

JANUARY 29, 2020

REHABILITATION OF BRIDGE NO. 03903 MOSHER AVENUE  
OVER AMTRAK RAILROAD

FEDERAL AID PROJECT NO. 6058(002)  
STATE PROJECT NO. 0058-0336  
TOWN OF GROTON

ADDENDUM NO. 3

SPECIAL PROVISIONS

NEW SPECIAL PROVISION

The following Special Provision is hereby added to the Contract:

- ITEM NO. 1803300A – IMPACT ATTENUATION SYSTEM (TANGENTIAL)

REVISED SPECIAL PROVISIONS

The following Special Provisions are hereby deleted in their entirety and replaced with the attached like-named Special Provisions:

- NOTICE TO CONTRACTOR – AWARD AND EXECUTION OF CONTRACT
- NOTICE TO CONTRACTOR – WORK ON OR ABOVE AMTRAK  
PROPERTY

CONTRACT ITEMS

NEW CONTRACT ITEM

<u>ITEM NO.</u>	<u>DESCRIPTION</u>	<u>UNIT</u>	<u>QUANTITY</u>
<u>0949000</u>	<u>WOOD CHIP MULCH</u>	<u>SY</u>	<u>16</u>

REVISED CONTRACT ITEMS

<u>ITEM NO.</u>	<u>DESCRIPTION</u>	<u>ORIGINAL QUANTITY</u>	<u>REVISED QUANTITY</u>
<u>0202000</u>	<u>EARTH EXCAVATION</u>	<u>156 CY</u>	<u>175 CY</u>
<u>0214100</u>	<u>COMPACTED GRANULAR FILL</u>	<u>18 CY</u>	<u>19 CY</u>
<u>0219003</u>	<u>SEDIMENTATION CONTROL FILTER FABRIC FENCE SYSTEM</u>	<u>850 LF</u>	<u>1,090 LF</u>
<u>0305000</u>	<u>PROCESSED AGGEGATE</u>	<u>110 TON</u>	<u>170 TON</u>
<u>0406171</u>	<u>HMA S.05</u>	<u>396 TON</u>	<u>416 TON</u>
<u>0406173</u>	<u>HMA S.025</u>	<u>27 TON</u>	<u>23 TON</u>

<u>0514271A</u>	<u>PRECAST CONCRETE/STEEL COMPOSITE SUPERSTRUCTURE</u>	<u>4,362 SF</u>	<u>3,709 SF</u>
<u>0601054A</u>	<u>ULTRA HIGH PERFORMANCE CONCRETE</u>	<u>9 CY</u>	<u>8 CY</u>
<u>0601062</u>	<u>FOOTING CONCRETE</u>	<u>20 CY</u>	<u>22 CY</u>
<u>0601064</u>	<u>ABUTMENT AND WALL CONCRETE</u>	<u>21 CY</u>	<u>22 CY</u>
<u>0601121</u>	<u>PARAPET CONCRETE</u>	<u>62 CY</u>	<u>63 CY</u>
<u>0811001</u>	<u>CONCRETE CURBING</u>	<u>425 LF</u>	<u>340 LF</u>
<u>0910170</u>	<u>METAL BEAM RAIL (TYPE R-B 350)</u>	<u>219 LF</u>	<u>213 LF</u>
<u>0921001</u>	<u>CONCRETE SIDEWALK</u>	<u>1,115 SF</u>	<u>1,150 SF</u>
<u>0924002</u>	<u>CONCRETE DRIVEWAY RAMP</u>	<u>25 CY</u>	<u>16 CY</u>
<u>0944000</u>	<u>FURNISHING AND PLACING TOPSOIL</u>	<u>1,562 SY</u>	<u>1,600 SY</u>
<u>0950005</u>	<u>TURF ESTABLISHMENT</u>	<u>1,562 SY</u>	<u>1,600 SY</u>
<u>1210101</u>	<u>4" WHITE EPOXY RESIN PAVEMENT MARKINGS</u>	<u>395 LF</u>	<u>455 LF</u>

**PLANS**

**REVISED PLANS**

The following Plan Sheets are hereby deleted and replaced with the like-numbered Plan Sheets:

- 02.01.A3
- 03.03.A3, 03.04.A3, 03.05.A3, 03.07.A3, 03.08.A3, 03.09.A3, 03.10.A3, 03.14.A3, 03.15.A3, 03.16.A3, 03.17.A3
- 04.08.A3
- 05.02.A3, 05.08.A3, 05.09.A3, 05.11.A3, 05.15.A3, 05.18.A3
- 06.08.A3

The Detailed Estimate Sheets do not reflect these changes.

The Bid Proposal Form has been revised to reflect these changes.

There will be no change in the number of calendar days due to this Addendum.

The foregoing is hereby made a part of the contract.

**NOTICE TO CONTRACTOR – AWARD AND EXECUTION OF CONTRACT**

Project No. 58-336 is anticipated to have a Notice to Proceed prior to April 1, 2020. See Section 1.03 – Award and Execution of Contract.

Work anticipated April 1, 2020 to November 30, 2020 includes, but is not limited to, utility work (by others), mobilization, construction staking and layout, clearing and grubbing, shop drawings, fabrication, Prefabricated Bridge Unit (PBU) construction, installing sedimentation and erosion control measures, installing temporary fence, M&PT measures, installing temporary shields, permanent underground utility relocation, temporary above ground utility relocation, demolition of the south overhang, earth stabilization, temporary pavement, installation of the temporary utility bridge, temporary barriers, temporary bituminous sidewalk, and site cleanup.

Work anticipated November 30, 2020 to April 1, 2021 includes, but is not limited to, ground preparation for cranes above temporary earth stabilization, demolition of the north overhang, modification of the shielding, crane mobilization, Placement of PBU Module A, placement of PBU module B, removal of existing deck slab and concrete encasement, temporary bracing of the through-girders, removal of floor beams and stringers, removal of temporary shielding, removal of through-girders.

The bridge is anticipated to be closed Monday through Friday during one (1) week in the Fall of 2020 for the soil reinforcement construction to take place. Work for the soil reinforcement will include excavation of contaminated soils, which shall be direct hauled from the site. Overnight work is anticipated in order to complete the soil reinforcement in the allotted time period. The bridge closure will extend from Monday, 12 A.M. to Friday, 11:59 P.M. of the same week (total of five (5) days). The week chosen for this work shall be approved by the District.

The full bridge closure for the replacement of the superstructure is anticipated to start March 3, 2021 and be complete by May 30, 2021.

**ITEM #1803300A – IMPACT ATTENUATION SYSTEM (TANGENTIAL)**

Work under this item shall conform to the requirements of Section 18.03, amended as follows:

**18.03.02 – Materials:** Replace this section with the following:

The impact attenuation system (tangential) shall be the SKT-SP type TL-2, available through the following supplier:

Road Systems, Inc.  
3616 Old Howard County Airport Road  
Big Spring, Texas 79720  
Phone: (432) 263-2435  
Fax: (432) 267-4039

The reflector shall meet requirements of M18.09.

<u>Pay Item</u>	<u>Pay Unit</u>
Impact Attenuation System (Tangential)	L.F.

## **NOTICE TO CONTRACTOR – WORK ON OR ABOVE AMTRAK PROPERTY**

The Contractor acknowledges that work to be accomplished under this Contract is to be performed on Railroad territory, which consists of territory owned by the National Railroad Passenger Corporation (Amtrak). The Contractor's work must be accomplished simultaneously with ongoing daily railroad operations. Such operations include, but are not limited to, the passage of trains, storage of trains, flagging, inspection, repair, construction, reconstruction, and maintenance of the railroad right-of-way and facilities and must be in conformance with Amtrak EP3014.

The Contractor will be required to perform the following on or above Amtrak Right of Way:

1. Construct temporary utility support structure
2. Demolish existing structure
3. Construct new structure including, but not limited to:
  - a. Lifting and setting Prefabricated Bridge Units (PBU)
  - b. Placing concrete deck closure pours
  - c. Setting and relocating temporary structure barrier
  - d. Forming and placing cast-in-place parapets and sidewalks on structure
  - e. Installing protective fencing

The Contractor is advised that Amtrak controls all activity and the Department expects that these conditions may cause delays and possibly a complete suspension of construction activity. If the Contractor is delayed or suspended in the completion of work by Amtrak operations or restrictions, the Contractor will be entitled to a time extension for every full day that he can demonstrate that the delays affected the completion date of the contract. This extension of time will be considered non-compensable and the Contractor will not be entitled to any additional compensation for damages incurred for all direct and indirect costs including, but not limited to, all delay and impact costs, and inefficiencies.

There is a potential for limitations on track outages and extraordinary requirements for vehicular access coordination. The Contractor must conduct his work within such limitations. This will require night work and may require premium time (weekend work) or double shifts. The Contractor is fully responsible to complete the contract work.

### **Coordination of Work**

The Contractor shall be responsible for the coordination of the work of his various subcontractors. The Contractor shall coordinate his operations with those of the Railroad in carrying out railroad force account work.

Amtrak will make available railroad protection personnel and other railroad employees to provide various Support Services, including without limitation, protection services, inspection, and other services to ensure the safety of railroad operations and to protect contractor employees during the course of the construction. Notwithstanding any other provision of this contract, no work on the

project in the vicinity of Amtrak property may be performed before all protection services required by Amtrak are in place.

Amtrak will make available railroad construction personnel, to perform construction of Amtrak facilities in accordance with the plans. Specifically, all work involving rails, ties, ballast (uppermost 4" only), communication and signal equipment, and other Amtrak owned appurtenances, unless designated otherwise within the contract, will be performed by Amtrak. The contractor may not remove track unless given prior written approval by Amtrak and the Engineer.

The Contractor must make his own arrangements with Amtrak for the use of railroad equipment or changes in railroad facilities that are requested solely to facilitate the Contractor's operations. Any temporary at-grade crossings required to complete the project, if any, are identified on the plans. Temporary at-grade crossings other than those identified on the plans will not be permitted, except as approved by Amtrak. The expense incurred by making any such arrangement with Amtrak, including temporary at-grade crossings, shall be at the Contractors expense and not a part of this contract.

Some of the Contractor's activities will be required to take place during de-energizing of the catenary system. As the result of the time associated with Amtrak de-energizing and re-energizing the catenary system, there is a potential for limitations on track outages or foul time. The Contractor must conduct his work within such limitations. This may require the Contractor to perform night work, weekend work, or multiple shifts, all of which may be at premium time. The Contractor is fully responsible to complete the contract work.

The Contractor is notified the Contract plans may not reflect the current configuration of the railroad. Furthermore, the existing track structure may differ from the historical configuration of the railroad. It shall be the Contractor's responsibility to prepare a site specific work plan based on railroad facilities in their current configuration.

The work required to complete the project will require extensive coordination with Amtrak. As such, Amtrak has designated a primary point of contact for the initiative. All construction coordination, including but not limited to, scheduling of protection services, requesting of track outages, review/approval of site specific work plans, and other activities as determined by Amtrak, shall all be made through the designated point of contact. Amtrak's designee is:

Mr. Joseph Travaglino  
 Project Engineer  
 National Railroad Passenger Corporation (Amtrak)  
 MOW Base – Hamden CT  
 255 Welton Street, 2nd Floor Rear  
 Hamden, CT 06517  
 (201)397-4750  
[Joseph.Travaglino@amtrak.com](mailto:Joseph.Travaglino@amtrak.com)

### **Access to Amtrak Property**

Contractors seeking permission to enter Amtrak property in furtherance of the project, or to do work on, over or adjacent to Amtrak property must first execute Amtrak's then-current standard

“Temporary Permit to Enter Upon Property (Temporary Permit)” and comply with all requirements thereto, including but not limited to, all insurance and safety requirements. The current version of the Temporary Permit shall be obtained by the contractor directly from Amtrak.

All matters pertaining to the Amtrak Temporary Permit and Insurance Requirements shall be directed to:

Mr. Michael Kolonauski  
Senior Manager - Engineering  
National Railroad Passenger Corporation  
30th Street Station, 4S-027, Mailbox 64  
2955 Market Street  
Philadelphia, PA 19104  
Telephone No. (215) 349-1127  
[Michael.Kolonauski@Amtrak.com](mailto:Michael.Kolonauski@Amtrak.com)

### **Amtrak Contractor Safety and Security Training**

The Contractor, Subcontractors, and representative employees must first attend Owner’s Safety Orientation Class. They are required to comply with Owner’s safety requirements throughout the entire construction period. The Safety Orientation Class will be provided under the jurisdiction of the Project Engineer, who will be responsible to assure that the Contractor, Subcontractors, and the respective employees have completed the Safety Orientation Class. The Safety Orientation class is an online computer based program that is available 24 hours per day / 7 days per week, provided at the sole expense of the Contractor and Subcontractor on a per-person basis at <http://www.amtrakcontractor.com/>. All participants completing this course are required to be able to read, comprehend and demonstrate in English their understanding of the materials presented, as well as all the safety instructions, briefings and warnings. All other costs encountered due to complying with the Owner’s safety requirements will be at the sole expense of the Contractor and Subcontractor.

The Contractor should contact the Amtrak Contractor Safety Enrollment Coordinator for information concerning the training class. The coordinator’s contact information is as follows:

Mr. Joseph Travaglino  
Project Engineer  
National Railroad Passenger Corporation (AMTRAK)  
MOW Base – Hamden, CT  
255 Welton Street, 2<sup>nd</sup> Floor Rear  
Hamden, CT 0617  
Phone (201) 397-4750  
[Joseph.Travaglino@Amtrak.com](mailto:Joseph.Travaglino@Amtrak.com)

### **Potential Track Outages and Foul Time**

In general, unless otherwise authorized by Amtrak, operations directly over or adjacent to operating right-of-way will be performed during the time periods noted in the “Notice to Contractor – Allowable Track Outages”, elsewhere in these special provisions.

Amtrak anticipates that track outages from 11:30pm-3:30am (Mon-Sun) will be available in 2021, however, this is not guaranteed.

Overhead Catenary System (OCS) outages are required, therefore the available time will be reduced by 1 hour on each end to obtain/release the OCS clearance. Amtrak cannot guarantee the availability of any outage at a particular time. It should also be expressly understood that; a) actual length of time for any track outage is contingent upon operating schedules at time of construction; b) programmed Amtrak construction and maintenance work requiring track outage within the same operating block will have priority, therefore contract work requiring track outage, if scheduled within the same time frame, must be coordinated with such work; and c) the potential times for track outages are not guaranteed and are for normal operating conditions. Contractors will be required to submit a two week look ahead schedule to coordinate work outages with other projects. Outages are subject to availability based on Train operations and other Amtrak projects.

As established under the contract, and as detailed under the Standard Specifications (Form 817), this Notice to Contractor, and the additional Amtrak requirements included herein, the Contractor's operations shall be planned and staged to avoid track usage unless absolutely essential. The Contractor's plans for demolition, erection, and any operation adjacent to or within the Railroad Right of Way shall be submitted to the Engineer for Railroad approval, prior to start of work. Further, track usage is granted by Amtrak based on need, not for the convenience of the Contractor.

### **Train Operations**

- Currently, through the project area, there are 38 Amtrak trains Monday – Friday and 24 Saturday and 28 Sunday.
- There is one schedule freight train that runs from Monday through Friday at night, and no freight trains running on Saturday or Sunday day/night. However, this is subject to change.
- The maximum speed of passenger trains is 80 mph (35 mph freight). A “Slow Down Order” will not be in effect through the project site.
- The track(s) through the project site are considered “Main Line”.

### **Amtrak Specifications and Requirements**

The Contractor is hereby notified that the following railroad specifications are included as part of this Notice and shall be made a part of this contract. The Contractor shall be bound to comply with all requirements of these specifications. The requirements and conditions set forth in the subject specifications shall be binding on the Contractor just as any other specification would be.

EP3005 - PIPELINE OCCUPANCY

SECTION 2081A - PIPELINE OCCUPANCY



SECTION 2082A -	ADDITIONAL REQUIREMENTS FOR HORIZONTAL DIRECTIONAL DRILLING (HDD) / DIRECTIONAL BORING
EP3006 -	DESIGN AND CONSTRUCTION CRITERIA FOR OVERHEAD BRIDGES
EP3014 -	MAINTENANCE AND PROTECTION OF RAILROAD TRAFFIC DURING CONTRACTOR OPERATIONS
SECTION 01141A -	SAFETY AND PROTECTION OF RAILROAD TRAFFIC AND PROPERTY
SECTION 01142A -	SUBMISSION DOCUMENTATION REQUIRED FOR AMTRAK REVIEW AND APPROVAL OF PLANS FOR BRIDGE ERECTION, DEMOLITION AND OTHER CRANE/ HOISTING OPERATIONS OVER RAILROAD RIGHT-OF-WAY
SECTION 01520A -	REQUIREMENTS FOR TEMPORARY PROTECTION SHIELDS FOR DEMOLITION AND CONSTRUCTION OF OVERHEAD BRIDGES AND OTHER STRUCTURES
SECTION 02261A -	REQUIREMENTS FOR TEMPORARY SHEETING AND SHORING TO SUPPORT AMTRAK TRACKS
EP3016 -	STORM WATER DRAINAGE AND DISCHARGE FROM ADJACENT PROPERTY ONTO AMTRAK RIGHT OF WAY
SPEC. NO. 150 -	STORMWATER MANAGEMENT POLICY
AED-1	PROCEDURES AND DESIGN CRITERIA TO BE EMPLOYED BY ELECTRIFICATION CONSULTANTS ENGAGED IN THE DESIGN OF ELECTRIFICATION FACILITIES ON THE NATIONAL RAILROAD PASSENGER CORPORATION
CE-4	ELECTRIFIED TERRITORY SPECIFICATION FOR WIRE, CONDUIT AND CABLE OCCUPATIONS

### **Contractor Requirements for Work Affecting Amtrak Railroad**

The Contractor shall be governed by the terms of the Contract and the referenced sections of the document entitled “State of Connecticut Department of Transportation, Standard Specifications for Roads, Bridges, and Incidental Construction, Form 817,” dated 2016, and supplemental specifications thereto dated January 2019, with the following additions:

1. All matters requiring National Railroad Passenger Corporation (Amtrak) approval or coordination shall be directed to:

Mr. Michael Kolonauski  
Director I&C Projects  
Amtrak - National Railroad Passenger Corporation  
30<sup>th</sup> Street Station, 4S-027, Box 64  
2955 Market Street  
Philadelphia, PA 19104  
(215) 349-1127

2. In general, unless otherwise authorized by Amtrak, operations directly over or adjacent to operating right-of-way will be performed during the time periods noted in the “Notice to Contractor – Allowable Track Outages”, elsewhere in these special provisions.

Temporary at-grade crossings across any tracks in the project area for vehicles and equipment for ANY purpose shall be approved by AMTRAK. Railroad property shall be accessed as shown on the Contract Plans.

Any work involving rail, ties, and other track components on active tracks, unless specifically designated otherwise within the contract, will be performed by Amtrak employees.

All tracks within the project limits shall be assumed to be operating / live, unless otherwise designated by Amtrak.

### **Protection of Utilities**

All underground utilities, cable, and facilities must be located and protected before any excavating, drilling, boring/direction drilling, ground penetrating activities, or construction takes place. This includes railroad and commercial utilities, cables, duct lines, and facilities. These activities will not be performed in close proximity to the Amtrak duct lines unless monitored by on-site Amtrak Communications and Signal (C&S) department personnel. Hand digging may be required, as directed by Amtrak through the on-site Amtrak C&S support personnel. Amtrak maintains the right to access all existing cables and conduits throughout construction. Amtrak also reserves the right to upgrade and install new cables and conduits in the affected area. The “One-Call” process must be followed. Be aware that Amtrak is not a part of the One-Call process; contact Amtrak Engineering to have all Amtrak underground utilities and assets located. If requested by Amtrak, existing depths of utilities being crossed must be verified through test pits performed by the Contractor as directed by and under the direct supervision of Amtrak C&S support personnel. Precautions must be taken to prevent any interruption to Amtrak’s operation. Precautions must be taken to prevent any interruption to Amtrak’s operation.

### **Insurance Requirements**

Amtrak “Exhibit D Insurance Requirements” are attached to this NTC.

**Permit to Enter Upon Property**

All contractors must execute the then current version of Amtrak's "Temporary Permit to Enter Upon Property" which requires all persons that are on or adjacent to Amtrak property successfully complete the Contractor Orientation Training. All contractors must carry their "Amtrak Contractor Roadway Worker Protection" card with them at all times while on or adjacent to Amtrak property. Information for Temporary Permits to Enter Upon Amtrak Property (PTE) in the State of CT is attached to this NTC.

**Clearance Requirements**

This project requires shielding to protect the track(s) and train operations during construction. As far as practical, the shielding shall be designed and constructed to provide a clear envelope around the track(s) that is equal to or greater than the envelope shown in the detail titled "Standard Track Plan Minimum Roadway Clearances" which is included in the Amtrak Specifications and Requirements and attached to this NTC.

This project reuses the existing abutments and therefore does maintains the existing vertical underclearance. Final approval for Design Exception Request 01 (DER-01) was granted by Amtrak on 12/4/2017, and will be part of the approval of the "Site Specific Work Plan". The approved DER-01 is attached to this NTC.

Due to the site constraints on this project, a design exception from Amtrak has been requested allowing a smaller clearance envelope with the dimensions of 21'-4" vertically from the top of the rails to the shielding. Design Exception Request 02 (DER-02) has been approved and will be part of the "Site Specific Work Plan". The approved DER-02 is attached to this NTC.

