Transcend Wireless

10 Industrial Ave,
Suite 3
Mahwah NJ 07430

Phone: 201.684.0055
Fax: 201.684.0066

September 6, 2023

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

RE: Notice of Exempt Modification
Amtrak Maintenance Yard, Old Saybrook, CT 06475 (also know as 44 Ford Drive)
Latitude: 41.301257
Longitude: -72.374695
T-Mobile Site#: CT11327A – Anchor

Dear Ms. Bachman:

T-Mobile currently maintains nine (9) antennas at the 150-foot level of the existing 150-foot monopole at the Amtrak Maintenance Yard in Old Saybrook, CT. Please note, this property is not on the Town of Old Saybrook tax roll. A markup of where the site is located on the tax map is included with this submission. The 150-foot monopole and property are owned by the National Railroad Passenger Corporation (Amtrak). A copy of the property card for the associated Amtrak station is included for reference. T-Mobile now intends to replace all existing antennas with nine (9) new 600/700/1900/2100/2500 MHz antennas. The new antennas will be installed at the same 150-foot level of the tower. The new antennas will support 5G technology.

Planned Modifications:
Tower:

Remove
(3) TMAs
(3) RRUS11B12
(6) 1-5/8" Coax
(1) 1-5/8" hybrid cable

Remove and Replace:
(3) AIR 21 for (3) AIR 6419 2500 MHz Antennas
(3) AIR 21 for (3) Commscope VV-65A-R1 1900/2100 MHz Antennas
(3) LNX-6515DS for (3) APXVAALL24_43-U-NA20 600/700 MHz Antennas

Install New:
(3) 4460 RRUs
(3) 4480 RRUs
(3) 1-5/8" Hybrid Cables

Existing to Remain:
N/A

Ground:
Install New: 6160 Cabinet and B160 Battery Cabinet

This facility was originally approved by the Siting Council on April 25, 2002 in Petition 551. The proposed modification complies with the original approval.

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 -Carl Fortuna, Elected Official, and Christina Costa, Town Planner, as well as the owner.

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: Carl Fortuna – First Selectman – Town of Old Saybrook
Christina Costa – Town Planner – Town of Old Saybrook
National Railroad Passenger Corporation (Amtrak)- Owner

Kyle Richers

From: UPS <pkginfo@ups.com>
Sent: Thursday, September 7, 2023 8:22 PM
To: krichers@transcendwireless.com
Subject: UPS Schedule Delivery Update, Tracking Number 1ZV257424290186659

Your scheduled delivery date has changed.
Scheduled Delivery Date: Friday, 09/08/2023

Important Delivery Information

From:	TRANSCEND WIRELESS
Tracking Number:	1ZV257424290186659

Shipment Details

Ship To:	Carl Fortuna Town of Old Saybrook 302 Main Street Old Saybrook Center, CT 06475 US
Number of Packages:	1
Signature Required:	A signature is required for package delivery
Weight:	1.0 LBS
Reference Number 1:	CT11327A CSC EO

Kyle Richers

From: UPS <pkginfo@ups.com>
Sent: Thursday, September 7, 2023 8:22 PM
To: krichers@transcendwireless.com
Subject: UPS Schedule Delivery Update, Tracking Number 1ZV257424290324642

Your scheduled delivery date has changed.
Scheduled Delivery Date: Friday, 09/08/2023

Important Delivery Information

From:	TRANSCEND WIRELESS
Tracking Number:	1ZV257424290324642

Shipment Details

Ship To:	Christina Costa Town of Old Saybrook 302 Main Street Old Saybrook Center, CT 06475 US
Number of Packages:	1
Signature Required:	A signature is required for package delivery
Weight:	1.0 LBS
Reference Number 1:	CT11327A CSC ZO

Kyle Richers

From: UPS <pkginfo@ups.com>
Sent: Thursday, September 7, 2023 8:22 PM
To: krichers@transcendwireless.com
Subject: UPS Schedule Delivery Update, Tracking Number 1ZV257424294852663

A signature is required for package delivery. Log in or enroll in UPS My Choice to take any action.

Your scheduled delivery date has changed.

Scheduled Delivery Date: Friday, 09/08/2023

Sign Now

Change Delivery | Manage Preferences | View Delivery Planner

Important Delivery Information

From: TRANSCEND WIRELESS

Tracking Number: 1ZV257424294852663

Shipment Details

Ship To:
National Railroad Passenger Corp
100 Nooks Hill Road
Cromwell, CT 06416
US

UPS Service: UPS GROUND

Kyle Richers

From: UPS <pkginfo@ups.com>
Sent: Friday, September 8, 2023 10:43 AM
To: KRICHERS@TRANSCENDWIRELESS.COM
Subject: UPS Delivery Notification, Tracking Number 1ZV257424290186659

Hello, your package has been delivered.

Delivery Date: Friday, 09/08/2023
Delivery Time: 10:41 AM
Left At: FRONT DESK
Signed by: NERI

TRANSCEND WIRELESS

Tracking Number:	1ZV257424290186659
Ship To:	TOWN OF OLD SAYBROOK 302 MAIN STREET OLD SAYBROOK CENTER, CT 06475 US
Number of Packages:	1
UPS Service:	UPS Ground
Package Weight:	1.0 LBS
Reference Number:	CT11327A CSC EO

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Sign Up For Additional E-Mail From UPS
Read Compass Online

Kyle Richers

From: UPS <pkginfo@ups.com>
Sent: Friday, September 8, 2023 10:44 AM
To: KRICHERS@TRANSCENDWIRELESS.COM
Subject: UPS Delivery Notification, Tracking Number 1ZV257424290324642

Hello, your package has been delivered.

Delivery Date: Friday, 09/08/2023
Delivery Time: 10:42 AM
Left At: FRONT DESK
Signed by: COSTA

TRANSCEND WIRELESS

Tracking Number:	1ZV257424290324642
Ship To:	TOWN OF OLD SAYBROOK 302 MAIN STREET OLD SAYBROOK CENTER, CT 06475 US
Number of Packages:	1
UPS Service:	UPS Ground
Package Weight:	1.0 LBS
Reference Number:	CT11327A CSC ZO

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Sign Up For Additional E-Mail From UPS
Read Compass Online

Proof of Delivery

Dear Customer,

This notice serves as proof of delivery for the shipment listed below.

Tracking Number
1ZV257424294852663

Weight
1.00 LBS

Service

UPS Ground

Shipped / Billed On
09/06/2023

Additional Information

Signature Required

Delivered On

09/08/2023 1:05 P.M.

Delivered To
CROMWELL, CT, US

Received By

KASAN

Left At
Residential

Please print for your records as photo and details are only available for a limited time.

Sincerely,

UPS

Tracking results provided by UPS: 09/11/2023 8:09 A.M. EST

455 BOSTON POST RD

Location	455 BOSTON POST RD	**MBLU**	040/ 18T/ / /
Acct#	00475500	**Owner**	NATIONAL RAILROAD PASSENGER CORPORATION
Assessment	$640,600	**Appraisal**	$915,000
PID	714	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2018	$125,900	$789,100	$915,000
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2018	$88,200	$552,400	$640,600

Owner of Record

Owner	NATIONAL RAILROAD PASSENGER CORPORATION	**Sale Price**	$0
Co-Owner	C/O LISA KEHAYIAS SAYBROOK JUNCTION LLC	**Certificate**	
Address	100 NOOKS HILL RD CROMWELL, CT 06416	**Book & Page**	0629/0001
		Sale Date	11/30/2017

Ownership History

Ownership History				
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Sale Date**
NATIONAL RAILROAD PASSENGER CORPORATION	$1,200,000		0551/0411	08/26/2010
NATIONAL RAILROAD PASSENGER CORPORATION	$0		0313/0626	12/21/1993
NATIONAL RAILROAD PASSENGER CORPORATION	$0		0313/0624	12/21/1993
NATIONAL RAILROAD PASSENGER CORPORATION	$0		0304/0816	04/30/1993

Building Information

Building 1 : Section 1

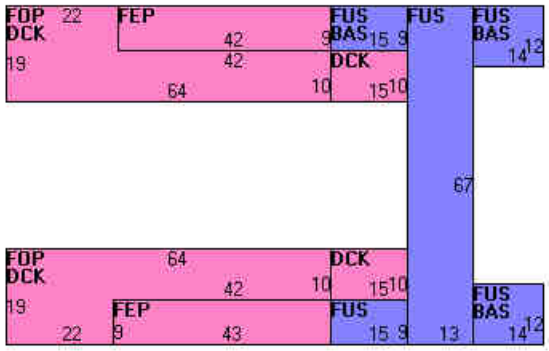
Year Built:
Living Area: 0

Building Attributes	
Field	**Description**
Style:	Outbuildings
Model	
Grade:	
Stories:	
Occupancy	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure:	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Total Bthrms:	
Total Half Baths:	
Total Xtra Fixtrs:	
Total Rooms:	
Bath Style:	
Kitchen Style:	
Num Kitchens	
Cndtn	
Num Park	
Fireplaces	
Fndtn Cndtn	
Basement	

Building Photo

(https://images.vgsi.com/photos/OldSaybrookCTPhotos//default.jpg)

Building Layout



(https://images.vgsi.com/photos/OldSaybrookCTPhotos//Sketches/714_71

Building Sub-Areas (sq ft)	Legend
No Data for Building Sub-Areas	

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	390V
Description	DEVEL LAND MDL-00
Zone	B-4

Land Line Valuation

Size (Acres)	1.75
Depth	0
Assessed Value	$552,400
Appraised Value	$789,100

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
PAV1	PAVING-ASPHALT			76000.00 S.F.	$114,000	1
LT10	W/DOUBLE LIGHT			10.00 UNITS	$10,500	1
LT9	HGH PRE-SOD PL			2.00 UNITS	$1,400	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$125,900	$789,100	$915,000
2018	$125,900	$789,100	$915,000
2016	$74,400	$668,500	$742,900

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$88,200	$552,400	$640,600
2018	$88,200	$552,400	$640,600
2016	$52,100	$468,000	$520,100

SITE

Property Map

Town of Old Saybrook

New Haven County, Connecticut

Tie Line | Leader Line | Rail Road | Lot Number | Condo Unit

Encumbrance Line | Flagged Wetlands | Parcel | Parcel on adjacent sheet | Former Parcel Line

N

Feet 0 100 200

1 inch = 225 feet

October 2015

Map Number 040

Petition 551
Omnipoint Communications, Inc.
Ford Drive, Old Saybrook
April 25, 2002
Staff Report

On March 28, 2002, Connecticut Siting Council (Council) staff Paul M. Aresta met Omnipoint Communications, Inc. (Omnipoint) representative Stephen J. Humes and Amtrak representatives Joe Glass and Ron Klimas off of Ford Drive in Old Saybrook, Connecticut for an inspection of an existing 150-foot monopole tower and associated equipment. Omnipoint is petitioning the Council for a declaratory ruling that modifications to an existing 104-foot communications tower, owned and operated by Amtrak, would not require a Certificate of Environmental Compatibility and Public Need (Certificate).

In July 2000, Omnipoint was issued a building permit, and shortly thereafter constructed a 150-foot monopole tower to replace an existing 104-foot tall monopole communications tower, owned and operated by Amtrak. Omnipoint also installed telecommunications equipment on a ten-foot by ten-foot concrete slab at the base of the tower. The new 150-foot monopole tower is currently owned by Omnipoint. However, ownership of the 150-foot telecommunications tower would be transferred to Amtrak once Amtrak's proposed antennas are installed on the new tower. Amtrak would then remove the existing 104-foot communications tower.

Omnipoint installed a platform with six panel antennas mounted at a centerline height of 150 feet above ground level (AGL) on the new 150-foot monopole tower. Amtrak proposes to mount, pointing downward, two omni-directional whip antennas on the platform at the 150 foot level, and whip antennas, pointing upwards at the 50-foot, 70-foot and 100-foot levels. Amtrak's antennas are elements of an improved communications infrastructure system, known as "Advanced Train Control".

The original compound for Amtrak's tower and telecommunications equipment measured 28 feet by 48.5 feet. Omnipoint's proposal expands the existing compound by approximately 242 square feet, a 22-foot by 11-foot area. The existing eight foot tall chain link fence would be expanded to encompass the new portion of the compound. The new 150-foot monopole tower and expanded compound area are located within Amtrak's existing right-of-way. The site is located within a general Business Zoning District, and it is adjacent to an Industrial Zoning District, a Residential Zoning District, and a Shopping Center Business District.

Omnipoint contends that the 150-foot monopole tower is necessary to support the telecommunications equipment for Omnipoint and Amtrak; is located in an industrial and transportation corridor with existing railroad-related facilities; and would not damage existing scenic, historical, or recreational values in the area. Omnipoint contends that the proposed replacement of Amtrak's existing 104-foot monopole tower would not have a substantial adverse environmental effect, and therefore would not require a Certificate.

T-Mobile™

SITE NAME: AMTRAK - OLD SAYBROOK

SITE ID NUMBER: CT11327A

SITE ADDRESS: AMTRAK MAINTENANCE YARD,
OLD SAYBROOK, CT

AMTRAK FILE NO.: 626.59

WORK CATEGORY: L600 - ANTENNA AND RRU REPLACEMENT AND CABLE ADDITION

PROJECT SUMMARY

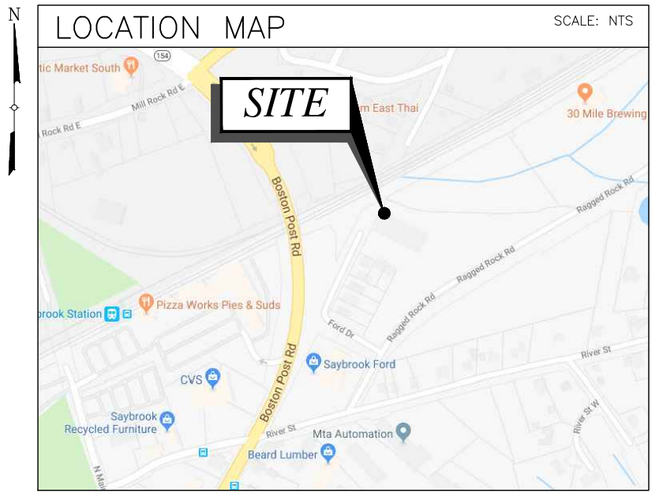
SITE NUMBER:	CT11327A
AMTRAK FILE #:	626.59
MILEPOST:	105
SITE NAME:	AMTRAK-OLD SAYBROOK
SITE ADDRESS:	AMTRAK MAINTENANCE YARD, OLD SAYBROOK, CT
COUNTY:	HARTFORD
PROPERTY OWNER:	AMTRAK (NATIONAL RAILROAD PASSENGER CORPORATION)
APPLICANT:	T-MOBILE NORTHEAST, LLC. 4 SYLVAN WAY PARSIPPANY, NJ 07054 (914) 696-5243
CONTACT: PHONE:	REY SOLIS (201) 450-1540
ENGINEER/ SURVEYOR/ STRUCTURAL ENG:	TECTONIC ENGINEERING CONSULTANTS, GEOLOGISTS & LAND SURVEYING, D.P.C., INC. 1279 ROUTE 300 NEWBURGH, NY 12550
CONTACT: PHONE:	MIKE PATEL (845) 567-6656 EXT. 2808
LATITUDE: (NAD 83)	41.301295
LONGITUDE: (NAD 83)	-72.374685

SITE DIRECTIONS

HEAD NORTHWEST TOWARD SYLVAN WAY. TURN LEFT TOWARD SYLVAN WAY. TURN LEFT ONTO SYLVAN WAY. TURN RIGHT ONTO DRYDEN WAY. KEEP LEFT AT THE FORK, FOLLOW SIGNS FOR U.S. 1 E AND MERGE ONTO NJ-10 E. USE THE RIGHT LANE TO MERGE ONTO I-287 N VIA THE RAMP TO BOONTON. MERGE ONTO I-287 N. KEEP LEFT TO STAY ON I-287 N. USE THE RIGHT 2 LANES TO MERGE ONTO I-287 E/I-87 S TOWARD TAPPAN ZEE BR/NEW YORK CITY. KEEP LEFT AT THE FORK TO CONTINUE ON I-287 E, FOLLOW SIGNS FOR WHITE PLAINS/RYE. KEEP LEFT TO STAY ON I-287 E. MERGE ONTO I-95 N. TAKE EXIT 67 TO MERGE ONTO CT-154 W TOWARD OLD SAYBROOK. MERGE ONTO CT-154 W. TURN LEFT ONTO RIVER ST. TURN LEFT ONTO FORD DR. TURN LEFT TO STAY ON FORD DR. DESTINATION WILL BE ON THE LEFT.

LOCATION MAP

SCALE: NTS



SHEET INDEX

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AERIAL

0 1 2 3

ORIGINAL SIZE IN INCHES

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.
Tectonic Engineering Consultants, Geologists & Land Surveyors, D.P.C., Inc.
Project Contact Info
1279 Route 300
Newburgh, NY 12550
Phone: (845) 567-6656
(800) 829-6531
www.tectonicengineering.com

T-Mobile

PROJECT NUMBER: 10481.CT11327A
DESIGNED BY: MP

REV	DATE	REVISION	DRAWN BY
0	05/12/22	FOR COMMENT	NM
1	05/22/23	PER UPDATED RFDS	TP
2	08/31/23	PER RF COMMENTS	TP

ISSUED BY:
DATE:

STATE OF CONNECTICUT
MANOJKUMAR PATEL
PEN.0022038
LICENSED PROFESSIONAL ENGINEER
9/5/23

SITE INFORMATION

CT11327A
AMTRAK-OLD SAYBROOK
AMTRAK MAINTENANCE YARD
OLD SAYBROOK, CT

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 SIX (6) OF THE EXISTING ANTENNAS WITH THE PROPOSED ANTENNAS, THE REPLACEMENT OF THREE (3) OF THE EXISTING RRUs WITH THE PROPOSED RRUs, THE ADDITION OF THREE (3) PROPOSED FIBER CABLES AND THE INSTALLATION OF ONE (1) PROPOSED ANTENNA MOUNT STABILIZER KIT. 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 ENSURE 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.
20. MAN-LIFT/CRANE LISTED IN EQUIPMENT SPECIFICATION SHEET NEEDS TO BE BONDED AND/OR GROUNDED AS PER AMTRAK SPECIFICATIONS AND INSPECTED BY AMTRAK'S EQUIPMENT GROUP PRIOR TO WORKING IN ELECTRIFIED TERRITORY.

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 OF 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.

0 1 2 3

ORIGINAL SIZE IN INCHES

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PROJECT NUMBER	DESIGNED BY
10481.CT11327A	MP

REV	DATE	REVISION	DRAWN BY
0	05/12/22	FOR COMMENT	NM
1	05/22/23	PER UPDATED RFDS	TP
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ISSUED BY | DATE

STATE OF CONNECTICUT
MANOJKUMAR PATEL
PEN.0022038
LICENSED
PROFESSIONAL ENGINEER
9/5/23

SITE INFORMATION

CT11327A
AMTRAK-OLD SAYBROOK
AMTRAK MAINTENANCE YARD
OLD SAYBROOK, CT

SHEET TITLE

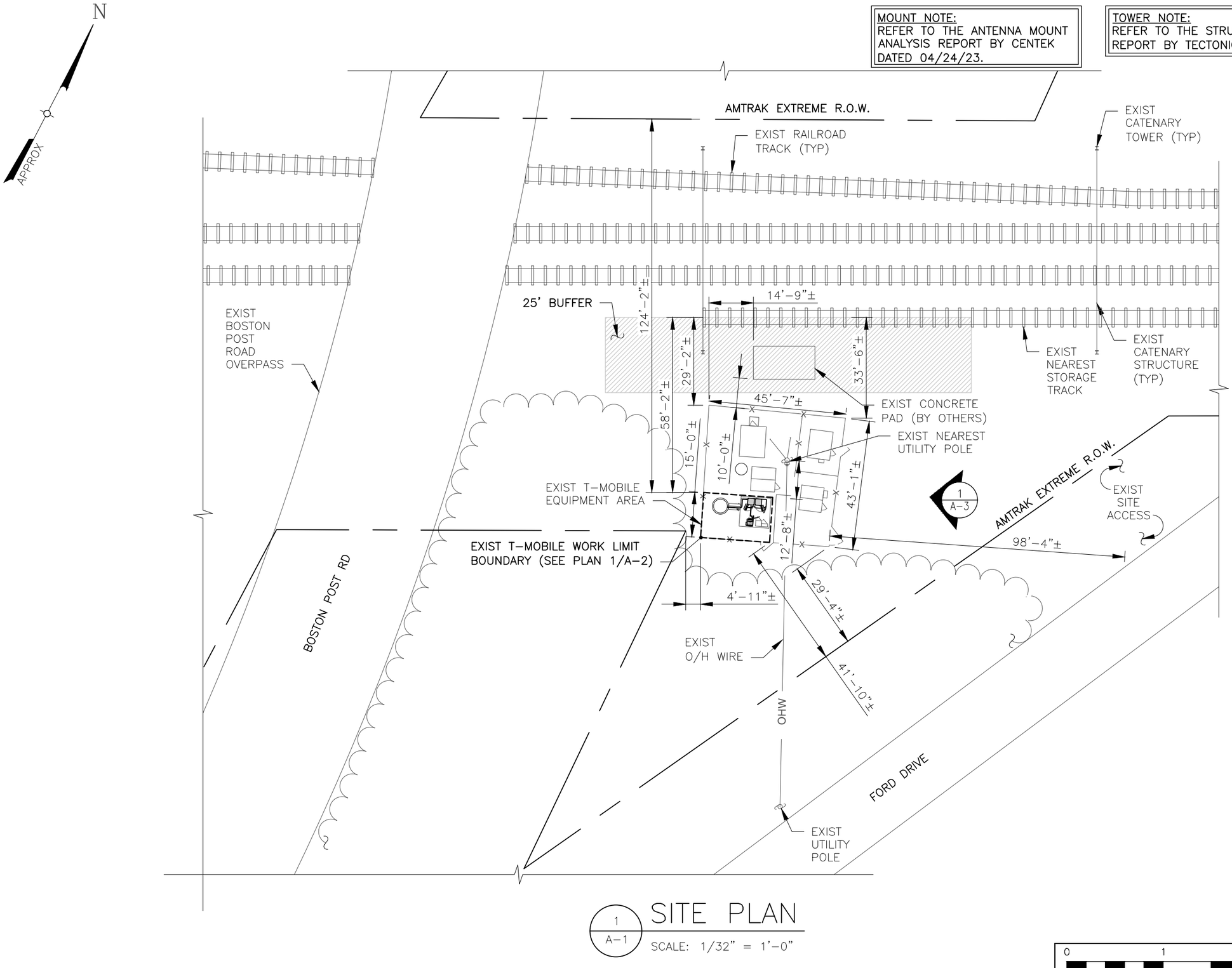
NOTES

SHEET NUMBER

T-2

MOUNT NOTE:
REFER TO THE ANTENNA MOUNT ANALYSIS REPORT BY CENTEK DATED 04/24/23.

TOWER NOTE:
REFER TO THE STRUCTURAL ANALYSIS REPORT BY TECTONIC DATED 05/22/23.



1/A-1 SITE PLAN

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

0 1 2 3

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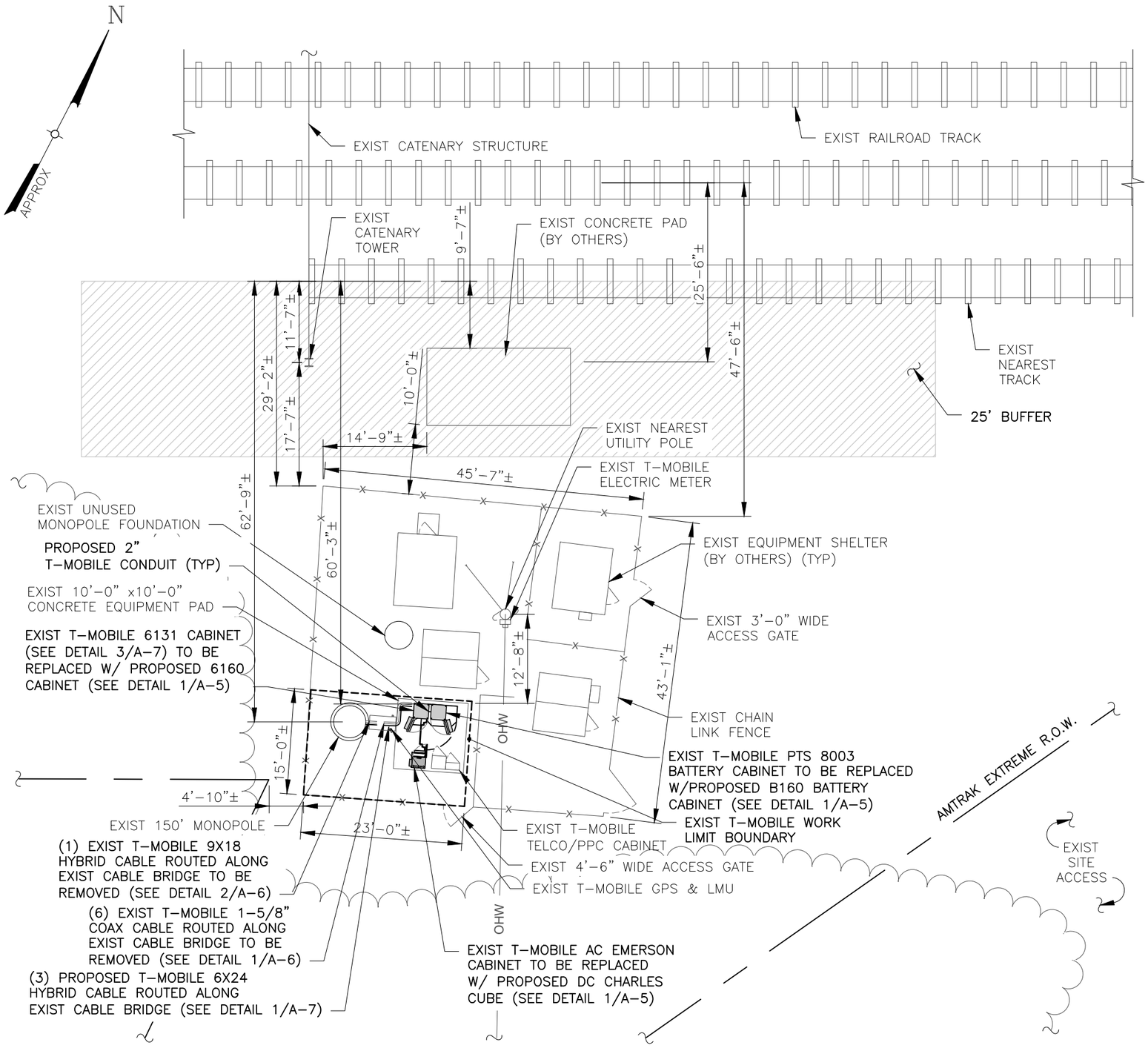
SITE PLAN

SHEET NUMBER
A-1



1/A-2 EQUIPMENT PLAN

SCALE: 1/16" = 1'-0'

2/A-2 PHOTO

SCALE: N.T.S.

0 1 2 3

ORIGINAL SIZE IN INCHES

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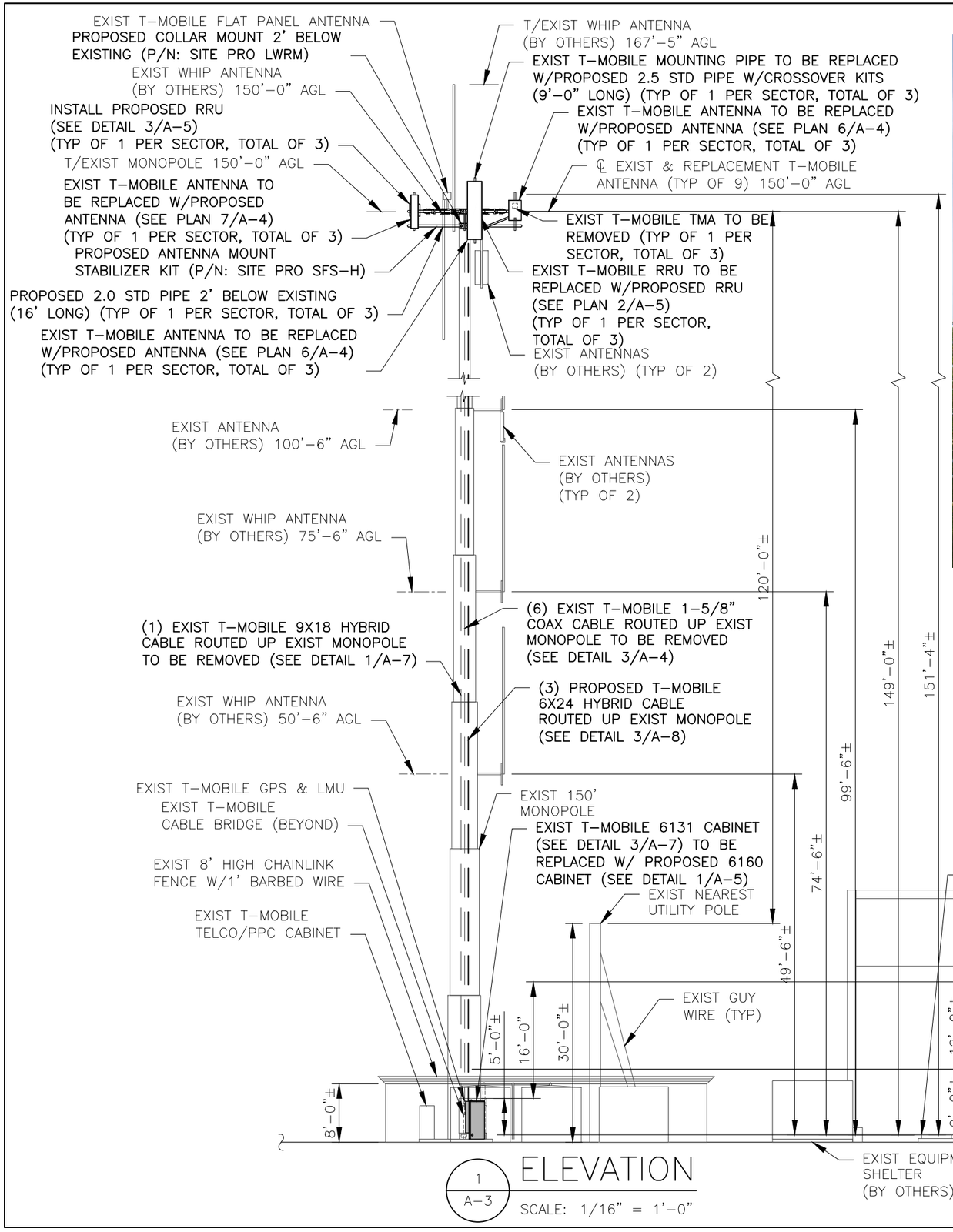
SHEET TITLE

EQUIPMENT PLAN & PHOTO

SHEET NUMBER

A-2



1/A–3 ELEVATION

SCALE: 1/16" = 1'–0"

2/A–3 PHOTO

SCALE: N.T.S.

MOUNT NOTE:
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ORIGINAL SIZE IN INCHES

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SHEET TITLE

ELEVATION & PHOTO

SHEET NUMBER

A–3

N

APPROX

MOUNT NOTE:
REFER TO THE ANTENNA MOUNT ANALYSIS REPORT BY CENTEK DATED 04/24/23.

EXIST T-MOBILE RRU (SEE DETAIL 4/A-7) TO BE REPLACED W/PROPOSED RRU (SEE DETAIL 2/A-5) (TYP OF 1 PER SECTOR, TOTAL OF 3)

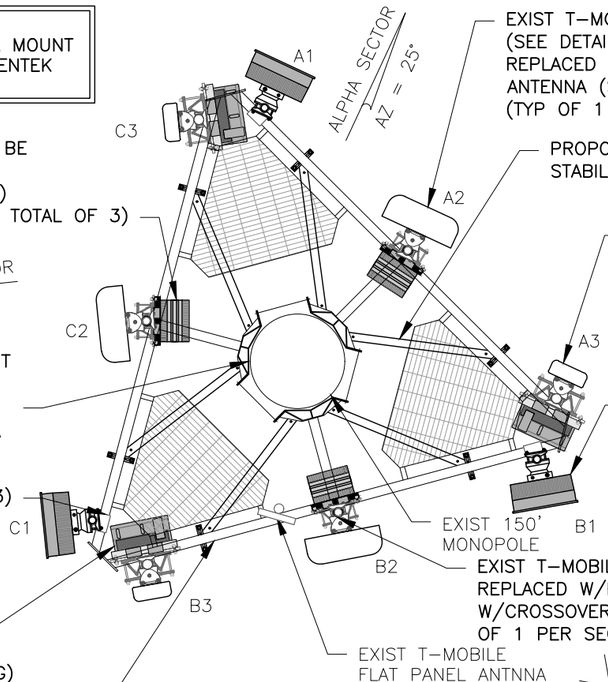
GAMMA SECTOR
AZ = 264°

PROPOSED COLLAR MOUNT 2' BELOW EXISTING (P/N: SITE PRO LWRM)

EXIST T-MOBILE TMA TO BE REMOVED (TYP OF 1 PER SECTOR, TOTAL OF 3)

INSTALL PROPOSED RRU (SEE DETAIL 3/A-5) (TYP OF 1 PER SECTOR, TOTAL OF 3)

PROPOSED 2.0 STD PIPE 2' BELOW EXISTING (16' LONG) (TYP OF 1 PER SECTOR, TOTAL OF 3)



EXIST T-MOBILE ANTENNA (SEE DETAIL 3/A-4) TO BE REPLACED W/PROPOSED ANTENNA (SEE DETAIL 6/A-4) (TYP OF 1 PER SECTOR, TOTAL OF 3)

PROPOSED ANTENNA MOUNT STABILIZER KIT (P/N: SITE PRO SFS-H)

EXIST T-MOBILE ANTENNA (SEE DETAIL 5/A-4) TO BE REPLACED W/PROPOSED ANTENNA (SEE DETAIL 7/A-4) (TYP OF 1 PER SECTOR, TOTAL OF 3)

EXIST T-MOBILE ANTENNA (SEE DETAIL 4/A-4) TO BE REPLACED W/PROPOSED ANTENNA (SEE DETAIL 8/A-4) (TYP OF 1 PER SECTOR, TOTAL OF 3)

EXIST 150' MONOPOLE

EXIST T-MOBILE MOUNTING PIPE TO BE REPLACED W/PROPOSED 2.5 STD PIPE W/CROSSOVER KITS (9'-0" LONG) (TYP OF 1 PER SECTOR, TOTAL OF 3)

EXIST T-MOBILE FLAT PANEL ANTNNA

1/A-4 ANTENNA PLAN

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

(6) EXIST T-MOBILE 1-5/8" COAX CABLES ROUTED UP EXIST MONOPOLE TO BE REMOVED (SEE DETAIL 1/A-6)

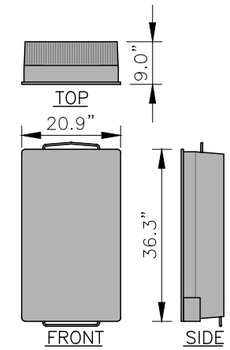
(1) EXIST T-MOBILE 9X18 HYBRID CABLE ROUTED UP EXIST MONOPOLE TO BE REMOVED (SEE DETAIL 1/A-7)

(3) PROPOSED T-MOBILE 6X24 HYBRID CABLE ROUTED UP EXIST MONOPOLE (SEE DETAIL 1/A-7)

EXIST MONOPOLE

2/A-4 ANTENNA CABLE MOUNTING

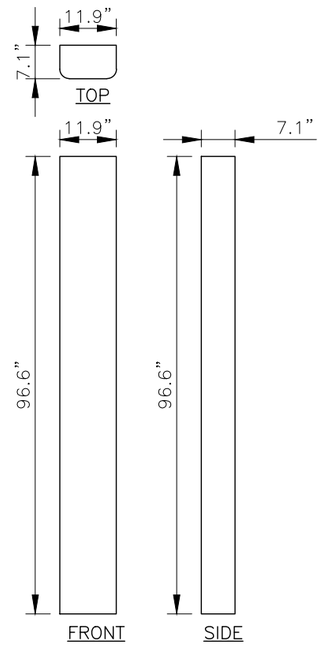
SCALE: 1/2" = 1'-0"



AIR6419 B41
WEIGHT: 83.3 LBS

8/A-4 ANTENNA (PROPOSED)

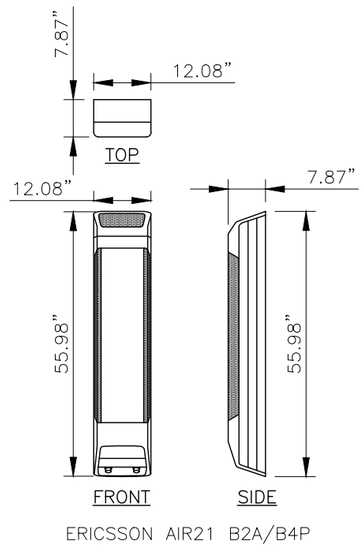
SCALE: 3/8" = 1'-0"



ANDREW LNX-6515DS-A1M
(WEIGHT: 43.7 LBS)

3/A-4 ANTENNA (EXISTING)

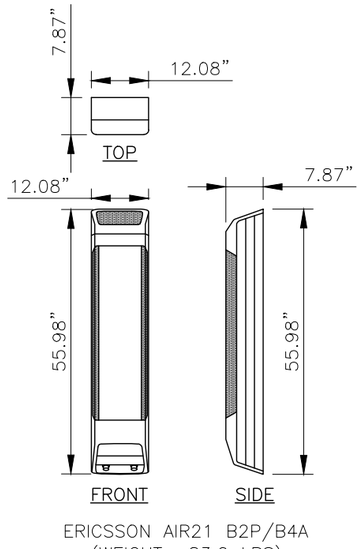
SCALE: 3/8" = 1'-0"



ERICSSON AIR21 B2A/B4P
(WEIGHT: 83.0 LBS)

4/A-4 ANTENNA (EXISTING)

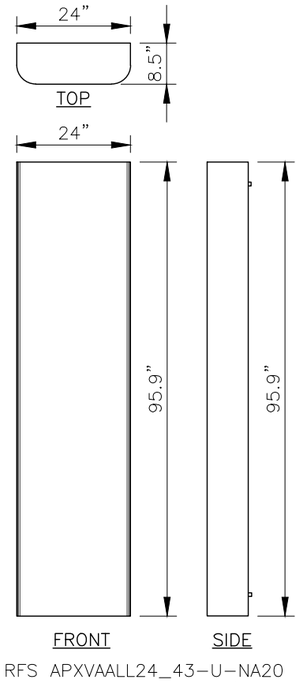
SCALE: 3/8" = 1'-0"



ERICSSON AIR21 B2P/B4A
(WEIGHT: 83.0 LBS)

5/A-4 ANTENNA (EXISTING)

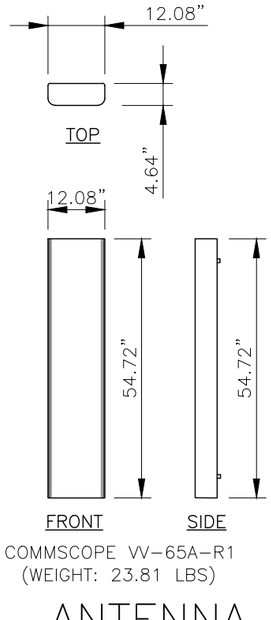
SCALE: 3/8" = 1'-0"



RFS APXVAALL24_43-U-NA20
(WEIGHT: 122.8 LBS)

6/A-4 ANTENNA (PROPOSED)

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



COMMSCOPE VV-65A-R1
(WEIGHT: 23.81 LBS)

7/A-4 ANTENNA (PROPOSED)

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

0 1 2 3
ORIGINAL SIZE IN INCHES

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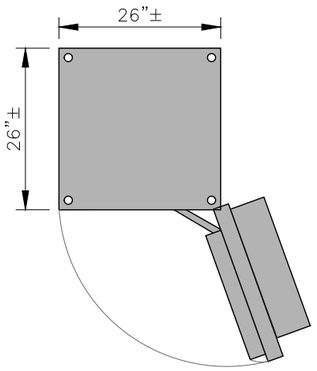
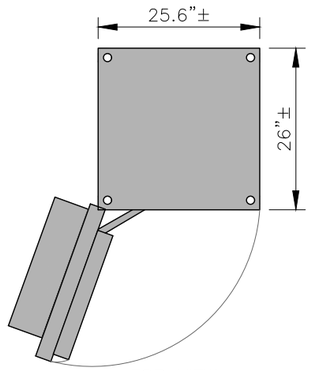
ANTENNA PLAN & EQUIPMENT DETAILS

SHEET NUMBER

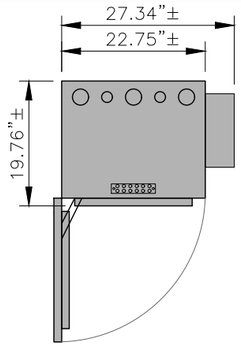
A-4



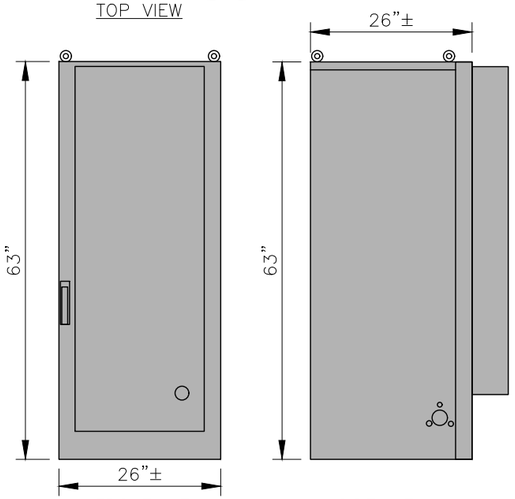
TOP VIEW



TOP VIEW



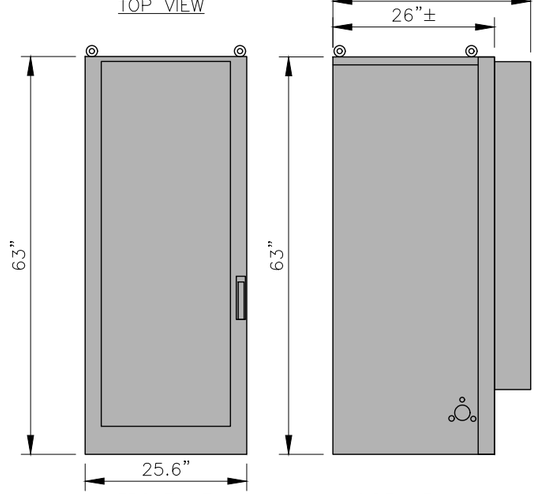
TOP VIEW



FRONT VIEW SIDE VIEW

WEIGHT: 1883 LBS (W/3 BATTERY STRINGS)

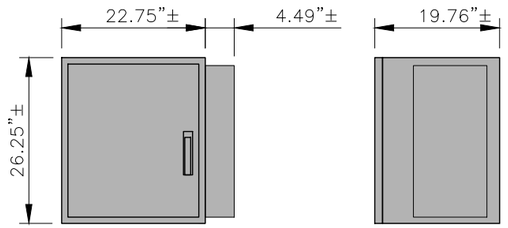
ERICSSON ENCLOSURE B160



FRONT VIEW SIDE VIEW

WEIGHT: 605 LB (FULLY LOADED)

ERICSSON ENCLOSURE 6160 AC

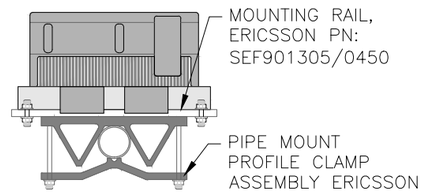


FRONT VIEW SIDE VIEW

WEIGHT: 260 LBS

CHARLES CUBE LT-RL 1003

MANUFACTURER:		ERICSSON
MODEL NO.:		RADIO-4460 B25+B66
DIMENSIONS		TOTAL WEIGHT:
A	17.0"	
B	15.1"	104 LBS
C	11.9"	

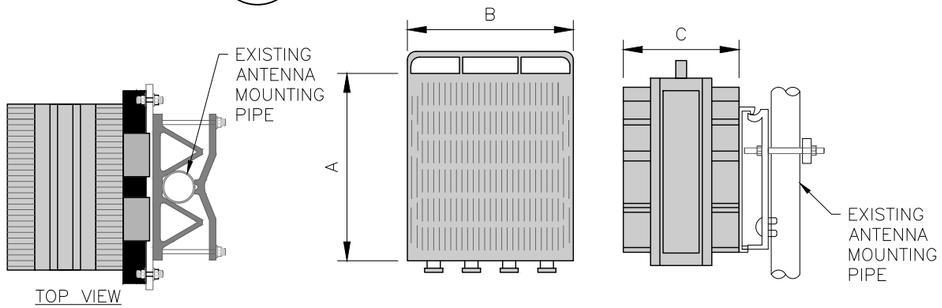


TOP

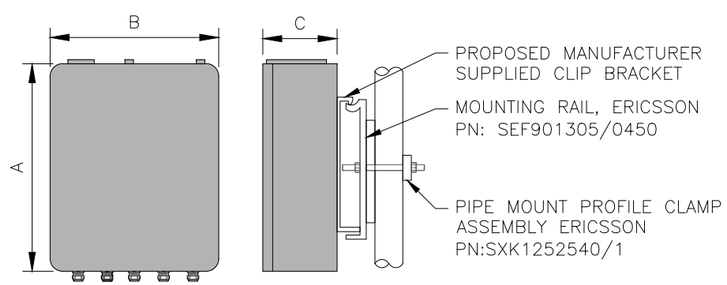
1 A-5 EQUIPMENT DETAILS

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

MANUFACTURER:		ERICSSON
MODEL NO.:		RADIO-4480 B71+B85
DIMENSIONS		TOTAL WEIGHT:
A	14.95"	
B	13.19"	75 LBS
C	9.25"	



TOP VIEW FRONT VIEW SIDE VIEW



FRONT SIDE

2 A-5 RRU (PROPOSED)

SCALE: N.T.S.

3 A-5 RRU (PROPOSED)

SCALE: N.T.S.

0 1 2 3

ORIGINAL SIZE IN INCHES

Tectonic

PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

Tectonic Engineering Consultants, Geologists & Land Surveyors, D.P.C., Inc.

Project Contact Info

1279 Route 300
Newburgh, NY 12550

Phone: (845) 567-6656
(800) 829-6531
www.tectonicengineering.com

T-Mobile

PROJECT NUMBER	DESIGNED BY
10481.CT11327A	MP

REV	DATE	REVISION	DRAWN BY
0	05/12/22	FOR COMMENT	NM
1	05/22/23	PER UPDATED RFDS	TP
2	08/31/23	PER RF COMMENTS	TP

ISSUED BY	DATE

STATE OF CONNECTICUT
MANOJKUMAR PATEL
PEN.0022038
LICENSED
PROFESSIONAL ENGINEER
9/5/23

SITE INFORMATION

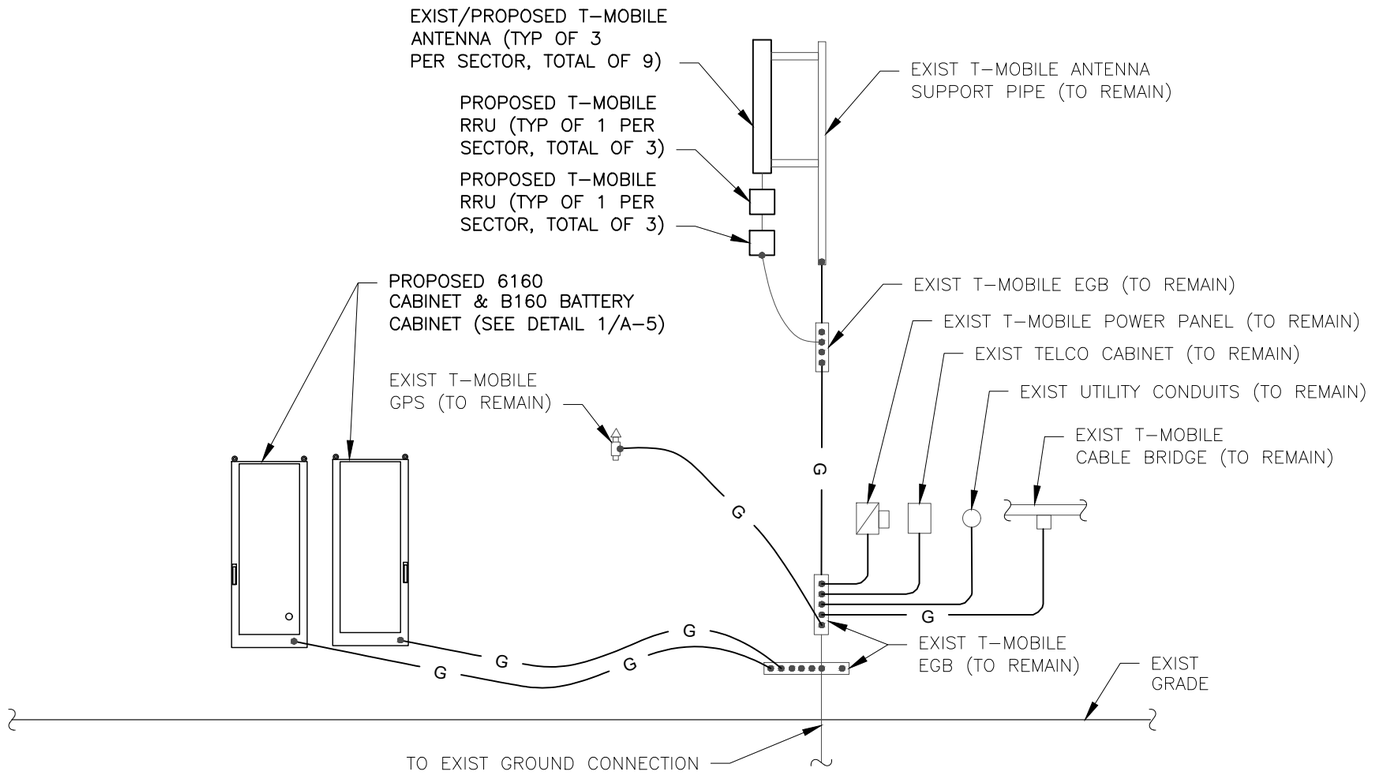
CT11327A
AMTRAK-OLD SAYBROOK
AMTRAK MAINTENANCE YARD
OLD SAYBROOK, CT

SHEET TITLE

EQUIPMENT DETAILS

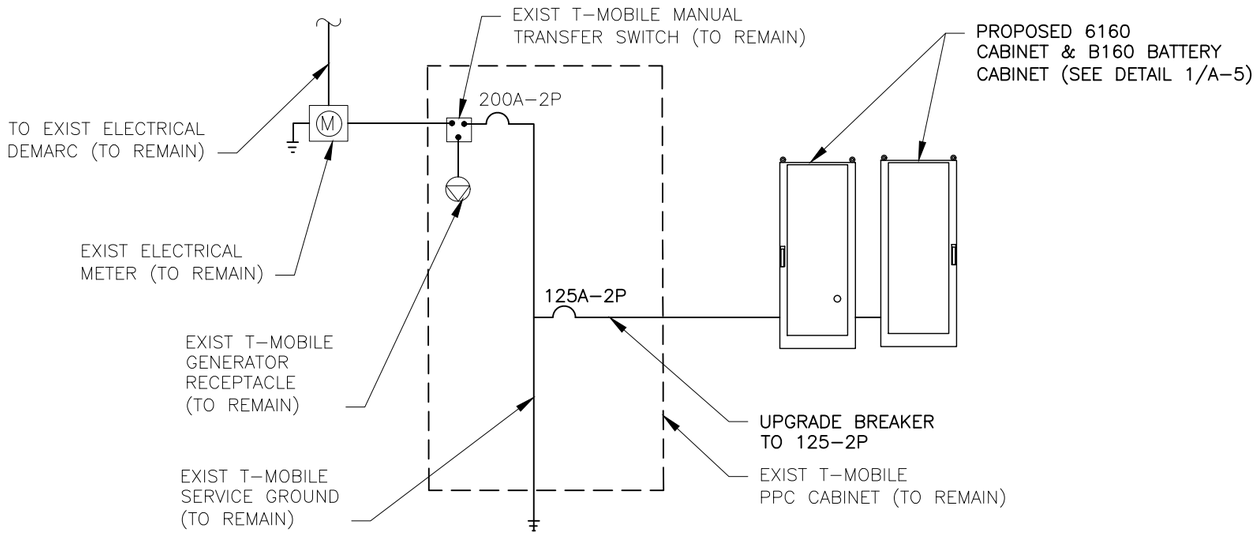
SHEET NUMBER

A-5



1 / A-6 GROUNDING RISER DIAGRAM

SCALE: NTS



2 / A-6 ONE-LINE POWER DIAGRAM

SCALE: NTS

T-MOBILE LICENSED SPECTRUM		
FREQUENCY	BAND #	Tx/Rx RANGE
1900 MHz	2	UL - 1850MHz-1910MHz DL - 1930MHz-1990MHz
1700/2100 MHz	4	UL - 1710MHz-1755MHz DL - 2110MHz-2155MHz
	66	UL - 1760MHz-1780MHz DL - 2160MHz-2180MHz
850 MHz	5	UL - 869MHz-894MHz DL - 824MHz-849MHz
700 MHz	12	UL - 698MHz-704MHz DL - 728MHz-734MHz
600 MHz	71	UL - 663MHz-698MHz DL - 617MHz-652MHz

0 1 2 3

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AMTRAK MAINTENANCE YARD
OLD SAYBROOK, CT

SHEET TITLE

WIRING DIAGRAMS & FREQUENCIES CHART

SHEET NUMBER

A-6

Product Specifications

COMMSCOPE®

POWERED BY ANDREW.

LDF7-50A

LDF7-50A, HELIAX® Low Density Foam Coaxial Cable, corrugated copper, 1-5/8 in, black PE jacket

OBSOLETE

This product was discontinued on: October 1, 2013

Replaced By:

AVA7-50	AVA7-50, HELIAX® Andrew Virtual Air™ Coaxial Cable, corrugated copper, 1-5/8 in, black PE jacket

Construction Materials

Jacket Material	PE
Outer Conductor Material	Corrugated copper
Dielectric Material	Foam PE
Flexibility	Standard
Inner Conductor Material	Corrugated copper tube
Jacket Color	Black

Dimensions

Nominal Size	1-5/8 in
Cable Weight	0.82 lb/ft | 1.22 kg/m
Diameter Over Dielectric	44.196 mm | 1.740 in
Diameter Over Jacket	49.784 mm | 1.960 in
Inner Conductor OD	17.2720 mm | 0.6800 in
Outer Conductor OD	46.482 mm | 1.830 in

Electrical Specifications

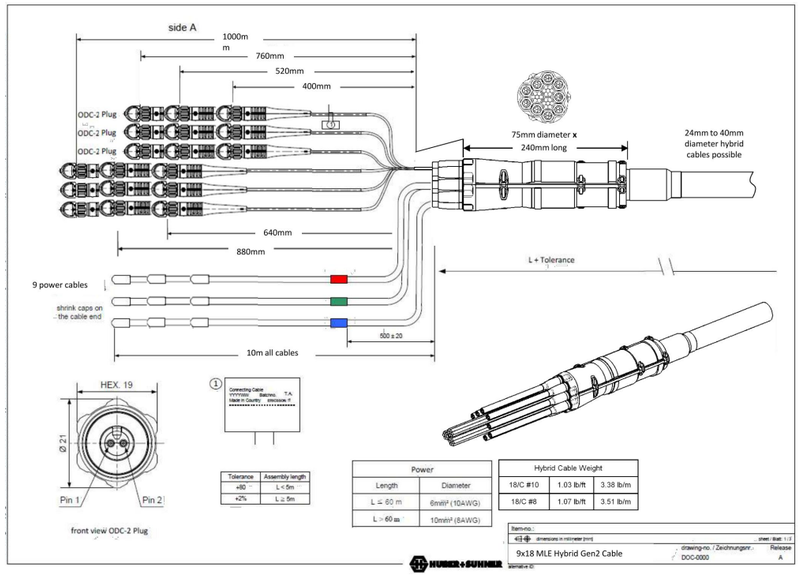
Cable Impedance	50 ohm ±1 ohm
Capacitance	23.1 pF/ft | 75.8 pF/m
dc Resistance, Inner Conductor	0.250 ohms/kft | 0.820 ohms/km
dc Resistance, Outer Conductor	0.160 ohms/kft | 0.525 ohms/km
dc Test Voltage	11000 V
Inductance	0.190 µH/m | 0.058 µH/ft
Insulation Resistance	100000 Mohms*km
Jacket Spark Test Voltage (rms)	10000 V
Operating Frequency Band	1 – 2700 MHz
Peak Power	315.0 kW
Velocity	88%

Environmental Specifications

Installation Temperature	-40 °C to +60 °C (-40 °F to +140 °F)
Operating Temperature	-55 °C to +85 °C (-67 °F to +185 °F)
Storage Temperature	-70 °C to +60 °C (-94 °F to +140 °F)

1 / A–7 COAX CABLE (EXIST)

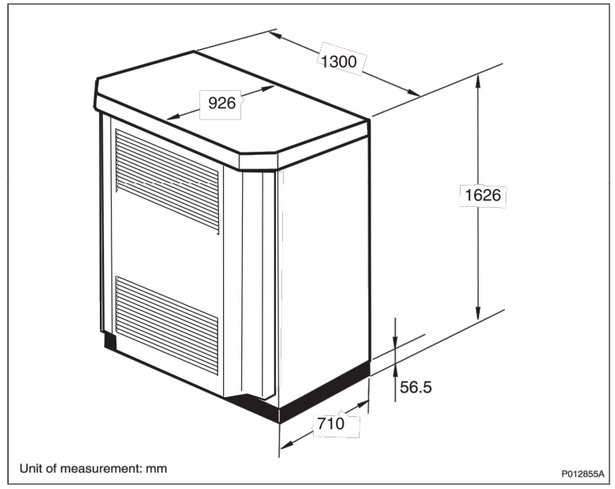
SCALE: NTS



2 / A–7 FIBER CABLE (EXIST)

SCALE: NTS

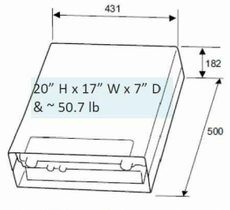
Unit	Dimensions (mm)
Height (including installation frame)	1626
Width	1300
Depth	710
Depth including door	926



3 / A–7 6131 CABINET (EXIST)

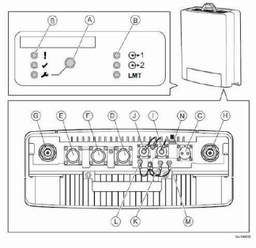
SCALE: 1/4" = 1'–0"

Remote Radio Unit – RRUS11 B12



* RRUS 11 B12 is exactly the same size as RRUS 11 B2 or B4 that T-Mobile is currently using.

