

JULIE D. KOHLER

PLEASE REPLY TO: Bridgeport
WRITER'S DIRECT DIAL: (203) 337-4157
E-Mail Address: jkohler@cohenandwolf.com

November 19, 2014

Attorney Melanie Bachman
Acting Executive Director
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

**Re: Notice of Exempt Modification
Amtrak/T-Mobile site upgrade
44 Ford Drive, Old Saybrook
Site ID CT11327E**

Dear Attorney Bachman:

This office represents T-Mobile Northeast LLC ("T-Mobile") and has been retained to file exempt modification filings with the Connecticut Siting Council on its behalf.

In this case, Amtrak owns the existing monopole telecommunications tower and related facility at 44 Ford Drive, Old Saybrook, Connecticut (Latitude: 41.301257, Longitude : -72.374695). T-Mobile intends to add six (6) antennas and replace three (3) existing antennas with three new antennas and related equipment at this existing telecommunications facility in Old Saybrook ("Old Saybrook Facility"). Please accept this letter as notification, pursuant to R.C.S.A. § 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to the First Selectman Carl P. Fortuna Jr., and the property owner, Anthony Ronca.

The existing Old Saybrook Facility consists of a 150 foot tall monopole tower.¹ T-Mobile plans to add three (3) antennas, replace six (6) existing antennas with six (6) new antennas, replace three (3) existing TMAs (tower mounted amplifiers) with three (3) new TMAs, and add three (3) RRUs (remote radio units) at a centerline of 150 feet. (See the plans revised to November 5, 2014 attached hereto as Exhibit A). T-Mobile will also install an equipment cabinet, remove an equipment cabinet, install fiber and coax cable and reuse existing coax cables. The existing Old Saybrook Facility is structurally capable of supporting T-Mobile's proposed modifications, as indicated in the structural analysis dated October 22, 2014 and

¹ This structure was approved (as a replacement facility) in Petition No. 551, which allowed for a 150 foot facility with Amtrak's whip antennas located off the top of the tower. T-Mobile most recently modified this facility in the notice of intent captioned EM-T-MOBILE-106-101208.

November 19, 2014
Site ID CT11327A
Page 2

attached hereto as Exhibit B.²

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

1. The proposed modification will not increase the height of the tower. T-Mobile's replacement and additional antennas will be installed at a centerline of 150 feet, merely replacing existing antennas located at the same 150 foot elevation. The enclosed tower drawing confirms that the proposed modification will not increase the height of the tower.

2. The proposed modifications will not require an extension of the site boundaries or lease area, as depicted on Sheet A-2 of Exhibit A. T-Mobile's equipment will be located entirely within the existing compound area.

3. The proposed modification to the Old Saybrook Facility will not increase the noise levels at the existing facility by six decibels or more.

4. The operation of the proposed and replacement antennas will not increase the total radio frequency (RF) power density, measured at the base of the tower, to a level at or above the applicable standard. According to a Radio Frequency Emissions Analysis Report prepared by EBI dated November 13, 2014, T-Mobile's operations would add 5.82% of the FCC Standard. Therefore, the calculated "worst case" power density for the planned combined operation at the site including all of the proposed antennas would be 16.22% of the FCC Standard as calculated for a mixed frequency site as evidenced by the engineering exhibit attached hereto as Exhibit C.

For the foregoing reasons, T-Mobile respectfully submits that the proposed and replacement antennas and equipment at the Old Saybrook Facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Upon acknowledgement by the Council of this proposed exempt modification, T-Mobile shall commence construction approximately sixty days from the date of the Council's notice of acknowledgement.

Sincerely,



Julie D. Kohler, Esq.

² The structural analysis indicates that the monopole will have adequate capacity to support the T-Mobile upgrade once reinforced according to the plans prepared by Tectonic, also included in Exhibit B.

November 19, 2014
Site ID CT11327A
Page 3

cc: Town of Old Saybrook, First Selectman Carl P. Fortuna Jr.
Amtrak
Anthony Ronca
Sheldon Freinle, Northeast Site Solutions

EXHIBIT A

Mobile

NORTHEAST LLC.

SITE NAME: **AMTRAK - OLD SAYBROOK**

SITE ID NUMBER: **CT11327A**

SITE ADDRESS: **AMTRAK MAINTENANCE YARD,
OLD SAYBROOK, CT**

AMTRAK FILE NO.: **626.59**

WORK CATEGORY: **CABINET, ANTENNA, TMA REPLACEMENT AND COAX 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: MIDDLESEX
 PROPERTY OWNER: AMTRAK (NATIONAL RAILROAD
 PASSENGER CORPORATION)
 APPLICANT: T-MOBILE NORTHEAST, LLC.
 12050 BALTIMORE AVENUE
 BELTSVILLE, MD 20705
 (240) 264-8600
 CONTACT: ANDREW STROCK
 PHONE: (215) 917-9950
 ENGINEER/
 SURVEYOR/
 STRUCTURAL ENG: TECTONIC ENGINEERING &
 SURVEYING CONSULTANTS P.C.
 1279 ROUTE 300
 NEWBURGH, NY 12550
 CONTACT: MIKE PATEL
 PHONE: (845) 567-6656 EXT. 2808
 LATITUDE: (NAD 83) 41.301257
 LONGITUDE: (NAD 83) -72.374695

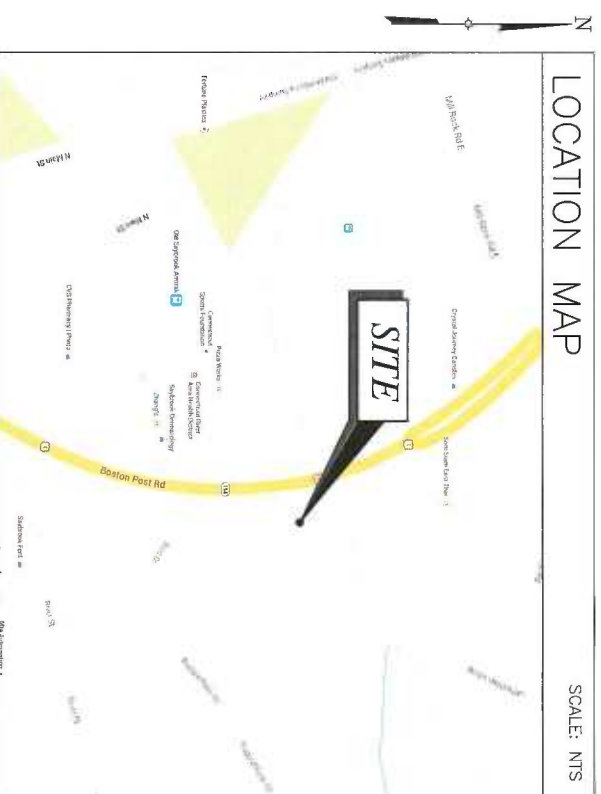
SITE DIRECTIONS

HEAD NORTHEAST ON U.S. 1 N/BALTIMORE AVE TOWARD MD-212 N/RITZ WAY. TURN LEFT ONTO MD-212/RITZ WAY. CONTINUE TO FOLLOW MD-212. MERGE ONTO I-95 N VIA THE RAMP TO BALTIMORE. KEEP RIGHT TO CONTINUE ON I-295 N/DELAWARE TURNPIKE, FOLLOW SIGNS FOR DEL MEM BR/NU-NY. CONTINUE TO FOLLOW I-295 N. KEEP LEFT TO CONTINUE ON US-40 E. CONTINUE ONTO NEW JERSEY TURNPIKE. CONTINUE ONTO I-95 N/NEW JERSEY TURNPIKE N. KEEP LEFT TO CONTINUE ON I-95 EXPRESS N, FOLLOW SIGNS FOR I-95 N/GEORGE WASHINGTON BRIDGE. CONTINUE ONTO I-95 N. MERGE ONTO I-95 N. TAKE EXIT 67 FOR CONNECTICUT 154 W TOWARD OLD SAYBROOK. MERGE ONTO CT-154 W/MIDDLESEX TURNPIKE. CONTINUE TO FOLLOW CT-154 W. TURN LEFT ONTO RIVER ST. SLIGHT LEFT ONTO FORD DR. TAKE THE 1ST LEFT TO STAY ON FORD DR. DESTINATION WILL BE ON THE LEFT.

SHEET INDEX

SHEET NO	DESCRIPTION	REV NO
T-1	TITLE SHEET	0
T-2	NOTES	0
A-1	SITE PLAN	0
A-2	EQUIPMENT PLAN & PHOTO	0
A-3	ELEVATION & PHOTO	0
A-4	ANTENNA PLAN, DETAILS & PHOTO	0
A-5	WIRING DIAGRAM	0
A-6	SPECIFICATIONS	0
A-7	SPECIFICATIONS	0
S-1	ELEVATION & DETAIL	0
S-2	BASE REINF. PLAN & SECTION	0
S-3	BRIDGE SPLICE PLAN & SECTION	0
S-4	GENERAL NOTES	0
S-5	STEEL NOTES	0

LOCATION MAP



AERIAL



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 MANAGEMENT

TECTONIC Engineering & Surveying
 Consultants P.C.
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 NEWBURGH, NY 12550
 Phone: (845) 567-6656
 Fax: (845) 567-8703

Mobile
 12050 BALTIMORE AVENUE
 BELTSVILLE, MD 20705

PROJECT NUMBER: 6421.011327A

DESIGNED BY: MP

REV DATE: 11/5/14 FOR APPROVAL

REVISION: KA

ISSUED BY: _____

DATE: _____

SITE INFORMATION

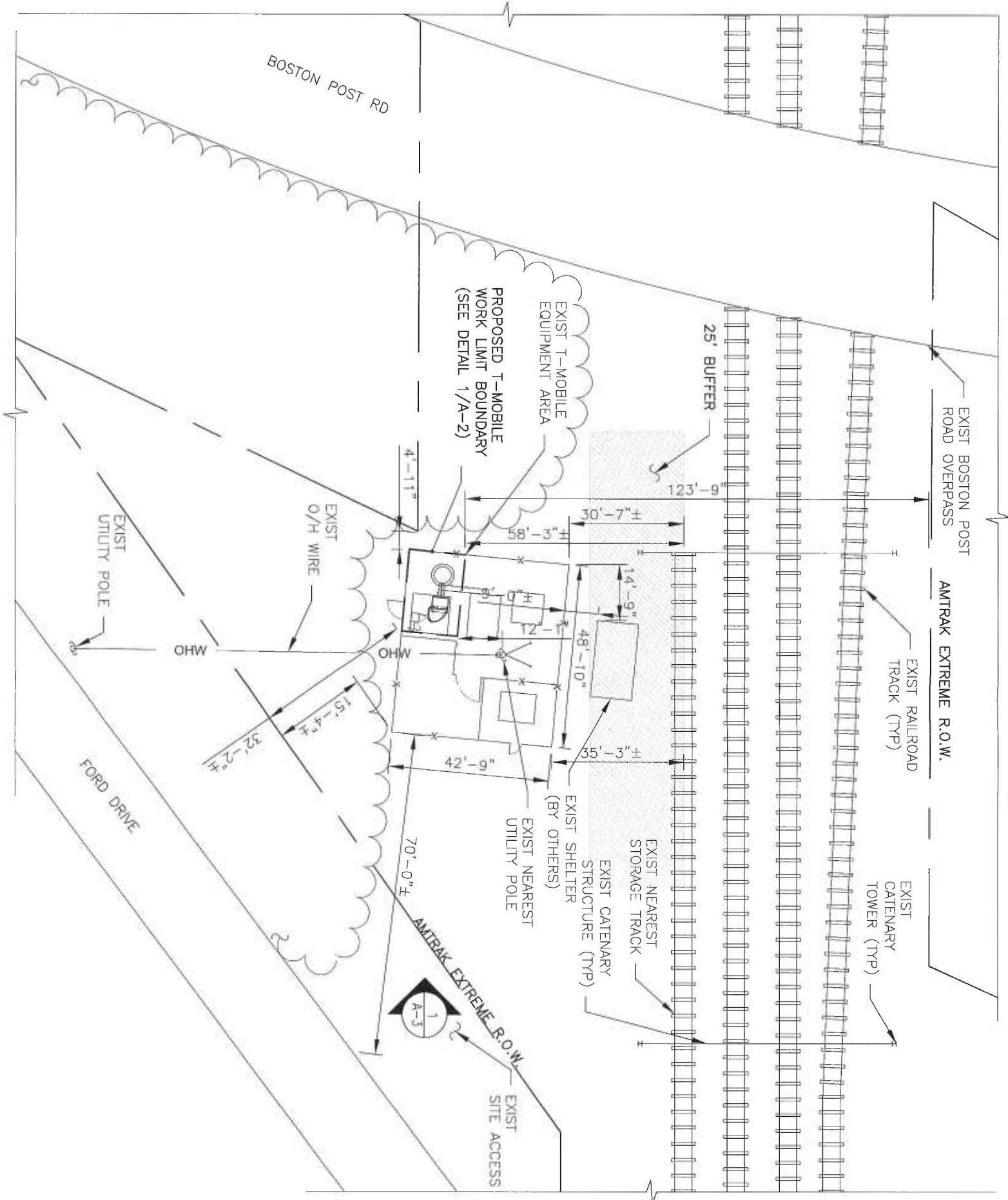
CT11327A
 AMTRAK-OLD SAYBROOK
 AMTRAK MAINTENANCE YARD
 OLD SAYBROOK, CT

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1



1
A-1
SITE PLAN
SCALE: 1/32" = 1'-0"



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••T••Mobile••

12050 BALTIMORE AVENUE
BELTSVILLE, MD 20705

PROJECT NUMBER 6421.CT11327A	DESIGNED BY MP
REV DATE 11/5/14 FOR APPROVAL	DRAWN BY KA

ISSUED BY	DATE
-----------	------

SITE INFORMATION

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

SHEET TITLE
SITE PLAN

SHEET NUMBER
A-1

EXIST FLAT PANEL ANTENNA (BY OTHERS) TO REMAIN

T/PROPOSED T-MOBILE ANTENNA (TYP OF 1 PER SECTOR, TOTAL OF 3) (SEE DETAIL 4/A-4) 154'-0" AGL

EXIST T-MOBILE ANTENNA (SEE DETAIL 3/A-4) TO BE REPLACED WITH NEW ANTENNA (SEE DETAILS 8 & 9/A-4) (TYP OF 2 PER SECTOR, TOTAL OF 6) 150'-0" AGL

EXIST WHIP ANTENNA (BY OTHERS) 167'-5" AGL

PROPOSED T-MOBILE ANTENNA (TYP OF 1 PER SECTOR, TOTAL OF 3) (SEE DETAILS 4/A-4) 150'-0" AGL

T/EXIST MONOPOLE 150'-0" AGL

EXIST WHIP ANTENNA (BY OTHERS) 142'-6" AGL

EXIST EMPTY ANTENNA MOUNT (BY OTHERS) 99'-8" AGL

PROPOSED T-MOBILE RRU (TYP OF 1 PER SECTOR, TOTAL OF 3) (SEE DETAIL 4/A-4)

PROPOSED (1) T-MOBILE FIBER CABLE ROUTED UP EXIST MONOPOLE (SEE DETAIL 7/A-4)

EXIST WHIP ANTENNA (BY OTHERS) 84'-7" AGL

EXIST WHIP ANTENNA (BY OTHERS) 59'-5" AGL

EXIST MONOPOLE TO BE REINFORCED PER STRUCTURAL REPORT BY TECTONIC ENGINEERING DATED 10/22/2014 (SEE SHEETS S-1 THROUGH S-5)

EXIST T-MOBILE GPS & LMU

PROPOSED T-MOBILE 6102 CABINET (SEE DETAIL 1/A-6)

EXIST T-MOBILE CABLE BRIDGE (BEYOND)

EXIST T-MOBILE TELCO/PPC CABINET

EXIST 8' HIGH CHAINLINK FENCE W/1' BARBED WIRE

EXIST 150' MONOPOLE

EXIST T-MOBILE S8000 CABINET TO BE REMOVED (SEE DETAIL 3/A-6)

EXIST (6) T-MOBILE 1-5/8" COAX CABLES ROUTED UP EXIST MONOPOLE (SEE DETAIL 7/A-4)

EXIST NEAREST UTILITY POLE

EXIST GUY WIRE (TYP)

EXIST NEAREST TRACK

EXIST EQUIPMENT SHELTER (BY OTHERS) (TYP)

EXIST CATERNARY TOWER (TYP)

EXIST GRADE

ELEVATION

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



PHOTO

SCALE: N.T.S.



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T-Mobile

12050 BALTIMORE AVENUE
BELTSVILLE, MD 20705

PROJECT NUMBER 6421.GT11327A	DESIGNED BY MP
REV. DATE 11/5/14 FOR APPROVAL	DRAWN BY KA
ISSUED BY	DATE

SITE INFORMATION

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

ELEVATION & PHOTO

SHEET NUMBER
A-3

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

EXIST T-MOBILE TMA (SEE DETAIL 5/A-4) TO BE REPLACED WITH PROPOSED T-MOBILE TMA (SEE DETAIL 6/A-4) (TYP 1 PER SECTOR, TOTAL OF 3)

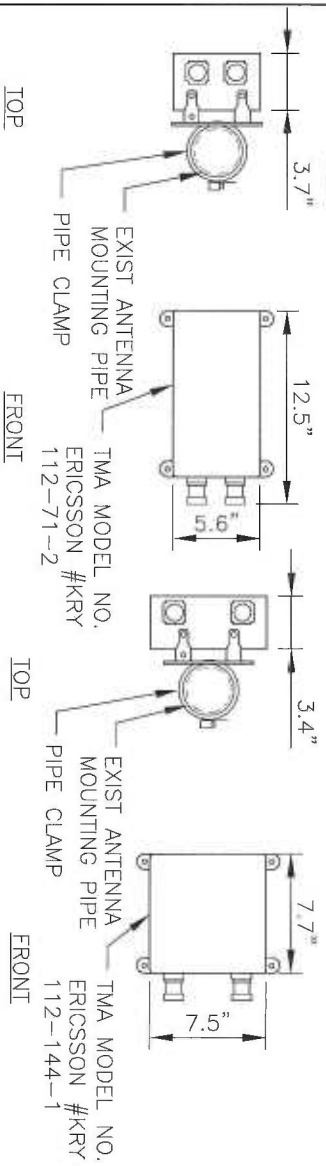
PROPOSED T-MOBILE RRU (SEE DETAIL 4/A-6) (TYP OF 1 PER SECTOR, TOTAL OF 3)

EXIST T-MOBILE ANTENNA (SEE DETAIL 3/A-4) TO BE REPLACED W/PROPOSED ANTENNA (SEE DETAIL 9/A-4) (TYP OF 1 PER SECTOR, TOTAL OF 3)

T-MOBILE TO RELOCATE EXIST FLAT PANEL ANTENNA (BY OTHERS)

ANTENNA PLAN

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



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

6 TMA (PROPOSED) SCALE: 1" = 1'-0"

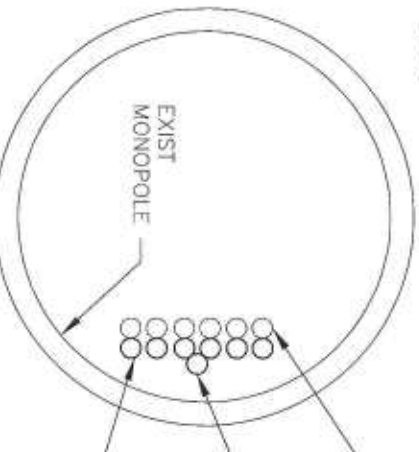
EXIST T-MOBILE (6) 1-5/8" COAX CABLES ROUTED UP EXIST MONOPOLE (SEE DETAIL 2/A-6)

PROPOSED T-MOBILE (1) FIBER CABLE ROUTED UP EXIST MONOPOLE

PROPOSED T-MOBILE (6) 1-5/8" COAX CABLES ROUTED UP EXIST MONOPOLE (SEE DETAIL 2/A-6)

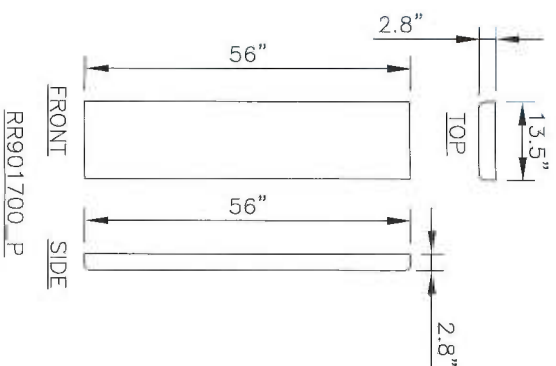
CABLE MOUNTING DETAIL

7 SCALE: 1" = 1'-0"



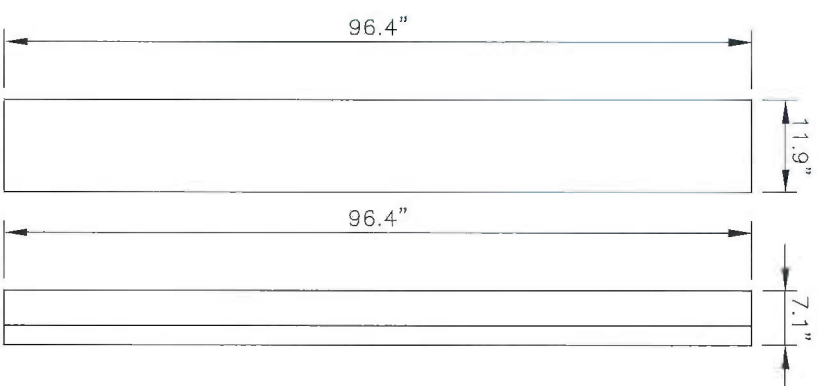
PHOTO

2 SCALE: N.T.S.



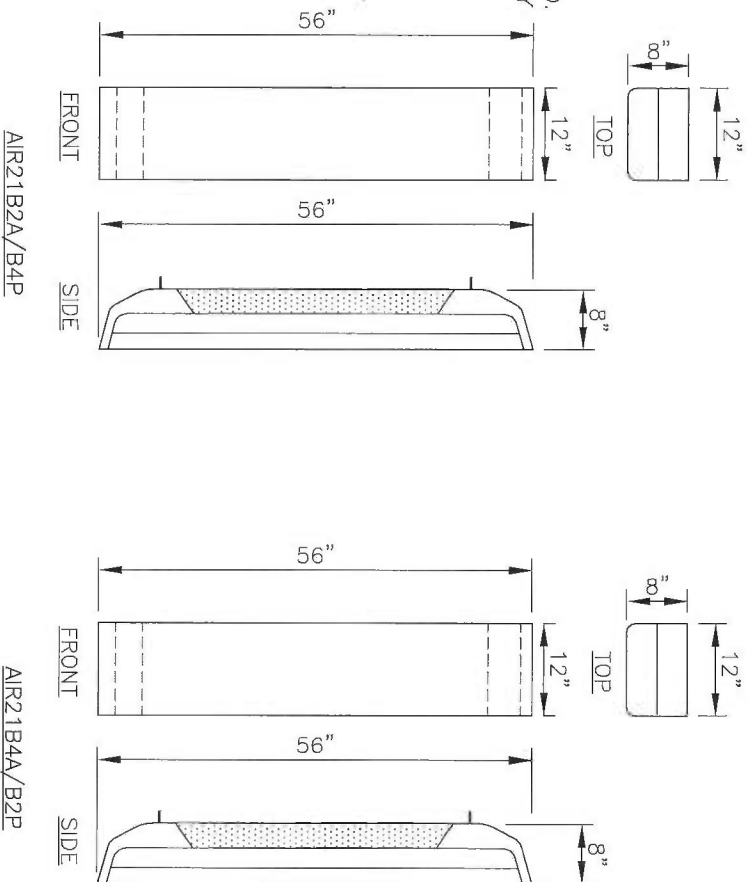
ANTENNA (EXIST)

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



ANTENNA (NEW)

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



ANTENNA (NEW)

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

ANTENNA (NEW)

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



ORIGINAL SIZE IN INCHES

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F-Mobile

12050 BALTIMORE AVENUE
BELTSVILLE, MD 20705

PROJECT NUMBER	DESIGNED BY	
6421.0T11327A	MP	
REV. DATE	REVISION	DRAWN BY
11/5/14	FOR APPROVAL	KA

ISSUED BY	DATE

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

SHEET TITLE	
ANTENNA PLAN, DETAILS & PHOTO	
SHEET NUMBER	
A-4	

EXHIBIT B

STRUCTURAL ANALYSIS REPORT – REV 1

REINFORCEMENT DESIGN

T-MOBILE UPGRADE

EXISTING 150' MONOPOLE

SITE NAME: AMTRAK – OLD SAYBROOK/I-95/AMTRK_1

**44 FORD DRIVE – AMTRAK MAINTENANCE ROAD,
OLD SAYBROOK, CT**

OCTOBER 22, 2014

TEC W.O. 6421.CT11327A

TECTONIC

Practical Solutions, Exceptional Service



STRUCTURAL ANALYSIS REPORT

Practical Solutions, Exceptional Service

Project Information

W.O. Number: 6421.CT11327A	Report Date: 10/22/2014
Client: T-Mobile	Revision: 1
Site Name: Old Saybrook/I-95/Amtrk_1	
Owner: AMTRAK	
Site Address: 44 Ford Drive - Amtrak Maintenance Yard	FCC Regulation Number: --
City, State: Old Saybrook, CT 06745	County: Middlesex

Structure Information

Structure Type: Monopole	Manufacturer: PiRod/Valmont
Structure Height: 150 ft.	Year Built: 2000
Original Drawings: Structure: No	Foundation: No

Documents provided:

<u>Item</u>	<u>By</u>	<u>No.</u>	<u>Date</u>
Geotechnical Report (10 pages)	French & Parrello	00N007AR1	1/20/00
Monopole Design Drawings (9 sheets)	PiRod Inc.	Dwg #:206047-B	7/11/00
Structural Analysis Report (65 pages)	CENTEK Engineering, Inc.	10116.CO1	10/25/10
Tower Mapping Report (10 pages)	Vertical Solutions	140875	8/24/14
Network Modernization RFDS v3.0 (3 Pages)	T-Mobile	-	9/5/14

Proposed Installation

T-Mobile is proposing to replace its existing six (6) antennas with newer model antennas. In addition, three (3) panel antennas and associated appurtenances are to be added as part of this upgrade. The final T-Mobile configuration upon this installation will be as follows:

Antennas:

Height (ft.)	Carrier	Qty	Manuf.	Model	Mount
150	T-Mobile	3	Ericsson	AIR21 B2A/B4P	Existing 16' Low Profile Platform
		3	Ericsson	AIR21 B4A/B2P	
		3	CommScope	LNX-6515DS-VTM	
		3	Ericsson	RRUS 11 B12	
		3	AWS	dB4	To be mounted behind the antennas

Cables:

Height (ft.)	Qty	Nom. Size	Location / Support
150	6	1-5/8" dia	Routed along the interior of the pole
150	1	7/8" dia	Routed along the interior of the pole
150	6	1-5/8" dia	To be routed along the interior of the pole
150	3	Hybriflex Fiber Cables	To be routed along the interior of the pole

Analysis Criteria

Design Standard: ANSI/TIA/EIA -222-F-1996

Building Code: 2005 CT State Building Code Supplement (IBC 2003)

	<u>Capacity (no ice)</u>	<u>Capacity w/ ice</u>
Wind Speed:	95 mph	82 mph
Basic Ice Thickness:	0 inch	0.5 inch

Assumptions:

1. The monopole was designed and constructed in accordance with the applicable codes and standards.
2. The foundation was designed and constructed based on site-specific geotechnical information.
3. The pole flanges were assembled in accordance with the manufacturer's specifications.
4. The flange plates have been adequately designed by the manufacturer for the full moment capacity of the unreinforced pole shaft.

STRUCTURAL ANALYSIS REPORT (CONT.)

W.O. Number: 6421.CT11327A
 Client: T-Mobile
 Site Name: Old Saybrook/I-95/AmtrK_1

Report Date: 10/22/2014
 Revision: 1

Analysis Results

Pole Shaft:

<u>Elevation (ft.)</u>	<u>Pole Shaft Usage (%)</u>	<u>Flange Plate Usage (%)</u>	<u>Flange Bolt Usage (%)</u>
120'-150'	91	91 ^d	83
100'-120'	91	91 ^d	94
80'-100'	98	98 ^d	97
68'-80'	93	94 ^{b,c}	62 ^b
60'-65' ^a	84		
49'-60'	91	87 ^{b,c}	59 ^b
40'-49' ^a	82		
29'-40'	94	91 ^{b,c}	62 ^b
20'-29' ^a	86		
10'-20'	94		
0'-10' ^a	92	-	-

Notes:

- a. Portion of the pole shaft to be reinforced.
- b. Usage upon installation of the proposed Bridge Splice reinforcement.
- c. Capacity of the Bridge Splice Channel member governs
- d. The flange plates have been adequately designed by the manufacturer for the full moment capacity of the unreinforced pole shaft.

Anchor Bolts: 69% of its capacity

Foundation Reactions (Envelope):

	<u>Original Design</u>			
	<u>Reactions¹</u>	<u>Current Analysis</u>	<u>Percentage²</u>	
Vertical	36.3 kips	32 kips	88%	
Shear	18.5 kips	21 kips	115%	
Moment	1960.3 kip-ft.	2065 kip-ft.	105%	

- 1. Based on the Original Design Reactions listed in the previous analysis report referenced herein.
- 2. For comparison purpose only. Existing foundation has been analyzed.

STRUCTURAL ANALYSIS REPORT (CONT.)

W.O. Number: 6421.CT11327A	Report Date: 10/22/2014
Client: T-Mobile	Revision: 1
Site Name: Old Saybrook/I-95/AmtrK_1	

Conclusions

Based on our analysis, once the monopole is reinforced as shown in the drawings prepared by TECTONIC, it will have adequate capacity to support the proposed T-Mobile upgrade as described herein in accordance with current code requirements.

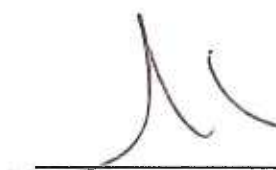
Furthermore, based on our analysis, the existing foundation has adequate capacity to support the additional loads due to the proposed T-Mobile installations.

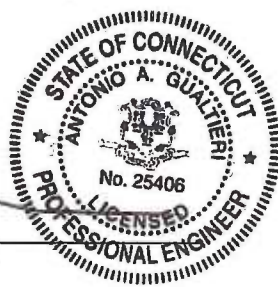
If the existing conditions are not as represented in this report, the design engineer should be immediately notified prior to construction. Any further changes to the antenna configuration or other appurtenances should be reviewed with respect to their effect on structural loads prior to implementation.

Prepared by: Vinod Ramesh, EIT
Structural Engineer

Reviewed by: Kavish. M. Zavar, P.E., PMP
Sr. Project Manager

Approved by:


Antonio A. Gualtieri, P.E.
Sr. Vice President



Date:

10/22/14



Tectonic Engineering & Surveying Consultants, P.C.
1279 Route 300
Newburgh, NY 12550

Phone: (845) 567-6656
Fax: (845) 567-8703
Web: www.tectonicengineering.com

EXHIBIT C

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 / Amtrak 1
44 Ford Drive - Amtrak Maintenance Yard
Old Saybrook, CT 06475

November 13, 2014

EBI Project Number: 62146159

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	16.22 %

November 13, 2014

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

Emissions Analysis for Site: **CT11327A – Old Saybrook / I-95 / Amtrak 1**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **44 Ford Drive - Amtrak Maintenance Yard, Old Saybrook, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

General population/uncontrolled exposure limits apply to situations in which the general public 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 public 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 ($\mu\text{W}/\text{cm}^2$). The general population exposure limit for the 700 MHz Band is $467 \mu\text{W}/\text{cm}^2$, and the general population exposure limit for the PCS and AWS bands is $1000 \mu\text{W}/\text{cm}^2$. Because each carrier

will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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 **44 Ford Drive - Amtrak Maintenance Yard, Old Saybrook, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, 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.

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

- 1) 2 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel
- 2) 2 UMTS channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 3) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 4) 1 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This channel has a transmit power of 30 Watts.

- 5) 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.
- 6) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB 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.
- 7) The antennas used in this modeling are the **Ericsson AIR21 B4A/B2P** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **Commscope LNX-6515DS-VTM** for 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **Ericsson AIR21 B4A/B2P** has a maximum gain of **15.9 dBd** at its main lobe. The **Commscope LNX-6515DS-VTM** has a maximum gain of **14.6 dBd** at its main lobe. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, 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.
- 8) The antenna mounting height centerline of the proposed antennas is **150 feet** above ground level (AGL).
- 9) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	150	Height (AGL):	150	Height (AGL):	150
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	2	Channel Count	2	# PCS Channels:	2
Total TX Power:	120	Total TX Power:	120	# AWS Channels:	120
ERP (W):	1,906.06	ERP (W):	1,906.06	ERP (W):	1,906.06
Antenna A1 MPE%	0.81	Antenna B1 MPE%	0.81	Antenna C1 MPE%	0.81
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	150	Height (AGL):	150	Height (AGL):	150
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power:	120	Total TX Power:	120	Total TX Power:	120
ERP (W):	1,906.06	ERP (W):	1,906.06	ERP (W):	1,906.06
Antenna A2 MPE%	0.81	Antenna B2 MPE%	0.81	Antenna C2 MPE%	0.81
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM
Gain:	14.6 dBd	Gain:	14.6 dBd	Gain:	14.6 dBd
Height (AGL):	150	Height (AGL):	150	Height (AGL):	150
Frequency Bands	700 Mhz	Frequency Bands	700 Mhz	Frequency Bands	700 Mhz
Channel Count	1	Channel Count	1	Channel Count	1
Total TX Power:	30	Total TX Power:	30	Total TX Power:	30
ERP (W):	445.37	ERP (W):	445.37	ERP (W):	445.37
Antenna A3 MPE%	0.32	Antenna B3 MPE%	0.32	Antenna C3 MPE%	0.32

Site Composite MPE %	
Carrier	MPE%
T-Mobile	5.82
Amtrak	10.40 %
Site Total MPE %:	16.22 %

T-Mobile Sector 1 Total:	1.94 %
T-Mobile Sector 2 Total:	1.94 %
T-Mobile Sector 3 Total:	1.94 %
Site Total:	16.22 %

Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general public 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 public exposure to RF Emissions are shown here:

T-Mobile Sector	Power Density Value (%)
Sector 1:	1.94 %
Sector 2:	1.94 %
Sector 3 :	1.94 %
T-Mobile Total:	5.82 %
Site Total:	16.22 %
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **16.22%** of the allowable FCC established general public 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.



Scott Heffernan
RF Engineering Director

EBI Consulting
21 B Street
Burlington, MA 01803

STRUCTURAL ANALYSIS REPORT – REV 1

REINFORCEMENT DESIGN

T-MOBILE UPGRADE

EXISTING 150' MONOPOLE

SITE NAME: AMTRAK – OLD SAYBROOK/I-95/AMTRK_1

**44 FORD DRIVE – AMTRAK MAINTENANCE ROAD,
OLD SAYBROOK, CT**

OCTOBER 22, 2014

TEC W.O. 6421.CT11327A



Practical Solutions, Exceptional Service



Practical Solutions, Exceptional Service

STRUCTURAL ANALYSIS REPORT

Project Information

W.O. Number:	6421.CT11327A	Report Date:	10/22/2014
Client:	T-Mobile	Revision:	1
Site Name:	Old Saybrook/I-95/AmtrK_1		
Owner:	AMTRAK		
Site Address:	44 Ford Drive - Amtrak Maintenance Yard	FCC Regulation Number:	--
City, State:	Old Saybrook, CT 06745	County:	Middlesex

Structure Information

Structure Type:	Monopole	Manufacturer:	PiRod/Valmont
Structure Height:	150 ft.	Year Built:	2000
Original Drawings:	Structure: No	Foundation:	No
Documents provided:			
	<u>Item</u>	<u>By</u>	<u>No.</u>
	Geotechnical Report (10 pages)	French & Parrello	00N007AR1
	Monopole Design Drawings (9 sheets)	PiRod Inc.	Dwg #:206047-B
	Structural Analysis Report (65 pages)	CENTEK Engineering, Inc.	10116.CO1
	Tower Mapping Report (10 pages)	Vertical Solutions	140875
	Network Modernization RFDS v3.0 (3 Pages)	T-Mobile	-
			<u>Date</u>
			1/20/00
			7/11/00
			10/25/10
			8/24/14
			9/5/14

Proposed Installation

T-Mobile is proposing to replace its existing six (6) antennas with newer model antennas. In addition, three (3) panel antennas and associated appurtenances are to be added as part of this upgrade. The final T-Mobile configuration upon this installation will be as follows:

Antennas:

Height (ft.)	Carrier	Qty	Manuf.	Model	Mount
150	T-Mobile	3	Ericsson	AIR21 B2A/B4P	Existing 16' Low Profile Platform
		3	Ericsson	AIR21 B4A/B2P	
		3	Commscope	LNX-6515DS-VTM	
		3	Ericsson	RRUS 11 B12	
		3	AWS	dB4	To be mounted behind the antennas

Cables:

Height (ft.)	Qty	Nom. Size	Location / Support
150	6	1-5/8" dia	Routed along the interior of the pole
150	1	7/8" dia	Routed along the interior of the pole
150	6	1-5/8" dia	To be routed along the interior of the pole
150	3	Hybriflex Fiber Cables	To be routed along the interior of the pole

Analysis Criteria

Design Standard: ANSI/TIA/EIA -222-F-1996		
Building Code: 2005 CT State Building Code Supplement (IBC 2003)		
	<u>Capacity (no ice)</u>	<u>Capacity w/ ice</u>
Wind Speed:	95 mph	82 mph
Basic Ice Thickness:	0 inch	0.5 inch
Assumptions:	<ol style="list-style-type: none"> 1. The monopole was designed and constructed in accordance with the applicable codes and standards. 2. The foundation was designed and constructed based on site-specific geotechnical information. 3. The pole flanges were assembled in accordance with the manufacturer's specifications. 4. The flange plates have been adequately designed by the manufacturer for the full moment capacity of the unreinforced pole shaft. 	

STRUCTURAL ANALYSIS REPORT (CONT.)

W.O. Number: 6421.CT11327A
 Client: T-Mobile
 Site Name: Old Saybrook/I-95/AmtrK_1

Report Date: 10/22/2014
 Revision: 1

Analysis Results

Pole Shaft:

<u>Elevation (ft.)</u>	<u>Pole Shaft Usage (%)</u>	<u>Flange Plate Usage (%)</u>	<u>Flange Bolt Usage (%)</u>
120'-150'	91	91 ^d	83
100'-120'	91	91 ^d	94
80'-100'	98	98 ^d	97
68'-80'	93	94 ^{b,c}	62 ^b
60'-65' ^a	84		
49'-60'	91	87 ^{b,c}	59 ^b
40'-49' ^a	82		
29'-40'	94	91 ^{b,c}	62 ^b
20'-29' ^a	86		
10'-20'	94		
0'-10' ^a	92	--	--

Notes:

- a. Portion of the pole shaft to be reinforced.
- b. Usage upon installation of the proposed Bridge Splice reinforcement.
- c. Capacity of the Bridge Splice Channel member governs
- d. The flange plates have been adequately designed by the manufacturer for the full moment capacity of the unreinforced pole shaft.

Anchor Bolts: 69% of its capacity

Foundation Reactions (Envelope):

	<u>Original Design</u>			
	<u>Reactions¹</u>	<u>Current Analysis</u>		<u>Percentage²</u>
Vertical	36.3 kips	32 kips		88%
Shear	18.5 kips	21 kips		115%
Moment	1960.3 kip-ft.	2065 kip-ft.		105%

- 1. Based on the Original Design Reactions listed in the previous analysis report referenced herein.
- 2. For comparison purpose only. Existing foundation has been analyzed.

STRUCTURAL ANALYSIS REPORT (CONT.)

W.O. Number: 6421.CT11327A
Client: T-Mobile
Site Name: Old Saybrook/I-95/AmtrK_1

Report Date: 10/22/2014
Revision: 1

Conclusions

Based on our analysis, once the monopole is reinforced as shown in the drawings prepared by TECTONIC, it will have adequate capacity to support the proposed T-Mobile upgrade as described herein in accordance with current code requirements.


Furthermore, based on our analysis, the existing foundation has adequate capacity to support the additional loads due to the proposed T-Mobile installations.

If the existing conditions are not as represented in this report, the design engineer should be immediately notified prior to construction. Any further changes to the antenna configuration or other appurtenances should be reviewed with respect to their effect on structural loads prior to implementation.