EXHIBIT D**INSURANCE REQUIREMENTS**

NATIONAL RAILROAD PASSENGER CORPORATION (AMTRAK) CHICAGO  
 UNION STATION COMPANY (CUSCO)  
 WASHINGTON TERMINAL COMPANY (WTC)  
 Revised as of March 14, 2013

## DEFINITIONS

In these Insurance Requirements, "Railroad" or "Amtrak" shall mean National Railroad *Passenger* Corporation and, as appropriate, its subsidiaries Chicago Union Station Company ("CUSCO") and Washington Terminal Company ("WTC"). "Contractor" shall mean the party identified as "Permittee" in the Temporary Permit to Enter Upon Property Agreement or the party with whom Amtrak has contracted in another agreement (e.g., Preliminary Engineering Agreement, Design Phase Agreement, Construction Phase Agreement or Force Account Agreement), as well as its officers, employees, agents, servants, contractors, subcontractors, or any other person acting for or by permission of Contractor. "Operations" shall mean activities of or work performed by Contractor. "Agreement" shall mean the Temporary Permit to Enter Upon Property Agreement or other such agreement, as applicable.

## INSURANCE

Contractor shall procure and maintain, at its sole cost and expense, the types of insurance specified below. Contractor shall evidence such coverage by submitting to Amtrak the original Railroad Protective Liability Policy and certificates of insurance evidencing the other required insurance, prior to commencement of Operations. In addition, Contractor agrees to provide certified copies of the insurance policies for the required insurance within 30 days of Amtrak's written request. All *insurance* shall be procured from insurers authorized to do business in the jurisdiction(s) where the Operations are to be performed. Contractor shall require all subcontractors to carry the insurance required herein or Contractor may, at its option, provide the coverage for any or all subcontractors, provided the evidence of insurance submitted by Contractor to Amtrak so stipulates. The insurance shall provide for thirty (30) days prior written notice to Amtrak in the event coverage is substantially changed, canceled or non-renewed. All insurance shall remain in force until all Operations are satisfactorily completed (unless otherwise noted below), all Contractor personnel and equipment have been removed from Railroad property, and any work has been formally accepted. Contractor may provide for the insurance coverages with such deductibles or retained amounts as Amtrak may approve from time to time, except, however, that Contractor shall, at its sole expense, pay for all claims and damages which fall within such deductible or retained amount on the same basis as if there were full commercial insurance in force in compliance with these requirements. Contractor's failure to comply with the insurance requirements set forth herein shall constitute a violation of the Agreement.

1. Workers' Compensation Insurance complying with the requirements of the statutes of the jurisdiction(s) in which the Operations will be performed, covering all employees of Contractor.

Employer's Liability coverage with limits of not less than \$1 million each accident or illness shall be included.

In the event the Operations are to be performed on, over, or adjacent to navigable waterways, a U.S. Longshoremen and Harbor Workers' Compensation Act Endorsement and Outer Continental Lands Act Endorsement are required.

2. **Commercial General Liability (CGL) Insurance** covering liability of Contractor with respect to all operations to be performed and all obligations assumed by Contractor under the terms of the Agreement. Products-completed operations, independent contractors and contractual liability coverages are to be included, with the contractual exclusion related to construction/demolition activity within fifty (50) feet of the railroad deleted and no exclusions for Explosion/Collapse/Underground (X-C-U) applicable or added.

The policy shall name National Railroad Passenger Corporation and, as appropriate CUSCO or WTC, and all commuter agencies and railroads that operate over the property or tracks at issue as additional insureds with respect to the operations to be performed. In addition, the policy shall include an ISO endorsement Form CG 24 17 1001 or its equivalent providing contractual liability coverage for railroads listed as additional insureds. Coverage for such additional insureds shall be primary and non-contributory with respect to any other insurance the additional insureds may carry.

Coverage under this policy shall have limits of liability of not less than \$5 million each occurrence, combined single limit, for bodily injury (including disease or death), personal injury and property damage (including loss of use) liability. Such coverage may be provided by a combination of a primary CGL policy and a following form excess or umbrella liability policy.

3. **Automobile Liability Insurance** covering the liability of Contractor arising out of the use of any vehicles which bear, or are required to bear, license plates according to the laws of the jurisdiction in which they are to be operated, and which are not covered under Contractor's CGL insurance. The policy shall name National Railroad Passenger Corporation and, as appropriate CUSCO or WTC, and all commuter agencies and railroads that operate over the property or tracks at issue as additional insureds with respect to the operations to be performed. Coverage under this policy shall have limits of liability of not less than \$1 million each occurrence, combined single limit, for bodily injury (including disease or death), personal injury and property damage (including loss of use) liability.

In the event Contractor or any subcontractor will be transporting and/or disposing of any hazardous material or waste off of the jobsite, a MCS-90 Endorsement is to be added to this policy and the limits of liability are to be increased to \$5 million each occurrence.

4. **Railroad Protective Liability (RRP) Insurance** covering the Operations performed by Contractor or any subcontractor within fifty (50) feet vertically or horizontally of railroad tracks. The current ISO Occurrence Form (claims-made forms are unacceptable) in the name of National Railroad Passenger Corporation (and as appropriate CUSCO or WTC, and all commuter agencies and railroads that operate over the property or tracks at issue) shall have limits of liability of not less than \$5 million each occurrence, combined single limit, for Coverages A and B, for losses arising out of injury to or death of all persons, and for physical loss or damage to or destruction of property, including the loss of use thereof. A **\$10 million annual aggregate** shall apply. Additionally, Policy Endorsement CG 28 31 - Pollution Exclusion Amendment, is required to be

endorsed onto the policy. Further, "Physical Damage to Property" as defined in the policy is to be deleted and replaced by the following endorsement:

"It is agreed that 'Physical Damage to Property' means direct and accidental loss of or damage to all property owned by any named insured and all property in any named insured's care, custody and control."

The original RRP Liability Insurance Policy must be submitted to Amtrak prior to commencement of Operations.

All Risk Property Insurance covering damage to or loss of all remaining personal property of Contractor, its contractors and subcontractors used during Operations including, but not limited to, tools, equipment, construction trailers and their contents and temporary scaffolding at the project site, whether owned, leased, rented or borrowed for the full replacement cost value. Insurance policies of Contractor, its contractors and subcontractors, covering tools, equipment and other personal property will include a waiver of subrogation and any other rights of recovery in favor of Amtrak and Contractor.

6. Contractor's Pollution Liability Insurance covering the liability of Contractor arising out of any sudden and/or non-sudden pollution or impairment of the environment, including clean-up costs and defense, that arise from the Operations of Contractor, with National Railroad Passenger Corporation and, as appropriate CUSCO or WTC, and all commuter agencies and railroads that operate over the property or tracks at issue named as additional insureds. Coverage under this policy shall have limits of liability of not less than \$2 million each occurrence. The coverage shall be maintained during the term of the project, and for at least two (2) years following Amtrak's acceptance of the completion of all Operations to be performed.

7. Pollution Lefial Liability Insurance is required if any hazardous material or waste is to be transported or disposed of off of the jobsite. Contractor, its subcontractor or transporter, as well as the disposal site operator, shall maintain this insurance. Contractor shall designate the disposal site, and must provide a certificate of insurance from the disposal facility to Amtrak. The policy shall name National Railroad Passenger Corporation and, as appropriate CUSCO or WTC, and all commuter agencies and raikoads that operate over the property or tracks at issue as additional insureds, with limits of liability of not less than \$2 million per claim.

Further, any additional insurance coverages, permits, licenses and other forms of documentation required by the United States Department of Transportation, the Environmental Protection Agency and/or related state and local laws, rules and regulations shall be obtained by Contractor.

8. Professional Liability Insurance covering the liability of Contractor for any and all errors or omissions committed by Contractor in the performance of the Operations, regardless of the type of damages. The coverage shall be maintained during the term of the Operations, and for at least three (3) years following completion thereof. The policy shall have a retroactive date that precedes any design work on the project and shall have limits of liability of not less than \$2 million per claim and \$2 million in the annual aggregate. . For a Project scopes which include under grade bridges (bridges which carry trains) the policy shall have limits of liability not less than \$10 million per claim and \$10 million in the annual aggregate.

If Contractor is not performing professional design or engineering services, Contractor may elect to satisfy this requirement through the addition of endorsement CG2279 "Incidental Professional

Liability” to its CGL policy.

9. Waiver of Subrogation As to all insurance policies required herein, Contractor waives all rights of recovery, and its insurers must waive all rights of subrogation of damages against Amtrak and, as appropriate, CUSCO and WTC, and their agents, officers, directors, and employees. The waiver must be stated on the certificate of insurance.
10. Punitive Damages Unless prohibited by law, no liability insurance policies required above shall contain an exclusion for punitive or exemplary damages.
11. Claims-Made Insurance If any liability insurance specified above shall be provided on a claims-made basis then, in addition to coverage requirements above, such policy shall provide that:
  - a. The retroactive date shall coincide with or precede Contractor’s start of Operations (including subsequent policies purchased as renewals or replacements);
  - b. The policy shall allow for the reporting of circumstances or incidents that might give rise to future claims;
  - c. Contractor will use its best efforts to maintain similar insurance under the same terms and conditions that describe each type of policy listed above (e.g., CGL, Professional Liability) for at least three (3) years following completion of the Operations; and
  - d. If insurance is terminated for any reason, Contractor will purchase an extended reporting provision of at least six (6) years to report claims arising from Operations.
12. Evidence of Insurance Contractor shall furnish evidence of insurance as specified above at least fifteen (15) days prior to commencing Operations. Prior to the cancellation, renewal, or expiration of any insurance policy specified above, Contractor shall furnish evidence of insurance replacing the cancelled or expired policies. **THESE DOCUMENTS SHALL INCLUDE A DESCRIPTION OF THE PROJECT AND THE LOCATION ALONG THE RAILROAD RIGHT-OF-WAY (typically given by milepost designation) IN ORDER TO FACILITATE PROCESSING.** The fifteen (15) day advance notice of coverage may be waived by Amtrak in situations where such waiver will benefit Amtrak, but under no circumstances will Contractor begin Operations without providing satisfactory evidence of insurance as approved by Amtrak. Such evidence of insurance coverage shall be sent to:

Director I&C Projects  
National Railroad Passenger Corporation 30th Street  
Station, Mail Box 64 Philadelphia, PA 19104-2817

**National Railroad Passenger Corporation  
30<sup>th</sup> Street Station, Mail Box 64  
2955 Market Street  
Philadelphia, PA 19104**

**Temporary Permits to Enter Upon Amtrak Property (PTE) in the State of CT**

Requests for Temporary Permits to Enter Upon Amtrak Property (PTE) in the State of CT must be submitted to Amtrak in writing and include the following information:

*(\*\* for DOT Projects, omit 4-7 and include DOT job number\*\*)*

1. Name of company requesting the permit (include address and telephone number)
2. Who's attention the permit should be addressed to
3. Permittee's e-mail address
4. Exact location of work (including railroad milepost, if known)
5. Specific work activity being performed on railroad property (please provide dollar value of the contract if work being performed is other than surveys or bridge inspections)
6. Projected duration of work being performed on railroad property in days
7. Contact, phone and address where invoices should be sent for payment by Permittee.

**Due to the heavy volume of requests for Temporary Permits to Enter Upon Amtrak Property, the processing time for initial Permit requests is approximately 30 business days.**

***Note:*** *Temporary Permits for performing any environmental or geotechnical tests or studies (e.g., air, soil or water sampling) may be issued subsequent to completion of Amtrak's environmental review and approval process. Requests are reviewed on a case-by-case basis. Depending on the site specific circumstances, a separate Site Access Agreement that addresses environmental liability issues may be required prior to any Temporary Permit.*

---

**All PTE Requests must be submitted to the Amtrak Engineering Construction Department e-mail or mail as noted below:**

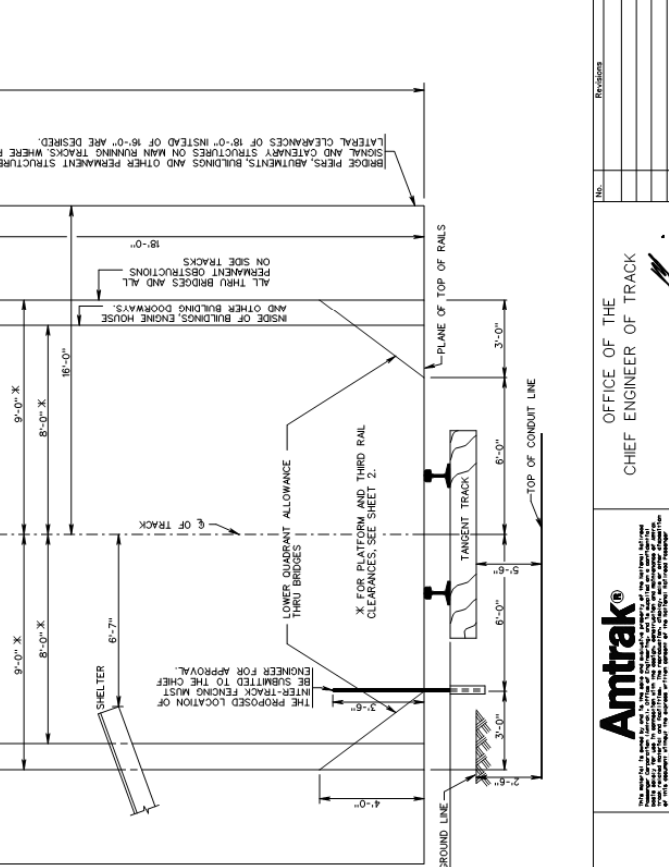
- Faxed to [\(215\) 349-3550](tel:215-349-3550) or [MCGRATM@AMTRAK.COM](mailto:MCGRATM@AMTRAK.COM)
- Email to [mcgratm@amtrak.com](mailto:mcgratm@amtrak.com)
- Mailed to the following address:
  - Director I&C Projects
  - National Railroad Passenger Corporation
  - 30<sup>th</sup> Street Station (Mail Box 64)
  - Philadelphia, PA 19104



SHEET 1 OF 2

NOTES:  
CLEARANCE REQUIREMENTS SHOWN ON THIS PLAN APPLY TO NEW CONSTRUCTION OR RECONSTRUCTION OF EXISTING TRACKS AND STRUCTURES. CLEARANCES ARE EXTENDED AT PRESENT CLEARANCES, UNLESS OTHERWISE REQUIRED BY LOCAL OR STATE AUTHORITIES.  
STRUCTURES MUST NOT BE LOCATED NEARER TO THE TRACK THAN THE CLEARANCES SHOWN ON THIS PLAN. WHERE POSSIBLE, CONSIDERATION SHOULD BE GIVEN TO CENTER LINES, WIDENING ROADED SHOULDERS AND WIDENING AND DEEPENING DITCHES, AND THE STRUCTURES SHOULD BE LOCATED ACCORDINGLY.  
FOR STANDARD DISTANCES BETWEEN TRACK CENTER LINES, LIMITING OBJECTS ARE LOCATED SEE AND MAINTENANCE OF TRACK.  
RESTRICTIONS EXCEPTING CLEARANCES CLOSER THAN THOSE SPECIFIED, THE MATTER MUST BE SUBMITTED TO THE STANDARD.  
MINIMUM CLEARANCES SHOWN ON THIS PLAN ARE FOR TANGENT LEVEL TRACK.  
FOR CURVED TRACK THE FOLLOWING PROVISIONS APPLY:  
VERTICAL - MEASURED VERTICALLY ABOVE HIGH RAIL EXCEPT FOR PASSENGER AND FREIGHT PLATFORMS WHICH ARE MEASURED PERPENDICULAR TO THE PLANE OF TOP OF RAIL.  
LATERAL - OUTSIDE AND INSIDE CLEARANCES SHALL BE MEASURED PERPENDICULAR TO THE PLANE OF TOP OF RAIL.  
IN ADDITION, THE INSIDE CLEARANCE FOR TANGENT TRACK SHALL BE INCREASED BY THREE FEET FOR EACH INCH OF SUPERELEVATION FOR EACH 5 FEET OF HEIGHT ABOVE TOP OF LOW RAIL.

X FOR STATE CLEARANCE REQUIREMENTS, SEE A.R.E.M.A. MANUAL CHAPTER 28, SECTION 3.6, LEGAL CLEARANCE REQUIREMENTS BY STATES.



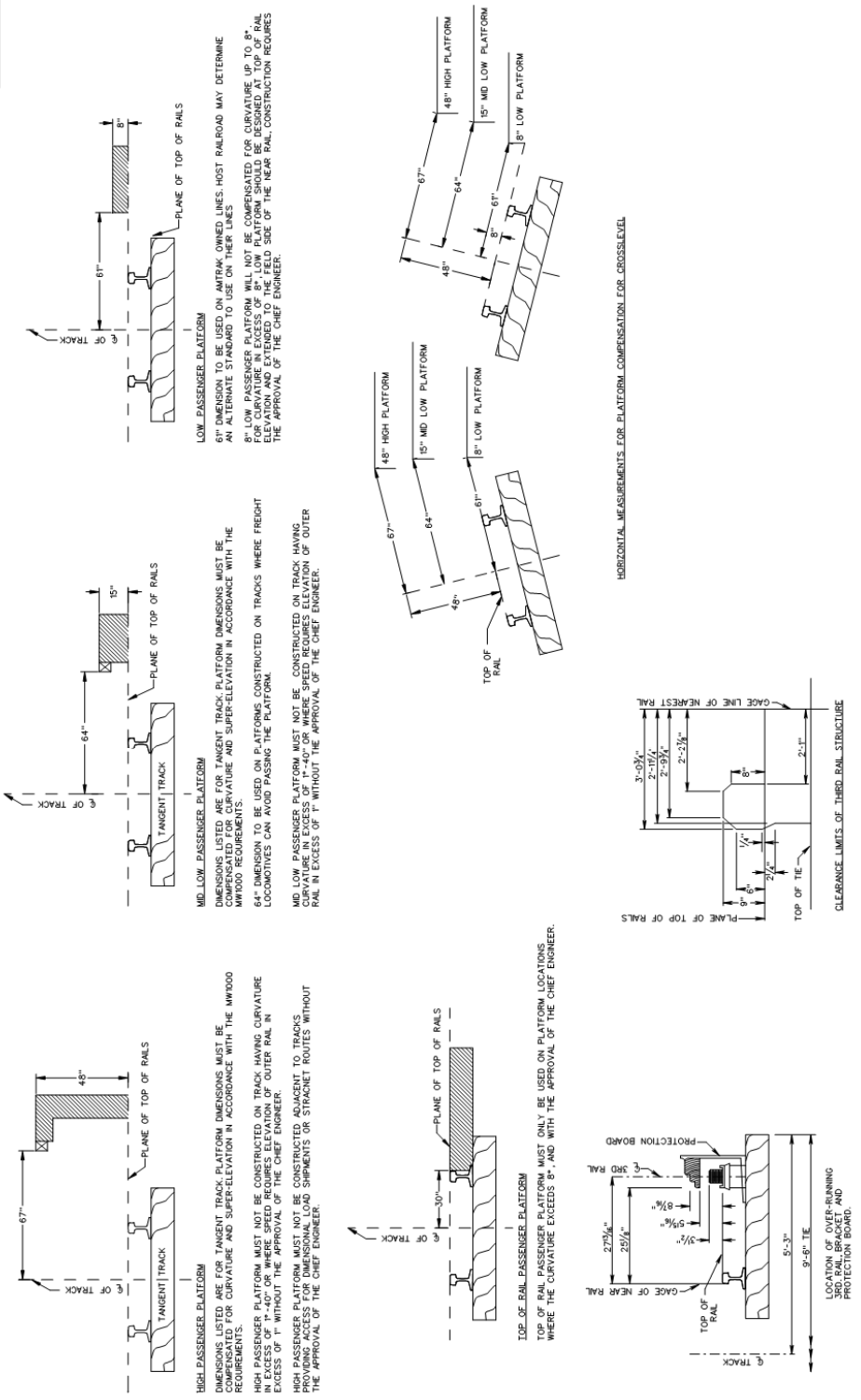
STANDARD TRACK PLAN  
MINIMUM ROADWAY CLEARANCES

No.	Revisions	Date	By
08	ADDED SHEET 2	08-01-16	K.W.

OFFICE OF THE  
CHIEF ENGINEER OF TRACK  
Date August 1, 2016  
Approved:



PHILADELPHIA, PA  
Date August 1, 2016  
Approved:



		OFFICE OF THE CHIEF ENGINEER OF THE TRACK		STANDARD TRACK PLAN MINIMUM ROADWAY CLEARANCES	
This drawing is the property of Amtrak and is to be used only for the project and location specified. It is not to be reproduced, copied, or used for any other purpose without the written permission of Amtrak.	Date: August 1, 2018	No.	Revisions	Date	By
PHILIP A. DATE	Approved	08	ADDED SHEET 2	08-07-18	J.W.
Date: August 1, 2018		Designer: Amtrak   Drawn: TDS-SJC   Checked: MT   Date: 08-07-18   Page No.: 705652.052.02			

NATIONAL RAILROAD PASSENGER CORPORATION  
Engineering Department, 30<sup>th</sup> Street Station, 4<sup>th</sup> Floor South Tower, Box 64  
2955 Market Street, Philadelphia, PA 19104



December 4, 2017

Rabih M. Barakat, PE  
Transportation Principal Engineer  
CT Department of Transportation  
2800 Berlin Turnpike  
P.O. Box 317546  
Newington, CT 06131-7546

Subject: Noank, CT, Shore Line, CDOT Project No. 58-336 PE  
Rehabilitation of Mosher Street Bridge No. 03903 (OH 130.31) over Amtrak  
Design Exception Request DER-01, Approved by Amtrak

Dear Mr. Barakat:

Amtrak has reviewed and approved the subject Design Exception Request information provided with your letter dated November 20, 2017.

