible]

S[illegible]r	C[illegible]	S[illegible] R[illegible]	R[illegible]
[illegible]	[illegible] D [illegible] M[illegible] R[illegible] RR[illegible]	[illegible]	PASS
	[illegible] D [illegible] R[illegible]	[illegible]	PASS
	[illegible]	[illegible]	PASS
	[illegible] D [illegible]	[illegible]	PASS
	[illegible]" ∅ [illegible]" [illegible] R[illegible]	[illegible]	PASS

Conclusion

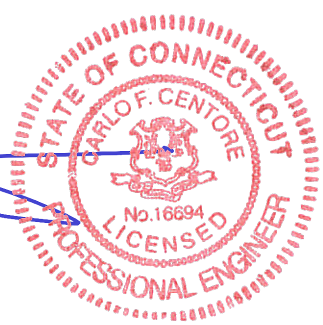
[illegible] **STRUCTURALL[illegible] ADE[illegible]UETE** [illegible]

- [illegible]
- [illegible]
- R[illegible]

[illegible]

[illegible]

R[illegible]



[illegible]

Standard Conditions for Furnishing of Professional Engineering Services on Existing Structures

[illegible]

- [illegible]
- [illegible]
- [illegible] has not significantly changed from the “as new” condition.
- [illegible]
- [illegible]

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Subject: TIA-222-H Loads on Equipment

Location: Branford, CT

Rev. 1: 04/11/2023 Prepared by: PPG Checked by: CFC
Job No. 20074.79

Development of Design Heights, Exposure Coefficients, and Velocity Pressures Per TIA-222-H

Wind Speeds

Basic Wind Speed	$V := 125$	mph	(User Input - 2022 CSBC Appendix P)
Basic Wind Speed with Ice	$V_i := 50$	mph	(User Input per Annex B of TIA-222-H)

Input

Structure Type =	$Structure\_Type := Antennas$		(User Input)
Structure Category =	$SC := II$		(User Input)
Exposure Category =	$Exp := C$		(User Input)
Topographic Category =	$T_c := 1$		(User Input)
Structure Height =	$h := 150$	ft	(User Input)
Height of Crest =	$H := 1$	ft	(User Input)
Base Elevation Above Sea Level =	$Zs := 50$	ft	(User Input)
Height to Center of Antennas =	$z := 150$	ft	(User Input)
Radial Ice Thickness =	$t_i := 1.0$	in	(User Input per Annex B of TIA-222-H)
Radial Ice Density =	$Id := 56.00$	pcf	(User Input)
Shielding Factor For Appurtenances =	$K_a := 0.9$		(Section 16.6 TIA-222-H)
Gust Effect Factor =	$G_H = 1$		(Section 16.6 TIA-222-H)
Wind Direction Probability Factor =	$K_d = 0.95$		(Table 2-2 & S16.6 TIA-222-H)

Output

Importance Factors =

$$I_{Wind} := \left\| \begin{array}{l} \text{if } SC = 1 \\ \quad \| \, 0.87 \\ \text{if } SC = 2 \\ \quad \| \, 1.00 \\ \text{if } SC = 3 \\ \quad \| \, 1.15 \end{array} \right\| = 1 \qquad I_{Wind\_w\_Ice} := \left\| \begin{array}{l} \text{if } SC = 1 \\ \quad \| \, 0 \\ \text{if } SC = 2 \\ \quad \| \, 1.00 \\ \text{if } SC = 3 \\ \quad \| \, 1.00 \end{array} \right\| = 1 \qquad I_{ice} := \left\| \begin{array}{l} \text{if } SC = 1 \\ \quad \| \, 0 \\ \text{if } SC = 2 \\ \quad \| \, 1.00 \\ \text{if } SC = 3 \\ \quad \| \, 1.15 \\ \text{if } SC = 4 \\ \quad \| \, 1.25 \end{array} \right\| = 1$$

Topographic Factor =

$$K_{zt} := \left\| \begin{array}{l} \text{if } T_c = 1 \\ \quad \| \, 1.0 \\ \text{if } T_c > 1 \\ \quad \| \, \left(1 + \left(\frac{K_c \cdot K_t}{K_h}\right)\right)^2 \end{array} \right\| = 1$$

(2.6.6.2.1 - TIA-222-H)

Ground Elevation Factor = $K_e := 2.71828^{(-0.0000362 \cdot Zs)} = 0.998$

Height Escalation Factor = $K_{iz} := \left(\frac{z}{33}\right)^{0.1} = 1.163$ (2.6.5.2 - TIA-222-H)

Factored Ice Thickness = $t_{iz} := t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}{}^{0.35} = 1.163$

Velocity Pressure Coefficient Antennas = $Kz := 2.01 \cdot \left(\left(\frac{z}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.378$ (2.6.5.2 - TIA-222-H)

Velocity Pressure w/o Ice Antennas = $qz := 0.00256 \cdot Kz \cdot K_{zt} \cdot K_e \cdot K_d \cdot V^2 = 52.284$ psf

Velocity Pressure with Ice Antennas = $qz_{ice} := 0.00256 \cdot Kz \cdot K_{zt} \cdot K_e \cdot K_d \cdot V_i{}^2 = 8.366$ psf

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFS APXVAARR24_43-U-NA20		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 95.9$	in	(User Input)
Antenna Width =	$W_{ant} := 24$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.7$	in	(User Input)
Antenna Weight =	$WT_{ant} := 153$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.0$		
Antenna Force Coefficient =	$Ca_{ant} = 1.27$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 16$	sf
Total Antenna Wind Force Front =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 953$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 5.8$	sf
Total Antenna Wind Force Side =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 345$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 18$	sf
Total Antenna Wind Force w/ Ice Front =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 171$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 7.5$	sf
Total Antenna Wind Force w/ Ice Side =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 72$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 153$	lbs

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 2 \cdot 10^4$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 8492$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 275$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 275$	lbs

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Ericsson AIR6419 B41		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 36.3$	in	(User Input)
Antenna Width =	$W_{ant} := 20.9$	in	(User Input)
Antenna Thickness =	$T_{ant} := 9.0$	in	(User Input)
Antenna Weight =	$WT_{ant} := 83$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 1.7$		
Antenna Force Coefficient =	$Ca_{ant} = 1.2$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 5.3$	sf
Total Antenna Wind Force Front =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 297$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 2.3$	sf
Total Antenna Wind Force Side =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 128$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 6.2$	sf
Total Antenna Wind Force w/ Ice Front =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 56$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 3$	sf
Total Antenna Wind Force w/ Ice Side =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 27$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 83$	lbs

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 6828$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 3334$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 108$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 108$	lbs

Development of Wind & Ice Load on RRUS's

RRUS Data:

RRUS Model = Ericsson 4449 B71+B85

RRUS Shape = Flat (User Input)

RRUS Height = $L_{RRUS} := 17.9$ in (User Input)

RRUS Width = $W_{RRUS} := 13.2$ in (User Input)

RRUS Thickness = $T_{RRUS} := 9.5$ in (User Input)

RRUS Weight = $WT_{RRUS} := 75$ lbs (User Input)

Number of RRUS's = $N_{RRUS} := 1$

RRUS Aspect Ratio = $Ar_{RRUS} := \frac{L_{RRUS}}{W_{RRUS}} = 1.4$

RRUS Force Coefficient = $Ca_{RRUS} = 1.2$

Wind Load (without ice)

Surface Area for One RRUS = $SA_{RRUSF} := \frac{L_{RRUS} \cdot W_{RRUS}}{144} = 1.6$ sf

Total RRUS Wind Force = $F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 93$ lbs

Surface Area for One RRUS = $SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 1.2$ sf

Total RRUS Wind Force = $F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 67$ lbs

Wind Load (with ice)

Surface Area for One RRUS w/ Ice = $SA_{ICERRUSF} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz})}{144} = 2.2$ sf

Total RRUS Wind Force w/ Ice = $Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 20$ lbs

Surface Area for One RRUS w/ Ice = $SA_{ICERRUSS} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz})}{144} = 1.7$ sf

Total RRUS Wind Force w/ Ice = $Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 15$ lbs

Gravity Load (without ice)

Weight of All RRUSs = $WT_{RRUS} \cdot N_{RRUS} = 75$ lbs

Gravity Loads (ice only)

Volume of Each RRUS = $V_{RRUS} := L_{RRUS} \cdot W_{RRUS} \cdot T_{RRUS} = 2245$ cu in

Volume of Ice on Each RRUS = $V_{ice} := (L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 1470$ cu in

Weight of Ice on Each RRUS = $W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 48$ lbs

Weight of Ice on All RRUSs = $W_{ICERRUS} \cdot N_{RRUS} = 48$ lbs

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Development of Wind & Ice Load on RRUS's

RRUS Data:

RRUS Model = Ericsson 4460 B25+B66

RRUS Shape = Flat (User Input)

RRUS Height = $L_{RRUS} := 14.9$ in (User Input)

RRUS Width = $W_{RRUS} := 13.2$ in (User Input)

RRUS Thickness = $T_{RRUS} := 5.4$ in (User Input)

RRUS Weight = $WT_{RRUS} := 109$ lbs (User Input)

Number of RRUS's = $N_{RRUS} := 1$

RRUS Aspect Ratio = $Ar_{RRUS} := \frac{L_{RRUS}}{W_{RRUS}} = 1.1$

RRUS Force Coefficient = $Ca_{RRUS} = 1.2$

Wind Load (without ice)

Surface Area for One RRUS = $SA_{RRUSF} := \frac{L_{RRUS} \cdot W_{RRUS}}{144} = 1.4$ sf

Total RRUS Wind Force = $F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 77$ lbs

Surface Area for One RRUS = $SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 0.6$ sf

Total RRUS Wind Force = $F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 32$ lbs

Wind Load (with ice)

Surface Area for One RRUS w/ Ice = $SA_{ICERRUSF} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz})}{144} = 1.9$ sf

Total RRUS Wind Force w/ Ice = $Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 17$ lbs

Surface Area for One RRUS w/ Ice = $SA_{ICERRUSS} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz})}{144} = 0.9$ sf

Total RRUS Wind Force w/ Ice = $Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 8$ lbs

Gravity Load (without ice)