Dimensions with Solar Shield and Handle	
Height	500 mm
Width	431 mm
Depth	182 mm
Weight	
RRUS 11	23 kg
Color	
Gray	NCS S2502-R

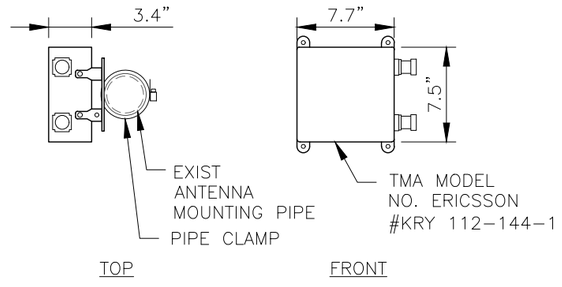


Unit	Output Power
RRUS 11 B1, B4	2x30 W
	2x40 W
RRUS 11 B2	2x30 W
	2x40 W
RRUS 11 B12	2x30 W

Position	Description	Marking
A	Maintenance button	
B	Optical indicators	1, ✓, 🔧 ⟜1, ⟜2 LMT
C	-48 V DC power supply	
D	–	LMT
E	Optical cable 1	⟜1
F	Optical cable 2	⟜2
G	Antenna 1	A
H	Antenna 2	B
I	ALD (used for a RET unit for example)	ALD
J	External alarm	
K(1)	Cross connect RXA	RXA I/O
L(1)	RXA co-site	RXA Out
M(1)	Cross connect RXB	RXB I/O
N	Grounding	

4 / A–7 RRU DETAIL (EXIST)

SCALE: NTS



5 / A–7 TMA (EXIST)

SCALE: 1" = 1'–0"

0 1 2 3

ORIGINAL SIZE IN INCHES

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SITE INFORMATION

CT11327A
AMTRAK–OLD SAYBROOK
AMTRAK MAINTENANCE YARD
OLD SAYBROOK, CT

SHEET TITLE

EXIST
SPECIFICATIONS

SHEET NUMBER

A–7

Radio 4480 B71+B85: FDD Dual-band Low-band RRU

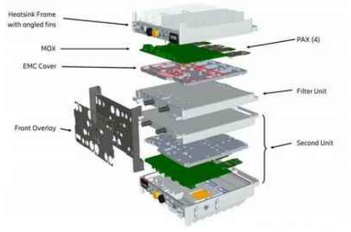
50% more RF power available on 600MHz

- Key Specifications
  - Dual band, 4TX/4RX per band
  - LTE, NR, NB-IoT
  - Output power
    - Up to 4x80W without fan or Up to 4x100W with fan
    - B71 max 60W/port, B85A max 40W/port
  - 2x 2.5/4.9/9.8/10.1 Gbps CPRI
  - Preliminary size (HxWxD) 488x384x191 mm
  - Preliminary 36 liter, 42kg
  - -48 VDC 3-wire or 2-wire (different cable connectors)
  - AISG TMA & RET support via RS-485 or RF connectors
  - Convectional cooling
  - Typical Power consumption: 1150W (at 320W without fan) or 1400W (at 400W with fan).

1 / A–8

RADIO 4480 B71+B85 (PROPOSED)

SCALE: NTS

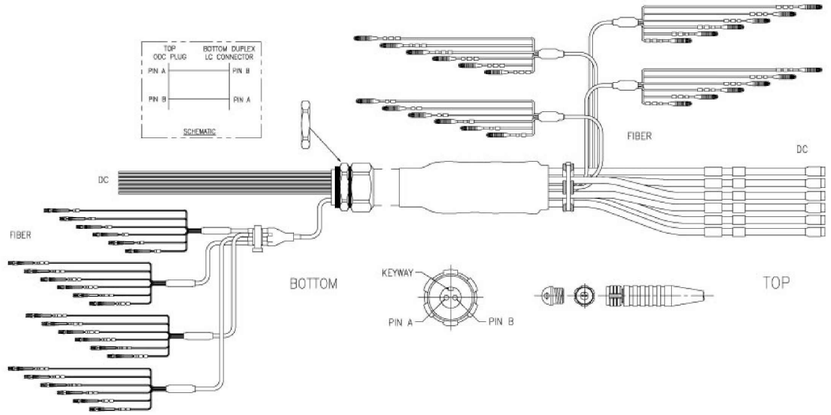


- Dual band, 4TX/4RX per band
- 4 antenna ports, each port carries both bands RX and TX
- Output power
  - Up to 4x80W per band
  - Up to 4x140W total
  - For example: B2/25 4x80W + B66 4x60W
- G, W, L, NR, NB-IoT with GSM in mixed mode
- 4x10Gbps CPRI ports
- Power Consumption: 2200W (maximum), 1500W (typical)
- Dimensions: 15.1” x 17.0” x 11.9” (est.)
- Weight: 104 lb (est.)
- -48 VDC 3-wire or 2-wire (different cable connectors)
- AISG TMA & RET support via RS-485 or RF connectors
- 4 external alarm
- Convectional cooling
- IP 65, -40 to +55˚C

2 / A–8

RADIO 4460 B25+B66 (PROPOSED)

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		3		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	GKFORM60-158	4	HOIST1-158L	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

3 / A–8

FIBER CABLE (PROPOSED)

SCALE: NTS

0 1 2 3

ORIGINAL SIZE IN INCHES

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Tectonic Engineering Consultants, Geologists & Land Surveyors, D.P.C., Inc.
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T-Mobile

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SITE INFORMATION

CT11327A
AMTRAK–OLD SAYBROOK
AMTRAK MAINTENANCE YARD
OLD SAYBROOK, CT

SHEET TITLE

PROPOSED SPECIFICATIONS

SHEET NUMBER

A–8

RFS PRODUCT DATASHEET

APXVAALL24_43-U-NA20

8-Ports, X-Pol, Panel Antenna, 2.4m, 2x 617-894/2x 1695-2690 MHz 65deg, Integrated RET

FEATURES / BENEFITS

- MIMO 4x4 in low-band and mid-band
- Integrated and fieldreplaceable RET
- ACU model number: x2 ACU-A20-SR, ACU HW 05
- Compliant with AISG V2.0 and 3GPP
- AISG jumper cable included
- Mechanical down tilt kit included
- Manual overdrive

Technical features

ELECTRICAL SPECIFICATIONS

Electrical Specification Header		Low Band Arrays (617-894 MHz) Ports 1-4		
Frequency Band	MHz	617-698	698-806	806-894
Gain	dBi	15.8	16.0	16.1
Azimuth Beamwidth 3dB	Deg	65 +/-2	64 +/-2	62 +/-5
Elevation Beamwidth 3dB	Deg	9.9 +/-1	8.6 +/-.8	7.5 +/-.5
Cross-Pol at Boresight	dB	17	19	17
F/B at 180 Copolar	dB	30	30	32
Electrical Downtilt	Deg	2 to 12	2 to 12	2 to 12
First Upper Side Lobe	dB	16	16	14
VSWR	-	1.5:1	1.5:1	1.5:1
Return Loss	dB	-14	-14	-14
Cross Polar Isolation	dB	25	25	25
3rd Order PIM 2 x 43dBm	dBc	-153	-153	-153
Maximum CW Power per Port	Watt	400	400	400
Gain Over All Tilts	dBi	15.2 +/- .6	15.5 +/- .5	15.7 +/- .4
Cross-Pol over Sector	dB	4	4	6
F/B at +/-30 Total Power	dB	17	19	23
Upper Side Lobe Peak to +20	dB	16	16	14

RFS PRODUCT DATASHEET

APXVAALL24_43-U-NA20

8-Ports, X-Pol, Panel Antenna, 2.4m, 2x 617-894/2x 1695-2690 MHz 65deg, Integrated RET

ELECTRICAL SPECIFICATIONS

Electrical Specification Header		Mid Band Arrays (1695-2690 MHz) Ports 5-8			
Frequency Band	MHz	1695-1780	1850-1990	1995-2200	2200-2690
Gain	dBi	18.2	18.7	19.1	18.7
Azimuth Beamwidth 3dB	Deg	67 +/-5	65 +/-4	66 +/-8	61 +/-6
Elevation Beamwidth 3dB	Deg	6.0 +/- .2	5.0 +/-.5	4.5 +/-.3	4.0 +/-.3
Cross-Pol at Boresight	dB	22	18	14	18
F/B at 180 Copolar	dB	31	30	29	27
Electrical Downtilt	Deg	2 to 12	2 to 12	2 to 12	2 to 12
First Upper Side Lobe	dB	15	15	15	14
VSWR	-	1.5:1	1.5:1	1.5:1	1.5:1
Return Loss	dB	-14	-14	-14	-14
Cross Polar Isolation	dB	25	25	25	25
3rd Order PIM 2 x 43dBm	dBc	-153	-153	-153	-153
Maximum CW Power per Port	Watt	300	300	300	300
Gain Over All Tilts	dBi	17.5 +/- .6	17.9 +/- .6	18.5 +/- .5	17.8 +/- .6
Cross-Pol over Sector	dB	8	8	8	2
F/B at +/-30 Total Power	dB	25	23	22	19
Upper Side Lobe Peak to +20	dB	14	14	14	13

ELECTRICAL SPECIFICATIONS

Impedance	Ohm	50
Polarization	Deg	+/- 45

MECHANICAL SPECIFICATIONS

Dimensions - H x W x D	mm (in)	2435 x 610 x 225 (95.9 x 24 x 8.9)
Weight (Antenna Only)	kg (lb)	54 (119)
Weight (Mounting Hardware only)	kg (lb)	7.5 (16.5)
Packing size- HxWxD	mm (in)	2645 x 735 x 285 (104.1 x 28.9 x 11.2)
Shipping Weight	kg (lb)	70 (154)
Connector type		8 x 4.3-10 female at bottom
Radome Material / Color		Fiber Glass / Light Grey RAL7035

TESTING AND ENVIRONMENTAL

Temperature Range	°C (°F)	-40 to 60 (-40 to 140)
Lightning protection		Direct Ground
Survival/Rated Wind Velocity	km/h	240 (150)
Wind Load @Rated Wind Front	N	1428
Wind Load @Rated Wind Side	N	434
Wind Load @Rated Wind Rear	N	1476

ORDERING INFORMATION

Order No.	Configuration	Mounting Hardware	Mounting pipe Diameter	Shipping Weight
APXVAALL24_43-U-NA20	ACU-A20-SR Field Replace RET included (2)	APM40-5E Beam tilt kit (included)	60-120mm	70 Kg (154 lb)

1 / A-9 APXVAALL24 ANTENNA (PROPOSED)

SCALE: NTS

PRODUCT DESCRIPTION

Frequency Range	LTE TDD B41: 2496 – 2690 MHz
Instantaneous BW	DL 194 MHz
Antenna Ports	64T64R
Technology	NR, LTE and NR+LTE MSMM
Antenna Elements	192 Antenna Elements (8 col x 12 rows x 2 pol)
Output RF Power	320 W (=64 TRX x 5W)
Data Ports	2 x 25Gb/s eCPRI
5G NR Support	YES
DC Feed	-48V DC power connector
Cooling	Passive cooling
Dimensions* (H x W x D)	36.3” x 20.9” x 9.0” (= 921x 531 x 229mm)
Weight*	83.3 lbs (=37.8 kg)
Power Consumption	1300 W
Electrical downtilt	-3 to 11 degrees
Horizontal beamwidth	+/- 65 degrees

*Note: Dimensions and weight are subject to change as the vendor finalizes the product.

2 / A-9 AIR 6419 B41 (PROPOSED)

SCALE: NTS

0 1 2 3

ORIGINAL SIZE IN INCHES

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AMTRAK MAINTENANCE YARD
OLD SAYBROOK, CT

SHEET TITLE

PROPOSED ANTENNA SPECIFICATIONS

SHEET NUMBER

A-9

VV-65A-R1

4-port sector antenna, 4x 1695–2690 MHz, 65° HPBW, 1x RET, The two high band arrays utilize a common tilt.

- The RET interface comprises one pair of AISG input/output ports

General Specifications

Antenna Type	Sector
Band	Single band
Color	Light gray
Grounding Type	RF connector inner conductor and body grounded to reflector and mounting bracket
Performance Note	Outdoor usage
Radome Material	PVC, UV resistant
Reflector Material	Aluminum
RF Connector Interface	4.3-10 Female
RF Connector Location	Bottom
RF Connector Quantity, high band	4
RF Connector Quantity, total	4

Remote Electrical Tilt (RET) Information

RET Hardware	CommRET v2
RET Interface	8-pin DIN Female | 8-pin DIN Male
RET Interface, quantity	1 female | 1 male
Input Voltage	10–30 Vdc
Internal RET	High band (1)
Power Consumption, idle state, maximum	2 W
Power Consumption, normal conditions, maximum	10 W
Protocol	3GPP/AISG 2.0

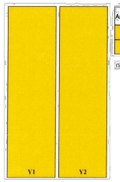
Dimensions

Width	307 mm | 12.087 in
Depth	118 mm | 4.646 in
Length	1390 mm | 54.724 in

VV-65A-R1

Net Weight, without mounting kit	10.8 kg | 23.81 lb

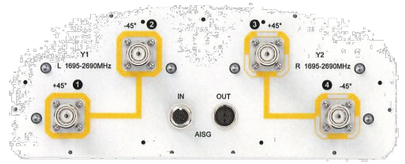
Array Layout



Array ID	Frequency (MHz)	RF Connector	HPBW	RET (optional)	AISG No.	AISG RET UID
Y1	1695–2690	1–2	65°	1	AISG1	CPxxxxxxxxxxxxxxxY1
Y2	1695–2690	3–4	65°			

(Vertical colored boxes are not color depictions of array type)

Port Configuration



Electrical Specifications

Impedance	50 ohm
Operating Frequency Band	1695 – 2690 MHz
Polarization	±45°
Total Input Power, maximum	400 W @ 50 °C

Electrical Specifications

Frequency Band, MHz	1695–1880	1850–1990	1920–2200	2300–2500	2490–2690
Gain, dBi	17.5	17.7	18.2	18.5	18.6
Beamwidth, Horizontal, degrees	66	65	66	63	62
Beamwidth, Vertical, degrees	6.9	6.5	6.1	5.4	5.2
Beam Tilt, degrees	0–12	0–12	0–12	0–12	0–12
USLS (First Lobe), dB	17	18	18	21	21
Front-to-Back Ratio at 180°, dB	30	31	32	29	30
Isolation, Cross Polarization, dB	30	30	30	30	30
Isolation, Inter-band, dB	28	28	28	28	28
VSWR | Return loss, dB	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153	-153	-153
Input Power per Port at 50°C, maximum, watts	300	300	300	300	250

VV-65A-R1

Electrical Specifications, BASTA

Frequency Band, MHz	1695–1880	1850–1990	1920–2200	2300–2500	2490–2690
Gain by all Beam Tilts, average, dBi	17.1	17.5	17.9	18.3	18.2
Gain by all Beam Tilts Tolerance, dB	±0.5	±0.4	±0.4	±0.4	±0.5
Beamwidth, Horizontal Tolerance, degrees	±4.5	±3.5	±2.7	±2.5	±3.2
Beamwidth, Vertical Tolerance, degrees	±0.4	±0.3	±0.5	±0.2	±0.2
USLS, beampeak to 20° above beampeak, dB	16	17	17	18	16
Front-to-Back Total Power at 180° ±30°, dB	24	26	27	26	26
CPR at Boresight, dB	16	17	17	20	19
CPR at Sector, dB	15	14	13	7	9

Mechanical Specifications

Wind Loading @ Velocity, frontal	494.0 N @ 150 km/h (111.1 lbf @ 150 km/h)
Wind Loading @ Velocity, lateral	102.0 N @ 150 km/h (22.9 lbf @ 150 km/h)
Wind Loading @ Velocity, rear	598.0 N @ 150 km/h (134.4 lbf @ 150 km/h)
Wind Speed, maximum	241 km/h | 149.75 mph

1 / A-10 VV-65A-21 ANTENNA (PROPOSED)

SCALE: NTS

0 1 2 3

ORIGINAL SIZE IN INCHES

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.
Tectonic Engineering Consultants, Geologists & Land Surveyors, D.P.C., Inc.
Project Contact Info
1279 Route 300
Newburgh, NY 12550
Phone: (845) 567-6656
(800) 829-6531
www.tectonicengineering.com

T-Mobile

PROJECT NUMBER	DESIGNED BY
10481.CT11327A	MP

REV	DATE	REVISION	DRAWN BY
0	05/12/22	FOR COMMENT	NM
1	05/22/23	PER UPDATED RFDS	TP
2	08/31/23	PER RF COMMENTS	TP

ISSUED BY | DATE

STATE OF CONNECTICUT
MANOJKUMAR PATEL
PEN.0022038
LICENSED
PROFESSIONAL ENGINEER
9/5/23

SITE INFORMATION

CT11327A
AMTRAK–OLD SAYBROOK
AMTRAK MAINTENANCE YARD
OLD SAYBROOK, CT

SHEET TITLE

PROPOSED ANTENNA SPECIFICATIONS

SHEET NUMBER

A–10

ANTENNA DATA

EXIST ANTENNA SPECIFICATIONS

SECTOR	MODEL	ELECTRICAL DOWN TILT	MECHANICAL DOWN TILT	STATUS	CABLE SIZE	CABLE TYPE	AZIMUTH	RADIO
ALPHA	ERICSSON–AIR21 B2A/B4P	2°	0°	(2) EXIST	1–5/8"	COAX	25°	
				EXIST	9x18	HYBRIFLEX		
ALPHA	ANDREW–LNX–6515DS–A1M	2°	0°	SHARED	–	–	25°	RRUS11 B12
ALPHA	ERICSSON–AIR21 B2A/B4P	2°	0°	SHARED	–	–	25°	
BETA	ERICSSON–AIR21 B2A/B4P	2°	0°	(2) EXIST	1–5/8"	COAX	144°	
				SHARED	9x18	HYBRIFLEX		
BETA	ANDREW–LNX–6515DS–A1M	2°	0°	SHARED	–	–	144°	RRUS11 B12
BETA	ERICSSON–AIR21 B2A/B4P	2°	0°	SHARED	–	–	144°	
GAMMA	ERICSSON–AIR21 B2A/B4P	2°	0°	(2) EXIST	1–5/8"	COAX	264°	
				SHARED	9x18	HYBRIFLEX		
GAMMA	ANDREW–LNX–6515DS–A1M	2°	0°	SHARED	–	–	264°	RRUS11 B12
GAMMA	ERICSSON–AIR21 B2A/B4P	2°	0°	SHARED	–	–	264°	

NEW ANTENNA SPECIFICATIONS

SECTOR								
ALPHA	ERICSSON–AIR6419 B41	2°	0°	NEW	6x24	HYBRIFLEX	25°	
ALPHA	RFS–APXVAALL24–43–U–NA20	2°	0°	SHARED	6x24	–	25°	4480 B71+B85
ALPHA	COMMSCOPE–VV–65A–R1	2°	0°	SHARED	6x24	–	25°	4460 B25+B66
BETA	ERICSSON–AIR6419 B41	2°	0°	NEW	6x24	HYBRIFLEX	170°	
BETA	RFS–APXVAALL24–43–U–NA20	2°	0°	SHARED	6x24	–	170°	4480 B71+B85
BETA	COMMSCOPE–VV–65A–R1	2°	0°	SHARED	6x24	–	170°	4460 B25+B66
GAMMA	ERICSSON–AIR6419 B41	2°	0°	NEW	6x24	HYBRIFLEX	264°	
GAMMA	RFS–APXVAALL24–43–U–NA20	2°	0°	SHARED	6x24	–	264°	4480 B71+B85
GAMMA	COMMSCOPE–VV–65A–R1	2°	0°	SHARED	6x24	–	264°	4460 B25+B66

0 1 2 3

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ISSUED BY:
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STATE OF CONNECTICUT
MANOJKUMAR PATEL
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LICENSED
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SITE INFORMATION
CT11327A
AMTRAK–OLD SAYBROOK
AMTRAK MAINTENANCE YARD
OLD SAYBROOK, CT

SHEET TITLE
ANTENNA SCHEDULE

SHEET NUMBER
A–11

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

Date: **May 22, 2023**

Structural Analysis Report – Revision 1

Tower Owner:	Amtrak (National Railroad Passenger Corporation)
Carrier:	T-Mobile
Site ID:	CT11327A
Site Name:	Old Saybrook/I-95/Amtrk_1
Site Data:	Amtrak Maintenance Yard, Old Saybrook, Middlesex County, CT Latitude *41° 18' 4.53"*, Longitude *-72° 22' 28.90"* 150 Foot Reinforced Monopole
Tectonic Project Number:	10481.CT11327A

Tectonic Engineering Consultants, Geologists & Land Surveyors, D.P.C., Inc. 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 – 87.7%**
Foundation:	**Sufficient – 77.1%**

This analysis has been performed in accordance with the 2022 Connecticut State Building Code and the 2021 International Building Code based upon an ultimate 3-second gust wind speed of 130 mph per Appendix P as required for use in the ANSI/TIA-222-H-1-2019 Standard. Exposure Category C with a maximum topographic factor, Kzt, of 1.0 and Risk Category II were used in this analysis.

All modifications and equipment proposed in this report shall be installed in accordance with drawing 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 Wireless. If you have any questions or need further assistance on this or any other projects please give us a call.

Structural analysis prepared by: John-Fritz Julien / Ian Marinaccio

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
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tectonicengineering.com
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TABLE OF CONTENTS

1) INTRODUCTION

The evaluation of the existing 150 ft modified monopole tower and its ability to support the existing loads and proposed T-Mobile load configurations. The tower was designed by PiRod Inc. and previously analyzed and modified by Tectonic Engineering.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	130 mph ultimate 3-second gust *per the town of Old Saybrook, CT*
Exposure Category:	C
Topographic Factor:	1
Ice Thickness:	1.0 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph
Seismic S_1 / S_s:	0.053 / 0.202

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Carrier Designation	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Notes
150.0	T-Mobile	3	RFS	APXVAALL24_43-U-NA20	3	6x24 Hybrid	-
		3	Ericsson	AIR 6419 B41			
		3	CommScope	VV-65A-R1			
		3	Ericsson	RADIO 4460			
		3	Ericsson	RADIO 4480			
		3	-	Platform Mount Reinforcement			

Table 2 - Existing Antenna and Cable Information

Mounting Level (ft)	Carrier Designation	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Notes
150.0	T-Mobile	1	Tower Mount	Platform Mount	6	1-5/8	1
		3	Ericsson	AIR21-B2A_B4P	1	9x18 Hybrid	2
		3	Ericsson	AIR21-B2P_B4A			
		3	Andrew	LNX-6515DS-A1M			
		3	-	TMA			
		3	Alcatel Lucient	RRUS11 B12			

Notes:
1) Existing Equipment
2) Existing Equipment to Be Removed, Not Considered in Analysis

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Dated
Geotechnical Report	French & Parrello	01/20/2000
Monopole Design Drawings	PiRod	07/10/2000

Document	Remarks	Dated
Mapping Report	Vertical Solutions	08/27/2014
Structural Analysis Report	Tectonic	10/22/2014
Monopole Modification Drawings	Tectonic	10/22/2014
Post Modification Inspection	Tectonic	03/25/2016
Mount Modification Design	Centek Engineering	05/16/2019
Structural Analysis Report	Tectonic	08/27/2019
RFDS	T-Mobile	04/07/2023
Mount Analysis Report (Rev 1)	Centek Engineering	04/24/2023

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) Tower member sizes and grades are on the structural design report by PiRod, referenced above.
4) Existing tower reinforcements are based on the structural analysis report by Tectonic, referenced above.
5) The existing mount reinforcement by Centek Engineering was considered in this analysis.
6) Base and flange plates have been adequately designed to resist the full moment capacity of the respective unreinforced shaft or splice bolts.

This analysis is solely for the supporting tower structure, and it 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	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	150 - 145	Pole	P18x0.375	1	-3.96	784.88	12.1	Pass
L2	145 - 140	Pole	P18x0.375	2	-4.46	784.88	25.0	Pass
L3	140 - 135	Pole	P18x0.375	3	-4.97	784.88	38.3	Pass
L4	135 - 130	Pole	P18x0.375	4	-5.51	784.88	52.0	Pass
L5	130 - 125	Pole	P18x0.375	5	-6.06	784.88	66.1	Pass
L6	125 - 120	Pole	P18x0.375	6	-6.63	784.88	80.5	Pass
L7	120 - 115	Pole	P24x0.375	7	-7.31	1052.07	56.3	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L8	115 - 110	Pole	P24x0.375	8	-8.00	1052.07	65.4	Pass
L9	110 - 105	Pole	P24x0.375	9	-8.69	1052.07	74.8	Pass
L10	105 - 100	Pole	P24x0.375	10	-9.57	1052.07	84.6	Pass
L11	100 - 95	Pole	P30x0.375	11	-10.40	1311.06	62.6	Pass
L12	95 - 90	Pole	P30x0.375	12	-11.24	1311.06	69.6	Pass
L13	90 - 85	Pole	P30x0.375	13	-12.08	1311.06	76.8	Pass
L14	85 - 80	Pole	P30x0.375	14	-12.93	1311.06	84.3	Pass
L15	80 - 75	Pole	P36x0.375	15	-14.02	1490.10	65.5	Pass
L16	75 - 70	Pole	P36x0.375	16	-15.00	1490.10	71.3	Pass
L17	70 - 68.25	Pole	P36x0.375	17	-15.35	1490.10	73.3	Pass
L18	68.25 - 68	Pole	P36x0.4625	18	-15.41	1951.82	58.3	Pass
L19	68 - 63	Pole	P36x0.4625	19	-16.57	1951.82	63.1	Pass
L20	63 - 60	Pole	P36x0.4625	20	-17.27	1951.82	66.0	Pass
L21	60 - 57.667	Pole	P42x0.45	21	-17.87	2102.80	52.8	Pass
L22	57.667 - 57.417	Pole	P42x0.375	22	-17.93	1668.87	64.8	Pass
L23	57.417 - 52.417	Pole	P42x0.375	23	-19.05	1668.87	69.6	Pass
L24	52.417 - 49.0833	Pole	P42x0.375	24	-19.93	1668.87	73.1	Pass
L25	49.0833 - 48.8333	Pole	P42x0.48125	25	-20.00	2293.34	55.7	Pass
L26	48.8333 - 43.8333	Pole	P42x0.48125	26	-21.38	2293.34	59.6	Pass
L27	43.8333 - 40	Pole	P42x0.48125	27	-22.45	2293.34	62.7	Pass
L28	40 - 37.4166	Pole	P48x0.4625	28	-23.23	2398.94	52.7	Pass
L29	37.4166 - 37.1666	Pole	P48x0.375	29	-23.30	1847.49	66.6	Pass
L30	37.1666 - 32.1666	Pole	P48x0.375	30	-24.58	1847.49	70.9	Pass
L31	32.1666 - 29.0833	Pole	P48x0.375	31	-25.37	1847.49	73.5	Pass
L32	29.0833 - 28.8333	Pole	P48x0.4625	32	-25.45	2398.94	58.6	Pass
L33	28.8333 - 23.8333	Pole	P48x0.4625	33	-26.98	2398.94	62.2	Pass
L34	23.8333 - 20	Pole	P48x0.4625	34	-28.16	2398.94	65.0	Pass
L35	20 - 17.5	Pole	P54x0.45625	35	-28.99	2575.46	54.3	Pass
L36	17.5 - 17.25	Pole	P54x0.375	36	-29.07	2026.00	67.4	Pass
L37	17.25 - 12.25	Pole	P54x0.375	37	-30.49	2026.00	71.1	Pass
L38	12.25 - 10.5833	Pole	P54x0.375	38	-30.97	2026.00	72.4	Pass
L39	10.5833 - 10.3333	Pole	P54x0.43125	39	-31.05	2402.24	62.4	Pass
L40	10.3333 - 5.3333	Pole	P54x0.43125	40	-32.66	2402.24	65.7	Pass
L41	5.3333 - 0.3333	Pole	P54x0.43125	41	-34.27	2402.24	69.1	Pass
L42	0.3333 - 0	Pole	P54x0.43125	42	-34.38	2402.24	69.3	Pass
							Summary	
						Pole (L10)	84.6	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
						Rating =	84.6	Pass

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

Table 5 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Flange Connection	120	75.6	Pass
1	Flange Connection	100	83.9	Pass
1	Flange Connection	80	86.5	Pass
1	Flange Connection	60	87.4	Pass
1	Flange Connection	40	87.7	Pass
1	Flange Connection	20	87.5	Pass
1	Anchor Rod	0	69.5	Pass
1	Base Foundation (Structure)	0	77.1	Pass
1	Base Foundation (Soil Interaction)	0	22.6	Pass

Structure Rating (max from all components) =	**87.7%**

Note:
1) See additional documentation in “Appendix B – Additional Calculations” for calculations supporting the % capacity consumed.

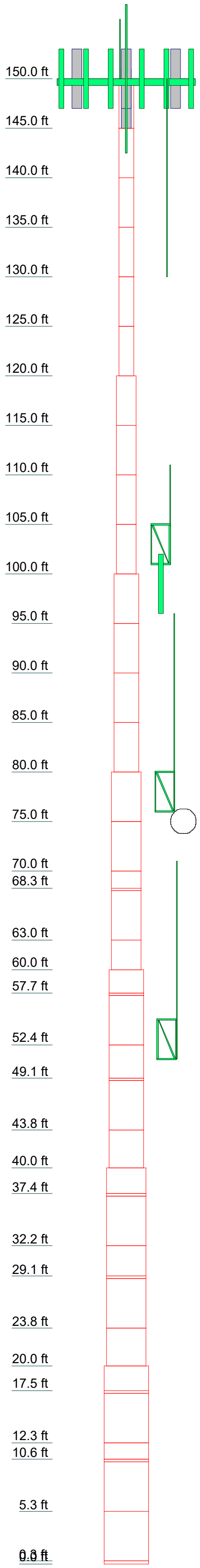
4.1) Result / Conclusions

The tower and its foundation have adequate capacity to support the proposed T-Mobile load configurations. No modification is required at this time.

APPENDIX A

TNXTOWER OUTPUT

Section	Size	Length (ft)	Grade	Weight (K)
1	P18x0.375	5.00	A53-B-42	0.4
2	P18x0.375	5.00	A53-B-42	0.4
3	P18x0.375	5.00	A53-B-42	0.4
4	P18x0.375	5.00	A53-B-42	0.4
5	P18x0.375	5.00	A53-B-42	0.4
6	P18x0.375	5.00	A53-B-42	0.4
7	P24x0.375	5.00	A53-B-42	0.5
8	P24x0.375	5.00	A53-B-42	0.5
9	P24x0.375	5.00	A53-B-42	0.5
10	P24x0.375	5.00	A53-B-42	0.5
11	P30x0.375	5.00	A53-B-42	0.6
12	P30x0.375	5.00	A53-B-42	0.6
13	P30x0.375	5.00	A53-B-42	0.6
14	P30x0.375	5.00	A53-B-42	0.6
15	P36x0.375	5.00	A53-B-42	0.7
16	[illegible]	5.00	A53-B-42	0.7
17	[illegible]	[illegible]	A53-B-42	0.2
18	[illegible]	[illegible]	A53-B-42	[illegible]
19	[illegible]	5.00	A53-B-42	0.9
20	[illegible]	3.00	A53-B-42	0.5
21	[illegible]	[illegible]	A53-B-42	[illegible]
22	[illegible]	[illegible]	A53-B-42	[illegible]
23	[illegible]	5.00	A53-B-42	0.8
24	[illegible]	3.33	A53-B-42	0.6
25	[illegible]	[illegible]	A53-B-42	[illegible]
26	[illegible]	5.00	A53-B-42	1.0
27	[illegible]	3.83	A53-B-42	0.8
28	[illegible]	[illegible]	A53-B-42	0.6
29	[illegible]	[illegible]	A53-B-42	[illegible]
30	[illegible]	5.00	A53-B-42	1.0
31	[illegible]	3.08	A53-B-42	0.6
32	[illegible]	[illegible]	A53-B-42	[illegible]
33	[illegible]	5.00	A53-B-42	1.2
34	[illegible]	3.83	A53-B-42	0.9
35	[illegible]	[illegible]	A53-B-42	0.6
36	[illegible]	[illegible]	A53-B-42	[illegible]
37	[illegible]	5.00	A53-B-42	1.1
38	[illegible]	[illegible]	A53-B-42	0.4
39	[illegible]	[illegible]	A53-B-42	[illegible]
40	[illegible]	5.00	A53-B-42	1.2
41	[illegible]	5.00	A53-B-42	1.2
42	[illegible]	0.33	A53-B-42	0.1
				22.0



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
4' Lightning Rod on 16' Extension	150	VV-65A-R1	150
6' x 1.5" Omni Antenna	150	RADIO 4460 B25+B66	150
MA0245-19AN w/ Mount Pipe	150	RADIO 4460 B25+B66	150
(2) DB874G45A-XY	150	RADIO 4460 B25+B66	150
20' x 2" Omni Antenna	150	RADIO 4480 B71 + B85A	150
16' Low Profile Platform	150	RADIO 4480 B71 + B85A	150
PERFECT10 VSK-M	150	RADIO 4480 B71 + B85A	150
APXVAALL24_43-U-NA20 w/ Mount Pipe	150	10' x 2" Omni Antenna w/mount pipe	101
		(2) MT-404067/ND w/ Mount Pipe	101
APXVAALL24_43-U-NA20 w/ Mount Pipe	150	(2) WIN7237	101
		3' Stand Off Mount	101
APXVAALL24_43-U-NA20 w/ Mount Pipe	150	3' Stand Off Mount	76
		20' x 2" Omni Antenna	76
AIR 6419 B41 w/ Mount Pipe	150	4' x 2" STD Pipe	76
AIR 6419 B41 w/ Mount Pipe	150	3' Stand Off Mount	51
AIR 6419 B41 w/ Mount Pipe	150	20' x 2" Omni Antenna	51
VV-65A-R1	150	4' x 2" STD Pipe	51
VV-65A-R1	150		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

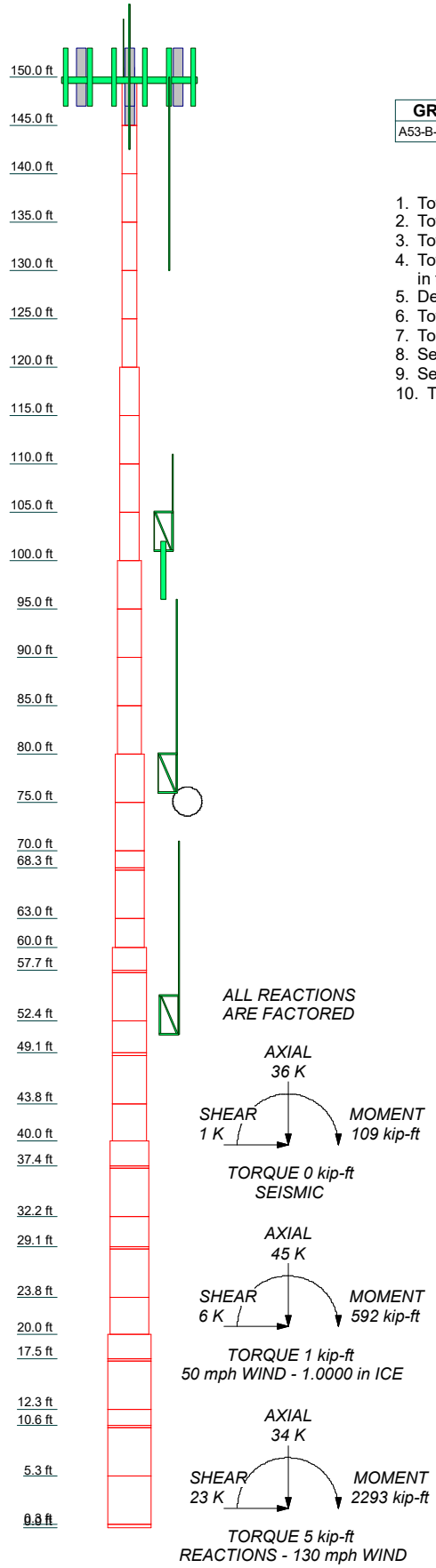
1. Tower is located in Middlesex County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 130 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in 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 0.00 ft

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

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

Job: ***10481.CT11327A - Revision 1***		
Project: ***CT11327A - Old Saybrook/I-98/AmtrK_1***		
Client: T-Mobile	Drawn by: Ian Marinaccio	App'd:
Code: TIA-222-H	Date: 05/22/23	Scale: NTS
Path:		Dwg No. E-1

Section	Size	Length (ft)	Grade	Weight (K)
1	P54.0x0.375	5.00	A53-B-42	0.4
2	P54.0x0.375	5.00		0.4
3	P54.0x0.375	5.00		0.4
4	P54.0x0.375	5.00		0.4
5	P54.0x0.375	5.00		0.4
6	P54.0x0.375	5.00		0.4
7	P54.0x0.375	5.00		0.5
8	P54.0x0.375	5.00		0.5
9	P54.0x0.375	5.00		0.5
10	P54.0x0.375	5.00		0.5
11	P50.0x0.375	5.00		0.6
12	P50.0x0.375	5.00		0.6
13	P50.0x0.375	5.00		0.6
14	P50.0x0.375	5.00		0.6
15	P46.0x0.375	5.00		0.7
16	P46.0x0.375	5.00		0.7
17	P42.0x0.375	2.75		0.2
18	P42.0x0.375	2.25		0.1
19	P42.0x0.375	5.00		0.9
20	P42.0x0.375	3.00		0.5
21	P42.0x0.375	2.33		0.5
22	P42.0x0.375	2.33		0.5
23	P42.0x0.375	5.00		0.8
24	P42.0x0.375	2.33		0.6
25	P42.0x0.375	2.33		0.6
26	P42.0x0.375	5.00		1.0
27	P42.0x0.375	3.83		0.8
28	P42.0x0.375	2.58		0.6
29	P42.0x0.375	2.50		0.6
30	P42.0x0.375	5.00		1.0
31	P42.0x0.375	2.08		0.6
32	P42.0x0.375	2.25		0.6
33	P42.0x0.375	5.00		1.2
34	P42.0x0.375	3.83		0.9
35	P42.0x0.375	2.50		0.6
36	P42.0x0.375	2.50		0.6
37	P42.0x0.375	5.00		1.1
38	P42.0x0.375	2.67		0.6
39	P42.0x0.375	2.67		0.6
40	P42.0x0.375	5.00		1.2
41	P42.0x0.375	5.00		1.2
42	P42.0x0.375	0.33		0.1
		150.0		22.3



ALL REACTIONS ARE FACTORED

AXIAL 36 K
SHEAR 1 K *MOMENT 109 kip-ft*
TORQUE 0 kip-ft
SEISMIC

AXIAL 45 K
SHEAR 6 K *MOMENT 592 kip-ft*
TORQUE 1 kip-ft
50 mph WIND - 1.0000 in ICE

AXIAL 34 K
SHEAR 23 K *MOMENT 2293 kip-ft*
TORQUE 5 kip-ft
REACTIONS - 130 mph WIND

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Middlesex County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 130 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 0.00 ft
8. Seismic loads generated by spreadsheet
9. Seismic calculations are in accordance with TIA-222-H-1
10. TOWER RATING: 84.6%

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PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

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

Job: ***10481.CT11327A - Revision 1***			
Project: ***CT11327A - Old Saybrook/I-98/AmtrK_1***			
Client: T-Mobile	Drawn by: Ian Marinaccio		App'd:
Code: TIA-222-H	Date: 05/22/23		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 Middlesex County, Connecticut.
- Tower base elevation above sea level: 22.50 ft.
- Basic wind speed of 130 mph.
- Risk Category II.
- Exposure Category C.
- Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- Topographic Category: 1.
- Crest Height: 0.00 ft.
- Nominal ice thickness of 1.0000 in.
- Custom ice parameters have been used.
- * Ice thickness multiplier: 1.000.
- Ice density of 56 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50 °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.
- 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	150.00-145.00	5.00	P18x0.375	A53-B-42 (42 ksi)	
L2	145.00-140.00	5.00	P18x0.375	A53-B-42 (42 ksi)	
L3	140.00-135.00	5.00	P18x0.375	A53-B-42 (42 ksi)	
L4	135.00-130.00	5.00	P18x0.375	A53-B-42 (42 ksi)	
L5	130.00-125.00	5.00	P18x0.375	A53-B-42 (42 ksi)	
L6	125.00-120.00	5.00	P18x0.375	A53-B-42 (42 ksi)	
L7	120.00-115.00	5.00	P24x0.375	A53-B-42 (42 ksi)	
L8	115.00-110.00	5.00	P24x0.375	A53-B-42 (42 ksi)	
L9	110.00-105.00	5.00	P24x0.375	A53-B-42 (42 ksi)	
L10	105.00-100.00	5.00	P24x0.375	A53-B-42 (42 ksi)	
L11	100.00-95.00	5.00	P30x0.375	A53-B-42 (42 ksi)	
L12	95.00-90.00	5.00	P30x0.375	A53-B-42 (42 ksi)	
L13	90.00-85.00	5.00	P30x0.375	A53-B-42 (42 ksi)	
L14	85.00-80.00	5.00	P30x0.375	A53-B-42 (42 ksi)	
L15	80.00-75.00	5.00	P36x0.375	A53-B-42 (42 ksi)	
L16	75.00-70.00	5.00	P36x0.375	A53-B-42 (42 ksi)	
L17	70.00-68.25	1.75	P36x0.375	A53-B-42 (42 ksi)	
L18	68.25-68.00	0.25	P36x0.4625	A53-B-42 (42 ksi)	
L19	68.00-63.00	5.00	P36x0.4625	A53-B-42 (42 ksi)	
L20	63.00-60.00	3.00	P36x0.4625	A53-B-42 (42 ksi)	
L21	60.00-57.67	2.33	P42x0.45	A53-B-42 (42 ksi)	
L22	57.67-57.42	0.25	P42x0.375	A53-B-42 (42 ksi)	
L23	57.42-52.42	5.00	P42x0.375	A53-B-42 (42 ksi)	
L24	52.42-49.08	3.33	P42x0.375	A53-B-42 (42 ksi)	
L25	49.08-48.83	0.25	P42x0.48125	A53-B-42 (42 ksi)	
L26	48.83-43.83	5.00	P42x0.48125	A53-B-42 (42 ksi)	
L27	43.83-40.00	3.83	P42x0.48125	A53-B-42 (42 ksi)	
L28	40.00-37.42	2.58	P48x0.4625	A53-B-42 (42 ksi)	
L29	37.42-37.17	0.25	P48x0.375	A53-B-42 (42 ksi)	
L30	37.17-32.17	5.00	P48x0.375	A53-B-42 (42 ksi)	
L31	32.17-29.08	3.08	P48x0.375	A53-B-42 (42 ksi)	
L32	29.08-28.83	0.25	P48x0.4625	A53-B-42 (42 ksi)	
L33	28.83-23.83	5.00	P48x0.4625	A53-B-42 (42 ksi)	
L34	23.83-20.00	3.83	P48x0.4625	A53-B-42 (42 ksi)	
L35	20.00-17.50	2.50	P54x0.45625	A53-B-42	

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L36	17.50-17.25	0.25	P54x0.375	(42 ksi) A53-B-42 (42 ksi)	
L37	17.25-12.25	5.00	P54x0.375	A53-B-42 (42 ksi)	
L38	12.25-10.58	1.67	P54x0.375	A53-B-42 (42 ksi)	
L39	10.58-10.33	0.25	P54x0.43125	A53-B-42 (42 ksi)	
L40	10.33-5.33	5.00	P54x0.43125	A53-B-42 (42 ksi)	
L41	5.33-0.33	5.00	P54x0.43125	A53-B-42 (42 ksi)	
L42	0.33-0.00	0.33	P54x0.43125	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 150.00-145.00				1	1	1			
L2 145.00-140.00				1	1	1			
L3 140.00-135.00				1	1	1			
L4 135.00-130.00				1	1	1			
L5 130.00-125.00				1	1	1			
L6 125.00-120.00				1	1	1			
L7 120.00-115.00				1	1	1			
L8 115.00-110.00				1	1	1			
L9 110.00-105.00				1	1	1			
L10 105.00-100.00				1	1	1			
L11 100.00-95.00				1	1	1			
L12 95.00-90.00				1	1	1			
L13 90.00-85.00				1	1	1			
L14 85.00-80.00				1	1	1			
L15 80.00-75.00				1	1	1			
L16 75.00-70.00				1	1	1			
L17 70.00-68.25				1	1	1			
L18 68.25-68.00				1	1	0.982458			
L19 68.00-63.00				1	1	0.982458			
L20 63.00-60.00				1	1	0.982458			
L21 60.00-57.67				1	1	0.983969			
L22 57.67-57.42				1	1	1			
L23 57.42-52.42				1	1	1			

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_r	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L24 52.42-49.08				1	1	1			
L25 49.08-48.83				1	1	0.978596			
L26 48.83-43.83				1	1	0.978596			
L27 43.83-40.00				1	1	0.978596			
L28 40.00-37.42				1	1	0.991683			
L29 37.42-37.17				1	1	1			
L30 37.17-32.17				1	1	1			
L31 32.17-29.08				1	1	1			
L32 29.08-28.83				1	1	0.991683			
L33 28.83-23.83				1	1	0.991683			
L34 23.83-20.00				1	1	0.991683			
L35 20.00-17.50				1	1	0.984605			
L36 17.50-17.25				1	1	1			
L37 17.25-12.25				1	1	1			
L38 12.25-10.58				1	1	1			
L39 10.58-10.33				1	1	0.99118			
L40 10.33-5.33				1	1	0.99118			
L41 5.33-0.33				1	1	0.99118			
L42 0.33-0.00				1	1	0.99118			

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 rungs	A	No	Surface Ar (CaAa)	150.00 - 0.00	1	1	0.000 0.000	0.0000		1.00
**										
MP303	C	No	Surface Af (CaAa)	10.50 - 0.00	1	1	0.000 0.000	4.0600	11.2600	0.00
MP304BS	C	No	Surface Af (CaAa)	23.00 - 18.00	1	1	0.000 0.000	4.7800	12.7800	0.00
MP303	C	No	Surface Af (CaAa)	30.50 - 20.50	1	1	0.000 0.000	4.0600	11.2600	0.00
MP303BS	C	No	Surface Af (CaAa)	43.00 - 38.00	1	1	0.000 0.000	4.0600	11.2600	0.00
MP303	C	No	Surface Af (CaAa)	45.50 - 40.50	1	1	0.000 0.000	4.0600	11.2600	0.00
MP303BS	C	No	Surface Af (CaAa)	63.00 - 58.00	1	1	0.000 0.000	4.0600	11.2600	0.00
MP303	C	No	Surface Af (CaAa)	65.50 - 60.50	1	1	0.000 0.000	4.0600	11.2600	0.00

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
LDF7-50A(1-5/8")	B	No	No	Inside Pole	150.00 - 0.00	6	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
LDF5-50A(7/8")	B	No	No	Inside Pole	150.00 - 0.00	3	No Ice	0.00	0.33
							1/2" Ice	0.00	0.33
							1" Ice	0.00	0.33
LDF4-50A(1/2")	B	No	No	Inside Pole	150.00 - 0.00	1	No Ice	0.00	0.15
							1/2" Ice	0.00	0.15
							1" Ice	0.00	0.15
**									
LDF4-50A(1/2")	B	No	No	Inside Pole	101.00 - 0.00	1	No Ice	0.00	0.15
							1/2" Ice	0.00	0.15
							1" Ice	0.00	0.15
LDF1-50A(1/4")	B	No	No	Inside Pole	101.00 - 0.00	1	No Ice	0.00	0.06
							1/2" Ice	0.00	0.06
							1" Ice	0.00	0.06
ATCB-B01-001(5/16)	B	No	No	Inside Pole	101.00 - 0.00	1	No Ice	0.00	0.07
							1/2" Ice	0.00	0.07
							1" Ice	0.00	0.07
**									
LDF5-50A(7/8")	B	No	No	Inside Pole	76.00 - 0.00	1	No Ice	0.00	0.33
							1/2" Ice	0.00	0.33
							1" Ice	0.00	0.33
**									
LDF5-50A(7/8")	B	No	No	Inside Pole	51.00 - 0.00	1	No Ice	0.00	0.33
							1/2" Ice	0.00	0.33
							1" Ice	0.00	0.33
**									
6x24 Hybrid Cable	C	No	No	Inside Pole	150.00 - 0.00	3	No Ice	0.00	2.65
							1/2" Ice	0.00	2.65
							1" Ice	0.00	2.65

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	150.00-145.00	A	0.000	0.000	0.000	0.000	0.01
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.04
L2	145.00-140.00	A	0.000	0.000	0.000	0.000	0.01
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.04
L3	140.00-135.00	A	0.000	0.000	0.000	0.000	0.01
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.04
L4	135.00-130.00	A	0.000	0.000	0.000	0.000	0.01
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.04
L5	130.00-125.00	A	0.000	0.000	0.000	0.000	0.01
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.04
L6	125.00-120.00	A	0.000	0.000	0.000	0.000	0.01
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.04
L7	120.00-115.00	A	0.000	0.000	0.000	0.000	0.01
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.04
L8	115.00-110.00	A	0.000	0.000	0.000	0.000	0.01

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
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.04
L9	110.00-105.00	A	0.000	0.000	0.000	0.000	0.01
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.04
L10	105.00-100.00	A	0.000	0.000	0.000	0.000	0.01
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.04
L11	100.00-95.00	A	0.000	0.000	0.000	0.000	0.01
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.04
L12	95.00-90.00	A	0.000	0.000	0.000	0.000	0.01
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.04
L13	90.00-85.00	A	0.000	0.000	0.000	0.000	0.01
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.04
L14	85.00-80.00	A	0.000	0.000	0.000	0.000	0.01
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.04
L15	80.00-75.00	A	0.000	0.000	0.000	0.000	0.01
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.04
L16	75.00-70.00	A	0.000	0.000	0.000	0.000	0.01
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.04
L17	70.00-68.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.01
		C	0.000	0.000	0.000	0.000	0.01
L18	68.25-68.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L19	68.00-63.00	A	0.000	0.000	0.000	0.000	0.01
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	1.375	0.000	0.04
L20	63.00-60.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.02
		C	0.000	0.000	3.026	0.000	0.02
L21	60.00-57.67	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.02
		C	0.000	0.000	1.100	0.000	0.02
L22	57.67-57.42	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L23	57.42-52.42	A	0.000	0.000	0.000	0.000	0.01
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.04
L24	52.42-49.08	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.02
		C	0.000	0.000	0.000	0.000	0.03
L25	49.08-48.83	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L26	48.83-43.83	A	0.000	0.000	0.000	0.000	0.01
		B	0.000	0.000	0.000	0.000	0.04
		C	0.000	0.000	0.917	0.000	0.04
L27	43.83-40.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	3.484	0.000	0.03
L28	40.00-37.42	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.02
		C	0.000	0.000	1.100	0.000	0.02
L29	37.42-37.17	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L30	37.17-32.17	A	0.000	0.000	0.000	0.000	0.01
		B	0.000	0.000	0.000	0.000	0.04
		C	0.000	0.000	0.000	0.000	0.04
L31	32.17-29.08	A	0.000	0.000	0.000	0.000	0.00

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
		B	0.000	0.000	0.000	0.000	0.02
		C	0.000	0.000	0.959	0.000	0.02
L32	29.08-28.83	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.169	0.000	0.00
L33	28.83-23.83	A	0.000	0.000	0.000	0.000	0.01
		B	0.000	0.000	0.000	0.000	0.04
		C	0.000	0.000	3.383	0.000	0.04
L34	23.83-20.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	4.124	0.000	0.03
L35	20.00-17.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.02
		C	0.000	0.000	1.245	0.000	0.02
L36	17.50-17.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L37	17.25-12.25	A	0.000	0.000	0.000	0.000	0.01
		B	0.000	0.000	0.000	0.000	0.04
		C	0.000	0.000	0.000	0.000	0.04
L38	12.25-10.58	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.01
		C	0.000	0.000	0.000	0.000	0.01
L39	10.58-10.33	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.113	0.000	0.00
L40	10.33-5.33	A	0.000	0.000	0.000	0.000	0.01
		B	0.000	0.000	0.000	0.000	0.04
		C	0.000	0.000	3.383	0.000	0.04
L41	5.33-0.33	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.04
		C	0.000	0.000	3.383	0.000	0.04
L42	0.33-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.226	0.000	0.00

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	150.00-145.00	A	1.162	0.000	0.000	1.162	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.04
L2	145.00-140.00	A	1.158	0.000	0.000	1.158	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.04
L3	140.00-135.00	A	1.153	0.000	0.000	1.153	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.04
L4	135.00-130.00	A	1.149	0.000	0.000	1.149	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.04
L5	130.00-125.00	A	1.145	0.000	0.000	1.145	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.04
L6	125.00-120.00	A	1.140	0.000	0.000	1.140	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.04
L7	120.00-115.00	A	1.135	0.000	0.000	1.135	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.04
L8	115.00-110.00	A	1.130	0.000	0.000	1.130	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.04
L9	110.00-105.00	A	1.125	0.000	0.000	1.125	0.000	0.01

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
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.04
L10	105.00-100.00	A	1.120	0.000	0.000	1.120	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.04
L11	100.00-95.00	A	1.114	0.000	0.000	1.114	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.04
L12	95.00-90.00	A	1.109	0.000	0.000	1.109	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.04
L13	90.00-85.00	A	1.102	0.000	0.000	1.102	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.04
L14	85.00-80.00	A	1.096	0.000	0.000	1.096	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.04
L15	80.00-75.00	A	1.089	0.000	0.000	1.089	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.04
L16	75.00-70.00	A	1.082	0.000	0.000	1.082	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.04
L17	70.00-68.25	A	1.077	0.000	0.000	0.377	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.01
		C		0.000	0.000	0.000	0.000	0.01
L18	68.25-68.00	A	1.075	0.000	0.000	0.054	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L19	68.00-63.00	A	1.071	0.000	0.000	1.071	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	1.669	0.000	0.06
L20	63.00-60.00	A	1.064	0.000	0.000	0.639	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.02
		C		0.000	0.000	3.667	0.000	0.06
L21	60.00-57.67	A	1.060	0.000	0.000	0.494	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.02
		C		0.000	0.000	1.333	0.000	0.03
L22	57.67-57.42	A	1.057	0.000	0.000	0.053	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L23	57.42-52.42	A	1.052	0.000	0.000	1.052	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.04
L24	52.42-49.08	A	1.044	0.000	0.000	0.696	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.02
		C		0.000	0.000	0.000	0.000	0.03
L25	49.08-48.83	A	1.040	0.000	0.000	0.052	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L26	48.83-43.83	A	1.035	0.000	0.000	1.035	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.04
		C		0.000	0.000	1.106	0.000	0.05
L27	43.83-40.00	A	1.024	0.000	0.000	0.785	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	4.196	0.000	0.07
L28	40.00-37.42	A	1.016	0.000	0.000	0.525	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.02
		C		0.000	0.000	1.323	0.000	0.03
L29	37.42-37.17	A	1.012	0.000	0.000	0.051	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L30	37.17-32.17	A	1.005	0.000	0.000	1.005	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.04
		C		0.000	0.000	0.000	0.000	0.04
L31	32.17-29.08	A	0.993	0.000	0.000	0.612	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.02
		C		0.000	0.000	1.152	0.000	0.03
L32	29.08-28.83	A	0.987	0.000	0.000	0.049	0.000	0.00

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
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.203	0.000	0.00
L33	28.83-23.83	A	0.978	0.000	0.000	0.978	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.04
		C		0.000	0.000	4.058	0.000	0.07
L34	23.83-20.00	A	0.960	0.000	0.000	0.736	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	4.883	0.000	0.07
L35	20.00-17.50	A	0.945	0.000	0.000	0.473	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.02
		C		0.000	0.000	1.453	0.000	0.03
L36	17.50-17.25	A	0.938	0.000	0.000	0.047	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L37	17.25-12.25	A	0.923	0.000	0.000	0.923	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.04
		C		0.000	0.000	0.000	0.000	0.04
L38	12.25-10.58	A	0.899	0.000	0.000	0.300	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.01
		C		0.000	0.000	0.000	0.000	0.01
L39	10.58-10.33	A	0.891	0.000	0.000	0.045	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.136	0.000	0.00
L40	10.33-5.33	A	0.866	0.000	0.000	0.866	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.04
		C		0.000	0.000	4.077	0.000	0.06
L41	5.33-0.33	A	0.782	0.000	0.000	0.782	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.04
		C		0.000	0.000	4.034	0.000	0.06
L42	0.33-0.00	A	0.589	0.000	0.000	0.039	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.262	0.000	0.00