If you have any questions concerning this matter, please contact Kathy Haywood, Project Manager II, at 215-349-4367.

Sincerely,

A handwritten signature in blue ink, appearing to read "Earl Watson III".

Earl Watson III

Senior Manager Engineering

Attachment

cc: R. Clark – CME  
M. Piteo – DOT



STATE OF CONNECTICUT  
DEPARTMENT OF TRANSPORTATION



2800 BERLIN TURNPIKE, P.O. BOX 317546  
NEWINGTON, CONNECTICUT 06131-7546

November 20, 2017

AMTRAK

NOV 30 2017

I & C Projects

Mr. Earl Watson, III  
Director – Project Initiation and Development  
South Tower, 3<sup>rd</sup> Floor  
30<sup>th</sup> Street Station  
Philadelphia, Pennsylvania 19104

Dear Mr. Watson:

Subject: Design Exception Request, DER-01  
State Project No. 58-336  
List 29 Bridge Rehabilitation Program  
Bridge No. 03903, Mosher Avenue over Amtrak  
Town of Groton

This letter is in reference to State Project No. 58-336, the rehabilitation of Bridge No. 03903, which carries Mosher Avenue over Amtrak in Groton, Connecticut (OH 130.31). The bridge is located near the intersection of Mosher Avenue and Ward Avenue. The existing superstructure of the bridge, which is a non-redundant steel through-girder type bridge, needs to be replaced due to its poor structural condition. The existing substructure is in fair condition, and will be repaired and reused. The low chord of the current superstructure is 21 feet-5 inches, which is below Amtrak’s requirement of 24 feet-3 inches for bridges in electrified territory with a 22 foot trolley wire height.

The Connecticut Department of Transportation (CTDOT) has researched the option of a superstructure replacement that would meet Amtrak’s required vertical underclearance of 24 feet-3 inches. This would result in an approximate 3 foot increase to the Mosher Avenue roadway profile at the end of the bridge. The change in profile would require approximately 500 feet of Ward Avenue to be regraded and reconstructed, as well as a 150 foot portion of Mosher Avenue to the west of the bridge.

The effects of regrading Ward Avenue include design and reconstruction of four private driveways. Three of these driveways already exceed the recommended maximum slope of 12 percent and could not be regraded without making them steeper. The alternative to making the driveways steeper would be to make extensive modifications to the properties.

For two of these properties, modifications would involve raising the existing detached garages, providing new grading and constructing permanent retaining walls. The third driveway leads to a garage that is part of the lower story of the property owner’s home. Therefore, this garage could no longer be used and would require the construction of a new garage with a higher floor and new associated grading. Based on current Department practices, the State would determine the required compensation, and the work would be undertaken by the property owner. Modification of these properties would require extensive cooperation from property owners and preferably would be completed before the State bridge project began. The coordination of contracting the required work and the inconvenience of extensive construction on their property would be an unwelcome burden to the property owners.

*An Equal Opportunity Employer*  
Printed on Recycled or Recovered Paper

Mr. Earl Watson, III

-2-

November 20, 2017

If the property owners objected to the compensation offered by the State, the State would likely face strong public objection. Noank is a small, close-knit community that would likely support the property owners in a conflict with the State. Additionally, any legal action by the property owners would likely delay the project, and delays to the project would have a significant impact to the community.

Project schedule delays have other impacts as well. Currently the sidewalk supports, which frame into the main through-girders, are in poor condition. These supports were evaluated by the Department's Bridge Safety unit recently because there was a concern about the safety of the sidewalk. Ultimately, the decision was made to keep the sidewalk open based on the anticipated service life which fits with the current project schedule. However, continued deterioration of the supports could lead to the closure of the sidewalk, and delays to the project make it more likely that this could occur.

The safety of pedestrians would be greatly reduced by the closure of the sidewalk. Spicer Park is located to the west of the bridge and Noank Play Area, a recreation area with basketball courts and a playground, are located to the east of the bridge. The sidewalk on the bridge provides a safe passage from Spicer Park to Noank Play Area. A protected area on the inside of the through-girders could be created if the sidewalk were closed. However, this would result in much narrower lanes, which is unfeasible because of the use of this bridge by tractor-trailers and trucks towing boats and the available turning radius at Ward Avenue would be greatly reduced.

With the closure of the bridge sidewalk, pedestrians would need to be more cautious of trucks with wide turning radii maneuvering through the intersection of Mosher Avenue and Ward Avenue. Additionally, it would worsen existing sub-standard site distances, putting both pedestrians and motorists at greater risk for accidents. For these reasons, delays to the project need to be avoided.

Additional construction impacts, associated with the significant raising of the profile, include the gas station to the south of the bridge on Ward Avenue. The roadway at the gas station would need to be raised approximately 3 inches at the curb line, requiring regrading of the gas station driveways and parking areas. Due to the age of the gas station and the hazardous nature of gasoline, the State would be at risk for the possibility of encountering contaminated soil during the excavation to reconstruct the driveway.

The Noank Fire Department driveway leading to the garage bays would also require redesign and reconstruction. This would have to be carefully coordinated so as not to prevent emergency personnel from responding to calls. Additionally, the sidewalk on the east side of Ward Avenue would be removed and reconstructed. Finally, the regrading could affect utility poles within the project limits that would need to maintain minimum vertical clearance below electric, communications and telephone cables. The effected properties, and the extent of the full depth reconstruction, are shown in the attached sketch.

These effects are both cost prohibitive and cause the Department, motorists and pedestrians unreasonable risk. For these reasons, the Department is requesting a design exception to Amtrak's vertical clearance standard. A design exception request form and the corresponding "Amtrak Standard Track Plan, Minimum Roadway Clearances Drawing No. 70050.001.08" have been included with this letter.



Mr. Earl Watson, III

-3-

November 20, 2017

In order to minimize the detrimental effects listed above, the Department has opted to replace the superstructure while maintaining the substructure geometry. The proposed vertical clearance is 21 feet-6 inches. Connecticut General Statute 13b-251 allows the State to maintain the existing vertical clearance over a railroad when the superstructure is being replaced and the abutments are being retained. The vertical profile of Mosher Avenue will still need to be raised to accommodate the slight increase in the superstructure depth due to the new structurally redundant cross-section. However, this increase will only require approximately 125 feet of Ward Avenue, and the intersection of Ward Avenue and Mosher Avenue, to be regraded and reconstructed. This option eliminates the impacts to the private driveways, the Noank Fire Department driveway, the driveway leading into the gas station, and the sidewalk on the east side of Mosher Avenue.

It is the Department's intent to proceed with the superstructure replacement maintaining the existing vertical underclearance. Additionally, temporary construction easements will need to be obtained to construct the new superstructure and repair the existing substructure. A response from Amtrak with any comments by November 16, 2017 would be much appreciated.

If you have any questions concerning this matter, please contact Mr. Andrew Cardinali, Project Manager, at (860) 594-3315.

Very truly yours,



Rabih M. Barakat P.E.  
2017.11.20  
10:47:03-05'00'

Rabih M. Barakat, P.E.  
Transportation Principal Engineer  
Bureau of Engineering and Construction

Enclosures

**DESIGN EXCEPTION REQUEST (DER)**

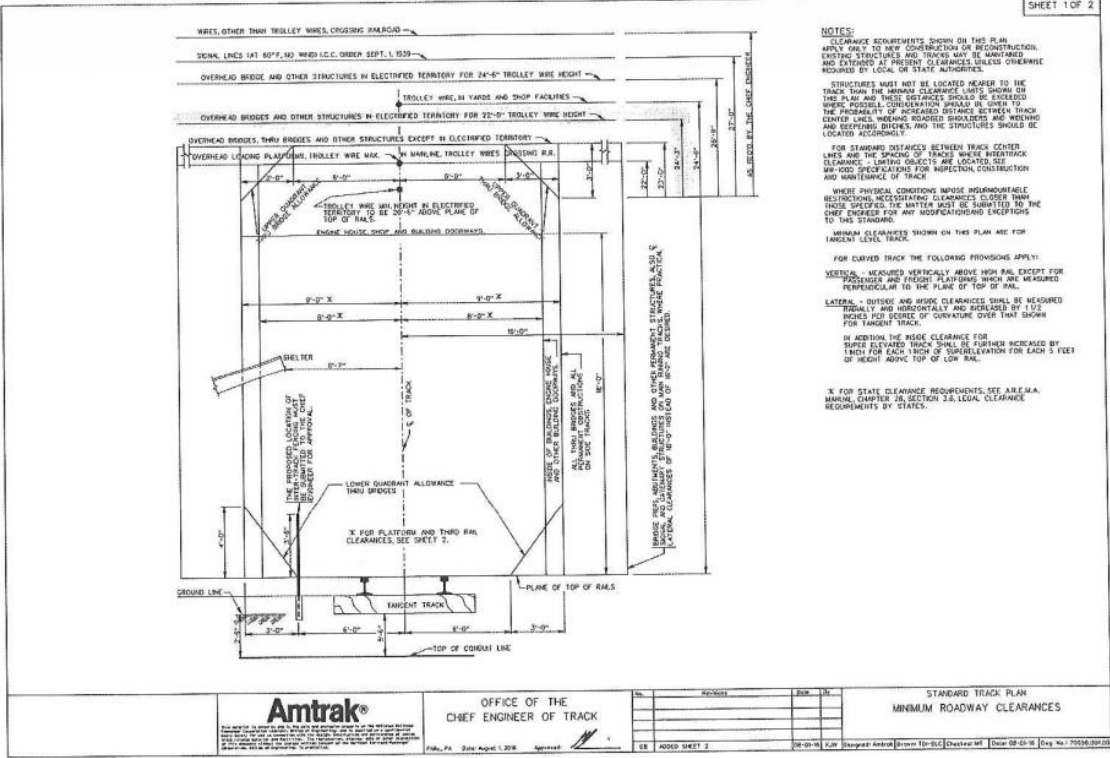
This form is to be used when a project warrants an exception to established design standards. Complete Section 1 and 2 and attach supporting documents prior to submission to Amtrak for consideration.

<b>Section 1: Request Information</b>			
Project Name	CTDOT Project No. 058-336; Rehabilitation of Bridge No. 03903 in Groton, CT		
Project DER No.	DER-01	Date	9/6/2017
Exception Location	Mosher Avenue over Amtrak; Groton, CT (OH 130.31)		
Requesting Agency	CTDOT	Requester	Rabih Barakat Principal Engineer
<b>Section 2: Design Exception Description (Provide brief concise statements)</b>			
Excepted Design Standard and section No.	70050.001.08 Minimum Roadway Clearances		
Attach Design Standard, <u>unless</u> it is an Amtrak or AREMA Standard			
Description of Exception	We are requesting a permanent Design Exception for substandard vertical underclearance over an electrified railroad for Bridge No. 03903 Mosher Avenue over Amtrak in Groton, CT. (OH 130.31)		
Reason for Request	<p>The existing minimum vertical underclearance from the top of the rail to the bottom of the superstructure of Bridge No. 03903 is noted as 21'-5" (see clearance diagram for Bridge No. 03903), which is less than the Amtrak standard of 24'-3". The bridge is in need of a superstructure replacement, while the substructure remains in fair and usable condition. Replacing the superstructure at the Amtrak standard of 24'-3" would result in an approximate 3' increase in the Mosher Avenue roadway profile at the end of the bridge, where Mosher Avenue intersects Ward Avenue. The effects of regrading Ward Avenue include design and reconstruction of four private driveways, which would make them steeper. Three of these driveways already exceed the recommended maximum slope of 12% and could not be regraded without making them steeper. The Noank Fire Department driveway leading to the garage bays would also require redesign and reconstruction. The roadway at the gas station would have to be raised approximately 3 inches at the curb line, requiring regrading of the gas station driveways and parking areas. Additionally, the sidewalk on the east side of Ward Avenue would be removed and reconstructed. Finally, the regrading could affect utility poles within the project limits that would need to maintain minimum vertical clearance below electric, communications and telephone cables. Affected properties, and the extent of the full depth reconstruction, are shown in the attached drawings. These effects are both cost prohibitive and cause CTDOT unreasonable risk due to the possibility of encountering contaminated soil at the gas station.</p>		
The potential impacts of a DER on: safety, capital costs, life cycle costs, future maintenance, or the right-of-way should be described in the Reason for Request field. Additional pages may be attached.			

DESIGN EXCEPTION REQUEST (DER) | 

Section 3: Amtrak Review Comments					
Comments and Recommendation	NO EXCEPTION				
Reviewer Name			Title	Sp. Engineer Clearance	
Section 4: Amtrak Approval / Denial Status					
APPROVE or DENY	Signature			Date	12/4/17
	Name	ALFRED J. CLAVIER		Title	DCE TRACK
APPROVE or DENY	Signature			Date	
	Name			Title	





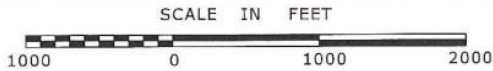
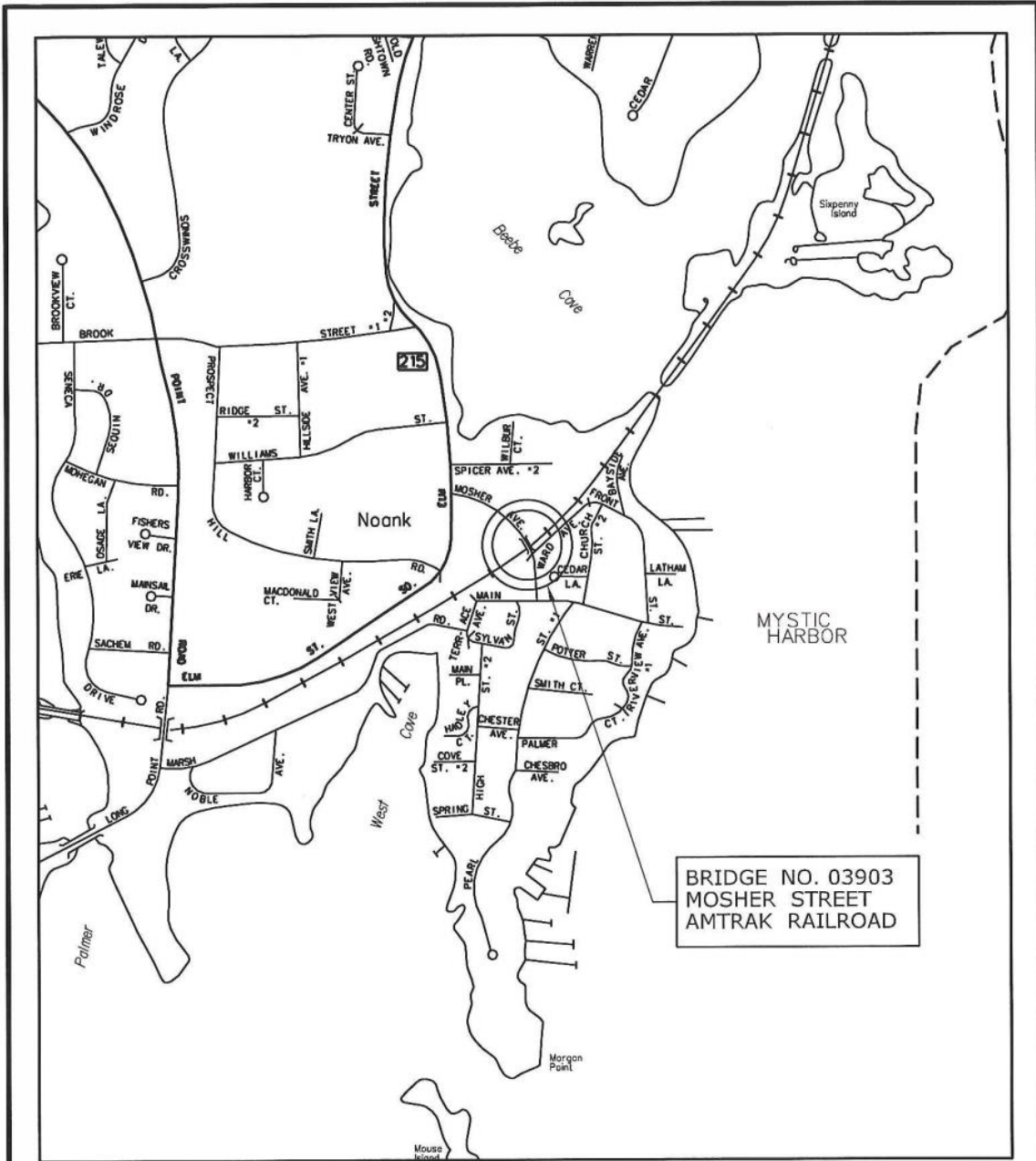
Amtrak®

OFFICE OF THE  
 CHIEF ENGINEER OF TRACK

STANDARD TRACK PLAN  
 MINIMUM ROADWAY CLEARANCES

NO.	REVISION	DATE	BY
01	ADDED SHEET 2	08-01-16	J.M.

FILE NO. DATE REVISION APPROVED  
 08-01-16 J.M. (Signature) 08-01-16 (Signature) 08-01-16 (Signature) 08-01-16 (Signature) 08-01-16 (Signature) 08-01-16 (Signature) 08-01-16 (Signature) 08-01-16 (Signature) 08-01-16 (Signature) 08-01-16 (Signature)



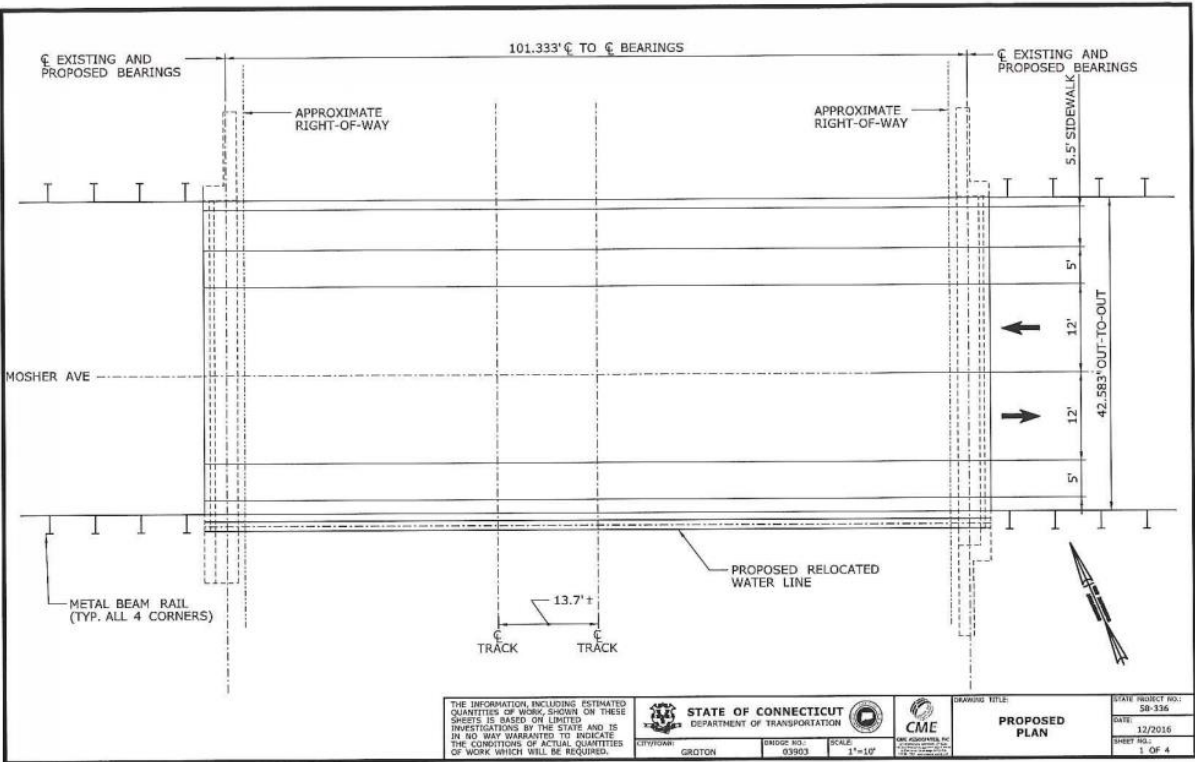
STATE PROJECT NO.:  
58-336  
CITY/TOWN:  
GROTON