Prepared by: Vinod Ramesh, EIT
Structural Engineer

Reviewed by: Kavish. M. Zavar, P.E., PMP
Sr. Project Manager

Approved by:


Antonio A. Gualtieri, P.E.
Sr. Vice President



Date: 10/22/14

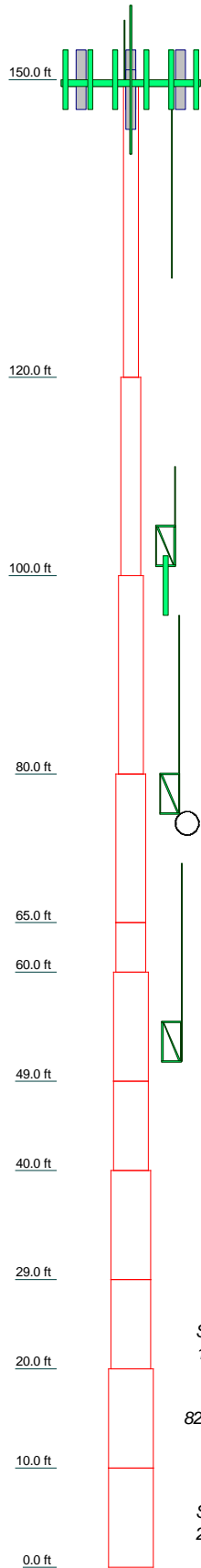


Tectonic Engineering & Surveying Consultants, P.C.
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Fax: (845) 567-8703
Web: www.tectonicengineering.com

TNX TOWER SUMMARY REPORT

Section	1	P18x3/8	30.00	A53-B-42	2.1	150.0 ft
Section	2	P24x3/8	20.00	A53-B-42	1.9	120.0 ft
Section	3	P30x3/8	20.00	A53-B-42	2.4	100.0 ft
Section	4	P36x3/8	15.00	A53-B-42	2.1	80.0 ft
Section	5	P36x0.45	5.00	35.9 Reinf	0.9	65.0 ft
Section	6	P42x3/8	11.00	A53-B-42	1.8	60.0 ft
Section	7	P42x0.47	9.00	39.1 Reinf	1.9	49.0 ft
Section	8	P48x3/8	11.00	A53-B-42	2.1	40.0 ft
Section	9	P48x0.45	9.00	40 Reinf	2.1	29.0 ft
Section	10	P54x3/8	10.00	40.7 Reinf	2.1	20.0 ft
Section	11	P54x0.425	10.00	40.7 Reinf	2.4	10.0 ft
Section		Length (ft)				0.0 ft
Section		Grade				
Section		Weight (K)				21.8



DESIGNED APPURTENANCE LOADING

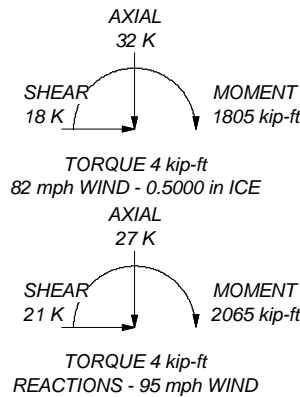
TYPE	ELEVATION	TYPE	ELEVATION
4' Lightning Rod on 16' Extension	150	LNx-6515DS-VTM w/ Mount Pipe	150
6' x 1.5" Omni Antenna	150	LNx-6515DS-VTM w/ Mount Pipe	150
MA0245-19AN w/ Mount Pipe	150	LNx-6515DS-VTM w/ Mount Pipe	150
(2) DB874G45A-XY	150	RRUS 11 B12	150
20' x 2" Omni Antenna	150	RRUS 11 B12	150
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	150	RRUS 11 B12	150
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	150	16' Low Profile Platform	150
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	150	10' x 2" Omni Antenna w/mount pipe	101
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	150	(2) MT-404067/ND w/ Mount Pipe	101
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	150	(2) WIN7237	101
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	150	3' Stand Off Mount	101
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	150	4' Walkway	99
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	150	20' x 2" Omni Antenna	76
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	150	4' x 2" STD Pipe	76
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	150	3' Stand Off Mount	76
dd B4	150	20' x 2" Omni Antenna	51
dd B4	150	4' x 2" STD Pipe	51
dd B4	150	3' Stand Off Mount	51

MATERIAL STRENGTH


GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-42	42 ksi	63 ksi	40 Reinf	40 ksi	55 ksi
35.9 Reinf	36 ksi	51 ksi	40.7 Reinf	41 ksi	56 ksi
39.1 Reinf	39 ksi	54 ksi			

TOWER DESIGN NOTES

1. Tower is located in Middlesex County, Connecticut.
2. Tower designed for a 95 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 82 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 97.8%



 TECTONIC Practical Solutions, Exceptional Service	Job: 6421.CT11327A Project: Old Saybrook/I-95/AmtraK 1	
	1279 Route 300 Newburgh, NY Phone: (845)-567-6656 FAX: (845)-567-8703	Client: T-Mobile Code: TIA/EIA-222-F Path:

 Practical Solutions, Exceptional Service TECTONIC 1279 Route 300 Newburgh, NY Phone: (845)-567-6656 FAX: (845)-567-8703	Job 6421.CT11327A	Page 1 of 35
	Project Old Saybrook/I-95/AmtraK_1	Date 14:20:07 10/21/14
	Client T-Mobile	Designed by Vinod Ramesh

Tower Input Data

There is a pole section.

This tower is designed using the TIA/EIA-222-F standard.

The following design criteria apply:

Tower is located in Middlesex County, Connecticut.

Basic wind speed of 95 mph.

Nominal ice thickness of 0.5000 in.

Ice density of 56 pcf.

A wind speed of 82 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 50 mph.

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

Stress ratio used in pole design is 1.333.

Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

<ul style="list-style-type: none"> Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification √ Use Code Stress Ratios √ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) Add IBC .6D+W Combination 	<ul style="list-style-type: none"> Distribute Leg Loads As Uniform Assume Legs Pinned √ Assume Rigid Index Plate √ Use Clear Spans For Wind Area Use Clear Spans For KL/r Retension Guys To Initial Tension √ Bypass Mast Stability Checks √ Use Azimuth Dish Coefficients √ Project Wind Area of Appurt. Autocalc Torque Arm Areas SR Members Have Cut Ends √ Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Use TIA-222-G Tension Splice Capacity Exemption 	<ul style="list-style-type: none"> Treat Feedline Bundles As Cylinder Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation √ Consider Feedline Torque Include Angle Block Shear Check <li style="text-align: center;">Poles √ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets
--	--	---

Pole Section Geometry

Section	Elevation <i>ft</i>	Section Length <i>ft</i>	Pole Size	Pole Grade	Socket Length <i>ft</i>
L1	150.00-120.00	30.00	P18x3/8	A53-B-42 (42 ksi)	
L2	120.00-100.00	20.00	P24x3/8	A53-B-42 (42 ksi)	
L3	100.00-80.00	20.00	P30x3/8	A53-B-42 (42 ksi)	
L4	80.00-65.00	15.00	P36x3/8	A53-B-42 (42 ksi)	
L5	65.00-60.00	5.00	P36x0.45	35.9 Reinf (36 ksi)	
L6	60.00-49.00	11.00	P42x3/8	A53-B-42 (42 ksi)	
L7	49.00-40.00	9.00	P42x0.47	39.1 Reinf (39 ksi)	

Job	6421.CT11327A	Page	2 of 35
Project	Old Saybrook/I-95/AmtraK_1	Date	14:20:07 10/21/14
Client	T-Mobile	Designed by	Vinod Ramesh

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L8	40.00-29.00	11.00	P48x3/8	A53-B-42 (42 ksi)	
L9	29.00-20.00	9.00	P48x0.45	40 Reinf (40 ksi)	
L10	20.00-10.00	10.00	P54x3/8	A53-B-42 (42 ksi)	
L11	10.00-0.00	10.00	P54x0.425	40.7 Reinf (41 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
L1				1	1	1		
150.00-120.00								
L2				1	1	1		
120.00-100.00								
L3				1	1	1		
100.00-80.00								
L4				1	1	1		
80.00-65.00								
L5				1	1	1		
65.00-60.00								
L6				1	1	1		
60.00-49.00								
L7				1	1	1		
49.00-40.00								
L8				1	1	1		
40.00-29.00								
L9				1	1	1		
29.00-20.00								
L10				1	1	1		
20.00-10.00								
L11				1	1	1		
10.00-0.00								

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	CAAA ft ² /ft	Weight plf
LDF7-50A(1-5/8")	B	No	Inside Pole	150.00 - 0.00	12	No Ice 1/2" Ice	0.00 0.82
LDF5-50A(7/8")	B	No	Inside Pole	150.00 - 0.00	3	No Ice 1/2" Ice	0.00 0.33
LDF4-50A(1/2")	B	No	Inside Pole	150.00 - 0.00	1	No Ice 1/2" Ice	0.00 0.15

LDF4-50A(1/2")	B	No	Inside Pole	100.50 - 0.00	1	No Ice 1/2" Ice	0.00 0.15
LDF1-50A(1/4")	B	No	Inside Pole	100.50 - 0.00	1	No Ice 1/2" Ice	0.00 0.06
ATCB-B01-001(5/16)	B	No	Inside Pole	100.50 - 0.00	1	No Ice 1/2" Ice	0.00 0.07

LDF5-50A(7/8")	B	No	Inside Pole	75.50 - 0.00	1	No Ice 1/2" Ice	0.00 0.33

LDF5-50A(7/8")	B	No	Inside Pole	50.50 - 0.00	1	No Ice 1/2" Ice	0.00 0.33

Climbing rungs	A	No	CaAa (Out Of Face)	150.00 - 0.00	1	No Ice 1/2" Ice	0.05 1.25
MP303	C	No	CaAa (Out Of	65.00 - 60.00	1	No Ice	0.26 0.00

Job	6421.CT11327A	Page	3 of 35
Project	Old Saybrook/I-95/AmtraK_1	Date	14:20:07 10/21/14
Client	T-Mobile	Designed by	Vinod Ramesh

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C _{AA} ft ² /ft	Weight plf
MP304	C	No	Face)	49.00 - 40.00	1	1/2" Ice	0.26	0.00
			CaAa (Out Of Face)			No Ice	0.27	0.00
MP304	C	No	Face)	29.00 - 20.00	1	1/2" Ice	0.27	0.00
			CaAa (Out Of Face)			No Ice	0.27	0.00
MP303	C	No	Face)	10.00 - 0.00	1	1/2" Ice	0.27	0.00
			CaAa (Out Of Face)			No Ice	0.26	0.00
MP304BS	C	No	Face)	20.00 - 17.33	1	1/2" Ice	0.26	0.00
			CaAa (Out Of Face)			No Ice	0.27	0.00
MP304BS	C	No	Face)	40.00 - 37.58	1	1/2" Ice	2.68	0.00
			CaAa (Out Of Face)			No Ice	0.27	0.00
MP303BS	C	No	Face)	60.00 - 57.58	1	1/2" Ice	2.68	0.00
			CaAa (Out Of Face)			No Ice	2.62	0.00
			Face)			1/2" Ice	2.62	0.00

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	150.00-120.00	A	0.000	0.000	0.000	1.590	0.03
		B	0.000	0.000	0.000	0.000	0.33
		C	0.000	0.000	0.000	0.000	0.00
L2	120.00-100.00	A	0.000	0.000	0.000	1.060	0.02
		B	0.000	0.000	0.000	0.000	0.22
		C	0.000	0.000	0.000	0.000	0.00
L3	100.00-80.00	A	0.000	0.000	0.000	1.060	0.02
		B	0.000	0.000	0.000	0.000	0.23
		C	0.000	0.000	0.000	0.000	0.00
L4	80.00-65.00	A	0.000	0.000	0.000	0.795	0.01
		B	0.000	0.000	0.000	0.000	0.17
		C	0.000	0.000	0.000	0.000	0.00
L5	65.00-60.00	A	0.000	0.000	0.000	0.265	0.01
		B	0.000	0.000	0.000	0.000	0.06
		C	0.000	0.000	0.000	1.310	0.00
L6	60.00-49.00	A	0.000	0.000	0.000	0.583	0.01
		B	0.000	0.000	0.000	0.000	0.13
		C	0.000	0.000	0.000	6.340	0.00
L7	49.00-40.00	A	0.000	0.000	0.000	0.477	0.01
		B	0.000	0.000	0.000	0.000	0.11
		C	0.000	0.000	0.000	2.412	0.00
L8	40.00-29.00	A	0.000	0.000	0.000	0.583	0.01
		B	0.000	0.000	0.000	0.000	0.13
		C	0.000	0.000	0.000	0.649	0.00
L9	29.00-20.00	A	0.000	0.000	0.000	0.477	0.01
		B	0.000	0.000	0.000	0.000	0.11
		C	0.000	0.000	0.000	2.412	0.00
L10	20.00-10.00	A	0.000	0.000	0.000	0.530	0.01
		B	0.000	0.000	0.000	0.000	0.12
		C	0.000	0.000	0.000	0.716	0.00
L11	10.00-0.00	A	0.000	0.000	0.000	0.530	0.01
		B	0.000	0.000	0.000	0.000	0.12
		C	0.000	0.000	0.000	2.620	0.00

Job	6421.CT11327A	Page	4 of 35
Project	Old Saybrook/I-95/AmtraK_1	Date	14:20:07 10/21/14
Client	T-Mobile	Designed by	Vinod Ramesh

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} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	150.00-120.00	A	0.500	0.000	0.000	0.000	4.224	0.04
		B		0.000	0.000	0.000	0.000	0.33
		C		0.000	0.000	0.000	0.000	0.00
L2	120.00-100.00	A	0.500	0.000	0.000	0.000	2.816	0.03
		B		0.000	0.000	0.000	0.000	0.22
		C		0.000	0.000	0.000	0.000	0.00
L3	100.00-80.00	A	0.500	0.000	0.000	0.000	2.816	0.03
		B		0.000	0.000	0.000	0.000	0.23
		C		0.000	0.000	0.000	0.000	0.00
L4	80.00-65.00	A	0.500	0.000	0.000	0.000	2.112	0.02
		B		0.000	0.000	0.000	0.000	0.17
		C		0.000	0.000	0.000	0.000	0.00
L5	65.00-60.00	A	0.500	0.000	0.000	0.000	0.704	0.01
		B		0.000	0.000	0.000	0.000	0.06
		C		0.000	0.000	0.000	1.310	0.00
L6	60.00-49.00	A	0.500	0.000	0.000	0.000	1.549	0.01
		B		0.000	0.000	0.000	0.000	0.13
		C		0.000	0.000	0.000	6.340	0.00
L7	49.00-40.00	A	0.500	0.000	0.000	0.000	1.267	0.01
		B		0.000	0.000	0.000	0.000	0.11
		C		0.000	0.000	0.000	2.412	0.00
L8	40.00-29.00	A	0.500	0.000	0.000	0.000	1.549	0.01
		B		0.000	0.000	0.000	0.000	0.13
		C		0.000	0.000	0.000	6.486	0.00
L9	29.00-20.00	A	0.500	0.000	0.000	0.000	1.267	0.01
		B		0.000	0.000	0.000	0.000	0.11
		C		0.000	0.000	0.000	2.412	0.00
L10	20.00-10.00	A	0.500	0.000	0.000	0.000	1.408	0.01
		B		0.000	0.000	0.000	0.000	0.12
		C		0.000	0.000	0.000	7.156	0.00
L11	10.00-0.00	A	0.500	0.000	0.000	0.000	1.408	0.01
		B		0.000	0.000	0.000	0.000	0.12
		C		0.000	0.000	0.000	2.620	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	150.00-120.00	0.0000	-0.0768	0.0000	-0.1837
L2	120.00-100.00	0.0000	-0.0774	0.0000	-0.1899
L3	100.00-80.00	0.0000	-0.0778	0.0000	-0.1938
L4	80.00-65.00	0.0000	-0.0781	0.0000	-0.1965
L5	65.00-60.00	-0.3080	0.1059	-0.2929	-0.0126
L6	60.00-49.00	-0.6346	0.2990	-0.6094	0.1799
L7	49.00-40.00	-0.3189	0.1113	-0.3052	-0.0089
L8	40.00-29.00	-0.0745	-0.0343	-0.6364	0.1920
L9	29.00-20.00	-0.3223	0.1125	-0.3100	-0.0091
L10	20.00-10.00	-0.0904	-0.0251	-0.7690	0.2693
L11	10.00-0.00	-0.3181	0.1093	-0.3072	-0.0133

Job	6421.CT11327A	Page	5 of 35
Project	Old Saybrook/I-95/AmtraK_1	Date	14:20:07 10/21/14
Client	T-Mobile	Designed by	Vinod Ramesh

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz	Vert						
			ft	ft	°	ft	ft ²	ft ²	K	
4' Lightning Rod on 16' Extension	C	None			0.0000	150.00	No Ice 1/2" Ice	4.05 6.09	4.05 6.09	0.07 0.11
6' x 1.5" Omni Antenna	C	From Leg	0.00 0.00 3.00		0.0000	150.00	No Ice 1/2" Ice	0.90 1.52	0.90 1.52	0.02 0.03

MA0245-19AN w/ Mount Pipe	A	From Leg	4.00 0.00 1.00		0.0000	150.00	No Ice 1/2" Ice	2.65 3.01	1.09 1.43	0.02 0.04
(2) DB874G45A-XY	A	From Leg	4.00 0.00 -2.00		0.0000	150.00	No Ice 1/2" Ice	5.89 6.29	2.51 2.82	0.01 0.05
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	4.00 6.03	0.03 0.06
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00 0.00 0.00		0.0000	150.00	No Ice 1/2" Ice	6.83 7.35	5.64 6.48	0.11 0.17
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00 0.00 0.00		0.0000	150.00	No Ice 1/2" Ice	6.83 7.35	5.64 6.48	0.11 0.17
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00 0.00 0.00		0.0000	150.00	No Ice 1/2" Ice	6.83 7.35	5.64 6.48	0.11 0.17
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.00 0.00 0.00		0.0000	150.00	No Ice 1/2" Ice	6.83 7.35	5.64 6.48	0.11 0.17
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	4.00 0.00 0.00		0.0000	150.00	No Ice 1/2" Ice	6.83 7.35	5.64 6.48	0.11 0.17
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	4.00 0.00 0.00		0.0000	150.00	No Ice 1/2" Ice	6.83 7.35	5.64 6.48	0.11 0.17
dd B4	C	From Leg	4.00 0.00 0.00		0.0000	150.00	No Ice 1/2" Ice	0.00 0.00	0.00 0.00	0.01 0.02
dd B4	C	From Leg	4.00 0.00 0.00		0.0000	150.00	No Ice 1/2" Ice	0.00 0.00	0.00 0.00	0.01 0.02
dd B4	C	From Leg	4.00 0.00 0.00		0.0000	150.00	No Ice 1/2" Ice	0.00 0.00	0.00 0.00	0.01 0.02
LNX-6515DS-VTM w/ Mount Pipe	A	From Leg	4.00 0.00 0.00		0.0000	150.00	No Ice 1/2" Ice	11.68 12.40	9.84 11.37	0.08 0.17
LNX-6515DS-VTM w/ Mount Pipe	B	From Leg	4.00 0.00 0.00		0.0000	150.00	No Ice 1/2" Ice	11.68 12.40	9.84 11.37	0.08 0.17
LNX-6515DS-VTM w/ Mount Pipe	C	From Leg	4.00 0.00 0.00		0.0000	150.00	No Ice 1/2" Ice	11.68 12.40	9.84 11.37	0.08 0.17
RRUS 11 B12	A	From Leg	4.00 0.00 0.00		0.0000	150.00	No Ice 1/2" Ice	3.31 3.55	1.36 1.54	0.05 0.07

Job	6421.CT11327A	Page	6 of 35
Project	Old Saybrook/I-95/AmtraK_1	Date	14:20:07 10/21/14
Client	T-Mobile	Designed by	Vinod Ramesh

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA}		Weight	
			Horz	Vert			Front	Side		
			ft	ft	°	ft	ft ²	ft ²	K	
RRUS 11 B12	B	From Leg	4.00	0.00	0.0000	150.00	No Ice 1/2" Ice	3.31 3.55	1.36 1.54	0.05 0.07
RRUS 11 B12	C	From Leg	4.00	0.00	0.0000	150.00	No Ice 1/2" Ice	3.31 3.55	1.36 1.54	0.05 0.07
16' Low Profile Platform	C	None			0.0000	150.00	No Ice 1/2" Ice	20.80 28.10	20.80 28.10	1.80 2.07

10' x 2" Omni Antenna w/mount pipe	B	From Leg	3.00	0.00	0.0000	101.00	No Ice 1/2" Ice	2.58 3.80	2.58 3.80	0.04 0.06
(2) MT-404067/ND w/ Mount Pipe	B	From Leg	3.00	0.00	0.0000	101.00	No Ice 1/2" Ice	1.37 1.62	1.18 1.52	0.02 0.03
(2) WIN7237	B	From Leg	3.00	0.00	0.0000	101.00	No Ice 1/2" Ice	0.88 1.01	0.39 0.48	0.01 0.02
3' Stand Off Mount	B	None			0.0000	101.00	No Ice 1/2" Ice	0.85 1.14	1.67 2.34	0.07 0.08
4' Walkway	B	From Leg	0.50	0.00	0.0000	99.00	No Ice 1/2" Ice	1.87 2.21	1.40 1.66	0.05 0.12

20' x 2" Omni Antenna	B	From Leg	3.00	0.00	0.0000	76.00	No Ice 1/2" Ice	4.00 6.03	4.00 6.03	0.03 0.06
4' x 2" STD Pipe	B	From Leg	3.00	0.00	0.0000	76.00	No Ice 1/2" Ice	0.87 1.11	0.87 1.11	0.01 0.02
3' Stand Off Mount	B	None			0.0000	76.00	No Ice 1/2" Ice	0.85 1.14	1.67 2.34	0.07 0.08

20' x 2" Omni Antenna	B	From Leg	3.00	0.00	0.0000	51.00	No Ice 1/2" Ice	4.00 6.03	4.00 6.03	0.03 0.06
4' x 2" STD Pipe	B	From Leg	3.00	0.00	0.0000	51.00	No Ice 1/2" Ice	0.87 1.11	0.87 1.11	0.01 0.02
3' Stand Off Mount	B	None			0.0000	51.00	No Ice 1/2" Ice	0.85 1.14	1.67 2.34	0.07 0.08

Tower Pressures - No Ice

$$G_H = 1.690$$

Section Elevation	z	K _Z	q _z	A _G	F _a	A _F	A _R	A _{leg}	Leg %	C _{AA} In	C _{AA} Out
ft	ft		psf	ft ²	c	ft ²	ft ²	ft ²	%	Face ft ²	Face ft ²
L1	135.00	1.496	35	45.000	A	0.000	45.000	45.000	100.00	0.000	1.590
150.00-120.00					B	0.000	45.000		100.00	0.000	0.000
					C	0.000	45.000		100.00	0.000	0.000
L2	110.00	1.411	33	40.000	A	0.000	40.000	40.000	100.00	0.000	1.060

Job	6421.CT11327A	Page	7 of 35
Project	Old Saybrook/I-95/AmtraK_1	Date	14:20:07 10/21/14
Client	T-Mobile	Designed by	Vinod Ramesh

Section Elevation ft	z ft	K _Z	q _z psf	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _{AA} In Face ft ²	C _{AA} Out Face ft ²
120.00-100.00					B	0.000	40.000		100.00	0.000	0.000
					C	0.000	40.000		100.00	0.000	0.000
L3 100.00-80.00	90.00	1.332	31	50.000	A	0.000	50.000	50.000	100.00	0.000	1.060
					B	0.000	50.000		100.00	0.000	0.000
					C	0.000	50.000		100.00	0.000	0.000
L4 80.00-65.00	72.50	1.252	29	45.000	A	0.000	45.000	45.000	100.00	0.000	0.795
					B	0.000	45.000		100.00	0.000	0.000
					C	0.000	45.000		100.00	0.000	0.000
L5 65.00-60.00	62.50	1.2	28	15.000	A	0.000	15.000	15.000	100.00	0.000	0.265
					B	0.000	15.000		100.00	0.000	0.000
					C	0.000	15.000		100.00	0.000	1.310
L6 60.00-49.00	54.50	1.154	27	38.500	A	0.000	38.500	38.500	100.00	0.000	0.583
					B	0.000	38.500		100.00	0.000	0.000
					C	0.000	38.500		100.00	0.000	6.340
L7 49.00-40.00	44.50	1.089	25	31.500	A	0.000	31.500	31.500	100.00	0.000	0.477
					B	0.000	31.500		100.00	0.000	0.000
					C	0.000	31.500		100.00	0.000	2.412
L8 40.00-29.00	34.50	1.013	23	44.000	A	0.000	44.000	44.000	100.00	0.000	0.583
					B	0.000	44.000		100.00	0.000	0.000
					C	0.000	44.000		100.00	0.000	0.649
L9 29.00-20.00	24.50	1	23	36.000	A	0.000	36.000	36.000	100.00	0.000	0.477
					B	0.000	36.000		100.00	0.000	0.000
					C	0.000	36.000		100.00	0.000	2.412
L10 20.00-10.00	15.00	1	23	45.000	A	0.000	45.000	45.000	100.00	0.000	0.530
					B	0.000	45.000		100.00	0.000	0.000
					C	0.000	45.000		100.00	0.000	0.716
L11 10.00-0.00	5.00	1	23	45.000	A	0.000	45.000	45.000	100.00	0.000	0.530
					B	0.000	45.000		100.00	0.000	0.000
					C	0.000	45.000		100.00	0.000	2.620

Tower Pressure - With Ice

$$G_H = 1.690$$

Section Elevation ft	z ft	K _Z	q _z psf	t _z in	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _{AA} In Face ft ²	C _{AA} Out Face ft ²
L1 150.00-120.00	135.00	1.496	26	0.5000	47.500	A	0.000	47.500	47.500	100.00	0.000	4.224
						B	0.000	47.500		100.00	0.000	0.000
						C	0.000	47.500		100.00	0.000	0.000
L2 120.00-100.00	110.00	1.411	24	0.5000	41.667	A	0.000	41.667	41.667	100.00	0.000	2.816
						B	0.000	41.667		100.00	0.000	0.000
						C	0.000	41.667		100.00	0.000	0.000
L3 100.00-80.00	90.00	1.332	23	0.5000	51.667	A	0.000	51.667	51.667	100.00	0.000	2.816
						B	0.000	51.667		100.00	0.000	0.000
						C	0.000	51.667		100.00	0.000	0.000
L4 80.00-65.00	72.50	1.252	22	0.5000	46.250	A	0.000	46.250	46.250	100.00	0.000	2.112
						B	0.000	46.250		100.00	0.000	0.000
						C	0.000	46.250		100.00	0.000	0.000
L5 65.00-60.00	62.50	1.2	21	0.5000	15.417	A	0.000	15.417	15.417	100.00	0.000	0.704
						B	0.000	15.417		100.00	0.000	0.000
						C	0.000	15.417		100.00	0.000	1.310
L6 60.00-49.00	54.50	1.154	20	0.5000	39.417	A	0.000	39.417	39.417	100.00	0.000	1.549
						B	0.000	39.417		100.00	0.000	0.000
						C	0.000	39.417		100.00	0.000	6.340
L7 49.00-40.00	44.50	1.089	19	0.5000	32.250	A	0.000	32.250	32.250	100.00	0.000	1.267
						B	0.000	32.250		100.00	0.000	0.000

Job	6421.CT11327A	Page	8 of 35
Project	Old Saybrook/I-95/AmtraK_1	Date	14:20:07 10/21/14
Client	T-Mobile	Designed by	Vinod Ramesh

Section Elevation ft	z ft	K _Z	q _z psf	t _z in	A _G ft ²	F a c e ft ²	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _{AA} In Face ft ²	C _{AA} Out Face ft ²
L8 40.00-29.00	34.50	1.013	18	0.5000	44.917	C	0.000	32.250	44.917	100.00	0.000	2.412
						A	0.000	44.917		100.00	0.000	1.549
						B	0.000	44.917		100.00	0.000	0.000
L9 29.00-20.00	24.50	1	17	0.5000	36.750	C	0.000	44.917	36.750	100.00	0.000	6.486
						A	0.000	36.750		100.00	0.000	1.267
						B	0.000	36.750		100.00	0.000	0.000
L10 20.00-10.00	15.00	1	17	0.5000	45.833	C	0.000	36.750	45.833	100.00	0.000	2.412
						A	0.000	45.833		100.00	0.000	1.408
						B	0.000	45.833		100.00	0.000	0.000
L11 10.00-0.00	5.00	1	17	0.5000	45.833	C	0.000	45.833	45.833	100.00	0.000	7.156
						A	0.000	45.833		100.00	0.000	1.408
						B	0.000	45.833		100.00	0.000	0.000
						C	0.000	45.833		100.00	0.000	2.620

Tower Pressure - Service

$G_H = 1.690$

Section Elevation ft	z ft	K _Z	q _z psf	A _G ft ²	F a c e ft ²	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _{AA} In Face ft ²	C _{AA} Out Face ft ²
L1 150.00-120.00	135.00	1.496	10	45.000	A	0.000	45.000	45.000	100.00	0.000	1.590
					B	0.000	45.000		100.00	0.000	0.000
					C	0.000	45.000		100.00	0.000	0.000
L2 120.00-100.00	110.00	1.411	9	40.000	A	0.000	40.000	40.000	100.00	0.000	1.060
					B	0.000	40.000		100.00	0.000	0.000
					C	0.000	40.000		100.00	0.000	0.000
L3 100.00-80.00	90.00	1.332	9	50.000	A	0.000	50.000	50.000	100.00	0.000	1.060
					B	0.000	50.000		100.00	0.000	0.000
					C	0.000	50.000		100.00	0.000	0.000
L4 80.00-65.00	72.50	1.252	8	45.000	A	0.000	45.000	45.000	100.00	0.000	0.795
					B	0.000	45.000		100.00	0.000	0.000
					C	0.000	45.000		100.00	0.000	0.000
L5 65.00-60.00	62.50	1.2	8	15.000	A	0.000	15.000	15.000	100.00	0.000	0.265
					B	0.000	15.000		100.00	0.000	0.000
					C	0.000	15.000		100.00	0.000	1.310
L6 60.00-49.00	54.50	1.154	7	38.500	A	0.000	38.500	38.500	100.00	0.000	0.583
					B	0.000	38.500		100.00	0.000	0.000
					C	0.000	38.500		100.00	0.000	6.340
L7 49.00-40.00	44.50	1.089	7	31.500	A	0.000	31.500	31.500	100.00	0.000	0.477
					B	0.000	31.500		100.00	0.000	0.000
					C	0.000	31.500		100.00	0.000	2.412
L8 40.00-29.00	34.50	1.013	6	44.000	A	0.000	44.000	44.000	100.00	0.000	0.583
					B	0.000	44.000		100.00	0.000	0.000
					C	0.000	44.000		100.00	0.000	0.649
L9 29.00-20.00	24.50	1	6	36.000	A	0.000	36.000	36.000	100.00	0.000	0.477
					B	0.000	36.000		100.00	0.000	0.000
					C	0.000	36.000		100.00	0.000	2.412
L10 20.00-10.00	15.00	1	6	45.000	A	0.000	45.000	45.000	100.00	0.000	0.530
					B	0.000	45.000		100.00	0.000	0.000
					C	0.000	45.000		100.00	0.000	0.716
L11 10.00-0.00	5.00	1	6	45.000	A	0.000	45.000	45.000	100.00	0.000	0.530
					B	0.000	45.000		100.00	0.000	0.000
					C	0.000	45.000		100.00	0.000	2.620

Job	6421.CT11327A	Page	9 of 35
Project	Old Saybrook/I-95/AmtraK_1	Date	14:20:07 10/21/14
Client	T-Mobile	Designed by	Vinod Ramesh

Tower Forces - No Ice - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
L1 150.00-120.00	0.36	2.12	A	1	0.59	1	1	1	45.000	1.64	54.77	C
			B	1	0.59	1	1	1	45.000			
			C	1	0.59	1	1	1	45.000			
L2 120.00-100.00	0.24	1.89	A	1	0.59	1	1	1	40.000	1.36	67.91	C
			B	1	0.59	1	1	1	40.000			
			C	1	0.59	1	1	1	40.000			
L3 100.00-80.00	0.25	2.38	A	1	0.59	1	1	1	50.000	1.59	79.47	C
			B	1	0.59	1	1	1	50.000			
			C	1	0.59	1	1	1	50.000			
L4 80.00-65.00	0.19	2.14	A	1	0.59	1	1	1	45.000	1.34	89.13	C
			B	1	0.59	1	1	1	45.000			
			C	1	0.59	1	1	1	45.000			
L5 65.00-60.00	0.06	0.86	A	1	0.59	1	1	1	15.000	0.49	97.71	C
			B	1	0.59	1	1	1	15.000			
			C	1	0.59	1	1	1	15.000			
L6 60.00-49.00	0.14	1.84	A	1	0.59	1	1	1	38.500	1.34	121.42	C
			B	1	0.59	1	1	1	38.500			
			C	1	0.59	1	1	1	38.500			
L7 49.00-40.00	0.12	1.88	A	1	0.59	1	1	1	31.500	0.91	101.47	C
			B	1	0.59	1	1	1	31.500			
			C	1	0.59	1	1	1	31.500			
L8 40.00-29.00	0.14	2.10	A	1	0.59	1	1	1	44.000	1.08	97.75	C
			B	1	0.59	1	1	1	44.000			
			C	1	0.59	1	1	1	44.000			
L9 29.00-20.00	0.12	2.06	A	1	0.59	1	1	1	36.000	0.94	104.68	C
			B	1	0.59	1	1	1	36.000			
			C	1	0.59	1	1	1	36.000			
L10 20.00-10.00	0.13	2.15	A	1	0.59	1	1	1	45.000	1.09	108.53	C
			B	1	0.59	1	1	1	45.000			
			C	1	0.59	1	1	1	45.000			
L11 10.00-0.00	0.13	2.43	A	1	0.59	1	1	1	45.000	1.16	115.97	C
			B	1	0.59	1	1	1	45.000			
			C	1	0.59	1	1	1	45.000			
Sum Weight:	1.87	21.84						OTM	837.43 kip-ft	12.93		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
L1 150.00-120.00	0.36	2.12	A	1	0.59	1	1	1	45.000	1.64	54.77	C
			B	1	0.59	1	1	1	45.000			
			C	1	0.59	1	1	1	45.000			
L2 120.00-100.00	0.24	1.89	A	1	0.59	1	1	1	40.000	1.36	67.91	C
			B	1	0.59	1	1	1	40.000			
			C	1	0.59	1	1	1	40.000			
L3 100.00-80.00	0.25	2.38	A	1	0.59	1	1	1	50.000	1.59	79.47	C
			B	1	0.59	1	1	1	50.000			
			C	1	0.59	1	1	1	50.000			
L4 80.00-65.00	0.19	2.14	A	1	0.59	1	1	1	45.000	1.34	89.13	C
			B	1	0.59	1	1	1	45.000			
			C	1	0.59	1	1	1	45.000			
L5	0.06	0.86	A	1	0.59	1	1	1	15.000	0.49	97.71	C

Job	6421.CT11327A	Page	10 of 35
Project	Old Saybrook/I-95/AmtraK_1	Date	14:20:07 10/21/14
Client	T-Mobile	Designed by	Vinod Ramesh

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	R _R	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
65.00-60.00			B	1	0.59	1	1	1	15.000			
			C	1	0.59	1	1	1	15.000			
L6	0.14	1.84	A	1	0.59	1	1	1	38.500	1.34	121.42	C
60.00-49.00			B	1	0.59	1	1	1	38.500			
			C	1	0.59	1	1	1	38.500			
L7	0.12	1.88	A	1	0.59	1	1	1	31.500	0.91	101.47	C
49.00-40.00			B	1	0.59	1	1	1	31.500			
			C	1	0.59	1	1	1	31.500			
L8	0.14	2.10	A	1	0.59	1	1	1	44.000	1.08	97.75	C
40.00-29.00			B	1	0.59	1	1	1	44.000			
			C	1	0.59	1	1	1	44.000			
L9	0.12	2.06	A	1	0.59	1	1	1	36.000	0.94	104.68	C
29.00-20.00			B	1	0.59	1	1	1	36.000			
			C	1	0.59	1	1	1	36.000			
L10	0.13	2.15	A	1	0.59	1	1	1	45.000	1.09	108.53	C
20.00-10.00			B	1	0.59	1	1	1	45.000			
			C	1	0.59	1	1	1	45.000			
L11	0.13	2.43	A	1	0.59	1	1	1	45.000	1.16	115.97	C
10.00-0.00			B	1	0.59	1	1	1	45.000			
			C	1	0.59	1	1	1	45.000			
Sum Weight:	1.87	21.84						OTM	837.43 kip-ft	12.93		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	R _R	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
L1	0.36	2.12	A	1	0.59	1	1	1	45.000	1.64	54.77	C
150.00-120.00			B	1	0.59	1	1	1	45.000			
			C	1	0.59	1	1	1	45.000			
L2	0.24	1.89	A	1	0.59	1	1	1	40.000	1.36	67.91	C
120.00-100.00			B	1	0.59	1	1	1	40.000			
			C	1	0.59	1	1	1	40.000			
L3	0.25	2.38	A	1	0.59	1	1	1	50.000	1.59	79.47	C
100.00-80.00			B	1	0.59	1	1	1	50.000			
			C	1	0.59	1	1	1	50.000			
L4	0.19	2.14	A	1	0.59	1	1	1	45.000	1.34	89.13	C
80.00-65.00			B	1	0.59	1	1	1	45.000			
			C	1	0.59	1	1	1	45.000			
L5	0.06	0.86	A	1	0.59	1	1	1	15.000	0.49	97.71	C
65.00-60.00			B	1	0.59	1	1	1	15.000			
			C	1	0.59	1	1	1	15.000			
L6	0.14	1.84	A	1	0.59	1	1	1	38.500	1.34	121.42	C
60.00-49.00			B	1	0.59	1	1	1	38.500			
			C	1	0.59	1	1	1	38.500			
L7	0.12	1.88	A	1	0.59	1	1	1	31.500	0.91	101.47	C
49.00-40.00			B	1	0.59	1	1	1	31.500			
			C	1	0.59	1	1	1	31.500			
L8	0.14	2.10	A	1	0.59	1	1	1	44.000	1.08	97.75	C
40.00-29.00			B	1	0.59	1	1	1	44.000			
			C	1	0.59	1	1	1	44.000			
L9	0.12	2.06	A	1	0.59	1	1	1	36.000	0.94	104.68	C
29.00-20.00			B	1	0.59	1	1	1	36.000			
			C	1	0.59	1	1	1	36.000			
L10	0.13	2.15	A	1	0.59	1	1	1	45.000	1.09	108.53	C
20.00-10.00			B	1	0.59	1	1	1	45.000			
			C	1	0.59	1	1	1	45.000			

Job	6421.CT11327A	Page	11 of 35
Project	Old Saybrook/I-95/AmtraK_1	Date	14:20:07 10/21/14
Client	T-Mobile	Designed by	Vinod Ramesh

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	R _R	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
L11 10.00-0.00	0.13	2.43	C	1	0.59	1	1	1	45.000	1.16	115.97	C
			A	1	0.59	1	1	1	45.000			
			B	1	0.59	1	1	1	45.000			
			C	1	0.59	1	1	1	45.000			
Sum Weight:	1.87	21.84						OTM	837.43 kip-ft	12.93		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	R _R	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
L1 150.00-120.00	0.37	2.46	A	1	0.59	1	1	1	47.500	1.41	47.08	C
			B	1	0.59	1	1	1	47.500			
			C	1	0.59	1	1	1	47.500			
L2 120.00-100.00	0.24	2.19	A	1	0.59	1	1	1	41.667	1.13	56.59	C
			B	1	0.59	1	1	1	41.667			
			C	1	0.59	1	1	1	41.667			
L3 100.00-80.00	0.25	2.75	A	1	0.59	1	1	1	51.667	1.30	64.94	C
			B	1	0.59	1	1	1	51.667			
			C	1	0.59	1	1	1	51.667			
L4 80.00-65.00	0.19	2.48	A	1	0.59	1	1	1	46.250	1.08	71.87	C
			B	1	0.59	1	1	1	46.250			
			C	1	0.59	1	1	1	46.250			
L5 65.00-60.00	0.06	0.97	A	1	0.59	1	1	1	15.417	0.39	78.09	C
			B	1	0.59	1	1	1	15.417			
			C	1	0.59	1	1	1	15.417			
L6 60.00-49.00	0.14	2.12	A	1	0.59	1	1	1	39.417	1.05	95.69	C
			B	1	0.59	1	1	1	39.417			
			C	1	0.59	1	1	1	39.417			
L7 49.00-40.00	0.12	2.11	A	1	0.59	1	1	1	32.250	0.72	80.47	C
			B	1	0.59	1	1	1	32.250			
			C	1	0.59	1	1	1	32.250			
L8 40.00-29.00	0.14	2.43	A	1	0.59	1	1	1	44.917	1.02	93.12	C
			B	1	0.59	1	1	1	44.917			
			C	1	0.59	1	1	1	44.917			
L9 29.00-20.00	0.12	2.33	A	1	0.59	1	1	1	36.750	0.74	82.52	C
			B	1	0.59	1	1	1	36.750			
			C	1	0.59	1	1	1	36.750			
L10 20.00-10.00	0.13	2.48	A	1	0.59	1	1	1	45.833	1.04	104.27	C
			B	1	0.59	1	1	1	45.833			
			C	1	0.59	1	1	1	45.833			
L11 10.00-0.00	0.13	2.77	A	1	0.59	1	1	1	45.833	0.91	90.99	C
			B	1	0.59	1	1	1	45.833			
			C	1	0.59	1	1	1	45.833			
Sum Weight:	1.90	25.08						OTM	697.95 kip-ft			