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	150.00-145.00	0.0000	0.0000	-0.7995	-0.4616
L2	145.00-140.00	0.0000	0.0000	-0.7973	-0.4603
L3	140.00-135.00	0.0000	0.0000	-0.7951	-0.4590
L4	135.00-130.00	0.0000	0.0000	-0.7927	-0.4577
L5	130.00-125.00	0.0000	0.0000	-0.7903	-0.4563
L6	125.00-120.00	0.0000	0.0000	-0.7878	-0.4548
L7	120.00-115.00	0.0000	0.0000	-0.8268	-0.4774
L8	115.00-110.00	0.0000	0.0000	-0.8238	-0.4756
L9	110.00-105.00	0.0000	0.0000	-0.8207	-0.4738
L10	105.00-100.00	0.0000	0.0000	-0.8174	-0.4719
L11	100.00-95.00	0.0000	0.0000	-0.8403	-0.4851
L12	95.00-90.00	0.0000	0.0000	-0.8364	-0.4829
L13	90.00-85.00	0.0000	0.0000	-0.8324	-0.4806
L14	85.00-80.00	0.0000	0.0000	-0.8281	-0.4781
L15	80.00-75.00	0.0000	0.0000	-0.8414	-0.4858
L16	75.00-70.00	0.0000	0.0000	-0.8364	-0.4829
L17	70.00-68.25	0.0000	0.0000	-0.8328	-0.4808
L18	68.25-68.00	0.0000	0.0000	-0.8318	-0.4802
L19	68.00-63.00	0.0000	2.4902	-0.7654	0.9954
L20	63.00-60.00	0.0000	4.1045	-0.6312	4.0046
L21	60.00-57.67	0.0000	3.9954	-0.7418	1.9670
L22	57.67-57.42	0.0000	0.0000	-0.8318	-0.4802
L23	57.42-52.42	0.0000	0.0000	-0.8283	-0.4782
L24	52.42-49.08	0.0000	0.0000	-0.8223	-0.4748
L25	49.08-48.83	0.0000	0.0000	-0.8197	-0.4732
L26	48.83-43.83	0.0000	1.7497	-0.7783	0.5474
L27	43.83-40.00	0.0000	6.5810	-0.6531	3.8033

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L28	40.00-37.42	0.0000	3.7356	-0.7386	1.7936
L29	37.42-37.17	0.0000	0.0000	-0.8085	-0.4668
L30	37.17-32.17	0.0000	0.0000	-0.8031	-0.4636
L31	32.17-29.08	0.0000	2.8426	-0.7407	1.2347
L32	29.08-28.83	0.0000	5.4511	-0.6830	2.9581
L33	28.83-23.83	0.0000	5.4511	-0.6771	2.9601
L34	23.83-20.00	0.0000	7.6736	-0.6179	4.5343
L35	20.00-17.50	0.0000	4.3309	-0.6950	2.1400
L36	17.50-17.25	0.0000	0.0000	-0.7595	-0.4385
L37	17.25-12.25	0.0000	0.0000	-0.7479	-0.4318
L38	12.25-10.58	0.0000	0.0000	-0.7302	-0.4216
L39	10.58-10.33	0.0000	3.9784	-0.6615	2.0231
L40	10.33-5.33	0.0000	5.5680	-0.6172	3.0965
L41	5.33-0.33	0.0000	5.5680	-0.5611	3.1141
L42	0.33-0.00	0.0000	5.5680	-0.4291	3.1548

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	13	Climbing rungs	145.00 - 150.00	1.0000	1.0000
L2	13	Climbing rungs	140.00 - 145.00	1.0000	1.0000
L3	13	Climbing rungs	135.00 - 140.00	1.0000	1.0000
L4	13	Climbing rungs	130.00 - 135.00	1.0000	1.0000
L5	13	Climbing rungs	125.00 - 130.00	1.0000	1.0000
L6	13	Climbing rungs	120.00 - 125.00	1.0000	1.0000
L7	13	Climbing rungs	115.00 - 120.00	1.0000	1.0000
L8	13	Climbing rungs	110.00 - 115.00	1.0000	1.0000
L9	13	Climbing rungs	105.00 - 110.00	1.0000	1.0000
L10	13	Climbing rungs	100.00 - 105.00	1.0000	1.0000
L11	13	Climbing rungs	95.00 - 100.00	1.0000	1.0000
L12	13	Climbing rungs	90.00 - 95.00	1.0000	1.0000
L13	13	Climbing rungs	85.00 - 90.00	1.0000	1.0000
L14	13	Climbing rungs	80.00 - 85.00	1.0000	1.0000
L15	13	Climbing rungs	75.00 - 80.00	1.0000	1.0000
L16	13	Climbing rungs	70.00 - 75.00	1.0000	1.0000
L17	13	Climbing rungs	68.25 - 70.00	1.0000	1.0000
L18	13	Climbing rungs	68.00 - 68.25	1.0000	1.0000
L19	13	Climbing rungs	63.00 - 68.00	1.0000	1.0000
L19	21	MP303	63.00 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			65.50		
L20	13	Climbing rungs	60.00 - 63.00	1.0000	1.0000
L20	20	MP303BS	60.00 - 63.00	1.0000	1.0000
L20	21	MP303	60.50 - 63.00	1.0000	1.0000
L21	13	Climbing rungs	57.67 - 60.00	1.0000	1.0000
L21	20	MP303BS	58.00 - 60.00	1.0000	1.0000
L22	13	Climbing rungs	57.42 - 57.67	1.0000	1.0000
L23	13	Climbing rungs	52.42 - 57.42	1.0000	1.0000
L24	13	Climbing rungs	49.08 - 52.42	1.0000	1.0000
L25	13	Climbing rungs	48.83 - 49.08	1.0000	1.0000
L26	13	Climbing rungs	43.83 - 48.83	1.0000	1.0000
L26	19	MP303	43.83 - 45.50	1.0000	1.0000
L27	13	Climbing rungs	40.00 - 43.83	1.0000	1.0000
L27	18	MP303BS	40.00 - 43.00	1.0000	1.0000
L27	19	MP303	40.50 - 43.83	1.0000	1.0000
L28	13	Climbing rungs	37.42 - 40.00	1.0000	1.0000
L28	18	MP303BS	38.00 - 40.00	1.0000	1.0000
L29	13	Climbing rungs	37.17 - 37.42	1.0000	1.0000
L30	13	Climbing rungs	32.17 - 37.17	1.0000	1.0000
L31	13	Climbing rungs	29.08 - 32.17	1.0000	1.0000
L31	17	MP303	29.08 - 30.50	1.0000	1.0000
L32	13	Climbing rungs	28.83 - 29.08	1.0000	1.0000
L32	17	MP303	28.83 - 29.08	1.0000	1.0000
L33	13	Climbing rungs	23.83 - 28.83	1.0000	1.0000
L33	17	MP303	23.83 - 28.83	1.0000	1.0000
L34	13	Climbing rungs	20.00 - 23.83	1.0000	1.0000
L34	16	MP304BS	20.00 - 23.00	1.0000	1.0000
L34	17	MP303	20.50 - 23.83	1.0000	1.0000
L35	13	Climbing rungs	17.50 - 20.00	1.0000	1.0000
L35	16	MP304BS	18.00 - 20.00	1.0000	1.0000
L36	13	Climbing rungs	17.25 - 17.50	1.0000	1.0000
L37	13	Climbing rungs	12.25 - 17.25	1.0000	1.0000
L38	13	Climbing rungs	10.58 - 12.25	1.0000	1.0000
L39	13	Climbing rungs	10.33 - 10.58	1.0000	1.0000
L39	15	MP303	10.33 - 10.50	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L40	13	Climbing rungs	5.33 - 10.33	1.0000	1.0000
L40	15	MP303	5.33 - 10.33	1.0000	1.0000
L41	13	Climbing rungs	0.33 - 5.33	1.0000	1.0000
L41	15	MP303	0.33 - 5.33	1.0000	1.0000
L42	13	Climbing rungs	0.00 - 0.33	1.0000	1.0000
L42	15	MP303	0.00 - 0.33	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
L19	21	MP303	63.00 - 65.50	Manual	1.0000
L20	20	MP303BS	60.00 - 63.00	Manual	1.0000
L20	21	MP303	60.50 - 63.00	Manual	1.0000
L21	20	MP303BS	58.00 - 60.00	Manual	1.0000
L26	19	MP303	43.83 - 45.50	Manual	1.0000
L27	18	MP303BS	40.00 - 43.00	Manual	1.0000
L27	19	MP303	40.50 - 43.83	Manual	1.0000
L28	18	MP303BS	38.00 - 40.00	Manual	1.0000
L31	17	MP303	29.08 - 30.50	Manual	1.0000
L32	17	MP303	28.83 - 29.08	Manual	1.0000
L33	17	MP303	23.83 - 28.83	Manual	1.0000
L34	16	MP304BS	20.00 - 23.00	Manual	1.0000
L34	17	MP303	20.50 - 23.83	Manual	1.0000
L35	16	MP304BS	18.00 - 20.00	Manual	1.0000
L39	15	MP303	10.33 - 10.50	Manual	1.0000
L40	15	MP303	5.33 - 10.33	Manual	1.0000
L41	15	MP303	0.33 - 5.33	Manual	1.0000
L42	15	MP303	0.00 - 0.33	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
Tower Section 1 - 1	147.50	0.00	0.0000	0.02	0.00	0.00	0.03
Tower Section 2 - 1	142.50	0.00	0.0000	0.02	0.00	0.00	0.03

Description	*Elevation*	*Offset From Centroid*	*Azimuth Angle*	E_v	E_{hx}	E_{hz}	E_h
	ft	*ft*	*°*	*K*	*K*	*K*	*K*
Tower Section 3 - 1	137.50	0.00	0.0000	0.02	0.00	0.00	0.03
Tower Section 4 - 1	132.50	0.00	0.0000	0.02	0.00	0.00	0.03
Tower Section 5 - 1	127.50	0.00	0.0000	0.02	0.00	0.00	0.02
Tower Section 6 - 1	122.50	0.00	0.0000	0.02	0.00	0.00	0.02
Tower Section 7 - 1	117.50	0.00	0.0000	0.02	0.00	0.00	0.03
Tower Section 8 - 1	112.50	0.00	0.0000	0.02	0.00	0.00	0.02
Tower Section 9 - 1	107.50	0.00	0.0000	0.02	0.00	0.00	0.02
Tower Section 10 - 1	102.50	0.00	0.0000	0.02	0.00	0.00	0.02
Tower Section 11 - 1	97.50	0.00	0.0000	0.03	0.00	0.00	0.02
Tower Section 12 - 1	92.50	0.00	0.0000	0.03	0.00	0.00	0.02
Tower Section 13 - 1	87.50	0.00	0.0000	0.03	0.00	0.00	0.02
Tower Section 14 - 1	82.50	0.00	0.0000	0.03	0.00	0.00	0.02
Tower Section 15 - 1	77.50	0.00	0.0000	0.03	0.00	0.00	0.02
Tower Section 16 - 1	72.50	0.00	0.0000	0.03	0.00	0.00	0.02
Tower Section 17 - 1	69.13	0.00	0.0000	0.01	0.00	0.00	0.00
Tower Section 18 - 1	68.13	0.00	0.0000	0.00	0.00	0.00	0.00
Tower Section 19 - 1	65.50	0.00	0.0000	0.04	0.00	0.00	0.01
Tower Section 20 - 1	61.50	0.00	0.0000	0.02	0.00	0.00	0.01
Tower Section 21 - 1	58.83	0.00	0.0000	0.02	0.00	0.00	0.01
Tower Section 22 - 1	57.54	0.00	0.0000	0.00	0.00	0.00	0.00
Tower Section 23 - 1	54.92	0.00	0.0000	0.04	0.00	0.00	0.01
Tower Section 24 - 1	50.75	0.00	0.0000	0.02	0.00	0.00	0.01
Tower Section 25 - 1	48.96	0.00	0.0000	0.00	0.00	0.00	0.00
Tower Section 26 - 1	46.33	0.00	0.0000	0.04	0.00	0.00	0.01
Tower Section 27 - 1	41.92	0.00	0.0000	0.03	0.00	0.00	0.01
Tower Section 28 - 1	38.71	0.00	0.0000	0.03	0.00	0.00	0.00
Tower Section 29 - 1	37.29	0.00	0.0000	0.00	0.00	0.00	0.00
Tower Section 30 - 1	34.67	0.00	0.0000	0.04	0.00	0.00	0.00
Tower Section 31 - 1	30.63	0.00	0.0000	0.03	0.00	0.00	0.00
Tower Section 32 - 1	28.96	0.00	0.0000	0.00	0.00	0.00	0.00
Tower Section 33 - 1	26.33	0.00	0.0000	0.05	0.00	0.00	0.00
Tower Section 34 - 1	21.92	0.00	0.0000	0.04	0.00	0.00	0.00
Tower Section 35 - 1	18.75	0.00	0.0000	0.03	0.00	0.00	0.00
Tower Section 36 - 1	17.38	0.00	0.0000	0.00	0.00	0.00	0.00
Tower Section 37 - 1	14.75	0.00	0.0000	0.05	0.00	0.00	0.00
Tower Section 38 - 1	11.42	0.00	0.0000	0.02	0.00	0.00	0.00
Tower Section 39 - 1	10.46	0.00	0.0000	0.00	0.00	0.00	0.00
Tower Section 40 - 1	7.83	0.00	0.0000	0.05	0.00	0.00	0.00
Tower Section 41 - 1	2.83	0.00	0.0000	0.05	0.00	0.00	0.00
Tower Section 42 - 1	0.17	0.00	0.0000	0.00	0.00	0.00	0.00
miscl 4' Lightning Rod on 16' Extension	150.00	0.00	0.0000	0.00	0.00	0.00	0.01
omni antennas 6' x 1.5" Omni Antenna	150.00	0.00	0.0000	0.00	0.00	0.00	0.00
rfs MA0245-19AN w/ Mount Pipe	150.00	0.00	0.0000	0.00	0.00	0.00	0.00
(2) decibel DB874G45A-XY	150.00	0.00	0.0000	0.00	0.00	0.00	0.00
omni antennas 20' x 2" Omni Antenna	150.00	0.00	0.0000	0.00	0.00	0.00	0.00
16' Low Profile Platform	150.00	0.00	0.0000	0.08	0.00	0.00	0.16
omni antennas 10' x 2" Omni Antenna w/mount pipe	101.00	0.00	0.0000	0.00	0.00	0.00	0.00
(2) mti wireless edge MT-404067/ND w/ Mount Pipe	101.00	0.00	0.0000	0.00	0.00	0.00	0.00
(2) ruggedcom WIN7237	101.00	0.00	0.0000	0.00	0.00	0.00	0.00
3' Stand Off Mount	101.00	0.00	0.0000	0.00	0.00	0.00	0.00
omni antennas 20' x 2" Omni Antenna	76.00	0.00	0.0000	0.00	0.00	0.00	0.00
mount pipes 4' x 2" STD Pipe	76.00	0.00	0.0000	0.00	0.00	0.00	0.00
3' Stand Off Mount	76.00	0.00	0.0000	0.00	0.00	0.00	0.00
omni antennas 20' x 2" Omni Antenna	51.00	0.00	0.0000	0.00	0.00	0.00	0.00
mount pipes 4' x 2" STD Pipe	51.00	0.00	0.0000	0.00	0.00	0.00	0.00
3' Stand Off Mount	51.00	0.00	0.0000	0.00	0.00	0.00	0.00
PERFECT10 VSK-M	150.00	0.00	0.0000	0.01	0.00	0.00	0.03
rfs celwave APXVAALL24_43-U-NA20 w/ Mount Pipe	150.00	0.00	0.0000	0.01	0.00	0.00	0.01

Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
rfs celwave APXVAALL24_43-U-NA20 w/ Mount Pipe	150.00	0.00	0.0000	0.01	0.00	0.00	0.01
rfs celwave APXVAALL24_43-U-NA20 w/ Mount Pipe	150.00	0.00	0.0000	0.01	0.00	0.00	0.01
ericsson AIR 6419 B41 w/ Mount Pipe	150.00	0.00	0.0000	0.00	0.00	0.00	0.01
ericsson AIR 6419 B41 w/ Mount Pipe	150.00	0.00	0.0000	0.00	0.00	0.00	0.01
ericsson AIR 6419 B41 w/ Mount Pipe	150.00	0.00	0.0000	0.00	0.00	0.00	0.01
commscope VV-65A-R1	150.00	0.00	0.0000	0.00	0.00	0.00	0.00
commscope VV-65A-R1	150.00	0.00	0.0000	0.00	0.00	0.00	0.00
commscope VV-65A-R1	150.00	0.00	0.0000	0.00	0.00	0.00	0.00
ericsson RADIO 4460 B25+B66	150.00	0.00	0.0000	0.00	0.00	0.00	0.01
ericsson RADIO 4460 B25+B66	150.00	0.00	0.0000	0.00	0.00	0.00	0.01
ericsson RADIO 4460 B25+B66	150.00	0.00	0.0000	0.00	0.00	0.00	0.01
ericsson RADIO 4480 B71 + B85A	150.00	0.00	0.0000	0.00	0.00	0.00	0.01
ericsson RADIO 4480 B71 + B85A	150.00	0.00	0.0000	0.00	0.00	0.00	0.01
ericsson RADIO 4480 B71 + B85A	150.00	0.00	0.0000	0.00	0.00	0.00	0.01
(6) andrew LDF7-50A(1-5/8") From 0 to 150 (140ft to150ft)	145.00	0.00	0.0000	0.00	0.00	0.00	0.00
(6) andrew LDF7-50A(1-5/8") From 0 to 150 (130ft to140ft)	135.00	0.00	0.0000	0.00	0.00	0.00	0.00
(6) andrew LDF7-50A(1-5/8") From 0 to 150 (120ft to130ft)	125.00	0.00	0.0000	0.00	0.00	0.00	0.00
(6) andrew LDF7-50A(1-5/8") From 0 to 150 (110ft to120ft)	115.00	0.00	0.0000	0.00	0.00	0.00	0.00
(6) andrew LDF7-50A(1-5/8") From 0 to 150 (100ft to110ft)	105.00	0.00	0.0000	0.00	0.00	0.00	0.00
(6) andrew LDF7-50A(1-5/8") From 0 to 150 (90ft to100ft)	95.00	0.00	0.0000	0.00	0.00	0.00	0.00
(6) andrew LDF7-50A(1-5/8") From 0 to 150 (80ft to90ft)	85.00	0.00	0.0000	0.00	0.00	0.00	0.00
(6) andrew LDF7-50A(1-5/8") From 0 to 150 (70ft to80ft)	75.00	0.00	0.0000	0.00	0.00	0.00	0.00
(6) andrew LDF7-50A(1-5/8") From 0 to 150 (60ft to70ft)	65.00	0.00	0.0000	0.00	0.00	0.00	0.00
(6) andrew LDF7-50A(1-5/8") From 0 to 150 (50ft to60ft)	55.00	0.00	0.0000	0.00	0.00	0.00	0.00
(6) andrew LDF7-50A(1-5/8") From 0 to 150 (40ft to50ft)	45.00	0.00	0.0000	0.00	0.00	0.00	0.00
(6) andrew LDF7-50A(1-5/8") From 0 to 150 (30ft to40ft)	35.00	0.00	0.0000	0.00	0.00	0.00	0.00
(6) andrew LDF7-50A(1-5/8") From 0 to 150 (20ft to30ft)	25.00	0.00	0.0000	0.00	0.00	0.00	0.00
(6) andrew LDF7-50A(1-5/8") From 0 to 150 (10ft to20ft)	15.00	0.00	0.0000	0.00	0.00	0.00	0.00
(6) andrew LDF7-50A(1-5/8") From 0 to 150 (0ft to10ft)	5.00	0.00	0.0000	0.00	0.00	0.00	0.00
(3) andrew LDF5-50A(7/8") From 0 to 150 (140ft to150ft)	145.00	0.00	0.0000	0.00	0.00	0.00	0.00
(3) andrew LDF5-50A(7/8") From 0 to 150 (130ft to140ft)	135.00	0.00	0.0000	0.00	0.00	0.00	0.00
(3) andrew LDF5-50A(7/8") From 0 to 150 (120ft to130ft)	125.00	0.00	0.0000	0.00	0.00	0.00	0.00
(3) andrew LDF5-50A(7/8") From 0 to 150 (110ft to120ft)	115.00	0.00	0.0000	0.00	0.00	0.00	0.00
(3) andrew LDF5-50A(7/8") From 0 to 150 (100ft to110ft)	105.00	0.00	0.0000	0.00	0.00	0.00	0.00
(3) andrew LDF5-50A(7/8")	95.00	0.00	0.0000	0.00	0.00	0.00	0.00

Description	*Elevation*	*Offset From Centroid*	*Azimuth Angle*	E_v	E_{hx}	E_{hz}	E_h
	ft	*ft*	*°*	*K*	*K*	*K*	*K*
From 0 to 150 (90ft to100ft) (3) andrew LDF5-50A(7/8")	85.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 150 (80ft to90ft) (3) andrew LDF5-50A(7/8")	75.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 150 (70ft to80ft) (3) andrew LDF5-50A(7/8")	65.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 150 (60ft to70ft) (3) andrew LDF5-50A(7/8")	55.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 150 (50ft to60ft) (3) andrew LDF5-50A(7/8")	45.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 150 (40ft to50ft) (3) andrew LDF5-50A(7/8")	35.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 150 (30ft to40ft) (3) andrew LDF5-50A(7/8")	25.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 150 (20ft to30ft) (3) andrew LDF5-50A(7/8")	15.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 150 (10ft to20ft) (3) andrew LDF5-50A(7/8")	5.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 150 (0ft to10ft) andrew LDF4-50A(1/2")	145.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 150 (140ft to150ft) andrew LDF4-50A(1/2")	135.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 150 (130ft to140ft) andrew LDF4-50A(1/2")	125.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 150 (120ft to130ft) andrew LDF4-50A(1/2")	115.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 150 (110ft to120ft) andrew LDF4-50A(1/2")	105.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 150 (100ft to110ft) andrew LDF4-50A(1/2")	95.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 150 (90ft to100ft) andrew LDF4-50A(1/2")	85.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 150 (80ft to90ft) andrew LDF4-50A(1/2")	75.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 150 (70ft to80ft) andrew LDF4-50A(1/2")	65.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 150 (60ft to70ft) andrew LDF4-50A(1/2")	55.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 150 (50ft to60ft) andrew LDF4-50A(1/2")	45.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 150 (40ft to50ft) andrew LDF4-50A(1/2")	35.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 150 (30ft to40ft) andrew LDF4-50A(1/2")	25.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 150 (20ft to30ft) andrew LDF4-50A(1/2")	15.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 150 (10ft to20ft) andrew LDF4-50A(1/2")	5.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 150 (0ft to10ft) andrew LDF4-50A(1/2")	95.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 101 (90ft to100ft) andrew LDF4-50A(1/2")	85.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 101 (80ft to90ft) andrew LDF4-50A(1/2")	75.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 101 (70ft to80ft) andrew LDF4-50A(1/2")	65.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 101 (60ft to70ft) andrew LDF4-50A(1/2")	55.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 101 (50ft to60ft) andrew LDF4-50A(1/2")	45.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 101 (40ft to50ft) andrew LDF4-50A(1/2")	35.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 101 (30ft to40ft) andrew LDF4-50A(1/2")	25.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 101 (20ft to30ft) andrew LDF4-50A(1/2")	15.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 101 (10ft to20ft) andrew LDF4-50A(1/2")	5.00	0.00	0.0000	0.00	0.00	0.00	0.00

Description	*Elevation*	*Offset From Centroid*	*Azimuth Angle*	E_v	E_{hx}	E_{hz}	E_h
	ft	*ft*	*°*	*K*	*K*	*K*	*K*
From 0 to 101 (0ft to10ft) andrew LDF5-50A(7/8'')	73.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 76 (70ft to76ft) andrew LDF5-50A(7/8'')	65.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 76 (60ft to70ft) andrew LDF5-50A(7/8'')	55.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 76 (50ft to60ft) andrew LDF5-50A(7/8'')	45.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 76 (40ft to50ft) andrew LDF5-50A(7/8'')	35.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 76 (30ft to40ft) andrew LDF5-50A(7/8'')	25.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 76 (20ft to30ft) andrew LDF5-50A(7/8'')	15.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 76 (10ft to20ft) andrew LDF5-50A(7/8'')	5.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 76 (0ft to10ft) andrew LDF5-50A(7/8'')	45.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 51 (40ft to50ft) andrew LDF5-50A(7/8'')	35.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 51 (30ft to40ft) andrew LDF5-50A(7/8'')	25.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 51 (20ft to30ft) andrew LDF5-50A(7/8'')	15.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 51 (10ft to20ft) andrew LDF5-50A(7/8'')	5.00	0.00	0.0000	0.00	0.00	0.00	0.00
From 0 to 51 (0ft to10ft)							
Climbing rungs From 0 to 150 (140ft to150ft)	145.00	0.00	0.0000	0.00	0.00	0.00	0.00
Climbing rungs From 0 to 150 (130ft to140ft)	135.00	0.00	0.0000	0.00	0.00	0.00	0.00
Climbing rungs From 0 to 150 (120ft to130ft)	125.00	0.00	0.0000	0.00	0.00	0.00	0.00
Climbing rungs From 0 to 150 (110ft to120ft)	115.00	0.00	0.0000	0.00	0.00	0.00	0.00
Climbing rungs From 0 to 150 (100ft to110ft)	105.00	0.00	0.0000	0.00	0.00	0.00	0.00
Climbing rungs From 0 to 150 (90ft to100ft)	95.00	0.00	0.0000	0.00	0.00	0.00	0.00
Climbing rungs From 0 to 150 (80ft to90ft)	85.00	0.00	0.0000	0.00	0.00	0.00	0.00
Climbing rungs From 0 to 150 (70ft to80ft)	75.00	0.00	0.0000	0.00	0.00	0.00	0.00
Climbing rungs From 0 to 150 (60ft to70ft)	65.00	0.00	0.0000	0.00	0.00	0.00	0.00
Climbing rungs From 0 to 150 (50ft to60ft)	55.00	0.00	0.0000	0.00	0.00	0.00	0.00
Climbing rungs From 0 to 150 (40ft to50ft)	45.00	0.00	0.0000	0.00	0.00	0.00	0.00
Climbing rungs From 0 to 150 (30ft to40ft)	35.00	0.00	0.0000	0.00	0.00	0.00	0.00
Climbing rungs From 0 to 150 (20ft to30ft)	25.00	0.00	0.0000	0.00	0.00	0.00	0.00
Climbing rungs From 0 to 150 (10ft to20ft)	15.00	0.00	0.0000	0.00	0.00	0.00	0.00
Climbing rungs From 0 to 150 (0ft to10ft)	5.00	0.00	0.0000	0.00	0.00	0.00	0.00
(3) rfs celwave 6x24 Hybrid Cable From 0 to 150 (140ft to150ft)	145.00	0.00	0.0000	0.00	0.00	0.00	0.01
(3) rfs celwave 6x24 Hybrid Cable From 0 to 150 (130ft to140ft)	135.00	0.00	0.0000	0.00	0.00	0.00	0.01
(3) rfs celwave 6x24 Hybrid Cable From 0 to 150 (120ft to130ft)	125.00	0.00	0.0000	0.00	0.00	0.00	0.01
(3) rfs celwave 6x24 Hybrid Cable From 0 to 150 (110ft	115.00	0.00	0.0000	0.00	0.00	0.00	0.00

Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
to120ft)							
(3) rfs celwave 6x24 Hybrid Cable From 0 to 150 (100ft to110ft)	105.00	0.00	0.0000	0.00	0.00	0.00	0.00
(3) rfs celwave 6x24 Hybrid Cable From 0 to 150 (90ft to100ft)	95.00	0.00	0.0000	0.00	0.00	0.00	0.00
(3) rfs celwave 6x24 Hybrid Cable From 0 to 150 (80ft to90ft)	85.00	0.00	0.0000	0.00	0.00	0.00	0.00
(3) rfs celwave 6x24 Hybrid Cable From 0 to 150 (70ft to80ft)	75.00	0.00	0.0000	0.00	0.00	0.00	0.00
(3) rfs celwave 6x24 Hybrid Cable From 0 to 150 (60ft to70ft)	65.00	0.00	0.0000	0.00	0.00	0.00	0.00
(3) rfs celwave 6x24 Hybrid Cable From 0 to 150 (50ft to60ft)	55.00	0.00	0.0000	0.00	0.00	0.00	0.00
(3) rfs celwave 6x24 Hybrid Cable From 0 to 150 (40ft to50ft)	45.00	0.00	0.0000	0.00	0.00	0.00	0.00
(3) rfs celwave 6x24 Hybrid Cable From 0 to 150 (30ft to40ft)	35.00	0.00	0.0000	0.00	0.00	0.00	0.00
(3) rfs celwave 6x24 Hybrid Cable From 0 to 150 (20ft to30ft)	25.00	0.00	0.0000	0.00	0.00	0.00	0.00
(3) rfs celwave 6x24 Hybrid Cable From 0 to 150 (10ft to20ft)	15.00	0.00	0.0000	0.00	0.00	0.00	0.00
(3) rfs celwave 6x24 Hybrid Cable From 0 to 150 (0ft to10ft)	5.00	0.00	0.0000	0.00	0.00	0.00	0.00

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
4' Lightning Rod on 16' Extension	C	None		0.0000	150.00	No Ice 1/2" Ice 1" Ice	4.05 6.09 8.05	4.05 6.09 8.05	0.07 0.11 0.16
6' x 1.5" Omni Antenna	C	From Leg	0.00 0.00 3.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	0.90 1.52 2.00	0.90 1.52 2.00	0.02 0.03 0.04
***									
MA0245-19AN w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	2.36 2.69 3.04	1.09 1.43 1.78	0.02 0.04 0.06
(2) DB874G45A-XY	A	From Leg	4.00 0.00 -2.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	5.31 5.64 5.98	2.51 2.82 3.13	0.01 0.05 0.08
20' x 2" Omni Antenna	B	From Leg	4.00 0.00 -10.00	0.0000	150.00	No Ice 1/2" Ice	4.00 6.03 8.07	4.00 6.03 8.07	0.03 0.06 0.10

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			
16' Low Profile Platform	C	None		0.0000	150.00	No Ice	20.80	20.80	1.80
						1/2" Ice	28.10	28.10	2.07
						1" Ice	35.40	35.40	2.33
**									
10' x 2" Omni Antenna w/mount pipe	B	From Leg	3.00 0.00 5.00	0.0000	101.00	No Ice	2.58	2.58	0.04
						1/2" Ice	3.80	3.80	0.06
						1" Ice	5.03	5.03	0.10
(2) MT-404067/ND w/ Mount Pipe	B	From Leg	3.00 0.00 -2.00	0.0000	101.00	No Ice	1.28	1.18	0.02
						1/2" Ice	1.50	1.52	0.03
						1" Ice	1.73	1.87	0.05
(2) WIN7237	B	From Leg	3.00 0.00 -3.00	0.0000	101.00	No Ice	0.76	0.33	0.01
						1/2" Ice	0.87	0.41	0.02
						1" Ice	0.98	0.49	0.02
3' Stand Off Mount	B	From Leg	1.00 0.00 0.00	0.0000	101.00	No Ice	0.85	1.67	0.07
						1/2" Ice	1.14	2.34	0.08
						1" Ice	1.43	3.01	0.09
**									
20' x 2" Omni Antenna	B	From Leg	3.00 0.00 10.00	0.0000	76.00	No Ice	4.00	4.00	0.03
						1/2" Ice	6.03	6.03	0.06
						1" Ice	8.07	8.07	0.10
4' x 2" STD Pipe	B	From Leg	3.00 0.00 0.00	0.0000	76.00	No Ice	0.87	0.87	0.01
						1/2" Ice	1.11	1.11	0.02
						1" Ice	1.36	1.36	0.03
3' Stand Off Mount	B	From Leg	1.00 0.00 0.00	0.0000	76.00	No Ice	0.85	1.67	0.07
						1/2" Ice	1.14	2.34	0.08
						1" Ice	1.43	3.01	0.09
**									
20' x 2" Omni Antenna	B	From Leg	3.00 0.00 10.00	0.0000	51.00	No Ice	4.00	4.00	0.03
						1/2" Ice	6.03	6.03	0.06
						1" Ice	8.07	8.07	0.10
4' x 2" STD Pipe	B	From Leg	3.00 0.00 0.00	0.0000	51.00	No Ice	0.87	0.87	0.01
						1/2" Ice	1.11	1.11	0.02
						1" Ice	1.36	1.36	0.03
3' Stand Off Mount	B	From Leg	1.00 0.00 0.00	0.0000	51.00	No Ice	0.85	1.67	0.07
						1/2" Ice	1.14	2.34	0.08
						1" Ice	1.43	3.01	0.09
**									
PERFECT10 VSK-M	C	None		0.0000	150.00	No Ice	11.84	11.84	0.28
						1/2" Ice	16.96	16.96	0.30
						1" Ice	22.08	22.08	0.32
APXVAALL24_43-U-NA20 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice	20.24	10.63	0.15
						1/2" Ice	20.89	12.06	0.28
						1" Ice	21.55	13.34	0.43
APXVAALL24_43-U-NA20 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice	20.24	10.63	0.15
						1/2" Ice	20.89	12.06	0.28
						1" Ice	21.55	13.34	0.43
APXVAALL24_43-U-NA20 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice	20.24	10.63	0.15
						1/2" Ice	20.89	12.06	0.28
						1" Ice	21.55	13.34	0.43

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
AIR 6419 B41 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	7.50 8.34 9.09	4.78 5.85 6.78	0.11 0.18 0.25
AIR 6419 B41 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	7.50 8.34 9.09	4.78 5.85 6.78	0.11 0.18 0.25
AIR 6419 B41 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	7.50 8.34 9.09	4.78 5.85 6.78	0.11 0.18 0.25
VV-65A-R1	A	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	5.93 6.29 6.66	2.75 3.09 3.44	0.02 0.06 0.10
VV-65A-R1	B	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	5.93 6.29 6.66	2.75 3.09 3.44	0.02 0.06 0.10
VV-65A-R1	C	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	5.93 6.29 6.66	2.75 3.09 3.44	0.02 0.06 0.10
RADIO 4460 B25+B66	A	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	2.56 2.76 2.97	1.98 2.16 2.34	0.11 0.13 0.16
RADIO 4460 B25+B66	B	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	2.56 2.76 2.97	1.98 2.16 2.34	0.11 0.13 0.16
RADIO 4460 B25+B66	C	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	2.56 2.76 2.97	1.98 2.16 2.34	0.11 0.13 0.16
RADIO 4480 B71 + B85A	A	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	2.85 3.06 3.28	1.38 1.54 1.71	0.08 0.11 0.13
RADIO 4480 B71 + B85A	B	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	2.85 3.06 3.28	1.38 1.54 1.71	0.08 0.11 0.13
RADIO 4480 B71 + B85A	C	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	2.85 3.06 3.28	1.38 1.54 1.71	0.08 0.11 0.13
**									

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

Comb. No.	Description
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
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	26	0.00	0.00	-0.00
			Max. Compression	26	-8.29	-0.50	0.97
			Max. Mx	8	-4.04	-40.39	0.03
			Max. My	2	-3.96	-0.05	41.98
			Max. Vy	8	8.78	-40.39	0.03
			Max. Vx	2	-9.23	-0.05	41.98
			Max. Torque	10			1.56
L2	145 - 140	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-8.95	-0.50	0.99
			Max. Mx	8	-4.54	-85.11	0.04
			Max. My	2	-4.46	-0.07	88.91
			Max. Vy	8	9.10	-85.11	0.04
			Max. Vx	2	-9.55	-0.07	88.91
			Max. Torque	10			1.56
L3	140 - 135	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-9.61	-0.50	1.00
			Max. Mx	8	-5.05	-131.39	0.05
			Max. My	2	-4.97	-0.09	137.42
			Max. Vy	8	9.41	-131.39	0.05
			Max. Vx	2	-9.86	-0.09	137.42
			Max. Torque	10			1.56
L4	135 - 130	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-10.26	-0.50	1.01
			Max. Mx	8	-5.58	-179.17	0.06
			Max. My	2	-5.51	-0.10	187.43
			Max. Vy	8	9.71	-179.17	0.06
			Max. Vx	2	-10.15	-0.10	187.43
			Max. Torque	10			1.56
L5	130 - 125	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-10.92	-0.50	1.02
			Max. Mx	8	-6.13	-228.38	0.07
			Max. My	2	-6.06	-0.12	238.87
			Max. Vy	8	9.98	-228.38	0.07
			Max. Vx	2	-10.43	-0.12	238.87
			Max. Torque	10			1.56
L6	125 - 120	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-11.57	-0.50	1.03
			Max. Mx	8	-6.70	-278.92	0.08
			Max. My	2	-6.63	-0.13	291.65
			Max. Vy	8	10.24	-278.92	0.08
			Max. Vx	2	-10.69	-0.13	291.65
			Max. Torque	10			1.55
L7	120 - 115	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-12.41	-0.50	1.04
			Max. Mx	8	-7.37	-331.05	0.08
			Max. My	2	-7.31	-0.14	346.02
			Max. Vy	8	10.62	-331.05	0.08
			Max. Vx	2	-11.06	-0.14	346.02
			Max. Torque	10			1.55
L8	115 - 110	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-13.25	-0.50	1.05
			Max. Mx	8	-8.06	-385.02	0.08
			Max. My	2	-8.00	-0.15	402.23
			Max. Vy	8	10.98	-385.02	0.08
			Max. Vx	2	-11.42	-0.15	402.23
			Max. Torque	10			1.55
L9	110 - 105	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-14.09	-0.50	1.06
			Max. Mx	8	-8.75	-440.75	0.09
			Max. My	2	-8.69	-0.16	460.20
			Max. Vy	8	11.32	-440.75	0.09
			Max. Vx	2	-11.77	-0.16	460.20
			Max. Torque	10			1.55
L10	105 - 100	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-15.33	-1.69	0.38

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	8	-9.62	-499.38	-0.12
			Max. My	14	-9.57	-0.56	-520.57
			Max. Vy	8	12.09	-499.38	-0.12
			Max. Vx	2	-12.53	-0.70	520.30
			Max. Torque	2			-2.29
L11	100 - 95	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-16.35	-1.68	0.39
			Max. Mx	8	-10.45	-560.89	-0.14
			Max. My	14	-10.40	-0.59	-584.27
			Max. Vy	8	12.52	-560.89	-0.14
			Max. Vx	2	-12.96	-0.68	584.02
			Max. Torque	2			-2.29
L12	95 - 90	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-17.38	-1.68	0.39
			Max. Mx	8	-11.28	-624.53	-0.17
			Max. My	14	-11.24	-0.63	-650.12
			Max. Vy	8	12.94	-624.53	-0.17
			Max. Vx	2	-13.38	-0.66	649.87
			Max. Torque	2			-2.29
L13	90 - 85	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-18.40	-1.67	0.40
			Max. Mx	8	-12.12	-690.23	-0.19
			Max. My	14	-12.08	-0.66	-718.01
			Max. Vy	8	13.35	-690.23	-0.19
			Max. Vx	2	-13.79	-0.64	717.79
			Max. Torque	2			-2.28
L14	85 - 80	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-19.42	-1.65	0.41
			Max. Mx	8	-12.97	-757.91	-0.22
			Max. My	14	-12.93	-0.69	-787.88
			Max. Vy	8	13.73	-757.91	-0.22
			Max. Vx	2	-14.17	-0.61	787.67
			Max. Torque	2			-2.28
L15	80 - 75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-20.89	-2.49	-0.07
			Max. Mx	8	-14.06	-830.66	-0.41
			Max. My	14	-14.02	-1.01	-862.69
			Max. Vy	8	14.55	-830.66	-0.41
			Max. Vx	2	-15.01	-0.92	862.09
			Max. Torque	2			-3.53
L16	75 - 70	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-22.09	-2.48	-0.06
			Max. Mx	8	-15.04	-904.53	-0.34
			Max. My	14	-15.00	-0.94	-938.86
			Max. Vy	8	15.01	-904.53	-0.34
			Max. Vx	2	-15.47	-0.98	938.27
			Max. Torque	2			-3.53
L17	70 - 68.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-22.51	-2.47	-0.06
			Max. Mx	8	-15.38	-930.93	-0.31
			Max. My	14	-15.35	-0.92	-966.07
			Max. Vy	8	15.18	-930.93	-0.31
			Max. Vx	2	-15.64	-1.01	965.48
			Max. Torque	2			-3.53
L18	68.25 - 68	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-22.58	-2.47	-0.06
			Max. Mx	8	-15.44	-934.72	-0.31
			Max. My	14	-15.41	-0.92	-969.98
			Max. Vy	8	15.19	-934.72	-0.31
			Max. Vx	2	-15.65	-1.01	969.39
			Max. Torque	2			-3.53
L19	68 - 63	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-23.98	-2.45	-0.08
			Max. Mx	8	-16.60	-1011.81	-0.24
			Max. My	14	-16.57	-0.85	-1049.36
			Max. Vy	8	15.65	-1011.81	-0.24
			Max. Vx	2	-16.11	-1.08	1048.80
			Max. Torque	2			-3.53
L20	63 - 60	Pole	Max Tension	1	0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	26	-24.84	-2.44	-0.12
			Max. Mx	8	-17.30	-1059.15	-0.20
			Max. My	14	-17.27	-0.81	-1098.08
			Max. Vy	8	15.92	-1059.15	-0.20
			Max. Vx	2	-16.66	-1.12	1097.94
			Max. Torque	2			-3.53
L21	60 - 57.667	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-25.58	-2.43	-0.14
			Max. Mx	8	-17.90	-1096.56	-0.16
			Max. My	2	-17.87	-1.15	1137.08
			Max. Vy	8	16.17	-1096.56	-0.16
			Max. Vx	2	-16.91	-1.15	1137.08
			Max. Torque	2			-3.53
L22	57.667 - 57.417	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-25.65	-2.43	-0.14
			Max. Mx	8	-17.96	-1100.60	-0.16
			Max. My	2	-17.93	-1.15	1141.31
			Max. Vy	8	16.19	-1100.60	-0.16
			Max. Vx	2	-16.93	-1.15	1141.31
			Max. Torque	2			-3.53
L23	57.417 - 52.417	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-27.02	-2.41	-0.13
			Max. Mx	8	-19.09	-1182.80	-0.09
			Max. My	2	-19.05	-1.22	1227.22
			Max. Vy	8	16.70	-1182.80	-0.09
			Max. Vx	2	-17.44	-1.22	1227.22
			Max. Torque	2			-3.53
L24	52.417 - 49.0833	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-28.20	-3.29	-0.63
			Max. Mx	8	-19.96	-1242.02	-0.21
			Max. My	2	-19.93	-1.65	1288.34
			Max. Vy	8	17.33	-1242.02	-0.21
			Max. Vx	2	-18.09	-1.65	1288.34
			Max. Torque	2			-4.75
L25	49.0833 - 48.8333	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-28.28	-3.29	-0.63
			Max. Mx	8	-20.03	-1246.35	-0.20
			Max. My	2	-20.00	-1.66	1292.87
			Max. Vy	8	17.35	-1246.35	-0.20
			Max. Vx	2	-18.11	-1.66	1292.87
			Max. Torque	2			-4.75
L26	48.8333 - 43.8333	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-29.92	-3.27	-0.64
			Max. Mx	8	-21.41	-1334.31	-0.04
			Max. My	2	-21.38	-1.81	1384.63
			Max. Vy	8	17.84	-1334.31	-0.04
			Max. Vx	2	-18.60	-1.81	1384.63
			Max. Torque	2			-4.75
L27	43.8333 - 40	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-31.21	-3.25	-0.70
			Max. Mx	8	-22.47	-1403.37	0.08
			Max. My	2	-22.45	-1.93	1456.60
			Max. Vy	8	18.20	-1403.37	0.08
			Max. Vx	2	-18.96	-1.93	1456.60
			Max. Torque	2			-4.75
L28	40 - 37.4166	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-32.15	-3.24	-0.72
			Max. Mx	8	-23.26	-1450.74	0.16
			Max. My	2	-23.23	-2.01	1505.93
			Max. Vy	8	18.48	-1450.74	0.16
			Max. Vx	2	-19.24	-2.01	1505.93
			Max. Torque	2			-4.75
L29	37.4166 - 37.1666	Pole	Max Tension	1	0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	26	-32.23	-3.24	-0.72
			Max. Mx	8	-23.32	-1455.36	0.17
			Max. My	2	-23.30	-2.01	1510.74
			Max. Vy	8	18.51	-1455.36	0.17
			Max. Vx	2	-19.26	-2.01	1510.74
			Max. Torque	2			-4.75
L30	37.1666 - 32.1666	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-33.78	-3.22	-0.71
			Max. Mx	8	-24.60	-1549.15	0.33
			Max. My	2	-24.58	-2.16	1608.33
			Max. Vy	8	19.02	-1549.15	0.33
			Max. Vx	2	-19.78	-2.16	1608.33
			Max. Torque	2			-4.75
L31	32.1666 - 29.0833	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-34.74	-3.21	-0.72
			Max. Mx	8	-25.39	-1608.24	0.43
			Max. My	2	-25.37	-2.25	1669.75
			Max. Vy	8	19.32	-1608.24	0.43
			Max. Vx	2	-20.08	-2.25	1669.75
			Max. Torque	2			-4.75
L32	29.0833 - 28.8333	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-34.83	-3.20	-0.72
			Max. Mx	8	-25.47	-1613.07	0.44
			Max. My	2	-25.45	-2.26	1674.77
			Max. Vy	8	19.34	-1613.07	0.44
			Max. Vx	2	-20.10	-2.26	1674.77
			Max. Torque	2			-4.75
L33	28.8333 - 23.8333	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-36.65	-3.18	-0.77
			Max. Mx	8	-26.99	-1710.96	0.60
			Max. My	2	-26.98	-2.41	1776.45
			Max. Vy	8	19.83	-1710.96	0.60
			Max. Vx	2	-20.58	-2.41	1776.45
			Max. Torque	2			-4.75
L34	23.8333 - 20	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-38.06	-3.17	-0.83
			Max. Mx	8	-28.17	-1787.59	0.73
			Max. My	2	-28.16	-2.52	1855.97
			Max. Vy	8	20.17	-1787.59	0.73
			Max. Vx	2	-20.92	-2.52	1855.97
			Max. Torque	2			-4.75
L35	20 - 17.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-39.05	-3.16	-0.86
			Max. Mx	8	-29.01	-1838.31	0.81
			Max. My	2	-28.99	-2.59	1908.58
			Max. Vy	8	20.42	-1838.31	0.81
			Max. Vx	2	-21.18	-2.59	1908.58
			Max. Torque	2			-4.75
L36	17.5 - 17.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-39.14	-3.16	-0.85
			Max. Mx	8	-29.08	-1843.42	0.82
			Max. My	2	-29.07	-2.60	1913.88
			Max. Vy	8	20.44	-1843.42	0.82
			Max. Vx	2	-21.19	-2.60	1913.88
			Max. Torque	2			-4.75
L37	17.25 - 12.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-40.84	-3.13	-0.84
			Max. Mx	8	-30.50	-1946.79	0.98
			Max. My	2	-30.49	-2.74	2021.01
			Max. Vy	8	20.91	-1946.79	0.98
			Max. Vx	2	-21.66	-2.74	2021.01
			Max. Torque	2			-4.75
L38	12.25 - 10.5833	Pole	Max Tension	1	0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	26	-41.40	-3.13	-0.84
			Max. Mx	8	-30.97	-1981.76	1.03
			Max. My	2	-30.97	-2.79	2057.23
			Max. Vy	8	21.07	-1981.76	1.03
			Max. Vx	2	-21.82	-2.79	2057.23
			Max. Torque	2			-4.75
L39	10.5833 - 10.3333	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-41.49	-3.13	-0.84
			Max. Mx	8	-31.06	-1987.03	1.04
			Max. My	2	-31.05	-2.80	2062.69
			Max. Vy	8	21.09	-1987.03	1.04
			Max. Vx	2	-21.83	-2.80	2062.69
			Max. Torque	2			-4.75
L40	10.3333 - 5.3333	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43.38	-3.11	-0.88
			Max. Mx	8	-32.66	-2093.59	1.20
			Max. My	2	-32.66	-2.94	2173.00
			Max. Vy	8	21.55	-2093.59	1.20
			Max. Vx	2	-22.30	-2.94	2173.00
			Max. Torque	2			-4.75
L41	5.3333 - 0.3333	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-45.23	-3.09	-0.92
			Max. Mx	8	-34.27	-2202.44	1.37
			Max. My	2	-34.27	-3.08	2285.59
			Max. Vy	8	22.00	-2202.44	1.37
			Max. Vx	2	-22.75	-3.08	2285.59
			Max. Torque	2			-4.75
L42	0.3333 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-45.35	-3.09	-0.93
			Max. Mx	8	-34.38	-2209.78	1.38
			Max. My	2	-34.38	-3.09	2293.17
			Max. Vy	8	22.03	-2209.78	1.38
			Max. Vx	2	-22.77	-3.09	2293.17
			Max. Torque	2			-4.75

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	45.35	-0.00	0.00
	Max. H_x	20	34.38	22.03	-0.03
	Max. H_z	2	34.38	-0.03	22.77
	Max. M_x	2	2293.17	-0.03	22.77
	Max. M_z	8	2209.78	-22.03	0.03
	Max. Torsion	14	4.74	0.03	-22.49
	Min. Vert	58	24.55	-0.86	0.00
	Min. H_x	8	34.38	-22.03	0.03
	Min. H_z	14	34.38	0.03	-22.49
	Min. M_x	14	-2276.72	0.03	-22.49
	Min. M_z	20	-2207.30	22.03	-0.03
	Min. Torsion	2	-4.75	-0.03	22.77

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft

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	28.65	0.00	0.00	0.40	-0.99	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	34.38	0.03	-22.77	-2293.17	-3.09	4.75
0.9 Dead+1.0 Wind 0 deg - No Ice	25.79	0.03	-22.77	-2275.48	-2.77	4.73
1.2 Dead+1.0 Wind 30 deg - No Ice	34.38	11.18	-19.74	-1986.98	-1115.83	4.62
0.9 Dead+1.0 Wind 30 deg - No Ice	25.79	11.18	-19.74	-1971.67	-1106.91	4.61
1.2 Dead+1.0 Wind 60 deg - No Ice	34.38	19.09	-11.27	-1139.32	-1914.78	3.24
0.9 Dead+1.0 Wind 60 deg - No Ice	25.79	19.09	-11.27	-1130.56	-1899.62	3.23
1.2 Dead+1.0 Wind 90 deg - No Ice	34.38	22.03	-0.03	-1.38	-2209.78	0.98
0.9 Dead+1.0 Wind 90 deg - No Ice	25.79	22.03	-0.03	-1.50	-2192.32	0.97
1.2 Dead+1.0 Wind 120 deg - No Ice	34.38	19.06	11.22	1137.07	-1912.91	-1.55
0.9 Dead+1.0 Wind 120 deg - No Ice	25.79	19.06	11.22	1128.06	-1897.75	-1.54
1.2 Dead+1.0 Wind 150 deg - No Ice	34.38	10.99	19.46	1970.87	-1103.80	-3.64
0.9 Dead+1.0 Wind 150 deg - No Ice	25.79	10.99	19.46	1955.37	-1094.93	-3.63
1.2 Dead+1.0 Wind 180 deg - No Ice	34.38	-0.03	22.49	2276.72	0.65	-4.74
0.9 Dead+1.0 Wind 180 deg - No Ice	25.79	-0.03	22.49	2258.83	0.96	-4.73
1.2 Dead+1.0 Wind 210 deg - No Ice	34.38	-11.04	19.49	1972.73	1104.60	-4.58
0.9 Dead+1.0 Wind 210 deg - No Ice	25.79	-11.04	19.49	1957.22	1096.34	-4.56
1.2 Dead+1.0 Wind 240 deg - No Ice	34.38	-19.09	11.27	1140.29	1912.31	-3.20
0.9 Dead+1.0 Wind 240 deg - No Ice	25.79	-19.09	11.27	1131.28	1897.79	-3.19
1.2 Dead+1.0 Wind 270 deg - No Ice	34.38	-22.03	0.03	2.36	2207.30	-0.98
0.9 Dead+1.0 Wind 270 deg - No Ice	25.79	-22.03	0.03	2.23	2190.49	-0.98
1.2 Dead+1.0 Wind 300 deg - No Ice	34.38	-19.06	-11.22	-1136.07	1910.45	1.50
0.9 Dead+1.0 Wind 300 deg - No Ice	25.79	-19.06	-11.22	-1127.32	1895.93	1.50
1.2 Dead+1.0 Wind 330 deg - No Ice	34.38	-11.13	-19.70	-1985.09	1110.15	3.60
0.9 Dead+1.0 Wind 330 deg - No Ice	25.79	-11.13	-19.70	-1969.79	1101.87	3.59
1.2 Dead+1.0 Ice+1.0 Temp	45.35	0.00	-0.00	0.93	-3.09	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	45.35	0.01	-6.17	-589.83	-4.28	1.42
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	45.35	3.06	-5.35	-511.26	-293.85	1.45
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	45.35	5.28	-3.10	-295.40	-505.52	1.09
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	45.35	6.09	-0.01	-0.16	-582.59	0.44
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	45.35	5.26	3.07	295.37	-504.41	-0.33
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	45.35	3.03	5.33	512.01	-291.93	-1.01
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	45.35	-0.01	6.17	591.71	-2.07	-1.42
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	45.35	-3.06	5.35	513.11	287.49	-1.45
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	45.35	-5.28	3.10	297.28	499.17	-1.09
1.2 Dead+1.0 Wind 270	45.35	-6.09	0.01	2.05	576.24	-0.44

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	45.35	-5.26	-3.07	-293.48	498.07	0.33
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	45.35	-3.03	-5.33	-510.15	285.60	1.01
Dead+Wind 0 deg - Service	28.65	0.01	-4.34	-434.95	-1.38	0.91
Dead+Wind 30 deg - Service	28.65	2.13	-3.76	-376.82	-212.58	0.88
Dead+Wind 60 deg - Service	28.65	3.64	-2.15	-215.92	-364.21	0.61
Dead+Wind 90 deg - Service	28.65	4.20	0.90	0.20	-420.19	0.18
Dead+Wind 120 deg - Service	28.65	3.63	2.14	216.11	-363.85	-0.29
Dead+Wind 150 deg - Service	28.65	2.09	3.71	374.38	-210.30	-0.69
Dead+Wind 180 deg - Service	28.65	-0.01	4.29	432.44	-0.67	-0.91
Dead+Wind 210 deg - Service	28.65	-2.10	3.72	374.73	208.86	-0.88
Dead+Wind 240 deg - Service	28.65	-3.64	2.15	216.73	362.16	-0.61
Dead+Wind 270 deg - Service	28.65	-4.20	0.01	0.76	418.13	-0.19
Dead+Wind 300 deg - Service	28.65	-3.63	-2.14	-215.30	361.80	0.29
Dead+Wind 330 deg - Service	28.65	-2.12	-3.76	-376.46	209.92	0.69
1.2 Dead+1.0 Ev+1.0 Eh 0 deg	35.61	0.00	-0.86	-107.13	-1.24	0.00
0.9 Dead-1.0 Ev+1.0 Eh 0 deg	24.55	0.00	-0.86	-106.12	-0.92	0.00
1.2 Dead+1.0 Ev+1.0 Eh 30 deg	35.61	0.43	-0.74	-92.71	-55.05	0.00
0.9 Dead-1.0 Ev+1.0 Eh 30 deg	24.55	0.43	-0.74	-91.86	-54.16	0.00
1.2 Dead+1.0 Ev+1.0 Eh 60 deg	35.61	0.74	-0.43	-53.32	-94.44	0.00
0.9 Dead-1.0 Ev+1.0 Eh 60 deg	24.55	0.74	-0.43	-52.88	-93.14	0.00
1.2 Dead+1.0 Ev+1.0 Eh 90 deg	35.61	0.86	0.00	0.49	-108.86	0.00
0.9 Dead-1.0 Ev+1.0 Eh 90 deg	24.55	0.86	0.00	0.36	-107.41	0.00
1.2 Dead+1.0 Ev+1.0 Eh 120 deg	35.61	0.74	0.43	54.30	-94.44	-0.00
0.9 Dead-1.0 Ev+1.0 Eh 120 deg	24.55	0.74	0.43	53.61	-93.14	-0.00
1.2 Dead+1.0 Ev+1.0 Eh 150 deg	35.61	0.43	0.74	93.69	-55.05	-0.00
0.9 Dead-1.0 Ev+1.0 Eh 150 deg	24.55	0.43	0.74	92.58	-54.16	-0.00
1.2 Dead+1.0 Ev+1.0 Eh 180 deg	35.61	0.00	0.86	108.11	-1.24	-0.00
0.9 Dead-1.0 Ev+1.0 Eh 180 deg	24.55	0.00	0.86	106.85	-0.92	-0.00
1.2 Dead+1.0 Ev+1.0 Eh 210 deg	35.61	-0.43	0.74	93.69	52.57	-0.00
0.9 Dead-1.0 Ev+1.0 Eh 210 deg	24.55	-0.43	0.74	92.58	52.33	-0.00
1.2 Dead+1.0 Ev+1.0 Eh 240 deg	35.61	-0.74	0.43	54.30	91.96	-0.00
0.9 Dead-1.0 Ev+1.0 Eh 240 deg	24.55	-0.74	0.43	53.61	91.30	-0.00
1.2 Dead+1.0 Ev+1.0 Eh 270 deg	35.61	-0.86	0.00	0.49	106.38	-0.00
0.9 Dead-1.0 Ev+1.0 Eh 270 deg	24.55	-0.86	0.00	0.36	105.57	-0.00
1.2 Dead+1.0 Ev+1.0 Eh 300 deg	35.61	-0.74	-0.43	-53.32	91.96	0.00
0.9 Dead-1.0 Ev+1.0 Eh 300 deg	24.55	-0.74	-0.43	-52.88	91.30	0.00

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
1.2 Dead+1.0 Ev+1.0 Eh 330 deg	35.61	-0.43	-0.74	-92.71	52.57	0.00
0.9 Dead-1.0 Ev+1.0 Eh 330 deg	24.55	-0.43	-0.74	-91.86	52.33	0.00