Weight of All RRUSs = $WT_{RRUS} \cdot N_{RRUS} = 109$ lbs

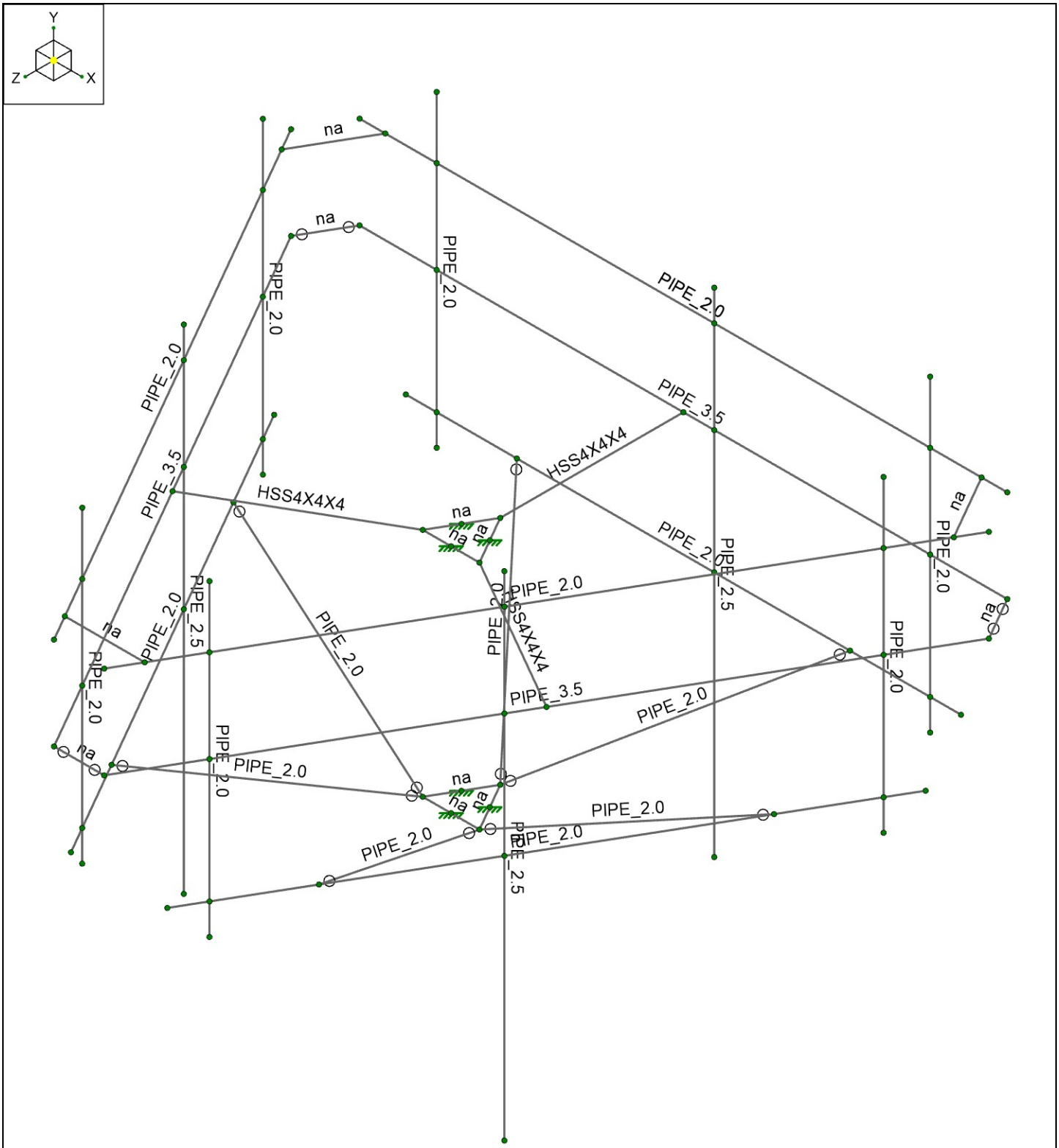
Gravity Loads (ice only)

Volume of Each RRUS = $V_{RRUS} := L_{RRUS} \cdot W_{RRUS} \cdot T_{RRUS} = 1062$ cu in

Volume of Ice on Each RRUS = $V_{ice} := (L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 1005$ cu in

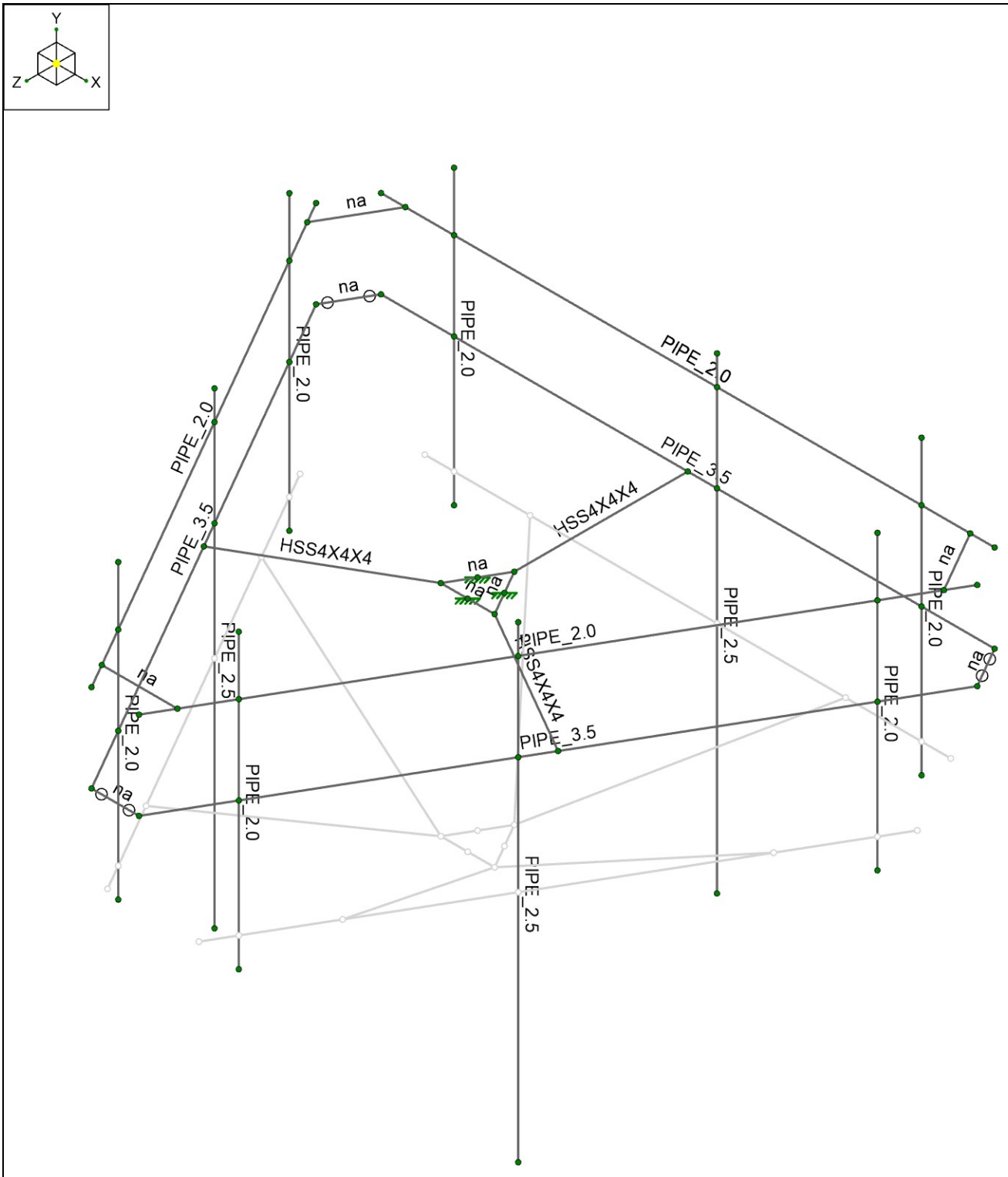
Weight of Ice on Each RRUS = $W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 33$ lbs

Weight of Ice on All RRUSs = $W_{ICERRUS} \cdot N_{RRUS} = 33$ lbs



Envelope Only Solution

RISA A NEMETSCHEK COMPANY	Centek	CT11024B_AMA	SK-2
	PPG		Jul 03, 2023 at 11:31 AM
	20074.79		CT11024B_AMA Rev 1.r3d