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	R _R	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
L1	0.37	2.46	A	1	0.59	1	1	1	47.500	1.41	47.08	C

Job	6421.CT11327A	Page	12 of 35
Project	Old Saybrook/I-95/AmtraK_1	Date	14:20:07 10/21/14
Client	T-Mobile	Designed by	Vinod Ramesh

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	R _R	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
150.00-120.00			B	1	0.59	1	1	1	47.500			
			C	1	0.59	1	1	1	47.500			
L2	0.24	2.19	A	1	0.59	1	1	1	41.667	1.13	56.59	C
120.00-100.00			B	1	0.59	1	1	1	41.667			
			C	1	0.59	1	1	1	41.667			
L3	0.25	2.75	A	1	0.59	1	1	1	51.667	1.30	64.94	C
100.00-80.00			B	1	0.59	1	1	1	51.667			
			C	1	0.59	1	1	1	51.667			
L4	0.19	2.48	A	1	0.59	1	1	1	46.250	1.08	71.87	C
80.00-65.00			B	1	0.59	1	1	1	46.250			
			C	1	0.59	1	1	1	46.250			
L5	0.06	0.97	A	1	0.59	1	1	1	15.417	0.39	78.09	C
65.00-60.00			B	1	0.59	1	1	1	15.417			
			C	1	0.59	1	1	1	15.417			
L6	0.14	2.12	A	1	0.59	1	1	1	39.417	1.05	95.69	C
60.00-49.00			B	1	0.59	1	1	1	39.417			
			C	1	0.59	1	1	1	39.417			
L7	0.12	2.11	A	1	0.59	1	1	1	32.250	0.72	80.47	C
49.00-40.00			B	1	0.59	1	1	1	32.250			
			C	1	0.59	1	1	1	32.250			
L8	0.14	2.43	A	1	0.59	1	1	1	44.917	1.02	93.12	C
40.00-29.00			B	1	0.59	1	1	1	44.917			
			C	1	0.59	1	1	1	44.917			
L9	0.12	2.33	A	1	0.59	1	1	1	36.750	0.74	82.52	C
29.00-20.00			B	1	0.59	1	1	1	36.750			
			C	1	0.59	1	1	1	36.750			
L10	0.13	2.48	A	1	0.59	1	1	1	45.833	1.04	104.27	C
20.00-10.00			B	1	0.59	1	1	1	45.833			
			C	1	0.59	1	1	1	45.833			
L11	0.13	2.77	A	1	0.59	1	1	1	45.833	0.91	90.99	C
10.00-0.00			B	1	0.59	1	1	1	45.833			
			C	1	0.59	1	1	1	45.833			
Sum Weight:	1.90	25.08						OTM	697.95 kip-ft	10.81		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	R _R	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
L1	0.37	2.46	A	1	0.59	1	1	1	47.500	1.41	47.08	C
150.00-120.00			B	1	0.59	1	1	1	47.500			
			C	1	0.59	1	1	1	47.500			
L2	0.24	2.19	A	1	0.59	1	1	1	41.667	1.13	56.59	C
120.00-100.00			B	1	0.59	1	1	1	41.667			
			C	1	0.59	1	1	1	41.667			
L3	0.25	2.75	A	1	0.59	1	1	1	51.667	1.30	64.94	C
100.00-80.00			B	1	0.59	1	1	1	51.667			
			C	1	0.59	1	1	1	51.667			
L4	0.19	2.48	A	1	0.59	1	1	1	46.250	1.08	71.87	C
80.00-65.00			B	1	0.59	1	1	1	46.250			
			C	1	0.59	1	1	1	46.250			
L5	0.06	0.97	A	1	0.59	1	1	1	15.417	0.39	78.09	C
65.00-60.00			B	1	0.59	1	1	1	15.417			
			C	1	0.59	1	1	1	15.417			
L6	0.14	2.12	A	1	0.59	1	1	1	39.417	1.05	95.69	C
60.00-49.00			B	1	0.59	1	1	1	39.417			

Job	6421.CT11327A	Page	13 of 35
Project	Old Saybrook/I-95/AmtraK_1	Date	14:20:07 10/21/14
Client	T-Mobile	Designed by	Vinod Ramesh

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
L7	0.12	2.11	C	1	0.59	1	1	1	39.417			
49.00-40.00			A	1	0.59	1	1	1	32.250	0.72	80.47	C
			B	1	0.59	1	1	1	32.250			
L8	0.14	2.43	C	1	0.59	1	1	1	32.250			
40.00-29.00			A	1	0.59	1	1	1	44.917	1.02	93.12	C
			B	1	0.59	1	1	1	44.917			
			C	1	0.59	1	1	1	44.917			
L9	0.12	2.33	A	1	0.59	1	1	1	36.750	0.74	82.52	C
29.00-20.00			B	1	0.59	1	1	1	36.750			
			C	1	0.59	1	1	1	36.750			
L10	0.13	2.48	A	1	0.59	1	1	1	45.833	1.04	104.27	C
20.00-10.00			B	1	0.59	1	1	1	45.833			
			C	1	0.59	1	1	1	45.833			
L11	0.13	2.77	A	1	0.59	1	1	1	45.833	0.91	90.99	C
10.00-0.00			B	1	0.59	1	1	1	45.833			
			C	1	0.59	1	1	1	45.833			
Sum Weight:	1.90	25.08						OTM	697.95	10.81		
									kip-ft			

Tower Forces - Service - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
L1	0.36	2.12	A	1	0.59	1	1	1	45.000	0.46	15.17	C
150.00-120.00			B	1	0.59	1	1	1	45.000			
			C	1	0.59	1	1	1	45.000			
L2	0.24	1.89	A	1	0.59	1	1	1	40.000	0.38	18.81	C
120.00-100.00			B	1	0.59	1	1	1	40.000			
			C	1	0.59	1	1	1	40.000			
L3	0.25	2.38	A	1	0.59	1	1	1	50.000	0.44	22.01	C
100.00-80.00			B	1	0.59	1	1	1	50.000			
			C	1	0.59	1	1	1	50.000			
L4	0.19	2.14	A	1	0.59	1	1	1	45.000	0.37	24.69	C
80.00-65.00			B	1	0.59	1	1	1	45.000			
			C	1	0.59	1	1	1	45.000			
L5	0.06	0.86	A	1	0.59	1	1	1	15.000	0.14	27.07	C
65.00-60.00			B	1	0.59	1	1	1	15.000			
			C	1	0.59	1	1	1	15.000			
L6	0.14	1.84	A	1	0.59	1	1	1	38.500	0.37	33.63	C
60.00-49.00			B	1	0.59	1	1	1	38.500			
			C	1	0.59	1	1	1	38.500			
L7	0.12	1.88	A	1	0.59	1	1	1	31.500	0.25	28.11	C
49.00-40.00			B	1	0.59	1	1	1	31.500			
			C	1	0.59	1	1	1	31.500			
L8	0.14	2.10	A	1	0.59	1	1	1	44.000	0.30	27.08	C
40.00-29.00			B	1	0.59	1	1	1	44.000			
			C	1	0.59	1	1	1	44.000			
L9	0.12	2.06	A	1	0.59	1	1	1	36.000	0.26	29.00	C
29.00-20.00			B	1	0.59	1	1	1	36.000			
			C	1	0.59	1	1	1	36.000			
L10	0.13	2.15	A	1	0.59	1	1	1	45.000	0.30	30.06	C
20.00-10.00			B	1	0.59	1	1	1	45.000			
			C	1	0.59	1	1	1	45.000			
L11	0.13	2.43	A	1	0.59	1	1	1	45.000	0.32	32.12	C
10.00-0.00			B	1	0.59	1	1	1	45.000			
			C	1	0.59	1	1	1	45.000			

Job	6421.CT11327A	Page	14 of 35
Project	Old Saybrook/I-95/AmtraK_1	Date	14:20:07 10/21/14
Client	T-Mobile	Designed by	Vinod Ramesh

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
Sum Weight:	1.87	21.84						OTM	231.98 kip-ft	3.58		

Tower Forces - Service - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
L1 150.00-120.00	0.36	2.12	A	1	0.59	1	1	1	45.000	0.46	15.17	C
			B	1	0.59	1	1	1	45.000			
			C	1	0.59	1	1	1	45.000			
L2 120.00-100.00	0.24	1.89	A	1	0.59	1	1	1	40.000	0.38	18.81	C
			B	1	0.59	1	1	1	40.000			
			C	1	0.59	1	1	1	40.000			
L3 100.00-80.00	0.25	2.38	A	1	0.59	1	1	1	50.000	0.44	22.01	C
			B	1	0.59	1	1	1	50.000			
			C	1	0.59	1	1	1	50.000			
L4 80.00-65.00	0.19	2.14	A	1	0.59	1	1	1	45.000	0.37	24.69	C
			B	1	0.59	1	1	1	45.000			
			C	1	0.59	1	1	1	45.000			
L5 65.00-60.00	0.06	0.86	A	1	0.59	1	1	1	15.000	0.14	27.07	C
			B	1	0.59	1	1	1	15.000			
			C	1	0.59	1	1	1	15.000			
L6 60.00-49.00	0.14	1.84	A	1	0.59	1	1	1	38.500	0.37	33.63	C
			B	1	0.59	1	1	1	38.500			
			C	1	0.59	1	1	1	38.500			
L7 49.00-40.00	0.12	1.88	A	1	0.59	1	1	1	31.500	0.25	28.11	C
			B	1	0.59	1	1	1	31.500			
			C	1	0.59	1	1	1	31.500			
L8 40.00-29.00	0.14	2.10	A	1	0.59	1	1	1	44.000	0.30	27.08	C
			B	1	0.59	1	1	1	44.000			
			C	1	0.59	1	1	1	44.000			
L9 29.00-20.00	0.12	2.06	A	1	0.59	1	1	1	36.000	0.26	29.00	C
			B	1	0.59	1	1	1	36.000			
			C	1	0.59	1	1	1	36.000			
L10 20.00-10.00	0.13	2.15	A	1	0.59	1	1	1	45.000	0.30	30.06	C
			B	1	0.59	1	1	1	45.000			
			C	1	0.59	1	1	1	45.000			
L11 10.00-0.00	0.13	2.43	A	1	0.59	1	1	1	45.000	0.32	32.12	C
			B	1	0.59	1	1	1	45.000			
			C	1	0.59	1	1	1	45.000			
Sum Weight:	1.87	21.84						OTM	231.98 kip-ft	3.58		

Tower Forces - Service - Wind 90 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
L1 150.00-120.00	0.36	2.12	A	1	0.59	1	1	1	45.000	0.46	15.17	C
			B	1	0.59	1	1	1	45.000			
			C	1	0.59	1	1	1	45.000			
L2 120.00-100.00	0.24	1.89	A	1	0.59	1	1	1	40.000	0.38	18.81	C
			B	1	0.59	1	1	1	40.000			

Job	6421.CT11327A	Page	15 of 35
Project	Old Saybrook/I-95/AmtraK_1	Date	14:20:07 10/21/14
Client	T-Mobile	Designed by	Vinod Ramesh

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	R _R	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
L3 100.00-80.00	0.25	2.38	C	1	0.59	1	1	1	40.000	0.44	22.01	C
			A	1	0.59	1	1	1	50.000			
			B	1	0.59	1	1	1	50.000			
L4 80.00-65.00	0.19	2.14	C	1	0.59	1	1	1	50.000	0.37	24.69	C
			A	1	0.59	1	1	1	45.000			
			B	1	0.59	1	1	1	45.000			
L5 65.00-60.00	0.06	0.86	C	1	0.59	1	1	1	45.000	0.14	27.07	C
			A	1	0.59	1	1	1	15.000			
			B	1	0.59	1	1	1	15.000			
L6 60.00-49.00	0.14	1.84	C	1	0.59	1	1	1	38.500	0.37	33.63	C
			A	1	0.59	1	1	1	38.500			
			B	1	0.59	1	1	1	38.500			
L7 49.00-40.00	0.12	1.88	C	1	0.59	1	1	1	31.500	0.25	28.11	C
			A	1	0.59	1	1	1	31.500			
			B	1	0.59	1	1	1	31.500			
L8 40.00-29.00	0.14	2.10	C	1	0.59	1	1	1	44.000	0.30	27.08	C
			A	1	0.59	1	1	1	44.000			
			B	1	0.59	1	1	1	44.000			
L9 29.00-20.00	0.12	2.06	C	1	0.59	1	1	1	36.000	0.26	29.00	C
			A	1	0.59	1	1	1	36.000			
			B	1	0.59	1	1	1	36.000			
L10 20.00-10.00	0.13	2.15	C	1	0.59	1	1	1	45.000	0.30	30.06	C
			A	1	0.59	1	1	1	45.000			
			B	1	0.59	1	1	1	45.000			
L11 10.00-0.00	0.13	2.43	C	1	0.59	1	1	1	45.000	0.32	32.12	C
			A	1	0.59	1	1	1	45.000			
			B	1	0.59	1	1	1	45.000			
Sum Weight:	1.87	21.84						OTM	231.98 kip-ft	3.58		

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M _x kip-ft	Sum of Overturning Moments, M _z kip-ft	Sum of Torques kip-ft
Leg Weight	21.84					
Bracing Weight	0.00					
Total Member Self-Weight	21.84					
Total Weight	27.17			0.17	-0.72	
Wind 0 deg - No Ice		-0.04	-21.32	-2018.54	3.48	3.83
Wind 30 deg - No Ice		10.40	-18.44	-1745.98	-971.74	3.63
Wind 60 deg - No Ice		18.05	-10.62	-1005.55	-1686.77	2.46
Wind 90 deg - No Ice		20.87	0.04	4.37	-1950.03	0.63
Wind 120 deg - No Ice		18.10	10.70	1013.15	-1690.97	-1.36
Wind 150 deg - No Ice		10.47	18.49	1750.51	-979.01	-3.00
Wind 180 deg - No Ice		0.04	21.32	2018.87	-4.92	-3.83
Wind 210 deg - No Ice		-10.40	18.44	1746.31	970.29	-3.63
Wind 240 deg - No Ice		-18.05	10.62	1005.88	1685.33	-2.46
Wind 270 deg - No Ice		-20.87	-0.04	-4.03	1948.58	-0.63
Wind 300 deg - No Ice		-18.10	-10.70	-1012.82	1689.53	1.36
Wind 330 deg - No Ice		-10.47	-18.49	-1750.18	977.57	3.00
Member Ice	3.23					
Total Weight Ice	31.87			0.22	-1.37	
Wind 0 deg - Ice		-0.03	-18.39	-1753.85	1.75	4.08
Wind 30 deg - Ice		9.00	-15.91	-1517.29	-848.97	4.04
Wind 60 deg - Ice		15.61	-9.17	-874.12	-1472.57	2.92

Job	6421.CT11327A	Page	16 of 35
Project	Old Saybrook/I-95/AmtraK_1	Date	14:20:07 10/21/14
Client	T-Mobile	Designed by	Vinod Ramesh

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M _x kip-ft	Sum of Overturning Moments, M _z kip-ft	Sum of Torques kip-ft
Wind 90 deg - Ice		18.05	0.03	3.34	-1701.97	1.01
Wind 120 deg - Ice		15.64	9.22	879.96	-1475.69	-1.16
Wind 150 deg - Ice		9.05	15.95	1520.85	-854.37	-3.03
Wind 180 deg - Ice		0.03	18.39	1754.29	-4.49	-4.08
Wind 210 deg - Ice		-9.00	15.91	1517.73	846.23	-4.04
Wind 240 deg - Ice		-15.61	9.17	874.55	1469.83	-2.92
Wind 270 deg - Ice		-18.05	-0.03	-2.90	1699.23	-1.01
Wind 300 deg - Ice		-15.64	-9.22	-879.52	1472.95	1.16
Wind 330 deg - Ice		-9.05	-15.95	-1520.41	851.63	3.03
Total Weight	27.17			0.17	-0.72	
Wind 0 deg - Service		-0.01	-5.91	-558.81	0.44	1.06
Wind 30 deg - Service		2.88	-5.11	-483.31	-269.70	1.01
Wind 60 deg - Service		5.00	-2.94	-278.21	-467.77	0.68
Wind 90 deg - Service		5.78	0.01	1.55	-540.69	0.18
Wind 120 deg - Service		5.01	2.96	280.99	-468.93	-0.38
Wind 150 deg - Service		2.90	5.12	485.24	-271.72	-0.83
Wind 180 deg - Service		0.01	5.91	559.58	-1.88	-1.06
Wind 210 deg - Service		-2.88	5.11	484.08	268.26	-1.01
Wind 240 deg - Service		-5.00	2.94	278.98	466.33	-0.68
Wind 270 deg - Service		-5.78	-0.01	-0.78	539.25	-0.18
Wind 300 deg - Service		-5.01	-2.96	-280.22	467.49	0.38
Wind 330 deg - Service		-2.90	-5.12	-484.48	270.27	0.83

Load Combinations

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

Job	6421.CT11327A	Page	17 of 35
Project	Old Saybrook/I-95/AmtraK_1	Date	14:20:07 10/21/14
Client	T-Mobile	Designed by	Vinod Ramesh

<i>Comb. No.</i>	<i>Description</i>
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Member Forces

<i>Section No.</i>	<i>Elevation ft</i>	<i>Component Type</i>	<i>Condition</i>	<i>Gov. Load Comb.</i>	<i>Force K</i>	<i>Major Axis Moment kip-ft</i>	<i>Minor Axis Moment kip-ft</i>
L1	150 - 120	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-7.03	0.02	0.34
			Max. Mx	11	-4.94	234.41	0.01
			Max. My	2	-4.87	0.02	249.14
			Max. Vy	5	8.76	-234.39	-0.01
			Max. Vx	8	9.28	0.00	-249.01
			Max. Torque	6			1.50
L2	120 - 100	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-9.70	-0.53	0.05
			Max. Mx	5	-7.29	-424.55	-0.11
			Max. My	8	-7.24	-0.28	-449.39
			Max. Vy	5	10.60	-424.55	-0.11
			Max. Vx	8	11.08	-0.28	-449.39
			Max. Torque	15			-2.16
L3	100 - 80	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-12.82	-0.71	-0.02
			Max. Mx	5	-10.05	-654.40	-0.98
			Max. My	8	-10.01	-1.24	-688.54
			Max. Vy	5	12.28	-654.40	-0.98
			Max. Vx	8	12.74	-1.24	-688.54
			Max. Torque	15			-2.27
L4	80 - 65	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-15.65	-1.03	-0.18
			Max. Mx	5	-12.54	-854.33	-1.69
			Max. My	8	-12.51	-2.03	-895.36
			Max. Vy	5	13.93	-854.33	-1.69
			Max. Vx	8	14.39	-2.03	-895.36
			Max. Torque	15			-3.34
L5	65 - 60	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-16.68	-1.03	-0.17
			Max. Mx	5	-13.48	-925.13	-1.90
			Max. My	8	-13.46	-2.26	-968.47
			Max. Vy	5	14.40	-925.13	-1.90
			Max. Vx	8	14.87	-2.26	-968.47
			Max. Torque	15			-3.34
L6	60 - 49	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-19.11	-1.37	-0.35
			Max. Mx	5	-15.61	-1093.33	-2.44
			Max. My	8	-15.58	-2.89	-1141.69
			Max. Vy	5	16.01	-1093.33	-2.44
			Max. Vx	8	16.47	-2.89	-1141.69
			Max. Torque	15			-4.30
L7	49 - 40	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-21.34	-1.37	-0.33
			Max. Mx	5	-17.65	-1241.34	-2.81
			Max. My	8	-17.63	-3.28	-1293.83
			Max. Vy	5	16.89	-1241.34	-2.81

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L8	40 - 29	Pole	Max. Vx	8	17.35	-3.28	-1293.83
			Max. Torque	15			-4.30
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-23.91	-1.37	-0.30
			Max. Mx	5	-19.96	-1432.70	-3.27
			Max. My	8	-19.94	-3.76	-1490.23
			Max. Vy	5	17.91	-1432.70	-3.27
			Max. Vx	8	18.37	-3.76	-1490.23
L9	29 - 20	Pole	Max. Torque	15			-4.28
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-26.35	-1.37	-0.28
			Max. Mx	5	-22.19	-1597.83	-3.64
			Max. My	8	-22.18	-4.15	-1659.46
			Max. Vy	5	18.79	-1597.83	-3.64
			Max. Vx	8	19.25	-4.15	-1659.46
			Max. Torque	15			-4.22
L10	20 - 10	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-28.97	-1.37	-0.25
			Max. Mx	5	-24.53	-1790.81	-4.05
			Max. My	8	-24.53	-4.58	-1856.97
			Max. Vy	5	19.81	-1790.81	-4.05
			Max. Vx	8	20.26	-4.58	-1856.97
			Max. Torque	15			-4.20
			Max Tension	1	0.00	0.00	0.00
L11	10 - 0	Pole	Max. Compression	14	-31.87	-1.37	-0.22
			Max. Mx	5	-27.17	-1994.19	-4.45
			Max. My	8	-27.17	-5.00	-2064.85
			Max. Vy	5	20.88	-1994.19	-4.45
			Max. Vx	8	21.33	-5.00	-2064.85
			Max. Torque	15			-4.14

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	15	31.87	0.03	18.39
	Max. H _x	11	27.17	20.87	0.04
	Max. H _z	2	27.17	0.04	21.32
	Max. M _x	2	2064.51	0.04	21.32
	Max. M _z	5	1994.19	-20.87	-0.04
	Max. Torsion	21	4.11	-0.03	-18.39
	Min. Vert	33	27.17	-0.01	-5.91
	Min. H _x	5	27.17	-20.87	-0.04
	Min. H _z	8	27.17	-0.04	-21.32
	Min. M _x	8	-2064.85	-0.04	-21.32
	Min. M _z	11	-1992.70	20.87	0.04
	Min. Torsion	15	-4.11	0.03	18.39

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead Only	27.17	0.00	0.00	0.17	-0.72	0.00

Job	6421.CT11327A	Page	19 of 35
Project	Old Saybrook/I-95/AmtraK_1	Date	14:20:07 10/21/14
Client	T-Mobile	Designed by	Vinod Ramesh

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead+Wind 0 deg - No Ice	27.17	-0.04	-21.32	-2064.51	3.54	3.84
Dead+Wind 30 deg - No Ice	27.17	10.40	-18.44	-1785.80	-993.70	3.67
Dead+Wind 60 deg - No Ice	27.17	18.05	-10.62	-1028.53	-1724.95	2.50
Dead+Wind 90 deg - No Ice	27.17	20.87	0.04	4.45	-1994.19	0.65
Dead+Wind 120 deg - No Ice	27.17	18.10	10.70	1036.28	-1729.21	-1.38
Dead+Wind 150 deg - No Ice	27.17	10.47	18.49	1790.41	-1001.10	-3.01
Dead+Wind 180 deg - No Ice	27.17	0.04	21.32	2064.85	-5.00	-3.83
Dead+Wind 210 deg - No Ice	27.17	-10.40	18.44	1786.14	992.23	-3.63
Dead+Wind 240 deg - No Ice	27.17	-18.05	10.62	1028.87	1723.47	-2.47
Dead+Wind 270 deg - No Ice	27.17	-20.87	-0.04	-4.10	1992.70	-0.66
Dead+Wind 300 deg - No Ice	27.17	-18.10	-10.70	-1035.92	1727.74	1.33
Dead+Wind 330 deg - No Ice	27.17	-10.47	-18.49	-1790.06	999.63	2.98
Dead+Ice+Temp	31.87	0.00	0.00	0.22	-1.37	0.00
Dead+Wind 0 deg+Ice+Temp	31.87	-0.03	-18.39	-1804.82	1.78	4.11
Dead+Wind 30 deg+Ice+Temp	31.87	9.00	-15.91	-1561.43	-873.47	4.09
Dead+Wind 60 deg+Ice+Temp	31.87	15.61	-9.17	-899.59	-1515.09	2.95
Dead+Wind 90 deg+Ice+Temp	31.87	18.05	0.03	3.41	-1751.12	1.02
Dead+Wind 120 deg+Ice+Temp	31.87	15.64	9.22	905.54	-1518.27	-1.19
Dead+Wind 150 deg+Ice+Temp	31.87	9.05	15.95	1565.05	-878.98	-3.06
Dead+Wind 180 deg+Ice+Temp	31.87	0.03	18.39	1805.26	-4.59	-4.11
Dead+Wind 210 deg+Ice+Temp	31.87	-9.00	15.91	1561.86	870.64	-4.05
Dead+Wind 240 deg+Ice+Temp	31.87	-15.61	9.17	900.01	1512.26	-2.93
Dead+Wind 270 deg+Ice+Temp	31.87	-18.05	-0.03	-2.97	1748.28	-1.02
Dead+Wind 300 deg+Ice+Temp	31.87	-15.64	-9.22	-905.09	1515.44	1.16
Dead+Wind 330 deg+Ice+Temp	31.87	-9.05	-15.95	-1564.60	876.16	3.04
Dead+Wind 0 deg - Service	27.17	-0.01	-5.91	-572.22	0.44	1.07
Dead+Wind 30 deg - Service	27.17	2.88	-5.11	-494.94	-276.02	1.02
Dead+Wind 60 deg - Service	27.17	5.00	-2.94	-285.00	-478.71	0.69
Dead+Wind 90 deg - Service	27.17	5.78	0.01	1.36	-553.34	0.18
Dead+Wind 120 deg - Service	27.17	5.01	2.96	287.40	-479.90	-0.38
Dead+Wind 150 deg - Service	27.17	2.90	5.12	496.47	-278.07	-0.84
Dead+Wind 180 deg - Service	27.17	0.01	5.91	572.57	-1.93	-1.07
Dead+Wind 210 deg - Service	27.17	-2.88	5.11	495.29	274.53	-1.01
Dead+Wind 240 deg - Service	27.17	-5.00	2.94	285.35	477.23	-0.69
Dead+Wind 270 deg - Service	27.17	-5.78	-0.01	-1.01	551.85	-0.18
Dead+Wind 300 deg - Service	27.17	-5.01	-2.96	-287.05	478.41	0.38
Dead+Wind 330 deg - Service	27.17	-2.90	-5.12	-496.13	276.58	0.83

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-27.17	0.00	0.00	27.17	0.00	0.000%
2	-0.04	-27.17	-21.32	0.04	27.17	21.32	0.000%
3	10.40	-27.17	-18.44	-10.40	27.17	18.44	0.000%
4	18.05	-27.17	-10.62	-18.05	27.17	10.62	0.000%
5	20.87	-27.17	0.04	-20.87	27.17	-0.04	0.000%
6	18.10	-27.17	10.70	-18.10	27.17	-10.70	0.000%
7	10.47	-27.17	18.49	-10.47	27.17	-18.49	0.000%
8	0.04	-27.17	21.32	-0.04	27.17	-21.32	0.000%
9	-10.40	-27.17	18.44	10.40	27.17	-18.44	0.000%
10	-18.05	-27.17	10.62	18.05	27.17	-10.62	0.000%
11	-20.87	-27.17	-0.04	20.87	27.17	0.04	0.000%
12	-18.10	-27.17	-10.70	18.10	27.17	10.70	0.000%
13	-10.47	-27.17	-18.49	10.47	27.17	18.49	0.000%
14	0.00	-31.87	0.00	0.00	31.87	0.00	0.000%
15	-0.03	-31.87	-18.39	0.03	31.87	18.39	0.000%
16	9.00	-31.87	-15.91	-9.00	31.87	15.91	0.000%

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Job

6421.CT11327A

Page

20 of 35

Project

Old Saybrook/I-95/AmtraK_1

Date

14:20:07 10/21/14

Client

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Vinod Ramesh

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
17	15.61	-31.87	-9.17	-15.61	31.87	9.17	0.000%
18	18.05	-31.87	0.03	-18.05	31.87	-0.03	0.000%
19	15.64	-31.87	9.22	-15.64	31.87	-9.22	0.000%
20	9.05	-31.87	15.95	-9.05	31.87	-15.95	0.000%
21	0.03	-31.87	18.39	-0.03	31.87	-18.39	0.000%
22	-9.00	-31.87	15.91	9.00	31.87	-15.91	0.000%
23	-15.61	-31.87	9.17	15.61	31.87	-9.17	0.000%
24	-18.05	-31.87	-0.03	18.05	31.87	0.03	0.000%
25	-15.64	-31.87	-9.22	15.64	31.87	9.22	0.000%
26	-9.05	-31.87	-15.95	9.05	31.87	15.95	0.000%
27	-0.01	-27.17	-5.91	0.01	27.17	5.91	0.000%
28	2.88	-27.17	-5.11	-2.88	27.17	5.11	0.000%
29	5.00	-27.17	-2.94	-5.00	27.17	2.94	0.000%
30	5.78	-27.17	0.01	-5.78	27.17	-0.01	0.000%
31	5.01	-27.17	2.96	-5.01	27.17	-2.96	0.000%
32	2.90	-27.17	5.12	-2.90	27.17	-5.12	0.000%
33	0.01	-27.17	5.91	-0.01	27.17	-5.91	0.000%
34	-2.88	-27.17	5.11	2.88	27.17	-5.11	0.000%
35	-5.00	-27.17	2.94	5.00	27.17	-2.94	0.000%
36	-5.78	-27.17	-0.01	5.78	27.17	0.01	0.000%
37	-5.01	-27.17	-2.96	5.01	27.17	2.96	0.000%
38	-2.90	-27.17	-5.12	2.90	27.17	5.12	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.0000001	0.0000001
2	Yes	5	0.0000001	0.00007287
3	Yes	5	0.0000001	0.00040971
4	Yes	5	0.0000001	0.00035358
5	Yes	4	0.0000001	0.00048024
6	Yes	5	0.0000001	0.00034986
7	Yes	5	0.0000001	0.00041805
8	Yes	5	0.0000001	0.00007602
9	Yes	5	0.0000001	0.00034167
10	Yes	5	0.0000001	0.00038154
11	Yes	4	0.0000001	0.00052238
12	Yes	5	0.0000001	0.00039202
13	Yes	5	0.0000001	0.00033988
14	Yes	4	0.0000001	0.0000001
15	Yes	5	0.0000001	0.00035397
16	Yes	5	0.0000001	0.00082706
17	Yes	5	0.0000001	0.00074663
18	Yes	5	0.0000001	0.00031731
19	Yes	5	0.0000001	0.00074980
20	Yes	5	0.0000001	0.00082949
21	Yes	5	0.0000001	0.00035540
22	Yes	5	0.0000001	0.00073149
23	Yes	5	0.0000001	0.00079038
24	Yes	5	0.0000001	0.00031671
25	Yes	5	0.0000001	0.00079278
26	Yes	5	0.0000001	0.00073465
27	Yes	4	0.0000001	0.00028084
28	Yes	4	0.0000001	0.00058545
29	Yes	4	0.0000001	0.00040862
30	Yes	4	0.0000001	0.00008156
31	Yes	4	0.0000001	0.00040013
32	Yes	4	0.0000001	0.00061052

Job	6421.CT11327A	Page	21 of 35
Project	Old Saybrook/I-95/AmtraK_1	Date	14:20:07 10/21/14
Client	T-Mobile	Designed by	Vinod Ramesh

33	Yes	4	0.00000001	0.00028420
34	Yes	4	0.00000001	0.00039244
35	Yes	4	0.00000001	0.00048874
36	Yes	4	0.00000001	0.00008224
37	Yes	4	0.00000001	0.00052058
38	Yes	4	0.00000001	0.00038981

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 120	20.130	33	1.4583	0.0096
L2	120 - 100	11.673	33	1.1103	0.0044
L3	100 - 80	7.556	33	0.8284	0.0034
L4	80 - 65	4.542	33	0.5946	0.0022
L5	65 - 60	2.885	33	0.4540	0.0016
L6	60 - 49	2.433	33	0.4076	0.0014
L7	49 - 40	1.591	33	0.3215	0.0010
L8	40 - 29	1.045	33	0.2561	0.0008
L9	29 - 20	0.541	33	0.1802	0.0005
L10	20 - 10	0.256	33	0.1213	0.0003
L11	10 - 0	0.064	33	0.0602	0.0001

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	33	20.130	1.4583	0.0099	17729
101.00	10' x 2" Omni Antenna w/mount pipe	33	7.733	0.8420	0.0034	4538
99.00	4' Walkway	33	7.382	0.8150	0.0033	4693
76.00	20' x 2" Omni Antenna	33	4.052	0.5558	0.0020	5425
51.00	20' x 2" Omni Antenna	33	1.729	0.3362	0.0011	7419

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 120	72.470	8	5.2516	0.0335
L2	120 - 100	42.046	8	3.9991	0.0171
L3	100 - 80	27.226	8	2.9841	0.0130
L4	80 - 65	16.368	8	2.1426	0.0087
L5	65 - 60	10.399	8	1.6361	0.0061
L6	60 - 49	8.772	8	1.4692	0.0054
L7	49 - 40	5.735	8	1.1589	0.0041
L8	40 - 29	3.769	8	0.9232	0.0030
L9	29 - 20	1.949	8	0.6496	0.0020
L10	20 - 10	0.921	8	0.4374	0.0012
L11	10 - 0	0.232	8	0.2173	0.0006



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Job	6421.CT11327A	Page	22 of 35
Project	Old Saybrook/I-95/AmtraK_1	Date	14:20:07 10/21/14
Client	T-Mobile	Designed by	Vinod Ramesh

Critical Deflections and Radius of Curvature - Design Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.00	4' Lightning Rod on 16' Extension	8	72.470	5.2516	0.0365	5002
101.00	10' x 2" Omni Antenna w/mount pipe	8	27.862	3.0329	0.0132	1267
99.00	4' Walkway	8	26.599	2.9359	0.0128	1310
76.00	20' x 2" Omni Antenna	8	14.606	2.0028	0.0079	1510
51.00	20' x 2" Omni Antenna	8	6.234	1.2118	0.0043	2061

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _a ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P/P _a
L1	150 - 148.5	P18x3/8	30.00	0.00	0.0	25.200	20.7640	-2.50	523.25	0.005
	148.5 - 147					25.200	20.7640	-2.59	523.25	0.005
	147 - 145.5					25.200	20.7640	-2.71	523.25	0.005
	145.5 - 144					25.200	20.7640	-2.83	523.25	0.005
	144 - 142.5					25.200	20.7640	-2.95	523.25	0.006
	142.5 - 141					25.200	20.7640	-3.07	523.25	0.006
	141 - 139.5					25.200	20.7640	-3.19	523.25	0.006
	139.5 - 138					25.200	20.7640	-3.31	523.25	0.006
	138 - 136.5					25.200	20.7640	-3.44	523.25	0.007
	136.5 - 135					25.200	20.7640	-3.56	523.25	0.007
	135 - 133.5					25.200	20.7640	-3.69	523.25	0.007
	133.5 - 132					25.200	20.7640	-3.81	523.25	0.007
	132 - 130.5					25.200	20.7640	-3.94	523.25	0.008
	130.5 - 129					25.200	20.7640	-4.07	523.25	0.008
	129 - 127.5					25.200	20.7640	-4.20	523.25	0.008
	127.5 - 126					25.200	20.7640	-4.33	523.25	0.008
	126 - 124.5					25.200	20.7640	-4.46	523.25	0.009
	124.5 - 123					25.200	20.7640	-4.60	523.25	0.009
	123 - 121.5					25.200	20.7640	-4.74	523.25	0.009
L2	121.5 - 120	P24x3/8	20.00	0.00	0.0	25.200	20.7640	-4.87	523.25	0.009
	120 - 119					25.200	27.8325	-4.99	701.38	0.007
	119 - 118					25.200	27.8325	-5.10	701.38	0.007
	118 - 117					25.200	27.8325	-5.21	701.38	0.007
	117 - 116					25.200	27.8325	-5.31	701.38	0.008
	116 - 115					25.200	27.8325	-5.42	701.38	0.008
	115 - 114					25.200	27.8325	-5.53	701.38	0.008
	114 - 113					25.200	27.8325	-5.64	701.38	0.008
	113 - 112					25.200	27.8325	-5.75	701.38	0.008
	112 - 111					25.200	27.8325	-5.86	701.38	0.008
	111 - 110					25.200	27.8325	-5.97	701.38	0.009
	110 - 109					25.200	27.8325	-6.08	701.38	0.009
	109 - 108					25.200	27.8325	-6.20	701.38	0.009
	108 - 107					25.200	27.8325	-6.31	701.38	0.009
107 - 106	25.200	27.8325	-6.42	701.38	0.009					
L3	106 - 105	P30x3/8	20.00	0.00	0.0	25.200	27.8325	-6.53	701.38	0.009
	105 - 104					25.200	27.8325	-6.65	701.38	0.009
	104 - 103					25.200	27.8325	-6.76	701.38	0.010
	103 - 102					25.200	27.8325	-6.87	701.38	0.010
	102 - 101					25.200	27.8325	-6.99	701.38	0.010
	101 - 100					25.200	27.8325	-7.24	701.38	0.010
	100 - 99					25.075	34.9011	-7.38	875.15	0.008



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Job	6421.CT11327A	Page	23 of 35
Project	Old Saybrook/I-95/AmtraK_1	Date	14:20:07 10/21/14
Client	T-Mobile	Designed by	Vinod Ramesh

Section No.	Elevation ft	Size	L ft	L _a ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
	99 - 98					25.075	34.9011	-7.56	875.15	0.009
	98 - 97					25.075	34.9011	-7.69	875.15	0.009
	97 - 96					25.075	34.9011	-7.83	875.15	0.009
	96 - 95					25.075	34.9011	-7.96	875.15	0.009
	95 - 94					25.075	34.9011	-8.09	875.15	0.009
	94 - 93					25.075	34.9011	-8.23	875.15	0.009
	93 - 92					25.075	34.9011	-8.36	875.15	0.010
	92 - 91					25.075	34.9011	-8.50	875.15	0.010
	91 - 90					25.075	34.9011	-8.64	875.15	0.010
	90 - 89					25.075	34.9011	-8.77	875.15	0.010
	89 - 88					25.075	34.9011	-8.91	875.15	0.010
	88 - 87					25.075	34.9011	-9.05	875.15	0.010
	87 - 86					25.075	34.9011	-9.18	875.15	0.010
	86 - 85					25.075	34.9011	-9.32	875.15	0.011
	85 - 84					25.075	34.9011	-9.46	875.15	0.011
	84 - 83					25.075	34.9011	-9.60	875.15	0.011
	83 - 82					25.075	34.9011	-9.73	875.15	0.011
	82 - 81					25.075	34.9011	-9.87	875.15	0.011
	81 - 80					25.075	34.9011	-10.01	875.15	0.011
L4	80 - 79	P36x3/8	15.00	0.00	0.0	23.696	41.9697	-10.17	994.51	0.010
	79 - 78					23.696	41.9697	-10.33	994.51	0.010
	78 - 77					23.696	41.9697	-10.49	994.51	0.011
	77 - 76					23.696	41.9697	-10.65	994.51	0.011
	76 - 75					23.696	41.9697	-10.90	994.51	0.011
	75 - 74					23.696	41.9697	-11.06	994.51	0.011
	74 - 73					23.696	41.9697	-11.22	994.51	0.011
	73 - 72					23.696	41.9697	-11.38	994.51	0.011
	72 - 71					23.696	41.9697	-11.54	994.51	0.012
	71 - 70					23.696	41.9697	-11.70	994.51	0.012
	70 - 69					23.696	41.9697	-11.86	994.51	0.012
	69 - 68					23.696	41.9697	-12.03	994.51	0.012
	68 - 67					23.696	41.9697	-12.19	994.51	0.012
	67 - 66					23.696	41.9697	-12.35	994.51	0.012
	66 - 65					23.696	41.9697	-12.51	994.51	0.013
L5	65 - 64	P36x0.45	5.00	0.00	0.0	21.600	50.2576	-12.70	1085.56	0.012
	64 - 63					21.600	50.2576	-12.89	1085.56	0.012
	63 - 62					21.600	50.2576	-13.08	1085.56	0.012
	62 - 61					21.600	50.2576	-13.27	1085.56	0.012
	61 - 60					21.600	50.2576	-13.46	1085.56	0.012
L6	60 - 59	P42x3/8	11.00	0.00	0.0	22.711	49.0383	-13.64	1113.69	0.012
	59 - 58					22.711	49.0383	-13.83	1113.69	0.012
	58 - 57					22.711	49.0383	-14.01	1113.69	0.013
	57 - 56					22.711	49.0383	-14.19	1113.69	0.013
	56 - 55					22.711	49.0383	-14.38	1113.69	0.013
	55 - 54					22.711	49.0383	-14.56	1113.69	0.013
	54 - 53					22.711	49.0383	-14.75	1113.69	0.013
	53 - 52					22.711	49.0383	-14.93	1113.69	0.013
	52 - 51					22.711	49.0383	-15.11	1113.69	0.014
	51 - 50					22.711	49.0383	-15.40	1113.69	0.014
	50 - 49					22.711	49.0383	-15.58	1113.69	0.014
L7	49 - 48	P42x0.47	9.00	0.00	0.0	23.008	61.3211	-15.81	1410.88	0.011
	48 - 47					23.008	61.3211	-16.04	1410.88	0.011
	47 - 46					23.008	61.3211	-16.27	1410.88	0.012
	46 - 45					23.008	61.3211	-16.49	1410.88	0.012
	45 - 44					23.008	61.3211	-16.72	1410.88	0.012
	44 - 43					23.008	61.3211	-16.95	1410.88	0.012
	43 - 42					23.008	61.3211	-17.18	1410.88	0.012
	42 - 41					23.008	61.3211	-17.40	1410.88	0.012
	41 - 40					23.008	61.3211	-17.63	1410.88	0.012
L8	40 - 39	P48x3/8	11.00	0.00	0.0	21.972	56.1069	-17.84	1232.77	0.014