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	0.00	-28.65	0.00	0.00	28.65	0.00	0.000%
2	0.03	-34.38	-22.77	-0.03	34.38	22.77	0.000%
3	0.03	-25.79	-22.77	-0.03	25.79	22.77	0.000%
4	11.18	-34.38	-19.74	-11.18	34.38	19.74	0.000%
5	11.18	-25.79	-19.74	-11.18	25.79	19.74	0.000%
6	19.09	-34.38	-11.27	-19.09	34.38	11.27	0.000%
7	19.09	-25.79	-11.27	-19.09	25.79	11.27	0.000%
8	22.03	-34.38	-0.03	-22.03	34.38	0.03	0.000%
9	22.03	-25.79	-0.03	-22.03	25.79	0.03	0.000%
10	19.06	-34.38	11.22	-19.06	34.38	-11.22	0.000%
11	19.06	-25.79	11.22	-19.06	25.79	-11.22	0.000%
12	10.99	-34.38	19.46	-10.99	34.38	-19.46	0.000%
13	10.99	-25.79	19.46	-10.99	25.79	-19.46	0.000%
14	-0.03	-34.38	22.49	0.03	34.38	-22.49	0.000%
15	-0.03	-25.79	22.49	0.03	25.79	-22.49	0.000%
16	-11.04	-34.38	19.49	11.04	34.38	-19.49	0.000%
17	-11.04	-25.79	19.49	11.04	25.79	-19.49	0.000%
18	-19.09	-34.38	11.27	19.09	34.38	-11.27	0.000%
19	-19.09	-25.79	11.27	19.09	25.79	-11.27	0.000%
20	-22.03	-34.38	0.03	22.03	34.38	-0.03	0.000%
21	-22.03	-25.79	0.03	22.03	25.79	-0.03	0.000%
22	-19.06	-34.38	-11.22	19.06	34.38	11.22	0.000%
23	-19.06	-25.79	-11.22	19.06	25.79	11.22	0.000%
24	-11.13	-34.38	-19.70	11.13	34.38	19.70	0.000%
25	-11.13	-25.79	-19.70	11.13	25.79	19.70	0.000%
26	0.00	-45.35	0.00	-0.00	45.35	0.00	0.000%
27	0.01	-45.35	-6.17	-0.01	45.35	6.17	0.000%
28	3.06	-45.35	-5.35	-3.06	45.35	5.35	0.000%
29	5.28	-45.35	-3.10	-5.28	45.35	3.10	0.000%
30	6.09	-45.35	-0.01	-6.09	45.35	0.01	0.000%
31	5.26	-45.35	3.07	-5.26	45.35	-3.07	0.000%
32	3.03	-45.35	5.33	-3.03	45.35	-5.33	0.000%
33	-0.01	-45.35	6.17	0.01	45.35	-6.17	0.000%
34	-3.06	-45.35	5.35	3.06	45.35	-5.35	0.000%
35	-5.28	-45.35	3.10	5.28	45.35	-3.10	0.000%
36	-6.09	-45.35	0.01	6.09	45.35	-0.01	0.000%
37	-5.26	-45.35	-3.07	5.26	45.35	3.07	0.000%
38	-3.03	-45.35	-5.33	3.03	45.35	5.33	0.000%
39	0.01	-28.65	-4.34	-0.01	28.65	4.34	0.000%
40	2.13	-28.65	-3.76	-2.13	28.65	3.76	0.000%
41	3.64	-28.65	-2.15	-3.64	28.65	2.15	0.000%
42	4.20	-28.65	-0.01	-4.20	28.65	-0.90	**3.145**%
43	3.63	-28.65	2.14	-3.63	28.65	-2.14	0.000%
44	2.09	-28.65	3.71	-2.09	28.65	-3.71	0.000%
45	-0.01	-28.65	4.29	0.01	28.65	-4.29	0.000%
46	-2.10	-28.65	3.72	2.10	28.65	-3.72	0.000%
47	-3.64	-28.65	2.15	3.64	28.65	-2.15	0.000%
48	-4.20	-28.65	0.01	4.20	28.65	-0.01	0.000%
49	-3.63	-28.65	-2.14	3.63	28.65	2.14	0.000%
50	-2.12	-28.65	-3.76	2.12	28.65	3.76	0.000%
51	0.00	-35.61	-0.86	-0.00	35.61	0.86	0.000%
52	0.00	-24.55	-0.86	0.00	24.55	0.86	0.000%
53	0.43	-35.61	-0.74	-0.43	35.61	0.74	0.000%
54	0.43	-24.55	-0.74	-0.43	24.55	0.74	0.000%
55	0.74	-35.61	-0.43	-0.74	35.61	0.43	0.000%
56	0.74	-24.55	-0.43	-0.74	24.55	0.43	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	0.86	-35.61	0.00	-0.86	35.61	0.00	0.000%
58	0.86	-24.55	0.00	-0.86	24.55	0.00	0.000%
59	0.74	-35.61	0.43	-0.74	35.61	-0.43	0.000%
60	0.74	-24.55	0.43	-0.74	24.55	-0.43	0.000%
61	0.43	-35.61	0.74	-0.43	35.61	-0.74	0.000%
62	0.43	-24.55	0.74	-0.43	24.55	-0.74	0.000%
63	0.00	-35.61	0.86	-0.00	35.61	-0.86	0.000%
64	0.00	-24.55	0.86	0.00	24.55	-0.86	0.000%
65	-0.43	-35.61	0.74	0.43	35.61	-0.74	0.000%
66	-0.43	-24.55	0.74	0.43	24.55	-0.74	0.000%
67	-0.74	-35.61	0.43	0.74	35.61	-0.43	0.000%
68	-0.74	-24.55	0.43	0.74	24.55	-0.43	0.000%
69	-0.86	-35.61	0.00	0.86	35.61	0.00	0.000%
70	-0.86	-24.55	0.00	0.86	24.55	0.00	0.000%
71	-0.74	-35.61	-0.43	0.74	35.61	0.43	0.000%
72	-0.74	-24.55	-0.43	0.74	24.55	0.43	0.000%
73	-0.43	-35.61	-0.74	0.43	35.61	0.74	0.000%
74	-0.43	-24.55	-0.74	0.43	24.55	0.74	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00046054
3	Yes	5	0.00000001	0.00021031
4	Yes	6	0.00000001	0.00008253
5	Yes	5	0.00000001	0.00090083
6	Yes	6	0.00000001	0.00006744
7	Yes	5	0.00000001	0.00073638
8	Yes	5	0.00000001	0.00011573
9	Yes	5	0.00000001	0.00005047
10	Yes	6	0.00000001	0.00006742
11	Yes	5	0.00000001	0.00073636
12	Yes	6	0.00000001	0.00008182
13	Yes	5	0.00000001	0.00089321
14	Yes	5	0.00000001	0.00045635
15	Yes	5	0.00000001	0.00020871
16	Yes	6	0.00000001	0.00006462
17	Yes	5	0.00000001	0.00070561
18	Yes	6	0.00000001	0.00007656
19	Yes	5	0.00000001	0.00083750
20	Yes	5	0.00000001	0.00011749
21	Yes	5	0.00000001	0.00005137
22	Yes	6	0.00000001	0.00007589
23	Yes	5	0.00000001	0.00082924
24	Yes	6	0.00000001	0.00006465
25	Yes	5	0.00000001	0.00070523
26	Yes	4	0.00000001	0.00016779
27	Yes	6	0.00000001	0.00011123
28	Yes	6	0.00000001	0.00011619
29	Yes	6	0.00000001	0.00011442
30	Yes	6	0.00000001	0.00010885
31	Yes	6	0.00000001	0.00011379
32	Yes	6	0.00000001	0.00011516
33	Yes	6	0.00000001	0.00011052
34	Yes	6	0.00000001	0.00011376
35	Yes	6	0.00000001	0.00011266
36	Yes	6	0.00000001	0.00010695
37	Yes	6	0.00000001	0.00011260
38	Yes	6	0.00000001	0.00011408
39	Yes	4	0.00000001	0.00054547
40	Yes	4	0.00000001	0.00080980
41	Yes	4	0.00000001	0.00055820
42	Yes	14	0.00000001	0.00000000

43	Yes	4	0.00000001	0.00052759
44	Yes	4	0.00000001	0.00078057
45	Yes	4	0.00000001	0.00054406
46	Yes	4	0.00000001	0.00058941
47	Yes	4	0.00000001	0.00067296
48	Yes	4	0.00000001	0.00027687
49	Yes	4	0.00000001	0.00063996
50	Yes	4	0.00000001	0.00055897
51	Yes	4	0.00000001	0.00010846
52	Yes	4	0.00000001	0.00005235
53	Yes	4	0.00000001	0.00011432
54	Yes	4	0.00000001	0.00005610
55	Yes	4	0.00000001	0.00011483
56	Yes	4	0.00000001	0.00005624
57	Yes	4	0.00000001	0.00011045
58	Yes	4	0.00000001	0.00005307
59	Yes	4	0.00000001	0.00011529
60	Yes	4	0.00000001	0.00005643
61	Yes	4	0.00000001	0.00011492
62	Yes	4	0.00000001	0.00005632
63	Yes	4	0.00000001	0.00010908
64	Yes	4	0.00000001	0.00005258
65	Yes	4	0.00000001	0.00011267
66	Yes	4	0.00000001	0.00005541
67	Yes	4	0.00000001	0.00011213
68	Yes	4	0.00000001	0.00005526
69	Yes	4	0.00000001	0.00010705
70	Yes	4	0.00000001	0.00005184
71	Yes	4	0.00000001	0.00011167
72	Yes	4	0.00000001	0.00005507
73	Yes	4	0.00000001	0.00011206
74	Yes	4	0.00000001	0.00005518

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 145	15.287	39	1.1303	0.0071
L2	145 - 140	14.106	39	1.1237	0.0064
L3	140 - 135	12.939	39	1.1017	0.0058
L4	135 - 130	11.804	39	1.0637	0.0052
L5	130 - 125	10.717	39	1.0093	0.0045
L6	125 - 120	9.696	39	0.9379	0.0039
L7	120 - 115	8.759	39	0.8491	0.0034
L8	115 - 110	7.892	39	0.8048	0.0032
L9	110 - 105	7.076	39	0.7528	0.0030
L10	105 - 100	6.318	39	0.6929	0.0028
L11	100 - 95	5.628	39	0.6250	0.0026
L12	95 - 90	4.993	39	0.5861	0.0024
L13	90 - 85	4.402	39	0.5428	0.0022
L14	85 - 80	3.858	39	0.4947	0.0020
L15	80 - 75	3.367	39	0.4418	0.0018
L16	75 - 70	2.922	39	0.4085	0.0016
L17	70 - 68.25	2.513	39	0.3721	0.0014
L18	68.25 - 68	2.379	39	0.3586	0.0014
L19	68 - 63	2.360	39	0.3570	0.0014
L20	63 - 60	2.004	39	0.3237	0.0012
L21	60 - 57.667	1.807	39	0.3024	0.0011
L22	57.667 - 57.417	1.662	39	0.2914	0.0011
L23	57.417 - 52.417	1.647	39	0.2899	0.0011
L24	52.417 - 49.0833	1.359	39	0.2599	0.0010
L25	49.0833 - 48.8333	1.185	39	0.2386	0.0009
L26	48.8333 - 43.8333	1.172	39	0.2374	0.0009
L27	43.8333 - 40	0.937	39	0.2107	0.0007
L28	40 - 37.4166	0.777	39	0.1890	0.0006

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L29	37.4166 - 37.1666	0.677	39	0.1785	0.0006
L30	37.1666 - 32.1666	0.668	39	0.1772	0.0006
L31	32.1666 - 29.0833	0.496	39	0.1508	0.0005
L32	29.0833 - 28.8333	0.404	39	0.1337	0.0004
L33	28.8333 - 23.8333	0.397	39	0.1325	0.0004
L34	23.8333 - 20	0.271	39	0.1087	0.0003
L35	20 - 17.5	0.191	39	0.0895	0.0003
L36	17.5 - 17.25	0.147	39	0.0802	0.0002
L37	17.25 - 12.25	0.143	39	0.0791	0.0002
L38	12.25 - 10.5833	0.072	39	0.0558	0.0002
L39	10.5833 - 10.3333	0.054	39	0.0477	0.0001
L40	10.3333 - 5.3333	0.051	39	0.0466	0.0001
L41	5.3333 - 0.3333	0.014	39	0.0247	0.0001
L42	0.3333 - 0	0.000	1	0.0000	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.00	4' Lightning Rod on 16' Extension	39	15.287	1.1303	0.0071	20119
147.50	Tower Section 1 - 1	39	14.695	1.1282	0.0068	20119
145.00	(6) andrew LDF7-50A(1-5/8") From 0 to 150 (140ft to150ft)	39	14.106	1.1237	0.0065	20119
142.50	Tower Section 2 - 1	39	13.519	1.1148	0.0062	13080
137.50	Tower Section 3 - 1	39	12.367	1.0848	0.0056	7511
135.00	(6) andrew LDF7-50A(1-5/8") From 0 to 150 (130ft to140ft)	39	11.804	1.0637	0.0052	6210
132.50	Tower Section 4 - 1	39	11.253	1.0383	0.0049	5319
127.50	Tower Section 5 - 1	39	10.197	0.9770	0.0043	3899
125.00	(6) andrew LDF7-50A(1-5/8") From 0 to 150 (120ft to130ft)	39	9.696	0.9379	0.0040	3580
122.50	Tower Section 6 - 1	39	9.217	0.8909	0.0036	3714
117.50	Tower Section 7 - 1	39	8.318	0.8237	0.0033	5155
115.00	(6) andrew LDF7-50A(1-5/8") From 0 to 150 (110ft to120ft)	39	7.892	0.8048	0.0032	5956
112.50	Tower Section 8 - 1	39	7.478	0.7807	0.0031	5786
107.50	Tower Section 9 - 1	39	6.689	0.7244	0.0029	4639
105.00	(6) andrew LDF7-50A(1-5/8") From 0 to 150 (100ft to110ft)	39	6.318	0.6929	0.0028	4482
102.50	Tower Section 10 - 1	39	5.965	0.6572	0.0027	4723
101.00	10' x 2" Omni Antenna w/mount pipe	39	5.761	0.6368	0.0027	5047
100.50	andrew LDF4-50A(1/2") From 0 to 101 (100ft to101ft)	39	5.694	0.6306	0.0026	5184
97.50	Tower Section 11 - 1	39	5.305	0.6034	0.0025	6228
95.00	(6) andrew LDF7-50A(1-5/8") From 0 to 150 (90ft to100ft)	39	4.993	0.5861	0.0024	6961
92.50	Tower Section 12 - 1	39	4.692	0.5656	0.0023	6837
87.50	Tower Section 13 - 1	39	4.123	0.5196	0.0021	5802
85.00	(6) andrew LDF7-50A(1-5/8") From 0 to 150 (80ft to90ft)	39	3.858	0.4947	0.0020	5666
82.50	Tower Section 14 - 1	39	3.606	0.4670	0.0019	5949
77.50	Tower Section 15 - 1	39	3.140	0.4236	0.0017	7531
76.00	20' x 2" Omni Antenna	39	3.008	0.4145	0.0017	8018
75.00	(6) andrew LDF7-50A(1-5/8") From 0 to 150 (70ft to80ft)	39	2.922	0.4085	0.0016	8202
73.00	andrew LDF5-50A(7/8") From 0 to 76 (70ft to76ft)	39	2.754	0.3951	0.0016	8112

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
72.50	Tower Section 16 - 1	39	2.713	0.3915	0.0015	8041
69.13	Tower Section 17 - 1	39	2.445	0.3650	0.0014	7921
68.13	Tower Section 18 - 1	39	2.370	0.3578	0.0014	8072
65.50	Tower Section 19 - 1	39	2.178	0.3411	0.0013	8359
65.00	(6) andrew LDF7-50A(1-5/8") From 0 to 150 (60ft to70ft)	39	2.142	0.3378	0.0013	8381
61.50	Tower Section 20 - 1	39	1.904	0.3123	0.0012	8891
58.83	Tower Section 21 - 1	39	1.734	0.2970	0.0011	9877
57.54	Tower Section 22 - 1	39	1.654	0.2907	0.0011	10075
55.00	(6) andrew LDF7-50A(1-5/8") From 0 to 150 (50ft to60ft)	39	1.504	0.2759	0.0010	9697
54.92	Tower Section 23 - 1	39	1.499	0.2754	0.0010	9678
51.00	20' x 2" Omni Antenna	39	1.283	0.2504	0.0009	9430
50.75	Tower Section 24 - 1	39	1.270	0.2487	0.0009	9468
50.50	andrew LDF5-50A(7/8") From 0 to 51 (50ft to51ft)	39	1.257	0.2471	0.0009	9511
48.96	Tower Section 25 - 1	39	1.178	0.2380	0.0009	9898
46.33	Tower Section 26 - 1	39	1.051	0.2246	0.0008	10418
45.00	(6) andrew LDF7-50A(1-5/8") From 0 to 150 (40ft to50ft)	39	0.990	0.2174	0.0008	10489
41.92	Tower Section 27 - 1	39	0.855	0.1992	0.0007	10856
38.71	Tower Section 28 - 1	39	0.726	0.1839	0.0006	11800
37.29	Tower Section 29 - 1	39	0.673	0.1778	0.0006	11765
35.00	(6) andrew LDF7-50A(1-5/8") From 0 to 150 (30ft to40ft)	39	0.590	0.1661	0.0005	11145
34.67	Tower Section 30 - 1	39	0.579	0.1644	0.0005	11051
30.63	Tower Section 31 - 1	39	0.449	0.1418	0.0005	10834
28.96	Tower Section 32 - 1	39	0.401	0.1331	0.0004	11228
26.33	Tower Section 33 - 1	39	0.331	0.1210	0.0004	11705
25.00	(6) andrew LDF7-50A(1-5/8") From 0 to 150 (20ft to30ft)	39	0.298	0.1146	0.0004	11767
21.92	Tower Section 34 - 1	39	0.229	0.0985	0.0003	12183
18.75	Tower Section 35 - 1	39	0.168	0.0850	0.0003	13185
17.38	Tower Section 36 - 1	39	0.145	0.0797	0.0002	13178
15.00	(6) andrew LDF7-50A(1-5/8") From 0 to 150 (10ft to20ft)	39	0.108	0.0688	0.0002	12563
14.75	Tower Section 37 - 1	39	0.104	0.0677	0.0002	12502
11.42	Tower Section 38 - 1	39	0.062	0.0516	0.0001	12379
10.46	Tower Section 39 - 1	39	0.053	0.0471	0.0001	12567
7.83	Tower Section 40 - 1	39	0.030	0.0367	0.0001	13031
5.00	(6) andrew LDF7-50A(1-5/8") From 0 to 150 (0ft to10ft)	39	0.012	0.0227	0.0001	12654
2.83	Tower Section 41 - 1	39	0.004	0.0089	0.0000	12654
0.17	Tower Section 42 - 1	0	0.000	0.0000	0.0000	12654

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 145	80.617	2	5.9604	0.0359
L2	145 - 140	74.397	2	5.9266	0.0327
L3	140 - 135	68.255	2	5.8114	0.0294
L4	135 - 130	62.276	2	5.6120	0.0262
L5	130 - 125	56.550	2	5.3258	0.0230
L6	125 - 120	51.169	2	4.9501	0.0199
L7	120 - 115	46.228	2	4.4825	0.0176
L8	115 - 110	41.657	2	4.2491	0.0167
L9	110 - 105	37.351	2	3.9752	0.0158
L10	105 - 100	33.353	2	3.6595	0.0148
L11	100 - 95	29.707	2	3.3007	0.0136
L12	95 - 90	26.357	2	3.0956	0.0125
L13	90 - 85	23.235	2	2.8665	0.0114
L14	85 - 80	20.365	2	2.6126	0.0104
L15	80 - 75	17.774	2	2.3330	0.0093

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L16	75 - 70	15.422	2	2.1570	0.0085
L17	70 - 68.25	13.263	2	1.9647	0.0076
L18	68.25 - 68	12.556	2	1.8936	0.0072
L19	68 - 63	12.457	2	1.8851	0.0072
L20	63 - 60	10.574	2	1.7091	0.0064
L21	60 - 57.667	9.536	2	1.5967	0.0059
L22	57.667 - 57.417	8.770	2	1.5382	0.0057
L23	57.417 - 52.417	8.690	2	1.5306	0.0056
L24	52.417 - 49.0833	7.169	2	1.3720	0.0050
L25	49.0833 - 48.8333	6.250	2	1.2597	0.0045
L26	48.8333 - 43.8333	6.184	2	1.2529	0.0045
L27	43.8333 - 40	4.945	2	1.1122	0.0039
L28	40 - 37.4166	4.098	2	0.9977	0.0034
L29	37.4166 - 37.1666	3.573	2	0.9419	0.0031
L30	37.1666 - 32.1666	3.524	2	0.9351	0.0031
L31	32.1666 - 29.0833	2.617	2	0.7957	0.0026
L32	29.0833 - 28.8333	2.132	2	0.7053	0.0022
L33	28.8333 - 23.8333	2.095	2	0.6992	0.0022
L34	23.8333 - 20	1.428	2	0.5734	0.0017
L35	20 - 17.5	1.008	2	0.4719	0.0014
L36	17.5 - 17.25	0.774	2	0.4233	0.0012
L37	17.25 - 12.25	0.752	2	0.4173	0.0012
L38	12.25 - 10.5833	0.379	2	0.2940	0.0008
L39	10.5833 - 10.3333	0.284	2	0.2515	0.0007
L40	10.3333 - 5.3333	0.271	2	0.2458	0.0007
L41	5.3333 - 0.3333	0.073	2	0.1301	0.0004
L42	0.3333 - 0	0.000	2	0.0083	0.0000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.00	4' Lightning Rod on 16' Extension	2	80.617	5.9604	0.0380	3939
147.50	Tower Section 1 - 1	2	77.502	5.9499	0.0364	3939
145.00	(6) andrew LDF7-50A(1-5/8") From 0 to 150 (140ft to150ft)	2	74.397	5.9266	0.0347	3939
142.50	Tower Section 2 - 1	2	71.311	5.8801	0.0330	2551
137.50	Tower Section 3 - 1	2	65.239	5.7226	0.0297	1458
135.00	(6) andrew LDF7-50A(1-5/8") From 0 to 150 (130ft to140ft)	2	62.276	5.6120	0.0280	1204
132.50	Tower Section 4 - 1	2	59.376	5.4782	0.0263	1030
127.50	Tower Section 5 - 1	2	53.809	5.1560	0.0229	752
125.00	(6) andrew LDF7-50A(1-5/8") From 0 to 150 (120ft to130ft)	2	51.169	4.9501	0.0212	690
122.50	Tower Section 6 - 1	2	48.645	4.7028	0.0193	715
117.50	Tower Section 7 - 1	2	43.905	4.3485	0.0171	990
115.00	(6) andrew LDF7-50A(1-5/8") From 0 to 150 (110ft to120ft)	2	41.657	4.2491	0.0167	1142
112.50	Tower Section 8 - 1	2	39.470	4.1223	0.0162	1109
107.50	Tower Section 9 - 1	2	35.309	3.8252	0.0153	888
105.00	(6) andrew LDF7-50A(1-5/8") From 0 to 150 (100ft to110ft)	2	33.353	3.6595	0.0148	857
102.50	Tower Section 10 - 1	2	31.487	3.4706	0.0142	902
101.00	10' x 2" Omni Antenna w/mount pipe	2	30.409	3.3629	0.0139	963
100.50	andrew LDF4-50A(1/2") From 0	2	30.056	3.3305	0.0138	989

Elevation	*Appurtenance*	*Gov. Load Comb.*	*Deflection*	*Tilt*	*Twist*	*Radius of Curvature*
ft			*in*	*°*	*°*	*ft*
	to 101 (100ft to101ft)					
97.50	Tower Section 11 - 1	2	28.001	3.1868	0.0131	1188
95.00	(6) andrew LDF7-50A(1-5/8") From 0 to 150 (90ft to100ft)	2	26.357	3.0956	0.0125	1327
92.50	Tower Section 12 - 1	2	24.767	2.9873	0.0120	1303
87.50	Tower Section 13 - 1	2	21.765	2.7443	0.0109	1105
85.00	(6) andrew LDF7-50A(1-5/8") From 0 to 150 (80ft to90ft)	2	20.365	2.6126	0.0104	1078
82.50	Tower Section 14 - 1	2	19.036	2.4663	0.0098	1132
77.50	Tower Section 15 - 1	2	16.572	2.2369	0.0089	1432
76.00	20' x 2" Omni Antenna	2	15.876	2.1891	0.0087	1525
75.00	(6) andrew LDF7-50A(1-5/8") From 0 to 150 (70ft to80ft)	2	15.422	2.1570	0.0085	1560
73.00	andrew LDF5-50A(7/8") From 0 to 76 (70ft to76ft)	2	14.535	2.0862	0.0082	1542
72.50	Tower Section 16 - 1	2	14.318	2.0671	0.0081	1529
69.13	Tower Section 17 - 1	2	12.906	1.9273	0.0074	1506
68.13	Tower Section 18 - 1	2	12.507	1.8893	0.0072	1534
65.50	Tower Section 19 - 1	2	11.493	1.8011	0.0068	1588
65.00	(6) andrew LDF7-50A(1-5/8") From 0 to 150 (60ft to70ft)	2	11.305	1.7837	0.0067	1592
61.50	Tower Section 20 - 1	2	10.047	1.6488	0.0061	1689
58.83	Tower Section 21 - 1	2	9.149	1.5678	0.0058	1876
57.54	Tower Section 22 - 1	2	8.730	1.5345	0.0057	1912
55.00	(6) andrew LDF7-50A(1-5/8") From 0 to 150 (50ft to60ft)	2	7.934	1.4564	0.0054	1839
54.92	Tower Section 23 - 1	2	7.908	1.4538	0.0053	1836
51.00	20' x 2" Omni Antenna	2	6.769	1.3217	0.0048	1788
50.75	Tower Section 24 - 1	2	6.700	1.3129	0.0048	1795
50.50	andrew LDF5-50A(7/8") From 0 to 51 (50ft to51ft)	2	6.631	1.3042	0.0047	1803
48.96	Tower Section 25 - 1	2	6.217	1.2563	0.0045	1876
46.33	Tower Section 26 - 1	2	5.546	1.1853	0.0042	1974
45.00	(6) andrew LDF7-50A(1-5/8") From 0 to 150 (40ft to50ft)	2	5.221	1.1474	0.0040	1987
41.92	Tower Section 27 - 1	2	4.510	1.0511	0.0036	2056
38.71	Tower Section 28 - 1	2	3.831	0.9707	0.0033	2235
37.29	Tower Section 29 - 1	2	3.548	0.9385	0.0031	2229
35.00	(6) andrew LDF7-50A(1-5/8") From 0 to 150 (30ft to40ft)	2	3.113	0.8764	0.0029	2111
34.67	Tower Section 30 - 1	2	3.052	0.8673	0.0028	2094
30.63	Tower Section 31 - 1	2	2.367	0.7484	0.0024	2053
28.96	Tower Section 32 - 1	2	2.114	0.7022	0.0022	2127
26.33	Tower Section 33 - 1	2	1.745	0.6386	0.0020	2218
25.00	(6) andrew LDF7-50A(1-5/8") From 0 to 150 (20ft to30ft)	2	1.572	0.6048	0.0019	2230
21.92	Tower Section 34 - 1	2	1.209	0.5194	0.0016	2309
18.75	Tower Section 35 - 1	2	0.888	0.4484	0.0013	2499
17.38	Tower Section 36 - 1	2	0.763	0.4203	0.0012	2498
15.00	(6) andrew LDF7-50A(1-5/8") From 0 to 150 (10ft to20ft)	2	0.568	0.3631	0.0011	2381
14.75	Tower Section 37 - 1	2	0.549	0.3570	0.0010	2370
11.42	Tower Section 38 - 1	2	0.330	0.2720	0.0008	2350
10.46	Tower Section 39 - 1	2	0.277	0.2486	0.0007	2383
7.83	Tower Section 40 - 1	2	0.157	0.1889	0.0005	2448
5.00	(6) andrew LDF7-50A(1-5/8") From 0 to 150 (0ft to10ft)	2	0.064	0.1222	0.0003	2403
2.83	Tower Section 41 - 1	2	0.021	0.0700	0.0002	2403
0.17	Tower Section 42 - 1	2	0.000	0.0042	0.0000	2403

Compression Checks

Pole Design Data

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	
L1	150 - 145 (1)	P18x0.375	5.00	0.00	0.0	20.7640	-3.96	784.88	0.005
L2	145 - 140 (2)	P18x0.375	5.00	0.00	0.0	20.7640	-4.46	784.88	0.006
L3	140 - 135 (3)	P18x0.375	5.00	0.00	0.0	20.7640	-4.97	784.88	0.006
L4	135 - 130 (4)	P18x0.375	5.00	0.00	0.0	20.7640	-5.51	784.88	0.007
L5	130 - 125 (5)	P18x0.375	5.00	0.00	0.0	20.7640	-6.06	784.88	0.008
L6	125 - 120 (6)	P18x0.375	5.00	0.00	0.0	20.7640	-6.63	784.88	0.008
L7	120 - 115 (7)	P24x0.375	5.00	0.00	0.0	27.8325	-7.31	1052.07	0.007
L8	115 - 110 (8)	P24x0.375	5.00	0.00	0.0	27.8325	-8.00	1052.07	0.008
L9	110 - 105 (9)	P24x0.375	5.00	0.00	0.0	27.8325	-8.69	1052.07	0.008
L10	105 - 100 (10)	P24x0.375	5.00	0.00	0.0	27.8325	-9.57	1052.07	0.009
L11	100 - 95 (11)	P30x0.375	5.00	0.00	0.0	34.9011	-10.40	1311.06	0.008
L12	95 - 90 (12)	P30x0.375	5.00	0.00	0.0	34.9011	-11.24	1311.06	0.009
L13	90 - 85 (13)	P30x0.375	5.00	0.00	0.0	34.9011	-12.08	1311.06	0.009
L14	85 - 80 (14)	P30x0.375	5.00	0.00	0.0	34.9011	-12.93	1311.06	0.010
L15	80 - 75 (15)	P36x0.375	5.00	0.00	0.0	41.9697	-14.02	1490.10	0.009
L16	75 - 70 (16)	P36x0.375	5.00	0.00	0.0	41.9697	-15.00	1490.10	0.010
L17	70 - 68.25 (17)	P36x0.375	1.75	0.00	0.0	41.9697	-15.35	1490.10	0.010
L18	68.25 - 68 (18)	P36x0.4625	0.25	0.00	0.0	51.6355	-15.41	1951.82	0.008
L19	68 - 63 (19)	P36x0.4625	5.00	0.00	0.0	51.6355	-16.57	1951.82	0.008
L20	63 - 60 (20)	P36x0.4625	3.00	0.00	0.0	51.6355	-17.27	1951.82	0.009
L21	60 - 57.667 (21)	P42x0.45	2.33	0.00	0.0	58.7399	-17.87	2102.80	0.008
L22	57.667 - 57.417 (22)	P42x0.375	0.25	0.00	0.0	49.0383	-17.93	1668.87	0.011
L23	57.417 - 52.417 (23)	P42x0.375	5.00	0.00	0.0	49.0383	-19.05	1668.87	0.011
L24	52.417 - 49.0833 (24)	P42x0.375	3.33	0.00	0.0	49.0383	-19.93	1668.87	0.012
L25	49.0833 - 48.8333 (25)	P42x0.48125	0.25	0.00	0.0	62.7718	-20.00	2293.34	0.009
L26	48.8333 - 43.8333 (26)	P42x0.48125	5.00	0.00	0.0	62.7718	-21.38	2293.34	0.009
L27	43.8333 - 40 (27)	P42x0.48125	3.83	0.00	0.0	62.7718	-22.45	2293.34	0.010
L28	40 - 37.4166 (28)	P48x0.4625	2.58	0.00	0.0	69.0714	-23.23	2398.94	0.010
L29	37.4166 - 37.1666 (29)	P48x0.375	0.25	0.00	0.0	56.1069	-23.30	1847.49	0.013
L30	37.1666 - 32.1666 (30)	P48x0.375	5.00	0.00	0.0	56.1069	-24.58	1847.49	0.013
L31	32.1666 - 29.0833 (31)	P48x0.375	3.08	0.00	0.0	56.1069	-25.37	1847.49	0.014
L32	29.0833 - 28.8333 (32)	P48x0.4625	0.25	0.00	0.0	69.0714	-25.45	2398.94	0.011
L33	28.8333 - 23.8333 (33)	P48x0.4625	5.00	0.00	0.0	69.0714	-26.98	2398.94	0.011
L34	23.8333 - 20 (34)	P48x0.4625	3.83	0.00	0.0	69.0714	-28.16	2398.94	0.012

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L35	20 - 17.5 (35)	P54x0.45625	2.50	0.00	0.0	76.7470	-28.99	2575.46	0.011
L36	17.5 - 17.25 (36)	P54x0.375	0.25	0.00	0.0	63.1755	-29.07	2026.00	0.014
L37	17.25 - 12.25 (37)	P54x0.375	5.00	0.00	0.0	63.1755	-30.49	2026.00	0.015
L38	12.25 - 10.5833 (38)	P54x0.375	1.67	0.00	0.0	63.1755	-30.97	2026.00	0.015
L39	10.5833 - 10.3333 (39)	P54x0.43125	0.25	0.00	0.0	72.5756	-31.05	2402.24	0.013
L40	10.3333 - 5.3333 (40)	P54x0.43125	5.00	0.00	0.0	72.5756	-32.66	2402.24	0.014
L41	5.3333 - 0.3333 (41)	P54x0.43125	5.00	0.00	0.0	72.5756	-34.27	2402.24	0.014
L42	0.3333 - 0 (42)	P54x0.43125	0.33	0.00	0.0	72.5756	-34.38	2402.24	0.014

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)	P18x0.375	41.98	367.00	0.114	0.00	367.00	0.000
L2	145 - 140 (2)	P18x0.375	88.91	367.00	0.242	0.00	367.00	0.000
L3	140 - 135 (3)	P18x0.375	137.42	367.00	0.374	0.00	367.00	0.000
L4	135 - 130 (4)	P18x0.375	187.43	367.00	0.511	0.00	367.00	0.000
L5	130 - 125 (5)	P18x0.375	238.87	367.00	0.651	0.00	367.00	0.000
L6	125 - 120 (6)	P18x0.375	291.65	367.00	0.795	0.00	367.00	0.000
L7	120 - 115 (7)	P24x0.375	346.02	623.72	0.555	0.00	623.72	0.000
L8	115 - 110 (8)	P24x0.375	402.23	623.72	0.645	0.00	623.72	0.000
L9	110 - 105 (9)	P24x0.375	460.20	623.72	0.738	0.00	623.72	0.000
L10	105 - 100 (10)	P24x0.375	520.57	623.72	0.835	0.00	623.72	0.000
L11	100 - 95 (11)	P30x0.375	584.27	947.86	0.616	0.00	947.86	0.000
L12	95 - 90 (12)	P30x0.375	650.12	947.86	0.686	0.00	947.86	0.000
L13	90 - 85 (13)	P30x0.375	718.01	947.86	0.758	0.00	947.86	0.000
L14	85 - 80 (14)	P30x0.375	787.88	947.86	0.831	0.00	947.86	0.000
L15	80 - 75 (15)	P36x0.375	862.69	1338.81	0.644	0.00	1338.81	0.000
L16	75 - 70 (16)	P36x0.375	938.87	1338.81	0.701	0.00	1338.81	0.000
L17	70 - 68.25 (17)	P36x0.375	966.07	1338.81	0.722	0.00	1338.81	0.000
L18	68.25 - 68 (18)	P36x0.4625	969.98	1688.72	0.574	0.00	1688.72	0.000
L19	68 - 63 (19)	P36x0.4625	1049.37	1688.72	0.621	0.00	1688.72	0.000
L20	63 - 60 (20)	P36x0.4625	1098.08	1688.72	0.650	0.00	1688.72	0.000
L21	60 - 57.667 (21)	P42x0.45	1137.08	2192.85	0.519	0.00	2192.85	0.000
L22	57.667 - 57.417 (22)	P42x0.375	1141.32	1796.56	0.635	0.00	1796.56	0.000
L23	57.417 - 52.417 (23)	P42x0.375	1227.22	1796.56	0.683	0.00	1796.56	0.000
L24	52.417 - 49.0833 (24)	P42x0.375	1288.34	1796.56	0.717	0.00	1796.56	0.000
L25	49.0833 - 48.8333 (25)	P42x0.48125	1292.87	2361.47	0.547	0.00	2361.47	0.000
L26	48.8333 - 43.8333 (26)	P42x0.48125	1384.63	2361.47	0.586	0.00	2361.47	0.000
L27	43.8333 - 40 (27)	P42x0.48125	1456.60	2361.47	0.617	0.00	2361.47	0.000
L28	40 - 37.4166 (28)	P48x0.4625	1505.93	2913.78	0.517	0.00	2913.78	0.000
L29	37.4166 - 37.1666 (29)	P48x0.375	1510.74	2321.11	0.651	0.00	2321.11	0.000
L30	37.1666 - 32.1666 (30)	P48x0.375	1608.33	2321.11	0.693	0.00	2321.11	0.000
L31	32.1666 -	P48x0.375	1669.76	2321.11	0.719	0.00	2321.11	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	29.0833 (31)							
L32	29.0833 - 28.8333 (32)	P48x0.4625	1674.78	2913.78	0.575	0.00	2913.78	0.000
L33	28.8333 - 23.8333 (33)	P48x0.4625	1776.45	2913.78	0.610	0.00	2913.78	0.000
L34	23.8333 - 20 (34)	P48x0.4625	1855.97	2913.78	0.637	0.00	2913.78	0.000
L35	20 - 17.5 (35)	P54x0.45625	1908.58	3596.51	0.531	0.00	3596.51	0.000
L36	17.5 - 17.25 (36)	P54x0.375	1913.88	2912.46	0.657	0.00	2912.46	0.000
L37	17.25 - 12.25 (37)	P54x0.375	2021.01	2912.46	0.694	0.00	2912.46	0.000
L38	12.25 - 10.5833 (38)	P54x0.375	2057.23	2912.46	0.706	0.00	2912.46	0.000
L39	10.5833 - 10.3333 (39)	P54x0.43125	2062.69	3384.07	0.610	0.00	3384.07	0.000
L40	10.3333 - 5.3333 (40)	P54x0.43125	2173.01	3384.07	0.642	0.00	3384.07	0.000
L41	5.3333 - 0.3333 (41)	P54x0.43125	2285.59	3384.07	0.675	0.00	3384.07	0.000
L42	0.3333 - 0 (42)	P54x0.43125	2293.18	3384.07	0.678	0.00	3384.07	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)	P18x0.375	9.23	235.46	0.039	0.98	364.87	0.003
L2	145 - 140 (2)	P18x0.375	9.55	235.46	0.041	0.98	364.87	0.003
L3	140 - 135 (3)	P18x0.375	9.86	235.46	0.042	0.98	364.87	0.003
L4	135 - 130 (4)	P18x0.375	10.15	235.46	0.043	0.98	364.87	0.003
L5	130 - 125 (5)	P18x0.375	10.43	235.46	0.044	0.98	364.87	0.003
L6	125 - 120 (6)	P18x0.375	10.69	235.46	0.045	0.98	364.87	0.003
L7	120 - 115 (7)	P24x0.375	11.06	315.62	0.035	0.98	655.57	0.001
L8	115 - 110 (8)	P24x0.375	11.42	315.62	0.036	0.98	655.57	0.001
L9	110 - 105 (9)	P24x0.375	11.77	315.62	0.037	0.97	655.57	0.001
L10	105 - 100 (10)	P24x0.375	12.53	315.62	0.040	2.28	655.57	0.003
L11	100 - 95 (11)	P30x0.375	12.96	395.78	0.033	2.28	994.73	0.002
L12	95 - 90 (12)	P30x0.375	13.38	395.78	0.034	2.28	994.73	0.002
L13	90 - 85 (13)	P30x0.375	13.79	395.78	0.035	2.27	994.73	0.002
L14	85 - 80 (14)	P30x0.375	14.17	395.78	0.036	2.27	994.73	0.002
L15	80 - 75 (15)	P36x0.375	15.01	454.19	0.033	3.53	1094.28	0.003
L16	75 - 70 (16)	P36x0.375	15.47	454.19	0.034	3.53	1094.28	0.003
L17	70 - 68.25 (17)	P36x0.375	15.64	454.19	0.034	3.52	1094.28	0.003
L18	68.25 - 68 (18)	P36x0.4625	15.65	585.55	0.027	3.52	1829.48	0.002
L19	68 - 63 (19)	P36x0.4625	16.11	585.55	0.028	3.52	1829.48	0.002
L20	63 - 60 (20)	P36x0.4625	16.38	585.55	0.028	3.52	1829.48	0.002
L21	60 - 57.667 (21)	P42x0.45	16.91	663.11	0.025	3.53	1863.33	0.002
L22	57.667 - 57.417 (22)	P42x0.375	16.93	429.27	0.039	3.53	1207.68	0.003
L23	57.417 - 52.417 (23)	P42x0.375	17.44	429.27	0.041	3.53	1207.68	0.003
L24	52.417 - 49.0833 (24)	P42x0.375	18.09	429.27	0.042	4.75	1207.68	0.004
L25	49.0833 - 48.8333 (25)	P42x0.48125	18.11	711.83	0.025	4.75	2200.56	0.002
L26	48.8333 - 43.8333 (26)	P42x0.48125	18.60	711.83	0.026	4.75	2200.56	0.002
L27	43.8333 - 40 (27)	P42x0.48125	18.96	711.83	0.027	4.75	2200.56	0.002
L28	40 - 37.4166	P48x0.4625	19.24	710.97	0.027	4.75	2284.29	0.002

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 $\frac{T_u}{\phi T_n}$
	(28)							
L29	37.4166 - 37.1666 (29)	P48x0.375	19.26	444.34	0.043	4.75	1430.28	0.003
L30	37.1666 - 32.1666 (30)	P48x0.375	19.78	444.34	0.045	4.75	1430.28	0.003
L31	32.1666 - 29.0833 (31)	P48x0.375	20.08	444.34	0.045	4.75	1430.28	0.003
L32	29.0833 - 28.8333 (32)	P48x0.4625	20.10	710.97	0.028	4.75	2284.29	0.002
L33	28.8333 - 23.8333 (33)	P48x0.4625	20.58	710.97	0.029	4.75	2284.29	0.002
L34	23.8333 - 20 (34)	P48x0.4625	20.92	710.97	0.029	4.75	2284.29	0.002
L35	20 - 17.5 (35)	P54x0.45625	21.18	710.99	0.030	4.75	2572.98	0.002
L36	17.5 - 17.25 (36)	P54x0.375	21.19	458.02	0.046	4.75	1660.04	0.003
L37	17.25 - 12.25 (37)	P54x0.375	21.66	458.02	0.047	4.75	1660.04	0.003
L38	12.25 - 10.5833 (38)	P54x0.375	21.82	458.02	0.048	4.75	1660.04	0.003
L39	10.5833 - 10.3333 (39)	P54x0.43125	21.83	626.62	0.035	4.75	2268.70	0.002
L40	10.3333 - 5.3333 (40)	P54x0.43125	22.30	626.62	0.036	4.75	2268.70	0.002
L41	5.3333 - 0.3333 (41)	P54x0.43125	22.75	626.62	0.036	4.75	2268.70	0.002
L42	0.3333 - 0 (42)	P54x0.43125	22.77	626.62	0.036	4.75	2268.70	0.002

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)	0.005	0.114	0.000	0.039	0.003	0.121	1.000	4.8.2
L2	145 - 140 (2)	0.006	0.242	0.000	0.041	0.003	0.250	1.000	4.8.2
L3	140 - 135 (3)	0.006	0.374	0.000	0.042	0.003	0.383	1.000	4.8.2
L4	135 - 130 (4)	0.007	0.511	0.000	0.043	0.003	0.520	1.000	4.8.2
L5	130 - 125 (5)	0.008	0.651	0.000	0.044	0.003	0.661	1.000	4.8.2
L6	125 - 120 (6)	0.008	0.795	0.000	0.045	0.003	0.805	1.000	4.8.2
L7	120 - 115 (7)	0.007	0.555	0.000	0.035	0.001	0.563	1.000	4.8.2
L8	115 - 110 (8)	0.008	0.645	0.000	0.036	0.001	0.654	1.000	4.8.2
L9	110 - 105 (9)	0.008	0.738	0.000	0.037	0.001	0.748	1.000	4.8.2
L10	105 - 100 (10)	0.009	0.835	0.000	0.040	0.003	0.846	1.000	4.8.2
L11	100 - 95 (11)	0.008	0.616	0.000	0.033	0.002	0.626	1.000	4.8.2
L12	95 - 90 (12)	0.009	0.686	0.000	0.034	0.002	0.696	1.000	4.8.2
L13	90 - 85 (13)	0.009	0.758	0.000	0.035	0.002	0.768	1.000	4.8.2
L14	85 - 80 (14)	0.010	0.831	0.000	0.036	0.002	0.843	1.000	4.8.2
L15	80 - 75 (15)	0.009	0.644	0.000	0.033	0.003	0.655	1.000	4.8.2
L16	75 - 70 (16)	0.010	0.701	0.000	0.034	0.003	0.713	1.000	4.8.2
L17	70 - 68.25 (17)	0.010	0.722	0.000	0.034	0.003	0.733	1.000	4.8.2
L18	68.25 - 68 (18)	0.008	0.574	0.000	0.027	0.002	0.583	1.000	4.8.2
L19	68 - 63 (19)	0.008	0.621	0.000	0.028	0.002	0.631	1.000	4.8.2
L20	63 - 60 (20)	0.009	0.650	0.000	0.028	0.002	0.660	1.000	4.8.2
L21	60 - 57.667 (21)	0.008	0.519	0.000	0.025	0.002	0.528	1.000	4.8.2
L22	57.667 - 57.417 (22)	0.011	0.635	0.000	0.039	0.003	0.648	1.000	4.8.2
L23	57.417 - 52.417 (23)	0.011	0.683	0.000	0.041	0.003	0.696	1.000	4.8.2
L24	52.417 -	0.012	0.717	0.000	0.042	0.004	0.731	1.000	4.8.2

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
	49.0833 (24)								
L25	49.0833 - 48.8333 (25)	0.009	0.547	0.000	0.025	0.002	0.557	1.000	4.8.2
L26	48.8333 - 43.8333 (26)	0.009	0.586	0.000	0.026	0.002	0.596	1.000	4.8.2
L27	43.8333 - 40 (27)	0.010	0.617	0.000	0.027	0.002	0.627	1.000	4.8.2
L28	40 - 37.4166 (28)	0.010	0.517	0.000	0.027	0.002	0.527	1.000	4.8.2
L29	37.4166 - 37.1666 (29)	0.013	0.651	0.000	0.043	0.003	0.666	1.000	4.8.2
L30	37.1666 - 32.1666 (30)	0.013	0.693	0.000	0.045	0.003	0.709	1.000	4.8.2
L31	32.1666 - 29.0833 (31)	0.014	0.719	0.000	0.045	0.003	0.735	1.000	4.8.2
L32	29.0833 - 28.8333 (32)	0.011	0.575	0.000	0.028	0.002	0.586	1.000	4.8.2
L33	28.8333 - 23.8333 (33)	0.011	0.610	0.000	0.029	0.002	0.622	1.000	4.8.2
L34	23.8333 - 20 (34)	0.012	0.637	0.000	0.029	0.002	0.650	1.000	4.8.2
L35	20 - 17.5 (35)	0.011	0.531	0.000	0.030	0.002	0.543	1.000	4.8.2
L36	17.5 - 17.25 (36)	0.014	0.657	0.000	0.046	0.003	0.674	1.000	4.8.2
L37	17.25 - 12.25 (37)	0.015	0.694	0.000	0.047	0.003	0.711	1.000	4.8.2
L38	12.25 - 10.5833 (38)	0.015	0.706	0.000	0.048	0.003	0.724	1.000	4.8.2
L39	10.5833 - 10.3333 (39)	0.013	0.610	0.000	0.035	0.002	0.624	1.000	4.8.2
L40	10.3333 - 5.3333 (40)	0.014	0.642	0.000	0.036	0.002	0.657	1.000	4.8.2
L41	5.3333 - 0.3333 (41)	0.014	0.675	0.000	0.036	0.002	0.691	1.000	4.8.2
L42	0.3333 - 0 (42)	0.014	0.678	0.000	0.036	0.002	0.693	1.000	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	P18x0.375	1	-3.96	784.88	12.1	Pass
L2	145 - 140	Pole	P18x0.375	2	-4.46	784.88	25.0	Pass
L3	140 - 135	Pole	P18x0.375	3	-4.97	784.88	38.3	Pass
L4	135 - 130	Pole	P18x0.375	4	-5.51	784.88	52.0	Pass
L5	130 - 125	Pole	P18x0.375	5	-6.06	784.88	66.1	Pass
L6	125 - 120	Pole	P18x0.375	6	-6.63	784.88	80.5	Pass
L7	120 - 115	Pole	P24x0.375	7	-7.31	1052.07	56.3	Pass
L8	115 - 110	Pole	P24x0.375	8	-8.00	1052.07	65.4	Pass
L9	110 - 105	Pole	P24x0.375	9	-8.69	1052.07	74.8	Pass
L10	105 - 100	Pole	P24x0.375	10	-9.57	1052.07	84.6	Pass
L11	100 - 95	Pole	P30x0.375	11	-10.40	1311.06	62.6	Pass
L12	95 - 90	Pole	P30x0.375	12	-11.24	1311.06	69.6	Pass
L13	90 - 85	Pole	P30x0.375	13	-12.08	1311.06	76.8	Pass
L14	85 - 80	Pole	P30x0.375	14	-12.93	1311.06	84.3	Pass
L15	80 - 75	Pole	P36x0.375	15	-14.02	1490.10	65.5	Pass
L16	75 - 70	Pole	P36x0.375	16	-15.00	1490.10	71.3	Pass
L17	70 - 68.25	Pole	P36x0.375	17	-15.35	1490.10	73.3	Pass
L18	68.25 - 68	Pole	P36x0.4625	18	-15.41	1951.82	58.3	Pass
L19	68 - 63	Pole	P36x0.4625	19	-16.57	1951.82	63.1	Pass
L20	63 - 60	Pole	P36x0.4625	20	-17.27	1951.82	66.0	Pass
L21	60 - 57.667	Pole	P42x0.45	21	-17.87	2102.80	52.8	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L22	57.667 - 57.417	Pole	P42x0.375	22	-17.93	1668.87	64.8	Pass
L23	57.417 - 52.417	Pole	P42x0.375	23	-19.05	1668.87	69.6	Pass
L24	52.417 - 49.0833	Pole	P42x0.375	24	-19.93	1668.87	73.1	Pass
L25	49.0833 - 48.8333	Pole	P42x0.48125	25	-20.00	2293.34	55.7	Pass
L26	48.8333 - 43.8333	Pole	P42x0.48125	26	-21.38	2293.34	59.6	Pass
L27	43.8333 - 40	Pole	P42x0.48125	27	-22.45	2293.34	62.7	Pass
L28	40 - 37.4166	Pole	P48x0.4625	28	-23.23	2398.94	52.7	Pass
L29	37.4166 - 37.1666	Pole	P48x0.375	29	-23.30	1847.49	66.6	Pass
L30	37.1666 - 32.1666	Pole	P48x0.375	30	-24.58	1847.49	70.9	Pass
L31	32.1666 - 29.0833	Pole	P48x0.375	31	-25.37	1847.49	73.5	Pass
L32	29.0833 - 28.8333	Pole	P48x0.4625	32	-25.45	2398.94	58.6	Pass
L33	28.8333 - 23.8333	Pole	P48x0.4625	33	-26.98	2398.94	62.2	Pass
L34	23.8333 - 20	Pole	P48x0.4625	34	-28.16	2398.94	65.0	Pass
L35	20 - 17.5	Pole	P54x0.45625	35	-28.99	2575.46	54.3	Pass
L36	17.5 - 17.25	Pole	P54x0.375	36	-29.07	2026.00	67.4	Pass
L37	17.25 - 12.25	Pole	P54x0.375	37	-30.49	2026.00	71.1	Pass
L38	12.25 - 10.5833	Pole	P54x0.375	38	-30.97	2026.00	72.4	Pass
L39	10.5833 - 10.3333	Pole	P54x0.43125	39	-31.05	2402.24	62.4	Pass
L40	10.3333 - 5.3333	Pole	P54x0.43125	40	-32.66	2402.24	65.7	Pass
L41	5.3333 - 0.3333	Pole	P54x0.43125	41	-34.27	2402.24	69.1	Pass
L42	0.3333 - 0	Pole	P54x0.43125	42	-34.38	2402.24	69.3	Pass
							Summary	
						Pole (L10)	84.6	Pass
						RATING =	**84.6**	**Pass**

APPENDIX B

ADDITIONAL CALCULATIONS

Existing Modifications

per TIA-222- H

Site Name: Old Saybrook/I-95/Amtr

Work Order: 10481.CT11327A

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	18	18	0.375		A53-B-42
2	120	20		0	24.00	24	0.375		A53-B-42
3	100	20		0	30.00	30	0.375		A53-B-42
4	80	20		0	36.00	36	0.375		A53-B-42
5	60	20		0	42.00	42	0.375		A53-B-42
6	40	20		0	48.00	48	0.375		A53-B-42
7	20	20		0	54.00	54	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	0	10.5833	channel	MP3-03 (1.1875in)	3	0						120						240					
2	17.5	29.0833	channel	MP3-04 (1.1875in)	3	0						120						240					
3	37.4166	49.0833	channel	MP3-04 (1.1875in)	3	0						120						240					
4	57.667	68.25	channel	MP3-03 (1.1875in)	3	0						120						240					
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	2.545	1.1875	A572-65
2	4.78	1.61	4.13	0.61	PC 8.8 - M20 (100)	17	PC 8.8 - M20 (100)	17.000	18.000	3.593	1.1875	A572-65
3	4.78	1.61	4.13	0.61	PC 8.8 - M20 (100)	17	PC 8.8 - M20 (100)	17.000	18.000	3.593	1.1875	A572-65
4	4.06	1.57	2.92	0.59	PC 8.8 - M20 (100)	14	PC 8.8 - M20 (100)	14.000	18.000	2.545	1.1875	A572-65

Analysis Date: 5/22/2023

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	18.000	18.000	0.375	A53-B-42	1.000
2	145 - 140	5		0	18.000	18.000	0.375	A53-B-42	1.000
3	140 - 135	5		0	18.000	18.000	0.375	A53-B-42	1.000
4	135 - 130	5		0	18.000	18.000	0.375	A53-B-42	1.000
5	130 - 125	5		0	18.000	18.000	0.375	A53-B-42	1.000
6	125 - 120	5	0	0	18.000	18.000	0.375	A53-B-42	1.000
7	120 - 115	5		0	24.000	24.000	0.375	A53-B-42	1.000
8	115 - 110	5		0	24.000	24.000	0.375	A53-B-42	1.000
9	110 - 105	5		0	24.000	24.000	0.375	A53-B-42	1.000
10	105 - 100	5	0	0	24.000	24.000	0.375	A53-B-42	1.000
11	100 - 95	5		0	30.000	30.000	0.375	A53-B-42	1.000
12	95 - 90	5		0	30.000	30.000	0.375	A53-B-42	1.000
13	90 - 85	5		0	30.000	30.000	0.375	A53-B-42	1.000
14	85 - 80	5	0	0	30.000	30.000	0.375	A53-B-42	1.000
15	80 - 75	5		0	36.000	36.000	0.375	A53-B-42	1.000
16	75 - 70	5		0	36.000	36.000	0.375	A53-B-42	1.000
17	70 - 68.25	1.75		0	36.000	36.000	0.375	A53-B-42	1.000
18	68.25 - 68	0.25		0	36.000	36.000	0.4625	A53-B-42	0.982
19	68 - 63	5		0	36.000	36.000	0.4625	A53-B-42	0.982
20	63 - 60	3	0	0	36.000	36.000	0.4625	A53-B-42	0.982
21	60 - 57.667	2.333		0	42.000	42.000	0.45	A53-B-42	0.984
22	57.667 - 57.417	0.25		0	42.000	42.000	0.375	A53-B-42	1.000
23	57.417 - 52.417	5		0	42.000	42.000	0.375	A53-B-42	1.000
24	52.417 - 49.0833	3.3337		0	42.000	42.000	0.375	A53-B-42	1.000
25	49.0833 - 48.8333	0.25		0	42.000	42.000	0.48125	A53-B-42	0.979
26	48.8333 - 43.8333	5		0	42.000	42.000	0.48125	A53-B-42	0.979
27	43.8333 - 40	3.8333	0	0	42.000	42.000	0.48125	A53-B-42	0.979
28	40 - 37.4166	2.5834		0	48.000	48.000	0.4625	A53-B-42	0.992
29	37.4166 - 37.1666	0.25		0	48.000	48.000	0.375	A53-B-42	1.000
30	37.1666 - 32.1666	5		0	48.000	48.000	0.375	A53-B-42	1.000
31	32.1666 - 29.0833	3.0833		0	48.000	48.000	0.375	A53-B-42	1.000
32	29.0833 - 28.8333	0.25		0	48.000	48.000	0.4625	A53-B-42	0.992
33	28.8333 - 23.8333	5		0	48.000	48.000	0.4625	A53-B-42	0.992
34	23.8333 - 20	3.8333	0	0	48.000	48.000	0.4625	A53-B-42	0.992
35	20 - 17.5	2.5		0	54.000	54.000	0.45625	A53-B-42	0.985
36	17.5 - 17.25	0.25		0	54.000	54.000	0.375	A53-B-42	1.000
37	17.25 - 12.25	5		0	54.000	54.000	0.375	A53-B-42	1.000
38	12.25 - 10.5833	1.6667		0	54.000	54.000	0.375	A53-B-42	1.000
39	10.5833 - 10.3333	0.25		0	54.000	54.000	0.43125	A53-B-42	0.991
40	10.3333 - 5.3333	5		0	54.000	54.000	0.43125	A53-B-42	0.991
41	5.3333 - 0.3333	5		0	54.000	54.000	0.43125	A53-B-42	0.991
42	0.3333 - 0	0.3333		0	54.000	54.000	0.43125	A53-B-42	0.991