Envelope Only Solution

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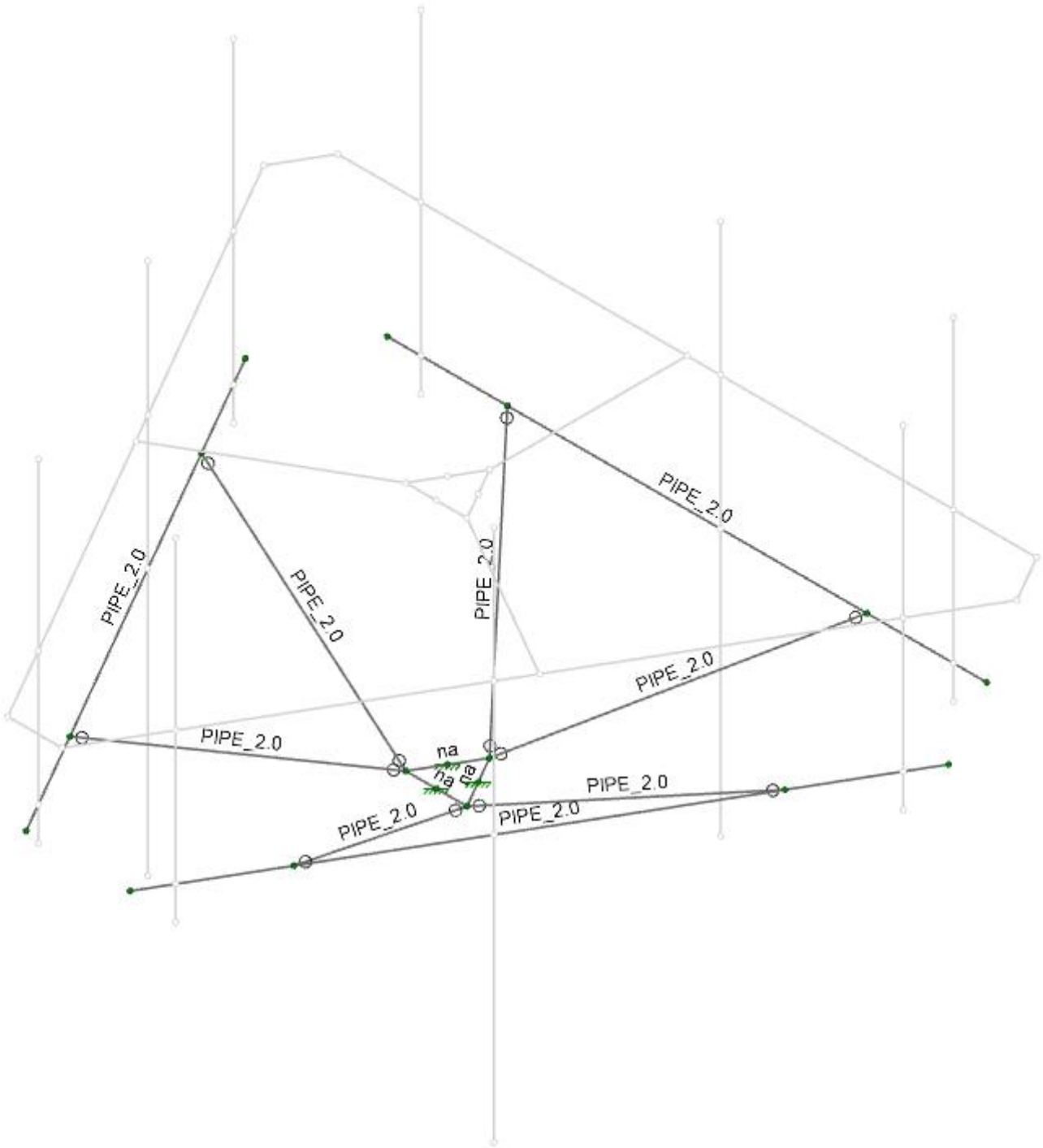


Centek	CT11024B_AMA	SK-2
PPG		Apr 12, 2023
20074.79		CT11024B_AMA Rev 1.r3d

Node Coordinates

	Label	X [in]	Y [in]	Z [in]	Detach From Diaphragm
1	N17	63.001927	0	-42.004995	
2	N18	-62.998072	0	-42.004995	
3	N19	0	0	-6.374995	
4	N20	0	0	-42.004995	
5	N13	48	0	-42.004995	
6	N14	-48	0	-42.004995	
7	N15	48	30	-42.004995	
8	N16	-48	30	-42.004995	
9	N21	48	-30	-42.004995	
10	N22	-48	-30	-42.004995	
11	N12	6	0	-42.004995	
12	N23	6	24	-42.004995	
13	N24	6	-72	-42.004995	
14	N51	67.876429	0	-33.555434	
15	N25	48	-24	-42.004995	
16	N26	-48	-24	-42.004995	
17	N28	6	-24	-42.004995	
18	N29	54	-24	-42.004995	
19	N30	-54	-24	-42.004995	
20	N34	0	-45	-6.374995	
21	N32	32.4	-24	-42.004995	
22	N36	-32.4	-24	-42.004995	
23	N33	-5.520908	0	3.187498	
24	N35	-36.377393	0	21.002498	
25	N37	-39.377393	0	15.806345	
26	N38	-60.377393	0	-20.566722	
27	N39	-12.377393	0	62.571717	
28	N40	-60.377393	30	-20.566722	
29	N41	-60.377393	-30	-20.566722	
30	N42	-12.377393	30	62.571717	
31	N43	-12.377393	-30	62.571717	
32	N44	-39.377393	24	15.806345	
33	N45	-39.377393	-72	15.806345	
34	N46	-67.878357	0	-33.558772	
35	N47	-4.878357	0	75.560429	
36	N48	-60.377393	-24	-20.566722	
37	N49	-12.377393	-24	62.571717	
38	N50	-39.377393	-24	15.806345	
39	N52	-63.377393	-24	-25.762874	
40	N53	-9.377393	-24	67.767869	
41	N54	-5.520908	-45	3.187498	
42	N55	-52.577393	-24	-7.056726	
43	N56	-20.177393	-24	49.061721	
44	N57	5.520908	0	3.187498	
45	N58	36.377393	0	21.002498	
46	N59	33.377393	0	26.19865	
47	N60	12.377393	0	62.571717	
48	N61	60.377393	0	-20.566722	
49	N62	12.377393	30	62.571717	
50	N63	12.377393	-30	62.571717	
51	N64	60.377393	30	-20.566722	
52	N65	60.377393	-30	-20.566722	
53	N66	33.377393	24	26.19865	
54	N67	33.377393	-72	26.19865	
55	N68	4.876429	0	75.563767	

Node Coordinates (Continued)

	Label	X [in]	Y [in]	Z [in]	Detach From Diaphragm
56	N69	12.377393	-24	62.571717	
57	N70	60.377393	-24	-20.566722	
58	N71	33.377393	-24	26.19865	
59	N72	9.377393	-24	67.767869	
60	N73	63.377393	-24	-25.762874	
61	N74	5.520908	-45	3.187498	
62	N75	20.177393	-24	49.061721	
63	N76	52.577393	-24	-7.056726	
64	N77	-2.760454	0	-1.593749	
65	N78	2.760454	0	-1.593749	
66	N79	0	0	3.187498	
67	N80	-2.760454	-45	-1.593749	
68	N81	2.760454	-45	-1.593749	
69	N82	0	-45	3.187498	
70	N83	12.377393	18	62.571717	
71	N84	4.876429	18	75.563767	
72	N85	67.876429	18	-33.555434	
73	N86	-67.878357	18	-33.558772	
74	N87	-4.878357	18	75.560429	
75	N88	63.001927	18	-42.004995	
76	N89	-62.998072	18	-42.004995	
77	N90	33.377393	18	26.19865	
78	N91	60.377393	18	-20.566722	
79	N92	-12.377393	18	62.571717	
80	N93	-39.377393	18	15.806345	
81	N94	-60.377393	18	-20.566722	
82	N95	48	18	-42.004995	
83	N96	6	18	-42.004995	
84	N97	-48	18	-42.004995	
85	N98	58.001927	18	-42.004995	
86	N99	-65.379344	18	-29.230356	
87	N100	-7.765678	18	70.55944	
88	N101	7.76261	18	70.564755	
89	N102	65.375441	18	-29.223595	
90	N103	-57.998072	18	-42.004995	

Node Boundary Conditions

	Node 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	N81	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N77	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N82	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
4	N79	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
5	N80	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
6	N78	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [1e^{5}°F^{-1}]	Density [k/ft^{3}]	Yield [ksi]	Ry	Fu [ksi]	Rt
1	A36 Gr.36	29000	11154	0.3	0.65	0.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	0.3	0.65	0.49	50	1.1	58	1.2
3	A992	29000	11154	0.3	0.65	0.49	50	1.1	58	1.2
4	A500 Gr.42	29000	11154	0.3	0.65	0.49	42	1.3	58	1.1
5	A500 Gr.46	29000	11154	0.3	0.65	0.49	46	1.2	58	1.1
6	A53 Grade B	29000	11154	0.3	0.65	0.49	35	1.5	58	1.2

Member Point Loads (BLC 2 : Dead Load)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(in, %)]
1	M5	Y	-0.077	6
2	M5	Y	-0.077	90
3	M5	Y	-0.075	24
4	M5	Y	-0.109	72
5	M57	Y	-0.077	6
6	M57	Y	-0.109	72
7	M57	Y	-0.075	24
8	M57	Y	-0.077	90
9	M122	Y	-0.077	6
10	M122	Y	-0.109	72
11	M122	Y	-0.075	24
12	M122	Y	-0.077	90
13	M3	Y	-0.083	%40
14	M51	Y	-0.083	%40
15	M116	Y	-0.083	%40

Member Point Loads (BLC 3 : Ice Load)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(in, %)]
1	M5	Y	-0.138	90
2	M5	Y	-0.138	6
3	M5	Y	-0.048	24
4	M5	Y	-0.033	72
5	M57	Y	-0.048	24
6	M57	Y	-0.138	90
7	M57	Y	-0.138	6
8	M57	Y	-0.033	72
9	M122	Y	-0.048	24
10	M122	Y	-0.138	90
11	M122	Y	-0.138	6
12	M122	Y	-0.033	72
13	M3	Y	-0.108	%40
14	M51	Y	-0.108	%40
15	M116	Y	-0.108	%40

Member Point Loads (BLC 4 : Wind with Ice X (8psf))

	Member Label	Direction	Magnitude [k, k-ft]	Location [(in, %)]
1	M5	X	0.036	6
2	M5	X	0.036	90
3	M5	X	0.015	36
4	M5	X	0.008	72
5	M57	X	0.086	90
6	M57	X	0.086	6
7	M57	X	0.017	72
8	M57	X	0.02	36
9	M122	X	0.086	90
10	M122	X	0.086	6
11	M122	X	0.017	72
12	M122	X	0.02	36
13	M3	X	0.014	20
14	M3	X	0.014	40
15	M116	X	0.028	40
16	M51	X	0.028	40

Member Point Loads (BLC 4 : Wind with Ice X (8psf)) (Continued)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(in, %)]
17	M116	X	0.028	20
18	M51	X	0.028	20

Member Point Loads (BLC 5 : Wind X(34psf))

	Member Label	Direction	Magnitude [k, k-ft]	Location [(in, %)]
1	M5	X	0.173	90
2	M5	X	0.173	6
3	M5	X	0.067	36
4	M5	X	0.032	72
5	M57	X	0.093	36
6	M57	X	0.477	90
7	M57	X	0.077	72
8	M57	X	0.477	6
9	M122	X	0.093	36
10	M122	X	0.477	90
11	M122	X	0.077	72
12	M122	X	0.477	6
13	M3	X	0.064	20
14	M3	X	0.064	40
15	M116	X	0.149	40
16	M51	X	0.149	40
17	M116	X	0.149	20
18	M51	X	0.149	20

Member Point Loads (BLC 6 : Wind with Ice Z(8psf))