Job	6421.CT11327A	Page	24 of 35
Project	Old Saybrook/I-95/AmtraK_1	Date	14:20:07 10/21/14
Client	T-Mobile	Designed by	Vinod Ramesh

Section No.	Elevation ft	Size	L ft	L _a ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
	39 - 38					21.972	56.1069	-18.05	1232.77	0.015
	38 - 37					21.972	56.1069	-18.26	1232.77	0.015
	37 - 36					21.972	56.1069	-18.47	1232.77	0.015
	36 - 35					21.972	56.1069	-18.68	1232.77	0.015
	35 - 34					21.972	56.1069	-18.89	1232.77	0.015
	34 - 33					21.972	56.1069	-19.10	1232.77	0.015
	33 - 32					21.972	56.1069	-19.31	1232.77	0.016
	32 - 31					21.972	56.1069	-19.52	1232.77	0.016
	31 - 30					21.972	56.1069	-19.73	1232.77	0.016
	30 - 29					21.972	56.1069	-19.94	1232.77	0.016
L9	29 - 28	P48x0.45	9.00	0.00	0.0	22.206	67.2222	-20.19	1492.75	0.014
	28 - 27					22.206	67.2222	-20.44	1492.75	0.014
	27 - 26					22.206	67.2222	-20.69	1492.75	0.014
	26 - 25					22.206	67.2222	-20.94	1492.75	0.014
	25 - 24					22.206	67.2222	-21.18	1492.75	0.014
	24 - 23					22.206	67.2222	-21.43	1492.75	0.014
	23 - 22					22.206	67.2222	-21.68	1492.75	0.015
	22 - 21					22.206	67.2222	-21.93	1492.75	0.015
	21 - 20					22.206	67.2222	-22.18	1492.75	0.015
L10	20 - 19	P54x3/8	10.00	0.00	0.0	21.397	63.1755	-22.41	1351.78	0.017
	19 - 18					21.397	63.1755	-22.65	1351.78	0.017
	18 - 17					21.397	63.1755	-22.88	1351.78	0.017
	17 - 16					21.397	63.1755	-23.12	1351.78	0.017
	16 - 15					21.397	63.1755	-23.35	1351.78	0.017
	15 - 14					21.397	63.1755	-23.59	1351.78	0.017
	14 - 13					21.397	63.1755	-23.82	1351.78	0.018
	13 - 12					21.397	63.1755	-24.06	1351.78	0.018
	12 - 11					21.397	63.1755	-24.29	1351.78	0.018
	11 - 10					21.397	63.1755	-24.53	1351.78	0.018
L11	10 - 9	P54x0.425	10.00	0.00	0.0	21.610	71.5321	-24.79	1545.82	0.016
	9 - 8					21.610	71.5321	-25.06	1545.82	0.016
	8 - 7					21.610	71.5321	-25.32	1545.82	0.016
	7 - 6					21.610	71.5321	-25.58	1545.82	0.017
	6 - 5					21.610	71.5321	-25.85	1545.82	0.017
	5 - 4					21.610	71.5321	-26.11	1545.82	0.017
	4 - 3					21.610	71.5321	-26.37	1545.82	0.017
	3 - 2					21.610	71.5321	-26.64	1545.82	0.017
	2 - 1					21.610	71.5321	-26.90	1545.82	0.017
	1 - 0					21.610	71.5321	-27.17	1545.82	0.018

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M _x kip-ft	Actual f _{bx} ksi	Allow. F _{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M _y kip-ft	Actual f _{by} ksi	Allow. F _{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	150 - 148.5	P18x3/8	7.93	1.061	27.720	0.038	0.00	0.000	27.720	0.000
	148.5 - 147		19.42	2.600	27.720	0.094	0.00	0.000	27.720	0.000
	147 - 145.5		31.04	4.156	27.720	0.150	0.00	0.000	27.720	0.000
	145.5 - 144		42.80	5.731	27.720	0.207	0.00	0.000	27.720	0.000
	144 - 142.5		54.70	7.324	27.720	0.264	0.00	0.000	27.720	0.000
	142.5 - 141		66.74	8.935	27.720	0.322	0.00	0.000	27.720	0.000
	141 - 139.5		78.91	10.565	27.720	0.381	0.00	0.000	27.720	0.000
	139.5 - 138		91.22	12.213	27.720	0.441	0.00	0.000	27.720	0.000
	138 - 136.5		103.66	13.879	27.720	0.501	0.00	0.000	27.720	0.000
	136.5 - 135		116.24	15.563	27.720	0.561	0.00	0.000	27.720	0.000
	135 - 133.5		128.95	17.265	27.720	0.623	0.00	0.000	27.720	0.000
	133.5 - 132		141.79	18.985	27.720	0.685	0.00	0.000	27.720	0.000
	132 - 130.5		154.76	20.721	27.720	0.748	0.00	0.000	27.720	0.000

Job	6421.CT11327A	Page	25 of 35
Project	Old Saybrook/I-95/AmtraK_1	Date	14:20:07 10/21/14
Client	T-Mobile	Designed by	Vinod Ramesh

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
	130.5 - 129		167.87	22.476	27.720	0.811	0.00	0.000	27.720	0.000
	129 - 127.5		181.10	24.248	27.720	0.875	0.00	0.000	27.720	0.000
	127.5 - 126		194.46	26.036	27.720	0.939	0.00	0.000	27.720	0.000
	126 - 124.5		207.94	27.842	27.720	1.004	0.00	0.000	27.720	0.000
	124.5 - 123		221.55	29.664	27.720	1.070	0.00	0.000	27.720	0.000
	123 - 121.5		235.29	31.502	27.720	1.136	0.00	0.000	27.720	0.000
	121.5 - 120		249.14	33.357	27.720	1.203	0.00	0.000	27.720	0.000
L2	120 - 119	P24x3/8	258.45	19.161	27.720	0.691	0.00	0.000	27.720	0.000
	119 - 118		267.83	19.857	27.720	0.716	0.00	0.000	27.720	0.000
	118 - 117		277.29	20.558	27.720	0.742	0.00	0.000	27.720	0.000
	117 - 116		286.81	21.264	27.720	0.767	0.00	0.000	27.720	0.000
	116 - 115		296.41	21.975	27.720	0.793	0.00	0.000	27.720	0.000
	115 - 114		306.07	22.692	27.720	0.819	0.00	0.000	27.720	0.000
	114 - 113		315.81	23.414	27.720	0.845	0.00	0.000	27.720	0.000
	113 - 112		325.62	24.141	27.720	0.871	0.00	0.000	27.720	0.000
	112 - 111		335.50	24.874	27.720	0.897	0.00	0.000	27.720	0.000
	111 - 110		345.44	25.611	27.720	0.924	0.00	0.000	27.720	0.000
	110 - 109		355.46	26.354	27.720	0.951	0.00	0.000	27.720	0.000
	109 - 108		365.55	27.101	27.720	0.978	0.00	0.000	27.720	0.000
	108 - 107		375.70	27.854	27.720	1.005	0.00	0.000	27.720	0.000
	107 - 106		385.92	28.612	27.720	1.032	0.00	0.000	27.720	0.000
	106 - 105		396.21	29.375	27.720	1.060	0.00	0.000	27.720	0.000
	105 - 104		406.57	30.142	27.720	1.087	0.00	0.000	27.720	0.000
	104 - 103		416.99	30.915	27.720	1.115	0.00	0.000	27.720	0.000
	103 - 102		427.48	31.693	27.720	1.143	0.00	0.000	27.720	0.000
	102 - 101		438.04	32.475	27.720	1.172	0.00	0.000	27.720	0.000
	101 - 100		449.39	33.318	27.720	1.202	0.00	0.000	27.720	0.000
L3	100 - 99	P30x3/8	460.51	21.646	25.075	0.863	0.00	0.000	25.075	0.000
	99 - 98		471.84	22.178	25.075	0.884	0.00	0.000	25.075	0.000
	98 - 97		483.20	22.712	25.075	0.906	0.00	0.000	25.075	0.000
	97 - 96		494.64	23.250	25.075	0.927	0.00	0.000	25.075	0.000
	96 - 95		506.17	23.792	25.075	0.949	0.00	0.000	25.075	0.000
	95 - 94		517.78	24.338	25.075	0.971	0.00	0.000	25.075	0.000
	94 - 93		529.46	24.887	25.075	0.993	0.00	0.000	25.075	0.000
	93 - 92		541.23	25.440	25.075	1.015	0.00	0.000	25.075	0.000
	92 - 91		553.08	25.997	25.075	1.037	0.00	0.000	25.075	0.000
	91 - 90		565.00	26.557	25.075	1.059	0.00	0.000	25.075	0.000
	90 - 89		577.01	27.122	25.075	1.082	0.00	0.000	25.075	0.000
	89 - 88		589.09	27.690	25.075	1.104	0.00	0.000	25.075	0.000
	88 - 87		601.25	28.261	25.075	1.127	0.00	0.000	25.075	0.000
	87 - 86		613.49	28.837	25.075	1.150	0.00	0.000	25.075	0.000
	86 - 85		625.81	29.416	25.075	1.173	0.00	0.000	25.075	0.000
	85 - 84		638.20	29.998	25.075	1.196	0.00	0.000	25.075	0.000
	84 - 83		650.67	30.584	25.075	1.220	0.00	0.000	25.075	0.000
	83 - 82		663.22	31.174	25.075	1.243	0.00	0.000	25.075	0.000
	82 - 81		675.84	31.767	25.075	1.267	0.00	0.000	25.075	0.000
	81 - 80		688.54	32.364	25.075	1.291	0.00	0.000	25.075	0.000
L4	80 - 79	P36x3/8	701.33	22.749	23.696	0.960	0.00	0.000	23.696	0.000
	79 - 78		714.20	23.167	23.696	0.978	0.00	0.000	23.696	0.000
	78 - 77		727.16	23.587	23.696	0.995	0.00	0.000	23.696	0.000
	77 - 76		740.21	24.011	23.696	1.013	0.00	0.000	23.696	0.000
	76 - 75		755.82	24.517	23.696	1.035	0.00	0.000	23.696	0.000
	75 - 74		769.38	24.957	23.696	1.053	0.00	0.000	23.696	0.000
	74 - 73		783.03	25.400	23.696	1.072	0.00	0.000	23.696	0.000
	73 - 72		796.77	25.845	23.696	1.091	0.00	0.000	23.696	0.000
	72 - 71		810.60	26.294	23.696	1.110	0.00	0.000	23.696	0.000
	71 - 70		824.51	26.745	23.696	1.129	0.00	0.000	23.696	0.000
	70 - 69		838.51	27.199	23.696	1.148	0.00	0.000	23.696	0.000
	69 - 68		852.59	27.656	23.696	1.167	0.00	0.000	23.696	0.000
	68 - 67		866.76	28.116	23.696	1.187	0.00	0.000	23.696	0.000

Job	6421.CT11327A	Page	26 of 35
Project	Old Saybrook/I-95/AmtraK_1	Date	14:20:07 10/21/14
Client	T-Mobile	Designed by	Vinod Ramesh

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L5	67 - 66	P36x0.45	881.02	28.578	23.696	1.206	0.00	0.000	23.696	0.000
	66 - 65		895.36	29.043	23.696	1.226	0.00	0.000	23.696	0.000
	65 - 64		909.79	24.748	23.760	1.042	0.00	0.000	23.760	0.000
	64 - 63		924.33	25.143	23.760	1.058	0.00	0.000	23.760	0.000
	63 - 62		938.94	25.541	23.760	1.075	0.00	0.000	23.760	0.000
L6	62 - 61	P42x3/8	953.67	25.941	23.760	1.092	0.00	0.000	23.760	0.000
	61 - 60		968.48	26.344	23.760	1.109	0.00	0.000	23.760	0.000
	60 - 59		983.40	23.331	22.711	1.027	0.00	0.000	22.711	0.000
	59 - 58		998.43	23.688	22.711	1.043	0.00	0.000	22.711	0.000
	58 - 57		1013.59	24.048	22.711	1.059	0.00	0.000	22.711	0.000
	57 - 56		1028.88	24.410	22.711	1.075	0.00	0.000	22.711	0.000
	56 - 55		1044.27	24.776	22.711	1.091	0.00	0.000	22.711	0.000
	55 - 54		1059.78	25.144	22.711	1.107	0.00	0.000	22.711	0.000
	54 - 53		1075.42	25.515	22.711	1.123	0.00	0.000	22.711	0.000
	53 - 52		1091.18	25.888	22.711	1.140	0.00	0.000	22.711	0.000
L7	52 - 51	P42x0.47	1107.04	26.265	22.711	1.156	0.00	0.000	22.711	0.000
	51 - 50		1125.28	26.698	22.711	1.176	0.00	0.000	22.711	0.000
	50 - 49		1141.69	27.087	22.711	1.193	0.00	0.000	22.711	0.000
	49 - 48		1158.20	22.074	23.008	0.959	0.00	0.000	23.008	0.000
	48 - 47		1174.82	22.391	23.008	0.973	0.00	0.000	23.008	0.000
	47 - 46		1191.53	22.709	23.008	0.987	0.00	0.000	23.008	0.000
	46 - 45		1208.33	23.030	23.008	1.001	0.00	0.000	23.008	0.000
	45 - 44		1225.23	23.352	23.008	1.015	0.00	0.000	23.008	0.000
	44 - 43		1242.24	23.676	23.008	1.029	0.00	0.000	23.008	0.000
	43 - 42		1259.34	24.002	23.008	1.043	0.00	0.000	23.008	0.000
L8	42 - 41	P48x3/8	1276.54	24.330	23.008	1.057	0.00	0.000	23.008	0.000
	41 - 40		1293.83	24.659	23.008	1.072	0.00	0.000	23.008	0.000
	40 - 39		1311.22	23.738	21.972	1.080	0.00	0.000	21.972	0.000
	39 - 38		1328.71	24.055	21.972	1.095	0.00	0.000	21.972	0.000
	38 - 37		1346.29	24.373	21.972	1.109	0.00	0.000	21.972	0.000
	37 - 36		1363.96	24.693	21.972	1.124	0.00	0.000	21.972	0.000
	36 - 35		1381.72	25.014	21.972	1.138	0.00	0.000	21.972	0.000
	35 - 34		1399.58	25.338	21.972	1.153	0.00	0.000	21.972	0.000
	34 - 33		1417.53	25.663	21.972	1.168	0.00	0.000	21.972	0.000
	33 - 32		1435.57	25.989	21.972	1.183	0.00	0.000	21.972	0.000
L9	32 - 31	P48x0.45	1453.70	26.317	21.972	1.198	0.00	0.000	21.972	0.000
	31 - 30		1471.92	26.647	21.972	1.213	0.00	0.000	21.972	0.000
	30 - 29		1490.23	26.979	21.972	1.228	0.00	0.000	21.972	0.000
	29 - 28		1508.64	22.867	22.206	1.030	0.00	0.000	22.206	0.000
	28 - 27		1527.15	23.148	22.206	1.042	0.00	0.000	22.206	0.000
	27 - 26		1545.76	23.430	22.206	1.055	0.00	0.000	22.206	0.000
	26 - 25		1564.47	23.714	22.206	1.068	0.00	0.000	22.206	0.000
	25 - 24		1583.28	23.999	22.206	1.081	0.00	0.000	22.206	0.000
	24 - 23		1602.18	24.285	22.206	1.094	0.00	0.000	22.206	0.000
	23 - 22		1621.18	24.573	22.206	1.107	0.00	0.000	22.206	0.000
L10	22 - 21	P54x3/8	1640.28	24.863	22.206	1.120	0.00	0.000	22.206	0.000
	21 - 20		1659.47	25.154	22.206	1.133	0.00	0.000	22.206	0.000
	20 - 19		1678.77	23.951	21.397	1.119	0.00	0.000	21.397	0.000
	19 - 18		1698.16	24.228	21.397	1.132	0.00	0.000	21.397	0.000
	18 - 17		1717.66	24.506	21.397	1.145	0.00	0.000	21.397	0.000
	17 - 16		1737.26	24.785	21.397	1.158	0.00	0.000	21.397	0.000
	16 - 15		1756.96	25.067	21.397	1.171	0.00	0.000	21.397	0.000
	15 - 14		1776.77	25.349	21.397	1.185	0.00	0.000	21.397	0.000
	14 - 13		1796.67	25.633	21.397	1.198	0.00	0.000	21.397	0.000
	13 - 12		1816.67	25.918	21.397	1.211	0.00	0.000	21.397	0.000
L11	12 - 11	P54x0.425	1836.78	26.205	21.397	1.225	0.00	0.000	21.397	0.000
	11 - 10		1856.97	26.493	21.397	1.238	0.00	0.000	21.397	0.000
	10 - 9		1877.28	23.698	21.610	1.097	0.00	0.000	21.610	0.000
	9 - 8		1897.70	23.956	21.610	1.109	0.00	0.000	21.610	0.000
	8 - 7		1918.22	24.215	21.610	1.121	0.00	0.000	21.610	0.000

Job	6421.CT11327A	Page	27 of 35
Project	Old Saybrook/I-95/AmtraK_1	Date	14:20:07 10/21/14
Client	T-Mobile	Designed by	Vinod Ramesh

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
	7 - 6		1938.85	24.475	21.610	1.133	0.00	0.000	21.610	0.000
	6 - 5		1959.58	24.737	21.610	1.145	0.00	0.000	21.610	0.000
	5 - 4		1980.43	25.000	21.610	1.157	0.00	0.000	21.610	0.000
	4 - 3		2001.38	25.265	21.610	1.169	0.00	0.000	21.610	0.000
	3 - 2		2022.43	25.530	21.610	1.181	0.00	0.000	21.610	0.000
	2 - 1		2043.59	25.797	21.610	1.194	0.00	0.000	21.610	0.000
	1 - 0		2064.86	26.066	21.610	1.206	0.00	0.000	21.610	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	150 - 148.5	P18x3/8	7.48	0.721	16.800	0.043	1.36	0.091	16.800	0.005
	148.5 - 147		7.70	0.742	16.800	0.044	0.93	0.062	16.800	0.004
	147 - 145.5		7.79	0.751	16.800	0.045	0.93	0.062	16.800	0.004
	145.5 - 144		7.89	0.760	16.800	0.045	0.93	0.062	16.800	0.004
	144 - 142.5		7.98	0.768	16.800	0.046	0.93	0.062	16.800	0.004
	142.5 - 141		8.07	0.777	16.800	0.046	0.93	0.062	16.800	0.004
	141 - 139.5		8.16	0.786	16.800	0.047	0.93	0.062	16.800	0.004
	139.5 - 138		8.25	0.795	16.800	0.047	0.93	0.062	16.800	0.004
	138 - 136.5		8.34	0.803	16.800	0.048	0.93	0.062	16.800	0.004
	136.5 - 135		8.43	0.812	16.800	0.048	0.93	0.062	16.800	0.004
	135 - 133.5		8.52	0.821	16.800	0.049	0.93	0.062	16.800	0.004
	133.5 - 132		8.61	0.829	16.800	0.049	0.93	0.062	16.800	0.004
	132 - 130.5		8.69	0.837	16.800	0.050	0.93	0.062	16.800	0.004
	130.5 - 129		8.78	0.846	16.800	0.050	0.93	0.062	16.800	0.004
	129 - 127.5		8.87	0.854	16.800	0.051	0.93	0.062	16.800	0.004
	127.5 - 126		8.95	0.862	16.800	0.051	0.93	0.062	16.800	0.004
	126 - 124.5		9.03	0.870	16.800	0.052	0.93	0.062	16.800	0.004
	124.5 - 123		9.12	0.878	16.800	0.052	0.93	0.062	16.800	0.004
	123 - 121.5		9.20	0.886	16.800	0.053	0.93	0.062	16.800	0.004
	121.5 - 120		9.28	0.894	16.800	0.053	0.93	0.062	16.800	0.004
L2	120 - 119	P24x3/8	9.35	0.672	16.800	0.040	0.93	0.034	16.800	0.002
	119 - 118		9.42	0.677	16.800	0.040	0.93	0.034	16.800	0.002
	118 - 117		9.49	0.682	16.800	0.041	0.93	0.034	16.800	0.002
	117 - 116		9.56	0.687	16.800	0.041	0.93	0.034	16.800	0.002
	116 - 115		9.63	0.692	16.800	0.041	0.93	0.034	16.800	0.002
	115 - 114		9.70	0.697	16.800	0.042	0.93	0.034	16.800	0.002
	114 - 113		9.77	0.702	16.800	0.042	0.93	0.034	16.800	0.002
	113 - 112		9.84	0.707	16.800	0.042	0.93	0.034	16.800	0.002
	112 - 111		9.91	0.712	16.800	0.042	0.93	0.034	16.800	0.002
	111 - 110		9.98	0.717	16.800	0.043	0.93	0.034	16.800	0.002
	110 - 109		10.05	0.722	16.800	0.043	0.93	0.034	16.800	0.002
	109 - 108		10.12	0.727	16.800	0.043	0.93	0.034	16.800	0.002
	108 - 107		10.19	0.732	16.800	0.044	0.93	0.034	16.800	0.002
	107 - 106		10.26	0.737	16.800	0.044	0.93	0.034	16.800	0.002
	106 - 105		10.33	0.742	16.800	0.044	0.93	0.034	16.800	0.002
105 - 104	10.39	0.747	16.800	0.044	0.93	0.034	16.800	0.002		
104 - 103	10.46	0.752	16.800	0.045	0.92	0.034	16.800	0.002		
103 - 102	10.53	0.756	16.800	0.045	0.92	0.034	16.800	0.002		
102 - 101	10.59	0.761	16.800	0.045	0.92	0.034	16.800	0.002		
101 - 100	11.08	0.796	16.800	0.047	2.00	0.074	16.800	0.004		
L3	100 - 99	P30x3/8	11.16	0.640	16.800	0.038	2.00	0.047	15.644	0.003
	99 - 98		11.33	0.649	16.800	0.039	2.12	0.050	15.644	0.003
	98 - 97		11.41	0.654	16.800	0.039	2.12	0.050	15.644	0.003
	97 - 96		11.49	0.658	16.800	0.039	2.12	0.050	15.644	0.003
	96 - 95		11.57	0.663	16.800	0.039	2.12	0.050	15.644	0.003

Job	6421.CT11327A	Page	28 of 35
Project	Old Saybrook/I-95/AmtraK_1	Date	14:20:07 10/21/14
Client	T-Mobile	Designed by	Vinod Ramesh

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vr} ksi	Allow. F_{vr} ksi	Ratio $\frac{f_{vr}}{F_{vr}}$
	95 - 94		11.65	0.668	16.800	0.040	2.12	0.050	15.644	0.003
	94 - 93		11.73	0.672	16.800	0.040	2.12	0.050	15.644	0.003
	93 - 92		11.81	0.677	16.800	0.040	2.12	0.050	15.644	0.003
	92 - 91		11.89	0.681	16.800	0.041	2.12	0.050	15.644	0.003
	91 - 90		11.97	0.686	16.800	0.041	2.12	0.050	15.644	0.003
	90 - 89		12.05	0.690	16.800	0.041	2.12	0.050	15.644	0.003
	89 - 88		12.13	0.695	16.800	0.041	2.12	0.050	15.644	0.003
	88 - 87		12.21	0.699	16.800	0.042	2.12	0.050	15.644	0.003
	87 - 86		12.28	0.704	16.800	0.042	2.12	0.050	15.644	0.003
	86 - 85		12.36	0.708	16.800	0.042	2.12	0.050	15.644	0.003
	85 - 84		12.44	0.713	16.800	0.042	2.12	0.050	15.644	0.003
	84 - 83		12.51	0.717	16.800	0.043	2.12	0.050	15.644	0.003
	83 - 82		12.59	0.722	16.800	0.043	2.12	0.050	15.644	0.003
	82 - 81		12.67	0.726	16.800	0.043	2.12	0.050	15.644	0.003
	81 - 80		12.74	0.730	16.800	0.043	2.12	0.050	15.644	0.003
L4	80 - 79	P36x3/8	12.83	0.611	16.800	0.036	2.12	0.034	11.901	0.003
	79 - 78		12.92	0.616	16.800	0.037	2.12	0.034	11.901	0.003
	78 - 77		13.01	0.620	16.800	0.037	2.12	0.034	11.901	0.003
	77 - 76		13.10	0.624	16.800	0.037	2.12	0.034	11.901	0.003
	76 - 75		13.12	0.624	16.800	0.038	3.09	0.050	11.901	0.004
	75 - 74		13.61	0.649	16.800	0.039	3.09	0.050	11.901	0.004
	74 - 73		13.70	0.653	16.800	0.039	3.09	0.050	11.901	0.004
	73 - 72		13.79	0.657	16.800	0.039	3.09	0.050	11.901	0.004
	72 - 71		13.87	0.661	16.800	0.039	3.09	0.050	11.901	0.004
	71 - 70		13.96	0.665	16.800	0.040	3.09	0.050	11.901	0.004
	70 - 69		14.05	0.669	16.800	0.040	3.09	0.050	11.901	0.004
	69 - 68		14.13	0.673	16.800	0.040	3.09	0.050	11.901	0.004
	68 - 67		14.22	0.678	16.800	0.040	3.09	0.050	11.901	0.004
	67 - 66		14.31	0.682	16.800	0.041	3.09	0.050	11.901	0.004
	66 - 65		14.39	0.686	16.800	0.041	3.09	0.050	11.901	0.004
L5	65 - 64	P36x0.45	14.49	0.576	14.400	0.040	3.09	0.042	14.400	0.003
	64 - 63		14.58	0.580	14.400	0.040	3.08	0.042	14.400	0.003
	63 - 62		14.68	0.584	14.400	0.041	3.08	0.042	14.400	0.003
	62 - 61		14.77	0.588	14.400	0.041	3.08	0.042	14.400	0.003
	61 - 60		14.87	0.592	14.400	0.041	3.08	0.042	14.400	0.003
L6	60 - 59	P42x3/8	14.98	0.611	16.800	0.036	3.07	0.036	9.978	0.004
	59 - 58		15.10	0.616	16.800	0.037	3.07	0.036	9.978	0.004
	58 - 57		15.22	0.621	16.800	0.037	3.06	0.036	9.978	0.004
	57 - 56		15.34	0.626	16.800	0.037	3.05	0.036	9.978	0.004
	56 - 55		15.46	0.631	16.800	0.038	3.05	0.036	9.978	0.004
	55 - 54		15.58	0.635	16.800	0.038	3.04	0.036	9.978	0.004
	54 - 53		15.70	0.640	16.800	0.038	3.03	0.036	9.978	0.004
	53 - 52		15.82	0.645	16.800	0.038	3.03	0.036	9.978	0.004
	52 - 51		15.93	0.650	16.800	0.039	3.02	0.036	9.978	0.004
	51 - 50		16.35	0.667	16.800	0.040	3.94	0.047	9.978	0.005
	50 - 49		16.47	0.672	16.800	0.040	3.94	0.047	9.978	0.005
L7	49 - 48	P42x0.47	16.57	0.540	15.600	0.035	3.93	0.037	13.251	0.003
	48 - 47		16.67	0.544	15.600	0.035	3.93	0.037	13.251	0.003
	47 - 46		16.76	0.547	15.600	0.035	3.92	0.037	13.251	0.003
	46 - 45		16.86	0.550	15.600	0.035	3.92	0.037	13.251	0.003
	45 - 44		16.96	0.553	15.600	0.035	3.92	0.037	13.251	0.003
	44 - 43		17.06	0.556	15.600	0.036	3.91	0.037	13.251	0.003
	43 - 42		17.16	0.560	15.600	0.036	3.91	0.037	13.251	0.003
	42 - 41		17.25	0.563	15.600	0.036	3.91	0.037	13.251	0.003
	41 - 40		17.35	0.566	15.600	0.036	3.91	0.037	13.251	0.003
L8	40 - 39	P48x3/8	17.44	0.622	16.800	0.037	3.90	0.035	9.027	0.004
	39 - 38		17.54	0.625	16.800	0.037	3.90	0.035	9.027	0.004
	38 - 37		17.63	0.628	16.800	0.037	3.90	0.035	9.027	0.004
	37 - 36		17.72	0.632	16.800	0.038	3.90	0.035	9.027	0.004
	36 - 35		17.82	0.635	16.800	0.038	3.90	0.035	9.027	0.004

Job	6421.CT11327A	Page	29 of 35
Project	Old Saybrook/I-95/AmtraK_1	Date	14:20:07 10/21/14
Client	T-Mobile	Designed by	Vinod Ramesh

Section No.	Elevation ft	Size	Actual V K	Actual f _v ksi	Allow. F _v ksi	Ratio f _v / F _v	Actual T kip-ft	Actual f _{vt} ksi	Allow. F _{vt} ksi	Ratio f _{vt} / F _{vt}
	35 - 34		17.91	0.638	16.800	0.038	3.90	0.035	9.027	0.004
	34 - 33		18.00	0.642	16.800	0.038	3.90	0.035	9.027	0.004
	33 - 32		18.09	0.645	16.800	0.038	3.90	0.035	9.027	0.004
	32 - 31		18.18	0.648	16.800	0.039	3.90	0.035	9.027	0.004
	31 - 30		18.28	0.651	16.800	0.039	3.90	0.035	9.027	0.004
L9	30 - 29	P48x0.45	18.37	0.655	16.800	0.039	3.90	0.035	9.027	0.004
	29 - 28		18.47	0.549	16.000	0.034	3.90	0.030	11.338	0.003
	28 - 27		18.56	0.552	16.000	0.035	3.89	0.030	11.338	0.003
	27 - 26		18.66	0.555	16.000	0.035	3.89	0.029	11.338	0.003
	26 - 25		18.76	0.558	16.000	0.035	3.89	0.029	11.338	0.003
	25 - 24		18.86	0.561	16.000	0.035	3.89	0.029	11.338	0.003
	24 - 23		18.96	0.564	16.000	0.035	3.88	0.029	11.338	0.003
	23 - 22		19.06	0.567	16.000	0.035	3.88	0.029	11.338	0.003
	22 - 21		19.15	0.570	16.000	0.036	3.88	0.029	11.338	0.003
	21 - 20		19.25	0.573	16.000	0.036	3.87	0.029	11.338	0.003
L10	20 - 19	P54x3/8	19.35	0.613	16.800	0.036	3.87	0.028	8.264	0.003
	19 - 18		19.45	0.616	16.800	0.037	3.87	0.028	8.264	0.003
	18 - 17		19.56	0.619	16.800	0.037	3.87	0.028	8.264	0.003
	17 - 16		19.66	0.622	16.800	0.037	3.87	0.028	8.264	0.003
	16 - 15		19.76	0.626	16.800	0.037	3.87	0.028	8.264	0.003
	15 - 14		19.86	0.629	16.800	0.037	3.87	0.028	8.264	0.003
	14 - 13		19.96	0.632	16.800	0.038	3.87	0.028	8.264	0.003
	13 - 12		20.06	0.635	16.800	0.038	3.87	0.028	8.264	0.003
	12 - 11		20.16	0.638	16.800	0.038	3.86	0.028	8.264	0.003
	11 - 10		20.26	0.641	16.800	0.038	3.86	0.028	8.264	0.003
L11	10 - 9	P54x0.425	20.37	0.569	16.400	0.035	3.86	0.024	9.663	0.003
	9 - 8		20.48	0.572	16.400	0.035	3.86	0.024	9.663	0.003
	8 - 7		20.58	0.575	16.400	0.035	3.86	0.024	9.663	0.003
	7 - 6		20.69	0.578	16.400	0.035	3.85	0.024	9.663	0.003
	6 - 5		20.80	0.581	16.400	0.035	3.85	0.024	9.663	0.003
	5 - 4		20.90	0.584	16.400	0.036	3.85	0.024	9.663	0.003
	4 - 3		21.01	0.587	16.400	0.036	3.84	0.024	9.663	0.003
	3 - 2		21.12	0.590	16.400	0.036	3.84	0.024	9.663	0.003
	2 - 1		21.22	0.593	16.400	0.036	3.84	0.024	9.663	0.003
	1 - 0		21.33	0.596	16.400	0.036	3.83	0.024	9.663	0.003

Pole Interaction Design Data

Section No.	Elevation ft	Ratio P P _a	Ratio f _{bx} F _{bx}	Ratio f _{by} F _{by}	Ratio f _v F _v	Ratio f _{vt} F _{vt}	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150 - 148.5	0.005	0.038	0.000	0.043	0.005	0.045	1.333	H1-3+VT ✓
	148.5 - 147	0.005	0.094	0.000	0.044	0.004	0.101	1.333	H1-3+VT ✓
	147 - 145.5	0.005	0.150	0.000	0.045	0.004	0.157	1.333	H1-3+VT ✓
	145.5 - 144	0.005	0.207	0.000	0.045	0.004	0.215	1.333	H1-3+VT ✓
	144 - 142.5	0.006	0.264	0.000	0.046	0.004	0.272	1.333	H1-3+VT ✓
	142.5 - 141	0.006	0.322	0.000	0.046	0.004	0.331	1.333	H1-3+VT ✓
	141 - 139.5	0.006	0.381	0.000	0.047	0.004	0.390	1.333	H1-3+VT ✓

Job	6421.CT11327A	Page	30 of 35
Project	Old Saybrook/I-95/AmtraK_1	Date	14:20:07 10/21/14
Client	T-Mobile	Designed by	Vinod Ramesh

Section No.	Elevation ft	Ratio	Ratio	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		P	$\frac{f_{bx}}{F_{bx}}$	$\frac{f_{by}}{F_{by}}$	$\frac{f_v}{F_v}$	$\frac{f_{vt}}{F_{vt}}$			
	139.5 - 138	0.006	0.441	0.000	0.047	0.004	0.450	1.333	H1-3+VT ✓
	138 - 136.5	0.007	0.501	0.000	0.048	0.004	0.510	1.333	H1-3+VT ✓
	136.5 - 135	0.007	0.561	0.000	0.048	0.004	0.571	1.333	H1-3+VT ✓
	135 - 133.5	0.007	0.623	0.000	0.049	0.004	0.633	1.333	H1-3+VT ✓
	133.5 - 132	0.007	0.685	0.000	0.049	0.004	0.695	1.333	H1-3+VT ✓
	132 - 130.5	0.008	0.748	0.000	0.050	0.004	0.758	1.333	H1-3+VT ✓
	130.5 - 129	0.008	0.811	0.000	0.050	0.004	0.822	1.333	H1-3+VT ✓
	129 - 127.5	0.008	0.875	0.000	0.051	0.004	0.886	1.333	H1-3+VT ✓
	127.5 - 126	0.008	0.939	0.000	0.051	0.004	0.951	1.333	H1-3+VT ✓
	126 - 124.5	0.009	1.004	0.000	0.052	0.004	1.016	1.333	H1-3+VT ✓
	124.5 - 123	0.009	1.070	0.000	0.052	0.004	1.082	1.333	H1-3+VT ✓
	123 - 121.5	0.009	1.136	0.000	0.053	0.004	1.149	1.333	H1-3+VT ✓
	121.5 - 120	0.009	1.203	0.000	0.053	0.004	1.216	1.333	H1-3+VT ✓
L2	120 - 119	0.007	0.691	0.000	0.040	0.002	0.700	1.333	H1-3+VT ✓
	119 - 118	0.007	0.716	0.000	0.040	0.002	0.725	1.333	H1-3+VT ✓
	118 - 117	0.007	0.742	0.000	0.041	0.002	0.751	1.333	H1-3+VT ✓
	117 - 116	0.008	0.767	0.000	0.041	0.002	0.777	1.333	H1-3+VT ✓
	116 - 115	0.008	0.793	0.000	0.041	0.002	0.802	1.333	H1-3+VT ✓
	115 - 114	0.008	0.819	0.000	0.042	0.002	0.828	1.333	H1-3+VT ✓
	114 - 113	0.008	0.845	0.000	0.042	0.002	0.855	1.333	H1-3+VT ✓
	113 - 112	0.008	0.871	0.000	0.042	0.002	0.881	1.333	H1-3+VT ✓
	112 - 111	0.008	0.897	0.000	0.042	0.002	0.908	1.333	H1-3+VT ✓
	111 - 110	0.009	0.924	0.000	0.043	0.002	0.934	1.333	H1-3+VT ✓
	110 - 109	0.009	0.951	0.000	0.043	0.002	0.961	1.333	H1-3+VT ✓
	109 - 108	0.009	0.978	0.000	0.043	0.002	0.989	1.333	H1-3+VT ✓
	108 - 107	0.009	1.005	0.000	0.044	0.002	1.016	1.333	H1-3+VT ✓

Job	6421.CT11327A	Page	31 of 35
Project	Old Saybrook/I-95/AmtraK_1	Date	14:20:07 10/21/14
Client	T-Mobile	Designed by	Vinod Ramesh

Section No.	Elevation ft	Ratio	Ratio	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		P	$\frac{f_{bx}}{F_{bx}}$	$\frac{f_{by}}{F_{by}}$	$\frac{f_v}{F_v}$	$\frac{f_{vt}}{F_{vt}}$			
	107 - 106	0.009	1.032	0.000	0.044	0.002	1.043	1.333	H1-3+VT ✓
	106 - 105	0.009	1.060	0.000	0.044	0.002	1.071	1.333	H1-3+VT ✓
	105 - 104	0.009	1.087	0.000	0.044	0.002	1.099	1.333	H1-3+VT ✓
	104 - 103	0.010	1.115	0.000	0.045	0.002	1.127	1.333	H1-3+VT ✓
	103 - 102	0.010	1.143	0.000	0.045	0.002	1.155	1.333	H1-3+VT ✓
	102 - 101	0.010	1.172	0.000	0.045	0.002	1.184	1.333	H1-3+VT ✓
	101 - 100	0.010	1.202	0.000	0.047	0.004	1.215	1.333	H1-3+VT ✓
L3	100 - 99	0.008	0.863	0.000	0.038	0.003	0.873	1.333	H1-3+VT ✓
	99 - 98	0.009	0.884	0.000	0.039	0.003	0.895	1.333	H1-3+VT ✓
	98 - 97	0.009	0.906	0.000	0.039	0.003	0.916	1.333	H1-3+VT ✓
	97 - 96	0.009	0.927	0.000	0.039	0.003	0.938	1.333	H1-3+VT ✓
	96 - 95	0.009	0.949	0.000	0.039	0.003	0.960	1.333	H1-3+VT ✓
	95 - 94	0.009	0.971	0.000	0.040	0.003	0.982	1.333	H1-3+VT ✓
	94 - 93	0.009	0.993	0.000	0.040	0.003	1.004	1.333	H1-3+VT ✓
	93 - 92	0.010	1.015	0.000	0.040	0.003	1.026	1.333	H1-3+VT ✓
	92 - 91	0.010	1.037	0.000	0.041	0.003	1.048	1.333	H1-3+VT ✓
	91 - 90	0.010	1.059	0.000	0.041	0.003	1.071	1.333	H1-3+VT ✓
	90 - 89	0.010	1.082	0.000	0.041	0.003	1.094	1.333	H1-3+VT ✓
	89 - 88	0.010	1.104	0.000	0.041	0.003	1.116	1.333	H1-3+VT ✓
	88 - 87	0.010	1.127	0.000	0.042	0.003	1.139	1.333	H1-3+VT ✓
	87 - 86	0.010	1.150	0.000	0.042	0.003	1.163	1.333	H1-3+VT ✓
	86 - 85	0.011	1.173	0.000	0.042	0.003	1.186	1.333	H1-3+VT ✓
	85 - 84	0.011	1.196	0.000	0.042	0.003	1.209	1.333	H1-3+VT ✓
	84 - 83	0.011	1.220	0.000	0.043	0.003	1.233	1.333	H1-3+VT ✓
	83 - 82	0.011	1.243	0.000	0.043	0.003	1.256	1.333	H1-3+VT ✓
	82 - 81	0.011	1.267	0.000	0.043	0.003	1.280	1.333	H1-3+VT ✓