TNX Section Forces

Increment (ft):	5	TNX Output		
	Section Height (ft)	P_u (K)	M_{ux} (kip-ft)	V_u (K)
1	150 - 145	3.96	41.98	9.23
2	145 - 140	4.46	88.91	9.55
3	140 - 135	4.97	137.42	9.86
4	135 - 130	5.51	187.43	10.15
5	130 - 125	6.06	238.87	10.43
6	125 - 120	6.63	291.65	10.69
7	120 - 115	7.31	346.02	11.06
8	115 - 110	8.00	402.23	11.42
9	110 - 105	8.69	460.20	11.77
10	105 - 100	9.57	520.57	12.53
11	100 - 95	10.40	584.27	12.96
12	95 - 90	11.24	650.12	13.38
13	90 - 85	12.08	718.01	13.79
14	85 - 80	12.93	787.88	14.17
15	80 - 75	14.02	862.69	15.01
16	75 - 70	15.00	938.86	15.47
17	70 - 68.25	15.35	966.07	15.64
18	68.25 - 68	15.41	969.98	15.65
19	68 - 63	16.57	1049.36	16.11
20	63 - 60	17.27	1098.08	16.38
21	60 - 57.667	17.87	1137.08	16.91
22	57.667 - 57.417	17.93	1141.31	16.93
23	57.417 - 52.417	19.05	1227.22	17.44
24	52.417 - 49.0833	19.93	1288.34	18.09
25	49.0833 - 48.8333	20.00	1292.87	18.11
26	48.8333 - 43.8333	21.38	1384.63	18.60
27	43.8333 - 40	22.45	1456.60	18.96
28	40 - 37.4166	23.23	1505.93	19.24
29	37.4166 - 37.1666	23.30	1510.75	19.26
30	37.1666 - 32.1666	24.58	1608.33	19.78
31	32.1666 - 29.0833	25.37	1669.75	20.08
32	29.0833 - 28.8333	25.45	1674.78	20.10
33	28.8333 - 23.8333	26.98	1776.45	20.58
34	23.8333 - 20	28.16	1855.97	20.92
35	20 - 17.5	28.99	1908.58	21.18
36	17.5 - 17.25	29.07	1913.88	21.19
37	17.25 - 12.25	30.49	2021.01	21.66
38	12.25 - 10.5833	30.97	2057.24	21.82
39	10.5833 - 10.3333	31.05	2062.69	21.83
40	10.3333 - 5.3333	32.66	2173.01	22.30
41	5.3333 - 0.3333	34.27	2285.59	22.75
42	0.3333 - 0	34.38	2293.18	22.77

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
150 - 145	Pole	TP18x18x0.375	Pole	12.0%	Pass
145 - 140	Pole	TP18x18x0.375	Pole	24.9%	Pass
140 - 135	Pole	TP18x18x0.375	Pole	38.1%	Pass
135 - 130	Pole	TP18x18x0.375	Pole	51.8%	Pass
130 - 125	Pole	TP18x18x0.375	Pole	65.9%	Pass
125 - 120	Pole	TP18x18x0.375	Pole	80.4%	Pass
120 - 115	Pole	TP24x24x0.375	Pole	56.2%	Pass
115 - 110	Pole	TP24x24x0.375	Pole	65.3%	Pass
110 - 105	Pole	TP24x24x0.375	Pole	74.7%	Pass
105 - 100	Pole	TP24x24x0.375	Pole	84.4%	Pass
100 - 95	Pole	TP30x30x0.375	Pole	62.5%	Pass
95 - 90	Pole	TP30x30x0.375	Pole	69.5%	Pass
90 - 85	Pole	TP30x30x0.375	Pole	76.7%	Pass
85 - 80	Pole	TP30x30x0.375	Pole	84.2%	Pass
80 - 75	Pole	TP36x36x0.375	Pole	65.4%	Pass
75 - 70	Pole	TP36x36x0.375	Pole	71.2%	Pass
70 - 68.25	Pole	TP36x36x0.375	Pole	73.2%	Pass
68.25 - 68	Pole + Reinf.	TP36x36x0.4625	Pole	59.8%	Pass
68 - 63	Pole + Reinf.	TP36x36x0.4625	Pole	64.7%	Pass
63 - 60	Pole + Reinf.	TP36x36x0.4625	Pole	67.7%	Pass
60 - 57.67	Pole + Reinf.	TP42x42x0.45	Pole	53.9%	Pass
57.67 - 57.42	Pole	TP42x42x0.375	Pole	64.6%	Pass
57.42 - 52.42	Pole	TP42x42x0.375	Pole	69.5%	Pass
52.42 - 49.08	Pole	TP42x42x0.375	Pole	73.0%	Pass
49.08 - 48.83	Pole + Reinf.	TP42x42x0.4813	Pole	57.4%	Pass
48.83 - 43.83	Pole + Reinf.	TP42x42x0.4813	Pole	61.5%	Pass
43.83 - 40	Pole + Reinf.	TP42x42x0.4813	Pole	64.7%	Pass
40 - 37.42	Pole + Reinf.	TP48x48x0.4625	Pole	53.4%	Pass
37.42 - 37.17	Pole	TP48x48x0.375	Pole	66.4%	Pass
37.17 - 32.17	Pole	TP48x48x0.375	Pole	70.7%	Pass
32.17 - 29.08	Pole	TP48x48x0.375	Pole	73.4%	Pass
29.08 - 28.83	Pole + Reinf.	TP48x48x0.4625	Pole	59.4%	Pass
28.83 - 23.83	Pole + Reinf.	TP48x48x0.4625	Pole	63.0%	Pass
23.83 - 20	Pole + Reinf.	TP48x48x0.4625	Pole	65.8%	Pass
20 - 17.5	Pole + Reinf.	TP54x54x0.4563	Pole	55.3%	Pass
17.5 - 17.25	Pole	TP54x54x0.375	Pole	67.2%	Pass
17.25 - 12.25	Pole	TP54x54x0.375	Pole	70.9%	Pass
12.25 - 10.58	Pole	TP54x54x0.375	Pole	72.2%	Pass
10.58 - 10.33	Pole + Reinf.	TP54x54x0.4313	Pole	63.0%	Pass
10.33 - 5.33	Pole + Reinf.	TP54x54x0.4313	Pole	66.4%	Pass
5.33 - 0.33	Pole + Reinf.	TP54x54x0.4313	Pole	69.8%	Pass
0.33 - 0	Pole + Reinf.	TP54x54x0.4313	Pole	70.1%	Pass
				Summary	
			Pole	84.4%	Pass
			Reinforcement	61.2%	Pass
			Overall	84.4%	Pass

Analysis Date: 5/22/2023

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in^4)			Area (in^2)			% Capacity				
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3	R4
150 - 145	807	n/a	807	20.76	n/a	20.76	12.0%				
145 - 140	807	n/a	807	20.76	n/a	20.76	24.9%				
140 - 135	807	n/a	807	20.76	n/a	20.76	38.1%				
135 - 130	807	n/a	807	20.76	n/a	20.76	51.8%				
130 - 125	807	n/a	807	20.76	n/a	20.76	65.9%				
125 - 120	807	n/a	807	20.76	n/a	20.76	80.4%				
120 - 115	1942	n/a	1942	27.83	n/a	27.83	56.2%				
115 - 110	1942	n/a	1942	27.83	n/a	27.83	65.3%				
110 - 105	1942	n/a	1942	27.83	n/a	27.83	74.7%				
105 - 100	1942	n/a	1942	27.83	n/a	27.83	84.4%				
100 - 95	3829	n/a	3829	34.90	n/a	34.90	62.5%				
95 - 90	3829	n/a	3829	34.90	n/a	34.90	69.5%				
90 - 85	3829	n/a	3829	34.90	n/a	34.90	76.7%				
85 - 80	3829	n/a	3829	34.90	n/a	34.90	84.2%				
80 - 75	6659	n/a	6659	41.97	n/a	41.97	65.4%				
75 - 70	6659	n/a	6659	41.97	n/a	41.97	71.2%				
70 - 68.25	6659	n/a	6659	41.97	n/a	41.97	73.2%				
68.25 - 68	6659	1516	8175	41.97	8.76	50.73	59.8%				54.1%
68 - 63	6659	1516	8175	41.97	8.76	50.73	64.7%				58.5%
63 - 60	6659	1516	8175	41.97	8.76	50.73	67.7%				61.2%
60 - 57.67	10622	2044	12666	49.04	8.76	57.80	53.9%				47.6%
57.67 - 57.42	10622	n/a	10622	49.04	n/a	49.04	64.6%				
57.42 - 52.42	10622	n/a	10622	49.04	n/a	49.04	69.5%				
52.42 - 49.08	10622	n/a	10622	49.04	n/a	49.04	73.0%				
49.08 - 48.83	10622	2900	13521	49.04	12.39	61.43	57.4%			50.4%	
48.83 - 43.83	10622	2900	13521	49.04	12.39	61.43	61.5%			54.0%	
43.83 - 40	10622	2900	13521	49.04	12.39	61.43	64.7%			56.8%	
40 - 37.42	15908	3759	19667	56.11	12.39	68.50	53.4%			46.1%	
37.42 - 37.17	15908	n/a	15908	56.11	n/a	56.11	66.4%				
37.17 - 32.17	15908	n/a	15908	56.11	n/a	56.11	70.7%				
32.17 - 29.08	15908	n/a	15908	56.11	n/a	56.11	73.4%				
29.08 - 28.83	15908	3759	19667	56.11	12.39	68.50	59.4%		51.3%		
28.83 - 23.83	15908	3759	19667	56.11	12.39	68.50	63.0%		54.4%		
23.83 - 20	15908	3759	19667	56.11	12.39	68.50	65.8%		56.8%		
20 - 17.5	22710	4729	27439	63.18	12.39	75.57	55.3%		47.1%		
17.5 - 17.25	22710	n/a	22710	63.18	n/a	63.18	67.2%				
17.25 - 12.25	22710	n/a	22710	63.18	n/a	63.18	70.9%				
12.25 - 10.58	22710	n/a	22710	63.18	n/a	63.18	72.2%				
10.58 - 10.33	22710	3337	26047	63.18	8.76	71.94	63.0%	54.0%			
10.33 - 5.33	22710	3337	26047	63.18	8.76	71.94	66.4%	56.9%			
5.33 - 0.33	22710	3337	26047	63.18	8.76	71.94	69.8%	59.9%			
0.33 - 0	22710	3337	26047	63.18	8.76	71.94	70.1%	60.1%			

Note: Section capacity checked using 5 degree increments.

Monopole Flange Plate Connection

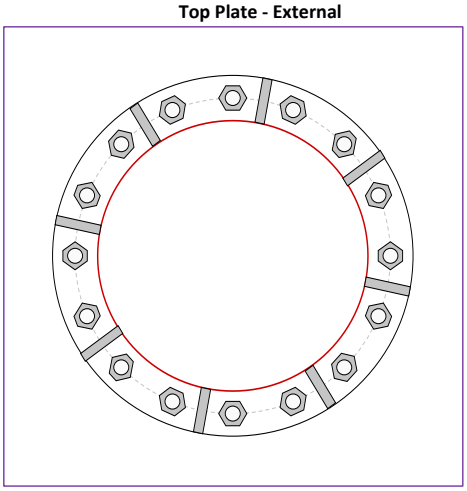
Elevation = 120 ft.

W.O.:	10481.CT11327A
Site Name	d Saybrook/I-95/Amtrk

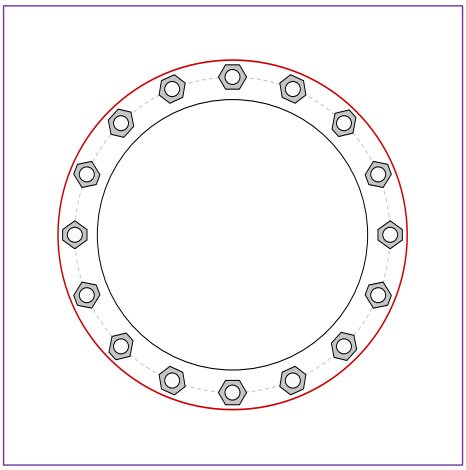
TIA-222 Revision	H

Applied Loads	
Moment (kip-ft)	291.65
Axial Force (kips)	6.63
Shear Force (kips)	10.69

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

(8) 5"H x 3"W x 0.625"T, Notch: 0.375"
plate: Fy= 36 ksi ; weld: Fy= 70 ksi
horiz. weld: 0.25" fillet
vert. weld: 0.25" fillet

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)	41.21	
Allowable (kips)	54.53	
Stress Rating:	**75.6%**	**Pass**

Analysis Date: 5/22/2023

Monopole Flange Plate Connection

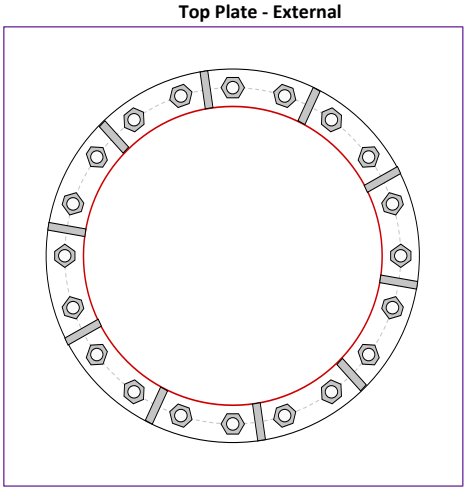
Elevation = 100 ft.

W.O.:	10481.CT11327A
Site Name	d Saybrook/I-95/Amtrk

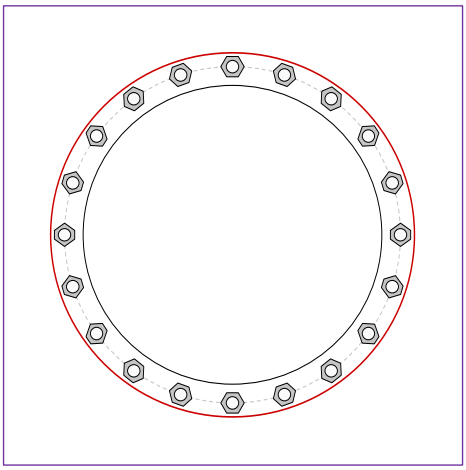
TIA-222 Revision	H

Applied Loads	
Moment (kip-ft)	520.57
Axial Force (kips)	9.57
Shear Force (kips)	12.53

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)

Bottom Plate Data

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

Top Stiffener Data

(10) 5"H x 3"W x 0.625"T, Notch: 0.375"
plate: Fy= 36 ksi ; weld: Fy= 70 ksi
horiz. weld: 0.25" fillet
vert. weld: 0.25" fillet

Bottom Stiffener Data

N/A

Top Pole Data

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

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)	45.77	
Allowable (kips)	54.53	
Stress Rating:	**83.9%**	**Pass**

Analysis Date: 5/22/2023

Monopole Flange Plate Connection

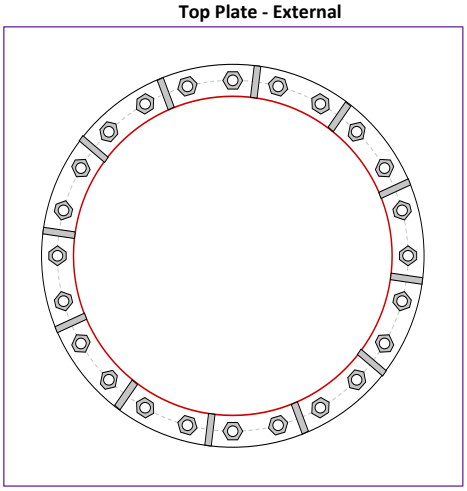
Elevation = 80 ft.

W.O.:	10481.CT11327A
Site Name	d Saybrook/I-95/Amtrk

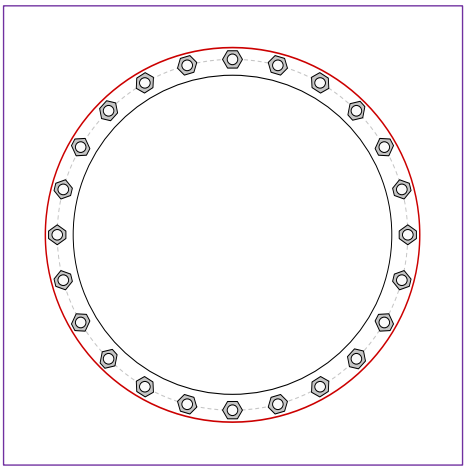
TIA-222 Revision	H

Applied Loads	
Moment (kip-ft)	787.88
Axial Force (kips)	12.93
Shear Force (kips)	14.17

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

(12) 5"H x 3"W x 0.625"T, Notch: 0.375"
plate: Fy= 36 ksi ; weld: Fy= 70 ksi
horiz. weld: 0.25" fillet
vert. weld: 0.25" fillet

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)	47.19	
Allowable (kips)	54.53	
Stress Rating:	**86.5%**	**Pass**

Analysis Date: 5/22/2023

Monopole Flange Plate Connection

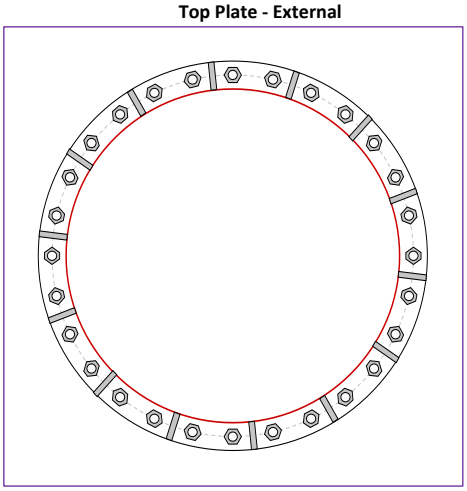
Elevation = 60 ft.

W.O.:	10481.CT11327A
Site Name	d Saybrook/I-95/Amtrk

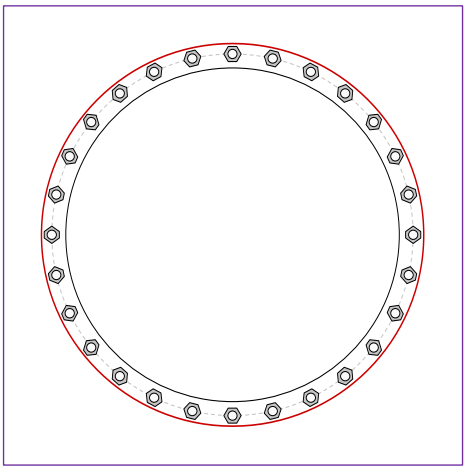
TIA-222 Revision	H

Applied Loads	
Moment (kip-ft)	1098.08
Axial Force (kips)	17.27
Shear Force (kips)	16.38

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

(14) 5"H x 3"W x 0.625"T, Notch: 0.375"
plate: Fy= 36 ksi ; weld: Fy= 70 ksi
horiz. weld: 0.25" fillet
vert. weld: 0.25" fillet

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)	47.64	
Allowable (kips)	54.53	
Stress Rating:	**87.4%**	**Pass**

Analysis Date: 5/22/2023

Monopole Flange Plate Connection

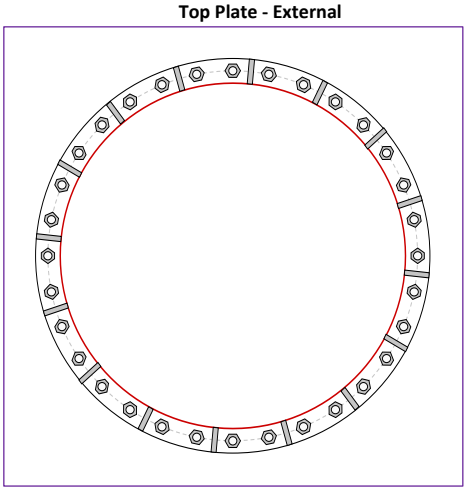
Elevation = 40 ft.

W.O.:	10481.CT11327A
Site Name	d Saybrook/I-95/Amtrk

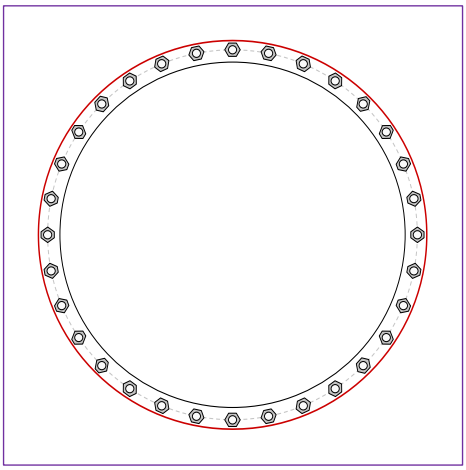
TIA-222 Revision	H

Applied Loads	
Moment (kip-ft)	1456.60
Axial Force (kips)	22.45
Shear Force (kips)	18.96

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)

Bottom Plate Data

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

Top Stiffener Data

(16) 5"H x 3"W x 0.625"T, Notch: 0.375"
plate: Fy= 36 ksi ; weld: Fy= 70 ksi
horiz. weld: 0.25" fillet
vert. weld: 0.25" fillet

Bottom Stiffener Data

N/A

Top Pole Data

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

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)	47.84	
Allowable (kips)	54.53	
Stress Rating:	**87.7%**	**Pass**

Analysis Date: 5/22/2023

Monopole Flange Plate Connection

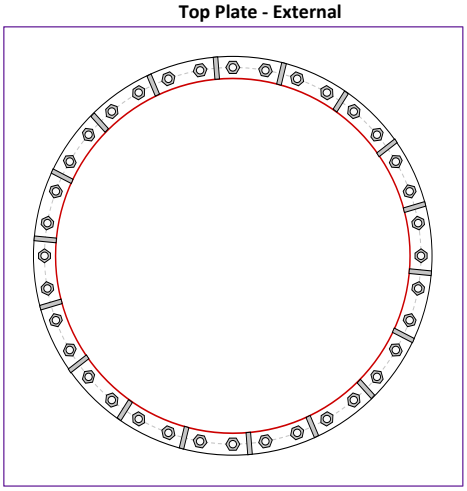
Elevation = 20 ft.

W.O.:	10481.CT11327A
Site Name	d Saybrook/I-95/Amtrk

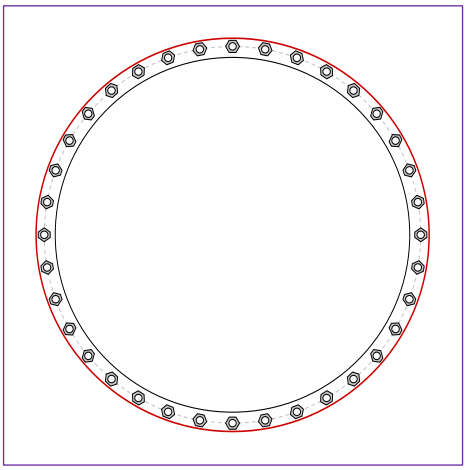
TIA-222 Revision	H

Applied Loads	
Moment (kip-ft)	1855.97
Axial Force (kips)	28.16
Shear Force (kips)	20.92

Top Plate - External



Bottom Plate - Internal



Connection Properties

Bolt Data

(36) 1" ø bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 51" BC

Top Plate Data

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

Bottom Plate Data

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

Top Stiffener Data

(18) 5"H x 3"W x 0.625"T, Notch: 0.375"
plate: Fy= 36 ksi ; weld: Fy= 70 ksi
horiz. weld: 0.25" fillet
vert. weld: 0.25" fillet

Bottom Stiffener Data

N/A

Top Pole Data

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

Bottom Pole Data

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

Analysis Results

Bolt Capacity

Max Load (kips)	47.73	
Allowable (kips)	54.53	
Stress Rating:	**87.5%**	**Pass**

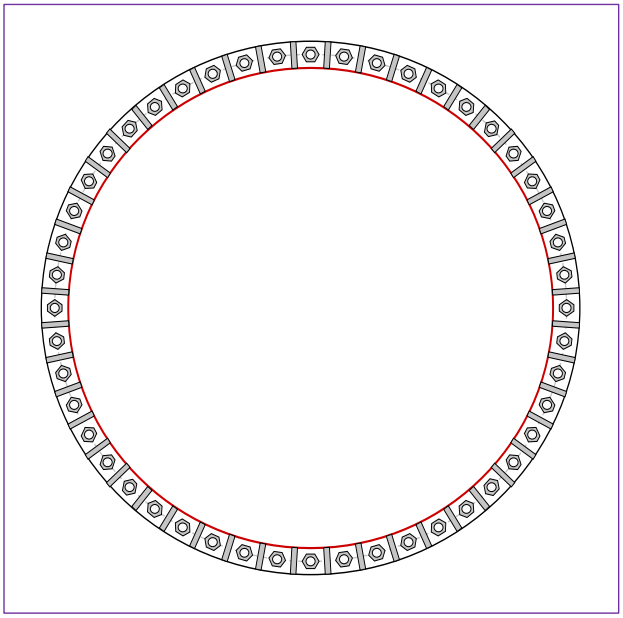
Analysis Date: 5/22/2023

Monopole Base Plate Connection

Site Info	
W.O.:	10481.CT11327A
Site Name	d Saybrook/I-95/Amtrk

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	0

Applied Loads	
Moment (kip-ft)	2293.18
Axial Force (kips)	34.38
Shear Force (kips)	22.77



Connection Properties

Anchor Rod Data

(48) 1" ø bolts (A687 N; Fy=105 ksi, Fu=125 ksi) on 57" BC

Base Plate Data

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

Analysis Results

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

Pu_t = 39.51	ϕPn_t = 56.81	**Stress Rating**
Vu = 0.47	ϕVn = 36.82	**69.5%**
Mu = n/a	ϕMn = n/a	**Pass**

Analysis Date: 5/22/2023

Drilled Pier Foundation

WO # : 10481.CT11327A
Site Name: Old Saybrook/I-95?Am

TIA-222 Revison: H
Tower Type: Monopole

Applied Loads	Comp.	Uplift
Moment (kip-ft)	2293.17	
Axial Force (kips)	34.38	
Shear Force (kips)	22.77	

Material Properties		
Concrete Strength, f'c:	3	ksi
Rebar Strength, Fy:	60	ksi
Tie Yield Strength, Fyt:	40	ksi

Pier Design Data		
Depth	31	ft
Ext. Above Grade	0.5	ft
Pier Section 1		
From 0.5' above grade to 31' below grade		
Pier Diameter	6	ft
Rebar Quantity	23	
Rebar Size	9	
Clear Cover to Ties	3	in
Tie Size	5	
Tie Spacing	12	in

Rebar & Pier Options
Embedded Pole Inputs
Belled Pier Inputs

Analysis Results		
Soil Lateral Check	*Compression*	*Uplift*
$D_{v=0}$ (ft from TOC)	7.13	-
Soil Safety Factor	5.89	-
Max Moment (kip-ft)	2441.92	-
Rating	*22.6%*	-
Soil Vertical Check	*Compression*	*Uplift*
Skin Friction (kips)	507.80	-
End Bearing (kips)	254.47	-
Weight of Concrete (kips)	111.60	-
Total Capacity (kips)	762.27	-
Axial (kips)	145.98	-
Rating	*19.2%*	-
Reinforced Concrete Flexure	*Compression*	*Uplift*
Critical Depth (ft from TOC)	6.85	-
Critical Moment (kip-ft)	2441.56	-
Critical Moment Capacity	3166.67	-
Rating	*77.1%*	-
Reinforced Concrete Shear	*Compression*	*Uplift*
Critical Depth (ft from TOC)	21.97	-
Critical Shear (kip)	211.45	-
Critical Shear Capacity	407.00	-
Rating	*52.0%*	-

Soil Interaction Rating	**22.6%**
Structural Foundation Rating	**77.1%**

Soil Profile

Groundwater Depth: 8
# of Layers: 3

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	120	150			0.000	0.000				10	Cohesionless
2	3	8	5	120	150		34	0.781	0.781				15	Cohesionless
3	8	31	23	60	87.6		34	1.392	1.392			12	14	Cohesionless

SEISMIC CALCULATIONS

Location

	Decimal Degrees		Deg	Min	Sec
Lat:	41.301257	+	41	18	4.53
Long:	-72.374695	-	72	22	28.90

Code and Site Parameters

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

USGS Seismic Reference			
	S_S:	0.2020	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}:	0.2155	g
Design spectral response acceleration 1 s period, S_{D1}:	0.0848	g
T_s:	0.3936	
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: 5/15/2023

Tower Details

Tower Type:	Stepped Monopole		
Height, h:	150	ft	
Effective Seismic Weight, W:	28.65	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:	3.80764	kips	
W_L:	24.84381347	kips	
E:	29000.0	ksi	
g:	386.088	in/s^2	
Average Moment of Inertia, I_{avg}:	9269.030227	in^4	
F_a:	0.373938817	hz	
Approximate Fundamental Period Monopole, T_a:	2.6742	s	2.7.7.1.3.3
Seismic Response Coefficient, C_s	0.1796		2.7.7.1.1
Seismic Response Coefficient Max 1, C_{smax}	0.0264		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	0.860	kips	2.7.7.1.1

Vertical Distribution Factors

Period Related Exponent, k:	2.000
Sum of $w_i h_i^k$	211774.97

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	0.3533	7685.96	0.0363	0.0312	0.0152
2 - 1	5.00	145.00	142.50	0.3533	7173.71	0.0339	0.0291	0.0152
3 - 1	5.00	140.00	137.50	0.3533	6679.12	0.0315	0.0271	0.0152
4 - 1	5.00	135.00	132.50	0.3533	6202.20	0.0293	0.0252	0.0152
5 - 1	5.00	130.00	127.50	0.3533	5742.94	0.0271	0.0233	0.0152
6 - 1	5.00	125.00	122.50	0.3533	5301.34	0.0250	0.0215	0.0152
7 - 1	5.00	120.00	117.50	0.4735	6537.81	0.0309	0.0265	0.0204
8 - 1	5.00	115.00	112.50	0.4735	5993.24	0.0283	0.0243	0.0204
9 - 1	5.00	110.00	107.50	0.4735	5472.35	0.0258	0.0222	0.0204
10 - 1	5.00	105.00	102.50	0.4735	4975.13	0.0235	0.0202	0.0204
11 - 1	5.00	100.00	97.50	0.5938	5644.85	0.0267	0.0229	0.0256
12 - 1	5.00	95.00	92.50	0.5938	5080.74	0.0240	0.0206	0.0256
13 - 1	5.00	90.00	87.50	0.5938	4546.31	0.0215	0.0185	0.0256
14 - 1	5.00	85.00	82.50	0.5938	4041.58	0.0191	0.0164	0.0256
15 - 1	5.00	80.00	77.50	0.7141	4288.87	0.0203	0.0174	0.0308
16 - 1	5.00	75.00	72.50	0.7141	3753.32	0.0177	0.0152	0.0308
17 - 1	1.75	70.00	69.13	0.2499	1194.20	0.0056	0.0048	0.0108
18 - 1	0.25	68.25	68.13	0.0432	200.29	0.0009	0.0008	0.0019
19 - 1	5.00	68.00	65.50	0.8631	3702.96	0.0175	0.0150	0.0372
20 - 1	3.00	63.00	61.50	0.5179	1958.70	0.0092	0.0079	0.0223
21 - 1	2.33	60.00	58.83	0.4588	1588.23	0.0075	0.0064	0.0198
22 - 1	0.25	57.67	57.54	0.0417	138.13	0.0007	0.0006	0.0018
23 - 1	5.00	57.42	54.92	0.8343	2516.24	0.0119	0.0102	0.0360
24 - 1	3.33	52.42	50.75	0.5563	1432.75	0.0068	0.0058	0.0240
25 - 1	0.25	49.08	48.96	0.0523	125.25	0.0006	0.0005	0.0023
26 - 1	5.00	48.83	46.33	1.0451	2243.67	0.0106	0.0091	0.0450
27 - 1	3.83	43.83	41.92	0.8013	1407.82	0.0066	0.0057	0.0345
28 - 1	2.58	40.00	38.71	0.6021	902.20	0.0043	0.0037	0.0259
29 - 1	0.25	37.42	37.29	0.0477	66.38	0.0003	0.0003	0.0021
30 - 1	5.00	37.17	34.67	0.9546	1147.21	0.0054	0.0047	0.0411
31 - 1	3.08	32.17	30.62	0.5887	552.10	0.0026	0.0022	0.0254
32 - 1	0.25	29.08	28.96	0.0583	48.86	0.0002	0.0002	0.0025
33 - 1	5.00	28.83	26.33	1.1654	808.14	0.0038	0.0033	0.0502
34 - 1	3.83	23.83	21.92	0.8935	429.17	0.0020	0.0017	0.0385
35 - 1	2.50	20.00	18.75	0.6428	226.00	0.0011	0.0009	0.0277
36 - 1	0.25	17.50	17.38	0.0537	16.22	0.0001	0.0001	0.0023
37 - 1	5.00	17.25	14.75	1.0749	233.85	0.0011	0.0009	0.0463
38 - 1	1.67	12.25	11.42	0.3583	46.70	0.0002	0.0002	0.0154
39 - 1	0.25	10.58	10.46	0.0612	6.69	0.0000	0.0000	0.0026
40 - 1	5.00	10.33	7.83	1.2239	75.10	0.0004	0.0003	0.0527
41 - 1	5.00	5.33	2.83	1.2239	9.82	0.0000	0.0000	0.0527
42 - 1	0.33	0.33	0.17	0.0816	0.00	0.0000	0.0000	0.0035
			Sum	22.3116	110196.13			

Discrete Loads						
Name	h_x	w_x	$w_x h_x^k$	C_{vx}	F_{xh}	F_{xv}
miscl 4' Lightning Rod on 16' Extension	150.00	0.0700	1575.00	0.0074	0.0064	0.0030
omni antennas 6' x 1.5" Omni Antenna	150.00	0.0200	450.00	0.0021	0.0018	0.0009
rfs MA0245-19AN w/ Mount Pipe	150.00	0.0200	450.00	0.0021	0.0018	0.0009
(2) decibel DB874G45A-XY	150.00	0.0200	450.00	0.0021	0.0018	0.0009
omni antennas 20' x 2" Omni Antenna	150.00	0.0300	675.00	0.0032	0.0027	0.0013
16' Low Profile Platform	150.00	1.8000	40500.00	0.1912	0.1644	0.0776
omni antennas 10' x 2" Omni Antenna w/mount pipe	101.00	0.0400	408.04	0.0019	0.0017	0.0017
(2) mti wireless edge MT-404067/ND w/ Mount Pipe	101.00	0.0400	408.04	0.0019	0.0017	0.0017
(2) ruggedcom WIN7237	101.00	0.0176	179.95	0.0008	0.0007	0.0008
3' Stand Off Mount	101.00	0.0650	663.07	0.0031	0.0027	0.0028
omni antennas 20' x 2" Omni Antenna	76.00	0.0300	173.28	0.0008	0.0007	0.0013
mount pipes 4' x 2" STD Pipe	76.00	0.0100	57.76	0.0003	0.0002	0.0004
3' Stand Off Mount	76.00	0.0650	375.44	0.0018	0.0015	0.0028
omni antennas 20' x 2" Omni Antenna	51.00	0.0300	78.03	0.0004	0.0003	0.0013
mount pipes 4' x 2" STD Pipe	51.00	0.0100	26.01	0.0001	0.0001	0.0004
3' Stand Off Mount	51.00	0.0650	169.07	0.0008	0.0007	0.0028
PERFECT10 VSK-M	150.00	0.2750	6187.50	0.0292	0.0251	0.0119
rfs celwave APXVAALL24_43-U-NA20 w/ Mount Pipe	150.00	0.1500	3375.00	0.0159	0.0137	0.0065
rfs celwave APXVAALL24_43-U-NA20 w/ Mount Pipe	150.00	0.1500	3375.00	0.0159	0.0137	0.0065
rfs celwave APXVAALL24_43-U-NA20 w/ Mount Pipe	150.00	0.1500	3375.00	0.0159	0.0137	0.0065
ericsson AIR 6419 B41 w/ Mount Pipe	150.00	0.1100	2475.00	0.0117	0.0100	0.0047
ericsson AIR 6419 B41 w/ Mount Pipe	150.00	0.1100	2475.00	0.0117	0.0100	0.0047
ericsson AIR 6419 B41 w/ Mount Pipe	150.00	0.1100	2475.00	0.0117	0.0100	0.0047
commscope VV-65A-R1	150.00	0.0200	450.00	0.0021	0.0018	0.0009
commscope VV-65A-R1	150.00	0.0200	450.00	0.0021	0.0018	0.0009
commscope VV-65A-R1	150.00	0.0200	450.00	0.0021	0.0018	0.0009
ericsson RADIO 4460 B25+B66	150.00	0.1100	2475.00	0.0117	0.0100	0.0047
ericsson RADIO 4460 B25+B66	150.00	0.1100	2475.00	0.0117	0.0100	0.0047
ericsson RADIO 4460 B25+B66	150.00	0.1100	2475.00	0.0117	0.0100	0.0047
ericsson RADIO 4480 B71 + B85A	150.00	0.0800	1800.00	0.0085	0.0073	0.0034
ericsson RADIO 4480 B71 + B85A	150.00	0.0800	1800.00	0.0085	0.0073	0.0034
ericsson RADIO 4480 B71 + B85A	150.00	0.0800	1800.00	0.0085	0.0073	0.0034
	Sum	4.0176	84551.18			

Linear Loads								
Name	Start Height	End Height	h_x	w_x	$w_x h_x^k$	C_{vx}	F_{xh}	F_{xv}
(6) andrew LDF7-50A(1-5/8") From 0 to 150	140.00	150.00	145.00	0.0492	1034.43	0.0049	0.0042	0.0021
(6) andrew LDF7-50A(1-5/8") From 0 to 150	130.00	140.00	135.00	0.0492	896.67	0.0042	0.0036	0.0021
(6) andrew LDF7-50A(1-5/8") From 0 to 150	120.00	130.00	125.00	0.0492	768.75	0.0036	0.0031	0.0021
(6) andrew LDF7-50A(1-5/8") From 0 to 150	110.00	120.00	115.00	0.0492	650.67	0.0031	0.0026	0.0021
(6) andrew LDF7-50A(1-5/8") From 0 to 150	100.00	110.00	105.00	0.0492	542.43	0.0026	0.0022	0.0021
(6) andrew LDF7-50A(1-5/8") From 0 to 150	90.00	100.00	95.00	0.0492	444.03	0.0021	0.0018	0.0021
(6) andrew LDF7-50A(1-5/8") From 0 to 150	80.00	90.00	85.00	0.0492	355.47	0.0017	0.0014	0.0021
(6) andrew LDF7-50A(1-5/8") From 0 to 150	70.00	80.00	75.00	0.0492	276.75	0.0013	0.0011	0.0021
(6) andrew LDF7-50A(1-5/8") From 0 to 150	60.00	70.00	65.00	0.0492	207.87	0.0010	0.0008	0.0021
(6) andrew LDF7-50A(1-5/8") From 0 to 150	50.00	60.00	55.00	0.0492	148.83	0.0007	0.0006	0.0021
(6) andrew LDF7-50A(1-5/8") From 0 to 150	40.00	50.00	45.00	0.0492	99.63	0.0005	0.0004	0.0021
(6) andrew LDF7-50A(1-5/8") From 0 to 150	30.00	40.00	35.00	0.0492	60.27	0.0003	0.0002	0.0021
(6) andrew LDF7-50A(1-5/8") From 0 to 150	20.00	30.00	25.00	0.0492	30.75	0.0001	0.0001	0.0021
(6) andrew LDF7-50A(1-5/8") From 0 to 150	10.00	20.00	15.00	0.0492	11.07	0.0001	0.0000	0.0021
(6) andrew LDF7-50A(1-5/8") From 0 to 150	0.00	10.00	5.00	0.0492	1.23	0.0000	0.0000	0.0021
(3) andrew LDF5-50A(7/8") From 0 to 150	140.00	150.00	145.00	0.0099	208.15	0.0010	0.0008	0.0004
(3) andrew LDF5-50A(7/8") From 0 to 150	130.00	140.00	135.00	0.0099	180.43	0.0009	0.0007	0.0004
(3) andrew LDF5-50A(7/8") From 0 to 150	120.00	130.00	125.00	0.0099	154.69	0.0007	0.0006	0.0004
(3) andrew LDF5-50A(7/8") From 0 to 150	110.00	120.00	115.00	0.0099	130.93	0.0006	0.0005	0.0004
(3) andrew LDF5-50A(7/8") From 0 to 150	100.00	110.00	105.00	0.0099	109.15	0.0005	0.0004	0.0004
(3) andrew LDF5-50A(7/8") From 0 to 150	90.00	100.00	95.00	0.0099	89.35	0.0004	0.0004	0.0004
(3) andrew LDF5-50A(7/8") From 0 to 150	80.00	90.00	85.00	0.0099	71.53	0.0003	0.0003	0.0004
(3) andrew LDF5-50A(7/8") From 0 to 150	70.00	80.00	75.00	0.0099	55.69	0.0003	0.0002	0.0004
(3) andrew LDF5-50A(7/8") From 0 to 150	60.00	70.00	65.00	0.0099	41.83	0.0002	0.0002	0.0004
(3) andrew LDF5-50A(7/8") From 0 to 150	50.00	60.00	55.00	0.0099	29.95	0.0001	0.0001	0.0004
(3) andrew LDF5-50A(7/8") From 0 to 150	40.00	50.00	45.00	0.0099	20.05	0.0001	0.0001	0.0004
(3) andrew LDF5-50A(7/8") From 0 to 150	30.00	40.00	35.00	0.0099	12.13	0.0001	0.0000	0.0004
(3) andrew LDF5-50A(7/8") From 0 to 150	20.00	30.00	25.00	0.0099	6.19	0.0000	0.0000	0.0004
(3) andrew LDF5-50A(7/8") From 0 to 150	10.00	20.00	15.00	0.0099	2.23	0.0000	0.0000	0.0004
(3) andrew LDF5-50A(7/8") From 0 to 150	0.00	10.00	5.00	0.0099	0.25	0.0000	0.0000	0.0004
andrew LDF4-50A(1/2") From 0 to 150	140.00	150.00	145.00	0.0015	31.54	0.0001	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 101	100.00	101.00	100.50	0.0002	1.52	0.0000	0.0000	0.0000
andrew LDF4-50A(1/2") From 0 to 101	90.00	100.00	95.00	0.0015	13.54	0.0001	0.0001	0.0001
andrew LDF4-50A(1/2") From 0 to 101	80.00	90.00	85.00	0.0015	10.84	0.0001	0.0000	0.0001
andrew LDF4-50A(1/2") From 0 to 101	70.00	80.00	75.00	0.0015	8.44	0.0000	0.0000	0.0001
andrew LDF4-50A(1/2") From 0 to 101	60.00	70.00	65.00	0.0015	6.34	0.0000	0.0000	0.0001
andrew LDF4-50A(1/2") From 0 to 101	50.00	60.00	55.00	0.0015	4.54	0.0000	0.0000	0.0001
andrew LDF4-50A(1/2") From 0 to 101	40.00	50.00	45.00	0.0015	3.04	0.0000	0.0000	0.0001
andrew LDF4-50A(1/2") From 0 to 101	30.00	40.00	35.00	0.0015	1.84	0.0000	0.0000	0.0001
andrew LDF4-50A(1/2") From 0 to 101	20.00	30.00	25.00	0.0015	0.94	0.0000	0.0000	0.0001
andrew LDF4-50A(1/2") From 0 to 101	10.00	20.00	15.00	0.0015	0.34	0.0000	0.0000	0.0001
andrew LDF4-50A(1/2") From 0 to 101	0.00	10.00	5.00	0.0015	0.04	0.0000	0.0000	0.0001
andrew LDF1-50A(1/4") From 0 to 101	100.00	101.00	100.50	0.0001	0.61	0.0000	0.0000	0.0000
andrew LDF1-50A(1/4") From 0 to 101	90.00	100.00	95.00	0.0006	5.42	0.0000	0.0000	0.0000
andrew LDF1-50A(1/4") From 0 to 101	80.00	90.00	85.00	0.0006	4.34	0.0000	0.0000	0.0000
andrew LDF1-50A(1/4") From 0 to 101	70.00	80.00	75.00	0.0006	3.38	0.0000	0.0000	0.0000
andrew LDF1-50A(1/4") From 0 to 101	60.00	70.00	65.00	0.0006	2.54	0.0000	0.0000	0.0000
andrew LDF1-50A(1/4") From 0 to 101	50.00	60.00	55.00	0.0006	1.82	0.0000	0.0000	0.0000
andrew LDF1-50A(1/4") From 0 to 101	40.00	50.00	45.00	0.0006	1.22	0.0000	0.0000	0.0000
andrew LDF1-50A(1/4") From 0 to 101	30.00	40.00	35.00	0.0006	0.74	0.0000	0.0000	0.0000
andrew LDF1-50A(1/4") From 0 to 101	20.00	30.00	25.00	0.0006	0.38	0.0000	0.0000	0.0000
andrew LDF1-50A(1/4") From 0 to 101	10.00	20.00	15.00	0.0006	0.14	0.0000	0.0000	0.0000
andrew LDF1-50A(1/4") From 0 to 101	0.00	10.00	5.00	0.0006	0.02	0.0000	0.0000	0.0000
andrew ATCB-B01-001(5/16) From 0 to 101	100.00	101.00	100.50	0.0001	0.76	0.0000	0.0000	0.0000
andrew ATCB-B01-001(5/16) From 0 to 101	90.00	100.00	95.00	0.0008	6.77	0.0000	0.0000	0.0000
andrew ATCB-B01-001(5/16) From 0 to 101	80.00	90.00	85.00	0.0008	5.42	0.0000	0.0000	0.0000
andrew ATCB-B01-001(5/16) From 0 to 101	70.00	80.00	75.00	0.0008	4.22	0.0000	0.0000	0.0000
andrew ATCB-B01-001(5/16) From 0 to 101	60.00	70.00	65.00	0.0008	3.17	0.0000	0.0000	0.0000
andrew ATCB-B01-001(5/16) From 0 to 101	50.00	60.00	55.00	0.0008	2.27	0.0000	0.0000	0.0000
andrew ATCB-B01-001(5/16) From 0 to 101	40.00	50.00	45.00	0.0008	1.52	0.0000	0.0000	0.0000
andrew ATCB-B01-001(5/16) From 0 to 101	30.00	40.00	35.00	0.0008	0.92	0.0000	0.0000	0.0000
andrew ATCB-B01-001(5/16) From 0 to 101	20.00	30.00	25.00	0.0008	0.47	0.0000	0.0000	0.0000
andrew ATCB-B01-001(5/16) From 0 to 101	10.00	20.00	15.00	0.0008	0.17	0.0000	0.0000	0.0000
andrew ATCB-B01-001(5/16) From 0 to 101	0.00	10.00	5.00	0.0008	0.02	0.0000	0.0000	0.0000
andrew LDF5-50A(7/8") From 0 to 76	70.00	76.00	73.00	0.0020	10.55	0.0000	0.0000	0.0001
andrew LDF5-50A(7/8") From 0 to 76	60.00	70.00	65.00	0.0033	13.94	0.0001	0.0001	0.0001
andrew LDF5-50A(7/8") From 0 to 76	50.00	60.00	55.00	0.0033	9.98	0.0000	0.0000	0.0001

andrew LDF5-50A(7/8") From 0 to 76	40.00	50.00	45.00	0.0033	6.68	0.0000	0.0000	0.0001
andrew LDF5-50A(7/8") From 0 to 76	30.00	40.00	35.00	0.0033	4.04	0.0000	0.0000	0.0001
andrew LDF5-50A(7/8") From 0 to 76	20.00	30.00	25.00	0.0033	2.06	0.0000	0.0000	0.0001
andrew LDF5-50A(7/8") From 0 to 76	10.00	20.00	15.00	0.0033	0.74	0.0000	0.0000	0.0001
andrew LDF5-50A(7/8") From 0 to 76	0.00	10.00	5.00	0.0033	0.08	0.0000	0.0000	0.0001
andrew LDF5-50A(7/8") From 0 to 51	50.00	51.00	50.50	0.0003	0.84	0.0000	0.0000	0.0000
andrew LDF5-50A(7/8") From 0 to 51	40.00	50.00	45.00	0.0033	6.68	0.0000	0.0000	0.0001
andrew LDF5-50A(7/8") From 0 to 51	30.00	40.00	35.00	0.0033	4.04	0.0000	0.0000	0.0001
andrew LDF5-50A(7/8") From 0 to 51	20.00	30.00	25.00	0.0033	2.06	0.0000	0.0000	0.0001
andrew LDF5-50A(7/8") From 0 to 51	10.00	20.00	15.00	0.0033	0.74	0.0000	0.0000	0.0001
andrew LDF5-50A(7/8") From 0 to 51	0.00	10.00	5.00	0.0033	0.08	0.0000	0.0000	0.0001
Climbing rungs From 0 to 150	140.00	150.00	145.00	0.0100	210.25	0.0010	0.0009	0.0004
Climbing rungs From 0 to 150	130.00	140.00	135.00	0.0100	182.25	0.0009	0.0007	0.0004
Climbing rungs From 0 to 150	120.00	130.00	125.00	0.0100	156.25	0.0007	0.0006	0.0004
Climbing rungs From 0 to 150	110.00	120.00	115.00	0.0100	132.25	0.0006	0.0005	0.0004
Climbing rungs From 0 to 150	100.00	110.00	105.00	0.0100	110.25	0.0005	0.0004	0.0004
Climbing rungs From 0 to 150	90.00	100.00	95.00	0.0100	90.25	0.0004	0.0004	0.0004
Climbing rungs From 0 to 150	80.00	90.00	85.00	0.0100	72.25	0.0003	0.0003	0.0004
Climbing rungs From 0 to 150	70.00	80.00	75.00	0.0100	56.25	0.0003	0.0002	0.0004
Climbing rungs From 0 to 150	60.00	70.00	65.00	0.0100	42.25	0.0002	0.0002	0.0004
Climbing rungs From 0 to 150	50.00	60.00	55.00	0.0100	30.25	0.0001	0.0001	0.0004
Climbing rungs From 0 to 150	40.00	50.00	45.00	0.0100	20.25	0.0001	0.0001	0.0004
Climbing rungs From 0 to 150	30.00	40.00	35.00	0.0100	12.25	0.0001	0.0000	0.0004
Climbing rungs From 0 to 150	20.00	30.00	25.00	0.0100	6.25	0.0000	0.0000	0.0004
Climbing rungs From 0 to 150	10.00	20.00	15.00	0.0100	2.25	0.0000	0.0000	0.0004
Climbing rungs From 0 to 150	0.00	10.00	5.00	0.0100	0.25	0.0000	0.0000	0.0004
(3) rfs celwave 6x24 Hybrid Cable From 0 to 150	140.00	150.00	145.00	0.0795	1671.49	0.0079	0.0068	0.0034
(3) rfs celwave 6x24 Hybrid Cable From 0 to 150	130.00	140.00	135.00	0.0795	1448.89	0.0068	0.0059	0.0034
(3) rfs celwave 6x24 Hybrid Cable From 0 to 150	120.00	130.00	125.00	0.0795	1242.19	0.0059	0.0050	0.0034
(3) rfs celwave 6x24 Hybrid Cable From 0 to 150	110.00	120.00	115.00	0.0795	1051.39	0.0050	0.0043	0.0034
(3) rfs celwave 6x24 Hybrid Cable From 0 to 150	100.00	110.00	105.00	0.0795	876.49	0.0041	0.0036	0.0034
(3) rfs celwave 6x24 Hybrid Cable From 0 to 150	90.00	100.00	95.00	0.0795	717.49	0.0034	0.0029	0.0034
(3) rfs celwave 6x24 Hybrid Cable From 0 to 150	80.00	90.00	85.00	0.0795	574.39	0.0027	0.0023	0.0034
(3) rfs celwave 6x24 Hybrid Cable From 0 to 150	70.00	80.00	75.00	0.0795	447.19	0.0021	0.0018	0.0034
(3) rfs celwave 6x24 Hybrid Cable From 0 to 150	60.00	70.00	65.00	0.0795	335.89	0.0016	0.0014	0.0034
(3) rfs celwave 6x24 Hybrid Cable From 0 to 150	50.00	60.00	55.00	0.0795	240.49	0.0011	0.0010	0.0034
(3) rfs celwave 6x24 Hybrid Cable From 0 to 150	40.00	50.00	45.00	0.0795	160.99	0.0008	0.0007	0.0034
(3) rfs celwave 6x24 Hybrid Cable From 0 to 150	30.00	40.00	35.00	0.0795	97.39	0.0005	0.0004	0.0034
(3) rfs celwave 6x24 Hybrid Cable From 0 to 150	20.00	30.00	25.00	0.0795	49.69	0.0002	0.0002	0.0034
(3) rfs celwave 6x24 Hybrid Cable From 0 to 150	10.00	20.00	15.00	0.0795	17.89	0.0001	0.0001	0.0034
(3) rfs celwave 6x24 Hybrid Cable From 0 to 150	0.00	10.00	5.00	0.0795	1.99	0.0000	0.0000	0.0034
			Sum	2.3222	17027.67			

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	
New Milford	110	115	125	130	85	89	97	101	35	0.198	0.055			
Newington	110	120	130	135	85	93	101	105	30	0.195	0.055			Yes
Newtown	110	120	130	130	85	93	101	101	30	0.209	0.055			Yes
Norfolk	105	115	125	130	81	89	97	101	40	0.165	0.054			
North Branford	115	125	135	135	89	97	105	105	30	0.204	0.054			Yes
North Canaan	105	115	125	130	81	89	97	101	40	0.164	0.054			
North Haven	110	120	130	135	85	93	101	105	30	0.204	0.054			Yes
North Stonington	120	130	140	140	93	101	108	108	30	0.186	0.052			Yes
Norwalk	110	120	130	135	85	93	101	105	30	0.240	0.056		Type B	Yes
Norwich	115	125	135	140	89	97	105	108	30	0.194	0.054			Yes
Old Lyme	120	130	135	140	93	101	105	108	30	0.201	0.053	Type B	Type B	Yes
Old Saybrook	120	130	135	140	93	101	105	108	30	0.202	0.053	Type B	Type B	Yes
Orange	110	120	130	135	85	93	101	105	30	0.201	0.054			Yes
Oxford	110	120	130	135	85	93	101	105	30	0.199	0.054			Yes
Plainfield	115	125	135	140	89	97	105	108	30	0.187	0.054			Yes
Plainville	110	120	130	135	85	93	101	105	35	0.191	0.055			Yes
Plymouth	110	120	125	130	85	93	97	101	35	0.185	0.054			Yes
Pomfret	115	125	130	135	89	97	101	105	40	0.182	0.055			Yes
Portland	110	120	130	135	85	93	101	105	30	0.208	0.056			Yes
Preston	120	125	135	140	93	97	105	108	30	0.191	0.053			Yes
Prospect	110	120	130	135	85	93	101	105	30	0.197	0.054			Yes
Putnam	115	125	130	135	89	97	101	105	40	0.184	0.055			Yes
Redding	110	120	125	130	85	93	97	101	30	0.228	0.056			Yes
Ridgefield	110	120	125	130	85	93	97	101	30	0.243	0.057			Yes
Rocky Hill	110	120	130	135	85	93	101	105	30	0.200	0.055			Yes
Roxbury	110	120	125	130	85	93	97	101	35	0.196	0.054			Yes
Salem	115	125	135	140	89	97	105	108	30	0.205	0.055			Yes
Salisbury	105	115	125	130	81	89	97	101	40	0.116	0.054			
Scotland	115	125	135	135	89	97	105	105	30	0.188	0.054			Yes
Seymour	110	120	130	135	85	93	101	105	30	0.200	0.054			Yes
Sharon	105	115	125	130	81	89	97	101	40	0.171	0.054			
Shelton	110	120	130	135	85	93	101	105	30	0.203	0.054			Yes

Seismic

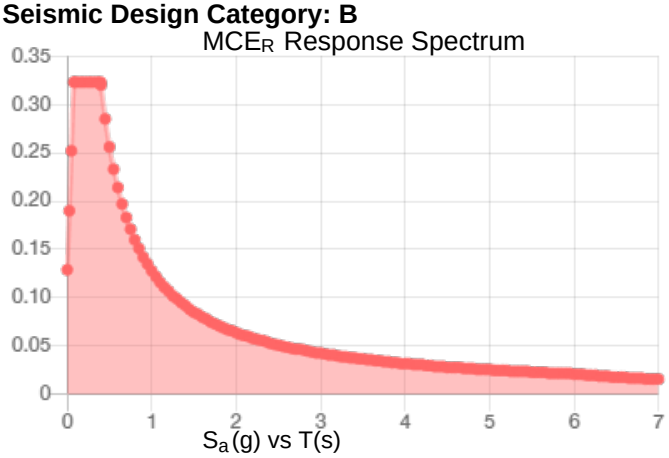
D - Default (see Section 11.4.3)

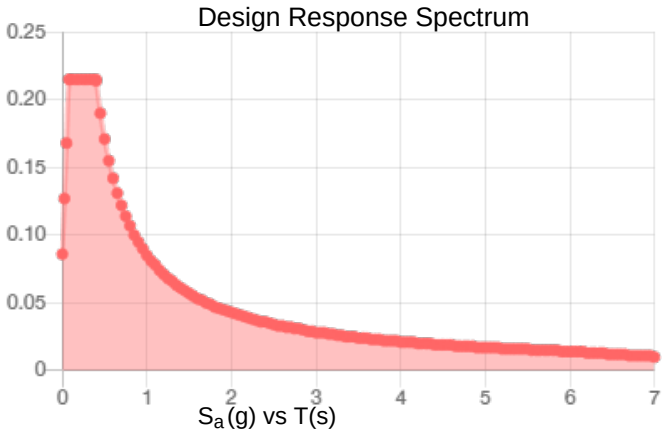
Site Soil Class:

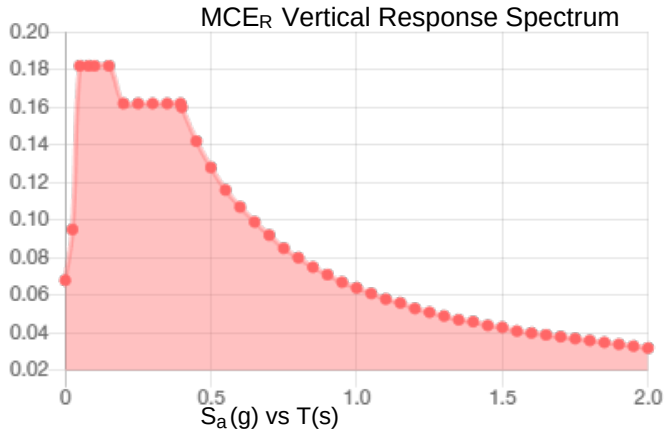
Results:

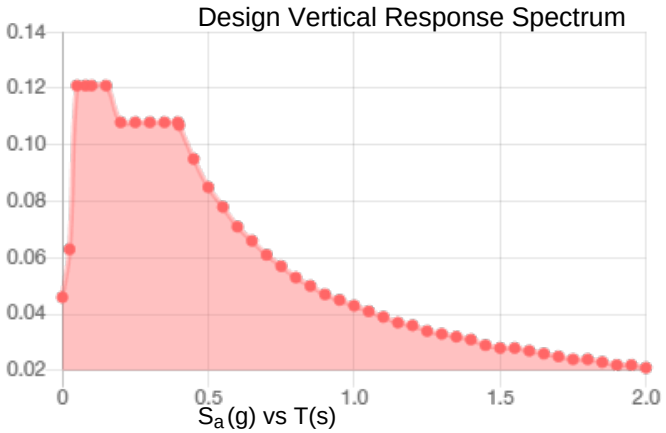
S_S :	0.202	S_{D1} :	0.085
S_1 :	0.053	T_L :	6
F_a :	1.6	PGA :	0.113
F_v :	2.4	PGA_M :	0.177
S_{MS} :	0.323	F_{PGA} :	1.575
S_{M1} :	0.128	I_e :	1
S_{DS} :	0.215	C_v :	0.704

Seismic Design Category: B









Data Accessed: **Mon May 15 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:	Mon May 15 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.