	Member Label	Direction	Magnitude [k, k-ft]	Location [(in, %)]
1	M5	Z	0.086	6
2	M5	Z	0.086	90
3	M5	Z	0.02	36
4	M5	Z	0.017	72
5	M57	Z	0.008	72
6	M57	Z	0.036	6
7	M57	Z	0.036	90
8	M57	Z	0.015	36
9	M122	Z	0.008	72
10	M122	Z	0.036	6
11	M122	Z	0.036	90
12	M122	Z	0.015	36
13	M3	Z	0.064	20
14	M3	Z	0.064	40
15	M116	Z	0.014	40
16	M51	Z	0.014	40
17	M116	Z	0.014	20
18	M51	Z	0.014	20

Member Point Loads (BLC 7 : Wind Z(34psf))

	Member Label	Direction	Magnitude [k, k-ft]	Location [(in, %)]
1	M5	Z	0.477	90
2	M5	Z	0.477	6
3	M5	Z	0.093	36
4	M5	Z	0.077	72
5	M57	Z	0.032	72

Member Point Loads (BLC 7 : Wind Z(34psf)) (Continued)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(in, %)]
6	M57	Z	0.067	24
7	M57	Z	0.173	6
8	M57	Z	0.173	90
9	M122	Z	0.032	72
10	M122	Z	0.067	24
11	M122	Z	0.173	6
12	M122	Z	0.173	90
13	M3	Z	0.149	20
14	M3	Z	0.149	40
15	M116	Z	0.064	40
16	M51	Z	0.064	40
17	M116	Z	0.064	20
18	M51	Z	0.064	20

Member Distributed Loads (BLC 4 : Wind with Ice X (8psf))

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/in]	End Magnitude [k/ft, F, ksf, k-ft/in]	Start Location [(in, %)]	End Location [(in, %)]
1	M103	X	0.003	0.003	0	%100
2	M147	X	0.003	0.003	0	%100
3	M2	X	0.003	0.003	0	%100
4	M61	X	0.003	0.003	0	%100
5	M126	X	0.003	0.003	0	%100
6	M111	X	0.002	0.002	0	%100
7	M155	X	0.002	0.002	0	%100
8	M49	X	0.002	0.002	0	%100
9	M3	X	0.002	0.002	0	%100
10	M5	X	0.002	0.002	0	%100
11	M4	X	0.002	0.002	0	%100
12	M114	X	0.002	0.002	0	%100
13	M113	X	0.002	0.002	0	%100
14	M112	X	0.002	0.002	0	%100
15	M47	X	0.002	0.002	0	%100
16	M48	X	0.002	0.002	0	%100
17	M157	X	0.002	0.002	0	%100
18	M156	X	0.002	0.002	0	%100
19	M37	X	0.017	0.017	0	%100
20	M35	X	0.017	0.017	0	%100
21	M34	X	0.017	0.017	0	%100

Member Distributed Loads (BLC 5 : Wind X(34psf))

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/in]	End Magnitude [k/ft, F, ksf, k-ft/in]	Start Location [(in, %)]	End Location [(in, %)]
1	M103	X	0.017	0.017	0	%100
2	M147	X	0.017	0.017	0	%100
3	M2	X	0.017	0.017	0	%100
4	M61	X	0.017	0.017	0	%100
5	M126	X	0.017	0.017	0	%100
6	M49	X	0.01	0.01	0	%100
7	M4	X	0.01	0.01	0	%100
8	M114	X	0.01	0.01	0	%100
9	M155	X	0.01	0.01	0	%100
10	M111	X	0.01	0.01	0	%100
11	M113	X	0.01	0.01	0	%100
12	M112	X	0.01	0.01	0	%100
13	M48	X	0.01	0.01	0	%100

Member Distributed Loads (BLC 5 : Wind X(34psf)) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/in]	End Magnitude [k/ft, F, ksf, k-ft/in]	Start Location [(in, %)]	End Location [(in, %)]
14	M156	X	0.01	0.01	0	%100
15	M157	X	0.01	0.01	0	%100
16	M47	X	0.01	0.01	0	%100
17	M5	X	0.01	0.01	0	%100
18	M3	X	0.01	0.01	0	%100
19	M37	X	0.106	0.106	0	%100
20	M35	X	0.106	0.106	0	%100
21	M34	X	0.106	0.106	0	%100

Member Distributed Loads (BLC 6 : Wind with Ice Z(8psf))

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/in]	End Magnitude [k/ft, F, ksf, k-ft/in]	Start Location [(in, %)]	End Location [(in, %)]
1	M1	Z	0.003	0.003	0	%100
2	M103	Z	0.003	0.003	0	%100
3	M147	Z	0.003	0.003	0	%100
4	M126	Z	0.003	0.003	0	%100
5	M61	Z	0.003	0.003	0	%100
6	M46	Z	0.002	0.002	0	%100
7	M155	Z	0.002	0.002	0	%100
8	M111	Z	0.002	0.002	0	%100
9	M4	Z	0.002	0.002	0	%100
10	M49	Z	0.002	0.002	0	%100
11	M114	Z	0.002	0.002	0	%100
12	M48	Z	0.002	0.002	0	%100
13	M112	Z	0.002	0.002	0	%100
14	M47	Z	0.002	0.002	0	%100
15	M113	Z	0.002	0.002	0	%100
16	M156	Z	0.002	0.002	0	%100
17	M157	Z	0.002	0.002	0	%100
18	M36	Z	0.017	0.017	0	%100
19	M35	Z	0.017	0.017	0	%100
20	M34	Z	0.017	0.017	0	%100

Member Distributed Loads (BLC 7 : Wind Z(34psf))

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/in]	End Magnitude [k/ft, F, ksf, k-ft/in]	Start Location [(in, %)]	End Location [(in, %)]
1	M1	Z	0.017	0.017	0	%100
2	M103	Z	0.017	0.017	0	%100
3	M147	Z	0.017	0.017	0	%100
4	M61	Z	0.017	0.017	0	%100
5	M126	Z	0.017	0.017	0	%100
6	M49	Z	0.01	0.01	0	%100
7	M4	Z	0.01	0.01	0	%100
8	M114	Z	0.01	0.01	0	%100
9	M111	Z	0.01	0.01	0	%100
10	M155	Z	0.01	0.01	0	%100
11	M46	Z	0.01	0.01	0	%100
12	M156	Z	0.01	0.01	0	%100
13	M113	Z	0.01	0.01	0	%100
14	M157	Z	0.01	0.01	0	%100
15	M48	Z	0.01	0.01	0	%100
16	M47	Z	0.01	0.01	0	%100
17	M112	Z	0.01	0.01	0	%100
18	M35	Z	0.106	0.106	0	%100
19	M36	Z	0.106	0.106	0	%100

Member Distributed Loads (BLC 7 : Wind Z(34psf)) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/in]	End Magnitude [k/ft, F, ksf, k-ft/in]	Start Location [(in, %)]	End Location [(in, %)]
20	M34	Z	0.106	0.106	0	%100

Basic Load Cases

	BLC Description	Category	Y Gravity	Point	Distributed
1	Self Weight	None	-1		
2	Dead Load	None		15	
3	Ice Load	None		15	
4	Wind with Ice X (8psf)	None		18	21
5	Wind X(34psf)	None		18	21
6	Wind with Ice Z(8psf)	None		18	20
7	Wind Z(34psf)	None		18	20

Load Combinations

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	1.2D + 1.6W (X-direction)	Yes	Y	1	1.2	2	1.2	5	1.6		
2	0.9D + 1.6W (X-direction)	Yes	Y	1	0.9	2	0.9	5	1.6		
3	1.2D + 1.0Di + 1.0Wi (X-direction)	Yes	Y	1	1.2	2	1.2	3	1	4	1
4	1.2D + 1.6W (Z-direction)	Yes	Y	1	1.2	2	1.2	7	1.6		
5	0.9D + 1.6W (Z-direction)	Yes	Y	1	0.9	2	0.9	7	1.6		
6	1.2D + 1.0Di + 1.0Wi (Z-direction)	Yes	Y	1	1.2	2	1.2	3	1	6	1

Envelope Node Reactions

	Node Label		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N81	max	0	3	0.397	4	-0.073	3	0.208	4	-0.003	6	-0.008	3
2		min	-0.364	2	-0.132	2	-0.757	4	0.021	3	-0.022	4	-0.106	5
3	N77	max	13.299	5	0.925	6	8.33	1	1.121	1	0.015	1	0.953	2
4		min	0.725	3	-2.054	2	-10.708	5	-2.21	5	-0.182	5	-1.25	4
5	N82	max	0.001	5	0.27	3	0.046	3	-0.005	6	0.016	2	0	6
6		min	-1.567	1	0.153	5	-0.053	5	-0.012	1	-0.001	4	-0.351	2
7	N79	max	-0.47	6	3.224	4	11.418	5	-0.289	2	-0.007	6	3.029	2
8		min	-25.339	2	0.697	2	-0.646	1	-0.847	4	-0.32	2	-0.17	5
9	N80	max	0.364	5	0.494	4	0.339	2	0.216	4	0.015	5	0.096	5
10		min	-0.411	1	0.292	3	-0.826	4	-0.153	2	-0.024	1	-0.101	1
11	N78	max	8.01	2	3.099	1	-0.82	3	0.199	3	0.175	4	1.544	1
12		min	-12.192	4	-1.109	5	-10.645	5	-2.09	5	-0.009	2	0.55	6
13	Totals:	max	0	5	4.034	3	0	3						
14		min	-12.779	1	1.979	5	-11.562	4						

Envelope Node Displacements

	Node Label		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
1	N17	max	0.117	2	0.116	5	0.189	5	3.667e-3	5	1.841e-3	2	3.121e-4	5
2		min	-0.003	6	-0.221	1	-0.035	1	-1.317e-3	1	-3.881e-3	4	-3.544e-3	1
3	N18	max	0.117	2	0.15	2	0.246	4	4.213e-3	5	5.097e-3	4	1.996e-4	6
4		min	-0.003	6	-0.058	6	0.008	3	1.166e-4	3	3.936e-4	3	-3.28e-3	2
5	N19	max	0	1	0	5	0	5	0	5	0	6	0	5
6		min	0	6	0	3	0	3	0	3	0	1	0	1
7	N20	max	0.116	2	0.067	5	0.001	5	2.992e-3	5	1.627e-4	6	8.528e-5	5
8		min	-0.003	6	-0.051	3	0	3	-1.489e-3	3	-2.692e-3	2	-2.421e-3	1
9	N13	max	0.117	2	0.109	5	0.132	5	3.905e-3	5	1.674e-3	2	7.133e-4	5
10		min	-0.003	6	-0.17	1	-0.008	1	-1.126e-3	1	-3.69e-3	4	-3.222e-3	1