Job	6421.CT11327A	Page	32 of 35
Project	Old Saybrook/I-95/AmtraK_1	Date	14:20:07 10/21/14
Client	T-Mobile	Designed by	Vinod Ramesh

Section No.	Elevation ft	Ratio	Ratio	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		P	f_{bx}	f_{by}	f_v	f_{vt}			
		P_a	F_{bx}	F_{by}	F_v	F_{vt}			
	81 - 80	0.011	1.291	0.000	0.043	0.003	1.304	1.333	H1-3+VT ✓
L4	80 - 79	0.010	0.960	0.000	0.036	0.003	0.972	1.333	H1-3+VT ✓
	79 - 78	0.010	0.978	0.000	0.037	0.003	0.990	1.333	H1-3+VT ✓
	78 - 77	0.011	0.995	0.000	0.037	0.003	1.008	1.333	H1-3+VT ✓
	77 - 76	0.011	1.013	0.000	0.037	0.003	1.026	1.333	H1-3+VT ✓
	76 - 75	0.011	1.035	0.000	0.038	0.004	1.047	1.333	H1-3+VT ✓
	75 - 74	0.011	1.053	0.000	0.039	0.004	1.066	1.333	H1-3+VT ✓
	74 - 73	0.011	1.072	0.000	0.039	0.004	1.085	1.333	H1-3+VT ✓
	73 - 72	0.011	1.091	0.000	0.039	0.004	1.104	1.333	H1-3+VT ✓
	72 - 71	0.012	1.110	0.000	0.039	0.004	1.123	1.333	H1-3+VT ✓
	71 - 70	0.012	1.129	0.000	0.040	0.004	1.142	1.333	H1-3+VT ✓
L5	70 - 69	0.012	1.148	0.000	0.040	0.004	1.162	1.333	H1-3+VT ✓
	69 - 68	0.012	1.167	0.000	0.040	0.004	1.181	1.333	H1-3+VT ✓
	68 - 67	0.012	1.187	0.000	0.040	0.004	1.201	1.333	H1-3+VT ✓
	67 - 66	0.012	1.206	0.000	0.041	0.004	1.220	1.333	H1-3+VT ✓
	66 - 65	0.013	1.226	0.000	0.041	0.004	1.240	1.333	H1-3+VT ✓
	65 - 64	0.012	1.042	0.000	0.040	0.003	1.055	1.333	H1-3+VT ✓
	64 - 63	0.012	1.058	0.000	0.040	0.003	1.072	1.333	H1-3+VT ✓
	63 - 62	0.012	1.075	0.000	0.041	0.003	1.089	1.333	H1-3+VT ✓
	62 - 61	0.012	1.092	0.000	0.041	0.003	1.106	1.333	H1-3+VT ✓
	61 - 60	0.012	1.109	0.000	0.041	0.003	1.123	1.333	H1-3+VT ✓
L6	60 - 59	0.012	1.027	0.000	0.036	0.004	1.041	1.333	H1-3+VT ✓
	59 - 58	0.012	1.043	0.000	0.037	0.004	1.057	1.333	H1-3+VT ✓
	58 - 57	0.013	1.059	0.000	0.037	0.004	1.073	1.333	H1-3+VT ✓
	57 - 56	0.013	1.075	0.000	0.037	0.004	1.089	1.333	H1-3+VT ✓
	56 - 55	0.013	1.091	0.000	0.038	0.004	1.106	1.333	H1-3+VT ✓

Job	6421.CT11327A	Page	33 of 35
Project	Old Saybrook/I-95/AmtraK_1	Date	14:20:07 10/21/14
Client	T-Mobile	Designed by	Vinod Ramesh

Section No.	Elevation ft	Ratio	Ratio	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		P	f_{bx}	f_{by}	f_v	f_{vt}			
		P_a	F_{bx}	F_{by}	F_v	F_{vt}			
	55 - 54	0.013	1.107	0.000	0.038	0.004	1.122	1.333	H1-3+VT ✓
	54 - 53	0.013	1.123	0.000	0.038	0.004	1.138	1.333	H1-3+VT ✓
	53 - 52	0.013	1.140	0.000	0.038	0.004	1.155	1.333	H1-3+VT ✓
	52 - 51	0.014	1.156	0.000	0.039	0.004	1.172	1.333	H1-3+VT ✓
	51 - 50	0.014	1.176	0.000	0.040	0.005	1.191	1.333	H1-3+VT ✓
	50 - 49	0.014	1.193	0.000	0.040	0.005	1.209	1.333	H1-3+VT ✓
L7	49 - 48	0.011	0.959	0.000	0.035	0.003	0.972	1.333	H1-3+VT ✓
	48 - 47	0.011	0.973	0.000	0.035	0.003	0.986	1.333	H1-3+VT ✓
	47 - 46	0.012	0.987	0.000	0.035	0.003	1.000	1.333	H1-3+VT ✓
	46 - 45	0.012	1.001	0.000	0.035	0.003	1.014	1.333	H1-3+VT ✓
	45 - 44	0.012	1.015	0.000	0.035	0.003	1.028	1.333	H1-3+VT ✓
	44 - 43	0.012	1.029	0.000	0.036	0.003	1.043	1.333	H1-3+VT ✓
	43 - 42	0.012	1.043	0.000	0.036	0.003	1.057	1.333	H1-3+VT ✓
	42 - 41	0.012	1.057	0.000	0.036	0.003	1.071	1.333	H1-3+VT ✓
	41 - 40	0.012	1.072	0.000	0.036	0.003	1.086	1.333	H1-3+VT ✓
L8	40 - 39	0.014	1.080	0.000	0.037	0.004	1.097	1.333	H1-3+VT ✓
	39 - 38	0.015	1.095	0.000	0.037	0.004	1.111	1.333	H1-3+VT ✓
	38 - 37	0.015	1.109	0.000	0.037	0.004	1.126	1.333	H1-3+VT ✓
	37 - 36	0.015	1.124	0.000	0.038	0.004	1.141	1.333	H1-3+VT ✓
	36 - 35	0.015	1.138	0.000	0.038	0.004	1.155	1.333	H1-3+VT ✓
	35 - 34	0.015	1.153	0.000	0.038	0.004	1.170	1.333	H1-3+VT ✓
	34 - 33	0.015	1.168	0.000	0.038	0.004	1.185	1.333	H1-3+VT ✓
	33 - 32	0.016	1.183	0.000	0.038	0.004	1.200	1.333	H1-3+VT ✓
	32 - 31	0.016	1.198	0.000	0.039	0.004	1.215	1.333	H1-3+VT ✓
	31 - 30	0.016	1.213	0.000	0.039	0.004	1.231	1.333	H1-3+VT ✓
	30 - 29	0.016	1.228	0.000	0.039	0.004	1.246	1.333	H1-3+VT ✓

Job	6421.CT11327A	Page	34 of 35
Project	Old Saybrook/I-95/AmtraK_1	Date	14:20:07 10/21/14
Client	T-Mobile	Designed by	Vinod Ramesh

Section No.	Elevation ft	Ratio	Ratio	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		P	f_{bx}	f_{by}	f_v	f_{vt}			
		P_a	F_{bx}	F_{by}	F_v	F_{vt}			
L9	29 - 28	0.014	1.030	0.000	0.034	0.003	1.045	1.333	H1-3+VT ✓
	28 - 27	0.014	1.042	0.000	0.035	0.003	1.057	1.333	H1-3+VT ✓
	27 - 26	0.014	1.055	0.000	0.035	0.003	1.070	1.333	H1-3+VT ✓
	26 - 25	0.014	1.068	0.000	0.035	0.003	1.083	1.333	H1-3+VT ✓
	25 - 24	0.014	1.081	0.000	0.035	0.003	1.096	1.333	H1-3+VT ✓
	24 - 23	0.014	1.094	0.000	0.035	0.003	1.109	1.333	H1-3+VT ✓
	23 - 22	0.015	1.107	0.000	0.035	0.003	1.123	1.333	H1-3+VT ✓
	22 - 21	0.015	1.120	0.000	0.036	0.003	1.136	1.333	H1-3+VT ✓
	21 - 20	0.015	1.133	0.000	0.036	0.003	1.149	1.333	H1-3+VT ✓
L10	20 - 19	0.017	1.119	0.000	0.036	0.003	1.138	1.333	H1-3+VT ✓
	19 - 18	0.017	1.132	0.000	0.037	0.003	1.151	1.333	H1-3+VT ✓
	18 - 17	0.017	1.145	0.000	0.037	0.003	1.164	1.333	H1-3+VT ✓
	17 - 16	0.017	1.158	0.000	0.037	0.003	1.177	1.333	H1-3+VT ✓
	16 - 15	0.017	1.171	0.000	0.037	0.003	1.190	1.333	H1-3+VT ✓
	15 - 14	0.017	1.185	0.000	0.037	0.003	1.204	1.333	H1-3+VT ✓
	14 - 13	0.018	1.198	0.000	0.038	0.003	1.217	1.333	H1-3+VT ✓
	13 - 12	0.018	1.211	0.000	0.038	0.003	1.231	1.333	H1-3+VT ✓
	12 - 11	0.018	1.225	0.000	0.038	0.003	1.244	1.333	H1-3+VT ✓
L11	11 - 10	0.018	1.238	0.000	0.038	0.003	1.258	1.333	H1-3+VT ✓
	10 - 9	0.016	1.097	0.000	0.035	0.003	1.114	1.333	H1-3+VT ✓
	9 - 8	0.016	1.109	0.000	0.035	0.003	1.126	1.333	H1-3+VT ✓
	8 - 7	0.016	1.121	0.000	0.035	0.003	1.138	1.333	H1-3+VT ✓
	7 - 6	0.017	1.133	0.000	0.035	0.003	1.151	1.333	H1-3+VT ✓
	6 - 5	0.017	1.145	0.000	0.035	0.003	1.163	1.333	H1-3+VT ✓
	5 - 4	0.017	1.157	0.000	0.036	0.003	1.175	1.333	H1-3+VT ✓
4 - 3	0.017	1.169	0.000	0.036	0.003	1.188	1.333	H1-3+VT ✓	

Job	6421.CT11327A	Page	35 of 35
Project	Old Saybrook/I-95/AmtraK_1	Date	14:20:07 10/21/14
Client	T-Mobile	Designed by	Vinod Ramesh

Section No.	Elevation ft	Ratio P	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
3 - 2		0.017	1.181	0.000	0.036	0.003	1.200	1.333	H1-3+VT ✓
2 - 1		0.017	1.194	0.000	0.036	0.003	1.213	1.333	H1-3+VT ✓
1 - 0		0.018	1.206	0.000	0.036	0.003	1.225	1.333	H1-3+VT ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P _{allow} K	% Capacity	Pass Fail	
L1	150 - 120	Pole	P18x3/8	1	-4.87	697.49	91.2	Pass	
L2	120 - 100	Pole	P24x3/8	2	-7.24	934.94	91.1	Pass	
L3	100 - 80	Pole	P30x3/8	3	-10.01	1166.57	97.8	Pass	
L4	80 - 65	Pole	P36x3/8	4	-12.51	1325.68	93.0	Pass	
L5	65 - 60	Pole	P36x0.45	5	-13.46	1447.05	84.3	Pass	
L6	60 - 49	Pole	P42x3/8	6	-15.58	1484.55	90.7	Pass	
L7	49 - 40	Pole	P42x0.47	7	-17.63	1880.70	81.5	Pass	
L8	40 - 29	Pole	P48x3/8	8	-19.94	1643.28	93.5	Pass	
L9	29 - 20	Pole	P48x0.45	9	-22.18	1989.84	86.2	Pass	
L10	20 - 10	Pole	P54x3/8	10	-24.53	1801.92	94.4	Pass	
L11	10 - 0	Pole	P54x0.425	11	-27.17	2060.58	91.9	Pass	
							Summary		
							Pole (L3)	97.8	Pass
							RATING =	97.8	Pass

FOUNDATION CALCULATIONS

Stiffened or Unstiffened, UngROUTed, Circular Base Plate - Any Rod Material

TIA Rev F

Site Data

WO#: 6421.CT11327A
 Site Name: Old Saybrook/-
 95/AmtrK_1

Pole Manufacturer: **Other**

Reactions

Moment:	2065	ft-kips
Axial:	32	kips
Shear:	21	kips

Anchor Rod Data

Qty:	48	
Diam:	1	in
Rod Material:	Other	(A687)
Strength (Fu):	150	ksi
Yield (Fy):	105	ksi
Bolt Circle:	57	in

If No stiffeners, Criteria: **AISC ASD** <-Only Applicable to Unstiffened Cases

Anchor Rod Results

Maximum Rod Tension: 35.6 Kips
 Allowable Tension: 51.8 Kips
 Anchor Rod Stress Ratio: 68.6% **Pass**

Stiffened
Service, ASD
Ft*ASIF

Plate Data

Diam:	60	in
Thick:	1.25	in
Grade:	36	ksi
Single-Rod B-eff:	3.53	in

Base Plate Results

Base Plate Stress: 4.9 ksi
 Allowable Plate Stress: 19.2 ksi
 Base Plate Stress Ratio: 25.6% **Pass**

Shear Check Only

Stiffened
Service, ASD
0.75*Fy*ASIF
Y.L. Length:
N/A, Roark

Stiffener Data (Welding at both sides)

Config:	1	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	3	in
Height:	5	in
Thick:	0.625	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Stiffener Results

Horizontal Weld : 76.8% **Pass**
 Vertical Weld: 52.1% **Pass**
 Plate Flex+Shear, fb/Fb+(fv/Fv)^2: 39.9% **Pass**
 Plate Tension+Shear, ft/Ft+(fv/Fv)^2: 60.2% **Pass**
 Plate Comp. (AISC Bracket): 82.5% **Pass**

Pole Results

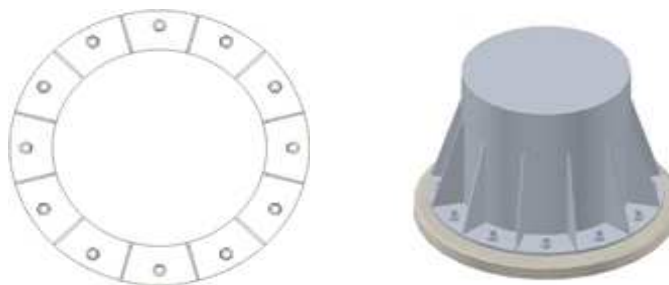
Pole Punching Shear Check: 26.4% **Pass**

Pole Data

Diam:	54	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	65	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor

ASIF: 1.333



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Tectonic Engineering

 * CAISSON - Pier Foundations Analysis and Design - Copyright Power Line Systems, Inc. 1993-2011 *
 *

Project Title: 6421.CT11327A

Project Notes: Caisson Check

Calculation Method: Full 8CD

***** I N P U T D A T A

Pier Properties

Diameter (ft)	Distance of Top of Pier above Ground (ft)	Concrete Strength (ksi)	Steel Yield Strength (ksi)
6.00	0.50	3.00	60.00

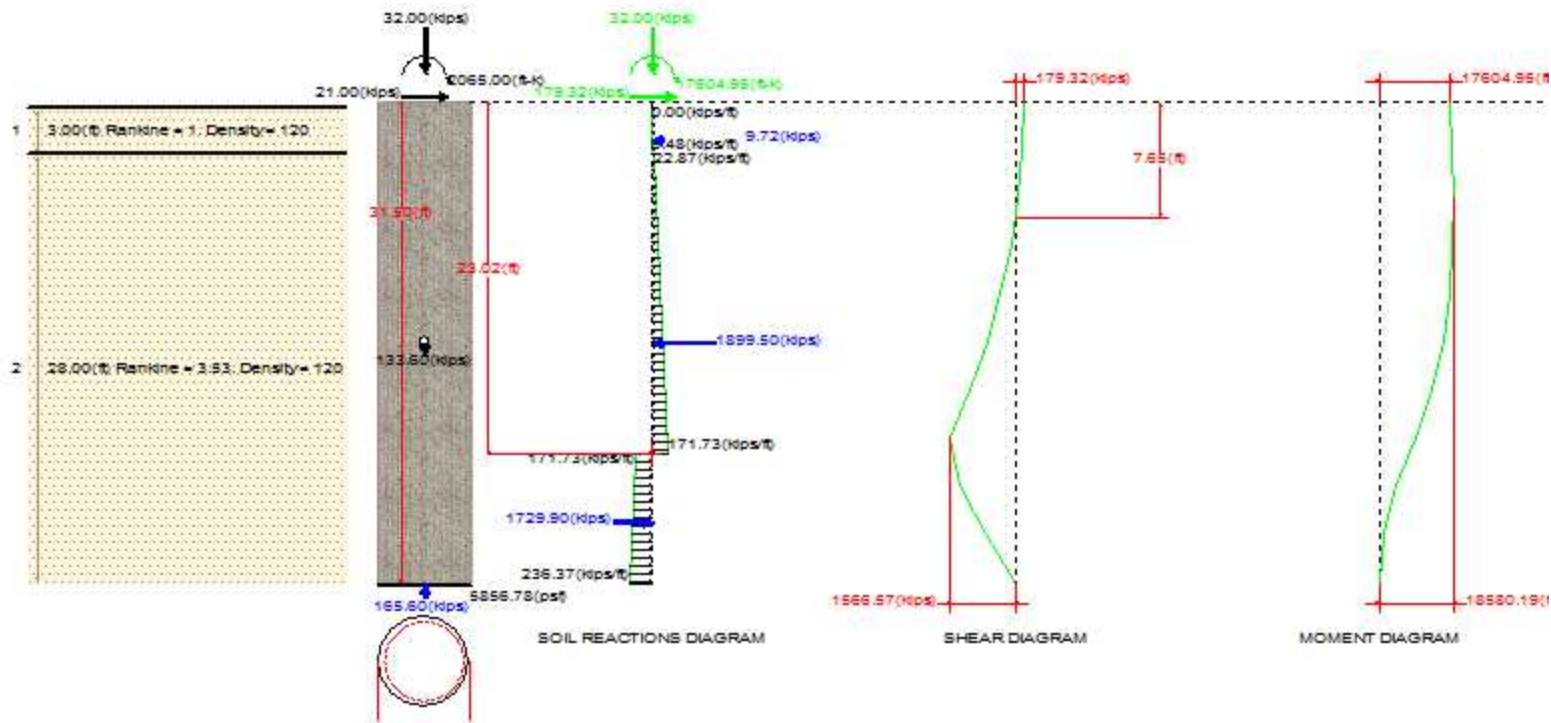
Soil Properties

Layer	Type	Thickness (ft)	Depth at Top of Layer (ft)	Density (lbs/ft^3)	CU (psf)	KP	PHI (deg)
1	Sand	3.00	0.00	120.0		1.000	
2	Sand	28.00	3.00	120.0		3.530	33.95

Design (Factored) Loads at Top of Pier

Moment (ft-k)	Axial Load (kips)	Shear Load (kips)	Additional Safety Factor Against Soil Failure
2065.0	32.0	21.00	8.50 --> Approximate Lateral Capacity = 23.5%

***** R E S U L T S



Calculated Pier Properties

Length (ft)	Weight (kips)	Pressure Due To Axial Load (psf)	Pressure Due To Weight (psf)	Total End-Bearing Pressure (psf)
31.500	133.596	1131.8	4725.0	5856.8

Ultimate Resisting Forces Along Pier

Type	Distance of Top of Layer to Top of Pier (ft)	Thickness (ft)	Density (lbs/ft^3)	CU (psf)	KP	Force (kips)	Arm (ft)
Sand	0.50	3.00	120.0		1.000	9.72	2.50
Sand	3.50	19.52	120.0		3.530	1899.50	15.75
Sand	23.02	8.48	120.0		3.530	-1729.90	27.48

Shear and Moments Along Pier

Distance below Top of Pier (ft)	Shear (with Safety Factor) (kips)	Moment (with Safety Factor) (ft-k)	Shear (without Safety Factor) (kips)	Moment (without Safety Factor) (ft-k)
0.00	179.3	17604.9	21.1	2071.2
3.15	171.7	18163.1	20.2	2136.8
6.30	75.7	18580.2	8.9	2185.9 -> MAX Moment
9.45	-101.5	18559.4	-11.9	2183.5
12.60	-354.3	17861.5	-41.7	2101.4
15.75	-682.7	16248.1	-80.3	1911.5
18.90	-1086.8	13481.0	-127.9	1586.0
22.05	-1566.6	9321.8	-184.3	1096.7
25.20	-1337.8	4373.0	-157.4	514.5
28.35	-706.7	1133.0	-83.1	133.3
31.50	-0.0	-0.0	-0.0	-0.0

Reinforcement and Capacity

Total Reinforcement Percent	Reinforcement Area (in^2)	Usable Axial Capacity (kips)	Usable Moment Capacity (ft-k)
0.42	17.10	32.0	2262.8

US Standard Re-Bars (Select one of the following)

Quantity	Name	Area (in^2)	Diameter (in)	Spacing (in)
86	#4	0.20	0.500	2.26
56	#5	0.31	0.625	3.48
39	#6	0.44	0.750	4.99
29	#7	0.60	0.875	6.72
22	#8	0.79	1.000	8.85
18	#9	1.00	1.128	10.82
14	#10	1.27	1.270	13.91
11	#11	1.56	1.410	17.71
8	#14	2.25	1.693	24.35

Moment Capacity of Drilled Concrete Shaft (Caisson) for TIA Rev F or G

Note: Shaft assumed to have ties, not spiral, transverse reinforcing

Site Data

WO#: 6421.CT11327A
Site Name: Old Saybrook/I-95/AmtrK_1

Enter Load Factors Below:		
For M (WL)	1.3	<---- Enter Factor
For P (DL)	1.3	<---- Enter Factor

Pier Properties	
Concrete:	
Pier Diameter =	6.0 ft
Concrete Area =	4071.5 in ²
Reinforcement:	
Clear Cover to Tie=	3.00 in
Horiz. Tie Bar Size=	5
Vert. Cage Diameter =	5.30 ft
Vert. Cage Diameter =	63.62 in
Vertical Bar Size =	9
Bar Diameter =	1.13 in
Bar Area =	1 in ²
Number of Bars =	23
As Total=	23 in ²
A s/ Aconc, Rho:	0.0056 0.56%

ACI 10.5 , ACI 21.10.4, and IBC 1810.
Min As for Flexural, Tension Controlled, Shafts:

$$(3) * (\text{Sqrt}(f'c) / F_y) = 0.0027$$

$$200 / F_y = 0.0033$$

Minimum Rho Check:

Actual Req'd Min. Rho:	0.33%	Flexural
Provided Rho:	0.56%	OK

Ref. Shaft Max Axial Capacities, ϕ Max(Pn or Tn):		
Max Pu = ($\phi=0.65$) Pn.		
Pn per ACI 318 (10-2)	6085.92	kips
at Mu=($\phi=0.65$)Mn=	3171.95	ft-kips
Max Tu, ($\phi=0.9$) Tn =	1242	kips
at Mu= $\phi=(0.90)$ Mn=	0.00	ft-kips

Maximum Shaft Superimposed Forces		
TIA Revision:	F	
Max. Service Shaft M:	2185.9	ft-kips (* Note)
Max. Service Shaft P:	32	kips
Max Axial Force Type:	Comp.	

(* Note: Max Shaft Superimposed Moment does not necessarily equal to the shaft top reaction moment

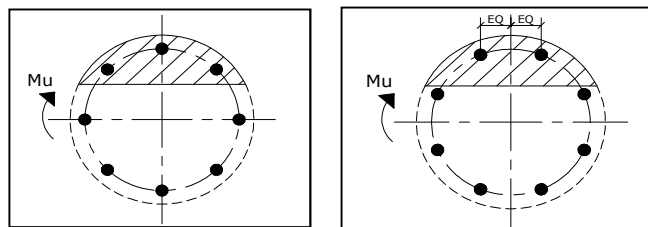
Load Factor	Shaft Factored Loads	
1.30	Mu:	2841.67 ft-kips
1.30	Pu:	41.6 kips

Material Properties		
Concrete Comp. strength, f'c =	3000	psi
Reinforcement yield strength, Fy =	60	ksi
Reinforcing Modulus of Elasticity, E =	29000	ksi
Reinforcement yield strain =	0.00207	
Limiting compressive strain =	0.003	
ACI 318 Code		
Select Analysis ACI Code=	2005	
Seismic Properties		
Seismic Design Category =	B	
Seismic Risk =	Low	

Solve (Run) <-- Press Upon Completing All Input

Results:

Governing Orientation Case: 2



Case 1

Case 2

Dist. From Edge to Neutral Axis: 11.66 in
Extreme Steel Strain, et: 0.0145

et > 0.0050, Tension Controlled

Reduction Factor, ϕ : 0.900

Output Note: Negative Pu=Tension

For Axial Compression, ϕ Pn = Pu: 41.60 kips
Drilled Shaft Moment Capacity, ϕ Mn: 3152.95 ft-kips
Drilled Shaft Superimposed Mu: 2841.67 ft-kips

(Mu/ ϕ Mn, Drilled Shaft Flexure CSR: 90.1%

ADDITIONAL CALCULATIONS

W.O.:	6421.CT11327A	Report Date:	10/20/2014
Client:	T-Mobile	Revision:	0
Site Name:	Old Saybrook/I-95/Amtrk_1	Prepared By:	VR
Owner:	Amtrak		
Site Address:	44 Ford Drive - Amtrak Maintenance Yard		
City, State:	Old Saybrook, CT 06745		

CHECK FOR REINFORCING MEMBER AND CONNECTIONS

SECTION	0' - 10'		
Fy	65 ksi	Reinf. Channel	MP3-03
Moment @ Base	24780 kip-in	Area of Channel	2.92 in ²
Moment @ Top	22524 kip-in	Channel Capacity	128.212 kips
Y _{POLE} @ Bottom	27.00 in		
Y _{POLE} @ Top	27.00 in		
Y _{REINF} @ Bottom	27.79 in		
Y _{REINF} @ Top	27.79 in		

POLE ELEVATION	Moment of Inertia (in ⁴)		
	w/o Reinforcement	w/Reinforcement	Reinforcement
Base	22710	26065	3355
Top	22710	26065	3355

Moment distribution within the pole and the reinforcing Channels

AT BASE	Ratios of the moments	Approx Moment Distribution (kip-in)	Axial Force in Channel (kips)
Pole Section	0.87	21590	
Reinforcing Channel	0.13	3190	77

AT TOP	Ratios of the moments	Approx Moment Distribution (kip-in)	Axial Force in Channel (kips)
Pole Section	0.87	19625	
Reinforcing Channel	0.13	2899	70

Max Percentage Stress of the reinforcing Channel member = 60% Therefore OK

Check for Bolts

Size of bolts:	0.75	in	
Quantity:	5		
Bolt Type:	Ajax M20		
Capacity of bolts:	41.23	kips each	
Force per bolt	15.4	kips	37.4%

W.O.:	6421.CT11327A	Report Date:	10/20/2014
Client:	T-Mobile	Revision:	0
Site Name:	Old Saybrook/I-95/Amtrk_1	Prepared By:	VR
Owner:	Amtrak		
Site Address:	44 Ford Drive - Amtrak Maintenance Yard		
City, State:	Old Saybrook, CT 06745		

CHECK FOR REINFORCING MEMBER AND CONNECTIONS

SECTION	20'		
Fy	65 ksi	Reinf. Channel	MP3-04
Moment @ Base	20148 kip-in	Area of Channel	4.13 in ²
		Channel Capacity	182.21 kips
Y _{BOLT} @ Bottom	26.00 in		
Y _{REINF} @ Bottom	27.81 in		

POLE ELEVATION	Moment of Inertia (in ⁴)		
	Bolts	w/Channel	Channel
Base	9194	13931	4737

Moment distribution within the flange connection bolts and the reinforcing Channels

AT BASE	Ratios of the moments	Approx Moment Distribution (kip-in)	Axial Force in Channel (kips)
Flange connection	0.66	13297	
Reinforcing Channel	0.34	6851	166

Max Percentage Stress of the reinforcing Channel member = 91% Therefore OK

Check for Bolts

Size of bolts:	0.75	in	
Quantity:	6		
Bolt Type:	Ajax M20		
Capacity of bolts:	41.23	kips each	
Force per bolt	27.7	kips	67.1%

W.O.:	6421.CT11327A	Report Date:	10/20/2014
Client:	T-Mobile	Revision:	0
Site Name:	Old Saybrook/I-95/Amtrk_1	Prepared By:	VR
Owner:	Amtrak		
Site Address:	44 Ford Drive - Amtrak Maintenance Yard		
City, State:	Old Saybrook, CT 06745		

CHECK FOR REINFORCING MEMBER AND CONNECTIONS

SECTION	20'-29'		
Fy	65 ksi	Reinf. Channel	MP3-04
Moment @ Base	19920 kip-in	Area of Channel	4.13 in ²
Moment @ Top	18108 kip-in	Channel Capacity	182.21 kips
Y _{POLE} @ Bottom	24.00 in		
Y _{POLE} @ Top	24.00 in		
Y _{REINF} @ Bottom	24.79 in		
Y _{REINF} @ Top	24.79 in		

POLE ELEVATION	Moment of Inertia (in ⁴)		
	w/o Reinforcement	w/Reinforcement	Reinforcement
Base	15908	19676	3768
Top	15908	19676	3768

Moment distribution within the pole and the reinforcing Channels

AT BASE	Ratios of the moments	Approx Moment Distribution (kip-in)	Axial Force in Channel (kips)
Pole Section	0.81	16106	
Reinforcing Channel	0.19	3814	104

AT TOP	Ratios of the moments	Approx Moment Distribution (kip-in)	Axial Force in Channel (kips)
Pole Section	0.81	14641	
Reinforcing Channel	0.19	3467	94

Max Percentage Stress of the reinforcing Channel member = 57% Therefore OK

Check for Bolts

Size of bolts:	0.75	in	
Quantity:	6		
Bolt Type:	Ajax M20		
Capacity of bolts:	41.23	kips each	
Force per bolt	17.3	kips	41.9%

W.O.:	6421.CT11327A	Report Date:	10/20/2014
Client:	T-Mobile	Revision:	0
Site Name:	Old Saybrook/I-95/Amtrk_1	Prepared By:	VR
Owner:	Amtrak		
Site Address:	44 Ford Drive - Amtrak Maintenance Yard		
City, State:	Old Saybrook, CT 06745		

CHECK FOR REINFORCING MEMBER AND CONNECTIONS

SECTION	40'	Reinf. Channel	MP3-04
Fy	65 ksi	Area of Channel	4.13 in ²
Moment @ Base	15732 kip-in	Channel Capacity	182.609 kips
Y _{BOLT} @ Bottom	23.00 in		
Y _{REINF} @ Bottom	24.81 in		

POLE ELEVATION	Moment of Inertia (in ⁴)		
	Bolts	w/Channel	Channel
Base	6363	10131	3768

Moment distribution within the flange connection bolts and the reinforcing Channels

AT BASE	Ratios of the moments	Approx Moment Distribution (kip-in)	Axial Force in Channel (kips)
Flange connection	0.63	9881	
Reinforcing Channel	0.37	5851	159

Max Percentage Stress of the reinforcing Channel member = 87% Therefore OK

Check for Bolts

Size of bolts:	0.75	in	
Quantity:	6		
Bolt Type:	Ajax M20		
Capacity of bolts:	41.23	kips each	
Force per bolt	26.5	kips	64.3%

W.O.	6421.CT11327A	Report Date:	10/20/2014
Client:	T-Mobile	Revision:	0
Site Name:	Old Saybrook/I-95/Amtrk_1	Prepared By:	VR
Owner:	Amtrak		
Site Address:	44 Ford Drive - Amtrak Maintenance Yard		
City, State:	Old Saybrook, CT 06745		

CHECK FOR REINFORCING MEMBER AND CONNECTIONS

SECTION	40'-49'		
Fy	65 ksi	Reinf. Channel	MP3-04
Moment @ Base	15528 kip-in	Area of Channel	4.13 in ²
Moment @ Top	13704 kip-in	Channel Capacity	182.21 kips
Y _{POLE} @ Bottom	24.00 in		
Y _{POLE} @ Top	24.00 in		
Y _{REINF} @ Bottom	24.79 in		
Y _{REINF} @ Top	24.79 in		

POLE ELEVATION	Moment of Inertia (in ⁴)		
	w/o Reinforcement	w/Reinforcement	Reinforcement
Base	10621	13531	2909
Top	10621	13531	2909

Moment distribution within the pole and the reinforcing Channels

AT BASE	Ratios of the moments	Approx Moment Distribution (kip-in)	Axial Force in Channel (kips)
Pole Section	0.78	12189	
Reinforcing Channel	0.22	3339	117

AT TOP	Ratios of the moments	Approx Moment Distribution (kip-in)	Axial Force in Channel (kips)
Pole Section	0.78	10758	
Reinforcing Channel	0.22	2946	104

Max Percentage Stress of the reinforcing Channel member = 64% Therefore OK

Check for Bolts

Size of bolts:	0.75	in	
Quantity:	6		
Bolt Type:	Ajax M20		
Capacity of bolts:	41.23	kips each	
Force per bolt	19.6	kips	47.5%

W.O.:	6421.CT11327A	Report Date:	10/20/2014
Client:	T-Mobile	Revision:	0
Site Name:	Old Saybrook/I-95/Amtrk_1	Prepared By:	VR
Owner:	Amtrak		
Site Address:	44 Ford Drive - Amtrak Maintenance Yard		
City, State:	Old Saybrook, CT 06745		

CHECK FOR REINFORCING MEMBER AND CONNECTIONS

SECTION	60'		
Fy	65 ksi	Reinf. Channel	MP3-03
Moment @ Base	11796 kip-in	Area of Channel	2.92 in ²
		Channel Capacity	128.212 kips
Y _{BOLT} @ Bottom	19.50 in		
Y _{REINF} @ Bottom	21.79 in		

POLE ELEVATION	Moment of Inertia (in ⁴)		
	Bolts	w/Channel	Channel
Base	4182	6240	2058

Moment distribution within the flange connection bolts and the reinforcing Channels

AT BASE	Ratios of the moments	Approx Moment Distribution (kip-in)	Axial Force in Channel (kips)
Flange connection	0.67	7906	
Reinforcing Channel	0.33	3890	120

Max Percentage Stress of the reinforcing Channel member = 94% Therefore OK

Check for Bolts

Size of bolts:	0.75	in	
Quantity:	6		
Bolt Type:	Ajax M20		
Capacity of bolts:	41.23	kips each	
Force per bolt	20.0	kips	48.6%

W.O.:	6421.CT11327A	Report Date:	10/21/2014
Client:	T-Mobile	Revision:	0
Site Name:	Old Saybrook/I-95/Amtrk_1	Prepared By:	VR
Owner:	Amtrak		
Site Address:	44 Ford Drive - Amtrak Maintenance Yard		
City, State:	Old Saybrook, CT 06745		

CHECK FOR REINFORCING MEMBER AND CONNECTIONS

SECTION	60'-65'		
Fy	65 ksi	Reinf. Channel	MP3-03
Moment @ Base	11628 kip-in	Area of Channel	2.92 in ²
Moment @ Top	10917.6 kip-in	Channel Capacity	128.212 kips
Y _{POLE} @ Bottom	18.00 in		
Y _{POLE} @ Top	18.00 in		
Y _{REINF} @ Bottom	18.79 in		
Y _{REINF} @ Top	18.79 in		

POLE ELEVATION	Moment of Inertia (in ⁴)		
	w/o Reinforcement	w/Reinforcement	Reinforcement
Base	6659	8188	1529
Top	6659	8188	1529

Moment distribution within the pole and the reinforcing Channels

AT BASE	Ratios of the moments	Approx Moment Distribution (kip-in)	Axial Force in Channel (kips)
Pole Section	0.81	9457	
Reinforcing Channel	0.19	2171	78

AT TOP	Ratios of the moments	Approx Moment Distribution (kip-in)	Axial Force in Channel (kips)
Pole Section	0.81	8879	
Reinforcing Channel	0.19	2039	73

Max Percentage Stress of the reinforcing Channel member = 61% Therefore OK

Check for Bolts

Size of bolts:	0.75	in	
Quantity:	5		
Bolt Type:	Ajax M20		
Capacity of bolts:	41.23	kips each	
Force per bolt	15.6	kips	37.8%

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev F

Site Data

WO#: 6421.CT11327A
 Site Name: Old Saybrook/I-95/AmtraK_1

Reactions

Moment:	1108.1	ft-kips
Axial:	22.4	kips
Shear:	19.4	kips
Elevation:	20	feet

Pole Manufacturer: Other

Bolt Data

Qty:	36		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	75	<-- Disregard	Bolt Fty:
N/A:	55	<-- Disregard	44.00
Circle (in.):	51		

If No stiffeners, Criteria: AISC ASD <-Only Applicable to Unstiffened Cases

Flange Bolt Results

Bolt Tension Capacity, B:	46.07 kips
Max Bolt directly applied T:	28.35 Kips
Min. PL "tc" for B cap. w/o Pry:	1.354 in
Min PL "treq" for actual T w/ Pry:	0.804 in
Min PL "t1" for actual T w/o Pry:	1.062 in
T allowable with Prying:	43.80 kips
Prying Force, Q:	0.00 kips
Total Bolt Tension=T+Q:	28.35 kips
Prying Bolt Stress Ratio=(T+Q)/(B):	61.5% Pass

Rigid
Service, ASD
Fty*ASIF

Plate Data

Diam:	54	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	4.19	in

Exterior Flange Plate Results

Flexural Check	
Compression Side Plate Stress:	26.5 ksi
Allowable Plate Stress:	36.0 ksi
Compression Plate Stress Ratio:	73.6% Pass
No Prying	
Tension Side Stress Ratio, (treq/t)^2:	41.3% Pass

Rigid
Service ASD
0.75*Fy*ASIF
Comp. Y.L. Length:
17.23

Stiffener Data (Welding at Both Sides)

Config:	2	*
Weld Type:	Fillet	
Groove Depth:	0.25	<-- Disregard
Groove Angle:	45	<-- Disregard
Fillet H. Weld:	0.25	in
Fillet V. Weld:	0.25	in
Width:	3	in
Height:	5	in
Thick:	0.625	in
Notch:	0.375	in
Grade:	36	ksi
Weld str.:	70	ksi

b/Le>2, Stiffeners are not fully effective

Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

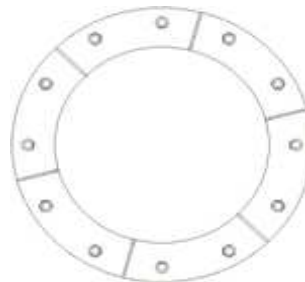
Pole Punching Shear Check: n/a

Pole Data

Diam:	48	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor

ASIF:	1.333
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* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data

WO#: 6421.CT11327A
 Site Name: Old Saybrook/I-95/Amtrak_1

Manufacturer: Other

Bolt Data

Qty:	36	Bolt Fu:	120
Diam:	1	Bolt Fy:	92
Bolt Material:	A325	Bolt Fty:	44.00
N/A:		<-- Disregard	
N/A:		<-- Disregard	
Circle:	51	in	

Reactions

Moment:	1108.1	ft-kips
Axial:	22.4	kips
Shear:	19.4	kips
Exterior Flange Run, T+Q:	38.35	kips