APPENDIX C

REFERENCES

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

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SCOTT D. WATKINS, P.E.

January 20, 2000

Mr. Joe Di Bernardo
ARCNET ARCHITECTS INC.
670 North Beers Street – Bldg. 2
Holmdel, New Jersey 07733

Re: Report of Subsurface Exploration
and Geotechnical Evaluation
Amtrak – Old Saybrook
Route 1 and Ford Drive; Milepost 105.46
Old Saybrook, CT
Arcnet No. A99.506-862A
FPA No. 00N007AR1

Dear Mr. Di Bernardo:

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 adjacent to the railroad tracks at milepost ±105.46, Old Saybrook, Connecticut. The location of the project site is presented on Drawing No. 1, "Regional Location Plan." The generalized site configuration is presented on Drawing No. 2, "Site Layout."

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 standard Arcnet specifications, and included the advancement of one test boring, 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 monopole foundation were unavailable at the time this report was prepared.

FPA

SUBSURFACE EXPLORATION

French & Parrello Associates (FPA) performed one test boring on January 14, 2000 to characterize subsurface conditions in the vicinity of 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 location is presented on Drawing No. 3, "Test Boring Location Plan."

Test boring B-1 was advanced to a depth of 42'0" feet below grade utilizing hollow stem auger and rotary drilling 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

From the ground surface to the terminating depth of the boring, the encountered soils consisted of a coarse to fine sand with varying fractions of silt and gravel. Based upon the results of the Standard Penetration Tests, the soil from the ground surface to the terminating depth of the boring is in a medium to dense state of relative density.

Groundwater was encountered at an approximate depth of 8 feet during our subsurface exploration. Seasonal fluctuations can be anticipated. 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. 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.

The proposed tower foundation will be located adjacent to existing structures and the existing rail line. Responsibility for protecting any adjacent structures and the rail line during installation should be stipulated to be with the contractor. We recommend that the contractor perform a pre-

construction survey to detail the condition of existing structures, and that a temporary steel casing should be utilized during the construction to reduce the risk of the hole caving in. To facilitate the design of the monopole foundation, we offer the following soil parameters.

	0-42 ft
Total Unit Weight of Soil (γ)	120 pcf
Submerged Unit Weight of Soil (γ')	60 pcf
Angle of Internal Friction (ϕ)	34°
Cohesion	--
Coefficient of Lateral Earth Pressure	
Active Earth Pressure (K_a)	.28
At Rest Earth Pressure (K_o)	.44
Passive Earth Pressure (K_p)	3.54
Allowable Bearing Pressure	6,000 psf

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 were 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 or hazardous and toxic materials in the soil, air, or groundwater. 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.

Should you have any questions or comments, please feel free to contact us.

Very truly yours,

FRENCH & PARRELLO ASSOCIATES, P.A.

John W. Colagrande
Project Manager

R. Raymond Mankbadi, P.E.
Senior Project Manager

RRM/JWC/clt

R. Raymond 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

AMTRACK – OLD SAYBROOK
OLD SAYBROOK, CT FPA NO. 00N007A

BORING NO.: B-1
SHEET 1 OF 2

DATE STARTED: 1-14-00
DATE FINISHED: 1-14-00

DEPTH OF WATER: 8.0'
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'	3 – 5 – 7 – 5		S-1	Light Brown cm^{+} f SAND, little^{-} Silt.
	S-2 2-4'	5 – 5 – 6 – 5		S-2	Same as S-1.
--- 5'---	S-3 4-6'	6 – 9 – 18 – 26		S-3	Light Brown cm^{+} SAND, some^{+} c^{-} mf Gravel, trace^{+} Silt.
	S-4 6-8'	18 – 16 – 15 – 13		S-4	Same as S-3.
---10'---	S-5 8-10'	19 – 22 – 23 – 32		S-5	Brown cm^{+} f SAND, some c^{-} mf Gravel, little Silt. (wet)
	S-6 10-12'	21 – 18 – 21 – 30		S-6	Brown cm SAND, little^{+} mf Gravel, little^{-} Silt.
---15'---	S-7 15-17'	11 – 13 – 17 – 18		S-7	Same as S-6.
---20'---	S-8 20-22'	7 – 7 – 10 – 12		S-8	Tan m^{+} f SAND, little Silt.
---25'---	S-9 25-27'	7 – 12 – 10 – 10		S-9	Tan cm^{+} SAND, little mf^{+} Gravel, trace^{+} Silt.
---30'---	S-10 30-32'	3 – 5 – 7 – 10		S-10	Tan m^{+} f SAND, little^{-} Silt.
---35'---	S-11 35-37'	11 – 13 – 35 – 65		S-11	Tan cm^{+} f SAND, little^{-} mf Gravel w/ 1" layer of Clayey Silt.
---40'---					

SOILS ENGINEER: R. MANKBADI, P.E.
TEST BORING OBSERVER: M. GIZZI

CONTRACTOR: NEW ENGLAND BORING CO.
DRILLER: T. ROE

The information shown hereon indicates the subsurface conditions encountered at the specific 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

AMTRACK – OLD SAYBROOK
OLD LAYBROOK, CT FPA NO. 00N007A

BORING NO.: B-1
SHEET 2 OF 2

DATE STARTED: 1-14-00
DATE FINISHED: 1-14-00

DEPTH OF WATER: 8.0'
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-12 40-42'	6 – 8 – 9 – 11		S-12 Tan f SAND, some Silt.
				END OF BORING AT 42.0'
--- 45'--				
---50'---				
---55'---				
---60'---				
---65'---				
---70'---				
---75'---				
---80'---				

SOILS ENGINEER: R. MANKBADI, P.E.
TEST BORING OBSERVER: M. GIZZI

CONTRACTOR: NEW ENGLAND BORING CO.
DRILLER: T. ROE

The information shown hereon indicates the subsurface conditions encountered at the specific 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.

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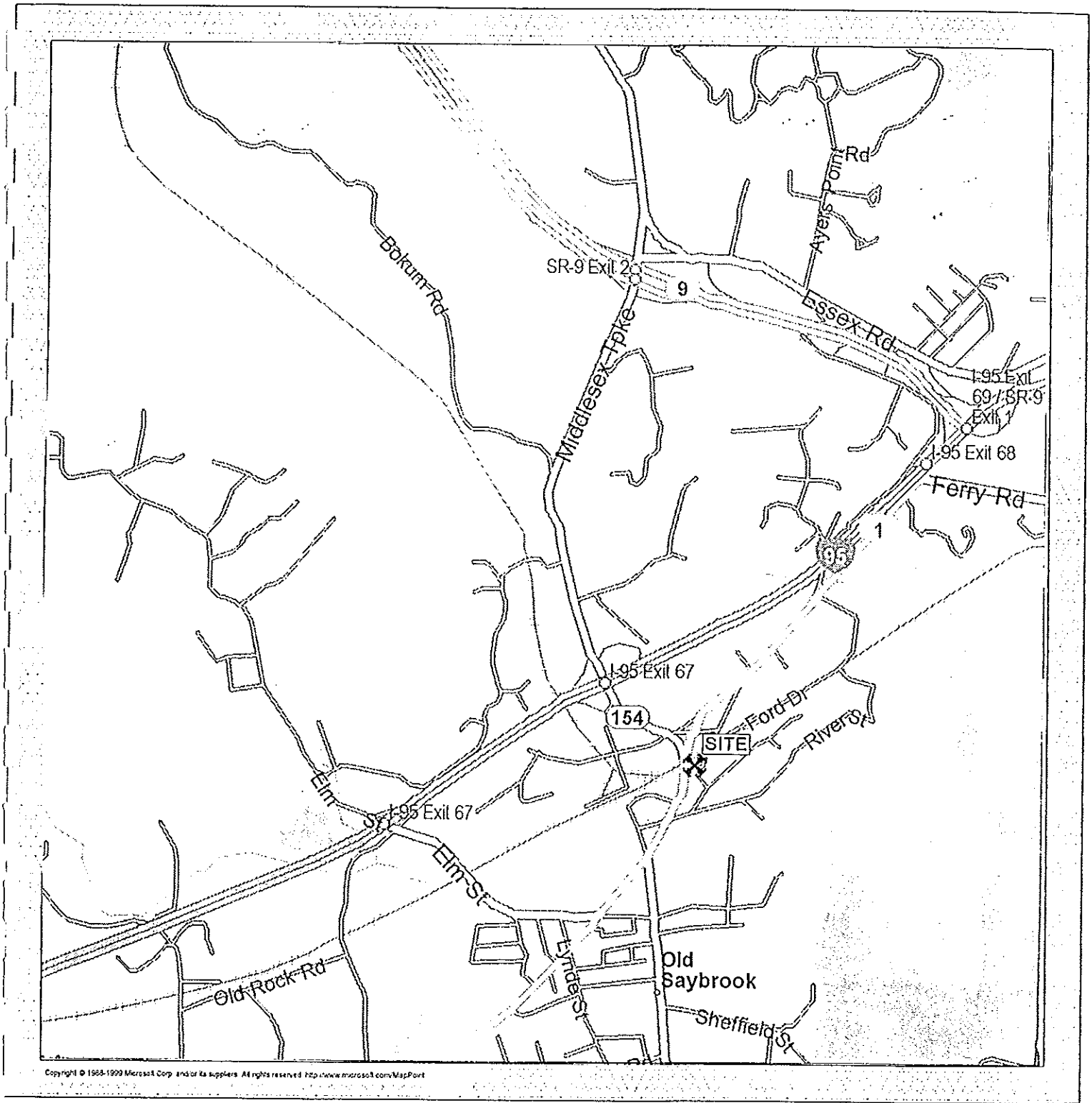
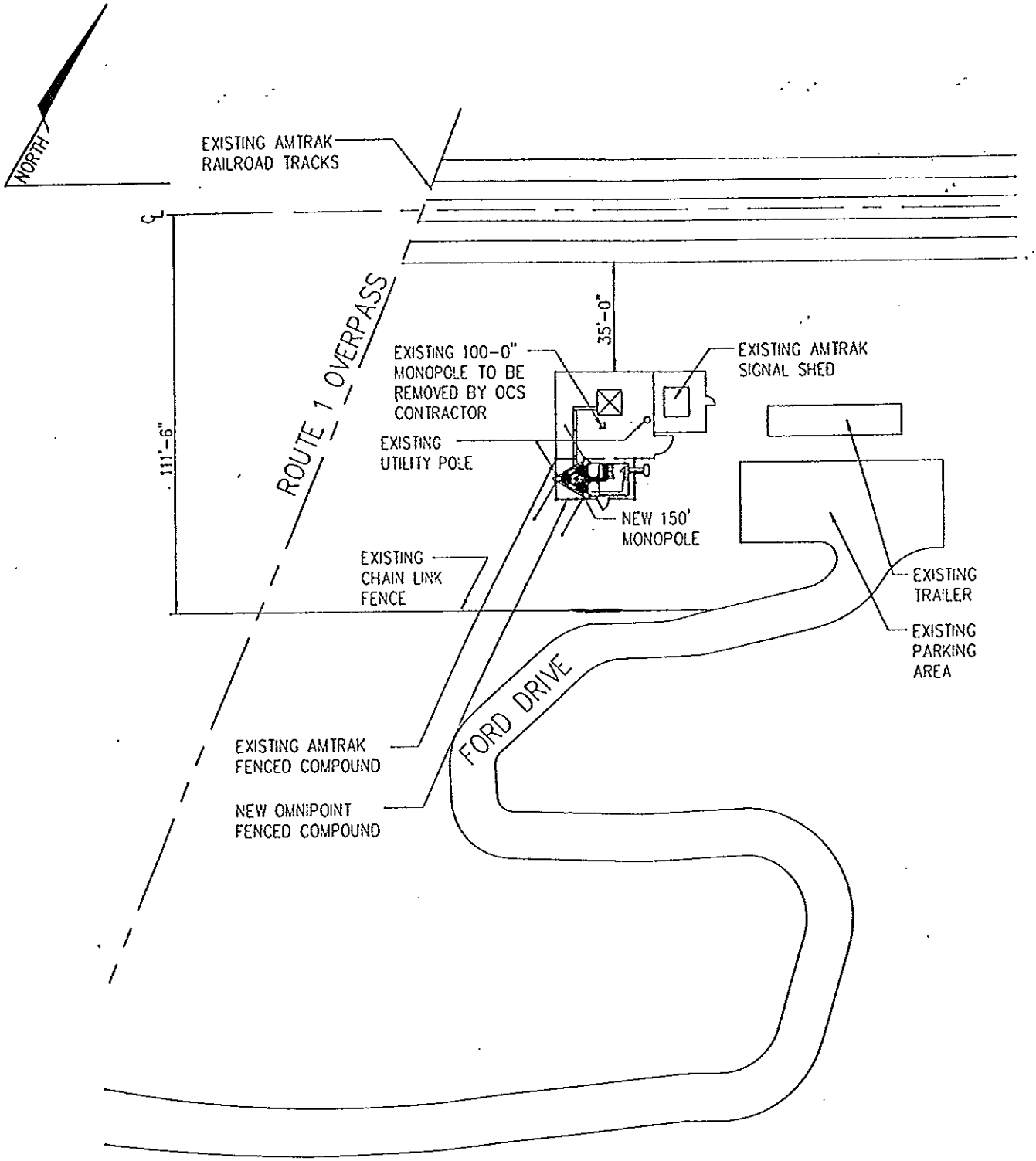


REGIONAL LOCATION PLAN

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

PROJECT:
AMTRAK-OLD SAYBROOK
ROUTE 1 @ FORD DRIVE
OLD SAYBROOK, CONNECTICUT

DRAWN BY:	CHECKED BY:	SCALE:	DATE:	JOB NO.:	DRAWING NO.:
J.W.C.	J.W.C.	N.T.S.	01/19/00	00N007A	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-OLD SAYBROOK
ROUTE 1 @ FORD DRIVE
OLD SAYBROOK, CONNECTICUT

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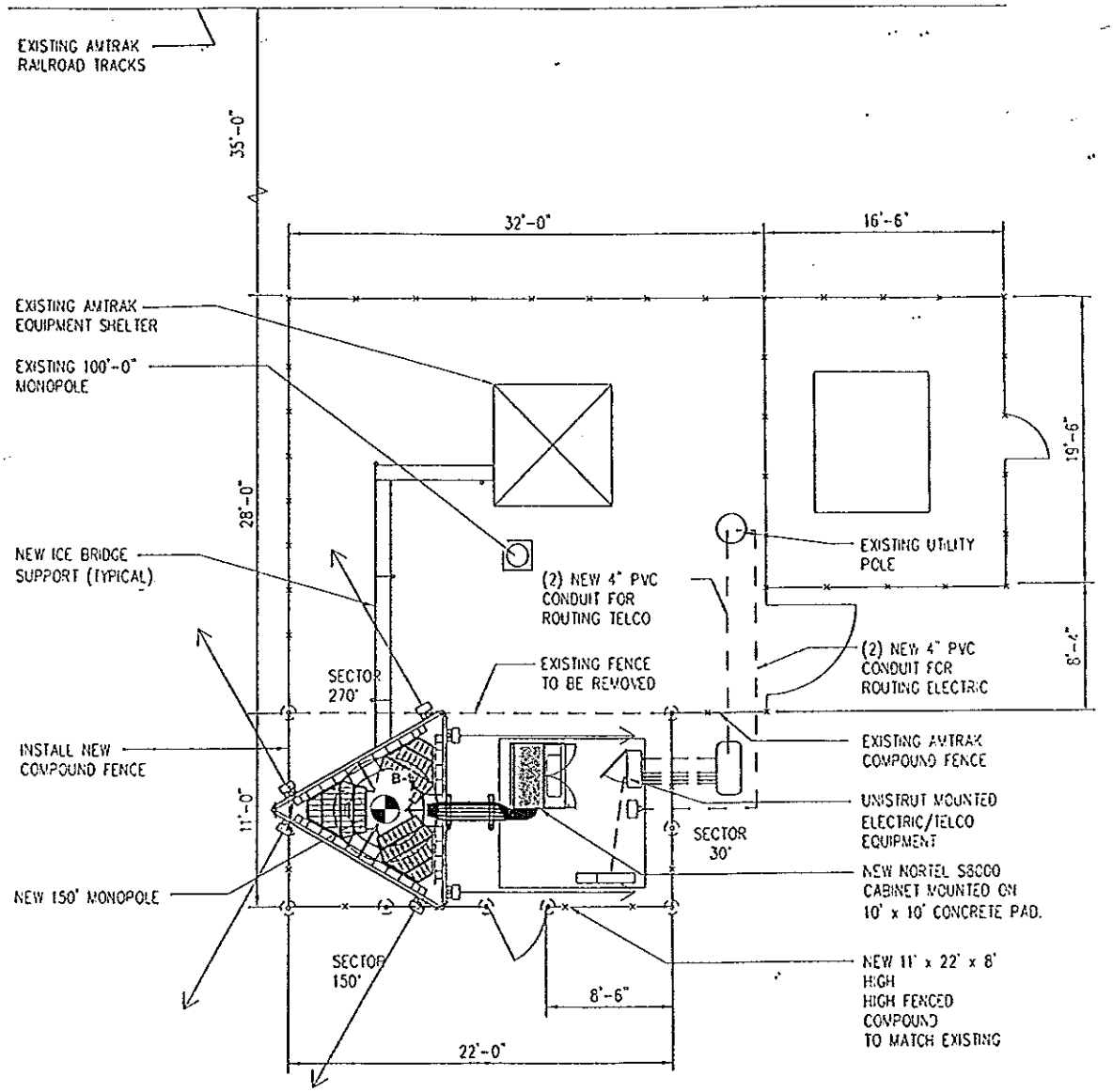
J.W.C.	J.W.C.	N.T.S.	01/19/00	00N007A	2



KEY

APPROXIMATE BORING LOCATION

TEST BORING 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-OLD SAYBROOK
ROUTE 1 @ FORD DRIVE
OLD SAYBROOK, CONNECTICUT

DRAWN BY:	CHECKED BY:	SCALE:	DATE:	JOB NO.:	DRAWING NO.:
K.G.	J.C.	N.T.S.	01/19/00	00N007A	3

BURMISTER SOIL CLASSIFICATION SYSTEM

A. Cohesionless Soils: Particle Size Definitions

Soil	Fraction	U.S. Standard Sieve	Actual Sizes
Gravel	coarse	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	coarse	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 0.75 mm
Silt		< No. 200	< 0.075 mm

B. Terms Describing Gradation of Cohesionless Soils

Written Description	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.

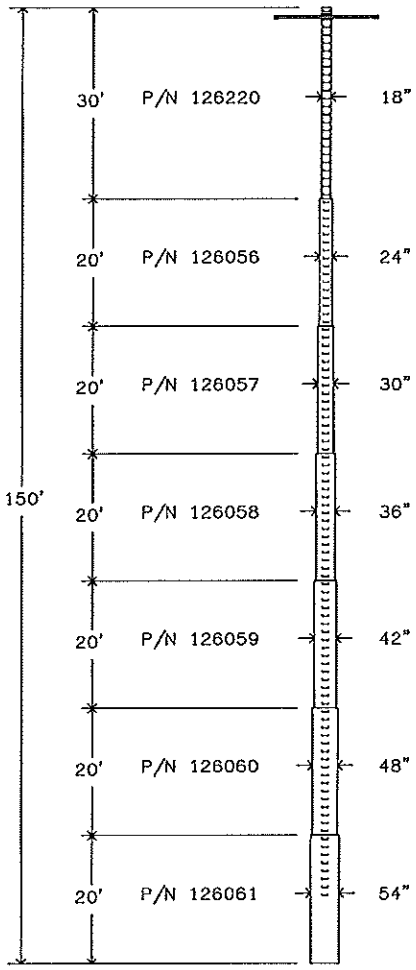
MONOPOLE SECTION DATA

(ALL BOLTS ARE FOR BOTTOM OF SECTION)

SECTION					CONNECT BOLT			PILOT BOLT		
LENGTH	PART#	SIZE	WALL	WT. *	DIAM	LENGTH	#	DIAM	LENGTH	#
30'	126220	18"	0.375"	2433#	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#	1"	4-1/2"	33	1"	5"	3
20'	126061	54"	0.375"	4918#						

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

CLAMP-ON PLATFORM TO BE PLACED AT 149' (C/L). SEE DWG # 135945-B FOR INSTALLATION DETAILS.



SEE TABLE ABOVE FOR SIZE & QTY FOR ALL CONNECT BOLTS.

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 7 OF THIS DRAWING FOR BASE SECTION INSTALL.

REMOVABLE CLIMBING RUNGS

REV	DESCRIPTION OF REVISIONS	INI	DATE
E	ADDED FOUNDATION PER SOIL REPORT	TAG	07/10/2000
D	HEIGHT CHANGE	KWD	07/07/2000
C	HEIGHT CHANGE	KWD	07/07/2000
B	ADDED FOUNDATION PER SOIL REPORT	WRH	02/25/2000
A	NEW SECTIONS - ALL PAGES	KWD	02/21/2000

VOICESTREAM WIRELESS
OLD SAYBROOK CT-11-327A, CT
MP54 X 150' ASSEMBLY DRAWING

APPROVED/ENG.	WBR	7/11/2000
APPROVED/FOUND.	N/A	
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PAGE 1 OF 9

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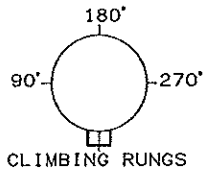
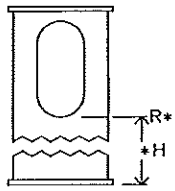
OPENINGS & BRACKETS WELDED TO POLE

HEIGHT *H	TYP	DESCRIPTION	ANGL	ASSEMBLY DRAWING#
149' -6"	13	SAFETY CLIMB BRACKET	0°	
148' -3"	11	PLATFORM MOUNTING ANGLES (4)	SEE>	121975-B
145' -9"	21	4" x 16" OVAL PORTHOLE	60°	
145' -9"	21	4" x 16" OVAL PORTHOLE	180°	
145' -9"	21	4" x 16" OVAL PORTHOLE	300°	
143' -9"	19	PAD EYES FOR FUTURE PLATFORM	SEE>	121975-B
139'	11	PLATFORM MOUNTING ANGLES (4)	SEE>	121975-B
136' -9"	21	4" x 16" OVAL PORTHOLE	60°	
136' -9"	21	4" x 16" OVAL PORTHOLE	180°	
136' -9"	21	4" x 16" OVAL PORTHOLE	300°	
134' -9"	19	PAD EYES FOR FUTURE PLATFORM	SEE>	121975-B
130'	11	PLATFORM MOUNTING ANGLES (4)	SEE>	121975-B
127' -9"	21	4" x 16" OVAL PORTHOLE	60°	
127' -9"	21	4" x 16" OVAL PORTHOLE	180°	
127' -9"	21	4" x 16" OVAL PORTHOLE	300°	
125' -9"	19	PAD EYES FOR FUTURE PLATFORM	SEE>	121975-B
97'	9	4" X 6" PORTHOLE EXITING UP	90°	
97'	9	4" X 6" PORTHOLE EXITING UP	270°	
73'	9	4" X 6" PORTHOLE EXITING UP	90°	
73'	9	4" X 6" PORTHOLE EXITING UP	270°	
48'	9	4" X 6" PORTHOLE EXITING UP	90°	
48'	9	4" X 6" PORTHOLE EXITING UP	270°	
9' -10"	8	TRANS. LINE BRIDGE ATTACH BRACKET	90°	
9' -10"	8	TRANS. LINE BRIDGE ATTACH BRACKET	180°	
9' -10"	8	TRANS. LINE BRIDGE ATTACH BRACKET	270°	
9' -6"	13	SAFETY CLIMB BRACKET	0°	
7' -4"	2	10" X 25" OVAL PORTHOLE	90°	
7' -4"	2	10" X 25" OVAL PORTHOLE	180°	
7' -4"	2	10" X 25" OVAL PORTHOLE	270°	
6' -9"	7	GROUNDING PLATE	90°	
6' -9"	7	GROUNDING PLATE	180°	
6' -9"	7	GROUNDING PLATE	270°	
1' -6"	2	10" X 25" OVAL PORTHOLE	180°	
1'	18	GROUNDING ANGLES (3)	SEE>	131093-B

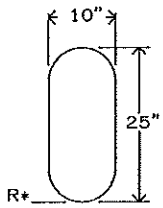


CLIMBING RUNGS

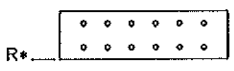
THE ANGLE TO THE OPENING IS MEASURED CLOCKWISE FROM THE CENTER-LINE OF THE CLIMBING RUNGS WHEN LOOKING DOWN.



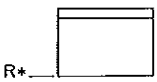
* THE HEIGHT IN THE TABLE IS THE DISTANCE FROM THE BASE OF THE BOTTOM SECTION OF THE POLE TO THE OPENING REFERENCE (R*) AS SHOWN ON PAGES 2 - 3 OF THIS DRAWING.



TYPE 2 OPENING



GROUNDING PLATE



LINE BRIDGE BRACKET

REV	DESCRIPTION OF REVISIONS	INI	DATE
E	ADDED FOUNDATION PER SOIL REPORT	TAG	07/10/2000
D	HEIGHT CHANGE	KWD	07/07/2000
C	HEIGHT CHANGE	KWD	07/07/2000
B	ADDED FOUNDATION PER SOIL REPORT	WRH	02/25/2000
A	NEW SECTIONS - ALL PAGES	KWD	02/21/2000

VOICESTREAM WIRELESS
OLD SAYBROOK CT-11-327A, CT
MP54 X 150' OPENINGS

APPROVED/ENG.	WBR	7/11/2000
APPROVED/FOUND.	N/A	
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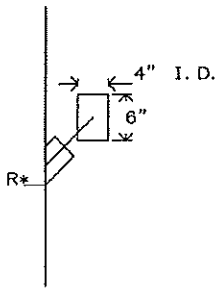
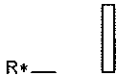
DRAWING NO. 206047-B
PAGE 2 OF 9



TYPE 9
OPENING

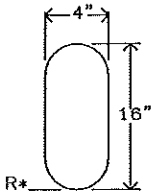
PLATFORM MOUNTING
ANGLE



SAFETY CLIMB
BRACKET

FRONT VIEW TOP VIEW

GROUNDING ANGLE



TYPE 21
OPENING

				VOICESTREAM WIRELESS OLD SAYBROOK CT-11-327A, CT MP54 X 150' OPENINGS			
E	ADDED FOUNDATION PER SOIL REPORT	TAG	07/10/2000				
D	HEIGHT CHANGE	KWD	07/07/2000				
C	HEIGHT CHANGE	KWD	07/07/2000	APPROVED/ENG.	WBR	7/11/2000	PIROD INC.
B	ADDED FOUNDATION PER SOIL REPORT	WRH	02/25/2000	APPROVED/FOUND.	N/A		1545 Pidco Dr. Plymouth, IN 46563-0128 219-936-4221
A	NEW SECTIONS - ALL PAGES	KWD	02/21/2000	COPYRIGHT 2014			
REV	DESCRIPTION OF REVISIONS	INI	DATE	DRAWN BY	KWD		
From F0091443.DFT - 07/10/2000 14:56 Printed from 206047_030E.DWG - 07/11/2000 15:16 @ 09/25/2014 11:12				ENG. FILE NO. A-117281- ARCHIVE F-0091443			DRAWING NO. 206047-B 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.
   (E) ANCHOR BOLTS CONFORM TO ASTM A-687 REQUIREMENTS.
3. BASE REACTIONS PER EIA/TIA-222-F FOR 85 MPH BASIC WIND SPEED WITH NO ICE.
   TOTAL WEIGHT= 36.3 KIPS.
   MOMENT= 1960.3 KIP-FT.
   MAXIMUM SHEAR= 18.5 KIPS TOTAL.
4. BASE REACTIONS PER EIA/TIA-222-F FOR 85 MPH BASIC WIND SPEED WITH 0.50" RADIAL ICE:
   TOTAL WEIGHT= 41.1 KIPS.
   MOMENT= 1622.7 KIP-FT.
   MAXIMUM SHEAR= 14.9 KIPS TOTAL.
5. FINISH: HOT DIPPED GALVANIZED AFTER FABRICATION.
6. ANTENNAS: 149' (9) EMSRR90-17-XXDP USING 1-5/8" LINES MOUNTED ON A LOW PROFILE PLATFORM.
   139' (9) EMSRR90-17-XXDP USING 1-5/8" LINES MOUNTED ON A LOW PROFILE PLATFORM.
   130' (9) EMSRR90-17-XXDP USING 1-5/8" LINES MOUNTED ON A LOW PROFILE PLATFORM.
   100' (1) PD220 USING 1-5/8" LINE MOUNTED ON 2' CLAMP-ON SIDE ARM.
   75' (1) PD220 USING 1-5/8" LINE MOUNTED ON 2' CLAMP-ON SIDE ARM.
   50' (1) PD220 USING 1-5/8" LINE MOUNTED ON 2' CLAMP-ON SIDE ARM.
7. INSTALL BASE SECTION WITH MINIMUM OF 2" CLEARANCE ABOVE CONCRETE. SEE BASE SECTION PLACEMENT PAGE OF THIS DRAWING FOR MORE INFORMATION.
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 STRUCTURAL BOLTS ARE TO BE TIGHTENED TO A SNUG TIGHT CONDITION AS DEFINED BY AISC SPECIFICATION UNLESS OTHERWISE NOTED. A MORE QUANTITATIVE ALTERNATIVE APPROACH TO ACHIEVING A SNUG TIGHT CONDITION IS TO TIGHTEN USING THE TORQUE VALUES FROM DRAWING 123107-A.
11. EIA GROUNDING FOR TOWER.
12. OUTSIDE CLIMB RUNGS WITH SAFETY CLIMB.
13. MONOPOLE TO BE PAINTED SLATE GRAY.

REV	DESCRIPTION OF REVISIONS	INI	DATE
E	ADDED FOUNDATION PER SOIL REPORT	TAG	07/10/2000
D	HEIGHT CHANGE	KWD	07/07/2000
C	HEIGHT CHANGE	KWD	07/07/2000
B	ADDED FOUNDATION PER SOIL REPORT	WRH	02/25/2000
A	NEW SECTIONS - ALL PAGES	KWD	02/21/2000

VOICESTREAM WIRELESS
OLD SAYBROOK CT-11-327A, CT
MP54 X 150' NOTES

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ARCHIVE F-0091443

DRAWING NO. 206047-B
PAGE 4 OF 9

FOUNDATION NOTES

1. SOIL AS PER REPORT BY FRENCH & PARRELLO ASSOCIATES, DATED 2/1/00, FILE #00N006AR1
2. CONCRETE TO BE 3000 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. BENDING, STRAIGHTENING OR REALIGNING (HOT OR COLD) OF THE ANCHOR BOLTS BY ANY METHOD IS PROHIBITED.
8. CROWN TOP OF FOUNDATION FOR PROPER DRAINAGE.
9. INSTALL BASE SECTION WITH MINIMUM OF 2" CLEARANCE ABOVE CONCRETE. SEE PAGE 9 OF THIS DRAWING FOR MORE INFORMATION.
10. A TEMPORARY STEEL CASING IS REQUIRED DURING INSTALLATION.
11. A SUMP PUMP OR OTHER DEWATERING SYSTEM MAY BE REQUIRED TO LOWER THE WATER TABLE TO FACILITATE THE INSTALLATION OF THE FOUNDATION.
12. TREMIE METHODS OF CONCRETE PLACEMENT MAY BE REQUIRED IF DEWATERING DOES NOT ADEQUATELY LOWER THE GROUNDWATER LEVEL.
13. ADEQUATE CONCRETE IS TO BE MAINTAINED IN THE STEEL CASING SO AS TO OFFSET THE HYDROSTATIC HEAD OF THE GROUNDWATER.

REV	DESCRIPTION OF REVISIONS	INI	DATE
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D	HEIGHT CHANGE	KWD	07/07/2000
C	HEIGHT CHANGE	KWD	07/07/2000
B	ADDED FOUNDATION PER SOIL REPORT	WRH	02/25/2000
A	NEW SECTIONS - ALL PAGES	KWD	02/21/2000

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VOICESTREAM WIRELESS
BRANFORD CT-11-328A, CT
MP54 X 150' NOTES

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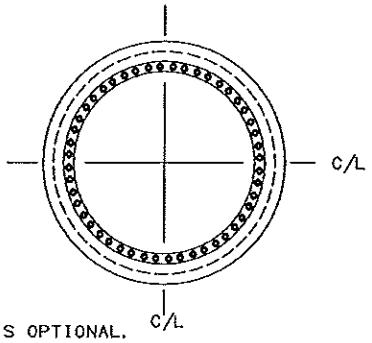
DRAWING NO. 206047-B
PAGE 5 OF 9

TOP VIEW

TOP AND SIDE VIEWS ARE DRAWN TO DIFFERENT SCALE

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

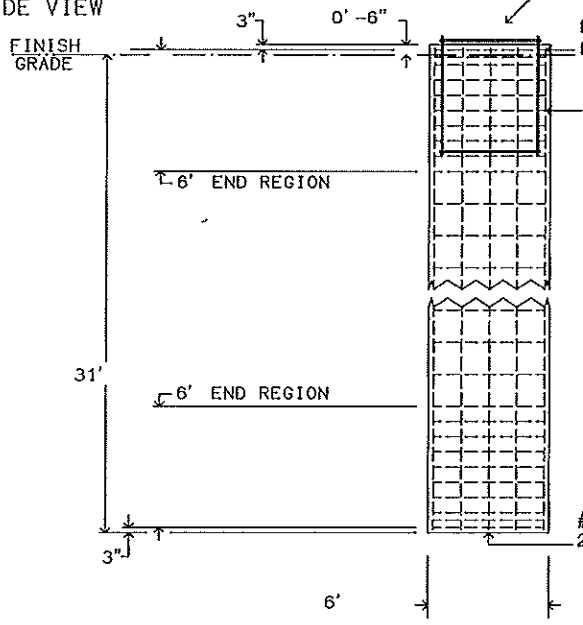


GROUTING OF MONOPOLE BASE IS OPTIONAL. IF GROUT IS USED, DRAINAGE MUST BE PROVIDED FROM THE INTERIOR OF POLE.

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. 32 PIECES REQUIRED. PLACE RINGS AT 0'-9" NOMINAL SPACING WITHIN END REGIONS, AND 1'-6" NOMINAL SPACING IN REMAINDER OF PIER.

9 VERTICAL REBAR - SEE (A) ON PAGE 7. 23 PIECES REQUIRED , EQUALLY SPACED, TO BE PLACED INSIDE TIES.

TOWER FOUNDATION

33.0 CUBIC YARDS CONCRETE REQUIRED

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

REV	DESCRIPTION OF REVISIONS	INI	DATE
E	ADDED FOUNDATION PER SOIL REPORT	TAG	07/10/2000
D	HEIGHT CHANGE	KWD	07/07/2000
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A	NEW SECTIONS - ALL PAGES	KWD	02/21/2000

VOICESTREAM WIRELESS
BRANFORD CT-11-328A, CT
MP54 X 150' FOUNDATION

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ARCHIVE F-0091442

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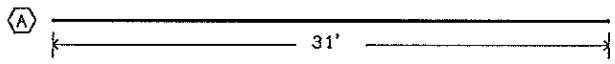
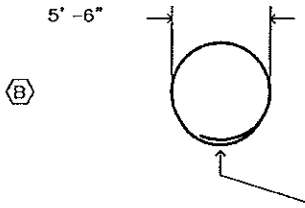
PAGE 6 OF 9



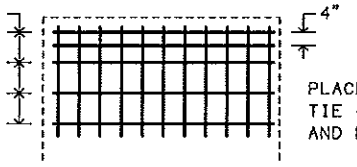
9 REBAR - 23 PIECES REQ. TOTAL
APPROX WT = 105.4# EACH, 2424# TOTAL



5 REBAR - 32 PIECES REQUIRED TOTAL
APPROX UNBENT LENGTH = 19' - 6- 1/8"
APPROX WT = 20.3# EACH, 650# TOTAL

LAP DIMENSION: 2' - 2- 3/4"
PLACE REBAR RINGS SO THAT LAPS ON ADJACENT RINGS ARE 180 DEGREES APART.
SEE PAGE 6 FOR RING PLACEMENT.

PLACE 9 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 = 3074#
REINFORCING BAR TO CONFORM TO ASTM A615 GRADE 60 SPECIFICATIONS.

REV	DESCRIPTION OF REVISIONS	INI	DATE
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C	HEIGHT CHANGE	KWD	07/07/2000
B	ADDED FOUNDATION PER SOIL REPORT	WRH	02/25/2000
A	NEW SECTIONS - ALL PAGES	KWD	02/21/2000

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VOICESTREAM WIRELESS
BRANFORD CT-11-328A, CT
MP54 X 150' REBAR DETAIL

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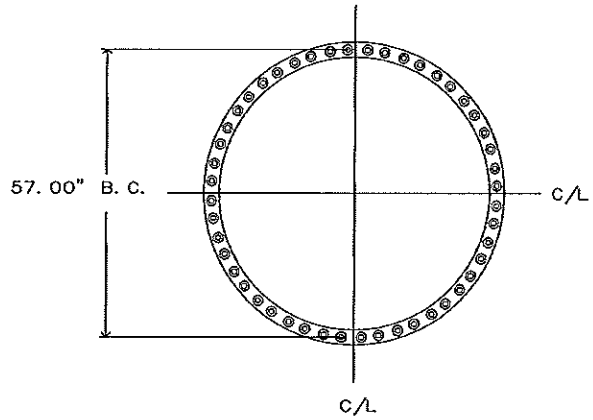
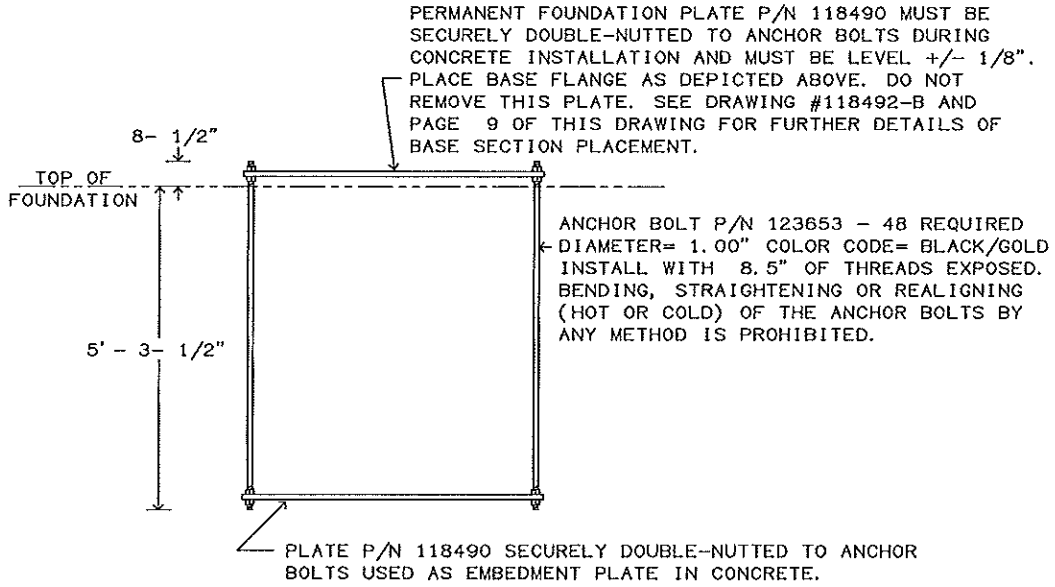
DRAWING NO. 206047-B
PAGE 7 OF 9

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

REV	DESCRIPTION OF REVISIONS	INI	DATE
E	ADDED FOUNDATION PER SOIL REPORT	TAG	07/10/2000
B	ADDED FOUNDATION PER SOIL REPORT	WRH	02/25/2000

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VOICESTREAM WIRELESS
BRANFORD CT-11-328A, CT
MP54 X 150' ANCHOR STEEL

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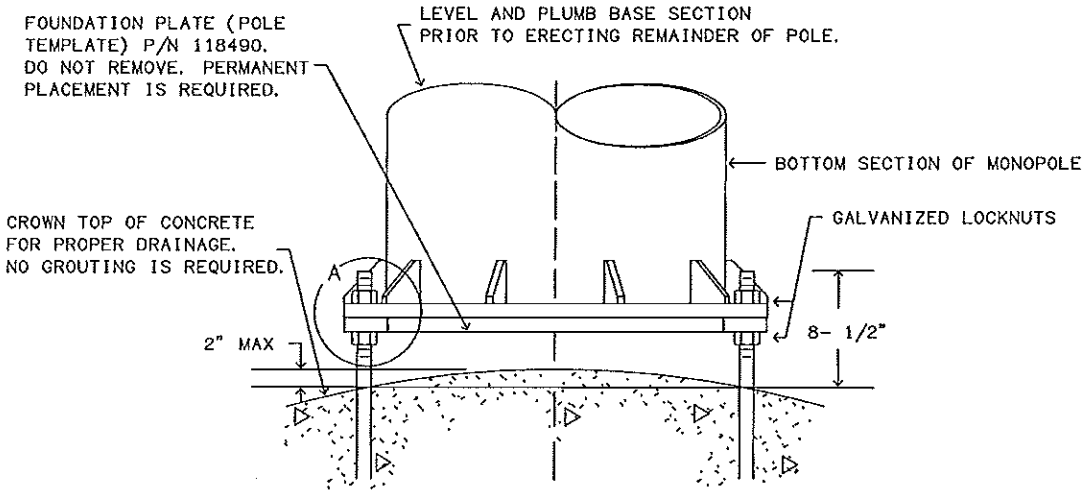
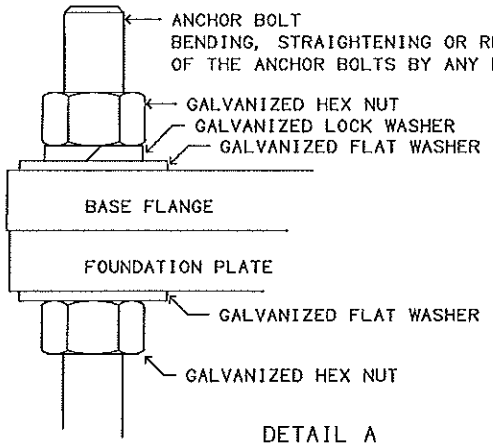
DRAWING NO. 206047-B
PAGE 8 OF 9





DETAIL A

TOWER BASE SECTION PLACEMENT

REV	DESCRIPTION OF REVISIONS	INI	DATE
E	ADDED FOUNDATION PER SOIL REPORT	TAG	07/10/2000
B	ADDED FOUNDATION PER SOIL REPORT	WRH	02/25/2000

From: F0091442.DFT - 07/10/2000 13:48
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VOICESTREAM WIRELESS
BRANFORD CT-11-328A, CT
MP54 X 150' BASE SECTION PLACEMENT

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DRAWING NO. 206047-B
PAGE 9 OF 9

TOWER ELEVATION PHOTO

PROJECT INFORMATION:

150' SELF-SUPPORTING POLE STRUCTURE

TOWER MAPPING

PROJECT NAME:

FORD DRIVE

TECTONIC W.O. NUMBER:

6421.CT11327A

44 Ford Drive- Amtrack Maint Yard, Old Saybrook, CT 06475 (Middlesex County)

MAPPING DATE:

08/14/14

LATITUDE:	N 41° 18' 4.44"	N 41.301233°
LONGITUDE:	W 72° 22' 29.05"	W 72.374736°
GROUND ELEVATION (AMSL):	40'	
TOWER MANUFACTURER:	PiRod / Valmont	
TOWER MODEL OR SERIAL #:	-	
STRUCTURE HEIGHT:	151'	
FCC REGISTRATION:	-	

TABLE OF CONTENTS

FIELD AGENTS:

Toby Kloewer
Will Hinkle

PLANS PREPARED FOR:

TECTONIC
Practical Solutions, Exceptional Service

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

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	08/27/14	Tower Mapping Final Report

SIGNATURE OF CREW LEADER:

Toby Kloewer

VSI #: 140875

DRAWN BY: CLS

CHECKED BY: MRM

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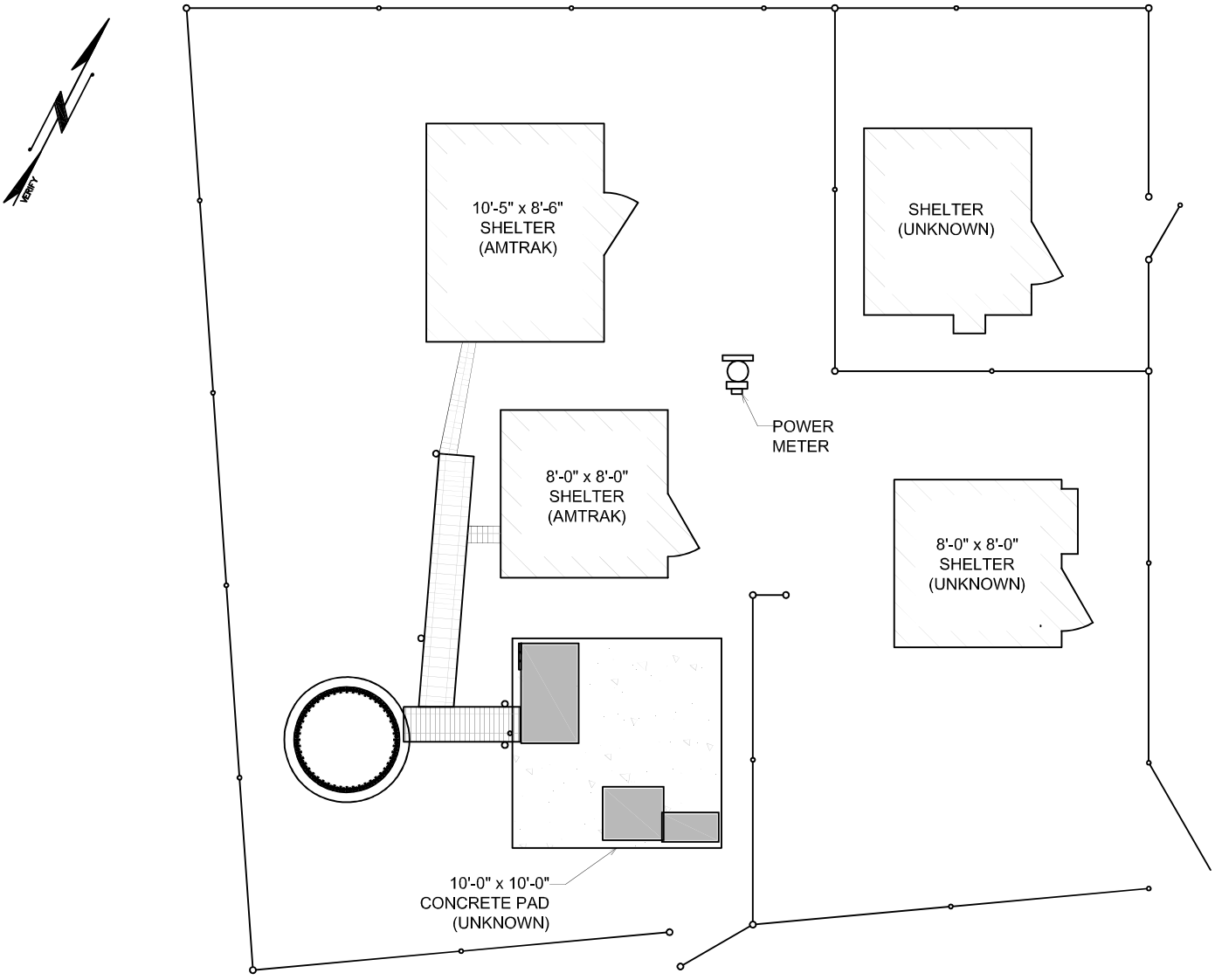
TOWER MAPPING REPORT

Site Name Ford Drive__CT
VSI # 140875
Client# 6421.CT11327A
Date 08/27/14

COMPOUND PLAN SKETCH

- Draw plan view of compound showing all physical features and/or dimensions.
- Show magnetic north and designate tower leg "A" with magnetic azimuth.



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

Carrier	Site ID	Meter #
T-Mobile	-	#
Amtrack	-	#
-	-	#

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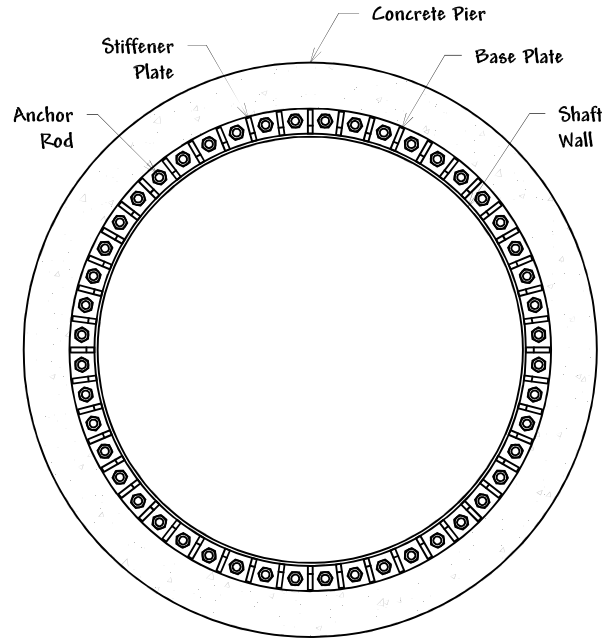
TOWER MAPPING REPORT

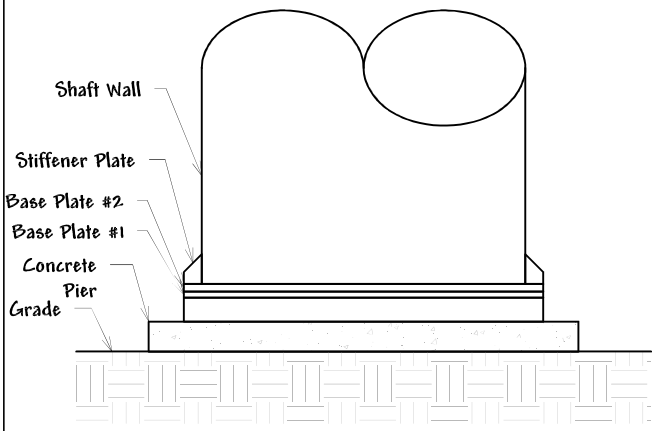
Site Name Ford Drive__CT
VSI # 140875
Client# 6421.CT11327A
Date 08/27/14

BASE PLATE / TOP OF FOUNDATION DETAILS

- Note any as-built conditions not depicted in drawings.



PLAN VIEW

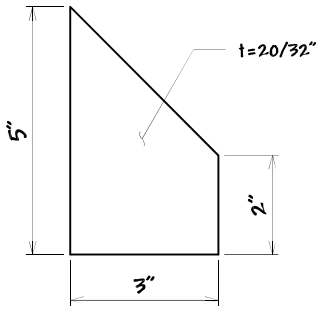


ELEVATION

DIMENSIONS	
Component	**Size**
Anchor Rods:	(48) 1"Ø
Base Plate Thickness :	#1 = 1', #2 = 1 1/4"
Base Plate Diameter :	5'-0"Ø
Gap :	4"
Height of Pier Above Grade :	5"
Pier Diameter :	6'Ø

NOTES

Stiffener Plate



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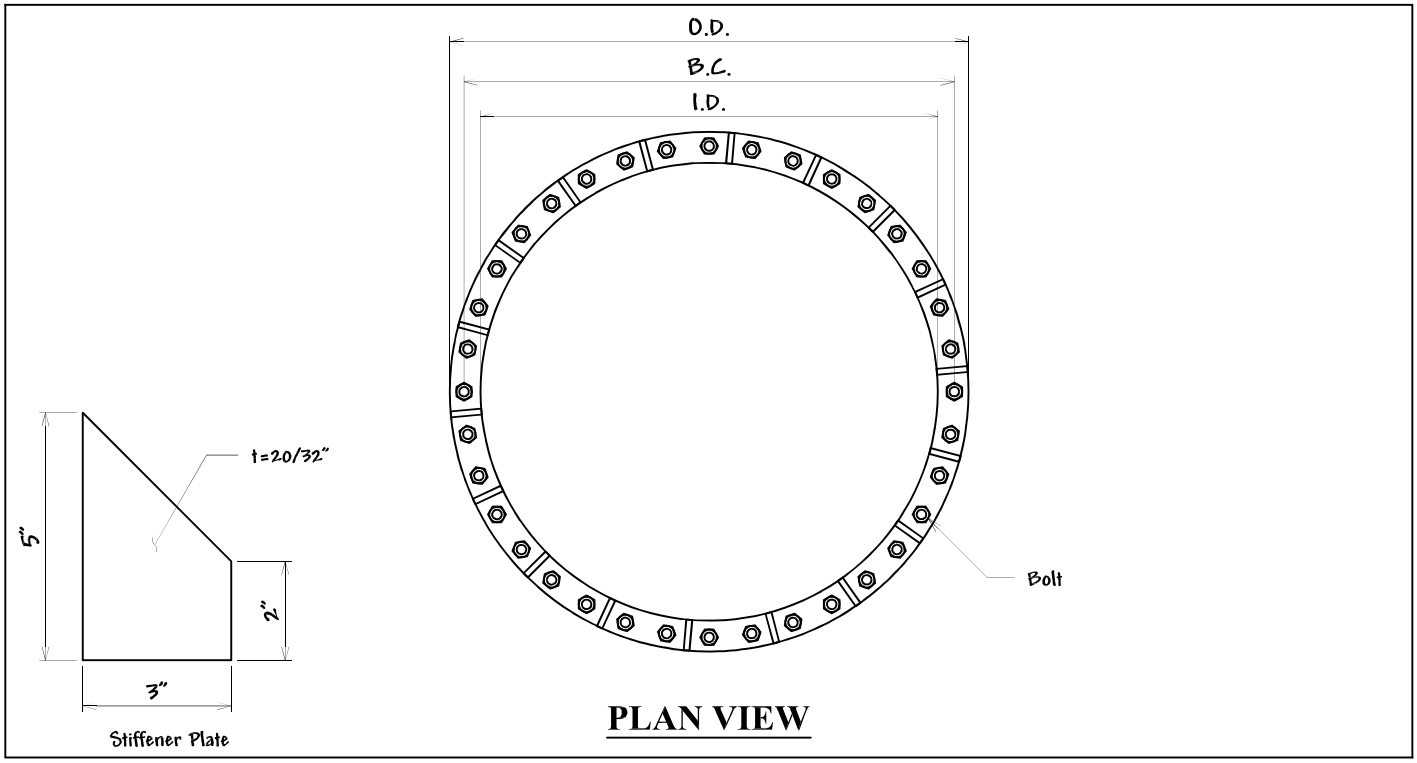
TOWER MAPPING REPORT

Site Name Ford Drive__CT
VSI # 140875
Client# 6421.CT11327A
Date 08/27/14

FLANGE DETAILS

- Note any as-built conditions not depicted in drawings.