Envelope Node Displacements (Continued)

	Node Label		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
11	N14	max	0.117	2	0.103	2	0.17	4	4.42e-3	5	4.967e-3	4	2.378e-4	6
12		min	-0.003	6	-0.055	3	0.002	3	5.229e-5	3	3.238e-4	3	-3.024e-3	2
13	N15	max	0.252	1	0.109	5	0.301	5	5.941e-3	4	1.836e-3	2	9.816e-4	5
14		min	-0.013	5	-0.17	1	-0.048	1	-1.215e-3	2	-1.214e-3	4	-4.181e-3	1
15	N16	max	0.253	1	0.103	2	0.335	5	5.316e-3	5	1.39e-3	1	-9.346e-5	6
16		min	-0.002	6	-0.055	3	0	3	-2.019e-4	3	2.832e-4	6	-4.318e-3	1
17	N21	max	0.07	2	0.109	5	0.078	5	1.269e-3	6	5.749e-4	2	-9.956e-6	5
18		min	-0.002	6	-0.17	1	-0.032	3	-4.598e-4	5	-9.467e-4	4	-2.153e-3	1
19	N22	max	0.073	1	0.103	2	0.067	5	2.429e-3	1	3.061e-3	4	1.204e-3	4
20		min	0.001	6	-0.055	3	-0.048	1	1.84e-3	6	7.001e-4	3	-1.636e-3	2
21	N12	max	0.116	2	0.069	5	0.013	2	3.078e-3	5	8.388e-5	6	4.545e-4	5
22		min	-0.003	6	-0.054	3	-0.001	6	-9.952e-4	3	-1.597e-3	2	-2.979e-3	1
23	N23	max	0.226	2	0.069	5	0.211	5	9.685e-3	5	1.244e-4	6	3.191e-4	4
24		min	-0.004	6	-0.054	3	-0.016	3	-5.326e-4	3	-7.55e-5	2	-4.082e-3	2
25	N24	max	0.392	1	0.069	5	1.67	5	9.501e-4	3	2.297e-4	6	8.748e-3	1
26		min	0.006	6	-0.055	3	-0.052	3	-3.71e-2	5	-1.117e-3	2	1.537e-4	6
27	N51	max	0.159	2	0.066	5	0.165	5	2.643e-3	5	1.476e-4	6	9.025e-4	5
28		min	-0.002	6	-0.227	1	-0.059	1	-3.371e-5	3	-3.59e-3	2	-5.083e-3	1
29	N25	max	0.083	1	0.109	5	0.075	5	1.27e-3	6	5.749e-4	2	-9.956e-6	5
30		min	-0.001	6	-0.17	1	-0.025	3	-4.565e-4	5	-9.467e-4	4	-2.156e-3	1
31	N26	max	0.083	2	0.103	2	0.078	5	2.429e-3	1	3.061e-3	4	1.204e-3	4
32		min	-0.001	6	-0.055	3	-0.033	1	1.84e-3	6	7.001e-4	3	-1.64e-3	2
33	N28	max	0.083	2	0.069	5	0.172	5	9.569e-4	3	2.297e-4	6	5.201e-4	4
34		min	-0.001	6	-0.054	3	-0.007	3	-1.614e-2	5	-1.117e-3	2	1.548e-4	6
35	N29	max	0.083	1	0.109	5	0.081	5	1.27e-3	6	5.749e-4	2	-1.06e-5	5
36		min	-0.001	6	-0.183	1	-0.024	3	-4.565e-4	5	-9.5e-4	4	-2.157e-3	1
37	N30	max	0.083	2	0.113	2	0.096	5	2.429e-3	1	3.064e-3	4	1.205e-3	4
38		min	-0.001	6	-0.057	6	-0.026	3	1.84e-3	6	7.001e-4	3	-1.639e-3	2
39	N34	max	0	2	0	2	0	4	0	2	0	1	0	5
40		min	0	4	0	4	0	2	0	4	0	5	0	2
41	N32	max	0.083	1	0.109	5	0.084	5	9.807e-4	3	2.783e-3	4	6.729e-4	5
42		min	-0.001	6	-0.115	1	-0.025	3	-5.932e-3	5	1.32e-4	2	-4.015e-3	1
43	N36	max	0.083	2	0.111	5	0.054	5	2.048e-3	1	8.186e-5	6	4.662e-4	6
44		min	-0.001	6	-0.051	3	-0.044	1	-3.124e-3	5	-8.201e-4	5	-3.262e-3	2
45	N33	max	0	5	0	2	0	5	0	4	0	5	0	4
46		min	0	3	0	4	0	3	0	2	0	3	0	2
47	N35	max	0.069	4	0.052	2	0.12	4	2.984e-3	4	3.924e-3	4	1.436e-3	4
48		min	0.006	3	-0.072	4	0.011	3	-2.196e-4	2	4.175e-4	3	-2.723e-3	2
49	N37	max	0.049	5	0.061	2	0.132	4	3.05e-3	4	3.577e-3	4	1.045e-3	4
50		min	0.004	3	-0.06	4	0.012	3	8.169e-5	2	2.88e-4	3	-3.227e-3	2
51	N38	max	0.087	2	0.142	2	0.189	4	2.486e-3	5	1.911e-3	5	4.761e-5	6
52		min	-0.049	4	-0.051	6	0.01	3	-8.262e-4	1	-2.684e-3	1	-4.952e-3	2
53	N39	max	0.269	1	0.013	2	0.134	5	4.099e-3	4	5.376e-3	1	1.522e-3	5
54		min	0.011	6	-0.196	4	-0.025	1	-4.064e-4	2	-2.593e-3	5	-3.258e-3	1
55	N40	max	0.296	2	0.142	2	0.308	5	3.762e-3	5	-1.976e-4	6	-1.957e-4	6
56		min	-0.017	4	-0.051	6	0.003	3	-5.786e-4	1	-9.148e-4	1	-7.004e-3	1
57	N41	max	-0.001	2	0.142	2	0.17	4	6.374e-4	5	2.e-3	5	-1.18e-3	6
58		min	-0.079	4	-0.051	6	0.031	3	-9.07e-4	3	-2.091e-4	3	-1.76e-3	4
59	N42	max	0.422	2	0.013	2	0.313	5	5.957e-3	5	9.777e-4	1	1.856e-3	4
60		min	-0.012	4	-0.196	4	-0.018	1	-8.967e-5	1	-5.341e-4	5	-5.107e-3	2
61	N43	max	0.208	2	0.014	2	0.083	4	1.675e-3	5	4.451e-3	1	2.097e-4	5
62		min	-0.017	6	-0.196	4	-0.001	2	-4.72e-4	3	-4.614e-4	5	-1.615e-3	3
63	N44	max	0.239	2	0.061	2	0.269	4	5.9e-3	4	2.142e-3	2	1.947e-3	4
64		min	-0.013	6	-0.06	4	0.016	3	-2.048e-3	2	2.149e-4	3	-9.181e-3	2
65	N45	max	1.496	2	0.061	2	0.474	4	5.004e-3	2	3.109e-3	1	3.372e-2	2

Envelope Node Displacements (Continued)