Elevation: 20 feet

Interior Flange Bolt Results

Maximum Bolt Tension: 38.4 Kips, Ext. Flange T+Q
 Allowable Tension: 46.1 Kips
 Bolt Stress Ratio: 83.3% **Pass**

Plate Data

Plate Outer Diam:	53.25	in
Plate Inner Diam:	48	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	4.65	in

Interior Flange Plate Results

Controlling Bolt Axial Force: 38.4 Kips, Ext. Flange T+Q
 Plate Stress: 35.7 ksi
 Allowable Plate Stress: 36.0 ksi
 Plate Stress Ratio: 99.1% **Pass**

Flexural Check

Stiffener Data (Welding at Both Sides)

Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a

Stiffener Results

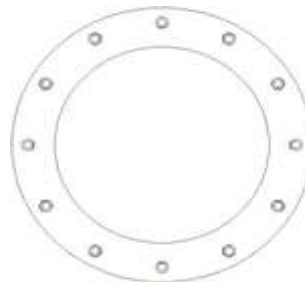
Horizontal Weld : n/a
 Vertical Weld: n/a
 Plate Flex+Shear, $f_b/F_b + (f_v/F_v)^2$: n/a
 Plate Tension+Shear, $f_t/F_t + (f_v/F_v)^2$: n/a
 Plate Comp. (AISC Bracket): n/a

Pole Results

Pole Punching Shear Check: n/a

Pole Data

Pole OuterDiam:	54	in
Thick:	0.375	in
Pole Inner Diam:	53.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi



Stress Increase Factor

ASIF:	1.333
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* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev F

Site Data

WO#: 6421.CT11327A
 Site Name: Old Saybrook/I-95/AmtraK_1

Reactions

Moment:	825.9	ft-kips
Axial:	17.8	kips
Shear:	17.4	kips
Elevation:	40	feet

Pole Manufacturer: Other

Bolt Data

Qty:	32		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	Bolt Fty:
N/A:		<-- Disregard	44.00
Circle (in.):	45		

If No stiffeners, Criteria: AISC ASD <-Only Applicable to Unstiffened Cases

Flange Bolt Results

Bolt Tension Capacity, B:	46.07 kips
Max Bolt directly applied T:	26.97 Kips
Min. PL "tc" for B cap. w/o Pry:	1.365 in
Min PL "treq" for actual T w/ Pry:	0.791 in
Min PL "t1" for actual T w/o Pry:	1.044 in
T allowable with Prying:	43.59 kips
Prying Force, Q:	0.00 kips
Total Bolt Tension=T+Q:	26.97 kips
Prying Bolt Stress Ratio=(T+Q)/(B):	58.6% Pass

Rigid
Service, ASD
Fty*ASIF

Plate Data

Diam:	48	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	4.12	in

Exterior Flange Plate Results

Flexural Check	
Compression Side Plate Stress:	25.3 ksi
Allowable Plate Stress:	36.0 ksi
Compression Plate Stress Ratio:	70.3% Pass
No Prying	
Tension Side Stress Ratio, (treq/t)^2:	40.1% Pass

Rigid
Service ASD
0.75*Fy*ASIF
Comp. Y.L. Length:
16.16

Stiffener Data (Welding at Both Sides)

Config:	2	*
Weld Type:	Fillet	
Groove Depth:	0.25	<-- Disregard
Groove Angle:	45	<-- Disregard
Fillet H. Weld:	0.25	in
Fillet V. Weld:	0.25	in
Width:	3	in
Height:	5	in
Thick:	0.625	in
Notch:	0.375	in
Grade:	36	ksi
Weld str.:	70	ksi

b/Le>2, Stiffeners are not fully effective

Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

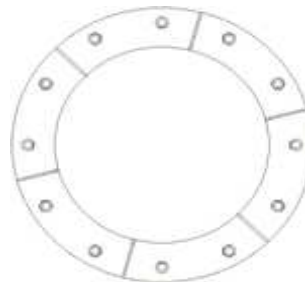
Pole Punching Shear Check: n/a

Pole Data

Diam:	42	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor

ASIF: 1.333



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data

WO#: 6421.CT11327A
 Site Name: Old Saybrook/I-95/Amtrak_1

Manufacturer: Other

Bolt Data

Qty:	32	Bolt Fu:	120
Diam:	1	Bolt Fy:	92
Bolt Material:	A325	Bolt Fty:	44.00
N/A:		<-- Disregard	
N/A:		<-- Disregard	
Circle:	45	in	

Reactions

Moment:	825.9	ft-kips
Axial:	17.8	kips
Shear:	17.4	kips
Exterior Flange Run, T+Q:	26.97	kips

Elevation: 40 feet

Interior Flange Bolt Results

Maximum Bolt Tension: 27.0 Kips, Ext. T=Interior T
 Allowable Tension: 46.1 Kips
 Bolt Stress Ratio: 58.6% **Pass**

Plate Data

Plate Outer Diam:	47.25	in
Plate Inner Diam:	42	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	4.64	in

Interior Flange Plate Results

Controlling Bolt Axial Force: 28.1 Kips, Ext. C= Interior C
 Plate Stress: 26.2 ksi
 Allowable Plate Stress: 36.0 ksi
 Plate Stress Ratio: 72.7% **Pass**

Stiffener Data (Welding at Both Sides)

Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a

Stiffener Results

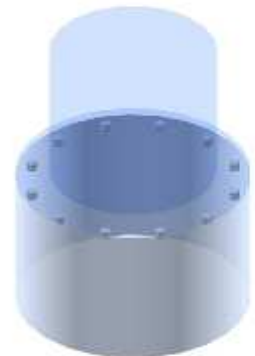
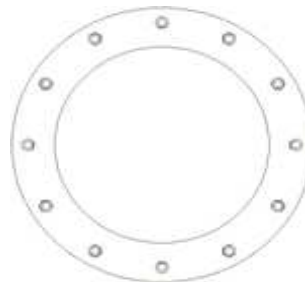
Horizontal Weld : n/a
 Vertical Weld: n/a
 Plate Flex+Shear, fb/Fb+(fv/Fv)^2: n/a
 Plate Tension+Shear, ft/Ft+(fv/Fv)^2: n/a
 Plate Comp. (AISC Bracket): n/a

Pole Results

Pole Punching Shear Check: n/a

Pole Data

Pole OuterDiam:	48	in
Thick:	0.375	in
Pole Inner Diam:	47.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi



Stress Increase Factor

ASIF:	1.333
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* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev F

Site Data

WO#: 6421.CT11327A
 Site Name: Old Saybrook/I-95/AmtraK_1

Reactions

Moment:	658.9	ft-kips
Axial:	13.6	kips
Shear:	15	kips
Elevation:	60	feet

Pole Manufacturer: Other

Bolt Data

Qty:	28		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		Bolt Fty:	44.00
N/A:			
Circle (in.):	39		

If No stiffeners, Criteria: AISC ASD <-Only Applicable to Unstiffened Cases

Flange Bolt Results

Bolt Tension Capacity, B:	46.07 kips
Max Bolt directly applied T:	28.48 Kips
Min. PL "tc" for B cap. w/o Pry:	1.379 in
Min PL "treq" for actual T w/ Pry:	0.823 in
Min PL "t1" for actual T w/o Pry:	1.084 in
T allowable with Prying:	43.33 kips
Prying Force, Q:	0.00 kips
Total Bolt Tension=T+Q:	28.48 kips
Prying Bolt Stress Ratio=(T+Q)/(B):	61.8% Pass

Rigid
Service, ASD
Fty*ASIF

Plate Data

Diam:	42	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	4.04	in

Exterior Flange Plate Results

Flexural Check	
Compression Side Plate Stress:	26.4 ksi
Allowable Plate Stress:	36.0 ksi
Compression Plate Stress Ratio:	73.4% Pass
No Prying	
Tension Side Stress Ratio, (treq/t)^2:	43.3% Pass

Rigid
Service ASD
0.75*Fy*ASIF
Comp. Y.L. Length:
15.00

Stiffener Data (Welding at Both Sides)

Config:	2	*
Weld Type:	Fillet	
Groove Depth:	0.25	<-- Disregard
Groove Angle:	45	<-- Disregard
Fillet H. Weld:	0.25	in
Fillet V. Weld:	0.25	in
Width:	3	in
Height:	5	in
Thick:	0.625	in
Notch:	0.375	in
Grade:	36	ksi
Weld str.:	70	ksi

b/Le>2, Stiffeners are not fully effective

Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

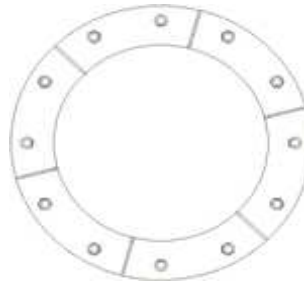
Pole Punching Shear Check: n/a

Pole Data

Diam:	36	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor

ASIF: 1.333



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data

WO#: 6421.CT11327A
 Site Name: Old Saybrook/I-95/Amtrak_1

Manufacturer: Other

Bolt Data

Qty:	28		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	Bolt Fty:
N/A:		<-- Disregard	44.00
Circle:	39	in	

Reactions

Moment:	658.9	ft-kips
Axial:	13.6	kips
Shear:	15	kips
Exterior Flange Run, T+Q:	28.48	kips

Elevation: 60 feet

Interior Flange Bolt Results

Maximum Bolt Tension: 28.5 Kips, Ext. Flange T+Q
 Allowable Tension: 46.1 Kips
 Bolt Stress Ratio: 61.8% **Pass**

Plate Data

Plate Outer Diam:	41.25	in
Plate Inner Diam:	36	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	4.63	in

Interior Flange Plate Results

Flexural Check
 Controlling Bolt Axial Force: 29.4 Kips, Ext. C= Interior C
 Plate Stress: 27.5 ksi
 Allowable Plate Stress: 36.0 ksi
 Plate Stress Ratio: 76.4% **Pass**

Stiffener Data (Welding at Both Sides)

Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a

Stiffener Results

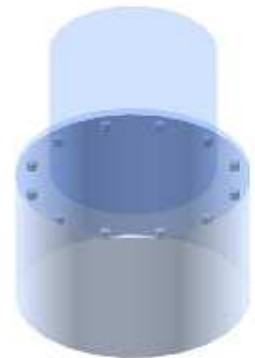
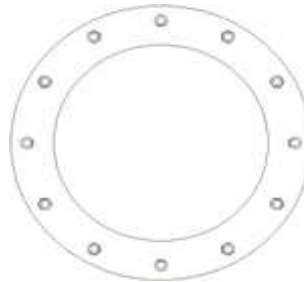
Horizontal Weld : n/a
 Vertical Weld: n/a
 Plate Flex+Shear, fb/Fb+(fv/Fv)^2: n/a
 Plate Tension+Shear, ft/Ft+(fv/Fv)^2: n/a
 Plate Comp. (AISC Bracket): n/a

Pole Results

Pole Punching Shear Check: n/a

Pole Data

Pole OuterDiam:	42	in
Thick:	0.375	in
Pole Inner Diam:	41.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi



Stress Increase Factor

ASIF:	1.333
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* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev F

Site Data

WO#: 6421.CT11327A
 Site Name: Old Saybrook/I-95/AmtraK_1

Reactions

Moment:	701.3	ft-kips
Axial:	10.2	kips
Shear:	12.83	kips
Elevation:	80	feet

Pole Manufacturer: Pirod

Bolt Data

Qty:	24		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		Bolt Fty:	44.00
N/A:			
Circle (in.):	33		

If No stiffeners, Criteria: AISC ASD <-Only Applicable to Unstiffened Cases

Flange Bolt Results

Bolt Tension Capacity, B:	46.07 kips
Max Bolt directly applied T:	42.08 Kips
Min. PL "tc" for B cap. w/o Pry:	1.398 in
Min PL "treq" for actual T w/ Pry:	1.203 in
Min PL "t1" for actual T w/o Pry:	1.337 in
T allowable with Prying:	42.98 kips
Prying Force, Q:	2.64 kips
Total Bolt Tension=T+Q:	44.71 kips
Prying Bolt Stress Ratio=(T+Q)/(B):	97.1% Pass

Rigid
Service, ASD
Fty*ASIF

Plate Data

Diam:	36	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	3.93	in

Exterior Flange Plate Results

Flexural Check	Rohn/Pirod, OK
Compression Side Plate Stress:	36.0 ksi
Allowable Plate Stress:	36.0 ksi
Compression Plate Stress Ratio:	Rohn/Pirod, OK

Rigid
Service ASD
0.75*Fy*ASIF
Comp. Y.L. Length:
13.75

Prying Occurs, Plate Check:

Tension Side Stress Ratio, (treq/t)^2: 92.7% **Pass**

b/Le>2, Stiffeners are not fully effective

Stiffener Results

N/A for Rohn / Pirod	
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A

Pole Results

Pole Punching Shear Check: N/A

Stiffener Data (Welding at Both Sides)

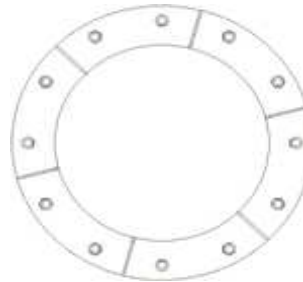
Config:	2	*
Weld Type:	Fillet	
Groove Depth:	0.25	<-- Disregard
Groove Angle:	45	<-- Disregard
Fillet H. Weld:	0.25	in
Fillet V. Weld:	0.25	in
Width:	3	in
Height:	5	in
Thick:	0.625	in
Notch:	0.375	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data

Diam:	30	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor

ASIF: 1.333



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data

WO#: 6421.CT11327A
 Site Name: Old Saybrook/I-95/Amtrak_1

Manufacturer: Pirod

Bolt Data

Qty:	24	Bolt Fu:	120
Diam:	1	Bolt Fy:	92
Bolt Material:	A325	Bolt Fty:	44.00
N/A:		<-- Disregard	
N/A:		<-- Disregard	
Circle:	33	in	

Reactions

Moment:	701.3	ft-kips
Axial:	10.2	kips
Shear:	12.83	kips
Exterior Flange Run, T+Q:	44.71	kips

Elevation: 80 feet

Interior Flange Bolt Results

Maximum Bolt Tension: 44.7 Kips, Ext. Flange T+Q
 Allowable Tension: 46.1 Kips
 Bolt Stress Ratio: 97.1% **Pass**

Plate Data

Plate Outer Diam:	35.25	in
Plate Inner Diam:	30	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	4.61	in

Interior Flange Plate Results

Flexural Check
 Controlling Bolt Axial Force: 44.7 Kips, Ext. Flange T+Q
 Plate Stress: Rohn/Pirod OK
 Allowable Plate Stress: 36.0 ksi
 Plate Stress Ratio: Rohn/Pirod OK

Stiffener Data (Welding at Both Sides)

Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a

Stiffener Results

N/A for Rohn / Pirod
 Horizontal Weld : N/A
 Vertical Weld: N/A
 Plate Flex+Shear, $f_b/F_b + (f_v/F_v)^2$: N/A
 Plate Tension+Shear, $f_t/F_t + (f_v/F_v)^2$: N/A
 Plate Comp. (AISC Bracket): N/A

Pole Results

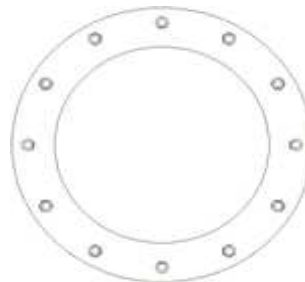
Pole Punching Shear Check: N/A

Pole Data

Pole OuterDiam:	36	in
Thick:	0.375	in
Pole Inner Diam:	35.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi

Stress Increase Factor

ASIF:	1.333
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* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev F

Site Data

WO#: 6421.CT11327A
 Site Name: Old Saybrook/I-95/AmtraK_1

Reactions

Moment:	460.5	ft-kips
Axial:	7.38	kips
Shear:	11.16	kips
Elevation:	100	feet

Pole Manufacturer: Pirod

If No stiffeners, Criteria: **AISC ASD** <-Only Applicable to Unstiffened Cases

Bolt Data

Qty:	20		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	Bolt Fty:
N/A:		<-- Disregard	44.00
Circle (in.):	27		

Flange Bolt Results

Bolt Tension Capacity, B :	46.07 kips
Max Bolt <u>directly</u> applied T:	40.56 Kips
Min. PL "tc" for B cap. w/o Pry:	1.427 in
Min PL "treq" for actual T w/ Pry :	1.143 in
Min PL "t1" for actual T w/o Pry:	1.339 in
T allowable with Prying:	42.49 kips
Prying Force, Q:	2.61 kips
Total Bolt Tension=T+Q:	43.17 kips
Prying Bolt Stress Ratio=(T+Q)/(B):	93.7% Pass

Rigid
Service, ASD
Fty*ASIF

Plate Data

Diam:	30	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	3.77	in

Exterior Flange Plate Results

Flexural Check	Rohn/Pirod, OK
Compression Side Plate Stress:	36.0 ksi
Allowable Plate Stress:	Rohn/Pirod, OK
Compression Plate Stress Ratio:	

Rigid
Service ASD
0.75*Fy*ASIF
Comp. Y.L. Length:
12.37

Prying Occurs, Plate Check:

Tension Side Stress Ratio, (treq/t)^2: 83.6% **Pass**

b/Le>2, Stiffeners are not fully effective

Stiffener Results

N/A for Rohn / Pirod	
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A

Pole Results

Pole Punching Shear Check: N/A

Stiffener Data (Welding at Both Sides)

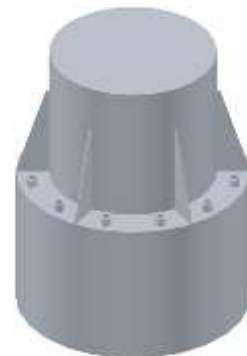
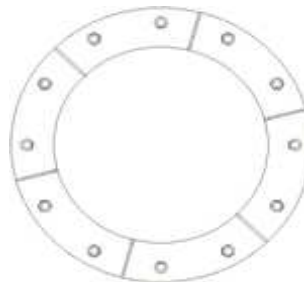
Config:	2	*
Weld Type:	Fillet	
Groove Depth:	0.25	<-- Disregard
Groove Angle:	45	<-- Disregard
Fillet H. Weld:	0.25	in
Fillet V. Weld:	0.25	in
Width:	3	in
Height:	5	in
Thick:	0.625	in
Notch:	0.375	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data

Diam:	24	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor

ASIF:	1.333
-------	-------



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data

WO#: 6421.CT11327A
 Site Name: Old Saybrook/I-95/Amtrak_1

Manufacturer: Pirod

Bolt Data

Qty:	20	Bolt Fu:	120
Diam:	1	Bolt Fy:	92
Bolt Material:	A325	Bolt Fty:	44.00
N/A:		<-- Disregard	
N/A:		<-- Disregard	
Circle:	27	in	

Reactions

Moment:	460.5	ft-kips
Axial:	7.38	kips
Shear:	11.16	kips
Exterior Flange Run, T+Q:	43.17	kips

Elevation: 100 feet

Interior Flange Bolt Results

Maximum Bolt Tension: 43.2 Kips, Ext. Flange T+Q
 Allowable Tension: 46.1 Kips
 Bolt Stress Ratio: 93.7% **Pass**

Plate Data

Plate Outer Diam:	29.25	in
Plate Inner Diam:	24	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	4.59	in

Interior Flange Plate Results

Flexural Check
 Controlling Bolt Axial Force: 43.2 Kips, Ext. Flange T+Q
 Plate Stress: Rohn/Pirod OK
 Allowable Plate Stress: 36.0 ksi
 Plate Stress Ratio: Rohn/Pirod OK

Stiffener Data (Welding at Both Sides)

Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a

Stiffener Results

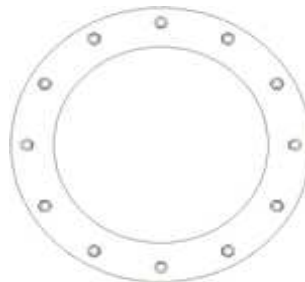
N/A for Rohn / Pirod
 Horizontal Weld : N/A
 Vertical Weld: N/A
 Plate Flex+Shear, $f_b/F_b + (f_v/F_v)^2$: N/A
 Plate Tension+Shear, $f_t/F_t + (f_v/F_v)^2$: N/A
 Plate Comp. (AISC Bracket): N/A

Pole Results

Pole Punching Shear Check: N/A

Pole Data

Pole OuterDiam:	30	in
Thick:	0.375	in
Pole Inner Diam:	29.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi



Stress Increase Factor

ASIF:	1.333
-------	-------

* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev F

Site Data

WO#: 6421.CT11327A
 Site Name: Old Saybrook/I-95/AmtraK_1

Reactions

Moment:	258.4	ft-kips
Axial:	4.99	kips
Shear:	9.35	kips
Elevation:	120	feet

Pole Manufacturer: Pirod

If No stiffeners, Criteria: AISC ASD <-Only Applicable to Unstiffened Cases

Bolt Data

Qty:	16		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		Bolt Fty:	44.00
N/A:			
Circle (in.):	21		

Flange Bolt Results

Bolt Tension Capacity, B:	46.07 kips
Max Bolt directly applied T:	36.61 Kips
Min. PL "tc" for B cap. w/o Pry:	1.474 in
Min PL "treq" for actual T w/ Pry:	1.008 in
Min PL "t1" for actual T w/o Pry:	1.314 in
T allowable with Prying:	41.75 kips
Prying Force, Q:	1.74 kips
Total Bolt Tension=T+Q:	38.35 kips
Prying Bolt Stress Ratio=(T+Q)/(B):	83.2% Pass

Rigid
Service, ASD
Fty*ASIF

Plate Data

Diam:	24	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	3.53	in

Exterior Flange Plate Results

Flexural Check	Rohn/Pirod, OK
Compression Side Plate Stress:	36.0 ksi
Allowable Plate Stress:	36.0 ksi
Compression Plate Stress Ratio:	Rohn/Pirod, OK

Rigid
Service ASD
0.75*Fy*ASIF
Comp. Y.L. Length:
10.82

Prying Occurs, Plate Check:

Tension Side Stress Ratio, (treq/t)^2: 65.0% **Pass**

b/Le>2, Stiffeners are not fully effective

Stiffener Results

N/A for Rohn / Pirod	
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A

Pole Results

Pole Punching Shear Check: N/A

Stiffener Data (Welding at Both Sides)

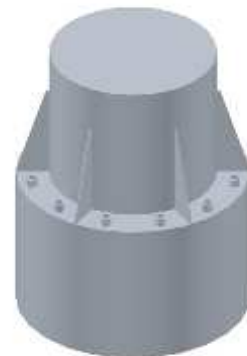
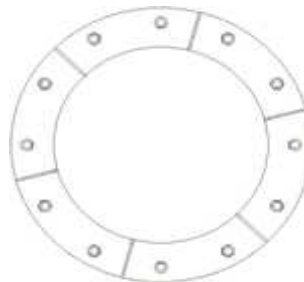
Config:	2	*
Weld Type:	Fillet	
Groove Depth:	0.25	<-- Disregard
Groove Angle:	45	<-- Disregard
Fillet H. Weld:	0.25	in
Fillet V. Weld:	0.25	in
Width:	3	in
Height:	5	in
Thick:	0.625	in
Notch:	0.375	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data

Diam:	18	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor

ASIF:	1.333
-------	-------



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data

WO#: 6421.CT11327A
 Site Name: Old Saybrook/I-95/Amtrak_1

Manufacturer: Pirod

Bolt Data

Qty:	16		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	Bolt Fty:
N/A:		<-- Disregard	44.00
Circle:	21	in	

Reactions

Moment:	258.4	ft-kips
Axial:	4.99	kips
Shear:	9.35	kips
Exterior Flange Run, T+Q:	38.35	kips

Elevation: 120 feet

Interior Flange Bolt Results

Maximum Bolt Tension: 38.4 Kips, Ext. Flange T+Q
 Allowable Tension: 46.1 Kips
 Bolt Stress Ratio: 83.3% **Pass**

Plate Data

Plate Outer Diam:	23.25	in
Plate Inner Diam:	18	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	4.57	in

Interior Flange Plate Results

Flexural Check
 Controlling Bolt Axial Force: 38.4 Kips, Ext. Flange T+Q
 Plate Stress: Rohn/Pirod OK
 Allowable Plate Stress: 36.0 ksi
 Plate Stress Ratio: Rohn/Pirod OK

Stiffener Data (Welding at Both Sides)

Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a

Stiffener Results

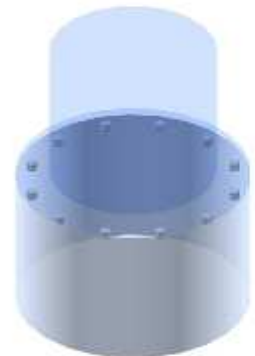
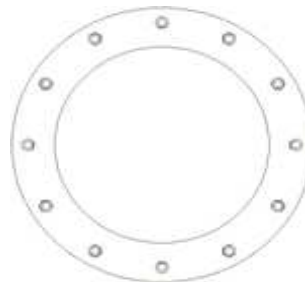
N/A for Rohn / Pirod
 Horizontal Weld : N/A
 Vertical Weld: N/A
 Plate Flex+Shear, $f_b/F_b + (f_v/F_v)^2$: N/A
 Plate Tension+Shear, $f_t/F_t + (f_v/F_v)^2$: N/A
 Plate Comp. (AISC Bracket): N/A

Pole Results

Pole Punching Shear Check: N/A

Pole Data

Pole OuterDiam:	24	in
Thick:	0.375	in
Pole Inner Diam:	23.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi



Stress Increase Factor

ASIF:	1.333
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* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

..T..Mobile..

NORTHEAST LLC.

SITE NAME: **AMTRAK - OLD SAYBROOK**

SITE ID NUMBER: **CT11327A**

SITE ADDRESS: **AMTRAK MAINTENANCE YARD,
OLD SAYBROOK, CT**

AMTRAK FILE NO: **626.59**

WORK CATEGORY: **CABINET, ANTENNA, TMA REPLACEMENT AND COAX ADDITION**

TECTONIC

- PLANNING
- ENGINEERING
- SURVEYING
- CONSTRUCTION MANAGEMENT

TECTONIC Engineering & Surveying
Consultants P.C.

1279 ROUTE 300
NEWBURGH, NY 12550
Phone: (845) 567-6656
Fax: (845) 567-8703

..T..Mobile..

12050 BALTIMORE AVENUE
BELTSVILLE, MD 20705

PROJECT SUMMARY

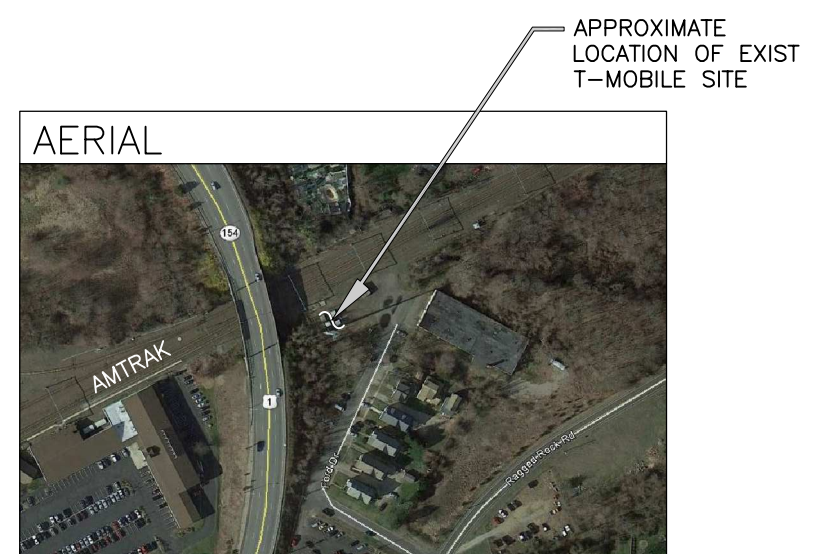
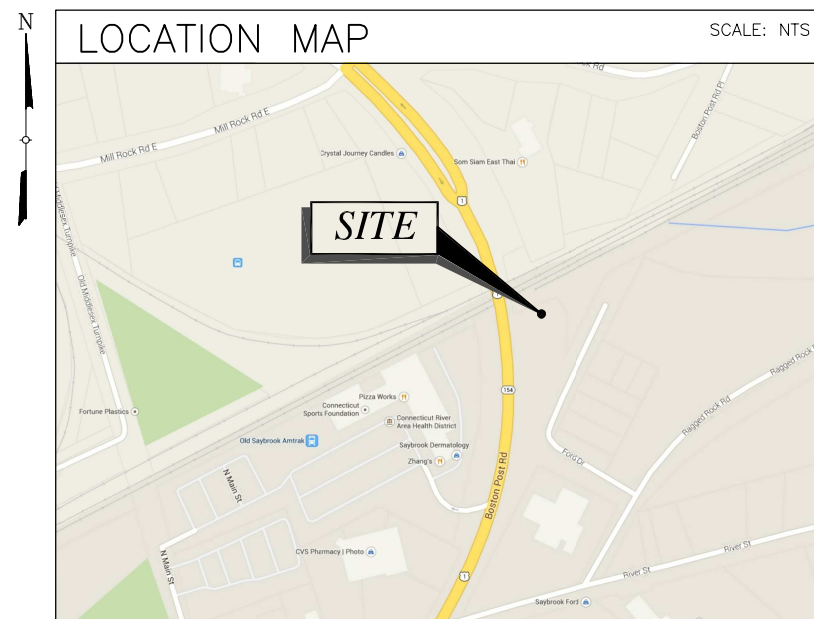
SITE NUMBER: CT11327A
 AMTRAK FILE #: 626.59
 MILEPOST: 105
 SITE NAME: AMTRAK-OLD SAYBROOK
 SITE ADDRESS: AMTRAK MAINTENANCE YARD
 OLD SAYBROOK, CT
 COUNTY: MIDDLESEX
 PROPERTY OWNER: AMTRAK (NATIONAL RAILROAD
 PASSENGER CORPORATION)
 APPLICANT: T-MOBILE NORTHEAST, LLC.
 12050 BALTIMORE AVENUE
 BELTSVILLE, MD 20705
 (240) 264-8600
 CONTACT: ANDREW STROCK
 PHONE: (215) 917-9950
 ENGINEER/
 SURVEYOR/
 STRUCTURAL ENG: TECTONIC ENGINEERING &
 SURVEYING CONSULTANTS P.C.
 1279 ROUTE 300
 NEWBURGH, NY 12550
 CONTACT: MIKE PATEL
 PHONE: (845) 567-6656 EXT. 2808
 LATITUDE: (NAD 83) 41.301257
 LONGITUDE: (NAD 83) -72.374695

SITE DIRECTIONS

HEAD NORTHEAST ON U.S. 1 N/BALTIMORE AVE TOWARD MD-212 N/RITZ WAY. TURN LEFT ONTO MD-212/RITZ WAY. CONTINUE TO FOLLOW MD-212. MERGE ONTO I-95 N VIA THE RAMP TO BALTIMORE. KEEP RIGHT TO CONTINUE ON I-295 N/DELAWARE TURNPIKE, FOLLOW SIGNS FOR DEL MEM BR/NJ-NY. CONTINUE TO FOLLOW I-295 N. KEEP LEFT TO CONTINUE ON US-40 E. CONTINUE ONTO NEW JERSEY TURNPIKE. CONTINUE ONTO I-95 N/NEW JERSEY TURNPIKE N. KEEP LEFT TO CONTINUE ON I-95 EXPRESS N, FOLLOW SIGNS FOR I-95 N/GEORGE WASHINGTON BRIDGE CONTINUE ONTO I-95 N. MERGE ONTO I-95 N. TAKE EXIT 67 FOR CONNECTICUT 154 W TOWARD OLD SAYBROOK. MERGE ONTO CT-154 W/MIDDLESEX TURNPIKE. CONTINUE TO FOLLOW CT-154 W. TURN LEFT ONTO RIVER ST. SLIGHT LEFT ONTO FORD DR. TAKE THE 1ST LEFT TO STAY ON FORD DR DESTINATION WILL BE ON THE LEFT.

SHEET INDEX

SHEET NO	DESCRIPTION	REV NO
T-1	TITLE SHEET	0
T-2	NOTES	0
A-1	SITE PLAN	0
A-2	EQUIPMENT PLAN & PHOTO	0
A-3	ELEVATION & PHOTO	0
A-4	ANTENNA PLAN, DETAILS & PHOTO	0
A-5	WIRING DIAGRAM	0
A-6	SPECIFICATIONS	0
A-7	SPECIFICATIONS	0
S-1	ELEVATION & DETAIL	0
S-2	BASE REINF. PLAN & SECTION	0
S-3	BRIDGE SPLICE PLAN & SECTION	0
S-4	GENERAL NOTES	0
S-5	STEEL NOTES	0



PROJECT NUMBER	DESIGNED BY		
6421.CT11327A	MP		
REV	DATE	REVISION	DRAWN BY
0	11/5/14	FOR APPROVAL	KA
ISSUED BY	DATE		

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

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

GENERAL NOTES

- ALL APPLICABLE PERMITS MUST BE OBTAINED AND INSURANCE REQUIREMENTS MUST BE MET PRIOR TO CONSTRUCTION.
- THESE PROJECT DRAWINGS ARE IN ACCORDANCE WITH AMTRAK STANDARDS AND ENGINEERING PRACTICES. PRIOR TO ENTERING AMTRAK'S PROPERTY, THE CONTRACTOR MUST NOTIFY PAUL DUBUQUE AT 401-413-9681.
- 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.
- UPGRADE OF EXISTING T-MOBILE TELECOMMUNICATIONS FACILITY. THE PROPOSED T-MOBILE PLANNED WORK INVOLVES THE REMOVAL OF ONE (1) EXIST S8000 CABINET, THE INSTALLATION OF ONE (1) PROPOSED 6102 CABINET, THE REPLACEMENT OF (6) ANTENNAS, THE ADDITION OF (3) ANTENNAS, THE REPLACEMENT OF THREE (3) TMAs, THE ADDITION OF (6) PROPOSED COAX CABLES, AND THE INSTALLATION OF (1) FIBER CABLE. NO DIGGING OR SOIL DISTURBANCE WILL OCCUR DURING THE PROJECT. NO MODIFICATIONS TO THE CATENARY AND TRANSMISSION SYSTEMS ARE REQUIRED TO ACCOMMODATE THIS PROJECT.
- IF MODIFICATIONS TO THE CATENARY AND TRANSMISSION SYSTEMS ARE REQUIRED TO ACCOMMODATE THIS PROJECT A QUALIFIED ELECTRICAL CONSULTANT MUST BE RETAINED TO PERFORM THIS DESIGN.
- THESE PROJECT DRAWINGS ARE IN COMPLIANCE WITH AED-1; AED-2; CE-4; EP3005-02081A & EP3014-01141A.
- ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE AMTRAK-APPROVED PROJECT DRAWINGS, STATEMENTS OF WORK, PLANS AND SCHEDULES AND ALL OTHER AMTRAK REQUIREMENTS.
- 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.
- 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

- BEFORE ENTRY OF PERMITTEE AND/OR CONTRACTORS ONTO RAILROAD'S PROPERTY, A PRE-ENTRY MEETING SHALL BE HELD WITH THE AMTRAK RAILROAD PROTECTION PERSONNEL.
- 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.
- 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.
- 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.
- 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.
- NO WORK WILL BE PERMITTED WITHIN TWENTY-FIVE (25) FEET OF THE CENTERLINE OF TRACK OR THE ENERGIZED WIRE OR HAVE POTENTIAL 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.

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

LIFT NOTES:

- 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.
- 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

- 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 ENCRDACHING 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.
- FINAL LIFT EQUIPMENT LOCATION WILL BE WITHIN THE RESTRICTED MANEUVERING ENVELOPE AS OUTLINED IN THIS APPROVED LIFT PLAN.
- CONTRACTOR TO VERIFY ALL DIMENSIONS AND SITE CONDITIONS PRIOR TO COMMENCING WORK.
- 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.
- DO NOT OPERATE IN WINDS OVER 30 MPH.
- OPERATIONS TO BE CONDUCTED IN ACCORDANCE WITH OSHA AND AMTRAK REGULATIONS AND ALL OTHER APPLICABLE RULES AND CODES.
- SWING PATH OF BOOM SHALL NOT BE OVER ADJACENT BUILDINGS, WORKERS OR OCCUPIED VEHICLES WHILE LIFTING LOADS.
- 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.
- THE TOTAL ESTIMATED DURATION OF LIFT ACTIVITIES ON SITE IS ONE EVENT LASTING (8) EIGHT HOURS.
- CHECK ALL OF THE PARTS OF THE EQUIPMENT EACH NEW WORK SHIFT, INCLUDING ALL OF THE CABLES, EQUIPMENT PARTS AND ENGINE PARTS.
- 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.
- ALWAYS INSPECT THE AREA PRIOR TO LIFTING A LOAD TO MAKE SURE THERE ARE NO PEOPLE BELOW.
- NO SIDE PULLS ALLOWED WHEN PERFORMING A LIFT.
- 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.
- 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.
- 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.
- THE EQUIPMENT IS CAPABLE OF PICKING 150% OF THE LOAD, WHILE MAINTAINING NORMAL, RECOMMENDED FACTORS OF SAFETY. THE ADEQUACY OF THE EQUIPMENT FOR THE PROPOSED PICK SHALL BE DETERMINED BY USING THE MANUFACTURER'S PUBLISHED LOAD RATING CHARTS AND NOT THE MAXIMUM CAPACITY IF THE BOOM.
- 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.
- 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.

TECTONIC

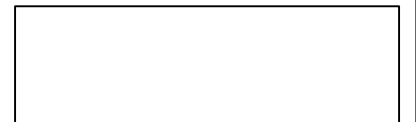
- PLANNING
- ENGINEERING
- SURVEYING
- CONSTRUCTION MANAGEMENT

TECTONIC Engineering & Surveying Consultants P.C.