**STATE OF CONNECTICUT**  
DEPARTMENT OF TRANSPORTATION

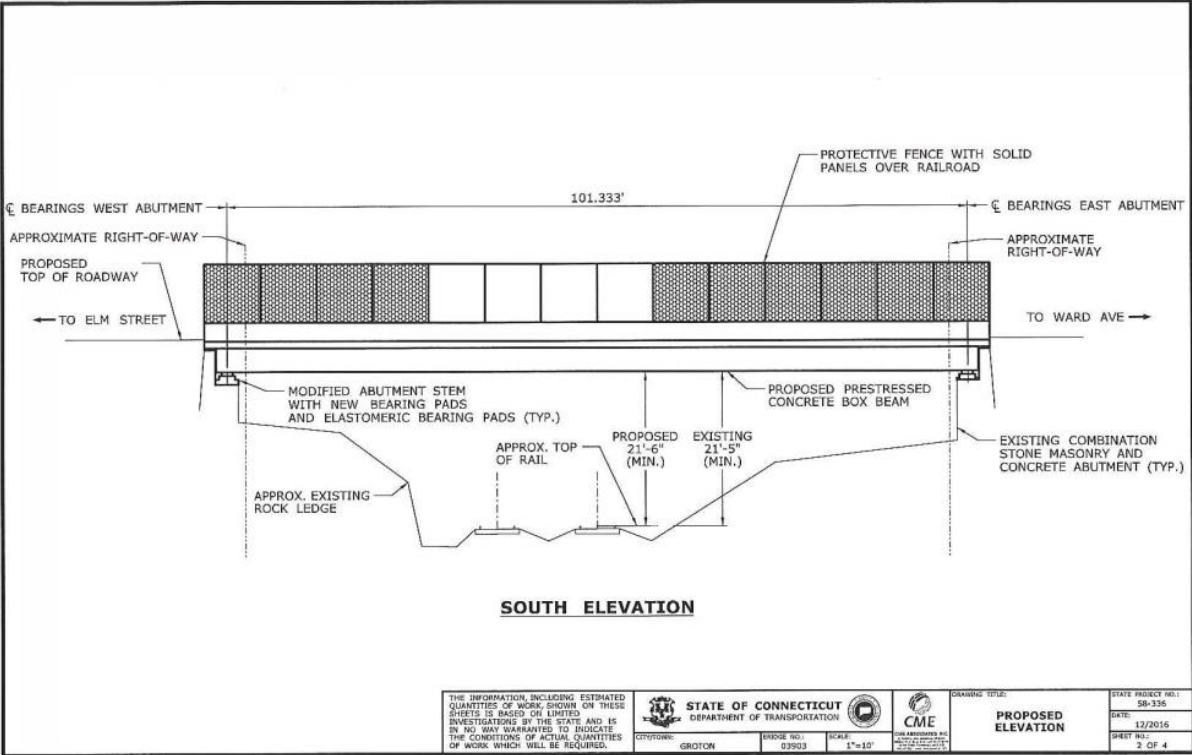
**BRIDGE NO. 03903**  
**LOCATION MAP**

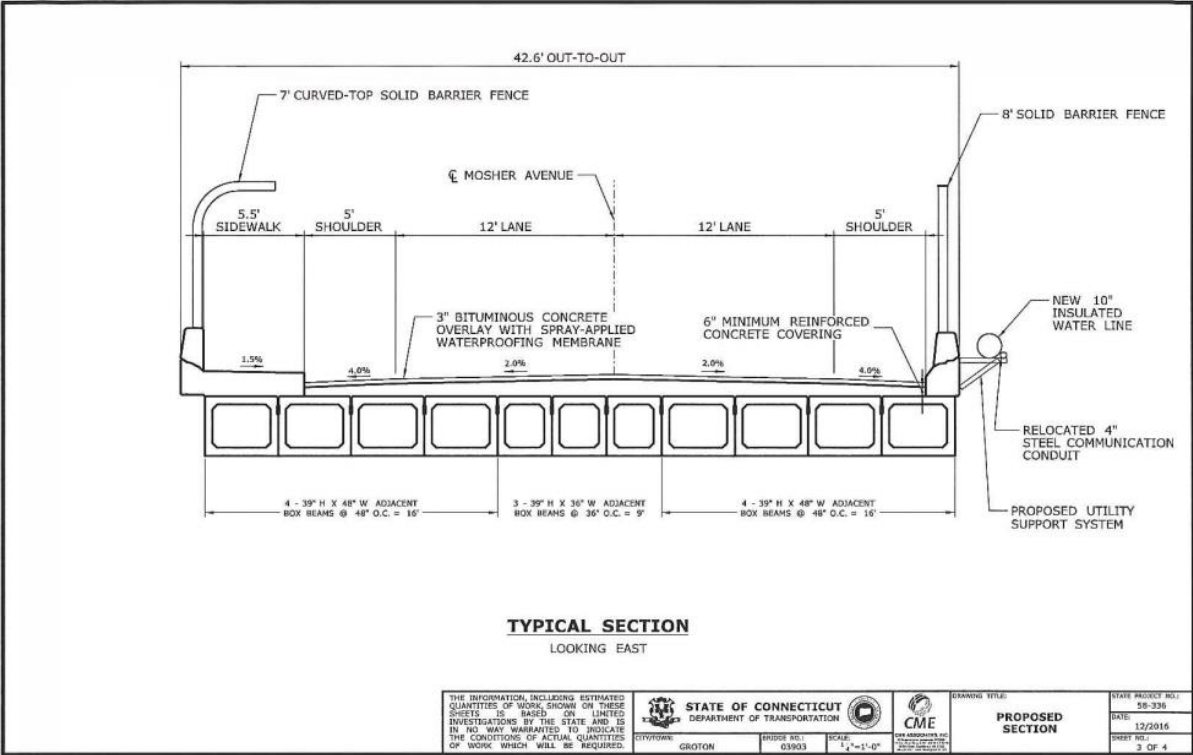
**CME**  
CME ASSOCIATES, INC.  
35 Cedar Lane, Groton, CT 06340  
8150 Colburn Drive, East Granby, CT 06036  
100 Elm Street, East Granby, CT 06036  
860-801-3237 www.cmeassoc.com

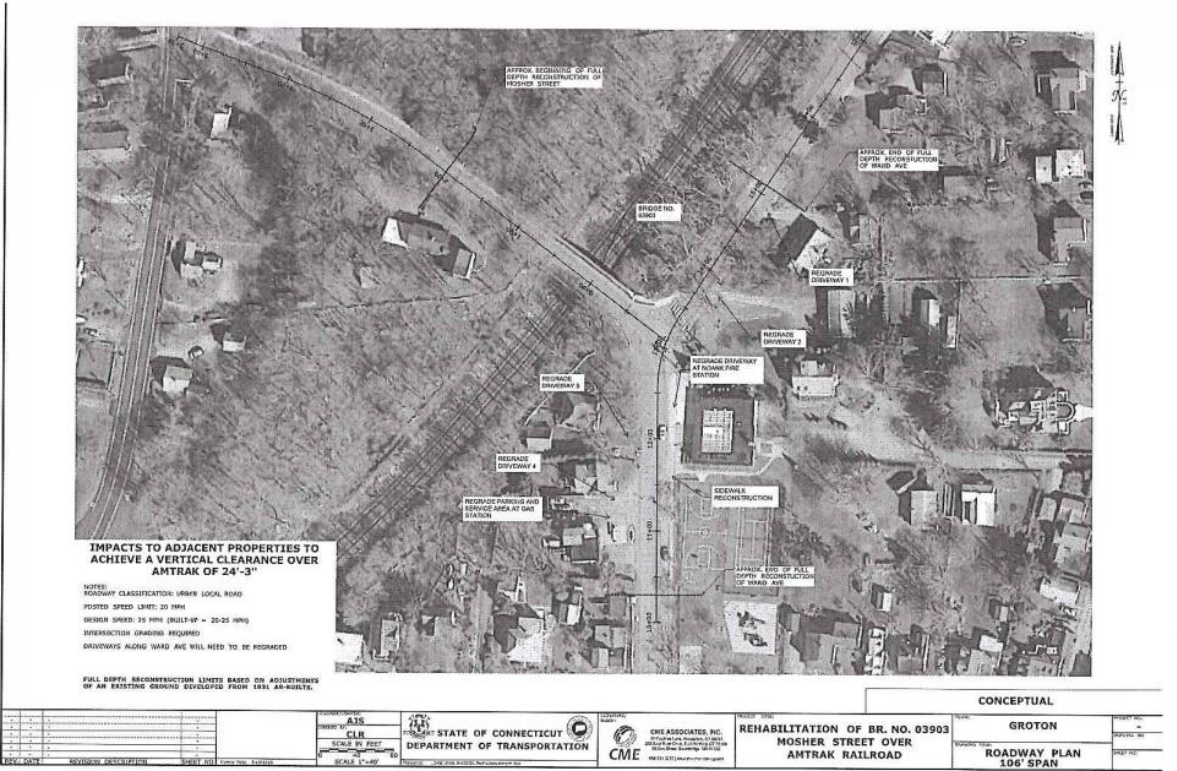
DATE:  
12/4/2015  
SHEET NO.:  
1 OF 1



<p>THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK, SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.</p>	<p>STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION</p>	<p>CME CONSTRUCTION MANAGEMENT ENGINEERS, INC.</p>	DRAWING TITLE:		STATE PROJECT NO.:
			PROPOSED PLAN		58-336
					DATE:
CITY/TOWN: GROTON		BRIDGE NO.: 03903	SCALE: 1"=10'	DATE: 12/2016	
				SHEET NO.: 1 OF 4	







**IMPACTS TO ADJACENT PROPERTIES TO ACHIEVE A VERTICAL CLEARANCE OVER AMTRAK OF 24'-3"**

NOTES:  
 ROADWAY CLASSIFICATION: URBAN LOCAL ROAD  
 POSTED SPEED LIMIT: 20 MPH  
 DESIGN SPEED: 35 MPH (BUILT-UP = 20-25 MPH)  
 INTERSECTION GRADING REQUIRED  
 DRIVEWAYS ALONG WARD AVE WILL NEED TO BE RECONSTRUCTED

FULL DEPTH RECONSTRUCTION LIMITED BASED ON ADJUSTMENTS OF AN EXISTING GROUND DEVELOPED FROM 1931 AS-BUILTS.

PROJECT NO. _____ SHEET NO. _____ DATE _____		PROJECT TITLE <b>REHABILITATION OF BR. NO. 03903          MOSHER STREET OVER          AMTRAK RAILROAD</b>		PROJECT NO. _____ SHEET NO. _____ DATE _____	
DESIGNER <b>A3S</b> CLIENT <b>STATE OF CONNECTICUT          DEPARTMENT OF TRANSPORTATION</b>		ENGINEER <b>CME</b> PROJECT NO. _____ SHEET NO. _____ DATE _____		CONTRACTOR <b>GROTON</b> PROJECT NO. _____ SHEET NO. _____ DATE _____	
SCALE: 1"=40' DATE: 1/23/2020		PROJECT NO. _____ SHEET NO. _____ DATE _____		PROJECT NO. _____ SHEET NO. _____ DATE _____	



NATIONAL RAILROAD PASSENGER CORPORATION  
Engineering Department, 30<sup>th</sup> Street Station, 4<sup>th</sup> Floor South Tower, Box 64  
2955 Market Street, Philadelphia, PA 19104



December 14, 2018

Kimery Nervais  
Utility Coordinator – CME  
101 East River Drive, 1<sup>st</sup> Floor  
East Hartford, CT 06108

Subject: Noank, CT, Shore Line, CDOT Project No. 58-336 PE  
Rehabilitation of Mosher Street Bridge No. 03903 (OH 130.31) over Amtrak  
Design Exception Request (DER-02), Conditionally Approved by Amtrak

Dear Mr. Nervais:

Amtrak has reviewed and conditionally approved the subject DER information subject to the comments in Section 3 of the DER provided with your email dated November 15, 2018.

If you have any questions concerning this matter, please contact Kathy Haywood, Project Manager II, at 215-349-4367.

Sincerely,

A handwritten signature in blue ink that reads "K Haywood".

Handwritten initials in blue ink, possibly "MK".  
Michael Kolonauski  
Senior Manager Engineering

Attachment


cc: R. Clark – CME  
M. Piteo – DOT

**DESIGN EXCEPTION REQUEST (DER)**

This form is to be used when a project warrants an exception to established design standards. Complete Section 1 and 2 and attach supporting documents prior to submission to Amtrak for consideration.

<b>Section 1: Request Information</b>			
Project Name	CTDOT Project No. 058-336; Rehabilitation of Bridge No. 03903 in Groton, CT		
Project DER No.	DER-02	Date	11/15/2018
Exception Location	Mosher Avenue over Amtrak; Groton, CT (OH 130.31)		
Requesting Agency	CTDOT	Requester	Mark Gardner Project Engineer
<b>Section 2: Design Exception Description (Provide brief concise statements)</b>			
Excepted Design Standard and section No.	70050.001.08 Minimum Roadway Clearances		
<small>Attach Design Standard, unless it is an Amtrak or AREMA Standard</small>			
Description of Exception	We are requesting a temporary Design Exception for the construction of protective shielding within close proximity to the Amtrak catenary wires, which will create substandard vertical underclearance over an electrified railroad for Bridge No. 03903 Mosher Avenue over Amtrak in Groton, CT. (OH 130.31)		
Reason for Request	<p>The existing minimum vertical underclearance from the top of the rail to the bottom of the superstructure of Bridge No. 03903 is 21'-5". The Amtrak Minimum Roadway Clearance diagram indicates a minimum underclearance of 24'-3" for railroads with 22'-0" trolley wire height. The minimum clearance between the messenger wire and the existing structure is approximately 18". In order to complete the proposed bridge repair work, consisting largely of replacing the existing bridge superstructure, concrete encasement will need to be chipped away from the existing beams, and lead paint will need to be removed. In order to prevent the concrete and lead paint debris from falling on the tracks, protective shielding will need to be installed temporarily (see sheets 3 and 4 of the attached PDF package, showing measurements and details of the proposed shielding). The shielding will have to be installed within close proximity to the existing Amtrak catenary wires that run parallel to the tracks, and perpendicular to the bridge. The minimum clearance between the messenger wire and the temporary shielding will be approximately 9". The protective shielding will be supported by cables that are attached to the bridge decking. The temporary shielding will be bonded and grounded in accordance with Amtrak's specifications.</p> <p>We anticipate that the contractor will drill through the bridge deck to allow for the installation of the support cables for the shielding. Drilling is not anticipated to create any substantial debris over the tracks. The contractor will provide collection of any debris that results from drilling. Since the existing catenary wires are estimated to be approximately 18" lower than the bottom flanges of the girders, the contractor will have sufficient space to install the protective shielding. However, this further infringes on the minimum vertical clearance over the railroad tracks.</p> <p>Installation and temporary use of the proposed protective shielding is not anticipated to impact the Amtrak Standard requiring a minimum of 16'-0" horizontal</p>		



**DESIGN EXCEPTION REQUEST (DER)** 

	<p>clearance beginning at the centerline of the railroad tracks and extending to either side (see highlighted and boxed text on sheet 3 of attached PDF package). Therefore, impacts within the limits of the catenary towers are not anticipated as a result of the installation and temporary use of the protective shielding.</p> <p>There are no anticipated negative impacts regarding safety, capital costs, life cycle costs, future maintenance, or the right-of-way.</p>
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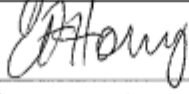
The potential impacts of a DER on: safety, capital costs, life cycle costs, future maintenance, or the right-of-way should be described in the Reason for Request field. Additional pages may be attached.


**Section 3: Amtrak Review Comments**

<b>Comments and Recommendation</b>	<p>The temporary protection shield is acceptable provided the following are met.</p> <ul style="list-style-type: none"> <li>• Wire heights (messenger, feeder, and static) and existing clearances are confirmed by Amtrak Division.</li> <li>• 9" is maintained vertically between the shield and the nearest wire (messenger, feeder, or static).</li> <li>• The connection design from the shield to the cable supports is submitted for approval.</li> <li>• Wood may not be used for the temporary shielding.</li> </ul>
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<b>Reviewer Name</b>	Joanna Pardini	<b>Title</b>	Senior Manager Engineering
----------------------	----------------	--------------	----------------------------

**Section 4: Amtrak Approval / Denial Status**

<input checked="" type="radio"/> APPROVE or <input type="radio"/> DENY	<b>Signature</b>		<b>Date</b>	12/5/18
	<b>Name</b>	ERIC F HORNUNG	<b>Title</b>	DOE, ET
APPROVE or DENY	<b>Signature</b>		<b>Date</b>	
	<b>Name</b>		<b>Title</b>	

 <b>ENGINEERING PRACTICES</b>	ORIGINAL ISSUE DATE <b>07/18/02</b>		NUMBER <b>EP3005</b>
	REVISED DATE <b>01/27/15</b>		
TITLE <b>PIPELINE OCCUPANCY</b>	RECOMMENDED by <b>K.L. Kulick</b>	DATE <b>01/27/15</b>	PAGE <b>1</b> OF <b>2</b>
	APPROVED by CHIEF ENGR, STRUCTURES <b>James S. Richter</b>	DATE <b>01/27/15</b>	

**SCOPE AND NATURE**

To provide design and construction specifications for pipelines within Amtrak right-of-way.

**SPECIAL REFERENCES**

Note: The former number for this Engineering Practice was 1604.

Section	Title	Revision No.	Revision Date
<b>02081A</b>	Pipeline Occupancy Specifications	2	06/23/14
<b>02082A</b>	Additional Requirement for Horizontal Directional Drilling (HDD) / Directional Boring	3	01/27/15

- ANSI Standards
- ASTM Standards
- AWS Standards
- AWWA Standards
- Engineering Practice 3014 Section 02261A
- Engineering Practice 3014 Section 01142A
- Horizontal Directional Drilling Good Practices Guidelines
- IEEE Standards
- National Electric Code
- National Electric and Safety Code
- NACE Standards
- AREMA Manual for Railway Engineering
- OSHA Standards

**SPECIAL MATERIALS**

N/A

<b>PIPELINE OCCUPANCY</b>	ORIGINAL ISSUE DATE <b>07/18/02</b>	NUMBER <b>EP3005</b>
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**PROCEDURE**

1. The Contractor shall conform to the applicable specifications.
2. Amtrak I&C shall assure that agencies and other third parties proposing construction on or adjacent to Amtrak Right-of-Way conform to Amtrak requirements detailed herein.
3. Amtrak Design and Construction shall review the Contractor’s proposed design and construction procedures for conformance with specifications, with sound engineering design practice and with the procedures detailed in the applicable Engineering Practice documents.
4. Amtrak Construction shall monitor the activities of the Contractor on-site to assure compliance/ adherence to approved procedures throughout the construction period.

**REPORTING**

As detailed in specification.

**RESPONSIBILITY**

Amtrak I&C Staff	Comply with Procedure
Director I&C	Assure Compliance
Amtrak Design Staff	Comply with Procedure
Amtrak Construction Staff	Comply with Procedure
Division Engineer	Comply with Procedure
Real Estate Department	Distribute Specification to Applicants

**EP 3005- PIPELINE OCCUPANCY- SPECIFICATION 02081A**

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## PART 1 – GENERAL

### 1.1 SCOPE AND NATURE

These specifications apply to the design, construction and maintenance of pipelines and casings carrying flammable and non-flammable substances, or containing wires and cables, under, over, across and longitudinally along Amtrak property, right-of-way and facilities.

It is to be clearly understood that Amtrak owns its right-of-way for the primary purpose of operating a railroad. All occupancies shall therefore be designed and constructed so that operations and facilities are not interfered with, interrupted or endangered. In addition, the proposed facility shall be located to minimize encumbrance to the right-of-way so that the railroad will have unrestricted use of its property for current and future operations.

### 1.2 APPLICATION FOR OCCUPANCY

Individuals, Owners, Corporations and Municipalities (hereinafter known as the Applicant) desiring pipeline occupancy on Amtrak property must agree, upon approval of the construction plans by Amtrak, to execute an appropriate License Agreement and pay any required fees and/or rentals outlined therein.

Application for a License Agreement shall be made by letter addressed to Real Estate Department – National Railroad Passenger Corporation, 30th Street Station, Box 25, Philadelphia, PA 19104. The application must provide the following information:

1. Name of Applicant desiring the occupancy.
2. Complete mailing address of Applicant.
3. Name and title of person who will sign the License Agreement.
4. The State in which the Applicant is incorporated.
5. Complete description of the project, including installation, location and specific details of the occupancy.

No entry upon Amtrak property for the purpose of conducting surveys, field inspections, obtaining soil information, or for any other purpose required for the design and engineering of the proposed occupancy, will be allowed without a Right of Entry Permit executed by Amtrak. The Applicant must apply for the Right-of-Entry Permit and pay any associated fees.

It is to be clearly understood that the issuance of a Right of Entry Permit does not constitute authority to proceed with the actual construction. Actual construction cannot begin until a formal License Agreement has been fully executed by Amtrak and authorization to proceed has been granted.

All persons entering Amtrak property must first attend Railroad's Contractor Orientation Computer Based Training Class. The Contractor Orientation Class will be provided electronically at [www.amtrakcontractor.com](http://www.amtrakcontractor.com). Upon successful completion of the course and test, the individual taking the course will receive a temporary certificate without a photo that is valid for three weeks. The individual must upload a photo of himself/herself that will be embedded in the permanent ID card. The photo ID will be mailed to the individual's home address and must be worn or displayed while on Railroad property. Training is valid for one calendar year. All costs of complying with Railroad's safety training shall be at the sole expense of Permittee and/or Contractor. The Permittee and/or Contractor shall appoint a qualified person as its Safety Representative. The Safety Representative shall continuously ensure that all individuals comply with Railroad's safety requirements. All safety training records must be maintained with the Permittee's and/or Contractor's site specific work plan.

### 1.3 SUBMISSION OF PLANS AND DOCUMENTATION

All License Agreement applications shall be accompanied by ten complete sets of all project construction plans, specifications and computations covering the proposed occupancy. The construction plans, specifications and computations shall be signed and sealed by a Registered Professional Engineer licensed in the state in which the work is to be performed. If the plans, specifications and computations (including those submitted by contractors or suppliers) are not signed and sealed, they will be given no further consideration.

All proposed pipeline occupancy submissions to Amtrak shall be accompanied by two full size sets and eight half size sets (11" x 17") of plans. The half size plans are to be folded to an 8½" x 11" size, with a 1½"

margin on the left hand side and a 1" margin on the top, so that they can be secured at the upper left hand corner and still be unfolded to full size without being removed from the file. After folding, the title block or any other identification of the plans shall be visible at the lower right hand corner without the necessity of unfolding. Each plan shall bear an individual identifying number and an original issue date, together with subsequent revision dates. Revisions shall be clearly identified on the plans so that it is readily apparent as to what revisions were made and when. All plan sheets are to be folded individually and, where more than one plan is involved, the plan sheets shall be assembled into complete sets before submission to Amtrak. Upon completion of the project, as-built plans shall also be provided in an Adobe Acrobat CD ROM format.