	Node Label		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
66		min	-0.099	4	-0.061	4	-0.206	2	-9.509e-3	4	4.723e-4	3	-2.524e-3	4
67	N46	max	0.124	2	0.167	2	0.202	4	2.678e-3	5	1.804e-3	5	9.349e-5	6
68		min	-0.072	4	-0.049	6	0.007	3	-9.838e-4	1	-2.952e-3	1	-4.685e-3	2
69	N47	max	0.339	1	-0.01	2	0.154	5	4.e-3	4	5.382e-3	1	1.518e-3	5
70		min	0.009	6	-0.237	4	-0.065	1	2.185e-4	3	-2.726e-3	5	-3.249e-3	1
71	N48	max	0.007	2	0.142	2	0.173	4	6.407e-4	5	2.e-3	5	-1.18e-3	6
72		min	-0.069	4	-0.051	6	0.026	3	-9.07e-4	3	-2.091e-4	3	-1.76e-3	4
73	N49	max	0.216	2	0.014	2	0.092	4	1.675e-3	5	4.451e-3	1	2.097e-4	5
74		min	-0.008	6	-0.196	4	0.003	2	-4.72e-4	3	-4.614e-4	5	-1.615e-3	3
75	N50	max	0.161	2	0.061	2	0.121	4	5.02e-3	2	3.109e-3	1	1.275e-2	2
76		min	-0.003	6	-0.06	4	0.007	3	-1.844e-3	4	4.723e-4	3	-2.534e-3	4
77	N52	max	0.005	2	0.144	2	0.179	4	6.401e-4	5	2.002e-3	5	-1.18e-3	6
78		min	-0.079	4	-0.052	6	0.025	3	-9.078e-4	3	-2.095e-4	3	-1.759e-3	4
79	N53	max	0.239	2	0.006	2	0.093	4	1.676e-3	5	4.454e-3	1	2.094e-4	5
80		min	-0.005	6	-0.204	4	-0.01	2	-4.713e-4	3	-4.63e-4	5	-1.615e-3	3
81	N54	max	0	1	0	5	0	5	0	1	0	1	0	1
82		min	0	5	0	1	0	1	0	5	0	5	0	5
83	N55	max	0.032	2	0.118	2	0.157	4	4.366e-3	2	4.349e-3	1	1.944e-3	2
84		min	-0.041	4	-0.05	6	0.025	3	-5.605e-4	6	7.6e-4	6	-2.973e-3	4
85	N56	max	0.171	2	0.05	2	0.094	4	3.704e-3	2	1.693e-3	1	1.529e-3	2
86		min	-0.015	6	-0.157	4	0.019	3	7.764e-5	6	1.203e-4	3	-1.692e-3	4
87	N57	max	0	1	0	5	0	4	0	1	0	1	0	5
88		min	0	5	0	1	0	2	0	6	0	5	0	1
89	N58	max	0.066	1	-0.053	6	0.104	5	2.882e-3	4	4.195e-3	1	-9.206e-4	5
90		min	-0.059	5	-0.11	1	-0.112	1	8.501e-4	3	-3.06e-3	5	-4.071e-3	1
91	N59	max	0.09	1	-0.056	6	0.097	5	3.421e-3	4	4.65e-3	1	-6.703e-4	5
92		min	-0.07	5	-0.106	1	-0.098	1	6.801e-4	3	-1.536e-3	5	-3.522e-3	1
93	N60	max	0.275	1	-0.063	3	0.125	4	3.893e-3	4	4.864e-3	2	-1.921e-4	6
94		min	-0.024	5	-0.19	4	0.002	3	1.936e-4	3	3.402e-4	6	-2.636e-3	2
95	N61	max	0.112	2	0.028	5	0.156	5	2.421e-3	5	8.017e-5	6	4.993e-4	5
96		min	0	6	-0.204	1	-0.085	1	-9.044e-5	3	-3.412e-3	2	-5.404e-3	1
97	N62	max	0.419	2	-0.063	3	0.297	4	5.79e-3	4	1.617e-3	5	1.169e-4	6
98		min	0.005	6	-0.19	4	0.002	3	9.22e-5	3	-8.682e-5	3	-5.025e-3	2
99	N63	max	0.295	1	-0.063	3	0.073	4	1.825e-3	5	2.774e-3	2	2.243e-3	1
100		min	-0.042	5	-0.189	4	-0.006	2	-1.386e-3	1	-4.986e-5	6	3.979e-4	5
101	N64	max	0.318	1	0.028	5	0.284	5	4.207e-3	4	3.707e-4	1	8.165e-4	5
102		min	-0.002	6	-0.205	1	-0.053	1	2.455e-4	3	2.206e-4	3	-6.71e-3	1
103	N65	max	0.065	4	0.027	5	0.135	4	1.527e-3	2	5.33e-4	6	1.75e-3	4
104		min	0.032	2	-0.204	1	-0.158	2	-1.018e-3	6	-1.538e-3	5	-1.225e-3	2
105	N66	max	0.291	1	-0.056	6	0.237	4	5.928e-3	4	3.083e-3	1	-7.63e-4	6
106		min	-0.035	5	-0.106	1	-0.049	2	5.104e-4	3	-9.317e-4	5	-9.392e-3	1
107	N67	max	1.637	1	-0.056	6	0.442	4	-1.106e-3	3	3.695e-3	1	3.521e-2	1
108		min	0.053	6	-0.107	1	0.053	3	-9.586e-3	4	-1.385e-3	5	1.015e-3	6
109	N68	max	0.339	1	-0.063	3	0.145	4	4.001e-3	4	4.886e-3	2	-1.915e-4	6
110		min	0.009	6	-0.232	4	0.005	3	2.184e-4	3	3.184e-4	6	-2.624e-3	2
111	N69	max	0.282	1	-0.063	3	0.083	4	1.828e-3	5	2.774e-3	2	2.24e-3	1
112		min	-0.044	5	-0.189	4	-0.013	2	-1.386e-3	1	-4.986e-5	6	3.979e-4	5
113	N70	max	0.055	4	0.027	5	0.138	4	1.527e-3	2	5.33e-4	6	1.75e-3	4
114		min	0.026	6	-0.204	1	-0.149	2	-1.018e-3	6	-1.538e-3	5	-1.225e-3	2
115	N71	max	0.229	1	-0.056	6	0.085	4	-8.404e-4	6	3.695e-3	1	1.427e-2	1
116		min	-0.039	5	-0.106	1	-0.042	2	-4.931e-3	1	-1.385e-3	5	1.022e-3	6
117	N72	max	0.296	1	-0.064	3	0.086	4	1.829e-3	5	2.777e-3	2	2.241e-3	1
118		min	-0.039	5	-0.2	4	-0.005	2	-1.385e-3	1	-4.965e-5	6	3.982e-4	5
119	N73	max	0.062	4	0.036	5	0.142	4	1.527e-3	2	5.328e-4	6	1.75e-3	4
120		min	0.023	6	-0.2	1	-0.148	2	-1.018e-3	6	-1.539e-3	5	-1.225e-3	2

Envelope Node Displacements (Continued)

	Node Label		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
121	N74	max	0	2	0	2	0	2	0	4	0	1	0	2
122		min	0	6	0	6	0	3	0	2	0	6	0	6
123	N75	max	0.256	1	-0.06	3	0.08	4	2.79e-3	5	8.386e-4	1	5.116e-3	1
124		min	-0.05	5	-0.142	4	-0.028	2	-4.655e-3	1	6.352e-5	5	1.225e-3	6
125	N76	max	0.057	1	-0.004	5	0.126	4	1.288e-3	5	2.981e-3	2	2.751e-3	4
126		min	0.028	5	-0.191	1	-0.143	2	-3.539e-3	1	-1.904e-3	4	9.942e-4	3
127	N77	max	0	3	0	2	0	5	0	5	0	5	0	4
128		min	0	5	0	6	0	1	0	1	0	1	0	2
129	N78	max	0	4	0	5	0	5	0	5	0	2	0	6
130		min	0	2	0	1	0	3	0	3	0	4	0	1
131	N79	max	0	2	0	2	0	1	0	4	0	2	0	5
132		min	0	6	0	4	0	5	0	2	0	6	0	2
133	N80	max	0	1	0	3	0	4	0	2	0	1	0	1
134		min	0	5	0	4	0	2	0	4	0	5	0	5
135	N81	max	0	2	0	2	0	4	0	3	0	4	0	5
136		min	0	3	0	4	0	3	0	4	0	6	0	3
137	N82	max	0	1	0	5	0	5	0	1	0	4	0	2
138		min	0	5	0	3	0	3	0	6	0	2	0	6
139	N83	max	0.359	1	-0.063	3	0.228	4	5.764e-3	4	1.617e-3	5	1.169e-4	6
140		min	0	5	-0.19	4	0.001	3	9.22e-5	3	-8.682e-5	3	-4.999e-3	2
141	N84	max	0.351	1	-0.064	3	0.235	5	5.84e-3	4	5.802e-4	5	5.364e-4	6
142		min	0.007	6	-0.264	4	0	3	5.727e-5	3	-1.391e-3	1	-4.211e-3	2
143	N85	max	0.219	2	0.094	5	0.23	5	4.719e-3	4	2.033e-3	2	1.271e-3	5
144		min	-0.003	6	-0.251	1	-0.073	1	-1.08e-3	2	-8.593e-6	6	-4.7e-3	1
145	N86	max	0.209	1	0.19	2	0.255	5	3.839e-3	5	9.19e-4	1	-2.482e-4	6
146		min	-0.013	5	-0.05	6	0.007	3	-3.923e-4	3	-1.258e-3	5	-5.005e-3	1
147	N87	max	0.351	1	-0.023	2	0.241	5	5.84e-3	4	5.491e-4	5	5.356e-4	6
148		min	0.007	6	-0.267	4	-0.011	1	5.727e-5	3	-1.391e-3	1	-4.212e-3	2
149	N88	max	0.201	1	0.127	5	0.232	5	4.719e-3	4	2.051e-3	2	1.27e-3	5
150		min	-0.003	6	-0.237	1	-0.063	1	-1.08e-3	2	-8.592e-6	6	-4.7e-3	1
151	N89	max	0.201	2	0.174	2	0.262	5	3.84e-3	5	9.365e-4	1	-2.48e-4	6
152		min	-0.004	6	-0.051	6	0.006	3	-3.919e-4	3	-1.258e-3	5	-5.005e-3	1
153	N90	max	0.235	1	-0.056	6	0.202	4	5.928e-3	4	3.083e-3	1	-7.63e-4	6
154		min	-0.047	5	-0.106	1	-0.065	2	5.104e-4	3	-9.317e-4	5	-9.392e-3	1
155	N91	max	0.238	2	0.028	5	0.233	5	4.207e-3	4	3.707e-4	1	8.165e-4	5
156		min	-0.002	6	-0.205	1	-0.062	1	2.455e-4	3	2.206e-4	3	-6.709e-3	1
157	N92	max	0.36	2	0.013	2	0.242	5	5.957e-3	5	9.777e-4	1	1.856e-3	4
158		min	0.005	6	-0.196	4	-0.017	1	-8.967e-5	1	-5.341e-4	5	-5.107e-3	2
159	N93	max	0.184	2	0.061	2	0.234	4	5.9e-3	4	2.142e-3	2	1.947e-3	4
160		min	-0.008	6	-0.06	4	0.016	3	-2.048e-3	2	2.149e-4	3	-9.181e-3	2
161	N94	max	0.212	2	0.142	2	0.263	5	3.735e-3	5	-1.976e-4	6	-1.957e-4	6
162		min	-0.026	4	-0.051	6	0.007	3	-5.786e-4	1	-9.148e-4	1	-6.978e-3	1
163	N95	max	0.201	1	0.109	5	0.23	5	5.915e-3	4	1.836e-3	2	9.816e-4	5
164		min	-0.003	6	-0.17	1	-0.034	1	-1.215e-3	2	-1.214e-3	4	-4.155e-3	1
165	N96	max	0.201	1	0.069	5	0.153	5	9.685e-3	5	1.244e-4	6	3.191e-4	4
166		min	-0.003	6	-0.054	3	-0.012	3	-5.326e-4	3	-7.55e-5	2	-4.081e-3	2
167	N97	max	0.201	2	0.103	2	0.271	5	5.316e-3	5	1.39e-3	1	-9.346e-5	6
168		min	-0.004	6	-0.055	3	0.003	3	-2.019e-4	3	2.832e-4	6	-4.292e-3	1
169	N98	max	0.201	1	0.121	5	0.234	5	4.719e-3	4	2.051e-3	2	1.271e-3	5
170		min	-0.003	6	-0.214	1	-0.053	1	-1.08e-3	2	-7.577e-6	6	-4.7e-3	1
171	N99	max	0.213	1	0.174	2	0.258	5	3.84e-3	5	9.365e-4	1	-2.485e-4	6
172		min	-0.018	5	-0.05	6	0.006	3	-3.919e-4	3	-1.268e-3	5	-5.005e-3	1
173	N100	max	0.358	1	-0.009	2	0.242	5	5.84e-3	4	5.647e-4	5	5.36e-4	6
174		min	0.006	6	-0.238	4	-0.015	1	5.661e-5	3	-1.418e-3	1	-4.212e-3	2
175	N101	max	0.358	1	-0.063	3	0.233	5	5.84e-3	4	5.647e-4	5	5.36e-4	6