1279 ROUTE 300
NEWBURGH, NY 12550
Phone: (845) 567-6656
Fax: (845) 567-8703

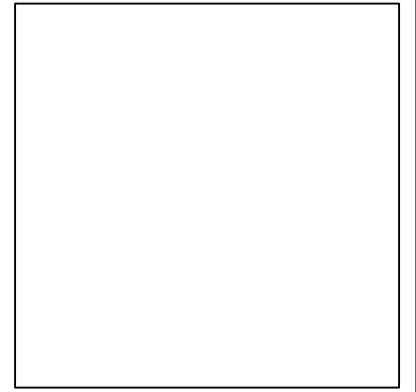
Mobile

12050 BALTIMORE AVENUE
BELTSVILLE, MD 20705



PROJECT NUMBER		DESIGNED BY	
6421.CT11327A		MP	
REV	DATE	REVISION	DRAWN BY
0	11/5/14	FOR APPROVAL	KA

ISSUED BY	DATE



SITE INFORMATION

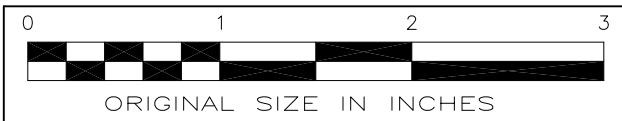
CT11327A
AMTRAK-OLD SAYBROOK
AMTRAK MAINTENANCE YARD
OLD SAYBROOK, CT

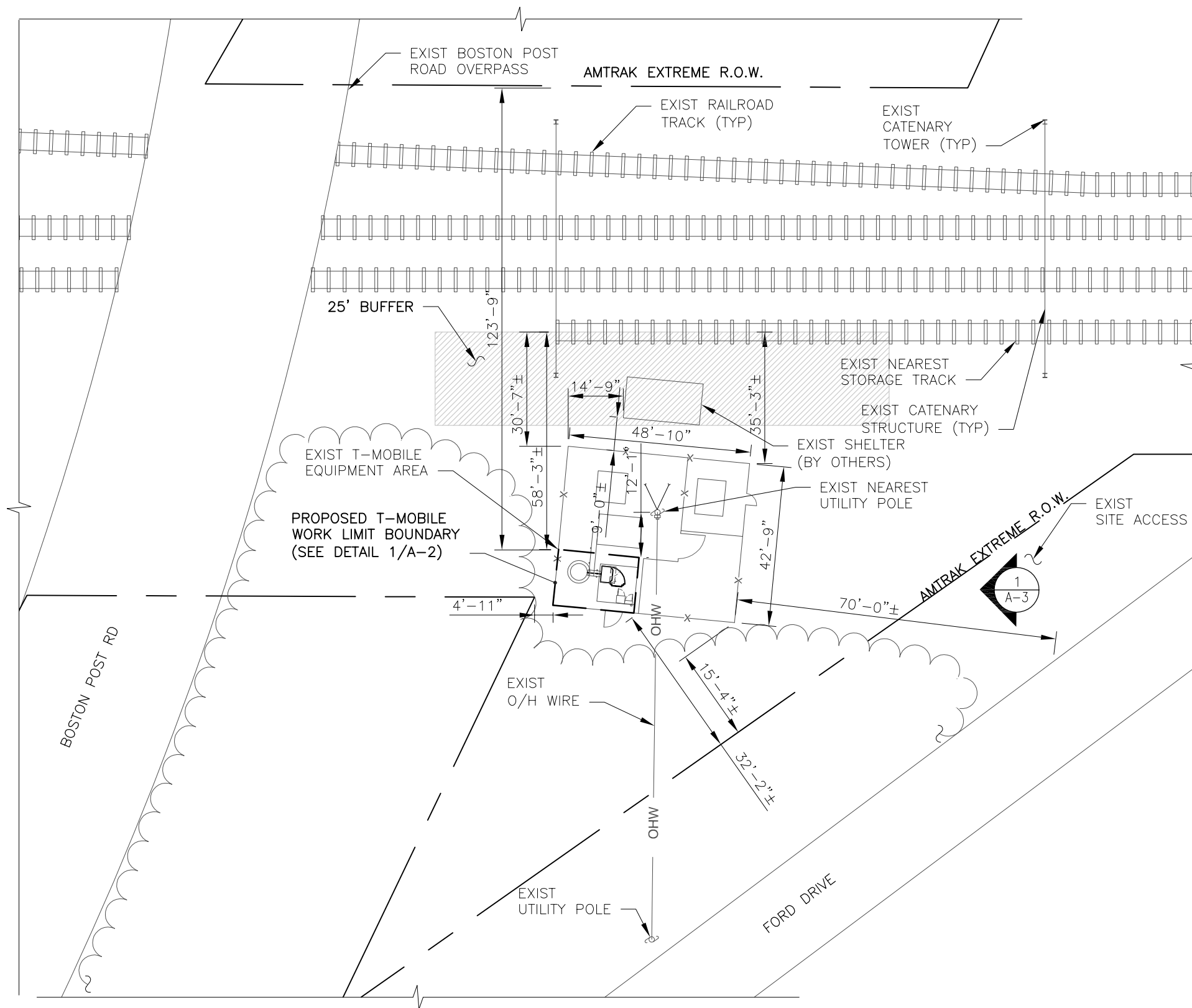
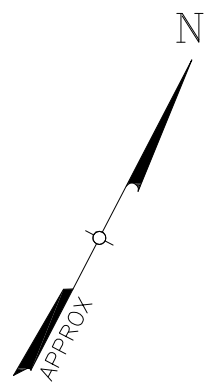
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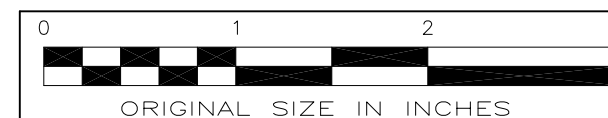
SHEET NUMBER

T-2





1 SITE PLAN
A-1 SCALE: 1/32" = 1'-0"



TECTONIC

- PLANNING
- ENGINEERING
- SURVEYING
- CONSTRUCTION MANAGEMENT

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Fax: (845) 567-8703

Mobile

12050 BALTIMORE AVENUE
BELTSVILLE, MD 20705

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<small>PROJECT NUMBER</small> 6421.CT11327A	<small>DESIGNED BY</small> MP
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<small>REV</small>	<small>DATE</small>	<small>REVISION</small>	<small>DRAWN BY</small>
0	11/5/14	FOR APPROVAL	KA

<small>ISSUED BY</small>	<small>DATE</small>
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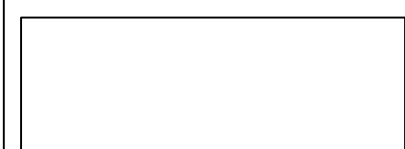
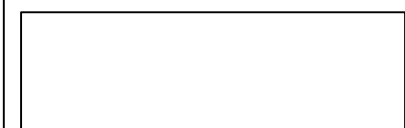
CT11327A
AMTRAK-OLD SAYBROOK
AMTRAK MAINTENANCE YARD
OLD SAYBROOK, CT

SHEET TITLE

SITE PLAN

SHEET NUMBER

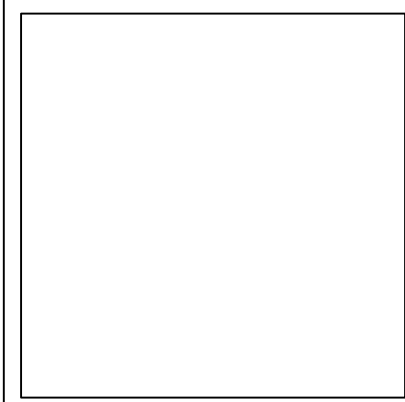
A-1



PROJECT NUMBER	DESIGNED BY
6421.CT11327A	MP

REV	DATE	REVISION	DRAWN BY
0	11/5/14	FOR APPROVAL	KA

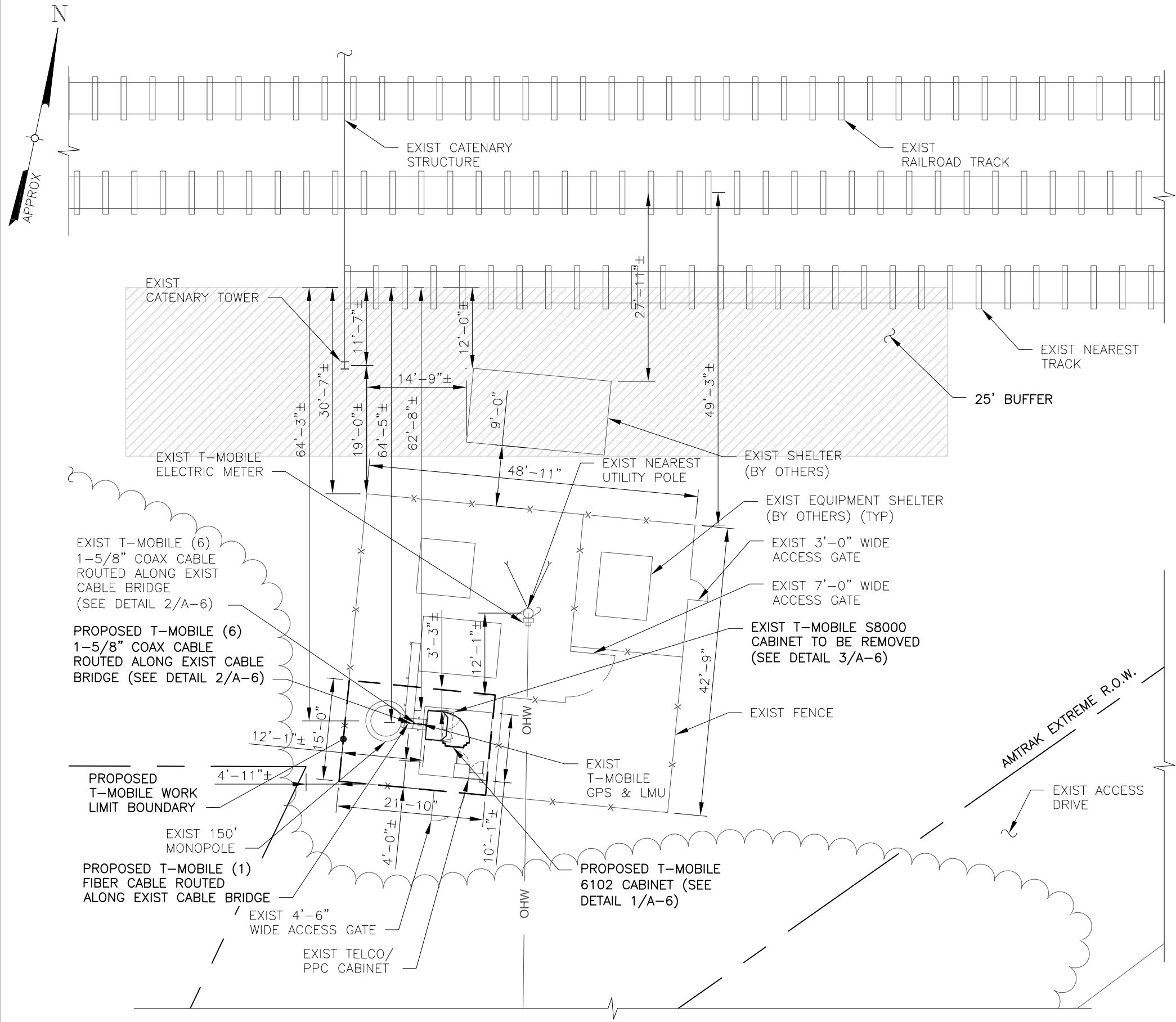
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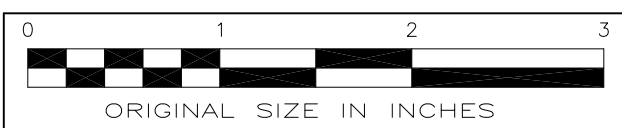
SITE INFORMATION
CT11327A
AMTRAK-OLD SAYBROOK
AMTRAK MAINTENANCE YARD
OLD SAYBROOK, CT

SHEET TITLE
EQUIPMENT PLAN
& PHOTO

SHEET NUMBER
A-2



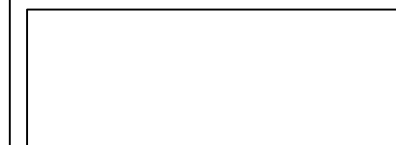
2 PHOTO
A-2 SCALE: N.T.S.



1 EQUIPMENT PLAN
A-2 SCALE: 3/16" = 1'-0"



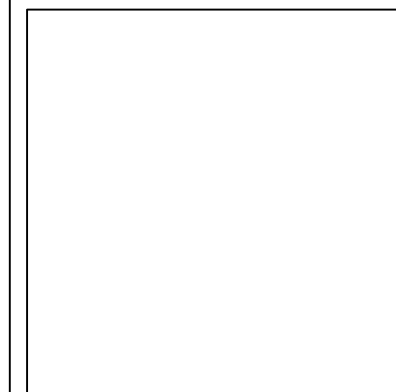
12050 BALTIMORE AVENUE
BELTSVILLE, MD 20705



PROJECT NUMBER: 6421.CT11327A
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REV	DATE	REVISION	DRAWN BY
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ISSUED BY: _____ DATE: _____



SITE INFORMATION

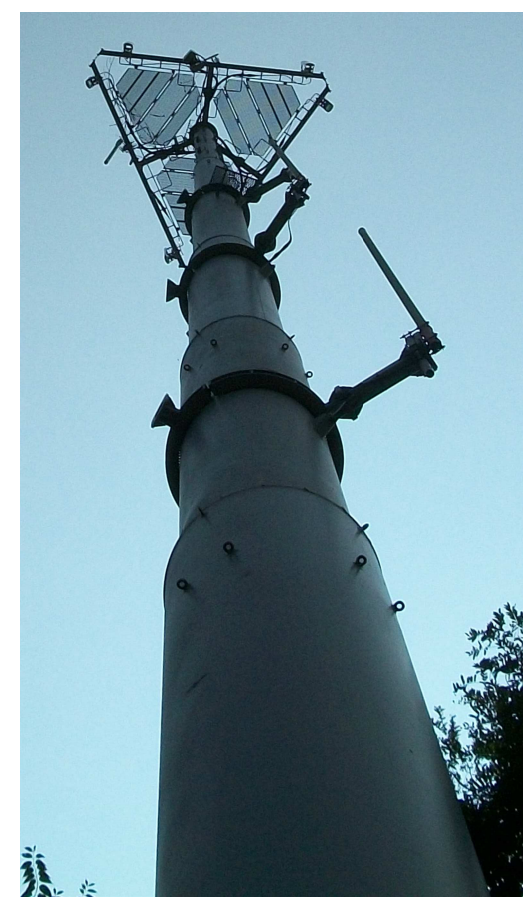
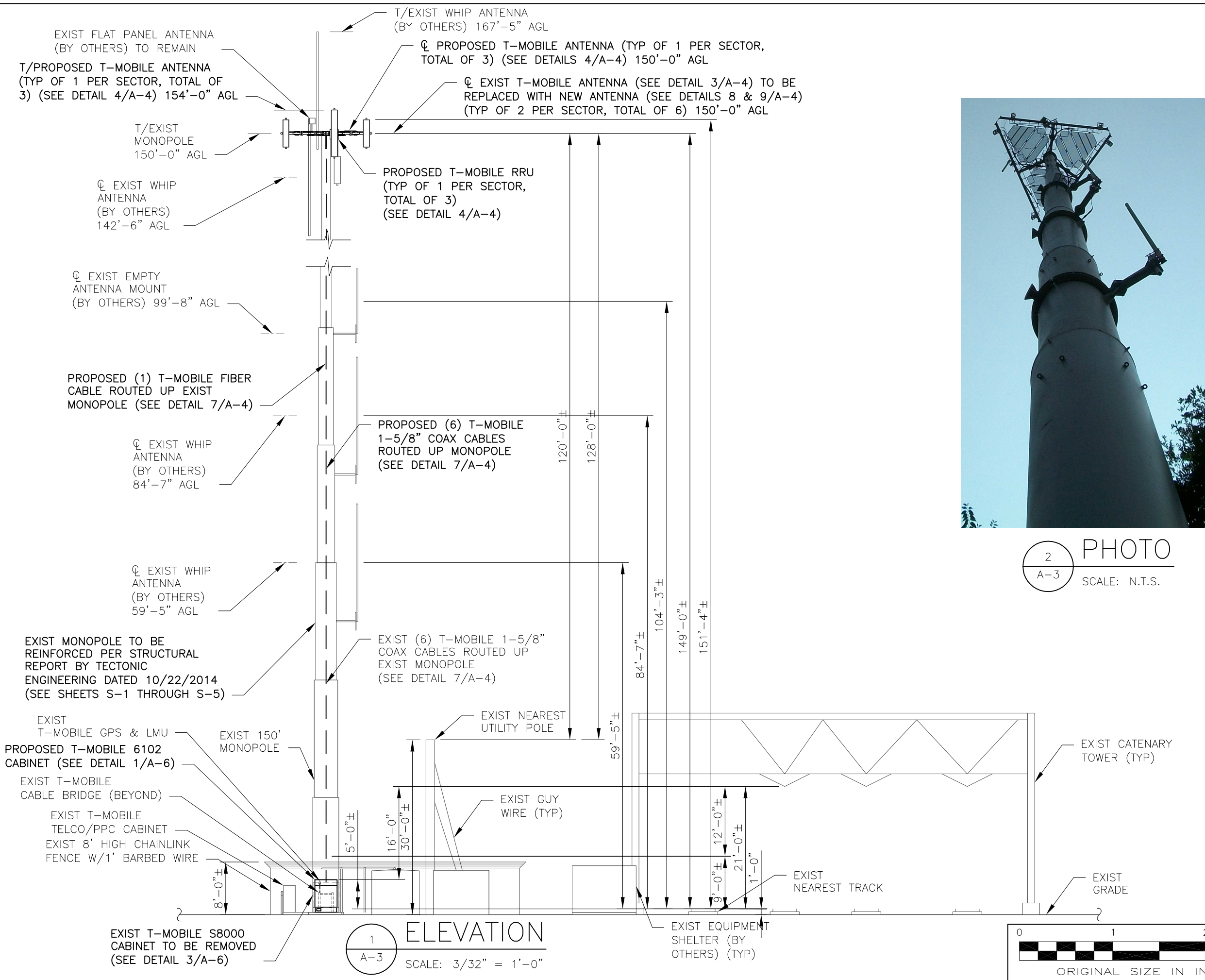
CT11327A
AMTRAK-OLD SAYBROOK
AMTRAK MAINTENANCE YARD
OLD SAYBROOK, CT

SHEET TITLE

ELEVATION & PHOTO

SHEET NUMBER

A-3



2 PHOTO
A-3 SCALE: N.T.S.

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





12050 BALTIMORE AVENUE
BELTSVILLE, MD 20705

PROJECT NUMBER DESIGNED BY

6421.CT11327A MP

REV DATE REVISION DRAWN BY

0 11/5/14 FOR APPROVAL KA

ISSUED BY DATE

SITE INFORMATION

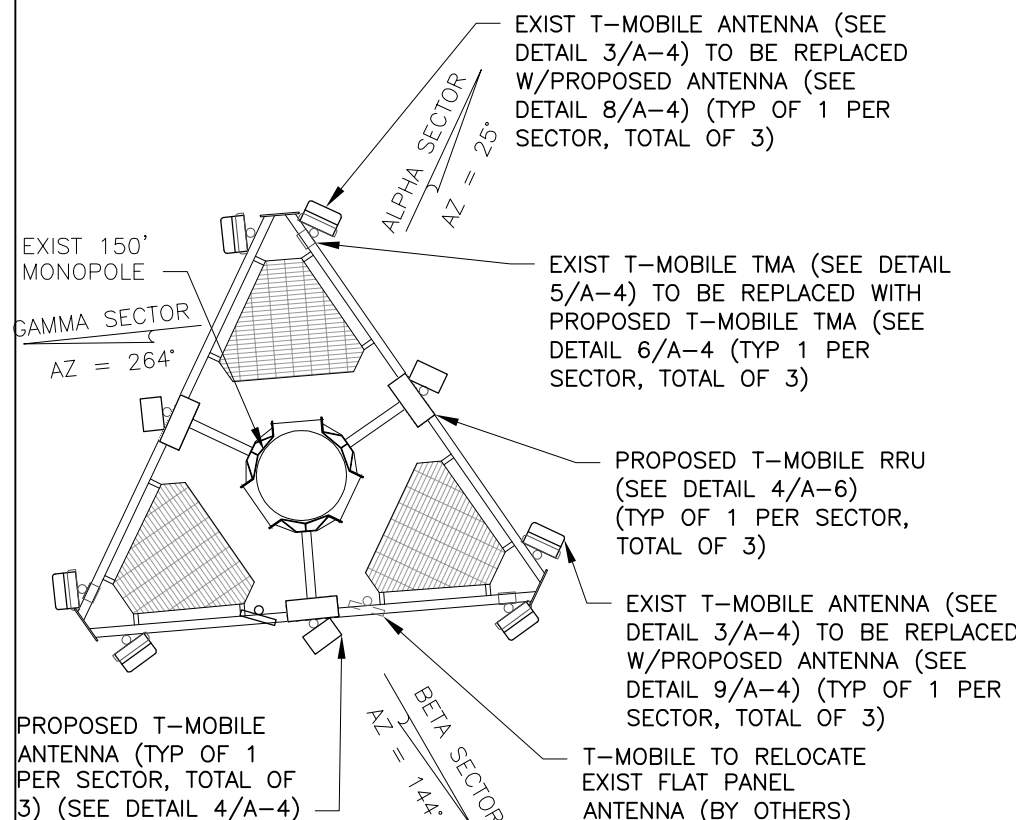
CT11327A
AMTRAK-OLD SAYBROOK
AMTRAK MAINTENANCE YARD
OLD SAYBROOK, CT

SHEET TITLE

ANTENNA PLAN, DETAILS & PHOTO

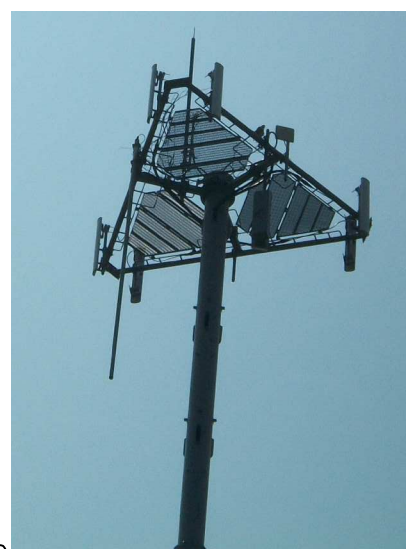
SHEET NUMBER

A-4



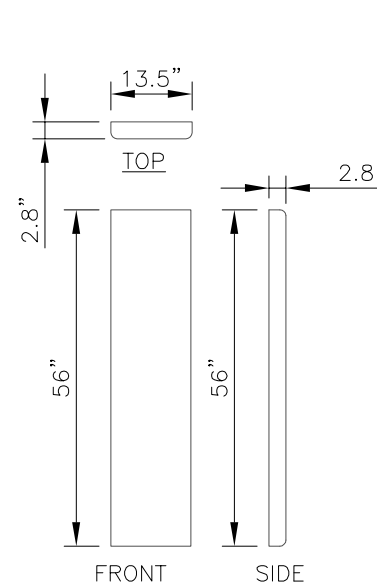
1 ANTENNA PLAN

A-4 SCALE: 3/8" = 1'-0"



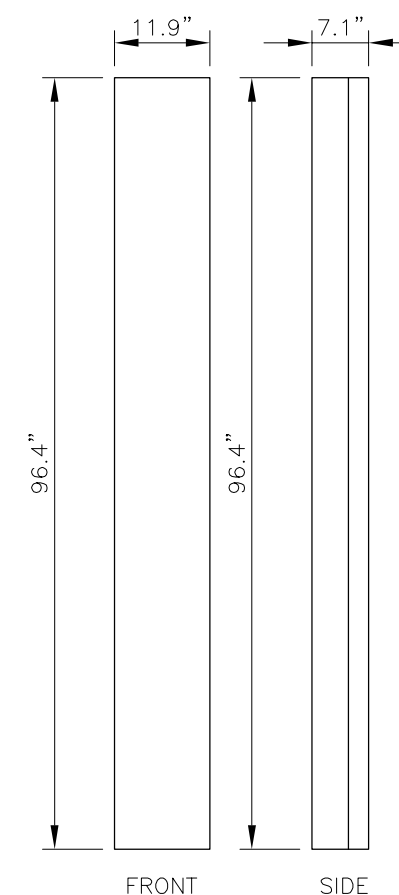
2 PHOTO

A-4 SCALE: N.T.S.



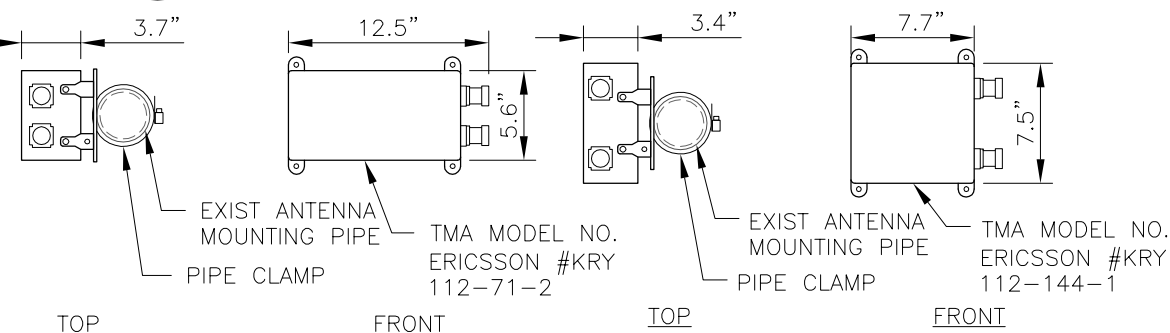
3 ANTENNA (EXIST)

A-4 SCALE: 3/8" = 1'-0"



4 ANTENNA (NEW)

A-4 SCALE: 1/2" = 1'-0"

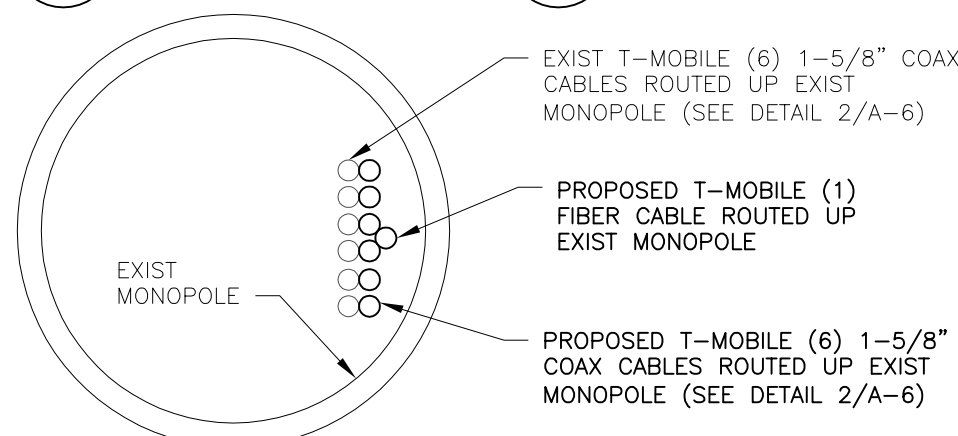


5 TMA (EXIST)

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

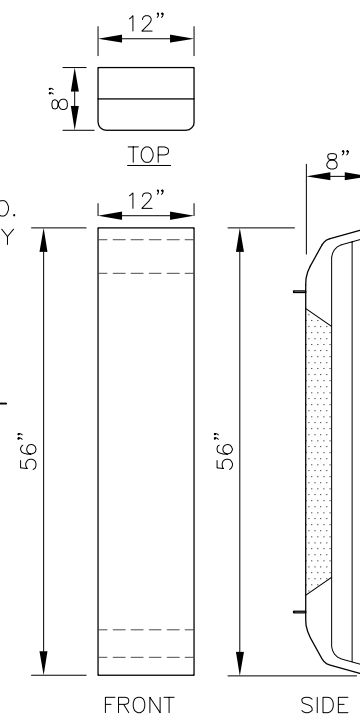
6 TMA (PROPOSED)

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



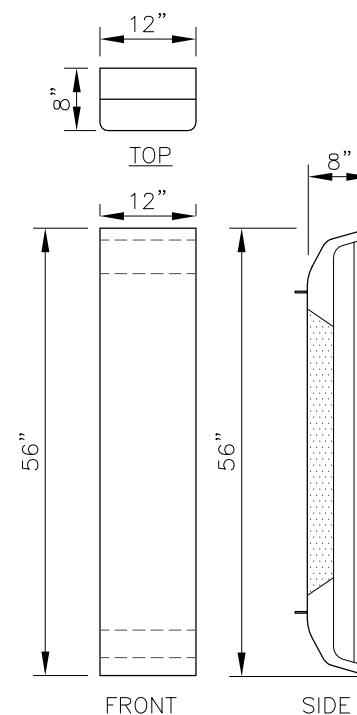
7 CABLE MOUNTING DETAIL

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



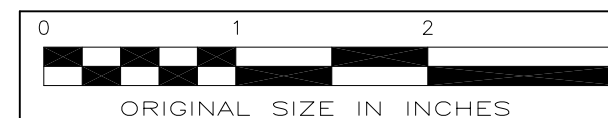
8 ANTENNA (NEW)

A-4 SCALE: 1/2" = 1'-0"



9 ANTENNA (NEW)

A-4 SCALE: 1/2" = 1'-0"





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SITE INFORMATION

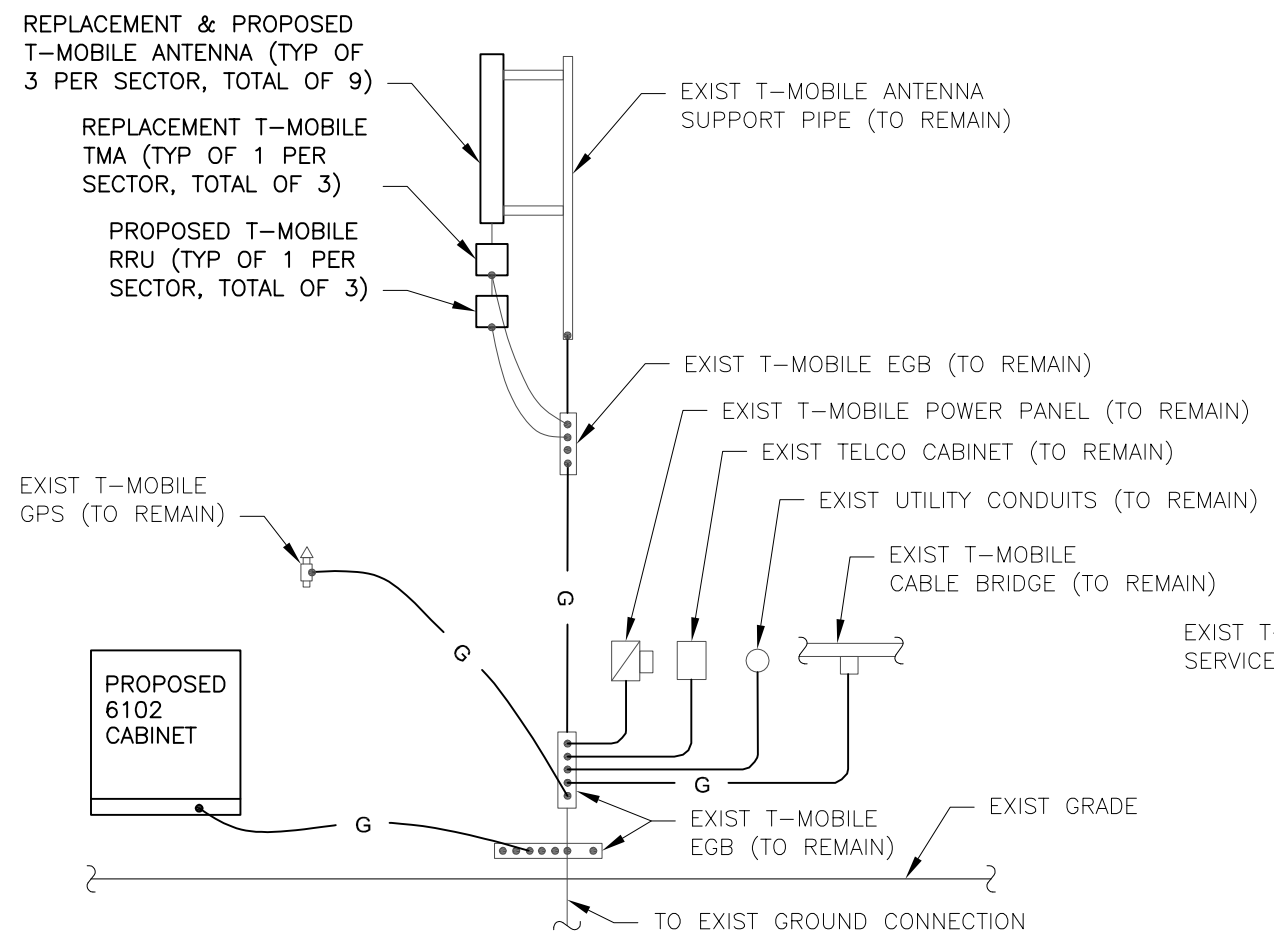
CT11327A
AMTRAK-OLD SAYBROOK
AMTRAK MAINTENANCE YARD
OLD SAYBROOK, CT

SHEET TITLE

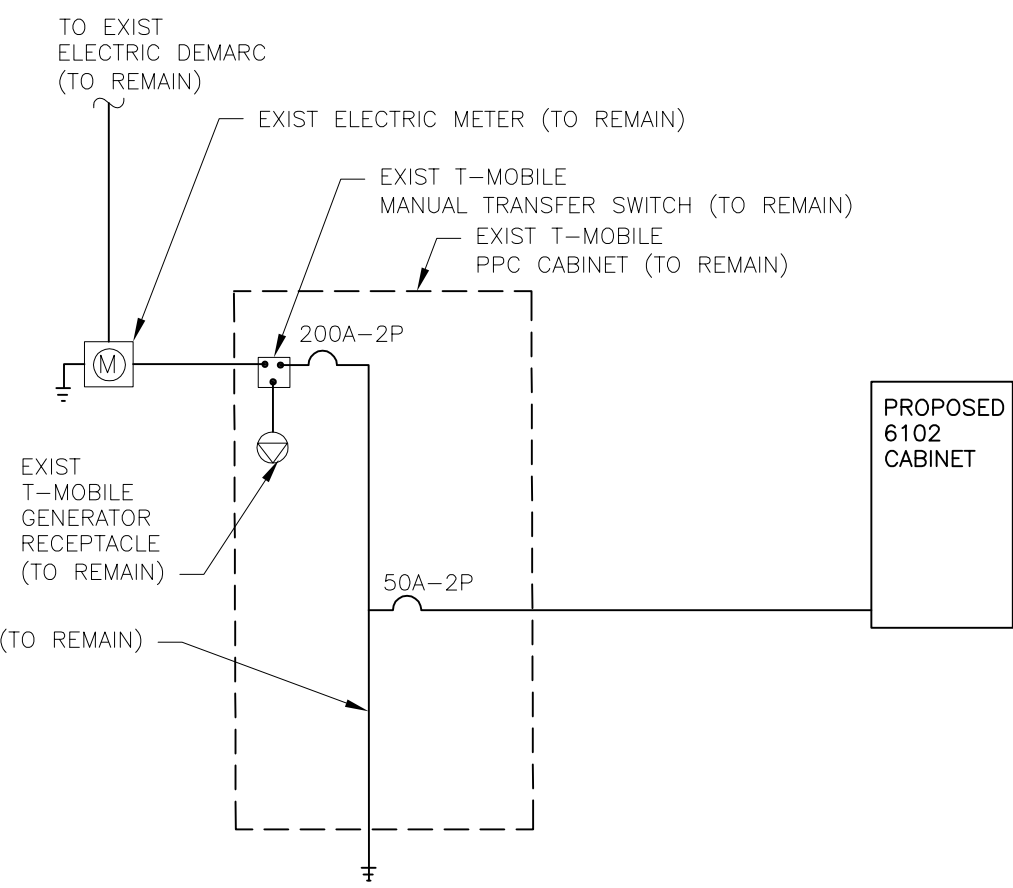
WIRING DIAGRAM

SHEET NUMBER

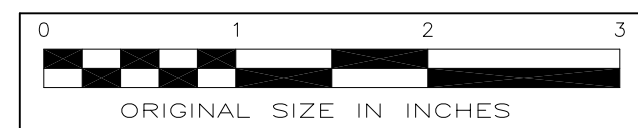
A-5



1 GROUNDING RISER DIAGRAM
A-5 SCALE: NTS



2 ONE-LINE POWER DIAGRAM
A-5 SCALE: NTS





TECHNICAL SPECIFICATIONS RBS 6102

CONFIGURATIONS:	3x8 + 3x8 GSM dualband 3x4 MIMO WCDMA + 3x4 MIMO WCDMA dualband 3x20 MHz MIMO LTE + 3x20 MHz MIMO LTE dualband Mix of above configuration is supported
MECHANICAL DIMENSION HxWxD:	1450 x 1300 x 700 mm
WEIGHT, FULLY EQUIPPED:	990 kg, including batteries
SITE POWER:	100 - 250 V AC -48 V DC
TRANSMISSION:	E1/T1/J1 STM-1 10G/100G Base-T Ethernet Space for at least 5U of customer equipment even in a fully configured RBS
TEMPERATURE RANGE:	-20 °C to +50 °C

1 **6102 CABINET (PROPOSED)**
A-6 SCALE: NTS

Technical Specifications

Frequency range
Indoor: 850/1900 MHz GSM / 900 MHz EGSM / 900/1800 MHz GSM / 900 MHz GSM-R
Outdoor: GSM 850/ 1900/ E 900/ 900/ 1800

Receive sensitivity
without diversity: -110 dBm guaranteed (w/o TMA)
with diversity: -115 dBm guaranteed (w/o TMA)

Dimensions
Height: 1700 mm (Indoor) 1600 mm (Outdoor)
Width: 750 mm (Indoor) 1350 mm (Outdoor)
Depth: 450 mm (Indoor) 650 mm (Outdoor)

Weight
Fully Equipped: 250 kg (Indoor) 440 kg (Outdoor)

Capacity
Standard: 8 TRX per radio cabinet, up to 3 radio cabinets

Configuration
Trisectorial: Up to S888
Omnidirectional: up to O16

Amplifier Output Power
Standard: 30W (+/- 0.5 dB)
Optional: 60W (+/- 0.5 dB), frequency dependent

Power Control
Static: 6 steps of 2 dB
Dynamic: 15 steps of 2 dB

Supported Vocoders
Full Rate (FR), Enhanced Full Rate (EFR), Half Rate (AMR HR)

Power Supply
Indoor: Nominal -48V Rate Voltage Range -57V to -40.5V
Outdoor: 230V AC 50/60 Hz



3 **S8000 CABINET (EXIST)**
A-6 SCALE: NTS

Product Specifications



LDF7-50A
LDF7-50A, HELIAX® Low Density Foam 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

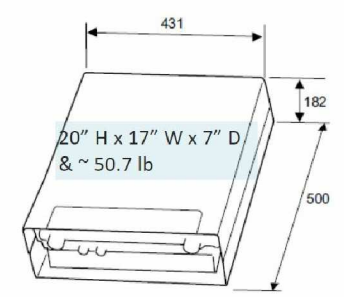
Cable Impedance	50 ohm ±1 ohm
Capacitance	23.1 pF/ft 75.8 pF/m
dc Resistance, Inner Conductor	0.250 ohms/kft 0.820 ohms/km
dc Resistance, Outer Conductor	0.160 ohms/kft 0.525 ohms/km
dc Test Voltage	11000 V
Inductance	0.190 µH/m 0.058 µH/ft
Insulation Resistance	100000 Mohms•km
Jacket Spark Test Voltage (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)

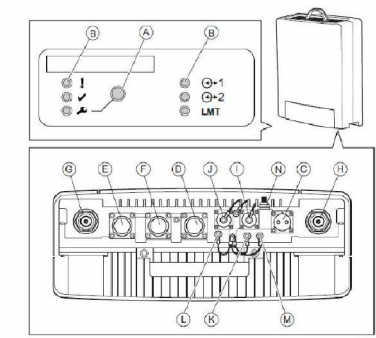
2 **COAX CABLE (PROPOSED)**
A-6 SCALE: NTS

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	
Grey	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	A1
H	Antenna 2	B1
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 **RRU**
A-6 SCALE: NTS

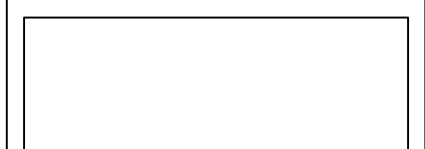
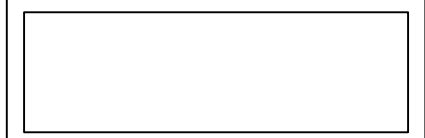


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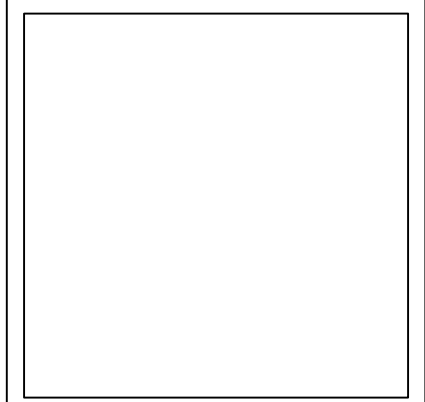
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SPECIFICATIONS

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A-6

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Product Data Sheet HB158-1-13U6-S6F18 **RFS**

HYBRIFLEX™ RRH Hybrid Feeder Cabling Solution, 1-5/8", Single-Mode Fiber

Product Description

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

It was developed to reduce installation complexity and costs at Cellular sites. HYBRIFLEX allows mobile operators deploying an RRH architecture to standardize the RRH installation process and eliminate the need for and cost of cable grounding. HYBRIFLEX combines optical fiber (multi-mode or single-mode) and power in a single corrugated cable. Standard RFS CELLFLEX® accessories can be used with HYBRIFLEX cable.