Failure of the Applicant to comply with these requirements may be sufficient cause for rejection of the application.

Plans shall be drawn to scale, and a bar scale shall be provided. As a minimum, the following information shall be included:

1. Plan view of proposed pipeline in relation to all Amtrak facilities and facilities immediately adjacent to Amtrak, including, but not limited to, tracks, buildings, signals, pole lines, catenary pole foundations and guy anchors, other utilities and all other facilities that may affect or influence the pipeline design and construction. The right-of-way property line shall be clearly delineated (see Sketch 1).
2. Location of centerline of pipe (in feet) from the nearest railroad milepost or centerline of a railroad bridge (giving bridge milepost number). In all cases, the names of the municipality and the county in which the proposed facilities are located must be shown.
3. Profile of ground at centerline of pipe (from field survey) showing the relationship of the pipe and casing to ground level, tracks and other facilities (see Sketch 2). For longitudinal occupations, the profile of adjacent track or tracks must be shown (see Sketch 3). The location and description of benchmarks used in the field survey shall be given.
4. If the pipeline is in a public highway, the limits of the right-of-way for the highway shall be clearly indicated with dimensions from the centerline of the highway (see Sketches 1 & 4).
5. The angle of crossings in relation to the centerline of tracks.
6. Location and description of valves or control stations of the pipeline, or junction boxes and splice points for cable conduits, shall be clearly shown on the plans.
7. The Pipeline Crossing Data Sheet must be completed and shown on the plans submitted for approval (see Sketch 6).
8. Location and description of all appurtenances, manholes and other accesses shall be shown on the plans.

The plans must be specific as to:

1. Method of construction and installation.
2. Size and material of casing pipe, including any insulation or coatings proposed.
3. Size and material of carrier pipe, including any insulation or coatings proposed.

Location and dimensions of jacking, boring, or tunneling pits and of longitudinal pipeline trenches shall be shown, along with details of their sheeting and shoring. For usual soil conditions, if the bottom of the excavated pit nearest the adjacent track intersects a line drawn on a slope of 1½ horizontal to 1 vertical from a the bottom corner of a tie on the adjacent track, a temporary support of excavation system designed by a Registered Professional Engineer licensed in the State in which the work is to be performed shall be submitted for approval. For special soil conditions, a temporary support of excavation may be required for distances further from centerline of adjacent track. All temporary sheeting and shoring must comply with Amtrak Engineering Practice EP3014, Section 02261A, Requirements for Temporary Sheeting and Shoring to Support Amtrak Tracks. In any event, the face of the pit shall be no less than 25' from adjacent track, unless otherwise approved by Amtrak. During construction, jacking, boring or tunneling, pits shall be fenced, lighted, and otherwise protected as directed by Amtrak designated field representative.

If required, a dewatering plan shall be included in the submission. The dewatering plan shall include the location and dimensions of system components, structural capacity of pits, etc., and all pertinent collection and discharge data.

When computer calculations are included with design calculations, the following minimum documentation shall be furnished:

1. A synopsis of the computer program(s), stating briefly: required input, method of solution, approximations used, specifications or codes used, cases considered, output generated, extent of previous usage or certification of program(s) and the name of the author of the program(s).
2. Identification by number, indexing and cross referencing of all calculation sheets, including supplemental "long-hand" calculations sheets.
3. Fully identified, dimensioned and annotated diagram of each member of the structure being considered.
4. Clear identification and printing of all input and output values, including intermediate values, if such values are necessary for orderly review.
5. Identification of the processing unit, input/output devices, storage requirements, etc., if such supplemental information is significant and necessary for evaluation of the submittal.

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.

#### 1.4 PERMIT APPROVAL – NOTIFICATION TO PROCEED

**Notification to Proceed with Construction:** After approval of the engineering plans, computations and specifications, and the execution of the License Agreement, the Applicant's project can be undertaken. The Applicant will notify Amtrak a minimum of 21 working days prior to the desired start of construction (see Amtrak Engineering Practice EP3014, Section 01141A, Safety and Protection of Railroad Traffic and Property). The Applicant is responsible for notifying and coordinating the work with all utility owners.

#### 1.5 MODIFICATION OF EXISTING FACILITIES

Any replacement or modification of an existing carrier pipe and/or casing shall be considered a new installation subject to the requirements of these specifications. The owner of all pipelines and other occupancies shall notify in writing, Amtrak of any intention to replace or modify existing facilities.

#### 1.6 ABANDONED PIPELINES AND/OR FACILITIES

The owner of all pipelines and other occupancies shall notify in writing, Amtrak of the intention to abandon. The owner will be continually billed for the occupancy until such written notice is received.

Upon abandonment, the carrier pipe shall be removed and the casing shall be completely filled with cement grout, compacted sand or other materials approved by Amtrak, using methods approved by Amtrak. If it is impracticable to remove the carrier pipe, then the carrier must be filled along with the annular space between the casing and the carrier.

Facilities other than pipelines will be removed or altered at abandonment to the satisfaction of Amtrak.

#### 1.7 CONFLICT OF SPECIFICATIONS

Where laws or orders of public authority prescribe a higher degree of protection than specified herein, then the higher degree so prescribed shall be deemed a part of these specifications. Any such requirements shall be clearly referenced in the application.

#### 1.8 DEFINITIONS

**AASHTO** – American Association of State Highway and Transportation Officials

**Amtrak** – National Railroad Passenger Corporation, and/or the duly authorized representative.

**ANSI** – American National Standards Institute

**API** – American Petroleum Institute

**Applicant** – Individuals, Owners, Corporations, and Municipalities desiring occupancy of Amtrak property by a pipeline.

**AREMA** – American Railway Engineering and Maintenance-of-Way Association

**ASTM** – American Society for Testing and Materials

**Boring** – Pushing a pipe through fill material, with a boring auger rotating within the pipe to remove the soil.

**Carrier Pipe** – Pipe containing primary fluid or cable through occupancy area.

**Casing Pipe** – Protective encasement for a carrier pipe whose function is both structural and for containment of carrier fluids within the occupancy area, and/or dispersion of carrier fluids beyond the occupancy area.

**Cooper E-80** – Live load for each track based on four 80 kips axle load with 5' axle spacing.

**Horizontal Directional Drilling (Directional Boring)** – method of controlled drilling beneath existing facilities using a pilot hole bore.

**Jack Boring** – method of jacking a pilot rod beneath existing facilities between a launching pit and a receiving pit.

**Longitudinal Occupancy** – The installation and maintenance of pipelines that do not cross tracks, along and adjacent to tracks and within Amtrak property, right-of-way and facilities.

**CLSM** – Controlled Low Strength Material

**MSDS** – Material Safety Data Sheet

**NEC** – National Electric Code

**NESC** – National Electric and Safety Code

**License Agreement** – Agreement between Amtrak and applicant to allow applicant to construct and maintain pipelines under, over, across or longitudinally along Amtrak property, right-of-way and facilities.

**Open-Cut Trenching** – Surface excavation methods to allow the installation of pipelines.

**OSHA** – Occupational Safety and Health Administration.

**Pits (Launch/Receiving)** – Excavations at each end of a work area to allow jacking, boring or tunneling operations beneath existing site conditions.

**Right of Entry Permit** – Permit allowing applicant to enter Amtrak property solely for the purpose of obtaining information required for the design and engineering of a proposed License Agreement.

**Transverse Occupancy** – The installation and maintenance of pipelines on Amtrak property, right-of-way and facilities, where such pipelines cross tracks.

**Tremie Grouting** – A method in which concrete placed underwater through a pipeline (tremie pipe) to form a seal between the subsurface and water levels.

**Tunneling** – Method of boring with or without the use of placing liner plates behind a tunneling shield of tunneling machine, thus forming a casing for the installation of a carrier pipe under existing conditions

## 1.9 PUBLICATION STANDARDS

**AWS** – American Welding Society, Inc., 550 NW 42<sup>nd</sup> Avenue, Miami, FL 33126-0567

**ANSI** – American National Standards Institute, Inc., 11 West 42<sup>nd</sup> Street, New York, NY 10036

**ASTM** – American Society for Testing and Material, 100 Bar Harbor Drive, West Conshohocken, PA 19428-2959

**AREMA** – American Railway Engineering and Maintenance-of-Way Association, 8201 Corporate Drive, Suite 1125, Landover, MD 20785

**AWWA** – American Water Works Association, Inc., 1401 New York Avenue N.W., Suite 640, Washington, DC 20005

**OSHA** – Occupational, Safety and Health Administration, Superintendent of Documents, U.S. Printing Office, Washington, DC 20402

**NACE** – National Association of Corrosion Engineers, P.O. Box 201009, Houston, TX 77216-1009

If other than American Railway Engineering and Maintenance-of-Way Association (AREMA), American Society for Testing and Materials (ASTM), and American National Standards (ANSI)



specifications are referred to for design, materials or workmanship on the plans and specifications for the work, then copies of the applicable sections of such other specifications shall accompany the plans and specifications for the work.

## PART 2 – TECHNICAL REQUIREMENTS

### 2.1 LOCATION OF PIPELINE ON THE RIGHT-OF-WAY

Pipelines laid longitudinally on Amtrak Right-of-Way shall be located as far as practicable from any tracks or other important structures and as close to the Amtrak property line as possible. Longitudinal pipelines must not be located within drainage ditches located on the right-of-way.

Pipelines shall be located, where practicable, to cross tracks at approximate right angles thereto, but generally no less than 45°.

Pipelines shall not be located within the limits of a turnout (switch) when crossing the track. The limits of the turnout extend from the second tie before the point of the switch to the first tie beyond the last long timber.

Pipelines shall not be located within the limits of a highway crossing at grade. If it is shown that no other location is possible, the Applicant will be responsible for reimbursing Amtrak for all costs associated with the removal and reconstruction of the grade crossing.

Pipelines and casings shall be suitably insulated from underground conduits or direct burial cables carrying electric wires on Amtrak property, in accordance with ANSI and NESC standards.

Pipelines shall not be placed within a culvert, under railroad bridges, nor closer than 45' to any portion of any railroad bridge, building or other important structure, except in special cases, and then by special design, as approved by Amtrak.

### 2.2 CARRIER PIPE

All proposed pipes, ditches and other structures carrying surface drainage on Amtrak property and/or crossing under Amtrak tracks shall be designed to carry the run-off from a 100 year storm. Computations indicating this design and suitable topographic plans, prepared by a Registered Professional Engineer licensed in the State in which the work is being performed shall be submitted to Amtrak for approval. If the drainage is to discharge into an existing drainage channel on Amtrak Right-of-Way and/or under Amtrak tracks, the computations should include the hydraulic analysis of any existing structures. Submitted with the computations should be formal approval of the proposed design by the appropriate governmental agency.

Carrier pipes within a casing shall be designed as if they are not encased.

All pipes shall be designed for the external and internal loads to which they will be subjected. The dead load of earth shall be considered 120 pounds per cubic foot. Railroad live loading shall be Cooper's E-80 with 50% added for impact. The following shall be the minimum requirements for carrier pipes:

1. Reinforced concrete pipe – ASTM C76, Class V. Wall C
2. Ductile Iron Pipe – ANSI A21.51, Class 56
3. Corrugated Metal Pipe – AREMA Manual, Chapter 1, Part 4.
4. Cast Iron Pipe – for culverts and gravity sewers – ASTM A-716 Extra Heavy.
5. Steel Pipe – ASTM A53, Type E or S, Grade A or B
6. Polyethylene – for cable, wire or fiber optic lines – Special approval required for pipe in excess of 6" OD. ASTM D 3350 – Standard Specification for Polyethylene Plastic Pipe and Fittings Materials, and ASTM D2513 – Standard Specification for Thermoplastic Gas Pressure Pipe, Tube and Fittings or AWWA C 901/C 906 – Standards for Polyethylene (PE) Pressure Pipe and Tubing for Water Service.
7. Others – as approved by Amtrak.

Pipelines carrying oil, liquefied petroleum gas, natural or manufactured gas and other flammable products shall conform to the requirements of the current ANSI B 31.4 with Addenda "*Liquid Transportation Systems for Hydrocarbons, Liquid Petroleum Gas, Anhydrous Ammonia, and Alcohols*"; ANSI B 31.8 "*Gas Transmission and Distribution Piping Systems*"; and other applicable ANSI Codes except that the maximum allowable stresses for design of steel pipe shall not exceed the following percentages of the specified minimum yield strength (multiplied by the longitudinal joint factor) of the pipe as defined in the ANSI Codes:

8. Steel pipe within a casing under Amtrak tracks, across Amtrak right-of-way, and longitudinally on Amtrak right-of-way (the following percentages apply to hoop stress):
  - a. Seventy-two percent for installation of oil pipelines.
  - b. Fifty percent for pipelines carrying liquefied petroleum gas and other flammable liquids with low flash point.
  - c. Sixty percent for installation of gas pipelines.

### 2.3 CASING PIPE

Pipelines under or along Amtrak tracks and across Amtrak right-of-way shall be encased in a larger pipe or conduit called the casing pipe.

Casing pipe will be required for all pipelines carrying oil, gas, petroleum products, or other flammable or highly volatile substances under pressure, and all non-flammable substances which, from their nature or pressure, as determined by Amtrak, might cause damage if escaping on, under, over, or near Amtrak property.

For non-pressure sewer or drainage crossings, where the installation is approved by Amtrak, the casing pipe may be omitted when the carrier pipe strength is capable of withstanding railroad loading hereinafter specified.

The casing pipe shall be designed in accordance with criteria on Section 2.4. Casing pipe shall be installed so as to provide an even bearing pressure throughout its length. Casing pipe laid transverse to the railroad shall slope to one end.

#### Protection at ends of casings:

1. Casings for carriers of flammable substances shall be suitably sealed to the outside of the carrier pipe. Details of seals shall be shown on the plans.
2. Casings for carriers of non-flammable substances shall have both ends of the casing blocked up in such a way as to prevent the entrance of foreign material, but allowing leakage to be safely detected in the event of a carrier break.
3. Where ends of casings are at or above ground surface and above high water level, they may be left open, provided drainage is afforded in such a manner that leakage will be conducted away from railroad tracks and structures.

#### Vents:

1. All sealed casings shall be adequately vented. Special attention shall be given to sealed casings for flammable substances in accordance with ANSI Standards. Vent pipes shall be of sufficient diameter, but in no case less than 2" in diameter, and shall be attached near each end of the casing and project through the ground surface at right-of-way lines or not less than 45' (measured at right angles) from centerline of nearest track.
2. Vent pipes shall extend not less than 4' above the ground surface. Top of vent pipe shall have a down-turned elbow, properly screened, or a relief valve. Vents in locations subject to high water shall be extended above the maximum elevation of high water and shall be supported and protected in a manner approved by Amtrak.
3. Vent pipes shall be at least 4' vertically from aerial electric wires or greater if required by NESC and ANSI Standards.
4. When the pipeline is in a public highway, street-type vents shall be installed.

If additional tracks are constructed in the future, the casing shall be extended correspondingly at the expense of the Applicant.

**2.4 DESIGN CRITERIA**

Pipes may be rigid or flexible, as permitted by their specific use. The design criteria follows, and shall be in accordance with the current AREMA Manual for Railway Engineering.

The inside diameter of the casing pipe shall be such as to allow the carrier pipe to be subsequently removed without disturbing the casing or the roadbed. For carrier pipe less than 6" in diameter, the inside diameter of a steel casing pipe shall be at least 2" greater than the largest outside diameter of the carrier pipe, joints, or couplings; for carrier pipe 6" and over in diameter, the inside diameter of a steel casing pipe shall be at least 4" greater than the largest outside diameter of the carrier pipe, joints, or couplings.

Casing pipe under Amtrak tracks and across Amtrak Right-of-Way shall extend the greater of the following distances measured at right angles to centerline of tracks:

1. Across the entire width of Amtrak Right-of-Way.
2. 3' beyond ditch line.
3. 2' beyond toe of slope.
4. A minimum distance of 25' each side from centerline of outside track when casing is sealed at both ends.
5. A minimum distance of 45' from centerline of outside track when casing is open at both ends.

Where installation of the casing pipe is proposed by means of open cut, the designer should determine the effects upon the casing due to change in weight of the new compacted fills and potential for lateral spreading of the embankment and account for these effects in the design. Where segmental casing pipe segments are used, temporary or permanent tension rods may be required by the Engineer.

The values shown in Table 1 shall be used for the live load vertical pressure on a buried structure for the various heights of cover.

**TABLE 1 (MODIFIED)**  
(AREMA, CHAPTER 1, PART 4, TABLE 4-39)  
PRESSURE FROM COOPER E-80 LIVE LOAD, INCLUDING IMPACT, FOR VARIOUS HEIGHTS OF COVER

Height of Cover (feet)	Live Load Pressure (lb/sq.ft.)
5.5	2400
8	1600
10	1100
12	800
15	600
20	300
30	100

Note: If height of cover, from bottom of cross tie to top of structure, is over 30', use dead load pressure only.

Steel casing pipe shall have a minimum wall thickness as shown in Table 2 (next page), unless computations indicate that a thicker wall is required. Computations showing the adequacy of casing pipe wall thickness shall be furnished as part of the submittal.

**TABLE 2**  
(AREMA, CHAPTER 1, PART 5, TABLE 5-1)

<b>Pipe Diameter</b>	<b>Coated or Cathodically Protected</b>	<b>Uncoated and Unprotected</b>
<b>Nominal Pipe Size (inches)</b>	<b>Nominal Wall Thickness (inches)</b>	<b>Nominal Wall Thickness (inches)</b>
12 <sup>3</sup> / <sub>4</sub> and under	0.188	0.188
14	0.188	0.250
16	0.219	0.281
18	0.250	0.312
20 and 22	0.281	0.344
24	0.312	0.375
26	0.344	0.406
28	0.375	0.438
30	0.406	0.469
32	0.438	0.500
34 and 36	0.469	0.531
38	0.500	0.562
40	0.531	0.594
42	0.562	0.625
44 and 46	0.594	0.656
48	0.625	0.688
50	0.656	0.719
52	0.688	0.750
54	0.719	0.781
56 and 58	0.750	0.812
60	0.781	0.844
62	0.812	0.875
64	0.844	0.906
66 and 68	0.875	0.938
70	0.906	0.969
72	0.938	1.000

Steel pipe shall have minimum yield strength of 35,000 psi. The ASTM or API specification and grade for the pipe are to be shown on the Pipe Data Sheet.

Corrugated metal pipe or corrugated structural plate pipe may be used for casing, provided the pressure in the carrier pipe is less than 100 psi, and only when placed by the open cut method. Jacking or boring through railroad embankment for corrugated pipe is not permitted. Pipe shall be bituminous coated and shall conform to the current AREMA Manual for Railway Engineering, Chapter 1, Part 4.

Tunnel liner plates shall be galvanized and bituminous coated and shall conform to the current, at time Application is made, AREMA Manual for Railway Engineering, Chapter 1, Part 4. In no event shall the liner plate thickness be less than 0.105".

If the tunnel liner plates are used only to maintain a tunneled opening until the carrier pipe is installed, and the annular space between the carrier pipe and the tunnel liner is completely filled with cement grout within a

reasonably short time after completion of the tunnel, then the tunnel liner plates need not be galvanized and coated.

Reinforced concrete pipe may be used for a casing. For a cover depth of 14' or less, reinforced concrete pipe shall conform to the current ASTM C76, Class V, Wall C. It may be used in open cut methods of installation, or when suitably designed for jacking methods. For depth of cover greater than 14', the designer shall prepare an engineering analysis in accordance with the current, at time of Application, AREMA Manual for Railway Engineering, Chapter 8, Part 10. For elliptical or arch pipe, where reinforced concrete pipe with supporting strength of the pipe (D) equal to 3,000 pounds per linear foot is not available, a separate engineering analysis shall be submitted.

For flexible casing pipe, a minimum vertical deflection of the casing pipe of 3 percent of its diameter plus 1/2" shall be provided so that no loads from the roadbed, track, traffic or casing pipe itself are transmitted to the carrier pipe. When insulators are used on the carrier pipe, the inside diameter of flexible casing pipe shall be at least 2" greater than the outside diameter, including insulation, of the carrier pipe for pipe less than 8" in diameter; at least 3/4" greater for pipe 8" to 16" inclusive in diameter; and at least 4 1/2" greater for pipe 18" and over in diameter.

When steel casing pipe is used, the joints shall be fully closed by welding or mechanical means to ensure tightness. The closure shall develop the full strength of the casing pipe. Closure details shall be shown on the plans.

## 2.5 SIGNS

All pipelines (except those in streets where it would not be practical to do so) shall be prominently marked at Right-of-Way lines (on both sides of track for under crossings) by durable, weatherproof signs located on the edge of Right-of-Way over the centerline of the pipe. Signs shall show the following:

1. Name and address of Owner
2. Contents of Pipe
3. Pressure in Pipe
4. Depth of pipe below grade at point of sign
5. Emergency telephone in event of pipe rupture

The material, size of lettering and the installation method of the sign shall be as approved by Amtrak. For pipelines running longitudinally on Amtrak property, signs shall be placed over the pipe (or offset and appropriately marked) at all changes in direction of the pipeline. Such signs should also be located so that when standing at one sign the next adjacent sign in either direction is visible. The owner shall maintain all signs on Amtrak Right-of-Way as long as the Occupancy Permit is in effect. Any entry on to Amtrak property shall be made in accordance with all provisions of the Right of Entry Permit.