					Bolts		
Section #	O.D.	I.D.	B.C.	Thickness	Qty	Size	Stiffener Qty
Bottom #1	60"	54"	57"	1 1/4"	48	1"Ø	48
Top #1	54"	-	51"	1 1/4"	36	1"Ø	-
Bottom #2	54"	48"	51"	1 1/4"	36	1"Ø	18
Top #2	48"	-	45"	1 1/4"	32	1"Ø	-
Bottom #3	48"	42"	45"	1 1/4"	32	1"Ø	16
Top #3	42"	-	39"	1 1/4"	28	1"Ø	-
Bottom #4	42"	36"	39"	1 1/4"	28	1"Ø	14
Top #4	36"	-	33"	1 1/4"	24	1"Ø	-
Bottom #5	36"	30"	33"	1 1/4"	24	1"Ø	12
Top #5	30"	-	27"	1 1/4"	20	1"Ø	-
Bottom #6	30"	24"	27"	1 1/4"	20	1"Ø	10
Top #6	24"	-	21"	1 1/4"	16	1"Ø	-
Bottom #7	24"	18"	21"	1 1/4"	16	1"Ø	8
Top #7	18"	-	15"	1 1/4"	-	-	-

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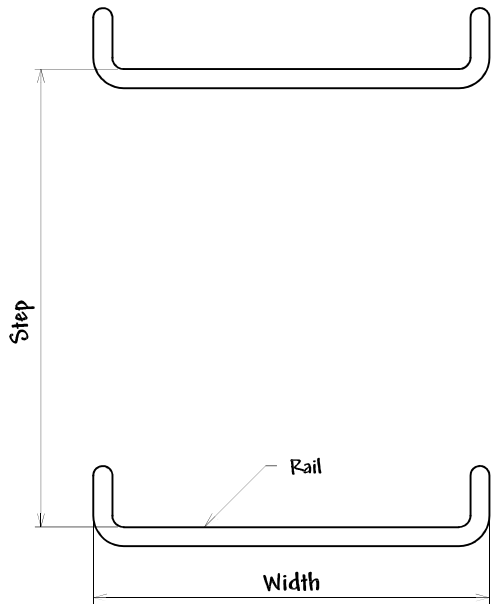
TOWER MAPPING REPORT

Site Name Ford Drive__CT
VSI # 140875
Client# 6421.CT11327A
Date 08/27/14

LADDER AND WAVEGUIDE

- Draw a front elevation view of climbing ladder(s) and waveguide ladder(s).
- Drawings should be typical when appropriate, showing generic dimensions.

Climbing Ladder Sketch



Waveguide Ladder Sketch

NA
Coax is routed inside of shaft

Ladder #	Flats #	Height	Width	Step	Rung (type and size)	Safety Wire (type and size)
1	NA	10'	13"	15"	SR 20/32"Ø	3/8"Ø Stranded

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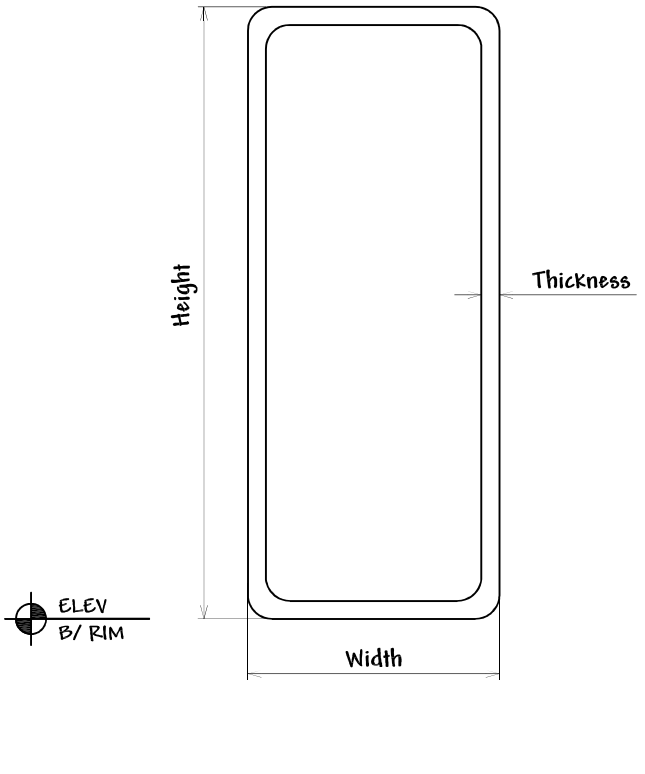
TOWER MAPPING REPORT

Site Name Ford Drive__CT
VSI # 140875
Client# 6421.CT11327A
Date 08/27/14

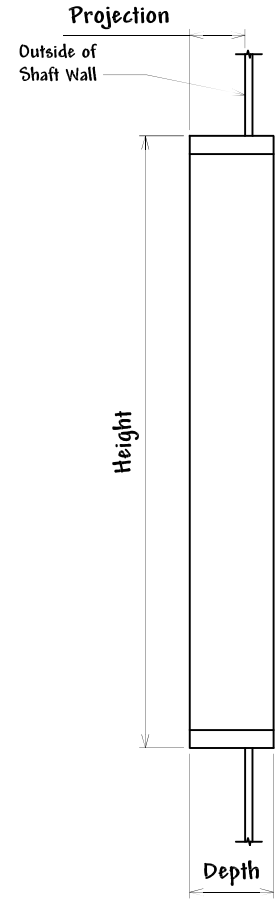
HAND HOLE RIMS

- Draw a front and side elevation view of entry & exit hand hole rim(s).
- Drawings should be typical when appropriate, showing generic dimensions.

Front Elevation

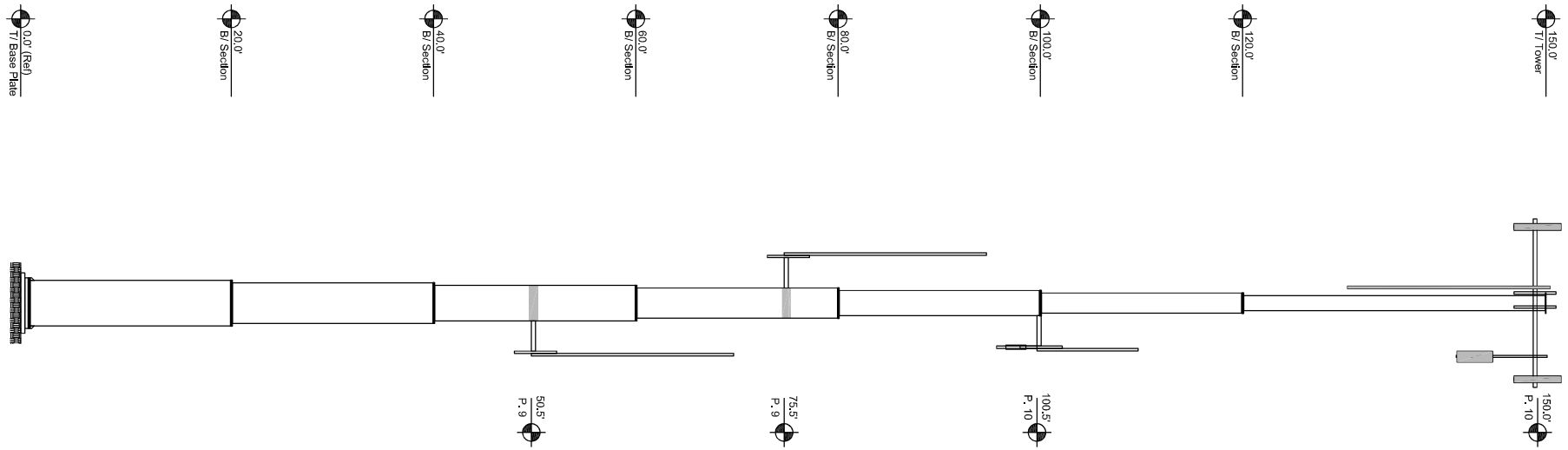


Side Elevation



#	Elevation	Width	Height	Thickness	Depth	Projection	Flat #(s)	Description
1	16 1/2"	13	27	1	6	3	60°	NNE
2-4	87"	13	27	1	6	3	330°,60°,150°	NNW,NNE,SSE
5-6	48'	4	6	1/4	2 1/4-8 1/2	1, 5	330°,150°	Top - Bot
7-8	74'	4	6	1/4	2 1/4-8 1/2	1, 5	330°,150°	Top - Bot
9-10	99'	4	6	1/4	2 1/4-8 1/2	1, 5	330°,150°	Top - Bot
11-13	129'	4	16	1/2	4	2 1/4	330°,60°,150°	-
14-16	138'	4	16	1/2	4	2 1/4	330°,60°,150°	-
17-19	147'	4	16	1/2	4	2 1/4	330°,60°,150°	-

STRUCTURE							
SECTION	01	02	03	04	05	06	07
LENGTH	20'	20'	20'	20'	20'	20'	30'
PiROD PN	126061	126060	126059	126058	-	126056	126220
NUMBER OF SIDES	ROUND	ROUND	ROUND	ROUND	ROUND	ROUND	ROUND
THICKNESS	0.375"	0.375"	0.375"	0.375"	0.375"	0.375"	0.375"
DIAMETER	54"	48"	42"	36"	30"	24"	18"
FLANGE BOLTS	-	(36) 1"Ø	(32) 1"Ø	(28) 1"Ø	(24) 1"Ø	(20) 1"Ø	(16) 1"Ø
ANCHOR RODS	(48) 1"Ø	-	-	-	-	-	-

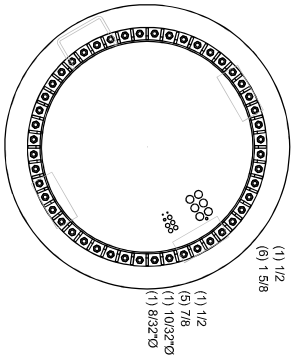


TOWER ELEVATION
SCALE: 3/32" = 1'-0"

APPURTENANCES							
ELEV.	CARRIER	MOUNT	QTY	ANTENNA TYPE	ANT. DIMS. (LxWxD)	AZIMUTH ±	TX-LINE
150.0'	T-Mobile	Platform	6	EMS / RR901702DP	56" x 8" x 2 3/4"±	30°, 150°, 270°	(6) 1 5/8
153.0'			1	RFS / MA0245-19 AN	14 1/2" x 14 1/2" x 1 1/2"±	-	(1) 7/8
150.0'	Unknown		2	DB874G45-XY	48x12x8±	-	(1) 7/8
150.0'			1	Inverted Omni	20'	-	(1) 7/8
153.0'			1	Pipe w/ Rings	14"	-	(1) 1/2
100.5'	Amtrak	Side Arm	2	MTI Wireless Edge / MT - 404067/ND	23.625" x 5.125" x 2.5"	70°, 250°	(1) 10/32"Ø
			2	RUGGED MAX / WIN7237-5	8.97" x 10.11" x 1.4"		(1) 8/32"Ø
			1	Omni	10'	-	(1) 1/2
75.5'	Amtrak	Side Arm	1	Omni	20'	-	(1) 7/8
50.5'	Amtrak	Side Arm	1	Omni	20'	-	(1) 7/8

X
P. Y

NOTES:
1. X DENOTES ANTENNA ELEVATION
   Y DENOTES PAGE NUMBER OF MAPPING REPORT TO REFER TO FOR MORE DETAIL



PLAN VIEW
SCALE: N.T.S

TOWER MAPPING REPORT
Site Name Ford Drive CT
VSI # 140875
Client# 6421.CT11321A
Date 08/27/14
Page 7 of 10

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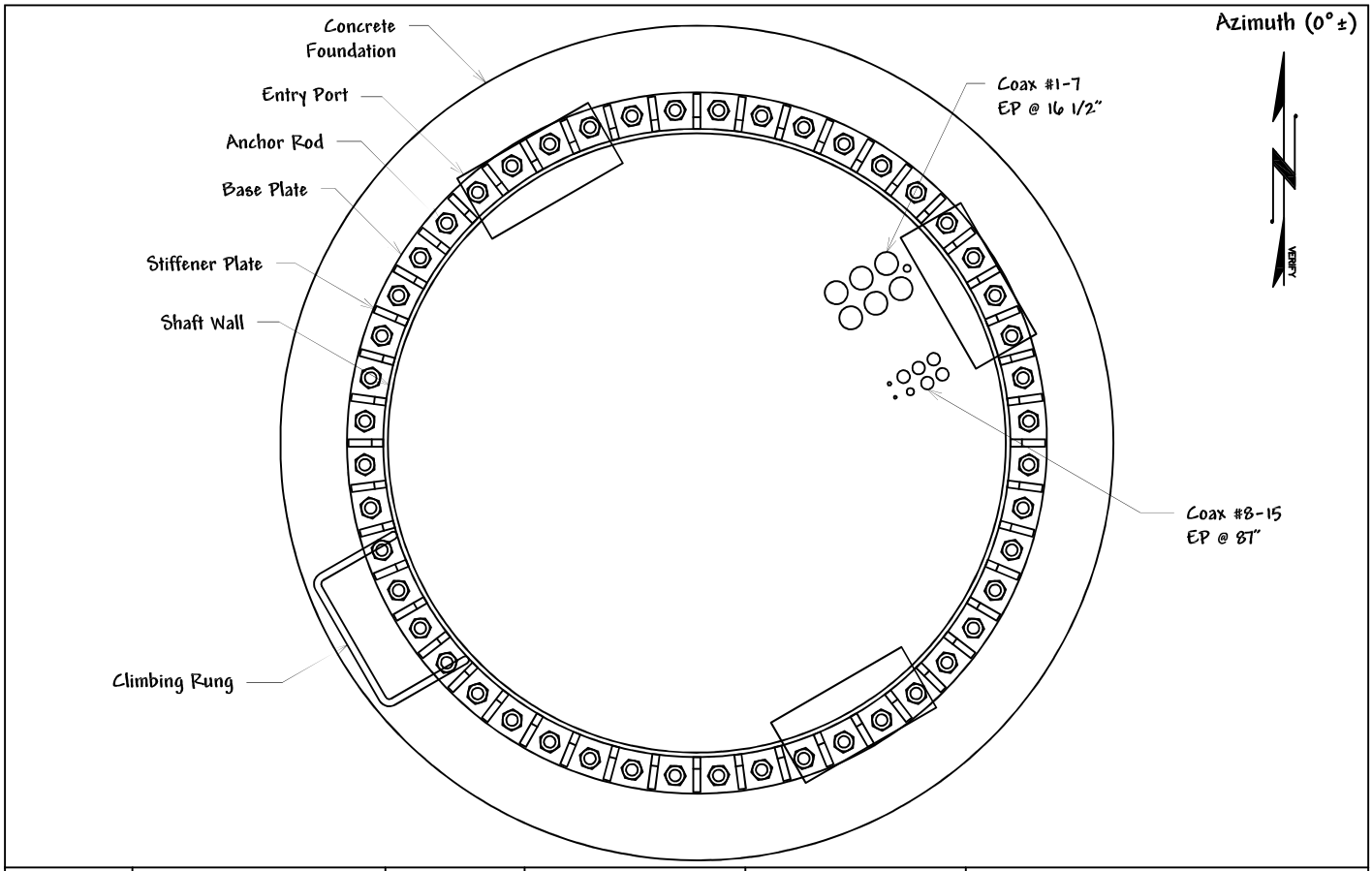
TOWER MAPPING REPORT

Site Name Ford Drive__CT
VSI # 140875
Client# 6421.CT11327A
Date 08/27/14

TRANSMISSION CABLES I

- Draw a plan view of the tower showing all cables, conduits, climbing ladders, waveguide ladders, etc.
- Beginning with coax on "A" leg, number all coax clockwise.



Coax #	Carrier	Type	Nominal Size	Measured Size	Stamp / Writing On Coax
1	T-Mobile	FH	1 5/8	-	-
2	T-Mobile	FH	1 5/8	-	-
3	T-Mobile	FH	1 5/8	-	-
4	T-Mobile	FH	1 5/8	-	-
5	T-Mobile	FH	1 5/8	-	-
6	T-Mobile	FH	1 5/8	-	-
7	T-Mobile	FH	1/2	-	-
8	Amtrak	FH	7/8	-	-
9	Amtrak	FH	7/8	-	-
10	Amtrak	FH	1/2	-	-
11	Amtrak	FH	-	10/32"Ø	-
12	Amtrak	FH	-	8/32"Ø	-
13	Amtrak	FH	7/8	-	-
14	Amtrak	FH	7/8	-	-
15	Amtrak	FH	7/8	-	-

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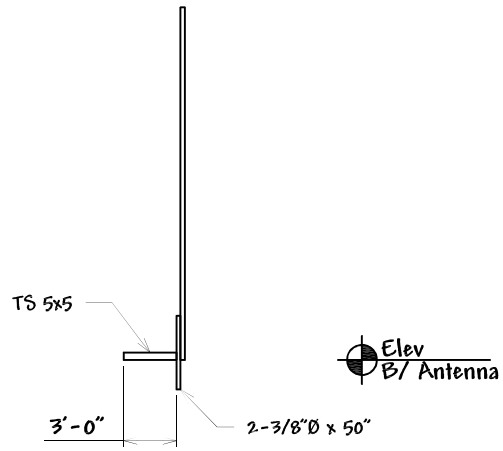
TOWER MAPPING REPORT

Site Name Ford Drive__CT
VSI # 140875
Client# 6421.CT11327A
Date 08/27/14

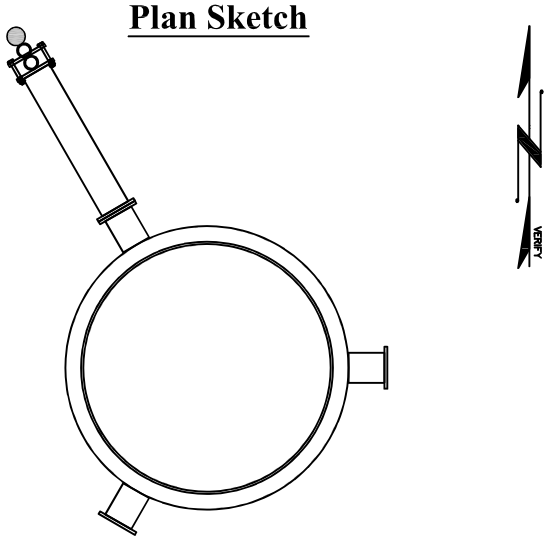
ANTENNA AND MOUNT SKETCH

- Draw an elevation & plan view of each antenna showing all dimensions of mount and antenna.
- Drawings can be used to show single antennas, sectors, or platforms.

Elevation Sketch



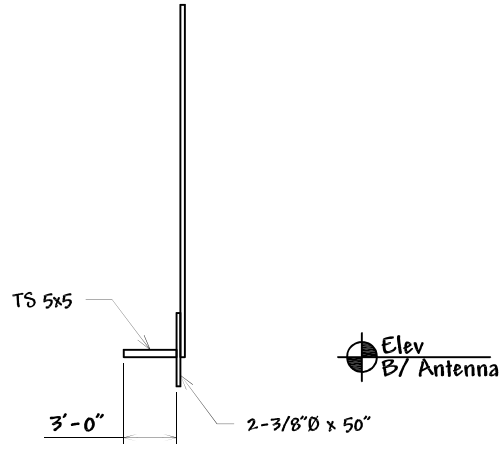
Plan Sketch



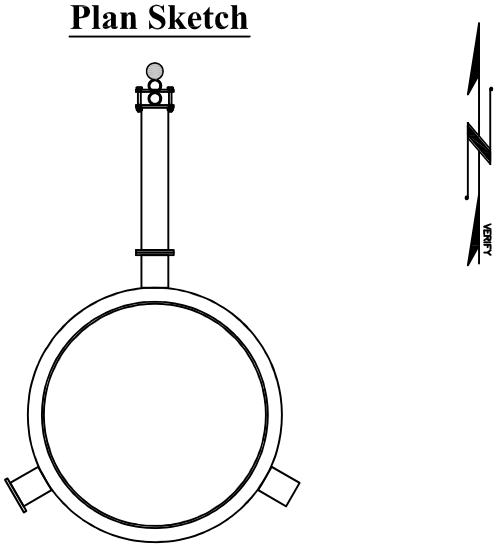
#	Elevation	Leg	Mount Type	Azimuth ±	Coax Size	Coax #
1	50.5'	N/A	Side Arm	-	7/8	8

Antenna Manufacturer	Antenna Model #	Ant. Dims. (LxWxD)	Carrier
-	Omni	20'	Amtrak

Elevation Sketch



Plan Sketch



#	Elevation	Leg	Mount Type	Azimuth ±	Coax Size	Coax #
2	75.5'	N/A	Side Arm	-	7/8	9

Antenna Manufacturer	Antenna Model #	Ant. Dims. (LxWxD)	Carrier
-	Omni	20'	-

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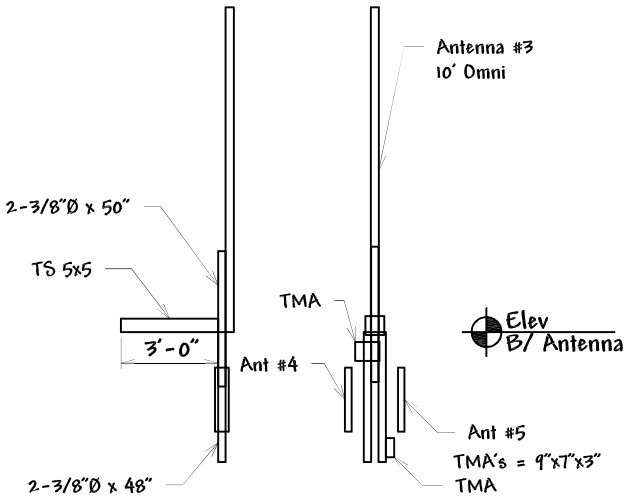
TOWER MAPPING REPORT

Site Name Ford Drive__CT
VSI # 140875
Client# 6421.CT11327A
Date 08/27/14

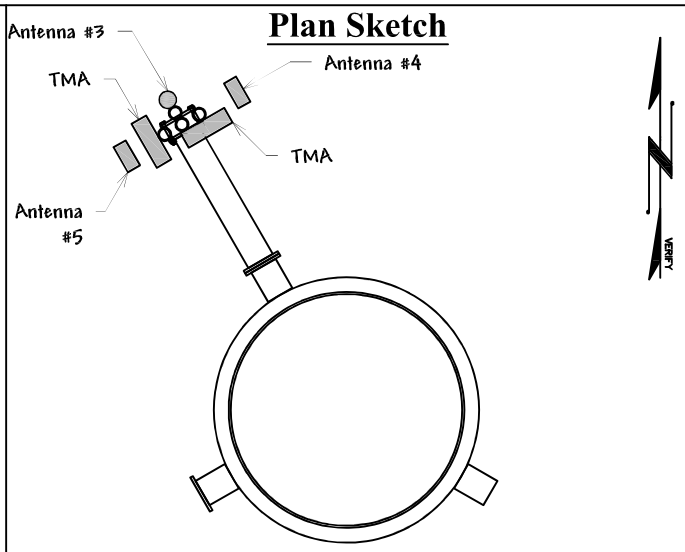
ANTENNA AND MOUNT SKETCH

- Draw an elevation & plan view of each antenna showing all dimensions of mount and antenna.
- Drawings can be used to show single antennas, sectors, or platforms.

Elevation Sketch



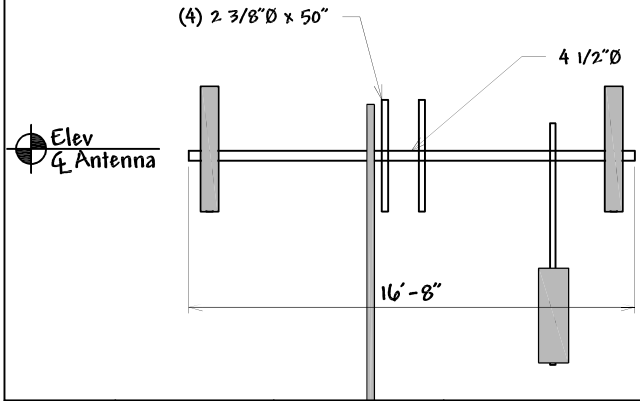
Plan Sketch



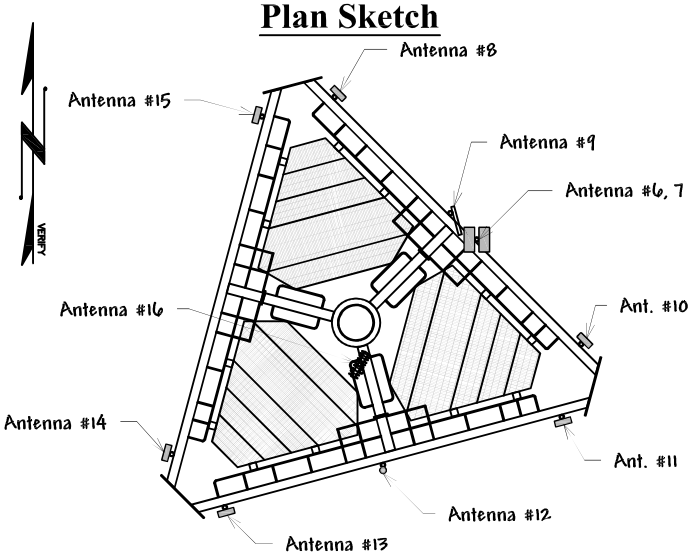
#	Elevation	Leg	Mount Type	Azimuth ±	Coax Size	Coax #
3-5	100.5'	N/A	Side Arm	70°, 250°	1/2, 10/32, 8/32	10-12

Antenna Manufacturer	Antenna Model #	Ant. Dims. (LxWxD)	Carrier
MTI Wireless Edge	Omni / MT-404067/ND	10' / 600mm x 130mm x 63mm	Amtrak

Elevation Sketch



Plan Sketch



#	Elevation	Leg	Mount Type	Azimuth ±	Coax Size	Coax #
6-16	150'	N/A	Platform	30°, 150°, 270°	1 5/8, 7/8, 1/2	-

Antenna Manufacturer	Antenna Model #	Ant. Dims. (LxWxD)	Carrier
EMS	RR9017020P	56"x8"x2 3/4"	T-Mobile
RFS	MA0245-19AN	14.5x14.5x1.5	T-Mobile
Andrew	DB874G45-XY	48x12x8±	Amtrak

CENTEK engineering

Centered on Solutions℠

Analysis Report

Antenna Mount Analysis

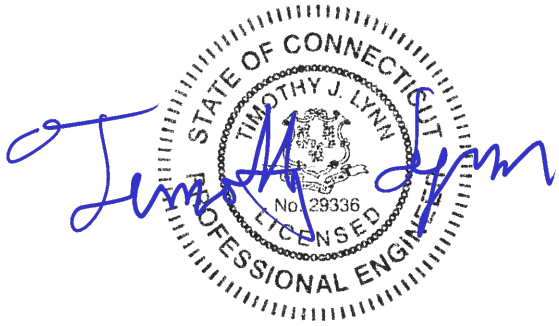
T-Mobile Site #: CT11327A

44 Ford Drive - Amtrak Main. Yard
Old Saybrook, CT

Centek Project No. 22022.18

~~Date: July 5, 2022~~
Rev 1: April 24, 2023

Max Stress Ratio = 77.2%



Prepared for:

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

Table of Contents

CENTEK engineering

Centered on Solutions℠

April 24, 2023

Mr. Dan Reid
Transcend Wireless
10 Industrial Ave
Mahwah, NJ 07430

Re: Structural Letter ~ Antenna Mount
T-Mobile – Site Ref: CT11327A
44 Ford Drive - Amtrak Main. Yard
Old Saybrook, CT 06475

Centek Project No. 22022.18

Dear Mr. Reid,

Centek Engineering, Inc. has reviewed the T-Mobile antenna installation at the above referenced site. The purpose of the review is to determine the structural adequacy of the existing mount, consisting of a low profile platform to support the equipment configuration. The review considered the effects of wind load, dead load and ice load in accordance with the 2021 International Building Code as modified by the 2022 Connecticut State Building Code (CTBC) including ASCE 7-16 and ANSI/TIA-222-H *Structural Standard for Antenna Supporting Structures, Antennas and Small Wind Turbine Support Structures"*.

The loads considered in this analysis consist of the following:

- T-Mobile:
  Low Profile Platform: Three (3) Ericsson AIR6419 panel antennas, three (3) RFS APXVAALL24-43 panel antennas, three (3) Commscope VV-65A-R1 panel antennas, three (3) Ericsson 4460 remote radio units and three (3) Ericsson 4480 remote radio units mounted on one (1) low profile platform with a RAD center elevation of 150 ft +/- AGL.
- Amtrak:
  On T-Mobile's Low Profile Platform: Two (2) omni-directional whip antennas, one (1) dish and two (2) panel antennas mounted on T-Mobile's low profile platform.

The antenna mount was analyzed per the requirements of the 2021 International Building Code as modified by the 2022 Connecticut State Building Code considering a Ultimate design wind speed of 130 mph for Old Saybrook as required in Appendix P of the 2022 Connecticut State Building Code.

A structural analysis of tower and foundation needs to be completed prior to any work.

Based on our review of the installation, it is our opinion that the subject antenna mount with the below recommendations has sufficient capacity to support the aforementioned antenna configuration. If there are any questions regarding this matter, please feel free to call.

1. Installation of three (3) stabilizer kits (Site Pro p/n: SFS-H) 2-ft below the existing collar w/ three (3) 2.0 std. x 16-ft long horizontal pipes.
2. Replacement of existing pipe masts at position 2 antennas w/ 2.5 std. x 9-ft long pipes.

Respectfully Submitted by:

Timothy J. Lynn, PE
Structural Engineer

STATE OF CONNECTICUT
TIMOTHY LYNN
No. 29336
LICENSED
PROFESSIONAL ENGINEER

Section 2 - Calculations

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:	TIA-222-H Loads
Location:	Old Saybrook, CT
Rev. 1: 4/24/23	Prepared by: T.J.L. Checked by: C.F.C. Job No. 22022.18

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

Wind Speeds

Basic Wind Speed	$V := 130$	mph	(User Input - CSBC 2022 Appendix P)
Basic Wind Speed with Ice	$V_i := 50$	mph	(User Input - TIA-222-H Annex B)
Basic Wind Speed (Mount)	$V_m := 30$	mph	(User Input - TIA-222-H Section 16.3)

Input

Structure Type =	Structure_Type := Flexible		(User Input)
Structure Category =	SC := II		(User Input)
Exposure Category =	Exp := C		(User Input)
Structure Height =	$h := 150$	ft	(User Input)
Height to Center of Antennas =	$z_{ant} := 150$	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)
Topograpic Factor =	$K_{zt} := 1$		(User Input)
Shielding Factor for Appurtenances =	$K_a := 1.0$		(User Input)
Rooftop Wind Speed-up Factor =	$K_s := 1.0$		(User Input)
Ground Elevation Factor =	$K_e = 0.996$		(User Input)
Gust Response Factor =	$G_H = 1.35$		(User Input)

Output

Wind Direction Probability Factor = $K_d := 0.95$ (Per Table 2-2 of TIA-222-H)

Importance Factors =

$$I_{ice} := \begin{cases} 0 \text{ if } SC = 1 \\ 1.00 \text{ if } SC = 2 \\ 1.15 \text{ if } SC = 3 \\ 1.25 \text{ if } SC = 4 \end{cases} = 1$$

(Per Table 2-3 of TIA-222-H)

$$I_{Seismic} := \begin{cases} 0 \text{ if } SC = 1 \\ 1.00 \text{ if } SC = 2 \\ 1.25 \text{ if } SC = 3 \\ 1.50 \text{ if } SC = 4 \end{cases} = 1$$

$$K_{iz} := \left(\frac{z_{ant}}{33}\right)^{0.1} = 1.163$$

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

Velocity Pressure Coefficient Antennas =

$$Kz_{ant} := 2.01\left(\left(\frac{z_{ant}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.378$$

Velocity Pressure w/o Ice Antennas = $qz_{ant} := 0.00256 \cdot K_{zt} \cdot K_s \cdot K_e \cdot K_d \cdot Kz_{ant} \cdot V^2 = 56.404$

Velocity Pressure with Ice Antennas = $qz_{ice.ant} := 0.00256 \cdot K_{zt} \cdot K_s \cdot K_e \cdot K_d \cdot Kz_{ant} \cdot V_i^2 = 8.344$

Velocity Pressure with Ice Antennas = $qz_m := 0.00256 \cdot K_{zt} \cdot K_s \cdot K_e \cdot K_d \cdot Kz_{ant} \cdot V_m^2 = 3.004$

Development of Wind & Ice Load on Appurtenances

Appurtenance Data:

Appurtenance Model =	RFSAPXVAALL24_43		
Appurtenance Shape =	Flat		(User Input)
Appurtenance Height=	$L_{app} := 95.9$	in	(User Input)
Appurtenance Width =	$W_{app} := 24$	in	(User Input)
Appurtenance Thickness =	$T_{app} := 8.5$	in	(User Input)
Appurtenance Weight =	$WT_{app} := 150$	lbs	(User Input)
Number of Appurtenances=	$N_{app} := 1$		(User Input)
Appurtenance Aspect Ratio =	$Ar_{app} := \frac{L_{app}}{W_{app}} = 4.0$		
Appurtenance Force Coefficient =	$Ca_{app} = 1.27$		

Wind Load (without ice)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 16$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 1541$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 5.7$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 546$	lbs

Wind Load (with ice)

Surface Area for One Appurtenance w/ Ice (Front)=	$SA_{ICEappF} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (W_{app} + 2 \cdot t_{iz})}{144} = 18$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappF} = 256$	lbs
Surface Area for One Appurtenance w/ Ice (Side) =	$SA_{ICEappS} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz})}{144} = 7.4$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappS} = 105$	lbs

Wind Load (Mount)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 16$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 82$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 5.7$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 29$	lbs

Gravity Loads (ice only)

Volume of Each Appurtenance =	$V_{app} := L_{app} \cdot W_{app} \cdot T_{app} = 2 \times 10^4$	cu in
Volume of Ice on Each Appurtenance =	$V_{ice} := (L_{app} + 2 \cdot t_{iz})(W_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz}) - V_{app} = 8435$	cu in
Weight of Ice on Each Appurtenance =	$W_{ICEapp} := \frac{V_{ice}}{1728} \cdot Id = 273$	lbs
Weight of Ice on All Appurtenances =	$W_{ICEapp} \cdot N_{app} = 273$	lbs

Development of Wind & Ice Load on Appurtenances

Appurtenance Data:

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

Wind Load (without ice)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 5.3$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 481$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 2.3$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 207$	lbs

Wind Load (with ice)

Surface Area for One Appurtenance w/ Ice (Front) =	$SA_{ICEappF} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (W_{app} + 2 \cdot t_{iz})}{144} = 6.2$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappF} = 84$	lbs
Surface Area for One Appurtenance w/ Ice (Side) =	$SA_{ICEappS} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz})}{144} = 3$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappS} = 41$	lbs

Wind Load (Mount)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 5.3$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 26$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 2.3$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 11$	lbs

Gravity Loads (ice only)

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

Development of Wind & Ice Load on Appurtenances

Appurtenance Data:

Appurtenance Model =	Commscope VV-65A-R1		
Appurtenance Shape =	Flat		(User Input)
Appurtenance Height=	$L_{app} := 54.724$	in	(User Input)
Appurtenance Width =	$W_{app} := 12.087$	in	(User Input)
Appurtenance Thickness =	$T_{app} := 4.646$	in	(User Input)
Appurtenance Weight =	$WT_{app} := 30$	lbs	(User Input)
Number of Appurtenances =	$N_{app} := 1$		(User Input)
Appurtenance Aspect Ratio =	$Ar_{app} := \frac{L_{app}}{W_{app}} = 4.5$		
Appurtenance Force Coefficient =	$Ca_{app} = 1.29$		

Wind Load (without ice)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 4.6$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 451$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 1.8$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 173$	lbs

Wind Load (with ice)

Surface Area for One Appurtenance w/ Ice (Front)=	$SA_{ICEappF} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (W_{app} + 2 \cdot t_{iz})}{144} = 5.7$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappF} = 83$	lbs
Surface Area for One Appurtenance w/ Ice (Side) =	$SA_{ICEappS} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz})}{144} = 2.8$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappS} = 40$	lbs

Wind Load (Mount)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 4.6$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 24$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 1.8$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 9$	lbs

Gravity Loads (ice only)

Volume of Each Appurtenance =	$V_{app} := L_{app} \cdot W_{app} \cdot T_{app} = 3073$	cu in
Volume of Ice on Each Appurtenance =	$V_{ice} := (L_{app} + 2 \cdot t_{iz})(W_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz}) - V_{app} = 2661$	cu in
Weight of Ice on Each Appurtenance =	$W_{ICEapp} := \frac{V_{ice}}{1728} \cdot Id = 86$	lbs
Weight of Ice on All Appurtenances =	$W_{ICEapp} \cdot N_{app} = 86$	lbs

Development of Wind & Ice Load on Appurtenances

Appurtenance Data:

Appurtenance Model =	Ericsson 4460		
Appurtenance Shape =	Flat		(User Input)
Appurtenance Height=	$L_{app} := 19.6$	in	(User Input)
Appurtenance Width =	$W_{app} := 15.7$	in	(User Input)
Appurtenance Thickness =	$T_{app} := 12.1$	in	(User Input)
Appurtenance Weight =	$WT_{app} := 109$	lbs	(User Input)
Number of Appurtenances=	$N_{app} := 1$		(User Input)
Appurtenance Aspect Ratio =	$Ar_{app} := \frac{L_{app}}{W_{app}} = 1.2$		
Appurtenance Force Coefficient =	$Ca_{app} = 1.2$		

Wind Load (without ice)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 2.1$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 195$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 1.6$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 150$	lbs

Wind Load (with ice)

Surface Area for One Appurtenance w/ Ice (Front)=	$SA_{ICEappF} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (W_{app} + 2 \cdot t_{iz})}{144} = 2.7$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappF} = 37$	lbs
Surface Area for One Appurtenance w/ Ice (Side) =	$SA_{ICEappS} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz})}{144} = 2.2$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappS} = 30$	lbs

Wind Load (Mount)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 2.1$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 10$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 1.6$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 8$	lbs

Gravity Loads (ice only)

Volume of Each Appurtenance =	$V_{app} := L_{app} \cdot W_{app} \cdot T_{app} = 3723$	cu in
Volume of Ice on Each Appurtenance =	$V_{ice} := (L_{app} + 2 \cdot t_{iz})(W_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz}) - V_{app} = 1979$	cu in
Weight of Ice on Each Appurtenance =	$W_{ICEapp} := \frac{V_{ice}}{1728} \cdot Id = 64$	lbs
Weight of Ice on All Appurtenances =	$W_{ICEapp} \cdot N_{app} = 64$	lbs

Development of Wind & Ice Load on Appurtenances

Appurtenance Data:

Appurtenance Model =	Ericsson 4480		
Appurtenance Shape =	Flat		(User Input)
Appurtenance Height=	$L_{app} := 21.8$	in	(User Input)
Appurtenance Width =	$W_{app} := 15.7$	in	(User Input)
Appurtenance Thickness =	$T_{app} := 7.5$	in	(User Input)
Appurtenance Weight =	$WT_{app} := 84$	lbs	(User Input)
Number of Appurtenances=	$N_{app} := 1$		(User Input)
Appurtenance Aspect Ratio =	$Ar_{app} := \frac{L_{app}}{W_{app}} = 1.4$		
Appurtenance Force Coefficient =	$Ca_{app} = 1.2$		

Wind Load (without ice)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 2.4$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 217$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 1.1$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 104$	lbs

Wind Load (with ice)

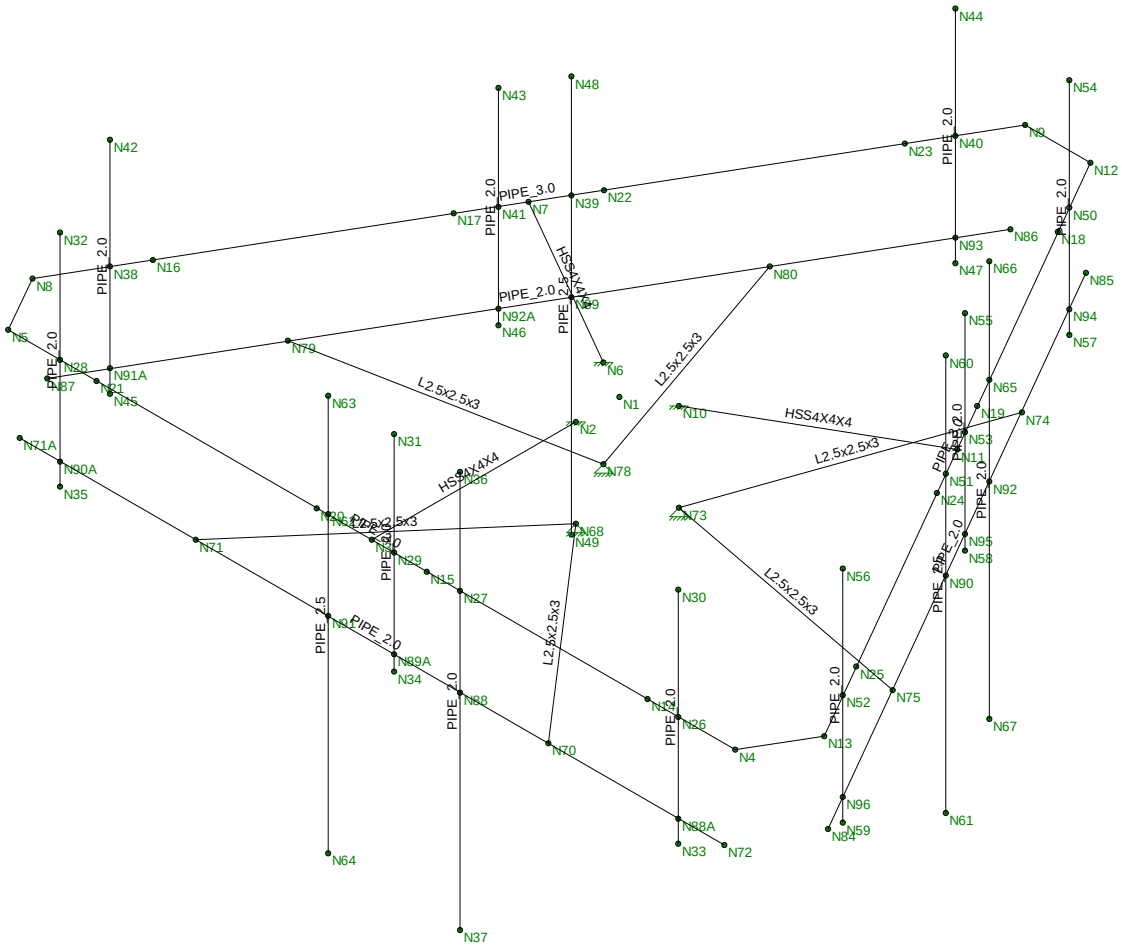
Surface Area for One Appurtenance w/ Ice (Front)=	$SA_{ICEappF} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (W_{app} + 2 \cdot t_{iz})}{144} = 3$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappF} = 41$	lbs
Surface Area for One Appurtenance w/ Ice (Side) =	$SA_{ICEappS} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz})}{144} = 1.6$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappS} = 22$	lbs

Wind Load (Mount)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 2.4$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 12$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 1.1$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 6$	lbs

Gravity Loads (ice only)

Volume of Each Appurtenance =	$V_{app} := L_{app} \cdot W_{app} \cdot T_{app} = 2567$	cu in
Volume of Ice on Each Appurtenance =	$V_{ice} := (L_{app} + 2 \cdot t_{iz})(W_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz}) - V_{app} = 1707$	cu in
Weight of Ice on Each Appurtenance =	$W_{ICEapp} := \frac{V_{ice}}{1728} \cdot Id = 55$	lbs
Weight of Ice on All Appurtenances =	$W_{ICEapp} \cdot N_{app} = 55$	lbs



Envelope Only Solution

Centek		
TJL	CT11327A - Mount	July 5, 2022 at 11:13 AM
22022.18	Member Framing	CT11327A_AMA.r3d

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (ft/sec^2)	32.2
Wall Mesh Size (in)	12
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 14th(360-10): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 14th(360-10): ASD
Cold Formed Steel Code	AISI S100-10: ASD
Wood Code	AWC NDS-12: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-11
Masonry Code	ACI 530-11: ASD
Aluminum Code	AA ADM1-10: ASD - Building
Stainless Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)

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

(Global) Model Settings, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	1
Cd X	1
Rho Z	1
Rho X	1
Footing Overturning Safety Factor	1
Optimize for OTM/Sliding	No
Check Concrete Bearing	No
Footing Concrete Weight (k/ft^3)	150.001
Footing Concrete f'c (ksi)	4
Footing Concrete Ec (ksi)	3644
Lambda	1
Footing Steel fy (ksi)	60
Minimum Steel	0.0018
Maximum Steel	0.0075
Footing Top Bar	#3
Footing Top Bar Cover (in)	2
Footing Bottom Bar	#3
Footing Bottom Bar Cover (in)	3.5
Pedestal Bar	#3
Pedestal Bar Cover (in)	1.5
Pedestal Ties	#3

Hot Rolled Steel Properties

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

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	(E)Antenna Mast	PIPE_2.0	Column	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
2	(E) HSS4X4X1/4	HSS4X4X4	Beam	Tube	A500 Gr.46	Typical	3.37	7.8	7.8	12.8
3	(E) Horizontal	PIPE_3.0	Beam	Tube	A53 Grade B	Typical	2.07	2.85	2.85	5.69
4	(P) Antenna Mast	PIPE_2.5	Column	Pipe	A53 Grade B	Typical	1.61	1.45	1.45	2.89
5	(P) Stablizer Horz	PIPE_2.0	Beam	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
6	(P) Stabilizer Brace	L2.5x2.5x3	Beam	Single An...	A36 Gr.36	Typical	.901	.535	.535	.011

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[...	Lcomp bot[...	L-torq...	Kyy	Kzz	Cb	Functi...
1	M1	(E) HSS4X4X1/4	4.625			Lbyy						Lateral
2	M2	(E) Horizontal	16.5			Lbyy						Lateral
3	M3	(E) HSS4X4X1/4	4.625			Lbyy						Lateral
4	M4	(E) Horizontal	16.5			Lbyy						Lateral
5	M5	(E) HSS4X4X1/4	4.625			Lbyy						Lateral
6	M6	(E) Horizontal	16.5			Lbyy						Lateral
7	M10	(E)Antenna Mast	5			Lbyy						Lateral
8	M11	(E)Antenna Mast	4.667			Lbyy						Lateral
9	M12	(E)Antenna Mast	5			Lbyy						Lateral
10	M13	(E)Antenna Mast	9			Lbyy						Lateral
11	M14	(E)Antenna Mast	5			Lbyy						Lateral
12	M15	(E)Antenna Mast	4.667			Lbyy						Lateral
13	M16	(E)Antenna Mast	5			Lbyy						Lateral
14	M17	(P) Antenna Mast	9			Lbyy						Lateral
15	M18	(E)Antenna Mast	5			Lbyy						Lateral
16	M19	(E)Antenna Mast	4.667			Lbyy						Lateral
17	M20	(E)Antenna Mast	5			Lbyy						Lateral
18	M21	(P) Antenna Mast	9			Lbyy						Lateral
19	M22	(P) Antenna Mast	9			Lbyy						Lateral
20	M23	(E)Antenna Mast	9			Lbyy						Lateral
21	M24	(P) Stabilizer Brace	6.115									Lateral
22	M25	(P) Stabilizer Brace	6.115									Lateral
23	M26	(P) Stablizer Horz	16									Lateral
24	M27	(P) Stabilizer Brace	6.115									Lateral
25	M28	(P) Stabilizer Brace	6.115									Lateral
26	M30	(P) Stabilizer Brace	6.115									Lateral
27	M31	(P) Stabilizer Brace	6.115									Lateral
28	M28A	(P) Stablizer Horz	16									Lateral
29	M29	(P) Stablizer Horz	16									Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design ...
1	M1	N2	N3			(E) HSS4X4X1/4	Beam	Tube	A500 Gr.46	Typical
2	M2	N4	N5			(E) Horizontal	Beam	Tube	A53 Grade B	Typical
3	M3	N6	N7			(E) HSS4X4X1/4	Beam	Tube	A500 Gr.46	Typical
4	M4	N8	N9			(E) Horizontal	Beam	Tube	A53 Grade B	Typical
5	M5	N10	N11			(E) HSS4X4X1/4	Beam	Tube	A500 Gr.46	Typical
6	M6	N12	N13			(E) Horizontal	Beam	Tube	A53 Grade B	Typical
7	M10	N30	N33			(E)Antenna Mast	Column	Pipe	A53 Grade B	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design ...
8	M11	N31	N34			(E)Antenna Mast	Column	Pipe	A53 Grade B	Typical
9	M12	N32	N35			(E)Antenna Mast	Column	Pipe	A53 Grade B	Typical
10	M13	N36	N37			(E)Antenna Mast	Column	Pipe	A53 Grade B	Typical
11	M14	N42	N45			(E)Antenna Mast	Column	Pipe	A53 Grade B	Typical
12	M15	N43	N46			(E)Antenna Mast	Column	Pipe	A53 Grade B	Typical
13	M16	N44	N47			(E)Antenna Mast	Column	Pipe	A53 Grade B	Typical
14	M17	N48	N49			(P) Antenna Mast	Column	Pipe	A53 Grade B	Typical
15	M18	N54	N57			(E)Antenna Mast	Column	Pipe	A53 Grade B	Typical
16	M19	N55	N58			(E)Antenna Mast	Column	Pipe	A53 Grade B	Typical
17	M20	N56	N59			(E)Antenna Mast	Column	Pipe	A53 Grade B	Typical
18	M21	N60	N61			(P) Antenna Mast	Column	Pipe	A53 Grade B	Typical
19	M22	N63	N64			(P) Antenna Mast	Column	Pipe	A53 Grade B	Typical
20	M23	N66	N67			(E)Antenna Mast	Column	Pipe	A53 Grade B	Typical
21	M24	N71	N68			(P) Stabilizer Brace	Beam	Single An...	A36 Gr.36	Typical
22	M25	N68	N70			(P) Stabilizer Brace	Beam	Single An...	A36 Gr.36	Typical
23	M26	N71A	N72			(P) Stablizer Horz	Beam	Pipe	A53 Grade B	Typical
24	M27	N75	N73			(P) Stabilizer Brace	Beam	Single An...	A36 Gr.36	Typical
25	M28	N73	N74			(P) Stabilizer Brace	Beam	Single An...	A36 Gr.36	Typical
26	M30	N80	N78			(P) Stabilizer Brace	Beam	Single An...	A36 Gr.36	Typical
27	M31	N78	N79			(P) Stabilizer Brace	Beam	Single An...	A36 Gr.36	Typical
28	M28A	N84	N85			(P) Stablizer Horz	Beam	Pipe	A53 Grade B	Typical
29	M29	N86	N87			(P) Stablizer Horz	Beam	Pipe	A53 Grade B	Typical
30	M30A	N8	N5			RIGID	None	None	RIGID	Typical
31	M31A	N9	N12			RIGID	None	None	RIGID	Typical
32	M32	N4	N13			RIGID	None	None	RIGID	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	N1	0	0	0	0	
2	N2	0	0	0.989583	0	
3	N3	0	0	5.614583	0	
4	N4	8.25	0	5.614583	0	
5	N5	-8.25	0	5.614583	0	
6	N6	-0.857004	0	-0.494792	0	
7	N7	-4.862372	0	-2.807292	0	
8	N8	-8.987372	0	4.337418	0	
9	N9	-0.737372	0	-9.952001	0	
10	N10	0.857004	0	-0.494792	0	
11	N11	4.862372	0	-2.807292	0	
12	N12	0.737372	0	-9.952001	0	
13	N13	8.987372	0	4.337418	0	
14	N14	6.25	0	5.614583	0	
15	N15	1.25	0	5.614583	0	
16	N16	-7.987372	0	2.605367	0	
17	N17	-5.487372	0	-1.72476	0	
18	N18	1.737372	0	-8.21995	0	
19	N19	4.237372	0	-3.889823	0	
20	N20	-1.25	0	5.614583	0	
21	N21	-6.25	0	5.614583	0	
22	N22	-4.237372	0	-3.889823	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
23	N23	-1.737372	0	-8.21995	0	
24	N24	5.487372	0	-1.72476	0	
25	N25	7.987372	0	2.605367	0	
26	N26	6.958333	0	5.614583	0	
27	N27	2	0	5.614583	0	
28	N28	-7.083333	0	5.614583	0	
29	N29	.5	0	5.614583	0	
30	N30	6.958333	2.5	5.614583	0	
31	N31	.5	2.333333	5.614583	0	
32	N32	-7.083333	2.5	5.614583	0	
33	N33	6.958333	-2.5	5.614583	0	
34	N34	.5	-2.333333	5.614583	0	
35	N35	-7.083333	-2.5	5.614583	0	
36	N36	2	2.333333	5.614583	0	
37	N37	2	-6.666667	5.614583	0	
38	N38	-8.341538	0	3.218802	0	
39	N39	-4.508205	0	-3.420726	0	
40	N40	-1.320705	0	-8.941638	0	
41	N41	-5.112372	0	-2.374279	0	
42	N42	-8.341538	2.5	3.218802	0	
43	N43	-5.112372	2.333333	-2.374279	0	
44	N44	-1.320705	2.5	-8.941638	0	
45	N45	-8.341538	-2.5	3.218802	0	
46	N46	-5.112372	-2.333333	-2.374279	0	
47	N47	-1.320705	-2.5	-8.941638	0	
48	N48	-4.508205	2.333333	-3.420726	0	
49	N49	-4.508205	-6.666667	-3.420726	0	
50	N50	1.383205	0	-8.833385	0	
51	N51	5.216538	0	-2.193857	0	
52	N52	8.404038	0	3.327055	0	
53	N53	4.612372	0	-3.240304	0	
54	N54	1.383205	2.5	-8.833385	0	
55	N55	4.612372	2.333333	-3.240304	0	
56	N56	8.404038	2.5	3.327055	0	
57	N57	1.383205	-2.5	-8.833385	0	
58	N58	4.612372	-2.333333	-3.240304	0	
59	N59	8.404038	-2.5	3.327055	0	
60	N60	5.216538	2.333333	-2.193857	0	
61	N61	5.216538	-6.666667	-2.193857	0	
62	N62	-1	0	5.614583	0	
63	N63	-1	2.333333	5.614583	0	
64	N64	-1	-6.666667	5.614583	0	
65	N65	3.862372	0	-4.539342	0	
66	N66	3.862372	2.333333	-4.539342	0	
67	N67	3.862372	-6.666667	-4.539342	0	
68	N68	0	-2	0.989583	0	
69	N70	4.	-2	5.614583	0	
70	N71	-4.	-2	5.614583	0	
71	N71A	-8	-2	5.614583	0	
72	N72	8	-2	5.614583	0	
73	N73	0.857004	-2	-0.494792	0	
74	N74	2.862372	-2	-6.271393	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
75	N75	6.862371	-2	0.65681	0	
76	N78	-0.857004	-2	-0.494792	0	
77	N79	-6.862371	-2	0.65681	0	
78	N80	-2.862372	-2	-6.271393	0	
79	N88	2	-2	5.614583	0	
80	N89	-4.508205	-2	-3.420726	0	
81	N90	5.216538	-2	-2.193857	0	
82	N91	-1	-2	5.614583	0	
83	N92	3.862372	-2	-4.539342	0	
84	N84	8.862372	-2	4.120912	0	
85	N85	0.862372	-2	-9.735495	0	
86	N86	-0.862372	-2	-9.735495	0	
87	N87	-8.862372	-2	4.120912	0	
88	N88A	6.958333	-2	5.614583	0	
89	N89A	.5	-2	5.614583	0	
90	N90A	-7.083333	-2	5.614583	0	
91	N91A	-8.341538	-2	3.218802	0	
92	N92A	-5.112372	-2	-2.374279	0	
93	N93	-1.320705	-2	-8.941638	0	
94	N94	1.383205	-2	-8.833385	0	
95	N95	4.612372	-2	-3.240304	0	
96	N96	8.404038	-2	3.327055	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N2	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N6	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N10	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
4	N68	Reaction	Reaction	Reaction			
5	N73	Reaction	Reaction	Reaction			
6	N78	Reaction	Reaction	Reaction			

Member Point Loads (BLC 2 : Dead Load)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M17	Y	-.075	1
2	M21	Y	-.075	1
3	M22	Y	-.075	1
4	M17	Y	-.075	7
5	M21	Y	-.075	7
6	M22	Y	-.075	7
7	M10	Y	-.042	1
8	M14	Y	-.042	1
9	M18	Y	-.042	1
10	M10	Y	-.042	4
11	M14	Y	-.042	4
12	M18	Y	-.042	4
13	M12	Y	-.015	.5
14	M16	Y	-.015	.5
15	M20	Y	-.015	.5

Member Point Loads (BLC 2 : Dead Load) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
16	M12	Y	-.015	4.5
17	M16	Y	-.015	4.5
18	M20	Y	-.015	4.5
19	M17	Y	-.109	2
20	M21	Y	-.109	2
21	M22	Y	-.109	2
22	M17	Y	-.084	5
23	M21	Y	-.084	5
24	M22	Y	-.084	5
25	M13	Y	-.09	7
26	M23	Y	-.09	7
27	M11	Y	-.03	1

Member Point Loads (BLC 3 : Ice Load)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M17	Y	-.137	1
2	M21	Y	-.137	1
3	M22	Y	-.137	1
4	M17	Y	-.137	7
5	M21	Y	-.137	7
6	M22	Y	-.137	7
7	M10	Y	-.054	1
8	M14	Y	-.054	1
9	M18	Y	-.054	1
10	M10	Y	-.054	4
11	M14	Y	-.054	4
12	M18	Y	-.054	4
13	M12	Y	-.043	.5
14	M16	Y	-.043	.5
15	M20	Y	-.043	.5
16	M12	Y	-.043	4.5
17	M16	Y	-.043	4.5
18	M20	Y	-.043	4.5
19	M17	Y	-.064	2
20	M21	Y	-.064	2
21	M22	Y	-.064	2
22	M17	Y	-.055	5
23	M21	Y	-.055	5
24	M22	Y	-.055	5
25	M13	Y	-.169	7
26	M23	Y	-.169	7
27	M11	Y	-.04	1

Member Point Loads (BLC 4 : Lm Maintenance Load (500lb))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M22	Y	-.25	%50

Member Point Loads (BLC 5 : Lv Maintenance Load (250lb))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M2	Y	-.25	%50