Features/Benefits

- Aluminum corrugated armor with outstanding bending characteristics - minimizes installation time and enables mechanical protection and shielding
- Same accessories as 1 5/8" coaxial cable
- Outer conductor grounding - Eliminates typical grounding requirements and saves on installation costs
- Lightweight solution and compact design - Decreases tower loading
- Robust cabling - Eliminates need for expensive cable trays and ducts
- Installation of tight bundled fiber optic cable pairs directly to the RRH - Reduces CAPEX and wind load by eliminating need for interconnection
- Optical fiber and power cables housed in single corrugated cable - Saves CAPEX by standardizing RRH cable installation and reducing installation requirements
- UL-listed, flame-retardant jacket, UV protected assembly - Allows both indoor and outdoor applications



Figure 1: HYBRIFLEX Series

Technical Specifications

Structure:			
Outer Conductor Armor:	Corrugated Aluminum	[mm (in)]	46.5 (1.83)
Jacket:	Flame Retardant, Chlorin-based Thermoplastic, Zero-Halogen	[mm (in)]	50.3 (1.98)
UV-Protection:	Individual and External Jackets		Yes
Mechanical Properties:			
Weight, Approximate:		[kg/m (lb/ft)]	2.8 (1.9)
Minimum Bending Radius, Single Bending:		[mm (in)]	250 (10)
Minimum Bending Radius, Repeated Bending:		[mm (in)]	500 (20)
Recommended/Maximum Clamp Spacing:		[m (ft)]	1.0 / 1.2 (3.25 / 4.0)
Electrical Properties:			
DC Resistance Outer Conductor Armor:		[Ohm (Ω)/1000ft]	0.58 (0.178)
DC Resistance Power Cable, 13.3mm (0.525in):		[Ohm (Ω)/1000ft]	1.37 (0.42)
Fiber Optic Properties:			
Version:			Single-mode OM3
Quantity, Fiber Count:			12 (6 pairs)
Core/Clad:		[µm]	50/125
Primary Coating (Acrylate):		[µm]	245
Buffer Diameter, Nominal:		[µm]	900
Secondary Protection, Jacket, Nominal:		[mm (in)]	2.0 (0.08)
Minimum Bending Radius:		[mm (in)]	104 (4.1)
Insertion Loss @ wavelength 1310nm:		dB/km	0.5
Insertion Loss @ wavelength 1550nm:		dB/km	0.5
Standards (Meets or exceeds):			UL94-V0, UL1666, RoHS Compliant
DC Power Cable Properties:			
Size (Power):		[mm² (AWG)]	13.3 (6)
Quantity, Wire Count (Power):			12 (6 pairs)
Size (Alarm):		[mm² (AWG)]	0.8 (18)
Quantity, Wire Count (Alarm):			6 (3 pairs)
Type:			UV protected
Strands:			19
Primary Jacket Diameter, Nominal:		[mm (in)]	6.8 (0.27)
Standards (Meets or exceeds):			Power 1000p
	UL Standard 30G2, 1581 VW-1		UL Standard 82, 1581
	MTW Oil and Gasoline RES1		National Electrical Code, NFPA 70
	SUNRES (Cable meets UL requirements)		VW-1, Style-2, THWN-2
	RoHS/REACH Compliant		Sunlight Resistance
			RoHS/REACH Compliant
			Oil and Gasoline Resistance II
Environment:			
Installation Temperature:		[°C (°F)]	-20 to +65 (-4 to +149)
Operation Temperature:		[°C (°F)]	-40 to +65 (-40 to +149)
Storage Temperature:		[°C (°F)]	-40 to +70 (-40 to +158)

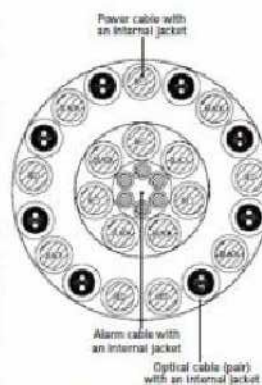
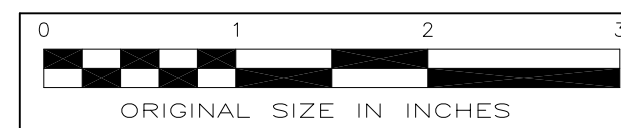
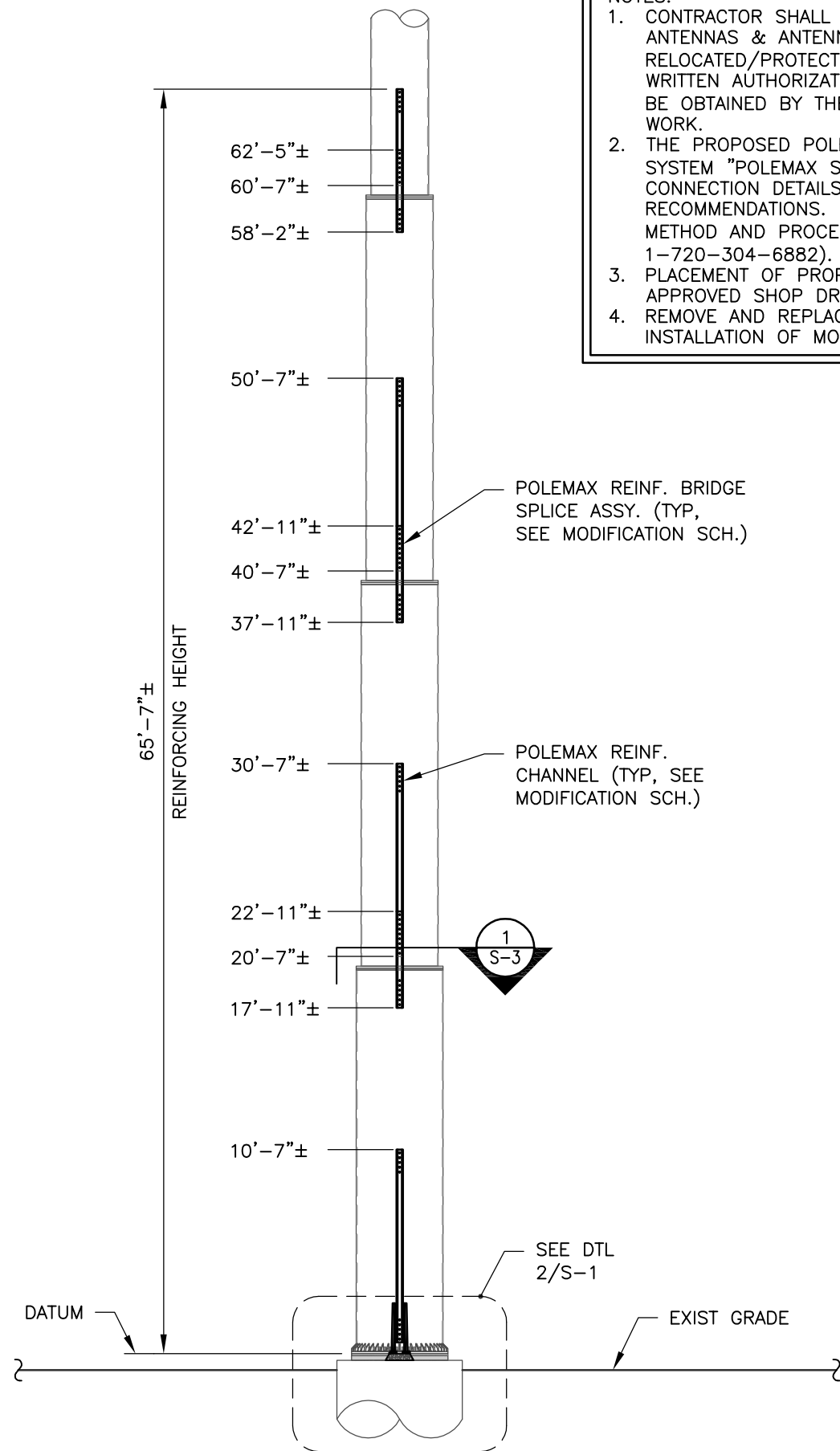


Figure 2: Construction Detail

1 FIBER CABLE (PROPOSED)
A-7 SCALE: NTS

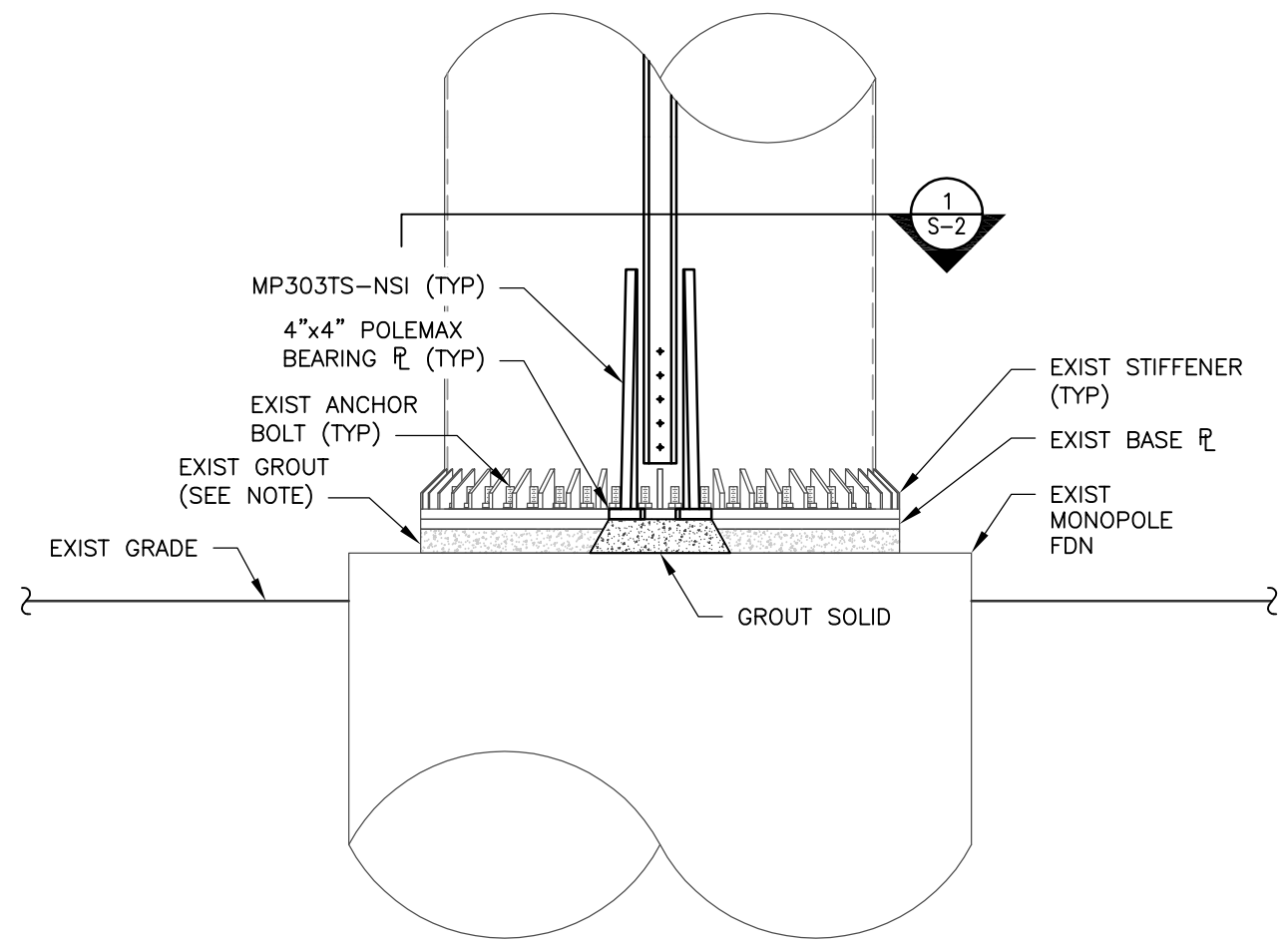




1
S-1
REINF. ELEVATION
SCALE: 1/8" = 1'-0"

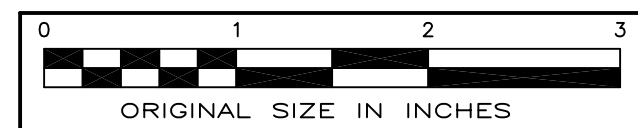
NOTES:
 1. CONTRACTOR SHALL IDENTIFY EXISTING CABLES, CABLE ATTACHMENTS, ANTENNAS & ANTENNA SUPPORT FRAMES THAT WILL NEED TO BE TEMPORARILY RELOCATED/PROTECTED FOR INSTALLING THE PROPOSED REINFORCEMENT. WRITTEN AUTHORIZATION FROM THE RESPECTIVE CARRIERS OR OWNERS SHALL BE OBTAINED BY THE CONTRACTOR/CLIENT PRIOR TO PROCEEDING WITH THE WORK.
 2. THE PROPOSED POLE REINFORCEMENT IS DESIGNED USING PROPRIETARY SYSTEM "POLEMAX SYSTEMS" AS MANUFACTURED BY AEROSOLUTIONS, LLC. CONNECTION DETAILS AS SHOWN ARE BASED ON MANUFACTURER RECOMMENDATIONS. CONTRACTOR SHALL COORDINATE FINAL INSTALLATION METHOD AND PROCEDURE WITH THE MANUFACTURER (CONTACT NUMBER: 1-720-304-6882).
 3. PLACEMENT OF PROPOSED REINFORCEMENT IN FIELD SHALL BE BASED ON APPROVED SHOP DRAWINGS PREPARED BY THE MANUFACTURER.
 4. REMOVE AND REPLACE EXISTING CLIMBING RUNGS AS REQUIRED TO ALLOW FOR INSTALLATION OF MONOPOLE REINFORCING.

MODIFICATION SCHEDULE	
ELEVATION	REINFORCING PART NUMBER
7"± TO 10'-7"±	(3) MP303-10-NSI CHANNELS
17'-11"± TO 22'-11"±	(3) MP304BS BRIDGE SPLICE ASSY.
20'-7"± TO 30'-7"±	(3) MP304-10-NSI CHANNELS
37'-11"± TO 42'-11"±	(3) MP304BS BRIDGE SPLICE ASSY.
40'-7"± TO 50'-7"±	(3) MP304-10-NSI CHANNELS
58'-2"± TO 62'-5"±	(3) MP303BS BRIDGE SPLICE ASSY.
60'-7"± TO 65'-7"±	(3) MP303-05-NSI CHANNELS



NOTE: EXISTING GROUT BELOW THE BASE PLATE IS DETERIORATED. WE RECOMMEND THAT ALL EXISTING GROUT BE REMOVED AND REPACKED WITH NEW GROUT, SEE NOTE 26 ON SHEET S-5.

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



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ELEVATION & DETAIL

SHEET NUMBER
S-1



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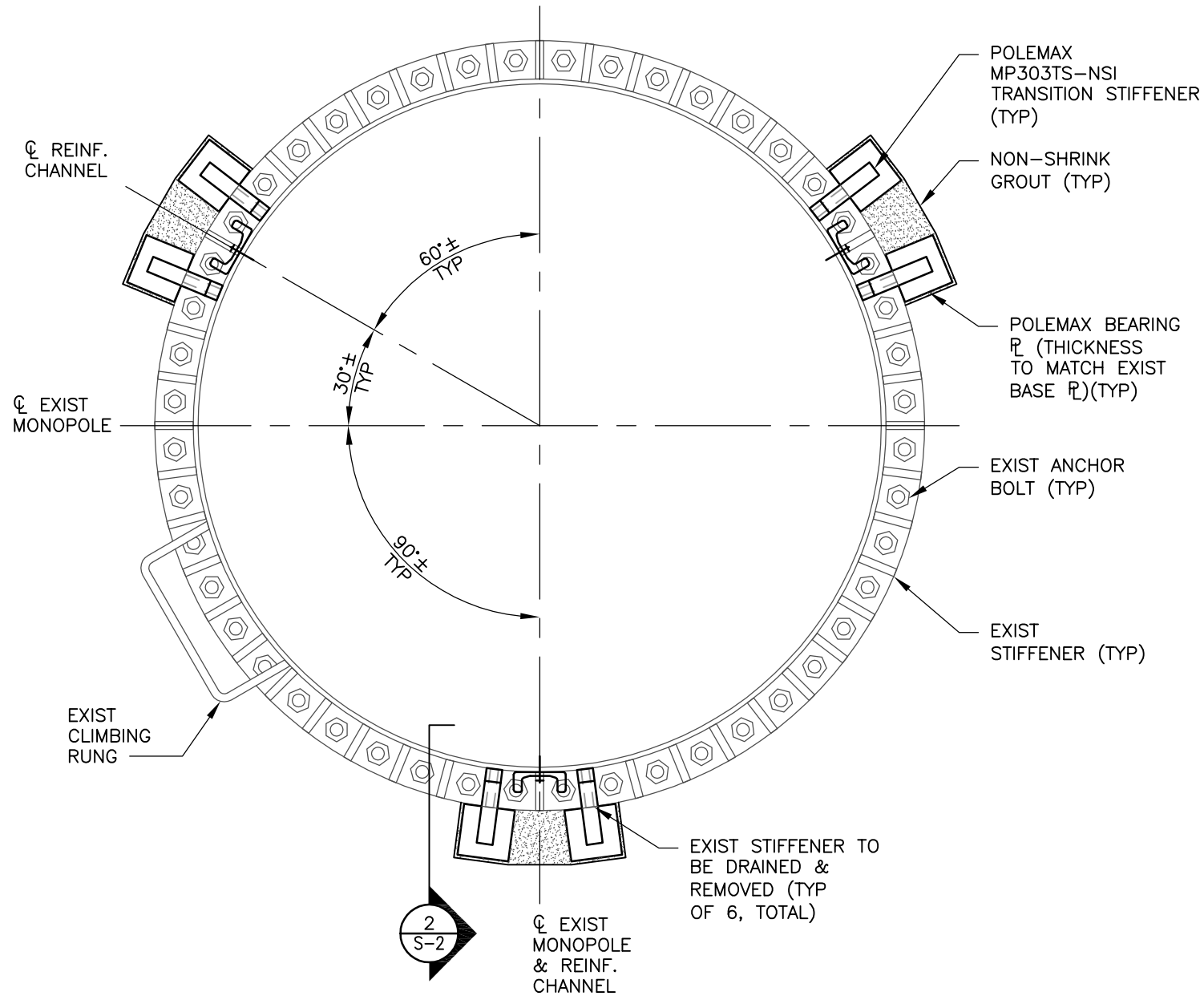
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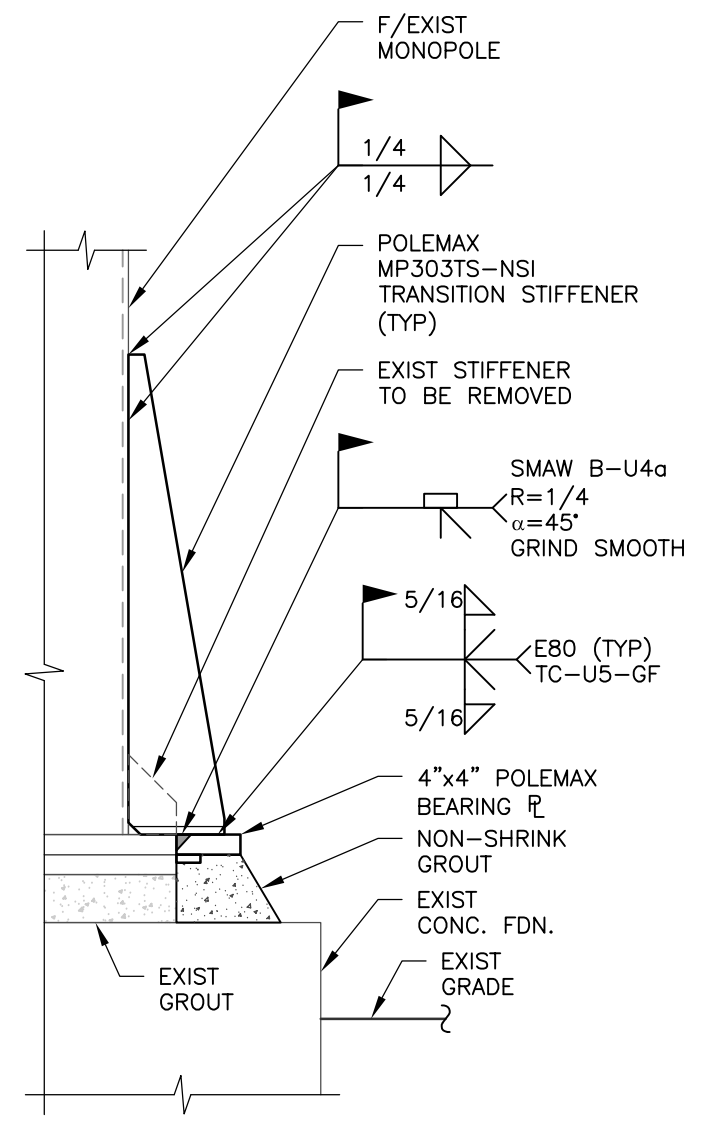
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CT11327A
AMTRAK-OLD SAYBROOK
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OLD SAYBROOK, CT

SHEET TITLE
BASE REINF.
PLAN & SECTION

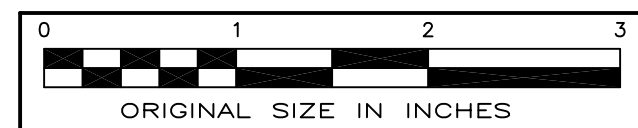
SHEET NUMBER
S-2



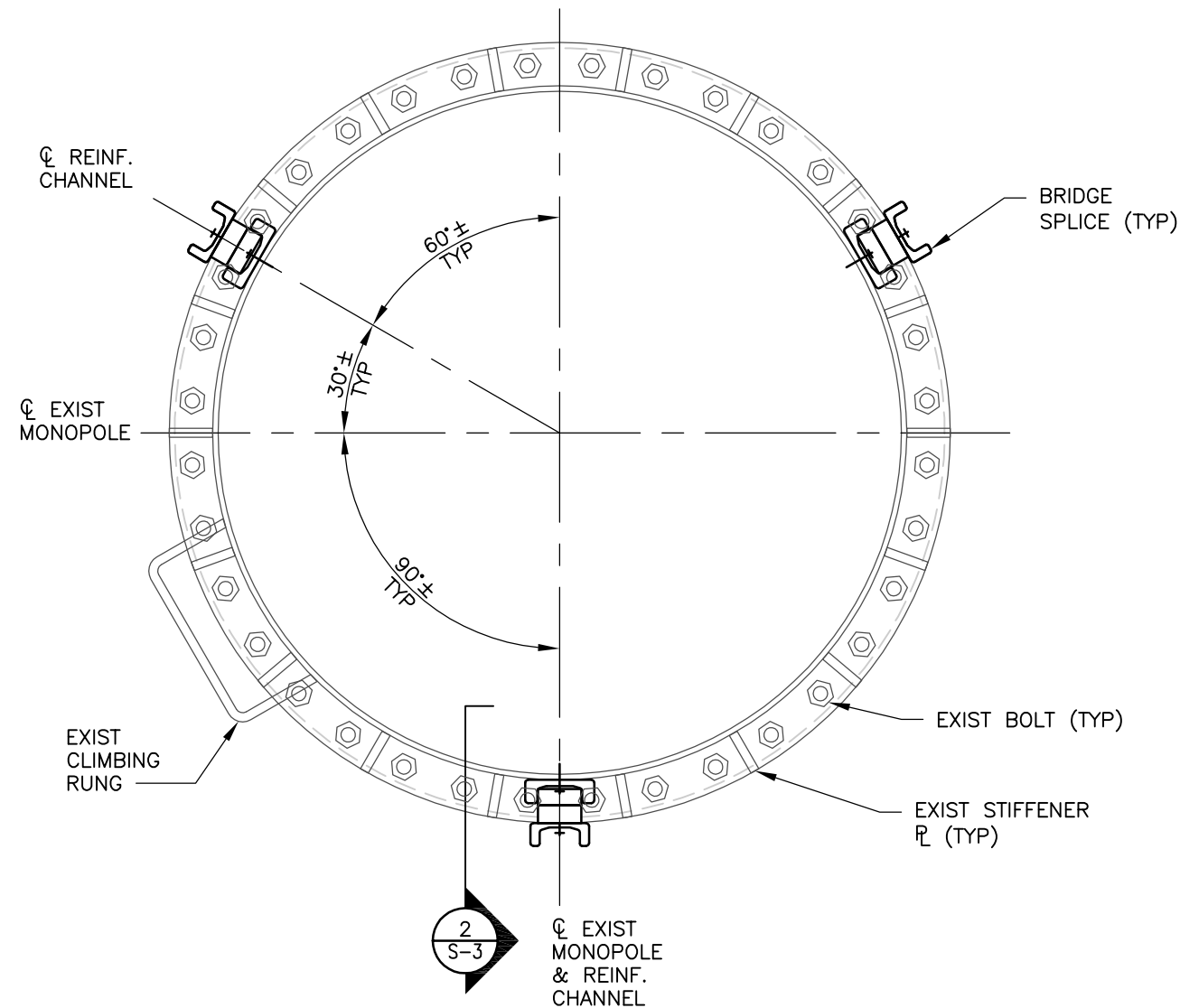
1 BASE REINF. PLAN
 S-2 SCALE: 1" = 1'-0"



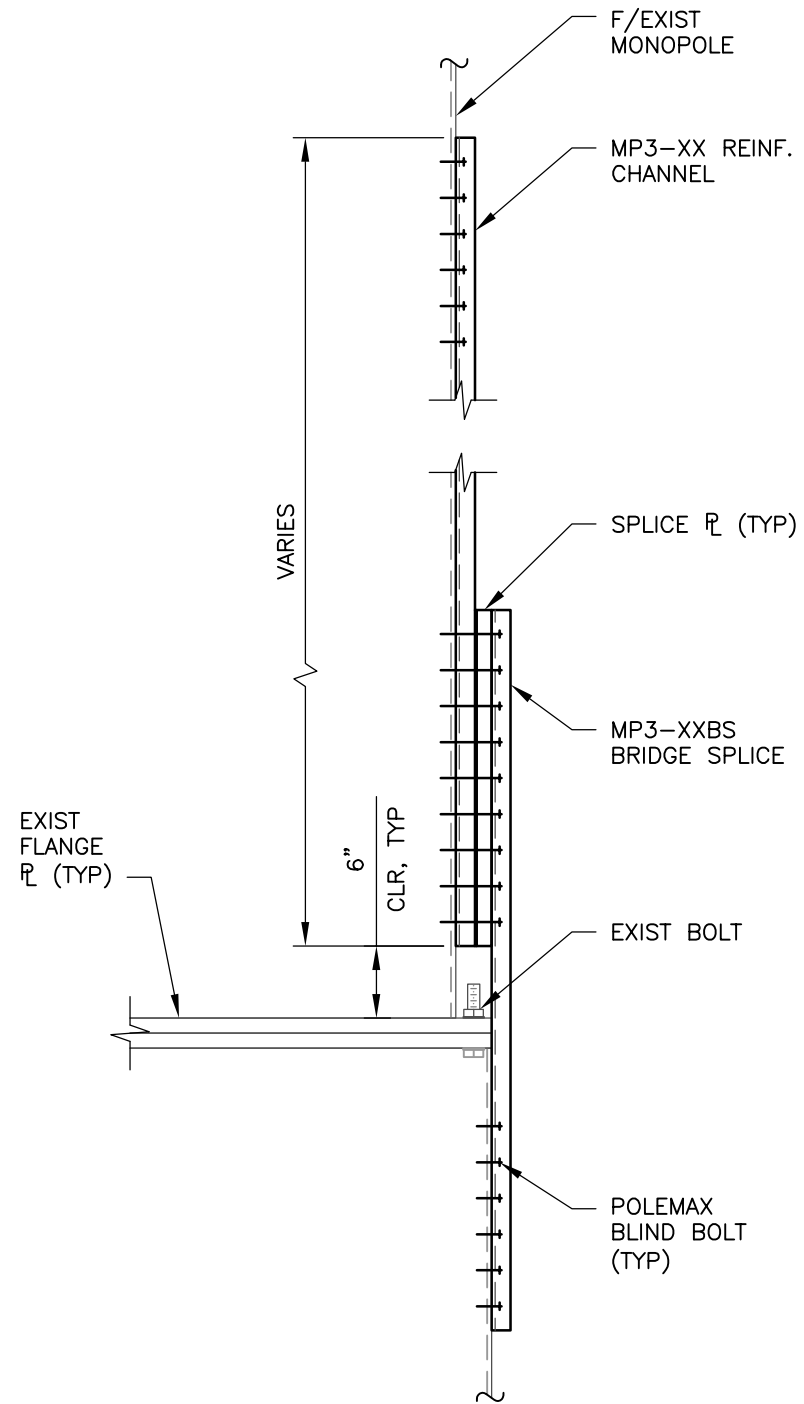
2 BASE REINF. SECTION
 S-2 SCALE: 1" = 1'-0"



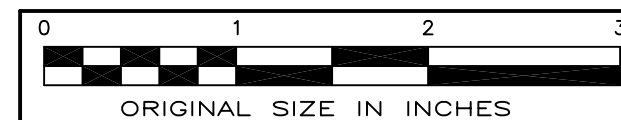
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1 BRIDGE SPLICE ASSY. PLAN
S-3 SCALE: 1" = 1'-0"



2 BRIDGE SPLICE ASSY. SECTION
S-3 SCALE: 3/4" = 1'-0"



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SHEET TITLE

BRIDGE SPLICE
PLAN & SECTION

SHEET NUMBER

S-3

GENERAL NOTES

1. ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE 2003 IBC, 2003 IRC (STATE BUILDING CODE, 2005 CT SUPPLEMENT), AND ALL OTHER APPLICABLE CODES AND ORDINANCES.
2. REINFORCEMENT OF THE EXISTING MONOPOLE HAS BEEN DESIGNED TO SUPPORT THE ANTENNAS AND CABLES LISTED IN THE STRUCTURAL ANALYSIS REPORT BY TECTONIC ENGINEERING & SURVEYING CONSULTANTS P.C., REVISION 1, DATED 10/22/14.
3. MONOPOLE AND FOUNDATION WAS ANALYZED IN CONFORMANCE TO ANSI/TIA-EIA-222-F, "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES".
4. DETAILS ARE INTENDED TO SHOW END RESULT OF DESIGN. MINOR MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK.
5. CONTRACTOR SHALL INSPECT THE EXISTING STRUCTURE PRIOR TO STARTING ANY WORK. IF CONDITIONS OR MATERIALS FOUND IN THE FIELD DIFFER FROM THOSE INDICATED, CONTACT THE ENGINEER FOR APPROVAL.
6. CONTRACTOR SHALL RECEIVE CLARIFICATION IN WRITING, AND SHALL RECEIVE IN WRITING AUTHORIZATION TO PROCEED BEFORE STARTING WORK ON ANY ITEMS NOT CLEARLY DEFINED OR IDENTIFIED BY THE CONTRACT DOCUMENTS.
7. CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK USING THE BEST CONSTRUCTION SKILLS AND ATTENTION. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER CONTRACT, UNLESS OTHERWISE NOTED.
8. CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF THE WORK AREA, ADJACENT AREAS AND BUILDING OCCUPANTS THAT ARE LIKELY TO BE AFFECTED BY THE WORK UNDER THIS CONTRACT. WORK SHALL CONFORM TO ALL OSHA REQUIREMENTS.
9. ALL MONOPOLE REINFORCEMENT SHALL BE COMPLETED PRIOR TO INSTALLATION OF PROPOSED ANTENNAS, MOUNTS, AND CABLES.
10. ALL WORK SHALL BE PERFORMED IN CALM WEATHER, WITH WIND GUSTS LESS THAN 10 MPH.
11. PROVIDE TEMPORARY BRACING, AS REQUIRED, TO MAINTAIN MONOPOLE ALIGNMENT AND PLUMBNESS DURING REINFORCEMENT OF MEMBERS AND FOUNDATION.
12. PROTECT EXISTING CABLES AND EQUIPMENT FROM DAMAGE DURING INSTALLATION OF ANTENNAS AND REINFORCING.
13. GROUNDING SYSTEM SHALL BE CHECKED AND UPGRADED AS NECESSARY, AS DIRECTED BY THE CONSTRUCTION MANAGER.

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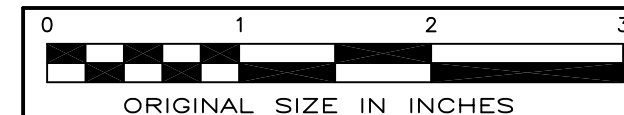
CT11327A
AMTRAK-OLD SAYBROOK
AMTRAK MAINTENANCE YARD
OLD SAYBROOK, CT

SHEET TITLE

GENERAL NOTES

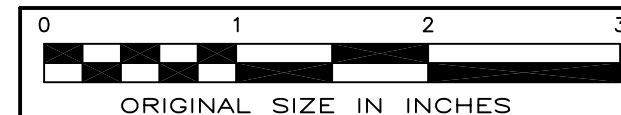
SHEET NUMBER

S-4



STEEL NOTES

1. DESIGN AND CONSTRUCTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, 2005".
2. CONNECTIONS: WELD OR BOLT CONNECTIONS, AS INDICATED:
 - A) CONNECTIONS NOT DETAILED ON THE DRAWINGS SHALL CONFORM TO THE REQUIREMENTS OF THE CITED AISC SPECIFICATION.
 - B) STRUCTURAL BOLTS SHALL CONFORM TO THE LATEST ASTM A325 "HIGH STRENGTH BOLTS FOR STRUCTURAL JOINTS, INCLUDING SUITABLE NUTS AND PLAIN HARDENED WASHERS".
 - C) WHERE THE REACTION VALUES OF BEAMS, BRACING, STRUTS, ETC., ARE NOT SHOWN ON THE DRAWINGS THE CONNECTIONS SHALL BE DESIGNED TO SUPPORT THE END REACTION DERIVED FROM THE TABLES AND FORMULA OF UNIFORM LOAD CONSTANTS IN PART 2, NINTH EDITION, OF THE AISC MANUAL OF STEEL CONSTRUCTION FOR THE GIVEN MEMBER SIZE, SPAN, AND YIELD STRENGTH.
 - D) MINIMUM 3/16" FILLET E70-XX WELD SHALL APPLY UNLESS NOTED.
 - E) MINIMUM 1/2" DIA. A325 BOLTS SHALL APPLY UNLESS NOTED.
 - F) MINIMUM SIZE OF CLIP ANGLES SHALL BE L3x3x1/4" UNLESS NOTED.
 - G) ALL GUSSET PLATES SHALL BE 3/8" THICK UNLESS NOTED.
 - H) ALL HOLES FOR BOLTS SHALL BE 1/16 INCH LARGER THAN THE BOLT DIAMETER WITH AN EDGE DISTANCE OF AT LEAST 1 1/2 TIMES THE BOLT DIAMETER AND A SPACING OF AT LEAST 3 TIMES THE BOLT DIAMETER. ALL BOLTS SHALL BE PROVIDED WITH PALNUTS OR LOCK NUTS.
3. STEEL ANGLES AND PLATES SHALL CONFORM TO ASTM A36 "CARBON STRUCTURAL STEEL", UNLESS OTHERWISE INDICATED.
4. ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS OTHERWISE NOTED.
5. ALL BOLTS SHALL BE HIGH STRENGTH BOLTS (HSB) CONFORMING TO ASTM A325 "STRUCTURAL BOLTS, STEEL, HEAT TREATED, 120/105 KSI MINIMUM TENSILE STRENGTH", WITH THREADS EXCLUDED FROM SHEAR PLANES (TYPE X). FULLY THREADED BOLTS (A325T) SHALL NOT BE USED.
6. U-BOLTS SHALL CONFORM TO ASTM A36 OR A307 "CARBON STEEL BOLTS AND STUDS, 60,000 PSI TENSILE STRENGTH". INSTALL DOUBLE NUTS ON ALL CONNECTIONS.
7. MATCHING NUTS SHALL BE HEAVY HEX TYPE, CONFORMING TO ASTM A563, "CARBON AND ALLOY STEEL NUTS".
8. ALL U-BOLTS SHALL BE 1/2" DIAMETER IN 9/16" DIAMETER HOLES, UNLESS OTHERWISE NOTED.
9. ALL BOLTS, U-BOLTS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE", UNLESS OTHERWISE NOTED.
10. DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED BY COLD GALVANIZING IN ACCORDANCE WITH ASTM A780 "REPAIR OF DAMAGED AND UNCOATED AREAS OF HOT-DIP GALVANIZED COATINGS".
11. ALL BOLT HOLES SHALL BE DRILLED OR PUNCHED 1/16" LARGER IN DIAMETER THAN THE CONNECTING BOLT, UNLESS OTHERWISE NOTED. THERMAL CUTTING OF HOLES (ARC OR TORCH) IS NOT PERMITTED.
12. ALL CONNECTIONS TO BE SNUG TIGHT TYPE IN ACCORDANCE WITH THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS".
13. CONTRACTOR SHALL COMPLY WITH AWS D1.1 "STRUCTURAL WELDING CODE - STEEL" FOR PROCEDURES, APPEARANCE AND QUALITY OF WELDS, AND FOR METHODS USED IN CORRECTING WELDING. ALL WELDERS AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES".
14. REMOVE ALL GALVANIZING IN AREAS TO BE WELDED BY GRINDING. AFTER WELDING, PROTECT ALL EXPOSED STEEL AND WELDS BY COLD GALVANIZING.
15. SPACES BETWEEN INTERMITTENT WELDS SHALL BE FILLED USING CHEM-CALK 500 AS MANUFACTURED AND MARKETED BY BOSTIK SEALANTS, MIDDLETON, MA 01949 (800) 523-2678 OR APPROVED EQUAL.
16. ALL WELDING TO THE TOWER SHALL BE PERFORMED WITH E80XX LOW HYDROGEN ELECTRODES, UNLESS OTHERWISE NOTED. LOW HYDROGEN ELECTRODES SHALL BE PURCHASED IN HERMETICALLY SEALED CONTAINERS AND SHALL BE USED WITHIN 4 HOURS AFTER OPENING THE CONTAINER. ELECTRODES NOT USED WITHIN 4 HOURS SHALL BE DISCARDED.
17. ALL FIELD WELDING SHALL BE VISUALLY INSPECTED BY AN AWS CERTIFIED WELDING INSPECTOR PRIOR TO INSTALLATION OF THE PROPOSED ANTENNAS.
18. FIELD VERIFY LENGTHS OF ALL MATERIAL PRIOR TO FABRICATION.
19. INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE ENGINEER PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER APPROVAL.
20. REINFORCING CHANNEL SHALL BE POLEMAX MP303/MP304 AS MANUFACTURED BY AEROSOLUTIONS, LLC. A SHOP DRAWING DETAILING THE PROPOSED REINFORCING SHALL BE SUPPLIED TO THE CONTRACTOR BY THE MANUFACTURER.
21. POLEMAX BLIND BOLT FASTENERS SHALL BE AJAX BOLT ASSEMBLIES AS MANUFACTURED BY AJAX FASTENERS, OR APPROVED EQUAL. UTILIZE 3/4" DIAMETER BOLTS UNLESS NOTED OTHERWISE.
22. AJAX BOLT SLEEVES HAVE BEEN SIZED TO ENGAGE THE POLE SHAFT AND NEW REINFORCEMENT. THE SLEEVES ARE TO BE INSERTED FIRMLY AGAINST SPLIT WASHER INSIDE POLE AND HAVE A 1/8" TO 1/4" GAP BETWEEN THE OUTMOST BOLTING SURFACE AND THE OUTERMOST SURFACE OF THE SLEEVE. THE CONTRACTOR SHALL INCORPORATE THE NECESSARY MEASURES TO ENSURE THAT THE SLEEVES DO NOT SLIDE FORWARD AND THEY REMAIN POSITIONED TOWARD THE BACKSIDE OF THE HOLE ENGAGING BOTH SIDES OF THE SHEAR PLANE BETWEEN THE POLE SHAFT AND THE NEW REINFORCEMENT.
23. BLIND BOLTS SHALL BE INSTALLED, TENSIONED AND INSPECTED IN ACCORDANCE WITH THE AISC "TURN-OF-NUT" METHOD AS SPECIFIED IN THE AISC BOLT SPECIFICATION DATED 12/31/2009.
24. TRANSITION STIFFENERS, BEARING PLATES (FOOT PADS), CHANNEL SPLICES AND SHIMS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
25. GROUT SHALL BE NON-METALLIC, NON-SHRINK PREPACKAGED GROUT WITH A MINIMUM COMPRESSIVE STRENGTH OF 7,500 PSI AT 28 DAYS REQUIRING ONLY THE ADDITION OF WATER. GROUT SHALL BE FIVE STAR GROUT AS MANUFACTURED BY FIVE STAR PRODUCTS INC., FAIRFIELD, CT OR APPROVED EQUAL. GROUT SHALL BE MIXED AND PLACED IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS.



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- PLANNING
- ENGINEERING
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- CONSTRUCTION MANAGEMENT

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Consultants P.C.

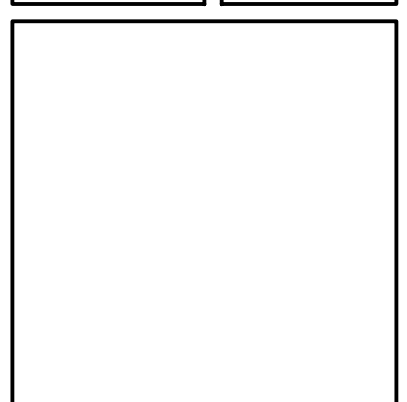
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PROJECT NUMBER	DESIGNED BY
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ISSUED BY	DATE



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

SHEET TITLE
STEEL NOTES

SHEET NUMBER
S-5