## 2.6 EMERGENCY SHUT-OFF VALVES

Accessible emergency shut-off valves shall be installed on each side of the railroad at locations selected by Amtrak. Where pipelines are provided with automatic control stations and within distances approved by Amtrak, no additional valves will be required. Description of location of those facilities shall be part of the Application.

## 2.7 DEPTH OF PIPELINE INSTALLATION

Pipe under Amtrak tracks and across Amtrak Right-of-Way shall be not less than 5 1/2' from bottom of tie to top of casing at its closest point. On other portions of Right-of-Way where casing is not directly beneath any track, the depth from ground surface or from bottom of ditches to top of casing shall be not less than 4', unless otherwise specified herein.

## 2.8 CATHODIC PROTECTION

Cathodic protection shall be applied to all pipelines and casings carrying flammable substances in accordance with ANSI Standards.

Where casing and/or carrier pipe is cathodically protected by other than anodes, Amtrak shall be notified and a suitable test shall be made and witnessed by Amtrak to insure that all structures and facilities are adequately protected from the cathodic current in accordance with the recommendation of Reports of Correlating Committee on Cathodic Protection, current issue by the National Association of Corrosion Engineers.

## 2.9 SOIL INVESTIGATIONS

For all pipe crossings, soil borings or other soil investigations approved by Amtrak shall be made to determine the nature of the underlying material (see Part 1, Section 1.2 for procedure to enter Amtrak property). Boring location plans need to be approved by Amtrak in advance of taking of the borings.

Borings shall be made on each side of the tracks, on the centerline of the pipe crossings, and as close to the tracks as practicable.

Soil borings shall be made in accordance with the current, at time of Application, AREMA Manual for Railway Engineering, Chapter 8, Part 22. Soils shall be investigated by the split-spoon and/or thin walled tube method, and rock shall be investigated by the coring method, as appropriate. The location of the carrying pipe and/or casing shall be superimposed on the Boring Location Plan before submission to Amtrak.

Soil boring logs shall clearly indicate all of the following:

1. Boring number as shown on Boring Location Plan.
2. Elevation of ground at boring, using the same NGVD (National Geodetic Vertical Datum) or NAVD (North American Vertical Datum) as the pipeline construction plans. The location of the carrier pipe and/or casing pipe shall be superimposed on the boring logs before submission to Amtrak.
3. Description or soil classification of each soil sample encountered shall be made in accordance with the Unified Soils Classification System. Classification and description of rock shall include type, local designation, joint or fracture frequency, foliation and, joint dip, surface degree of weathering and any other pertinent observations concerning the drilling and recovery.
4. Elevations or depth from surface for each change in strata.
5. Identification of depth where samples were taken or attempted and percentage of recovery.
6. Location of ground water at time of sampling and, if available, subsequent readings shall be reported. Observed conditions, such as depth of hole or casing, drill fluid, recent precipitation, surface elevation of nearby bodies of water and time permitted for the stabilized level to occur shall be noted.
7. Natural dry density in pounds per cubic foot for all strata.
8. Unconfined compressive strength in tons per square foot for all cohesive strata.
9. Natural water content (percent), liquid limit (percent) and plastic limit (percent) for all cohesive soils.
10. Standard Penetration Test N Value in blows per foot (or inches/blow), for each sample obtained or unsuccessful attempt.
11. Samples shall be retained for review by Amtrak.
12. Failed boring attempts shall be logged and reported.
13. All borings and attempts shall be tremie grouted with non-shrink grout or other approved material. The quantity of grout material used shall be measured and reported.

Soil boring logs shall be accompanied with a plan drawn to scale showing the location of borings in relation to the tracks and the proposed pipe location, the elevation of ground surface at each boring, and the elevation of the base of rail of the tracks. Elevations shall be shown to the nearest 0.1 foot.

## PART 3 – CONSTRUCTION

### 3.1 CONSTRUCTION INSPECTION REQUIREMENTS

The Applicant shall provide full time on-site inspection by a Resident Engineer during the installation of temporary and permanent facilities approved by Amtrak. This inspection shall be under the supervision of a Registered Professional Engineer licensed in the State in which the work is being performed. The Professional Engineer shall certify that the facilities were installed in accordance with these specifications and the approved plans. The on-site Resident Engineer shall coordinate the activities of the contractor with the Amtrak Project Engineer. All work shall be performed in accordance with Amtrak Engineering Practice EP3014 Maintenance and Protection of Railroad Traffic during Contractor Operations.

### 3.2 INSTALLATION METHODS

#### Open Cut or Braced Trench

1. Installation by open cut or braced trench methods shall comply with the current, at time of Application, AREMA Manual for Railway Engineering, Chapter 1, Part 4. At least 60 days may be required for Amtrak review and approval of open cut or braced trench methods.
2. Where Amtrak has approved the open cut method, pipe shall be installed on a Class B bed of compacted graded aggregate. Sand backfill shall be used to fill around the sides and on top of the pipe. A colored warning tape shall be placed a minimum of 12" above the top of the pipe. Additional backfill shall be well-graded, clean granular soil having less than 20 percent by dry weight passing No. 200 US STD sieve. Maximum aggregate size shall be ½". Backfill shall be placed in loose 8" layers and compacted to at least 95 percent of its maximum density at within 2% of the optimum moisture content as determined in accordance with current ASTM D1557 (AASHTO T180).
3. Prior to the start of an open cut installation, the contractor shall have all materials on site, including emergency stand-by handling equipment.

#### Jacking

1. Jacking of casing pipe shall be in accordance with the current AREMA Manual for Railway Engineering, Chapter 1, Part 4. This operation shall be continuous once started, and shall be conducted without hand-mining ahead of the pipe and without the use of any type of boring, auguring, or drilling equipment. Ordinarily 36-inch diameter pipe is the minimum size that should be used. Bracing and backstops shall be designed and jacks of sufficient rating shall be used so that the jacking can be progressed without stoppage (except for adding lengths of pipe) until the leading edge of the pipe has reached the receiving pit or is at least 25' from the centerline of the last track.
2. When jacking reinforced concrete pipe, grout holes, tapped for no smaller than 1½" pipe, shall be cast into pipe at manufacture. Grout holes shall be spaced at approximately 3' around the circumference and 4' longitudinally with a minimum of three grout holes around the circumference. Immediately upon completion of jacking operations, the installation shall be pressure grouted.

#### Horizontal Directional Drilling / Directional Boring

1. Due to the unique circumstances and conditions encountered along the railroad Right-of-Way (ROW), each Horizontal Directional Drilling (HDD) request will be reviewed and approved at Amtrak's sole discretion on a case by case basis.
2. The applicant utilizing the HDD method of installation shall meet all the requirements found in EP 3005, Section 02082A, Horizontal Directional Drilling / Directional Boring. If HDD is deemed unacceptable by Amtrak, the applicant may consider other installation techniques contained within EP 3005, Section 02081A, Pipeline Occupancy, for the installation of the pipeline or utility crossing.



**Tunneling with Liner Plate**

1. Tunneling operations shall be conducted as approved by Amtrak. Care shall be exercised in trimming the surface of the excavated section in order that the steel liner plates fit snugly against undisturbed material.
2. Excavation shall not be advanced ahead of the previously installed liner plates any more than is necessary for the installation of the succeeding liner plate. The vertical face of the excavation shall be supported as necessary to prevent sloughing.
3. At any interruption of the tunneling operation, the heading shall be completely bulkheaded.
4. Unless otherwise approved by Amtrak the tunneling shall be conducted continuously on a 24-hour basis, until the tunnel liners extend at least equal to 25' beyond the centerline of the last track.
5. A uniform mixture of 1:6 cement grout shall be placed under pressure behind the liner plates to fill any voids existing between the liner plates and the undisturbed material. Grout holes tapped for no smaller than ½" pipe, spaced at approximately 3' around the circumference of the tunnel liner shall be provided in every third ring. Grouting shall start at the lowest hole in each grout panel and proceed upwards simultaneously on both sides of the tunnel. A threaded plug shall be installed in each grout hole as the grouting is completed at that hole.
6. Grouting shall be kept as close to the heading as possible, using grout stops behind the liner plates if necessary. Grouting shall proceed as directed by Amtrak, but in no event shall more than six linear of tunnel be progressed beyond the grouting.

**Tunneling Shields**

1. All pipes 60" and larger in outside diameter shall be placed with the use of a tunneling shield unless otherwise approved by Amtrak. Pipes of smaller diameter may also require a shield when, at the sole discretion of Amtrak, soil or other conditions indicate its need.
2. The shield shall be of steel construction designed to support railroad track loading as specified herein, in addition to other loadings it must sustain. The advancing face shall be provided with a hood, extending no less than 20 inches beyond the face and extending around no less than the upper 240 degrees of the total circumference. It shall be of sufficient length to permit the installation of at least one complete ring of liner plates within the shield before it is advanced for the installation of the next ring of liner plates. It shall conform to and not exceed the outside dimensions of the pipe being placed by more than one inch at any point on the periphery unless otherwise approved by Amtrak.
3. The shield shall be adequately braced and provided with necessary appurtenances for completely bulk heading the face with horizontal breast boards and arranged so that the excavation can be benched as may be necessary. Excavation shall not be advanced beyond the edge of the hood, except in rock.
4. Manufacturer's shop detail plans and manufacturer's computations showing the ability of the tunnel liner plates to resist the jacking stresses shall be submitted to Amtrak for approval.
5. The detail shield plans and design calculations prepared by a Registered Professional Engineer licensed in the state in which the work is being performed shall be submitted to Amtrak for approval. No work shall proceed until such approval is obtained.

**Boring**

1. This method consists of pushing the pipe into the fill with a boring auger rotating within the pipe to remove the soil. When augers or similar devices, are used for pipe emplacement, the front of the pipe shall be provided with mechanical arrangements or devices that will positively prevent the auger and cutting head from leading the pipe so that there will be no unsupported excavation ahead of the pipe. The auger and cutting head arrangement shall be removable from within the pipe in the event an obstruction is encountered. The over-cut by the cutting head shall not exceed the outside diameter of the pipe by more than one half inch. The face of cutting head shall be arranged to prevent the free flow of soft or poor material. The use of water or other liquids to facilitate casing emplacement and spoil removal is prohibited. Plans

and descriptions of the arrangement to be used shall be submitted to Amtrak for approval and no work shall proceed until such approval is obtained.

2. Any method which employs simultaneous boring and jacking or drilling and jacking for pipes over 8" in diameter which does not have the above approved arrangement will not be permitted. For pipes 8" and less in diameter, auguring or boring without this arrangement may be considered for use only as approved by Amtrak.

### 3.3 CONSTRUCTION OPERATIONS

All construction operations shall be conducted so as not to interfere with, interrupt, or endanger the operation of trains or damage, destroy, or endanger the integrity of railroad facilities. All work on and near Amtrak property shall be conducted in accordance with Amtrak safety rules and regulations. The contractor shall secure and comply with the Amtrak safety rules and shall give written acknowledgment to Amtrak that they have been received, read, and understood by the contractor and his employees. Construction operations will be subject to Amtrak inspection at any and all times.

If an obstruction is encountered during installation to stop the forward action of the pipe and it becomes evident that it is impossible to advance the pipe, operations will cease and the pipe shall be abandoned in place and filled completely with grout.

Bored or jacked installations shall have a bored hole essentially the same as the outside diameter of the pipe plus the thickness of the protective coating. If voids should develop or if the bored hole diameter is greater than the outside diameter of the pipe (plus coating) by more than approximately 1 inch, grouting or other methods approved by Amtrak shall be employed to fill such voids.

Pressure grouting of the soils or freezing of the soils before or during jacking, boring, or tunneling may be required at the discretion of Amtrak to stabilize the soils, control ground water, prevent loss of material and prevent settlement or displacement of embankment and/or tracks. Grout shall be cement, chemical or other special injection material selected to accomplish the necessary stabilization.

The material to be used and the method of injection shall be prepared by a Registered Professional Engineer licensed in the state in which the work is being performed, or by an experienced and qualified company specializing in this work and submitted for approval to Amtrak before the start of work. Proof of experience and competency shall accompany the submission. Material Safety Data sheet shall be provided for all materials.

When the presence of surface, ground and/or artesian water is known or expected to be encountered, pumps of sufficient capacity to handle the flow shall be maintained at the site by the contractor, and upon approval of Amtrak, the contractor shall operate them. Pumps in operation shall be constantly attended on a 24-hour basis, until, in the sole judgment of Amtrak, the operation can be safely halted. When dewatering, close observation by optical survey, or other instrumentation as required, to verify the adequacy of work, shall be maintained to detect any settlement or displacement of railroad embankment, tracks and facilities. A detailed plan of water control for work including instrumentation shall be submitted by the Applicant for approval by Amtrak.

All cranes, lifts, or other equipment that will be operated in the vicinity of the Railroad's electrification and power transmission facilities shall be operated and electrically grounded as required by EP3014 section 01141A and shall comply with OSHA Safety and Health Standards, Page 175, Subpart N1926.950. OSHA 2207, Revised 1983, or as provided by the High Voltage Proximity Act.

At all times when the work is being progressed, a field supervisor for the work with no less than 12 months experience in the operation of the equipment being used shall be present. If boring, drilling, or similar machines are being used, the machine operator also shall have no less than 12 months experience in the operation of the equipment being used.

Blasting will not usually be permitted under or on Amtrak Right-of-Way. If the use of blasting is proposed, technical justification of its necessity must be submitted by review and approval. If blasting is approved, it must be performed in accordance with EP3003.

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.

#### **Support of Excavation Adjacent to Track.**

##### **1. Launching and Receiving Pits**

- a. The location and dimensions of all pits or excavations shall be shown on the plans. The distance from centerline of adjacent track to face of pit or excavation shall be clearly labeled. The elevation of the bottom of the pit or excavation must be shown on the profile.
- b. The face of all pits shall be located at a minimum of 25' from the centerline of adjacent track, measured at right angles to track, unless otherwise approved by Amtrak.
- c. If the bottom of the pit excavation intersects the theoretical railroad embankment line (see EP3014, Section 02261A, Requirements for Temporary Sheet piling and Shoring to Support Amtrak Tracks, Sketch 1), interlocking steel sheet piling, driven prior to excavation, must be used to protect the track stability. The use of trench boxes or similar devices is not acceptable in this area.
- d. Design plans and computations for the pits, signed and sealed by a Registered Professional Engineer licensed in the State in which the work is being performed, must be submitted by the Applicant at the time of application or by the contractor prior to the start of construction. If the pit design is to be submitted by the contractor, the project specification must require the contractor to obtain Amtrak's approval prior to beginning any work on or which may affect Amtrak's property.
- e. The sheeting shall be designed to support all lateral forces caused by the earth, railroad and other surcharge loads.
- f. After construction and backfilling, all sheet piling that is not removed within 10' of centerline of adjacent track must be cut off per EP3014, Section 02261A, Requirements for Temporary Sheet piling and Shoring to support Amtrak tracks, paragraph 3.1.F.
- g. All excavated areas are to be illuminated (flashing warning lights not permitted) fenced and otherwise protected as directed by Amtrak.

### **3.4 SUPPORT OF TRACKS**

When the jacking, drilling, tunneling or boring method of installation is used, and depending upon the size and location of the crossings, temporary track supporting structures shall be installed. The requirement for these temporary structures may be deleted only with the approval of Amtrak.

Unless otherwise agreed, all work involving rail, ties and other track material will be performed by Amtrak. The Applicant shall reimburse Amtrak for all costs associated with the installation and removal of track supports.

When excavation for a pipeline or other structure will be within the theoretical railroad embankment line (see EP3014, Section 02261A, Requirements for Temporary Sheet piling and Shoring to Support Amtrak Tracks, Sketch 1) of an adjacent track, interlocking steel sheet piling will be required to protect the track.

Prior to the start of construction, the applicant must deliver a stockpile (minimum 10 tons) of approved railroad ballast to an area designated by Amtrak at the project site.

### **3.5 PIPELINES IN ROADWAYS UNDER BRIDGES**

Pipelines to be installed under bridges that carry Amtrak tracks above a roadway shall be designed and constructed in conformance with all applicable Sections of this specification. The casing pipe, when required, may be designed for the applicable highway loading(see Sketch 4).

**3.6 PIPELINES ON BRIDGES**

Pipelines carrying flammable substances or non-flammable substances that by their nature might cause damage if escaping on or near railroad facilities or personnel shall not be installed on bridges over railroad tracks or bridges carrying railroad tracks.

In special cases when it can be demonstrated to Amtrak's satisfaction that such an installation is necessary and that no practicable alternative is available, Amtrak may permit the installation and only by special design approved by Amtrak (see Sketch 5).

Pipelines on bridges shall be so located as to minimize the possibility of damage from vehicles, railroad equipment, vandalism and other external causes. They shall be encased in a casing pipe. Where appropriate, permanent barriers shall be constructed at each end of the bridge to prevent trespassers from crossing the bridge via the pipe casing.

**3.7 BONDING AND GROUNDING OF PIPELINES ON BRIDGES IN ELECTRIFIED TERRITORY**

Carrier pipe shall be enclosed in a metal casing that is isolated from carrier pipe by approved insulators having a dielectric value of not less than 25 kV that provide an air gap between carrier pipe and casing of not less than 2 inches, in accordance with ANSI or NESC Standards.

Carrier pipe supporting hangers, mountings or cradles shall provide an insulation value of not less than 25 kV and provide an air gap of not less than 2 inches between casing and any portion of mounting assembly.

Casing shall be bonded to Amtrak's return conductor at each end through bridge steel or direct when bridge members are of non-conductive material conforming to Amtrak Standards.

The casing and installation equipment shall be bonded and grounded to an earth ground of not more than 25 ohms resistance to ground for construction. The applicant shall monitor adequacy of the ground.

**3.8 DRAINAGE**

Occupancies shall be designed and their construction shall be accomplished so that adequate and uninterrupted drainage of Amtrak Right-of-Way is maintained. If, in the course of construction it may be necessary to block a ditch, pipe or other drainage facility, temporary pipes, ditches or other drainage facilities shall be installed to maintain adequate drainage as approved by Amtrak. Upon completion of the work, the temporary facilities shall be removed and the permanent facilities restored.

Where disturbance of the ground may result in contamination of the ballast or this contamination occurs as result of a wash out, the Applicant shall be responsible for costs to restore the track and structure. Temporary soil erosion measures for protecting the track shall be submitted as part of the construction plan and approved by Amtrak.

Under no circumstances should additional flow be routed onto Amtrak Right-of-Way, either during construction or upon completion.

**3.9 INSPECTION AND TESTING REQUIREMENTS FOR HAZARDOUS MATERIALS**

For pipelines carrying flammable or hazardous materials, ANSI Codes B31.8 and B31.4, current at time of constructing the pipeline, shall govern the inspection and testing of the facility on Amtrak property except that proof-testing of strength of carrier pipe shall be in accordance with the requirements of ANSI Codes B31.8 for location Classes 2, 3, or 4 or ANSI Code B31.4, as applicable, for all pipelines carrying oil, liquefied petroleum gas, natural or manufactured gas and other flammable substances.

## **PART 4 – INFORMATION SKETCHES**

### **4.1 The following Information Sketches are attached:**

Sketch 1 – Information to be shown on Plan Section of drawing.

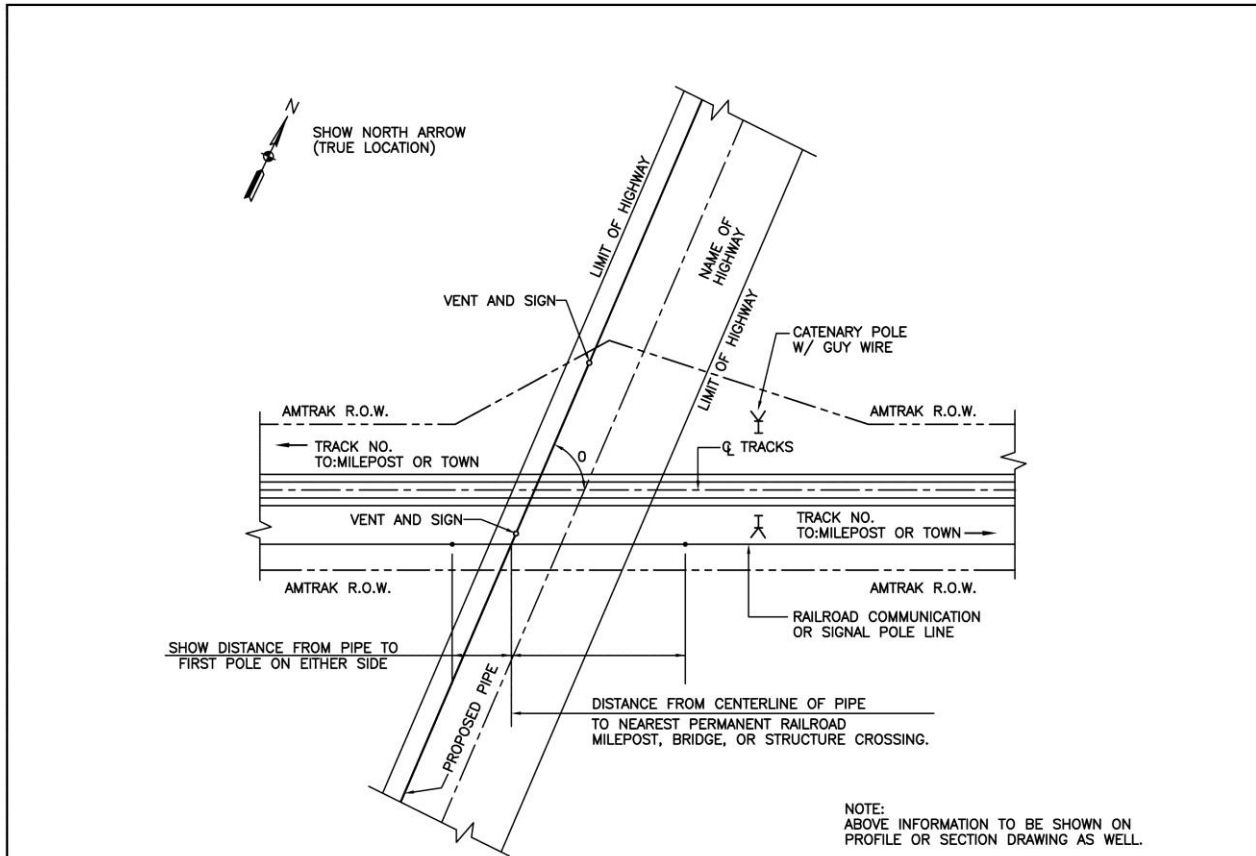
Sketch 2 – Information to be shown on Profile Section of drawing.