Member Point Loads (BLC 6 : Wind with Ice X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M22	X	.053	1
2	M22	X	.053	7
3	M17	X	.128	1
4	M21	X	.128	1
5	M17	X	.128	7
6	M21	X	.128	7
7	M10	X	.021	1
8	M10	X	.021	4
9	M14	X	.042	1
10	M18	X	.042	1
11	M14	X	.042	4
12	M18	X	.042	4
13	M12	X	.02	.5
14	M12	X	.02	4.5
15	M16	X	.042	.5
16	M20	X	.042	.5
17	M16	X	.042	4.5
18	M20	X	.042	4.5
19	M22	X	.03	2
20	M13	X	.056	7
21	M23	X	.077	7
22	M11	X	.03	1

Member Point Loads (BLC 7 : Wind X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M22	X	.273	1
2	M22	X	.273	7
3	M17	X	.771	1
4	M21	X	.771	1
5	M17	X	.771	7
6	M21	X	.771	7
7	M10	X	.104	1
8	M10	X	.104	4
9	M14	X	.241	1
10	M18	X	.241	1
11	M14	X	.241	4
12	M18	X	.241	4
13	M12	X	.087	.5
14	M12	X	.087	4.5
15	M16	X	.226	.5
16	M20	X	.226	.5
17	M16	X	.226	4.5
18	M20	X	.226	4.5
19	M22	X	.15	2
20	M22	X	.104	5
21	M13	X	.162	7
22	M23	X	.248	7
23	M11	X	.045	1

Member Point Loads (BLC 8 : Wm Wind X)

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

Member Point Loads (BLC 8 : Wm Wind X) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M22	X	.015	1
2	M22	X	.015	7
3	M17	X	.041	1
4	M21	X	.041	1
5	M17	X	.041	7
6	M21	X	.041	7
7	M10	X	.006	1
8	M10	X	.006	4
9	M14	X	.013	1
10	M18	X	.013	1
11	M14	X	.013	4
12	M18	X	.013	4
13	M12	X	.005	.5
14	M12	X	.005	4.5
15	M16	X	.012	.5
16	M20	X	.012	.5
17	M16	X	.012	4.5
18	M20	X	.012	4.5
19	M22	X	.008	2
20	M22	X	.006	5
21	M13	X	.03	7
22	M23	X	.065	7
23	M11	X	.015	1

Member Point Loads (BLC 9 : Wind with Ice Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M22	Z	.128	1
2	M22	Z	.128	7
3	M17	Z	.053	1
4	M21	Z	.053	1
5	M17	Z	.053	7
6	M21	Z	.053	7
7	M10	Z	.042	1
8	M10	Z	.042	4
9	M14	Z	.021	1
10	M18	Z	.021	1
11	M14	Z	.021	4
12	M18	Z	.021	4
13	M12	Z	.042	.5
14	M12	Z	.042	4.5
15	M16	Z	.02	.5
16	M20	Z	.02	.5
17	M16	Z	.02	4.5
18	M20	Z	.02	4.5
19	M17	Z	.03	2
20	M21	Z	.03	2
21	M17	Z	.022	5
22	M21	Z	.022	5
23	M13	Z	.077	7
24	M23	Z	.056	7
25	M11	Z	.06	1

Member Point Loads (BLC 10 : Wind Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M22	Z	.771	1
2	M22	Z	.771	7
3	M17	Z	.273	1
4	M21	Z	.273	1
5	M17	Z	.273	7
6	M21	Z	.273	7
7	M10	Z	.241	1
8	M10	Z	.241	4
9	M14	Z	.104	1
10	M18	Z	.104	1
11	M14	Z	.104	4
12	M18	Z	.104	4
13	M12	Z	.226	.5
14	M12	Z	.226	4.5
15	M16	Z	.087	.5
16	M20	Z	.087	.5
17	M16	Z	.087	4.5
18	M20	Z	.087	4.5
19	M17	Z	.15	2
20	M21	Z	.15	2
21	M17	Z	.104	5
22	M21	Z	.104	5
23	M13	Z	.248	7
24	M23	Z	.162	7
25	M11	Z	.144	1

Member Point Loads (BLC 11 : Wm Wind Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M22	Z	.041	1
2	M22	Z	.041	7
3	M17	Z	.015	1
4	M21	Z	.015	1
5	M17	Z	.015	7
6	M21	Z	.015	7
7	M10	Z	.013	1
8	M10	Z	.013	4
9	M14	Z	.006	1
10	M18	Z	.006	1
11	M14	Z	.006	4
12	M18	Z	.006	4
13	M12	Z	.012	.5
14	M12	Z	.012	4.5
15	M16	Z	.005	.5
16	M20	Z	.005	.5
17	M16	Z	.005	4.5
18	M20	Z	.005	4.5
19	M17	Z	.008	2
20	M21	Z	.008	2
21	M17	Z	.006	5
22	M21	Z	.006	5
23	M13	Z	.056	7

Member Point Loads (BLC 11 : Wm Wind Z) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
24	M23	Z	.077	7
25	M11	Z	.06	1

Member Distributed Loads (BLC 6 : Wind with Ice X)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	PX	.018	.018	0	0
2	M2	PX	.018	.018	0	0
3	M3	PX	.018	.018	0	0
4	M4	PX	.018	.018	0	0
5	M5	PX	.018	.018	0	0
6	M6	PX	.018	.018	0	0
7	M10	PX	.018	.018	0	0
8	M11	PX	.018	.018	0	0
9	M12	PX	.018	.018	0	0
10	M13	PX	.018	.018	0	0
11	M14	PX	.018	.018	0	0
12	M15	PX	.018	.018	0	0
13	M16	PX	.018	.018	0	0
14	M17	PX	.018	.018	0	0
15	M18	PX	.018	.018	0	0
16	M19	PX	.018	.018	0	0
17	M20	PX	.018	.018	0	0
18	M21	PX	.018	.018	0	0
19	M22	PX	.018	.018	0	0
20	M23	PX	.018	.018	0	0
21	M24	PX	.018	.018	0	0
22	M25	PX	.018	.018	0	0
23	M26	PX	.018	.018	0	0
24	M27	PX	.018	.018	0	0
25	M28	PX	.018	.018	0	0
26	M30	PX	.018	.018	0	0
27	M31	PX	.018	.018	0	0
28	M28A	PX	.018	.018	0	0
29	M29	PX	.018	.018	0	0
30	M30A	PX	.018	.018	0	0
31	M31A	PX	.018	.018	0	0
32	M32	PX	.018	.018	0	0

Member Distributed Loads (BLC 7 : Wind X)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	PX	.003	.003	0	0
2	M2	PX	.003	.003	0	0
3	M3	PX	.003	.003	0	0
4	M4	PX	.003	.003	0	0
5	M5	PX	.003	.003	0	0
6	M6	PX	.003	.003	0	0
7	M10	PX	.003	.003	0	0
8	M11	PX	.003	.003	0	0
9	M12	PX	.003	.003	0	0
10	M13	PX	.003	.003	0	0

Member Distributed Loads (BLC 7 : Wind X) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
11	M14	PX	.003	.003	0	0
12	M15	PX	.003	.003	0	0
13	M16	PX	.003	.003	0	0
14	M17	PX	.003	.003	0	0
15	M18	PX	.003	.003	0	0
16	M19	PX	.003	.003	0	0
17	M20	PX	.003	.003	0	0
18	M21	PX	.003	.003	0	0
19	M22	PX	.003	.003	0	0
20	M23	PX	.003	.003	0	0
21	M24	PX	.003	.003	0	0
22	M25	PX	.003	.003	0	0
23	M26	PX	.003	.003	0	0
24	M27	PX	.003	.003	0	0
25	M28	PX	.003	.003	0	0
26	M30	PX	.003	.003	0	0
27	M31	PX	.003	.003	0	0
28	M28A	PX	.003	.003	0	0
29	M29	PX	.003	.003	0	0
30	M30A	PX	.003	.003	0	0
31	M31A	PX	.003	.003	0	0
32	M32	PX	.003	.003	0	0

Member Distributed Loads (BLC 8 : Wm Wind X)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	PX	.002	.002	0	0
2	M2	PX	.002	.002	0	0
3	M3	PX	.002	.002	0	0
4	M4	PX	.002	.002	0	0
5	M5	PX	.002	.002	0	0
6	M6	PX	.002	.002	0	0
7	M10	PX	.002	.002	0	0
8	M11	PX	.002	.002	0	0
9	M12	PX	.002	.002	0	0
10	M13	PX	.002	.002	0	0
11	M14	PX	.002	.002	0	0
12	M15	PX	.002	.002	0	0
13	M16	PX	.002	.002	0	0
14	M17	PX	.002	.002	0	0
15	M18	PX	.002	.002	0	0
16	M19	PX	.002	.002	0	0
17	M20	PX	.002	.002	0	0
18	M21	PX	.002	.002	0	0
19	M22	PX	.002	.002	0	0
20	M23	PX	.002	.002	0	0
21	M24	PX	.002	.002	0	0
22	M25	PX	.002	.002	0	0
23	M26	PX	.002	.002	0	0
24	M27	PX	.002	.002	0	0
25	M28	PX	.002	.002	0	0
26	M30	PX	.002	.002	0	0

Member Distributed Loads (BLC 8 : Wm Wind X) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
27	M31	PX	.002	.002	0	0
28	M28A	PX	.002	.002	0	0
29	M29	PX	.002	.002	0	0
30	M30A	PX	.002	.002	0	0
31	M31A	PX	.002	.002	0	0
32	M32	PX	.002	.002	0	0

Member Distributed Loads (BLC 9 : Wind with Ice Z)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	PZ	.018	.018	0	0
2	M2	PZ	.018	.018	0	0
3	M3	PZ	.018	.018	0	0
4	M4	PZ	.018	.018	0	0
5	M5	PZ	.018	.018	0	0
6	M6	PZ	.018	.018	0	0
7	M10	PZ	.018	.018	0	0
8	M11	PZ	.018	.018	0	0
9	M12	PZ	.018	.018	0	0
10	M13	PZ	.018	.018	0	0
11	M14	PZ	.018	.018	0	0
12	M15	PZ	.018	.018	0	0
13	M16	PZ	.018	.018	0	0
14	M17	PZ	.018	.018	0	0
15	M18	PZ	.018	.018	0	0
16	M19	PZ	.018	.018	0	0
17	M20	PZ	.018	.018	0	0
18	M21	PZ	.018	.018	0	0
19	M22	PZ	.018	.018	0	0
20	M23	PZ	.018	.018	0	0
21	M24	PZ	.018	.018	0	0
22	M25	PZ	.018	.018	0	0
23	M26	PZ	.018	.018	0	0
24	M27	PZ	.018	.018	0	0
25	M28	PZ	.018	.018	0	0
26	M30	PZ	.018	.018	0	0
27	M31	PZ	.018	.018	0	0
28	M28A	PZ	.018	.018	0	0
29	M29	PZ	.018	.018	0	0
30	M30A	PZ	.018	.018	0	0
31	M31A	PZ	.018	.018	0	0
32	M32	PZ	.018	.018	0	0

Member Distributed Loads (BLC 10 : Wind Z)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	PZ	.003	.003	0	0
2	M2	PZ	.003	.003	0	0
3	M3	PZ	.003	.003	0	0
4	M4	PZ	.003	.003	0	0
5	M5	PZ	.003	.003	0	0
6	M6	PZ	.003	.003	0	0
7	M10	PZ	.003	.003	0	0

Member Distributed Loads (BLC 10 : Wind Z) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
8	M11	PZ	.003	.003	0	0
9	M12	PZ	.003	.003	0	0
10	M13	PZ	.003	.003	0	0
11	M14	PZ	.003	.003	0	0
12	M15	PZ	.003	.003	0	0
13	M16	PZ	.003	.003	0	0
14	M17	PZ	.003	.003	0	0
15	M18	PZ	.003	.003	0	0
16	M19	PZ	.003	.003	0	0
17	M20	PZ	.003	.003	0	0
18	M21	PZ	.003	.003	0	0
19	M22	PZ	.003	.003	0	0
20	M23	PZ	.003	.003	0	0
21	M24	PZ	.003	.003	0	0
22	M25	PZ	.003	.003	0	0
23	M26	PZ	.003	.003	0	0
24	M27	PZ	.003	.003	0	0
25	M28	PZ	.003	.003	0	0
26	M30	PZ	.003	.003	0	0
27	M31	PZ	.003	.003	0	0
28	M28A	PZ	.003	.003	0	0
29	M29	PZ	.003	.003	0	0
30	M30A	PZ	.003	.003	0	0
31	M31A	PZ	.003	.003	0	0
32	M32	PZ	.003	.003	0	0

Member Distributed Loads (BLC 11 : Wm Wind Z)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	PZ	.002	.002	0	0
2	M2	PZ	.002	.002	0	0
3	M3	PZ	.002	.002	0	0
4	M4	PZ	.002	.002	0	0
5	M5	PZ	.002	.002	0	0
6	M6	PZ	.002	.002	0	0
7	M10	PZ	.002	.002	0	0
8	M11	PZ	.002	.002	0	0
9	M12	PZ	.002	.002	0	0
10	M13	PZ	.002	.002	0	0
11	M14	PZ	.002	.002	0	0
12	M15	PZ	.002	.002	0	0
13	M16	PZ	.002	.002	0	0
14	M17	PZ	.002	.002	0	0
15	M18	PZ	.002	.002	0	0
16	M19	PZ	.002	.002	0	0
17	M20	PZ	.002	.002	0	0
18	M21	PZ	.002	.002	0	0
19	M22	PZ	.002	.002	0	0
20	M23	PZ	.002	.002	0	0
21	M24	PZ	.002	.002	0	0
22	M25	PZ	.002	.002	0	0
23	M26	PZ	.002	.002	0	0

Member Distributed Loads (BLC 11 : Wm Wind Z) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
24	M27	PZ	.002	.002	0	0
25	M28	PZ	.002	.002	0	0
26	M30	PZ	.002	.002	0	0
27	M31	PZ	.002	.002	0	0
28	M28A	PZ	.002	.002	0	0
29	M29	PZ	.002	.002	0	0
30	M30A	PZ	.002	.002	0	0
31	M31A	PZ	.002	.002	0	0
32	M32	PZ	.002	.002	0	0

Basic Load Cases

	BLC Description	Category	X Gra...	Y Gra...	Z Gra...	Joint	Point	Distrib..	Area(...	Surfa...
1	Self Weight	None		-1						
2	Dead Load	None					27			
3	Ice Load	None					27			
4	Lm Maintenance Load (500lb)	None					1			
5	Lv Maintenance Load (250lb)	None					1			
6	Wind with Ice X	None					22	32		
7	Wind X	None					23	32		
8	Wm Wind X	None					23	32		
9	Wind with Ice Z	None					25	32		
10	Wind Z	None					25	32		
11	Wm Wind Z	None					25	32		

Load Combinations

	Description	So...	P...	S...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...
1	1.4D	Yes	Y		1	1.4	2	1.4																
2	1.2D +1.5Lv	Yes	Y		1	1.2	2	1.2	5	1.5														
3	1.2D + 1.0W (X-directi...	Yes	Y		1	1.2	2	1.2	7	1														
4	1.2D + 1.0Di + 1.0Wi (...	Yes	Y		1	1.2	2	1.2	3	1	6	1												
5	1.2D +1.5Lm+ 1.0Wm ...	Yes	Y		1	1.2	2	1.2	4	1.5	8	1												
6	1.2D + 1.0W (Z-directi...	Yes	Y		1	1.2	2	1.2	10	1														
7	1.2D + 1.0Di + 1.0Wi (...	Yes	Y		1	1.2	2	1.2	3	1	9	1												
8	1.2D +1.5Lm+ 1.0Wm ...	Yes	Y		1	1.2	2	1.2	4	1.5	11	1												

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N2	max	.042	7	1.897	4	-.247	3	-3.304	6	.18	7	.039	7
2		min	-.671	3	1.084	6	-1.546	6	-6.846	4	-1.99	3	-.26	3
3	N6	max	.268	7	1.612	4	.545	3	3.036	7	4.236	3	-3	6
4		min	-1.363	3	.979	2	-.703	6	1.71	2	-2.252	6	-5.151	4
5	N10	max	-.224	2	1.881	7	.182	1	3.529	7	3.947	3	5.845	7
6		min	-1.732	3	1.04	3	-.639	6	1.801	3	-.056	1	2.527	3
7	N68	max	.024	2	.08	6	.687	4	0	8	0	8	0	8
8		min	-.793	3	.021	3	-1.278	6	0	1	0	1	0	1
9	N73	max	.75	7	.065	3	.186	3	0	8	0	8	0	8
10		min	-1.188	3	.012	6	-1.093	7	0	1	0	1	0	1

Envelope Joint Reactions (Continued)

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
11	N78	max	-.267	2	.027	1	-.167	2	0	8	0	8	0	8
12		min	-1.383	3	-.013	3	-.836	7	0	1	0	1	0	1
13	Totals:	max	0	6	5.416	4	0	3						
14		min	-7.13	3	3.277	6	-5.961	6						

Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
1	N1	max	0	8	0	8	0	8	0	8	0	8	0	8
2		min	0	1	0	1	0	1	0	1	0	1	0	1
3	N2	max	0	8	0	8	0	8	0	8	0	8	0	8
4		min	0	1	0	1	0	1	0	1	0	1	0	1
5	N3	max	.1	3	-.173	6	.001	6	9.258e-03	4	1.659e-03	3	1.215e-03	3
6		min	-.012	7	-.409	4	0	3	3.16e-03	6	-3.052e-04	7	-1.797e-04	7
7	N4	max	.101	3	-.246	3	.184	3	1.947e-03	4	2.302e-04	2	-1.006e-03	5
8		min	-.011	7	-.629	7	0	1	8.106e-04	6	-1.352e-03	3	-2.857e-03	7
9	N5	max	.1	3	-.331	6	.162	6	1.948e-03	5	-1.049e-04	1	2.468e-03	7
10		min	-.012	7	-.659	4	-.203	3	4.254e-04	3	-1.773e-03	3	1.417e-03	3
11	N6	max	0	8	0	8	0	8	0	8	0	8	0	8
12		min	0	1	0	1	0	1	0	1	0	1	0	1
13	N7	max	.128	3	-.207	2	.108	6	-2.191e-03	2	2.484e-03	6	7.208e-03	4
14		min	-.062	6	-.362	4	-.22	3	-4.709e-03	7	-5.746e-03	3	3.859e-03	6
15	N8	max	.127	3	-.33	6	.159	6	1.948e-03	5	-1.049e-04	1	2.468e-03	7
16		min	-.005	7	-.655	4	-.219	3	4.254e-04	3	-1.773e-03	3	1.417e-03	3
17	N9	max	.47	3	-.342	2	.158	6	-1.59e-03	2	2.691e-04	6	-1.428e-04	5
18		min	.005	2	-.684	7	-.024	3	-3.545e-03	4	-1.079e-03	3	-5.175e-04	7
19	N10	max	0	8	0	8	0	8	0	8	0	8	0	8
20		min	0	1	0	1	0	1	0	1	0	1	0	1
21	N11	max	.116	3	-.158	3	.198	3	-2.413e-03	2	-4.801e-05	1	-1.676e-03	3
22		min	0	1	-.409	7	-.001	1	-5.192e-03	7	-4.968e-03	3	-7.745e-03	7
23	N12	max	.47	3	-.346	2	.154	6	-1.59e-03	2	2.691e-04	6	-1.428e-04	5
24		min	.005	2	-.693	7	-.005	3	-3.545e-03	4	-1.079e-03	3	-5.175e-04	7
25	N13	max	.122	3	-.235	3	.196	3	1.947e-03	4	2.302e-04	2	-1.006e-03	5
26		min	-.013	7	-.628	7	-.001	1	8.106e-04	6	-1.352e-03	3	-2.857e-03	7
27	N14	max	.101	3	-.226	3	.151	7	3.609e-03	4	2.701e-04	1	-5.102e-04	3
28		min	-.011	7	-.564	7	.007	1	1.571e-03	6	-3.117e-03	3	-2.916e-03	7
29	N15	max	.101	3	-.18	6	.019	7	7.587e-03	4	5.704e-05	4	7.054e-04	3
30		min	-.012	7	-.413	4	-.012	3	1.725e-03	6	-1.787e-03	7	-1.616e-03	7
31	N16	max	.121	3	-.292	6	.16	6	1.826e-03	5	1.683e-03	3	3.757e-03	7
32		min	-.001	8	-.591	4	-.223	3	4.114e-04	6	-1.398e-04	7	1.808e-03	3
33	N17	max	.074	3	-.21	6	.125	6	-4.865e-04	5	2.03e-03	6	6.972e-03	4
34		min	-.033	6	-.377	4	-.25	3	-2.396e-03	7	-2.514e-03	3	3.85e-03	6
35	N18	max	.427	3	-.317	2	.134	6	-1.985e-03	2	2.351e-03	6	2.386e-04	6
36		min	.01	2	-.631	7	-.008	1	-4.242e-03	4	-3.233e-03	3	-7.321e-04	4
37	N19	max	.182	3	-.19	3	.16	3	-2.554e-03	2	-3.652e-04	2	2.459e-04	3
38		min	.003	1	-.434	7	-.003	1	-5.396e-03	7	-5.157e-03	3	-4.896e-03	7
39	N20	max	.1	3	-.181	6	.024	6	6.801e-03	4	1.899e-03	6	1.718e-03	3
40		min	-.012	7	-.429	4	.003	8	1.814e-03	6	2.653e-04	3	7.194e-04	2
41	N21	max	.1	3	-.29	6	.15	6	3.008e-03	7	1.348e-03	6	2.741e-03	4
42		min	-.012	7	-.603	4	-.13	3	4.971e-04	3	-3.616e-03	3	1.421e-03	2
43	N22	max	.202	3	-.212	2	.096	6	-2.48e-03	2	6.274e-04	6	4.946e-03	4

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
44		min	-.082	6	-.377	4	-.177	3	-5.199e-03	7	-5.515e-03	3	2.329e-03	6
45	N23	max	.429	3	-.307	2	.143	6	-2.029e-03	2	-1.089e-04	1	5.964e-04	3
46		min	0	6	-.609	7	-.047	3	-4.299e-03	4	-2.825e-03	3	-7.359e-04	6
47	N24	max	.072	3	-.147	3	.224	3	-9.68e-04	2	9.187e-05	1	-1.551e-03	3
48		min	0	1	-.413	7	-.002	1	-2.987e-03	7	-2.13e-03	6	-7.041e-03	7
49	N25	max	.114	3	-.2	3	.2	3	1.306e-03	2	1.462e-03	3	-1.82e-03	5
50		min	-.013	7	-.565	7	-.001	1	-1.368e-04	6	-1.512e-04	8	-4.163e-03	7
51	N26	max	.101	3	-.231	3	.161	7	3.076e-03	4	3.355e-04	2	-5.693e-04	3
52		min	-.011	7	-.587	7	.005	1	1.435e-03	1	-2.86e-03	3	-2.514e-03	7
53	N27	max	.101	3	-.189	6	.037	7	6.802e-03	4	-3.83e-04	1	5.264e-04	3
54		min	-.012	7	-.421	4	-.008	4	1.361e-03	6	-2.231e-03	7	-1.925e-03	7
55	N28	max	.1	3	-.307	6	.161	6	2.498e-03	7	7.315e-04	6	2.164e-03	4
56		min	-.012	7	-.628	4	-.165	3	-2.473e-05	3	-3.4e-03	3	1.202e-03	2
57	N29	max	.1	3	-.175	6	.005	7	8.373e-03	4	9.714e-04	3	9.874e-04	3
58		min	-.012	7	-.409	4	-.008	3	2.089e-03	6	-1.064e-03	7	-9.121e-04	7
59	N30	max	.165	4	-.231	3	.269	6	4.371e-03	6	3.355e-04	2	-8.568e-04	5
60		min	.021	8	-.588	7	.048	1	1.437e-03	1	-2.86e-03	3	-2.599e-03	4
61	N31	max	.109	4	-.175	6	.228	7	8.382e-03	4	9.714e-04	3	5.29e-04	3
62		min	-.009	8	-.409	4	.088	6	3.421e-03	6	-1.064e-03	7	-9.132e-04	7
63	N32	max	.088	3	-.307	6	.319	6	6.446e-03	6	7.315e-04	6	2.003e-03	7
64		min	-.072	7	-.628	4	-.166	3	-2.474e-05	3	-3.4e-03	3	-6.924e-05	3
65	N33	max	.139	3	-.231	3	.123	6	4.813e-03	3	1.112e-03	2	1.109e-03	3
66		min	-.028	7	-.587	7	-.024	4	6.648e-04	1	-5.087e-03	3	-6.731e-04	7
67	N34	max	.136	3	-.175	6	.142	6	4.899e-03	4	2.4e-03	6	8.301e-04	3
68		min	-.024	7	-.409	4	-.174	4	-8.407e-03	6	-1.171e-03	7	-5.603e-04	7
69	N35	max	.142	3	-.307	6	.155	6	1.425e-03	7	4.207e-03	6	1.405e-03	3
70		min	-.022	7	-.628	4	-.084	3	-3.156e-03	3	-7.353e-03	3	-3.048e-04	7
71	N36	max	.129	4	-.189	6	.199	7	6.803e-03	4	-3.83e-04	1	4.636e-04	3
72		min	.009	8	-.421	4	.049	6	1.424e-03	6	-2.231e-03	7	-1.926e-03	7
73	N37	max	.504	3	-.189	6	.859	6	4.864e-03	4	2.911e-03	6	7.798e-03	3
74		min	-.106	7	-.422	4	-.42	4	-1.598e-02	6	-2.738e-03	2	-1.474e-03	7
75	N38	max	.131	3	-.305	6	.161	6	1.652e-03	5	1.038e-03	3	3.001e-03	7
76		min	-.002	8	-.616	4	-.217	3	4.e-04	6	-2.827e-04	7	9.732e-04	3
77	N39	max	.17	3	-.209	2	.1	6	-2.253e-03	2	1.511e-03	6	5.716e-03	4
78		min	-.077	6	-.368	4	-.195	3	-4.791e-03	7	-5.663e-03	3	2.9e-03	6
79	N40	max	.451	3	-.322	2	.153	6	-1.59e-03	2	-1.068e-04	1	2.32e-04	5
80		min	.004	2	-.642	7	-.035	3	-3.488e-03	4	-2.167e-03	3	-9.087e-04	6
81	N41	max	.101	3	-.21	2	.115	6	-1.443e-03	5	2.282e-03	6	7.008e-03	4
82		min	-.05	6	-.364	4	-.235	3	-3.735e-03	7	-4.49e-03	3	3.793e-03	6
83	N42	max	.169	3	-.305	6	.203	6	1.653e-03	5	1.038e-03	3	3.006e-03	7
84		min	-.089	7	-.616	4	-.186	3	7.692e-04	1	-2.827e-04	7	-1.789e-03	3
85	N43	max	-.071	3	-.21	2	.037	6	-1.444e-03	5	2.282e-03	6	6.632e-03	4
86		min	-.209	7	-.364	4	-.292	3	-3.358e-03	7	-4.49e-03	3	3.794e-03	6
87	N44	max	.548	3	-.322	2	.144	6	1.806e-04	6	-1.068e-04	1	1.381e-04	2
88		min	0	2	-.643	7	-.114	4	-3.492e-03	4	-2.167e-03	3	-4.409e-03	3
89	N45	max	.106	3	-.305	6	.221	6	1.912e-03	3	7.394e-03	3	1.422e-03	7
90		min	.015	8	-.616	4	-.269	3	-2.161e-03	6	3.4e-04	7	-8.77e-04	3
91	N46	max	.333	3	-.21	2	.203	6	-7.678e-04	2	1.637e-03	6	9.519e-03	3
92		min	.043	6	-.365	4	-.134	3	-4.771e-03	3	-9.782e-03	3	2.239e-03	2
93	N47	max	.531	3	-.322	2	.155	6	6.689e-06	6	-8.01e-04	2	3.388e-03	3
94		min	-.052	6	-.643	7	-.024	3	-8.278e-04	4	-5.977e-03	6	-2.446e-03	6
95	N48	max	.098	3	-.209	2	.038	6	-1.997e-03	6	1.511e-03	6	5.079e-03	4

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
96		min	-.187	7	-.368	4	-.285	3	-4.534e-03	4	-5.663e-03	3	2.058e-03	3
97	N49	max	1.706	3	-.209	2	.624	6	-1.296e-03	2	3.692e-03	6	2.566e-02	3
98		min	.17	6	-.368	4	.106	5	-8.848e-03	6	-4.507e-03	3	2.169e-03	2
99	N50	max	.448	3	-.328	2	.143	6	-1.595e-03	2	2.121e-03	6	3.508e-04	6
100		min	.008	2	-.655	7	-.007	1	-3.622e-03	4	-2.431e-03	3	-6.641e-04	4
101	N51	max	.087	3	-.15	3	.215	3	-1.446e-03	3	1.212e-04	1	-1.347e-03	3
102		min	0	1	-.409	7	-.001	1	-3.842e-03	7	-3.23e-03	3	-7.096e-03	7
103	N52	max	.125	3	-.213	3	.194	3	1.278e-03	2	7.932e-04	3	-1.329e-03	5
104		min	-.014	7	-.591	7	0	1	1.135e-05	6	-1.055e-04	8	-3.316e-03	7
105	N53	max	.142	3	-.169	3	.183	3	-2.474e-03	2	-2.674e-04	1	-3.359e-04	3
106		min	0	1	-.416	7	-.002	1	-5.359e-03	7	-5.09e-03	3	-6.402e-03	7
107	N54	max	.517	3	-.328	2	.125	6	-3.677e-04	6	2.121e-03	6	3.512e-04	6
108		min	.025	2	-.655	7	-.103	4	-3.628e-03	4	-2.431e-03	3	-2.845e-03	3
109	N55	max	.262	7	-.169	3	.112	3	-2.474e-03	2	-2.674e-04	1	-3.988e-04	3
110		min	.112	5	-.416	7	-.093	1	-4.982e-03	7	-5.09e-03	3	-6.403e-03	7
111	N56	max	.293	3	-.213	3	.209	7	1.812e-03	6	7.932e-04	3	-1.487e-03	8
112		min	.036	8	-.591	7	.019	1	1.271e-04	3	-1.055e-04	8	-6.809e-03	3
113	N57	max	.488	3	-.328	2	.148	6	5.055e-05	6	5.718e-03	6	2.684e-03	6
114		min	-.013	2	-.655	7	.008	2	-1.38e-03	4	-4.01e-03	3	-5.773e-04	2
115	N58	max	.282	3	-.17	3	.227	7	2.567e-03	3	-7.655e-04	2	7.364e-03	3
116		min	-.091	1	-.417	7	.046	2	-3.812e-03	7	-4.746e-03	6	-4.649e-03	7
117	N59	max	.095	3	-.213	3	.276	3	9.868e-06	2	6.458e-03	3	-3.105e-04	5
118		min	-.066	7	-.591	7	.005	2	-2.656e-03	6	-9.002e-04	1	-2.046e-03	6
119	N60	max	.248	7	-.15	3	.175	3	-1.448e-03	3	1.212e-04	1	-3.7e-03	5
120		min	.114	5	-.409	7	-.063	1	-3.479e-03	7	-3.23e-03	3	-7.114e-03	7
121	N61	max	1.316	3	-.15	3	.711	6	2.446e-03	3	8.764e-04	1	2.219e-02	3
122		min	-.388	7	-.409	7	.069	3	-9.324e-03	6	-5.611e-03	3	-5.322e-03	7
123	N62	max	.1	3	-.179	6	.019	6	7.022e-03	4	1.777e-03	6	1.483e-03	3
124		min	-.012	7	-.424	4	.002	8	1.811e-03	6	3.014e-04	1	5.691e-04	2
125	N63	max	.084	3	-.179	6	.215	4	7.04e-03	4	1.777e-03	6	1.221e-03	5
126		min	-.038	8	-.424	4	.121	3	3.789e-03	3	3.014e-04	1	3.818e-04	3
127	N64	max	.485	3	-.179	6	1.354	6	4.339e-03	4	3.892e-03	4	7.105e-03	3
128		min	-.026	7	-.425	4	-.352	4	-2.385e-02	6	-6.385e-05	6	-8.551e-05	7
129	N65	max	.222	3	-.213	3	.137	3	-2.426e-03	2	-3.719e-04	2	6.985e-04	3
130		min	.007	1	-.455	7	-.006	1	-4.979e-03	7	-5.132e-03	3	-3.652e-03	7
131	N66	max	.236	4	-.213	3	.064	3	-2.427e-03	2	-3.719e-04	2	6.357e-04	3
132		min	.083	2	-.455	7	-.095	1	-4.758e-03	4	-5.132e-03	3	-3.652e-03	7
133	N67	max	1.139	3	-.213	3	.652	6	7.347e-04	3	-2.065e-03	2	1.661e-02	3
134		min	-.142	1	-.456	7	.102	5	-1.007e-02	6	-7.147e-03	7	-2.17e-03	7
135	N68	max	0	8	0	8	0	8	1.011e-02	7	3.994e-03	3	2.162e-03	3
136		min	0	1	0	1	0	1	5.803e-03	3	-4.871e-04	7	-2.251e-04	7
137	N70	max	.132	3	-.218	3	.021	7	3.879e-03	4	7.793e-05	6	-5.989e-04	3
138		min	-.023	7	-.486	7	-.113	3	-2.638e-03	6	-2.345e-03	4	-3.95e-03	7
139	N71	max	.133	3	-.242	6	.111	3	2.918e-03	4	1.793e-03	7	3.944e-03	4
140		min	-.021	7	-.532	4	-.017	7	-4.195e-03	6	-4.263e-04	6	2.052e-03	2
141	N71A	max	.133	3	-.307	6	.197	6	1.429e-03	7	4.211e-03	6	1.41e-03	3
142		min	-.02	7	-.635	4	-.184	3	-3.156e-03	3	-7.353e-03	3	-2.995e-04	7
143	N72	max	.132	3	-.217	3	.185	6	4.813e-03	3	1.112e-03	2	1.101e-03	3
144		min	-.024	7	-.596	7	-.031	2	6.648e-04	1	-5.087e-03	3	-6.809e-04	7
145	N73	max	0	8	0	8	0	8	-2.634e-03	2	2.451e-05	2	-4.496e-03	6
146		min	0	1	0	1	0	1	-5.118e-03	4	-6.241e-03	3	-8.842e-03	7
147	N74	max	.349	3	-.281	2	.12	3	-1.675e-03	3	-1.19e-03	5	4.125e-03	3

Envelope Joint Displacements (Continued)

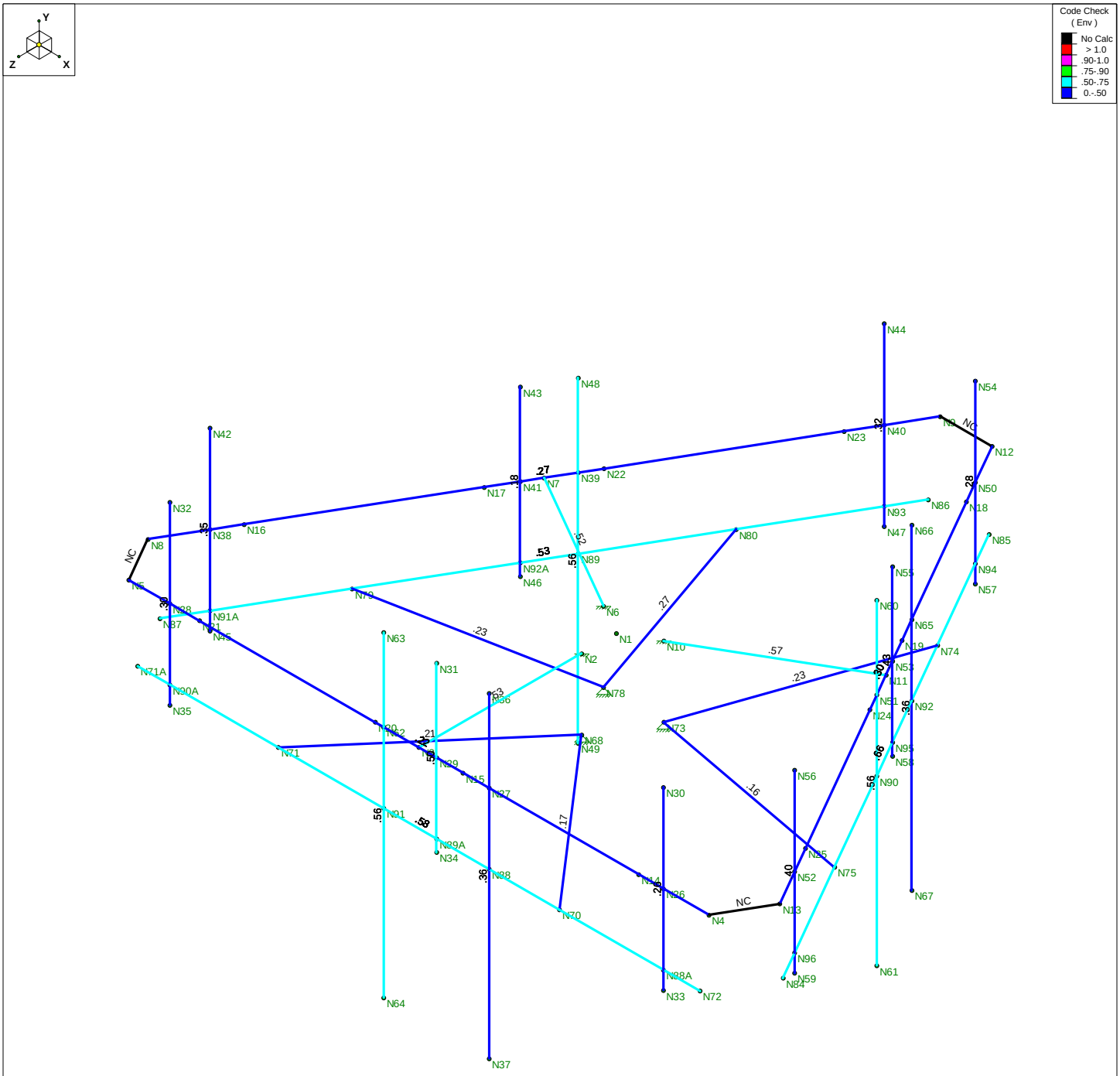
	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
148		min	-.001	2	-.545	7	0	2	-5.093e-03	7	-3.305e-03	4	-5.496e-04	8
149	N75	max	0	2	-.176	3	.355	3	3.941e-03	3	1.253e-03	1	1.663e-03	3
150		min	-.064	3	-.511	7	0	2	-1.735e-04	6	-2.06e-03	3	-5.371e-03	7
151	N78	max	0	8	0	8	0	8	-1.903e-03	3	3.867e-03	7	8.439e-03	7
152		min	0	1	0	1	0	1	-5.232e-03	4	-6.748e-03	3	5.025e-03	6
153	N79	max	.038	6	-.279	6	.198	6	2.527e-03	4	4.417e-04	6	5.368e-03	3
154		min	-.065	3	-.508	4	-.359	3	4.364e-04	6	-2.28e-03	3	2.86e-03	2
155	N80	max	.354	3	-.274	2	.068	6	-2.694e-03	2	1.245e-03	7	4.242e-03	3
156		min	-.187	6	-.513	7	-.12	3	-5.993e-03	4	-1.34e-03	3	-1.635e-04	7
157	N88	max	.133	3	-.189	6	.062	6	4.942e-03	4	2.911e-03	6	1.638e-03	3
158		min	-.023	7	-.421	4	-.146	4	-6.844e-03	6	-2.738e-03	2	-1.497e-03	7
159	N89	max	.392	3	-.209	2	.175	6	-1.302e-03	2	3.692e-03	6	1.383e-02	3
160		min	-.003	6	-.368	4	-.097	3	-5.547e-03	3	-4.507e-03	3	2.18e-03	2
161	N90	max	.197	3	-.15	3	.234	7	2.459e-03	3	8.764e-04	1	1.034e-02	3
162		min	-.089	7	-.409	7	.041	2	-4.896e-03	6	-5.611e-03	3	-5.374e-03	7
163	N91	max	.134	3	-.179	6	.142	6	4.381e-03	4	3.892e-03	4	2.666e-03	3
164		min	-.021	7	-.424	4	-.108	4	-1.201e-02	6	-6.385e-05	6	-8.634e-05	7
165	N92	max	.305	3	-.213	3	.156	7	7.398e-04	3	-2.065e-03	2	7.479e-03	3
166		min	-.051	1	-.456	7	.027	2	-4.306e-03	7	-7.147e-03	7	-2.205e-03	7
167	N84	max	.16	3	-.192	3	.225	3	1.445e-05	2	6.46e-03	3	-3.136e-04	5
168		min	-.063	7	-.581	7	.01	2	-2.651e-03	6	-9.002e-04	1	-2.048e-03	6
169	N85	max	.52	3	-.328	2	.184	6	4.444e-05	6	5.719e-03	6	2.688e-03	6
170		min	-.019	2	-.67	7	.011	2	-1.386e-03	4	-4.014e-03	3	-5.735e-04	2
171	N86	max	.563	3	-.321	2	.188	6	2.721e-06	6	-8.01e-04	2	3.385e-03	3
172		min	.02	6	-.657	7	.001	3	-8.324e-04	4	-5.978e-03	6	-2.448e-03	6
173	N87	max	.192	3	-.289	6	.21	6	1.919e-03	3	7.398e-03	3	1.426e-03	7
174		min	.018	8	-.619	4	-.211	3	-2.154e-03	6	3.483e-04	7	-8.738e-04	3
175	N88A	max	.132	3	-.231	3	.127	6	4.813e-03	3	1.112e-03	2	1.109e-03	3
176		min	-.024	7	-.587	7	-.017	2	6.648e-04	1	-5.087e-03	3	-6.731e-04	7
177	N89A	max	.133	3	-.175	6	.108	6	4.899e-03	4	2.4e-03	6	8.299e-04	3
178		min	-.022	7	-.409	4	-.154	4	-8.406e-03	6	-1.171e-03	7	-5.603e-04	7
179	N90A	max	.133	3	-.307	6	.15	6	1.429e-03	7	4.207e-03	6	1.405e-03	3
180		min	-.02	7	-.628	4	-.103	3	-3.156e-03	3	-7.353e-03	3	-3.048e-04	7
181	N91A	max	.112	3	-.305	6	.208	6	1.912e-03	3	7.394e-03	3	1.422e-03	7
182		min	.011	8	-.616	4	-.258	3	-2.16e-03	6	3.4e-04	7	-8.777e-04	3
183	N92A	max	.295	3	-.21	2	.193	6	-7.678e-04	2	1.637e-03	6	9.519e-03	3
184		min	.029	6	-.365	4	-.153	3	-4.771e-03	3	-9.782e-03	3	2.239e-03	2
185	N93	max	.511	3	-.322	2	.155	6	7.308e-06	6	-8.01e-04	2	3.388e-03	3
186		min	-.037	6	-.643	7	-.028	3	-8.278e-04	4	-5.977e-03	6	-2.446e-03	6
187	N94	max	.477	3	-.328	2	.148	6	5.117e-05	6	5.718e-03	6	2.684e-03	6
188		min	-.01	2	-.655	7	.006	2	-1.38e-03	4	-4.01e-03	3	-5.773e-04	2
189	N95	max	.252	3	-.17	3	.211	7	2.567e-03	3	-7.655e-04	2	7.364e-03	3
190		min	-.081	1	-.417	7	.041	2	-3.81e-03	7	-4.746e-03	6	-4.649e-03	7
191	N96	max	.098	3	-.213	3	.261	3	9.868e-06	2	6.458e-03	3	-3.11e-04	5
192		min	-.055	7	-.591	7	.005	2	-2.655e-03	6	-9.002e-04	1	-2.046e-03	6

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

	Mem...	Shape	Code Check	L...	LC	Sh...	Loc[ft]	Dir	...phi*P...	phi*P...	phi*Mn y-y [k-ft]	phi*...Cb	Eqn
1	M1	HSS4X4X4	.534	0	4	.058	0	y	127.5...	139.5...	16.181	16....	2....	H1...
2	M2	PIPE_3.0	.223	8....	7	.253	8.25		16.423	65.205	5.749	5.7...	1....	H1...

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

	Mem...	Shape	Code Check	L...	LC	Sh...	Loc[ft]	Dir	...	phi*P...	phi*P...	phi*Mn y-y [k-ft]	phi*...	Cb	Eqn
3	M3	HSS4X4X4	.522	0	3	.055	0	y	7	127.5...	139.5...	16.181	16....	1....	H1...
4	M4	PIPE 3.0	.269	8....	3	.225	8.25		7	16.423	65.205	5.749	5.7...	1....	H1...
5	M5	HSS4X4X4	.566	0	7	.060	0	y	4	127.5...	139.5...	16.181	16....	2....	H1...
6	M6	PIPE 3.0	.298	8....	3	.254	8.25		4	16.423	65.205	5.749	5.7...	1....	H1...
7	M10	PIPE 2.0	.264	2.5	4	.119	4.479		6	23.809	32.13	1.872	1.8...	1....	H1...
8	M11	PIPE 2.0	.503	2....	6	.108	2.333		6	24.746	32.13	1.872	1.8...	1....	H1...
9	M12	PIPE 2.0	.296	2.5	6	.146	4.479		3	23.809	32.13	1.872	1.8...	1....	H1...
10	M13	PIPE 2.0	.360	4....	6	.152	4.313		6	12.144	32.13	1.872	1.8...	4....	H1...
11	M14	PIPE 2.0	.351	2.5	7	.232	4.479		3	23.809	32.13	1.872	1.8...	1....	H1...
12	M15	PIPE 2.0	.177	2....	7	.161	2.333		3	24.746	32.13	1.872	1.8...	1....	H1...
13	M16	PIPE 2.0	.325	2.5	3	.162	4.479		7	23.809	32.13	1.872	1.8...	1....	H1...
14	M17	PIPE 2.5	.564	4....	3	.116	4.313		7	26.137	50.715	3.596	3.5...	1....	H1...
15	M18	PIPE 2.0	.279	2.5	7	.143	4.479		7	23.809	32.13	1.872	1.8...	1....	H1...
16	M19	PIPE 2.0	.430	2....	3	.069	2.333		3	24.746	32.13	1.872	1.8...	1....	H1...
17	M20	PIPE 2.0	.400	2.5	3	.213	2.5		3	23.809	32.13	1.872	1.8...	1....	H1...
18	M21	PIPE 2.5	.564	4....	3	.091	2.344		3	26.137	50.715	3.596	3.5...	1....	H1...
19	M22	PIPE 2.5	.564	4....	6	.135	4.313		3	26.137	50.715	3.596	3.5...	4....	H1...
20	M23	PIPE 2.0	.360	4....	3	.226	4.313		7	12.144	32.13	1.872	1.8...	1....	H1...
21	M24	L2.5x2.5x3	.205	0	6	.016	6.115	y	6	8.783	29.192	.873	1.7...	1....	H2...
22	M25	L2.5x2.5x3	.169	6....	3	.014	0	y	6	8.783	29.192	.873	1.7...	1....	H2...
23	M26	PIPE 2.0	.575	7	6	.196	4		6	3.842	32.13	1.872	1.8...	2....	H1...
24	M27	L2.5x2.5x3	.159	1....	7	.017	6.115	z	7	8.783	29.192	.873	1.6...	1....	H2...
25	M28	L2.5x2.5x3	.229	6....	7	.017	6.115	z	4	8.783	29.192	.873	1.5...	1....	H2...
26	M30	L2.5x2.5x3	.267	0	3	.015	6.115	z	4	8.783	29.192	.873	1.7...	1....	H2...
27	M31	L2.5x2.5x3	.227	6....	3	.016	0	z	7	8.783	29.192	.873	1.6...	1....	H2...
28	M28A	PIPE 2.0	.657	4	3	.193	8.5		3	3.842	32.13	1.872	1.8...	3....	H1...
29	M29	PIPE 2.0	.527	12	3	.272	8.5		3	3.842	32.13	1.872	1.8...	3....	H1...



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Centek		SK - 1
TJL	CT11327A - Mount	Apr 24, 2023 at 11:44 AM
20143.18	Unity Check	CT11327A_AMA.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 Host Building
Location:	Old Saybrook, CT
Rev. 1: 4/24/23	Prepared by: T.J.L. Checked by: C.F.C. Job No. 22022.18

Antenna Mount Connection:

Anchor Data:

A325 Bolt =

Number of Anchor Bolts = $N := 4$ (User Input)

Diameter of Bolts = $D := 0.625in$ (User Input)

Design Tension = $T_{design} := 20.7 \cdot kips$ (User Input)

Design Shear = $V_{design} := 12.4 \cdot kips$ (User Input)

Bolt Spacing= $S := 6 \cdot in$ (User Input)

Design Reactions:

Fx = $F_x := 0.7 \cdot kips$ (User Input)

Fy = $F_y := 1.9 \cdot kips$ (User Input)

Fz = $F_z := 1.6 \cdot kips$ (User Input)

Mx = $M_x := 6.9 \cdot ft \cdot kips$ (User Input)

My = $M_y := 2.0 \cdot ft \cdot kips$ (User Input)

Mz = $M_z := 0.3 \cdot ft \cdot kips$ (User Input)

Anchor Check:

Max Tension Force = $$T_{Max} := \frac{F_z}{N} + \frac{M_x}{S \cdot \frac{N}{2}} + \frac{M_y}{S \cdot \frac{N}{2}} = 9300\,lb$$

Max Shear Force = $$V_{Max} := \frac{F_y}{N} + \frac{F_x}{N} + \frac{M_z}{S \cdot \frac{N}{2}} = 950\,lb$$

Condition 1 = $$Condition1 := if\left(\frac{T_{Max}}{T_{design}} + \frac{V_{Max}}{V_{design}} \le 1.0, "OK", "NG"\right) = "OK"$$

% of Capacity = $$\max\left[\frac{T_{Max}}{T_{design}}, \frac{V_{Max}}{V_{design}}, \left(\frac{\frac{T_{Max}}{T_{design}} + \frac{V_{Max}}{V_{design}}}{1.0}\right)\right] = 52.6 \cdot \%$$

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 Host Building
Location:	Old Saybrook, CT
Rev. 1: 4/24/23	Prepared by: T.J.L. Checked by: C.F.C. Job No. 22022.18

Design Reactions:

Fx =	$F_x := 1.4 \cdot kips$	(User Input)
Fy =	$F_y := 1.6 \cdot kips$	(User Input)
Fz =	$F_z := 0.7 \cdot kips$	(User Input)
Mx =	$M_x := 3.1 \cdot ft \cdot kips$	(User Input)
My =	$M_y := 4.3 \cdot ft \cdot kips$	(User Input)
Mz =	$M_z := 5.2 \cdot ft \cdot kips$	(User Input)

Anchor Check:

Max Tension Force =

$$T_{Max} := \frac{F_x}{N} + \frac{M_z}{S \cdot \frac{N}{2}} + \frac{M_y}{S \cdot \frac{N}{2}} = 9850\,lb$$

Max Shear Force =

$$V_{Max} := \frac{F_y}{N} + \frac{F_z}{N} + \frac{M_x}{S \cdot \frac{N}{2}} = 3675\,lb$$

Condition 1 =

$$Condition1 := if\left(\frac{T_{Max}}{T_{design}} + \frac{V_{Max}}{V_{design}} \le 1.0, "OK", "NG"\right) = "OK"$$

% of Capacity =

$$\max\left[\frac{T_{Max}}{T_{design}}, \frac{V_{Max}}{V_{design}}, \left(\frac{\frac{T_{Max}}{T_{design}} + \frac{V_{Max}}{V_{design}}}{1.0}\right)\right] = 77.2 \cdot \%$$

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: CT11327A

Old Saybrook/I-95/Amtrk_1
Amtrak Maintenance Yard
Old Saybrook, Connecticut 06475

June 14, 2023

EBI Project Number: 6223002483

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**1.91%**

21 B Street, Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

June 14, 2023

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

Emissions Analysis for Site: CT11327A - Old Saybrook/I-95/Amtrk_1

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **Amtrak Maintenance Yard** in **Old Saybrook, 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 Amtrak Maintenance Yard in Old Saybrook, 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 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.

9) 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.

10) 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.

11) 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.

12) The antennas used in this modeling are the ERICSSON SON_AIR6419 B41 NR TB 02.09.21 2500 TMO for the 2500 MHz / 2500 MHz channel(s), the RFS APXVAALL24_43-U-NA20 02DT 600 for the 600 MHz / 600 MHz / 700 MHz channel(s), the COMMSCOPE VV-65A-R1 02DT 1900 for the 1900 MHz / 1900 MHz / 1900 MHz / 2100 MHz channel(s) in Sector A, the ERICSSON SON_AIR6419 B41 NR TB 02.09.21 2500 TMO for the 2500 MHz / 2500 MHz channel(s), the RFS APXVAALL24_43-U-NA20 02DT 600 for the 600 MHz / 600 MHz / 700 MHz channel(s), the COMMSCOPE VV-65A-R1 02DT 1900 for the 1900 MHz / 1900 MHz / 1900 MHz / 2100 MHz channel(s) in Sector B, the ERICSSON SON_AIR6419 B41 NR TB 02.09.21 2500 TMO for the 2500 MHz / 2500 MHz channel(s), the RFS APXVAALL24_43-U-NA20 02DT 600 for the 600 MHz / 600 MHz / 700 MHz channel(s), the COMMSCOPE VV-65A-R1 02DT 1900 for the 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.

13) The antenna mounting height centerline of the proposed antennas is 150 feet above ground level (AGL).

14) Emissions values for additional carriers were calculated in Far Field utilizing the past filings submitted to the CSC.

15) 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 NR TB 02.09.21 2500 TMO	Make / Model:	ERICSSON SON_AIR6419 B41 NR TB 02.09.21 2500 TMO	Make / Model:	ERICSSON SON_AIR6419 B41 NR TB 02.09.21 2500 TMO
Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz
Gain:	22.05 dBd / 15.55 dBd	Gain:	22.05 dBd / 15.55 dBd	Gain:	22.05 dBd / 15.55 dBd
Height (AGL):	150 feet	Height (AGL):	150 feet	Height (AGL):	150 feet
Channel Count:	2	Channel Count:	2	Channel Count:	2
Total TX Power (W):	120.00 Watts	Total TX Power (W):	120.00 Watts	Total TX Power (W):	120.00 Watts
ERP (W):	15,505.97	ERP (W):	15,505.97	ERP (W):	15,505.97
Antenna A1 MPE %:	**2.69%**	Antenna B1 MPE %:	**2.69%**	Antenna C1 MPE %:	**2.69%**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APXVAALL24_43-U-NA20 02DT 600	Make / Model:	RFS APXVAALL24_43-U-NA20 02DT 600	Make / Model:	RFS APXVAALL24_43-U-NA20 02DT 600
Frequency Bands:	600 MHz / 600 MHz / 700 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz
Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd
Height (AGL):	150 feet	Height (AGL):	150 feet	Height (AGL):	150 feet
Channel Count:	3	Channel Count:	3	Channel Count:	3
Total TX Power (W):	160.00 Watts	Total TX Power (W):	160.00 Watts	Total TX Power (W):	160.00 Watts
ERP (W):	2,878.76	ERP (W):	2,878.76	ERP (W):	2,878.76
Antenna A2 MPE %:	**1.20%**	Antenna B2 MPE %:	**1.20%**	Antenna C2 MPE %:	**1.20%**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	COMMSCOPE VV-65A-R1 02DT 1900	Make / Model:	COMMSCOPE VV-65A-R1 02DT 1900	Make / Model:	COMMSCOPE VV-65A-R1 02DT 1900
Frequency Bands:	1900 MHz / 1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 1900 MHz / 1900 MHz / 2100 MHz
Gain:	15.77 dBd / 15.77 dBd / 15.77 dBd / 16.47 dBd	Gain:	15.77 dBd / 15.77 dBd / 15.77 dBd / 16.47 dBd	Gain:	15.77 dBd / 15.77 dBd / 15.77 dBd / 16.47 dBd
Height (AGL):	150 feet	Height (AGL):	150 feet	Height (AGL):	150 feet
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	490.00 Watts	Total TX Power (W):	490.00 Watts	Total TX Power (W):	490.00 Watts
ERP (W):	16,955.71	ERP (W):	16,955.71	ERP (W):	16,955.71
Antenna A3 MPE %:	**2.94%**	Antenna B3 MPE %:	**2.94%**	Antenna C3 MPE %:	**2.94%**

Site Composite MPE %	
Carrier	**MPE %**
T-Mobile (Max at Sector A):	0.43%
Amtrak	1.47%
Site Total MPE % :	1.91%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	0.43%
T-Mobile Sector B Total:	0.43%
T-Mobile Sector C Total:	0.43%
Site Total MPE % :	1.91%

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 NR	1	14429.20852	150	25.01693307	2500 MHz NR	1000.0	2.50%
T-Mobile 2500 MHz NR	1	1076.765804	150	1.866864563	2500 MHz NR	1000.0	0.19%
T-Mobile 600 MHz LTE	1	689.5408364	150	1.195505418	600 MHz LTE	400.0	0.30%
T-Mobile 600 MHz NR	1	1379.081673	150	2.391010836	600 MHz NR	400.0	0.60%
T-Mobile 700 MHz LTE	1	810.1398427	150	1.404596392	700 MHz LTE	467.0	0.30%
T-Mobile 1900 MHz GSM	1	327.3406949	150	0.567533572	1900 MHz GSM	1000.0	0.06%
T-Mobile 1900 MHz LTE	1	5237.451118	150	9.080537159	1900 MHz LTE	1000.0	0.91%
T-Mobile 1900 MHz NR	1	5237.451118	150	9.080537159	1900 MHz NR	1000.0	0.91%
T-Mobile 2100 MHz LTE	1	6153.468513	150	10.66870091	2100 MHz LTE	1000.0	1.07%
						Total:	**0.44%**

• 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:	0.43%
Sector B:	0.43%
Sector C:	0.43%
T-Mobile Maximum MPE % (Sector A):	0.43%
Site Total:	1.91%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **1.91%** 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.