Envelope Node Displacements (Continued)

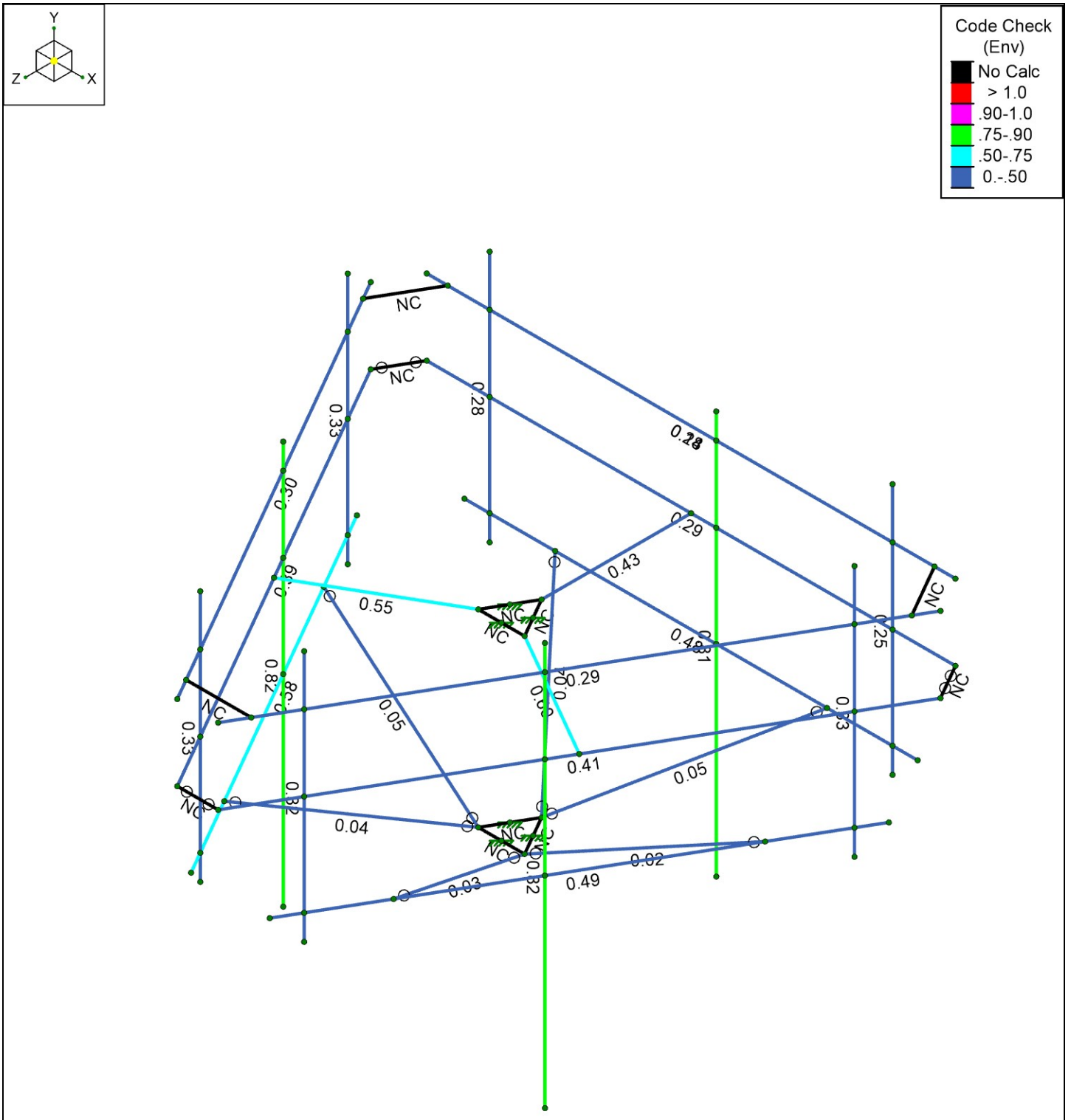
	Node Label		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
176		min	0.006	6	-0.234	4	0	3	5.661e-5	3	-1.418e-3	1	-4.212e-3	2
177	N102	max	0.228	2	0.07	5	0.231	5	4.719e-3	4	2.051e-3	2	1.271e-3	5
178		min	-0.003	6	-0.235	1	-0.068	1	-1.08e-3	2	-7.577e-6	6	-4.7e-3	1
179	N103	max	0.201	2	0.149	2	0.268	5	3.84e-3	5	9.365e-4	1	-2.485e-4	6
180		min	-0.004	6	-0.053	6	0.005	3	-3.919e-4	3	-1.268e-3	5	-5.005e-3	1

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

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pnc [k]	phi*Pnt [k]	phi*Mn y-y [k-ft]	phi*Mn z-z [k-ft]	Cb	Eqn
1	M1	PIPE_3.5	0.286	63	5	0.15	63		4	50.242	78.75	7.954	7.954	1	H1-1b
2	M2	HSS4X4X4	0.426	0	1	0.138	0	z	1	134.464	139.518	16.181	16.181	2.187	H1-1b
3	M3	PIPE_2.0	0.282	30	1	0.226	30		5	23.809	32.13	1.872	1.872	1	H1-1b
4	M4	PIPE_2.0	0.249	30	2	0.136	30		5	23.809	32.13	1.872	1.872	1	H1-1b
5	M5	PIPE_2.5	0.811	48	5	0.179	24		5	30.038	50.715	3.596	3.596	1	H1-1b
6	M46	PIPE_2.0	0.479	47.25	4	0.329	22.5		4	12.144	32.13	1.872	1.872	1	H3-6
7	M47	PIPE_2.0	0.047	52.538	4	0.043	52.538		5	25.533	32.13	1.872	1.872	1	H1-1b*
8	M48	PIPE_2.0	0.043	52.538	4	0.023	52.538		5	25.533	32.13	1.872	1.872	1	H1-1b*
9	M49	PIPE_2.0	0.327	30	1	0.149	30		4	23.809	32.13	1.872	1.872	1	H1-1b
10	M51	PIPE_2.0	0.331	30	1	0.239	30		2	23.809	32.13	1.872	1.872	1	H1-1b
11	M57	PIPE_2.5	0.818	48	2	0.16	24		4	30.038	50.715	3.596	3.596	1	H1-1b
12	M61	HSS4X4X4	0.549	0	4	0.125	0	z	5	134.464	139.518	16.181	16.181	1.825	H1-1b
13	M103	PIPE_3.5	0.386	63	2	0.169	63		1	50.242	78.75	7.954	7.954	1	H1-1b
14	M111	PIPE_2.0	0.584	47.25	1	0.325	22.5		1	12.144	32.13	1.872	1.872	1	H3-6
15	M112	PIPE_2.0	0.048	52.538	1	0.035	52.538		2	25.533	32.13	1.872	1.872	1	H1-1b*
16	M113	PIPE_2.0	0.036	26.269	1	0.029	52.538		4	25.533	32.13	1.872	1.872	1	H1-1b
17	M114	PIPE_2.0	0.317	30	1	0.207	30		1	23.809	32.13	1.872	1.872	1	H1-1b
18	M116	PIPE_2.0	0.332	30	2	0.205	30		2	23.809	32.13	1.872	1.872	1	H1-1b
19	M122	PIPE_2.5	0.82	48	2	0.188	24		1	30.038	50.715	3.596	3.596	1	H1-1b
20	M126	HSS4X4X4	0.597	0	1	0.123	0	z	4	134.464	139.518	16.181	16.181	1.84	H1-1b
21	M147	PIPE_3.5	0.411	63	1	0.211	63		1	50.242	78.75	7.954	7.954	1	H1-1b
22	M155	PIPE_2.0	0.488	48.375	2	0.257	85.5		2	12.144	32.13	1.872	1.872	1	H3-6
23	M156	PIPE_2.0	0.03	26.269	2	0.05	52.538		1	25.533	32.13	1.872	1.872	1	H1-1b
24	M157	PIPE_2.0	0.024	26.816	1	0.032	52.538		1	25.533	32.13	1.872	1.872	1	H1-1b
25	M34	PIPE_2.0	0.288	57.75	2	0.206	111.562		2	8.922	32.13	1.872	1.872	1	H1-1b
26	M35	PIPE_2.0	0.296	57.75	1	0.199	14.437		2	8.922	32.13	1.872	1.872	1	H1-1b
27	M36	PIPE_2.0	0.275	57.75	4	0.115	120.75		4	8.922	33.048	1.925	1.925	1	H1-1b
28	M37	PIPE_2.0	0.144	57.75	4	0.117	120.75		4	8.922	32.13	1.872	1.872	1	H1-1b

Material Take-Off

	Material	Size	Pieces	Length[in]	Weight[K]
1	General Members				
2	RIGID		12	140.6	0
3	Total General		12	140.6	0
4					
5	Hot Rolled Steel				
6	A36 Gr.36	PIPE_2.0	1	126	0.036
7	A500 Gr.46	HSS4X4X4	3	106.9	0.102
8	A53 Grade B	PIPE_2.0	18	1377.2	0.398
9	A53 Grade B	PIPE_2.5	3	288	0.131
10	A53 Grade B	PIPE_3.5	3	378	0.268
11	Total HR Steel		28	2276.1	0.936



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

IRISA A NEMETSCHEK COMPANY	Centek	CT11024B_AMA	SK-3
	PPG		Jul 03, 2023 at 11:35 AM
	20074.79		CT11024B_AMA Rev 1.r3d

CENTEK engineering
Centered on Solutions℠ www.centekeng.com
63-2 North Branford Road P: (203) 488-0580
Branford, CT 06405 F: (203) 488-8587