Sketch 3 – Longitudinal Occupancy.

Sketch 4 – Pipeline in Roadway Under Railroad Bridge

Sketch 5 – Details for Bonding and Grounding of Pipelines

Sketch 6 – Pipe Crossing Data Sheet



NOTE:  
ABOVE INFORMATION TO BE SHOWN ON  
PROFILE OR SECTION DRAWING AS WELL.

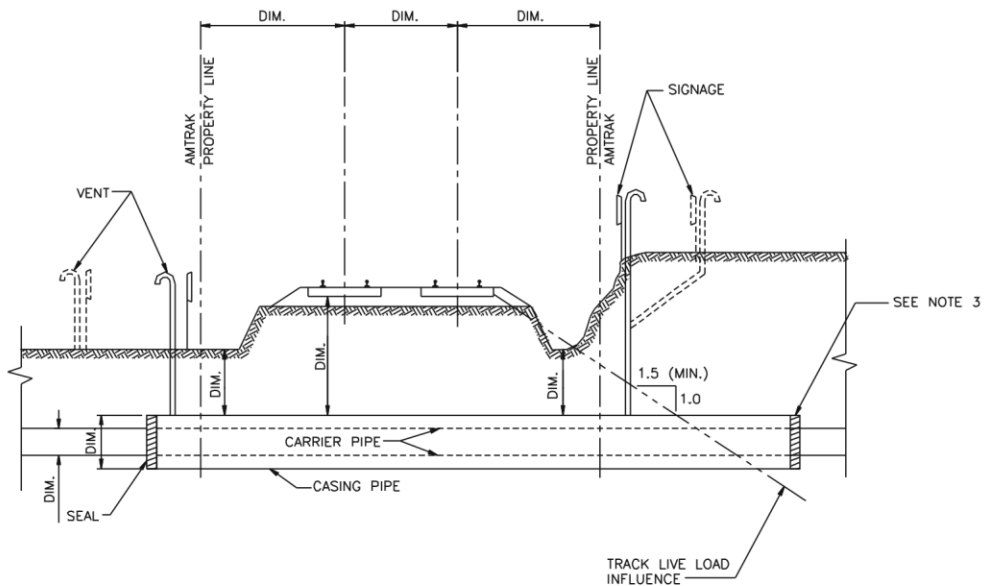
**PLAN**  
SCALE:

**NOTES:**

1. IF MANHOLES ARE PLACED ON AMTRAK PROPERTY, DETAILS OF SAME, WITH CLEARANCES TO NEAR RAILS ARE TO BE SHOWN ON THE DRAWINGS.
2. IF THE PROPOSED PIPE IS TO SERVE A NEW DEVELOPMENT, A MAP SHOWING THE AREA IN RELATION TO ESTABLISHED AREAS AND ROADS IS TO BE SUBMITTED WITH THE REQUEST.
3. IF THE PROPOSED PIPE IS NOT WHOLLY WITHIN HIGHWAY LIMITS, A REASONABLE CONTINUATION OF THE PIPE SHOULD BE SHOWN.
4. SCALE OF DRAWING TO BE SHOWN.
5. BURIED COMMUNICATION AND SIGNAL LINES MAY BE PRESENT. OTHER UTILITIES MAY ALSO BE ENCOUNTERED. PERMITTEE MUST VERIFY PRESENCE AND LOCATION OF ANY SUB SURFACE LINE PRIOR TO STARTING CONSTRUCTION.
6. PROVIDE DIMENSIONS WHERE INDICATED. INCLUDING ANGLE OF CROSSING.

**INFORMATION TO BE SHOWN ON PLAN SECTION OF DRAWING**

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Dist:	SK-1										
		Designed AEC    Drawn JLM    Date 3/01/02									



SECTION  
SCALE:

NOTES:

1. ABOVE INFORMATION AND DIMENSIONS TO BE SHOWN ON PROFILE SECTION DRAWING.
2. VENTS IF REQUIRED.
3. END OF CASING PIPE MUST BE OUTSIDE THE TRACK LIVE LOAD INFLUENCE

INFORMATION TO BE SHOWN ON PROFILE SECTION OF DRAWING

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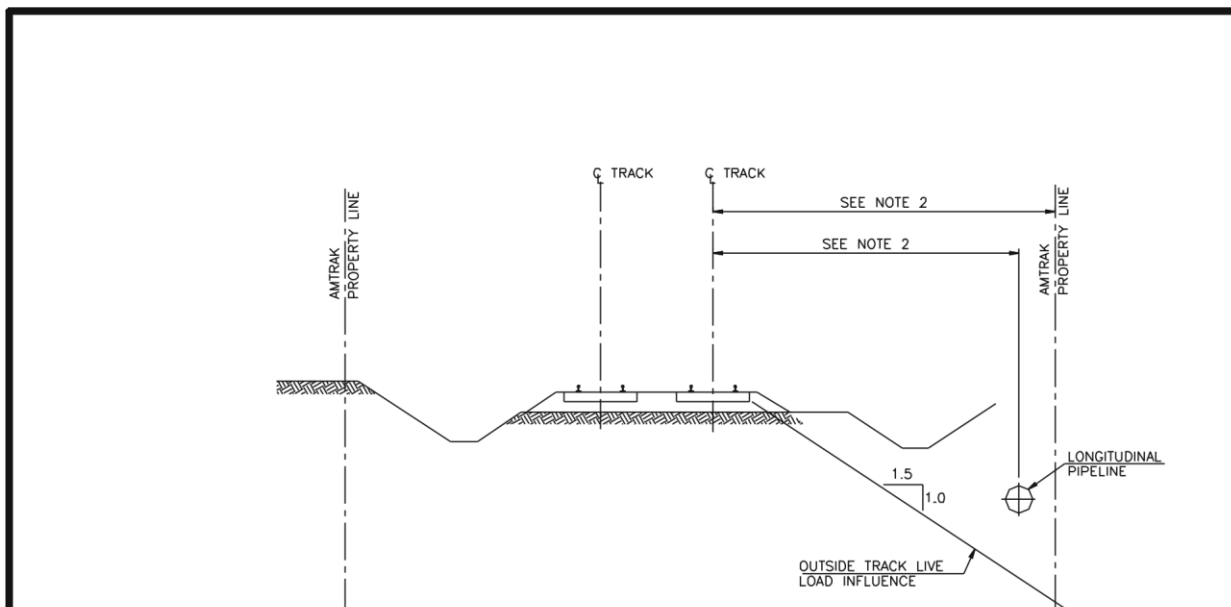
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National Railroad Passenger Corporation  
30th Street Station, Philadelphia, Pennsylvania 19104

SKETCH 2  
EP3005 SPECIFICATION

Designed AEC Drawn JLM Date 9/10/02

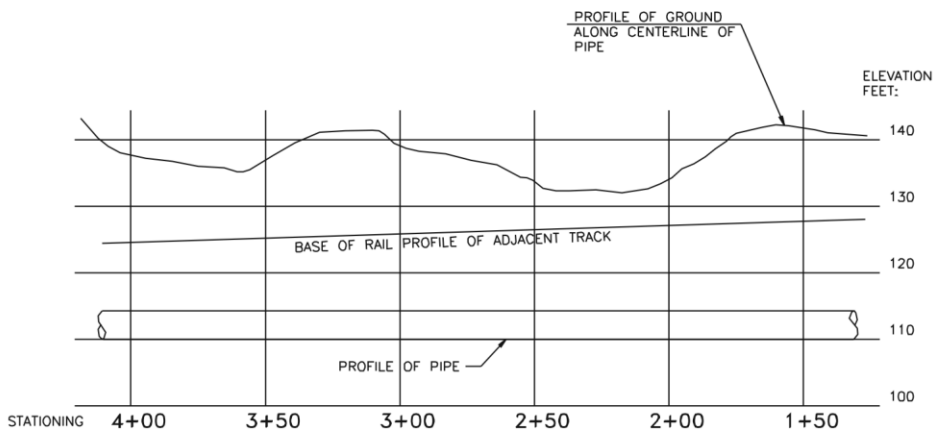
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Design No:	
Sheet No.	2 of 6
Dwg. No.	SK-2
	REV 1



**SECTION**  
SCALE:

**NOTE:**

1. ALL INFORMATION TO BE SHOWN TYPICALLY ON ALL CROSS SECTIONS AND PROFILE DRAWINGS.
2. SHOW THE DIMENSION ON PLAN VIEW.

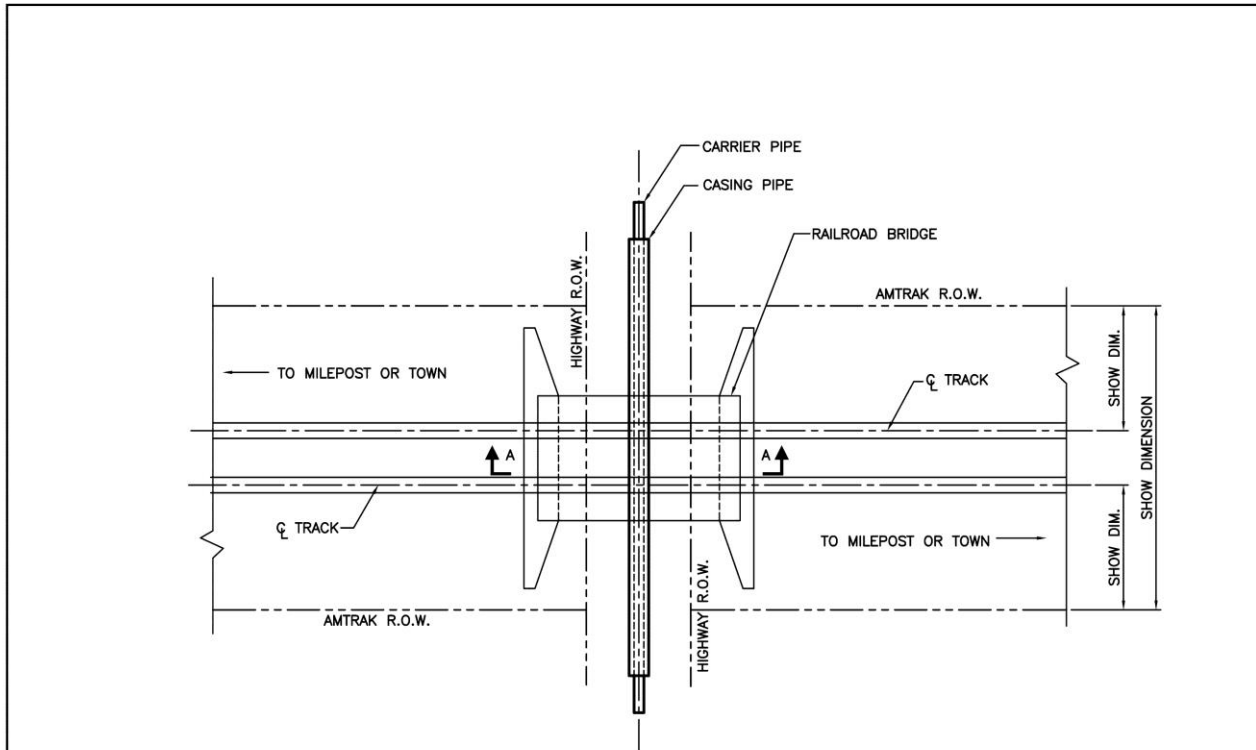


**PROFILE**  
SCALE: VERT.  
HORIZ.

**LONGITUDINAL OCCUPANCY**

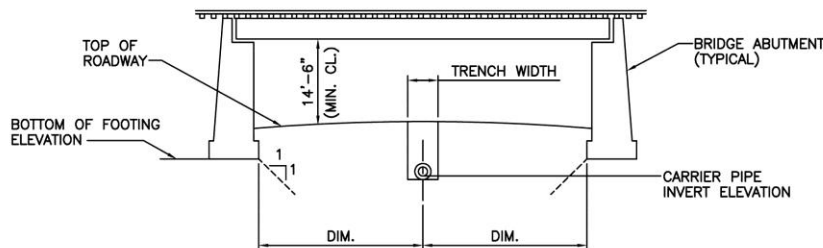
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			Design No:
Designed AEC    Drawn JLM    Date 9/10/02			Sheet No. 3 of 6
			Rev No. SK-3 REV 1





**PLAN**

SCALE:



**SECTION A-A**

SCALE:

**NOTE:**

PIPE OR EXCAVATION MUST NOT BE WITHIN THE 1 TO 1 SLOPE LINE THAT EXTENDS FROM BOTTOM OF FOOTING.

**PIPELINE IN ROADWAY UNDER RAILROAD BRIDGE**

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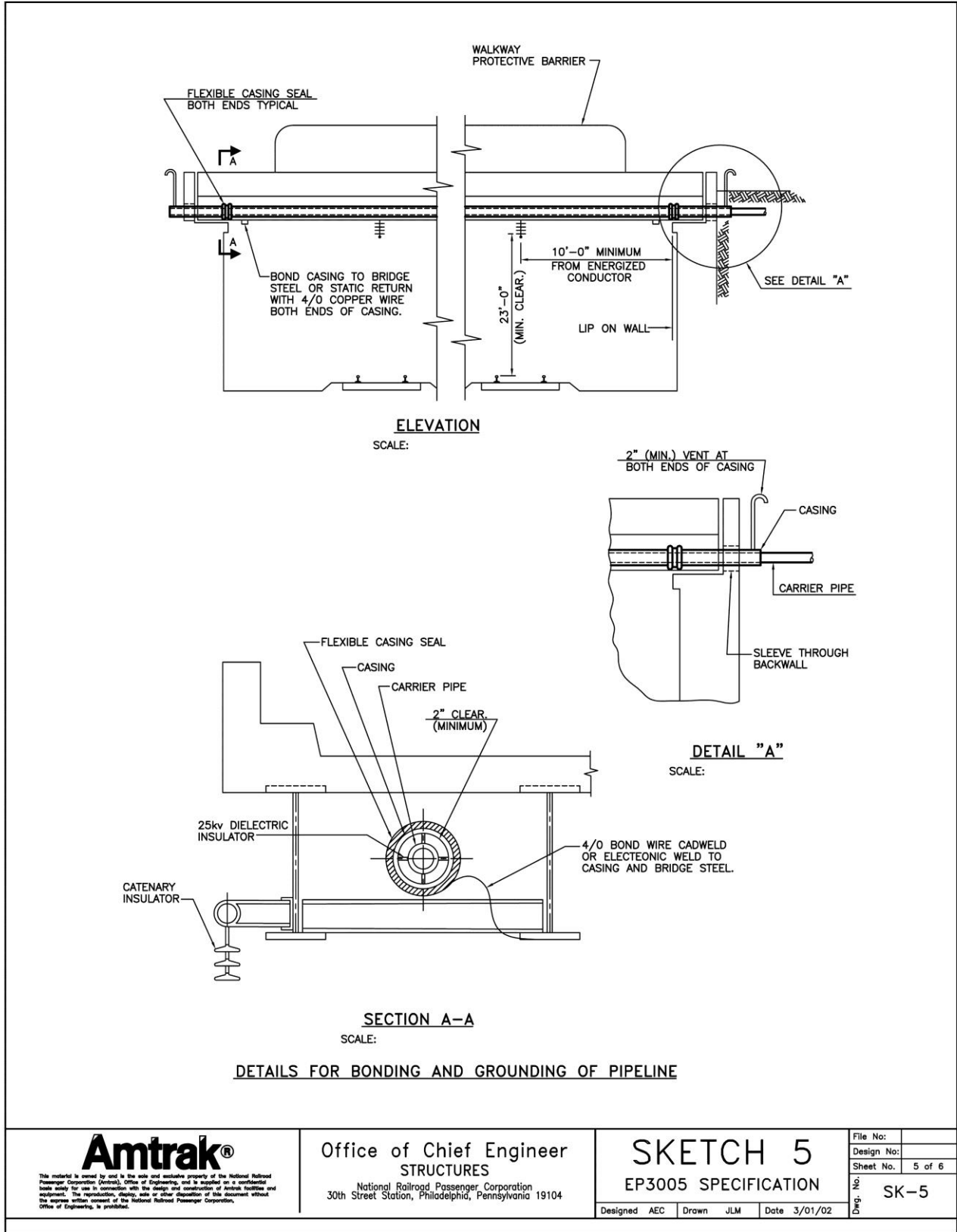
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**SKETCH 4**  
EP3005 SPECIFICATION

Designed AEC Drawn JLM Date 3/01/02

File No:	
Design No:	
Sheet No:	4 of 6
Dwg. No:	SK-4




PIPE CROSSING DATA SHEET

IN ADDITION TO PLAN AND PROFILE OF CROSSING, DRAWINGS SUBMITTED FOR AMTRAK APPROVAL SHALL CONTAIN THE FOLLOWING INFORMATION:

	<u>CARRIER PIPE</u>	<u>CASING PIPE</u>
CONTENTS TO BE HANDLED	_____	_____
NORMAL OPERATING PRESSURE	_____	_____
NOMINAL SIZE OF PIPE	_____	_____
OUTSIDE DIAMETER	_____	_____
INSIDE DIAMETER	_____	_____
WALL THICKNESS	_____	_____
WEIGHT PER FOOT	_____	_____
MATERIAL	_____	_____
PROCESS OF MANUFACTURE	_____	_____
SPECIFICATION	_____	_____
GRADE OR CLASS	_____	_____
TEST PRESSURE	_____	_____
TYPE OF JOINT	_____	_____
TYPE OF COATING	_____	_____
DETAILS OF CATHODIC PROTECTION	_____	_____
DETAILS OF SEAL OR PROTECTION AT ENDS OF CASING	_____	_____
METHOD OF INSTALLATION	_____	_____
CHARACTER OF SUBSURFACE MATERIAL AT THE CROSSING LOCATION _____ (UNIFIED SOIL CLASS)		
APPROXIMATE ELEVATION OF GROUND WATER LEVEL _____ FEET		
SOURCE OF INFORMATION OF SUBSURFACE CONDITIONS (BORING, TEST PITS OR OTHER )		

**NOTE:**

ANY SOIL INVESTIGATION MADE ON RAILROAD PROPERTY OR ADJACENT TO TRACKS SHALL BE CARRIED ON UNDER THE SUPERVISION OF AMTRAK.

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		<p>Designed AEC    Drawn JLM    Date 3/01/02</p>		<p>SK-6</p>	

**EP 3005 – ADDITIONAL REQUIREMENTS FOR HORIZONTAL  
DIRECTIONAL DRILLING (HDD) / DIRECTIONAL BORING –  
SPECIFICATION 02082A**

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## **PART 1 - GENERAL**

### **1.1 SCOPE**

This engineering practice supplements EP3005 – PIPELINE OCCUPANCY, and describes items to be included in the design and installation of buried pipelines using the Directional Boring/Horizontal Directional Drilling (HDD) method adjacent and proximate to Amtrak tracks.

### **1.2 RELATED DOCUMENTS**

Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

### **1.3 DEFINITIONS**

For all definitions, refer to EP3005 – PIPELINE OCCUPANCY, Section 02081A Pipeline Occupancy.

### **1.4 SUBMISSION REQUIREMENTS**

In addition to the plans and documentation specified in EP3005, Section 02081A, Pipeline Occupancy, the Applicant shall submit the following preliminary information with the request for consideration of this type of installation:

1. Application form.
2. Pre-bore survey grid line with angles and depths defined.
3. Actual planned depth of pipe under each railroad track. The plan and profile views must show the entire bore, including the sending and receiving pits, regardless of the railroad right-of-way limits.
4. Construction procedure, including a general description and the manufacturer's catalog information of equipment to be used.
5. Minimum allowable pipe bend radius vs. installation radius.
6. Specifications and capacities of the bore machine. This includes:
  - a. Maximum & intended capacities
  - b. Maximum & intended drilling RPM
  - c. Maximum & intended drilling PSI
  - d. Maximum & intended GPM
7. Slurry mix design appropriate to the anticipated geological conditions. Material list including bentonite and bentonite additives proposed for the project along with Material Safety Data Sheets (MSDS) for all materials used on the site, and water source for drilling operations.
8. A defined slurry recovery method. Disposal on Amtrak property or within Amtrak drainage ditches/facilities is prohibited.
9. Statement of expected soil conditions and statement of all drill heads on site for expected and unexpected soil conditions.
10. Submit calculations showing the theoretical settlement for the proposed installation is within safety limits (less than half the maximum allowable settlement) for the FRA class

of track as established by the Amtrak Track Department. See *Sketch 1 – Calculation of Theoretical Settlement* for approved method.