Subject: Connection to Monopole

Location: Branford, CT

Date: 04/12/2023

Prepared by: PPG; Checked by: CFC
Job No. 20074.79

Antenna Mast to Silo Connection:

Anchor Data

5/8" Dia. X 24" Long SAE J429 GR-2 Threaded Rod

Threaded Rod Dia. = $D := 0.625\ in$

Number of Bolts = $N := 3$ (User Input)

Spacing Between Bolts = $S := 6\ in$ (User Input)

Yield Strength = $F_Y := 57.0\ ksi$

Tensile Strength = $F_T := 74.0\ ksi$

Design Shear Strength = $\Phi F_{nt} := 0.75 \cdot \left(D^2 \cdot \frac{\pi}{4}\right) \cdot F_Y = 13.1\ kip$ (User Input)

Design Tensile Strength= $\Phi F_{nv} := 0.75 \cdot \left(D^2 \cdot \frac{\pi}{4}\right) \cdot F_T = 17\ kip$ (User Input)

Design Reactions: LC1 N79

Force X = $Shear_x := 12.904 \cdot kip$ (User Input)

Force Y= $Vertical := 1.168\ kip$ (User Input)

Force Z= $Shear_z := 0.403 \cdot kip$ (User Input)

Moment X= $M_X := 0.375 \cdot kip \cdot ft$ (User Input)

Moment Y= $M_Y := 0.156 \cdot kip \cdot ft$ (User Input)

Moment Z= $M_Z := 2.253\ kip \cdot ft$ (User Input)

Anchor Check:

Max Tension Force = $T_{Max} := \frac{Shear_x}{N} + \frac{M_Y + M_Z}{S \cdot \frac{N}{2}} = 7.51\ kip$

Max Shear Force = $V_{Max} := \frac{Shear_z + Vertical}{N} + \frac{M_X}{S \cdot \frac{N}{2}} = 1.02\ kip$

Condition 1 = $Condition1 := \text{if}\left(\frac{T_{Max}}{\Phi F_{nt}} \le 1.00\ ,\ \text{“OK”}\ ,\ \text{“NG”}\right) = \text{“OK”}$

Condition 2 = $Condition2 := \text{if}\left(\frac{V_{Max}}{\Phi F_{nv}} \le 1.00\ ,\ \text{“OK”}\ ,\ \text{“NG”}\right) = \text{“OK”}$

Condition 3 = $Condition3 := \text{if}\left(\frac{T_{Max}}{\Phi F_{nt}} + \frac{V_{Max}}{\Phi F_{nv}} \le 1.0\ ,\ \text{“OK”}\ ,\ \text{“NG”}\right) = \text{“OK”}$

% of Capacity = $\max\left(\frac{T_{Max}}{\Phi F_{nt}}, \frac{V_{Max}}{\Phi F_{nv}}, \left(\frac{T_{Max}}{\Phi F_{nt}}\right) + \left(\frac{V_{Max}}{\Phi F_{nv}}\right)\right) = 63.3\%$

EBI Consulting

environmental | engineering | due diligence

RADIO FREQUENCY EMISSIONS ANALYSIS REPORT
EVALUATION OF HUMAN EXPOSURE POTENTIAL TO NON-IONIZING EMISSIONS

T-Mobile Existing Facility

Site ID: CT11024B

Branford/ I-95/ X53/ Jct.
60 Hosley Avenue
Branford, Connecticut 06406

July 3, 2023

EBI Project Number: 6223002696

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**2.31%**

July 3, 2023

T-Mobile
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, Connecticut 06002

Emissions Analysis for Site: CT11024B - Branford/ I-95/ X53/ Jct.

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **60 Hosley Avenue** in **Branford, Connecticut** for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$, respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz frequency bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at 60 Hosley Avenue in Branford, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower. **All calculations were performed using Far Field Analysis.**

For all calculations, all equipment was calculated using the following assumptions:

1) 1 LTE channel (600 MHz Band) was considered for each sector of the proposed installation. This Channel has a transmit power of 40 Watts.

2) 1 NR channel (600 MHz Band) was considered for each sector of the proposed installation. This Channel has a transmit power of 80 Watts.

3) 1 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This Channel has a transmit power of 40 Watts per Channel.

4) 1 GSM channel (PCS Band - 1900 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 10 Watts per Channel.

5) 1 LTE channel (PCS Band - 1900 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 160 Watts per Channel.

6) 1 NR channel (PCS Band - 1900 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 160 Watts per Channel.

7) 1 LTE channel (AWS Band – 2100 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 160 Watts per Channel.

8) 1 LTE Traffic channel (LTE 1C and 2C BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 45 Watts.

9) 1 LTE Broadcast channel (LTE 1C and 2C BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 15 Watts.

10) 1 NR Traffic channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 90 Watts.

11) 1 NR Broadcast channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 30 Watts.

12) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

13) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

14) The antennas used in this modeling are the ERICSSON SON_AIR6419 B41 LTE TB 02.09.21 2500 TMO for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s), the RFS APXVAARR24 43-U-NA20 00DT 600 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 1900 MHz / 2100 MHz channel(s) in Sector A, the ERICSSON SON_AIR6419 B41 LTE TB 02.09.21 2500 TMO for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s), the RFS APXVAARR24 43-U-NA20 00DT 600 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 1900 MHz / 2100 MHz channel(s) in Sector B, the ERICSSON SON_AIR6419 B41 LTE TB 02.09.21 2500 TMO for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s), the RFS APXVAARR24 43-U-NA20 00DT 600 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 1900 MHz / 2100 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's

supplied specifications, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

15) The antenna mounting height centerline of the proposed antennas is 149 feet above ground level (AGL).

16) Emissions values for additional carriers were calculated in Far Field utilizing the antenna models provided in the structural analysis.

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

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	ERICSSON SON_AIR6419 B41 LTE TB 02.09.21 2500 TMO	Make / Model:	ERICSSON SON_AIR6419 B41 LTE TB 02.09.21 2500 TMO	Make / Model:	ERICSSON SON_AIR6419 B41 LTE TB 02.09.21 2500 TMO
Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz
Gain:	22.05 dBd / 22.05 dBd / 15.55 dBd / 15.55 dBd	Gain:	22.05 dBd / 22.05 dBd / 15.55 dBd / 15.55 dBd	Gain:	22.05 dBd / 22.05 dBd / 15.55 dBd / 15.55 dBd
Height (AGL):	149 feet	Height (AGL):	149 feet	Height (AGL):	149 feet
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	180.00 Watts	Total TX Power (W):	180.00 Watts	Total TX Power (W):	180.00 Watts
ERP (W):	23,258.96	ERP (W):	23,258.96	ERP (W):	23,258.96
Antenna A1 MPE %:	**4.09%**	Antenna B1 MPE %:	**4.09%**	Antenna C1 MPE %:	**4.09%**
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	RFS APXVAARR24 43-U-NA20 00DT 600	Make / Model:	RFS APXVAARR24 43-U-NA20 00DT 600	Make / Model:	RFS APXVAARR24 43-U-NA20 00DT 600
Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 1900 MHz / 2100 MHz
Gain:	13.09 dBd / 13.09 dBd / 13.17 dBd / 15.29 dBd / 15.29 dBd / 15.29 dBd / 17.32 dBd	Gain:	13.09 dBd / 13.09 dBd / 13.17 dBd / 15.29 dBd / 15.29 dBd / 15.29 dBd / 17.32 dBd	Gain:	13.09 dBd / 13.09 dBd / 13.17 dBd / 15.29 dBd / 15.29 dBd / 15.29 dBd / 17.32 dBd
Height (AGL):	149 feet	Height (AGL):	149 feet	Height (AGL):	149 feet
Channel Count:	7	Channel Count:	7	Channel Count:	7
Total TX Power (W):	650.00 Watts	Total TX Power (W):	650.00 Watts	Total TX Power (W):	650.00 Watts
ERP (W):	20,017.47	ERP (W):	20,017.47	ERP (W):	20,017.47
Antenna A2 MPE %:	**4.23%**	Antenna B2 MPE %:	**4.23%**	Antenna C2 MPE %:	**4.23%**

Site Composite MPE %	
Carrier	**MPE %**
T-Mobile (Max at Sector A):	0.64%
Amtrak	1.65%
Site Total MPE % :	2.31%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	0.64%
T-Mobile Sector B Total:	0.64%
T-Mobile Sector C Total:	0.64%
Site Total MPE % :	2.31%

T-Mobile Maximum MPE Power Values (Sector A)

T-Mobile Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
T-Mobile 2500 MHz LTE	1	7214.604258	149	12.68402182	2500 MHz LTE	1000.0	1.27%
T-Mobile 2500 MHz NR	1	14429.20852	149	25.36804363	2500 MHz NR	1000.0	2.54%
T-Mobile 2500 MHz LTE	1	538.382902	149	0.946532925	2500 MHz LTE	1000.0	0.09%
T-Mobile 2500 MHz NR	1	1076.765804	149	1.893065851	2500 MHz NR	1000.0	0.19%
T-Mobile 600 MHz LTE	1	712.1311635	149	1.252000372	600 MHz LTE	400.0	0.31%
T-Mobile 600 MHz NR	1	1424.262327	149	2.504000744	600 MHz NR	400.0	0.63%
T-Mobile 700 MHz LTE	1	725.3706703	149	1.275276797	700 MHz LTE	467.0	0.27%
T-Mobile 1900 MHz GSM	1	293.0893245	149	0.515281401	1900 MHz GSM	1000.0	0.05%
T-Mobile 1900 MHz LTE	1	4689.429192	149	8.244502408	1900 MHz LTE	1000.0	0.82%
T-Mobile 1900 MHz NR	1	4689.429192	149	8.244502408	1900 MHz NR	1000.0	0.82%
T-Mobile 2100 MHz LTE	1	7483.762261	149	13.15722947	2100 MHz LTE	1000.0	1.32%
						Total:	**0.66%**

• NOTE: Totals may vary by approximately 0.01% due to summation of remainders in calculations.

Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector A:	0.64%
Sector B:	0.64%
Sector C:	0.64%
T-Mobile Maximum MPE % (Sector A):	0.64%
Site Total:	2.31%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **2.31%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.