11. Statement that once the bore enters Amtrak property, the work will be continuous until the drilling is complete and the pipe is pulled into place.
12. Statement that the bore will be tracked constantly, with the location and depth marked every 10 feet.
13. Qualifications of drilling contractor, including specific instances of previous successful experience in drilling under railroad and other sensitive surface facilities.

If Amtrak determines this method of installation is acceptable, final design plans and specifications are to be prepared and submitted for approval.

The Applicant shall revise and resubmit plans and calculations as many times as necessary, until a complete and correct site-specific work plan for directional boring/HDD has been approved.

## **PART 2 - PRODUCTS (Not Used)**

## **PART 3 - CONSTRUCTION**

Due to the unique circumstances and conditions encountered along the railroad Right-of-Way (ROW), each HDD request will be reviewed at Amtrak's sole discretion on a case by case basis. The applicant utilizing the HDD method of installation shall meet all the requirements found in EP 3005, Section 02082A, Horizontal Directional Drilling / Directional Boring. If HDD is deemed unacceptable by Amtrak, the applicant may consider other installation techniques contained within EP 3005, Section 02081A, Pipeline Occupancy, for the installation of the pipeline or utility crossing.

Contractors installing buried pipelines using the directional boring/horizontal directional drilling (HDD) method shall conform to the following:

1. **USE OF HDD:** This method consists of setting up specialized drilling equipment on existing grade and boring a small diameter pilot hole on the desired vertical and horizontal alignment, using a mechanical cutting head with a high-pressure fluid (bentonite slurry) to remove the cuttings. The drill string is advanced with the bentonite slurry pumped through the drill string to the cutting head and then forced back along the outside of the drill string, carrying the cuttings back to the surface for removal. When the cutting head reaches the far side of the crossing, it is removed and a reamer is attached to the lead end of the drill string. The pipeline is attached to the reamer and the pilot hole is then back reamed while the pipeline is pulled into place.
2. For pipelines conveying gas or liquid substances, only steel pipe may be installed under track(s) and/or Amtrak right-of-way utilizing HDD.
3. For wireline installations, including fiber optic cable, HDPE pipe may be installed as the outermost pipe. Bundling is prohibited. All inner ducts must have an outer casing pipe. If the commodity to be conveyed permits the use of HDPE pipe, it must be grade SDR 11 or thicker wall.
4. Bore size shall not be any greater than is necessary.

Maximum Reamed Diameter ( $d_b$ ) by Product Diameter ( $d_p$ )	
$d_p$	$d_b$
< 8" (< 200 mm)	$d_p + 4"$ (100 mm)
8" - 24" (200 - 600 mm)	$d_p \times 1.5$
> 24" (>600 mm)	$d_p + 12"$ (300 mm)

Bennett, David, and Samuel T. Ariaratnam. Horizontal Directional Drilling Good Practices Guidelines. Third ed. HDD Consortium, 2008.

5. The launching and receiving pits, if used, must be situated outside of the railroad influence zone.
6. The Contractor shall provide Amtrak with a detailed schedule of proposed construction operations, detailing each step of the proposed construction operations in proximity to Amtrak tracks, so that Amtrak may review and approve the proposed operations, and may properly inspect and monitor operations.
  - a. The Contractor must submit a Boring Plan that describes the anticipated rig capacity, the proposed equipment, and the method for advancing the borehole through expected soil conditions, angles, depth, and exact location of the exit ditch, the pilot hole diameter, the proposed reaming plan, including the diameter of pre-reams/back-reams and diameter of the final reamed bore hole, and the contingency equipment and plans for dealing with soil conditions that a soil engineering could reasonably expect to be encountered at the proposed HDD installation site. The contractor needs to address the condition when obstructions are encountered and what will be the remedial actions taken to stabilize the bore hole in order to prevent settlement and contamination of the track structure. The Boring Plan will also need to address the anticipated hours of operation during the HDD bore hole drilling and installation process, the minimum number of personnel, and their responsibilities on-duty and on-site during all HDD drilling operations. Consideration for working hours must be given to minimize risk to railroad operations during drilling operations.
  - b. The Contractor must refer to Part 5 of this document to review the "Frac-Out Contingency Plan" (sometimes referred to as Fracture Mitigation or Inadvertent Return of Materials Plan) established by Amtrak's Track Department, which details the method of monitoring quantity and capturing the return of drilling fluids with particular attention to variation from proposed plan (i.e. volumes, pressure, or consistency), responsibilities of the Contractor Project Engineer, and the proper field response to a "frac-out" or inadvertent return of materials occurrence.
    - 1) Although utmost care must be taken against inadvertent return of materials, if it does occur, the drilling operations should cease immediately and the bore hole stabilized to prevent further contamination and settlement of the track structure. Amtrak forces will complete the clean-up and repair of the contaminated track structure at the sole cost of the applicant.
  - c. During the pilot bore operations the drill head must be continuously monitored while crossing railroad property. The contractor shall establish a Survey Grid Line and provide a program of monitoring and documenting the actual location of the bore hole during drilling operations. If the location of the drill head is "lost" during the pilot bore drilling operations, the contractor will immediately cease operations, stabilize the bore hole, and endeavor to re-establish the drill head position before resuming any drilling.

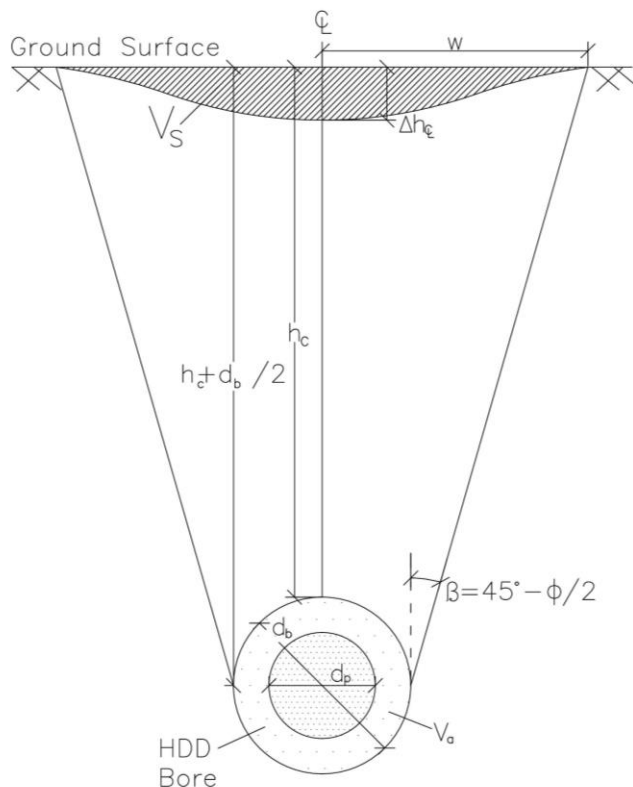
7. The ground and track must be monitored for movement during the drilling, reaming, and pullback processes. The inspection shall be carried out by a Resident Engineer provided by the Applicant as described in EP3005, Section 02081A, Horizontal Directional Drilling / Directional Boring.
8. No demobilization may occur until the casing pipe is in place or bore is abandoned and stabilized.

## **PART 4 - INFORMATION SKETCHES**

The following Information Sketches are attached:  
Sketch 1 – Calculation of Theoretical Settlement

*Reminder: HDD is not a standard approved installation method on Amtrak right-of-way, and will require advanced engineering review and approval.*





**VARIABLE DEFINITIONS**  
 c: CENTERLINE OF PIPE  
 w: SETTLEMENT TROUGH HALF-WIDTH  
 Δhc: SETTLEMENT TROUGH DEPTH AT CENTERLINE (MAXIMUM SETTLEMENT)  
 hc: DEPTH OF CLEARANCE ABOVE CROWN OF BORE (NOT PIPE)  
 db: REAMED (BORE) DIAMETER  
 dp: PRODUCT PIPE DIAMETER  
 Vs: SETTLEMENT TROUGH VOLUME PER UNIT OF BORE LENGTH  
 Va: VOLUME OF ANNULUS PER UNIT LENGTH OF BORE LENGTH  
 φ: FRICTION ANGLE OF SOIL

**EQUATIONS**

(1)  $\Delta hc = \frac{V_s}{w}$                       (3)  $V_e = \frac{2}{3}V_a$

(2)  $V_a = \frac{\pi}{4} \cdot (db^2 - dp^2) \cdot hc$                       (4)  $w = \frac{db}{2} + (hc + \frac{db}{2}) \cdot \tan(45^\circ - \frac{\phi}{2})$

CALCULATION OF THEORETICAL SETTLEMENT

Bennett, David, and Samuel T. Ariaratnam. Horizontal Directional Drilling Good Practices Guidelines. Third ed. HDD Consortium, 2008.

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		EP3005 SPEC 02082A		Design No:	
		Designed    Drawn JMR    Date 5/06/11		Sheet No.	1 of 1
				Fig. No.	SK-1

## PART 5 - ADDITIONAL TECHNICAL INFORMATION

### AMTRAK TRACK DEPARTMENT FRAC-OUT CONTINGENCY PLAN (FCP)

#### 5.1 INTRODUCTION AND PURPOSE

A frac-out is the condition where drilling fluid is released through either fractured bedrock or soil into the surrounding rock or soil and travels toward the surface fouling subballast and ballast in the railroad roadbed. Drilling operations have a potential to release drilling fluids into the surface environment through frac-outs.

Because drilling fluids consist largely of a bentonite clay-water mixture, they are not classified as toxic or hazardous substances as defined by EPA's 40 CFR, Part 261. However, if the drilling fluids are released into the water bodies, the bentonite has the potential to adversely impact fish and invertebrates. Therefore, they must be contained and disposed of properly.

Although drilling fluid seepage associated with a frac-out is most likely to occur near the bore entry and exit points where the drill head is shallow, frac-outs can occur in any location along the bore. This Frac-out Contingency Plan (FCP) establishes operational procedures and responsibilities for the prevention, containment, and clean-up of frac-outs associated with proposed drilling utility projects. All personnel and Subcontractors responsible for the work must adhere to this plan during the drilling process.

The specific objectives of this plan are the following:

1. Minimize the potential for a frac-out associated with drilling activities;
2. Provide for timely detection of frac-outs;
3. Protect the environmentally sensitive riverbed and associated riparian vegetation;
4. Ensure an organized, timely, and "minimum-impact" response in the event of a frac-out and release of drilling bentonite; and
5. Ensure that all appropriate notifications are made immediately to the Amtrak Project Manager, the on-site contractor, and all on-site personnel.

#### 5.2 DESCRIPTION OF WORK

Drilling operations will be halted by the drill rig operators immediately upon detection of a drop in the drilling pressure or other evidence of a frac-out. The cleanup or containment of all spills shall begin immediately and in accordance with procedures identified in this plan. The Contractor shall appoint a representative herein referred to as "The Contractor Project Engineer" to handle responsibility of implementing and enforcing the FCP. The Contractor Project Engineer shall be notified immediately of any spills by the on-site Drilling Foreman or Drilling Supervisor and shall be consulted by Amtrak's Environmental Group regarding cleanup procedures. The Contractor Project Engineer should be aware that other agencies may be involved in the cleanup procedures.

In the event of a frac-out, the Contractor Project Engineer will conduct an evaluation of the situation, recommend the type and level of response warranted including the level of notification required, and direct recommended mitigation actions based on the emergency guidelines and required actions discussed below:

1. Drilling will stop immediately for at least the period of time needed for both a thorough evaluation and recommendation by the Contractor Project Engineer;

2. Work must not take place without Amtrak authorization;
3. The bore stem will be pulled back to relieve pressure on the frac-out;
4. The Contractor Project Engineer will be notified by the on-site Contractor Drilling Foreman or Supervisor that a frac-out has occurred. The Contractor Project Engineer must ensure that the Amtrak Project Engineer, all on-site personnel, and Amtrak's Environmental Group are notified and that adequate response actions are taken under the consultation of Amtrak's Environmental Group;
5. If the frac-out is minor, easily contained, has not reached the surface, and is not threatening sensitive resources, a leak-stopping compound shall be used to block the frac-out. If the use of a leak-stopping compound is not fully successful or the problem cannot be stopped within the allotted time or track outage, the borehole must be grouted in place and abandoned. Abandonment of the bore will only be required when all efforts to control the frac-out within the existing bore have failed. At that point, Amtrak's EP 3005 Section 02081A "Pipeline Occupancy Specifications" must be followed. The appropriate mix and method of grouting the borehole must be used so as to not contribute to the problem;
6. A spill kit shall be on site and used if a small frac-out has reached the surface and can be handled without directing and containing the spill through berms, swales, or other methods;
7. If the frac-out has reached the surface and is within 25 feet of the centerline of the nearest track, all material contaminated with bentonite shall be removed by hand by Amtrak forces at the project's expense to a depth of at least the bottom of the subballast in the roadbed and to a width of at least 2 feet outside of the roadbed. However, for frac-outs that are entirely outside of a line that is 25 feet from the centerline of the nearest track, the Contractor must remove the material contaminated with bentonite in a similar manner and also at the project's expense. The method of removal must assure that roadbed drainage is not impeded and that the drainage is not altered to result in unfavorable conditions that cause erosion, roadbed instability, or standing water. Although removal of material contaminated with bentonite within 25 feet of the centerline of the nearest track is restricted to Amtrak forces within 25 feet of the centerline of the nearest track, containment and disposal of the material contaminated with bentonite is always the responsibility of the Contractor. For frac-outs within 25 feet of the centerline of the nearest track, the Contractor Project Engineer must direct all Contractor activities to take place at least 25 feet away from the centerline of the nearest track whenever it is possible to do so. Removal, containment, and disposal must be done as required by law at the project's expense. A dike or berm may be constructed around the frac-out to entrap released drilling fluid if necessary so that the spill does not spread further and does not reach water bodies either directly or indirectly through drainage. Clean material shall be placed and the area returned to pre-project contours. The Contractor Project Engineer must direct all activities performed by the Contractor described above in this paragraph;
8. If a frac-out occurs and has reached the surface and becomes widespread, the Contractor Project Engineer shall authorize a readily accessible vacuum truck and bulldozer stored either on-site or within 10 minutes off-site to be mobilized. Containment materials such as straw bales shall be on-site and readily available prior to and during all operations. The vacuum truck may be positioned at either end of the line of the drill so that the frac-out can be reached by crews on foot or may be pulled by a bulldozer so that contaminated material can be vacuumed; and
9. All mitigation procedures must not pose additional threats to sensitive resources.

### 5.3 CONTRACTOR PROJECT ENGINEER RESPONSIBILITIES

The Contractor Project Engineer has overall responsibility for implementing the FCP. The Contractor Project Engineer shall ensure that all workers are properly trained and familiar with the necessary procedures for response to a frac-out prior to commencement of drilling. For more details on training, see below. The Contractor Project Engineer shall ensure that he or she will be notified immediately by the on-site Drilling Foreman or Drilling Supervisor when a frac-out is detected. The Contractor Project Engineer will immediately notify the Amtrak Project Engineer. The Contractor Project Engineer will be responsible for ensuring that the site personnel are aware of the frac-out. With consultation with Amtrak's Environmental Group, the Contractor Project Engineer will be responsible for coordinating personnel, response procedures, clean-up procedures, disposal of recovered material, and timely reporting of the incident as described in Paragraph "g" above. Although Amtrak's Environmental Group will handle regulatory agency notification, the Contractor Project Engineer must delegate personnel experienced in the removal, transport, and disposal of drilling fluid. In addition, the Contractor Project Engineer shall ensure that all waste materials are properly containerized, labeled, and removed from the site and brought to an approved disposal facility. The Contractor Project Engineer must ensure that the material is properly recycled in an approved manner. The Contractor Project Engineer must provide all necessary follow-up response actions in coordination with the appropriate agency representatives as determined by Amtrak's Environmental Group. The Contractor Project Engineer will coordinate the mobilization of readily available equipment stored at off-site locations (e.g. vacuum trucks) on an as-needed basis. Because all cleanup activities will be done at the expense of the Contractor even if Amtrak forces provide the cleanup, the Contractor Project Engineer must ensure that all cleanup activities and time is documented and consistent with Amtrak records.

The Contractor Project Engineer shall be familiar with all aspects of the drilling activity, the contents of this FCP, and the conditions for approval under which the activity is permitted to take place. The Contractor Project Engineer shall have the authority to stop work and commit the resources (personnel and equipment) necessary to implement this plan. The Contractor Project Engineer shall assure that a copy of this plan is available on-site and accessible to all construction personnel.

Equipment – The Contractor Project Engineer shall ensure the following:

1. All equipment and vehicles are checked and maintained daily to prevent leaks of hazardous material;
2. Spill kits and spill containment materials are available on-site at all times and that the equipment is in good working order;
3. Equipment required to contain and clean up a frac-out release will either be available at the work site or readily available in an off-site location within 15 minutes of the bore site; and
4. If equipment is required to be operated near a riverbed, absorbent pads and plastic sheeting for placement beneath motorized equipment shall be used to protect the riverbed from engine fluids.

Training – Prior to the start of construction, the Contractor Project Engineer shall ensure that the crew members receive training in the following:

1. The provisions of the Frac-out Contingency Plan, equipment maintenance, and site specific permit and monitoring requirements;
2. Inspection procedures for release prevention and containment equipment and materials;
3. Contractor/Crew member responsibility in the event of a release;
4. Operation of release prevention and control equipment and the location of release control materials, as necessary and appropriate; and
5. Protocols for communication with agency representatives who may be on-site during the cleanup effort.

#### 5.4 DRILLING PROCEDURES

The following procedures shall be followed each day prior to the start of work:

1. The Frac-out Contingency Plan (FCP) shall be available on-site during all construction;
2. The Contractor Project Engineer shall be on-site at any time that drilling is occurring or is scheduled to occur;
3. The Contractor Project Engineer shall ensure that a Job Briefing Meeting is held at the start of drilling to review the appropriate procedures to be followed in case of a frac-out. Questions shall be answered and clarification given on any point over which the drilling crew or other project staff has concerns.

Drilling pressures shall be closely monitored so they do not exceed those needed to penetrate the formation. Pressure levels shall be monitored constantly by the operator. Pressure levels shall be set at a minimum level to prevent frac-outs. During the pilot bore, maintain the drilled annulus. Cutters and reamers will be pulled back into previously drilled sections after each new joint of pipe is added.

Exit and entry pits shall be enclosed by silt fences and straw. A spill kit shall be on-site and used if a frac-out occurs. A vacuum truck shall be readily available either on-site or within 10 minutes of the drilling site prior to and during all drilling operations. Containment materials (straw, silt fencing, sand bags, frac-out spill kits, etc.) shall be staged on-site at locations where they are readily available and easily mobilized for immediate use in the event of an accidental release of drilling fluid (frac-out). If necessary, barriers (straw bales or sedimentation fences) between the bore site and the edge of the water source shall be constructed prior to drilling to prevent released bentonite material from reaching the water.

Once the drill rig is in place and drilling begins, the drill operator shall stop work whenever either the pressure in the drill rig drops or there is a lack of returns in the entrance pit. At this time the Contractor Project Engineer and the drill rig operator(s) shall work to coordinate the likely location of the frac-out. The location of the frac-out shall be recorded and include notes such as the measures taken to address the concern.

Water containing drilling fluid, silt, bentonite, or other pollutants derived from the equipment washing or other activities shall not be allowed to enter a lake, flowing stream, wetland, or any other water body. The bentonite used in the drilling process shall be either disposed of at an approved disposal facility or recycled in an approved manner. Other construction materials and wastes shall be recycled or disposed of as appropriate.

## 5.5 RESPONSE CLOSE-OUT PROCEDURES

When the release has been contained and the area affected has been cleaned in accordance with this FCP and to satisfaction of the on-site Amtrak representative, response close-out activities will be conducted at the direction of the Contractor Project Engineer and shall include the following:

1. The recovered drilling fluid will either be recycled or hauled to an approved facility for disposal. No recovered drilling fluids will be discharged into streams, storm drains, or any other water source;
2. All frac-out excavation and clean-up sites will be returned to pre-project contours using the clean material necessary; and
3. All containment measures (fiber rolls, straw bales, etc.) will be removed unless otherwise specified by the Contractor Project Engineer.

## 5.6 CONSTRUCTION RE-START

For small releases not requiring external notification, drilling may continue if the following occurs:

1. 100 percent containment is achieved through the use of a leak-stopping compound;
2. If the on-site Amtrak representative authorizes the continuation of drilling; and
3. The clean-up crew remains at the frac-out location throughout the construction period.

For releases requiring external notification and/or other agencies, construction activities will not restart without prior approval from the Amtrak Project Engineer.

## 5.7 NOTIFICATION

In the event of a frac-out that reaches a water source, the Contractor Project Engineer will notify the Amtrak Project Engineer so that the appropriate resource agencies can be notified through Amtrak's Environmental Group. All agency notifications will occur within 24 hours and proper documentation will be accomplished in a timely and complete manner. If deemed necessary by the Amtrak Environmental Group, the necessary agency information and contacts will be provided to the Contractor.

## 5.8 COMMUNICATING WITH REGULATORY AGENCY PERSONNEL

All employees and subcontractors will follow the following protocols when regulatory agency personnel arrive on site:

1. Regulatory agency personnel will be required to comply with appropriate safety rules;
2. Only the Amtrak Project Engineer is to coordinate communication with regulatory agency personnel. If deemed necessary by the Amtrak Environmental Group, the necessary agency information and contacts will be provided to the Contractor; and
3. All communication records (emails, etc.) must be copied to Amtrak.


## **5.9 DOCUMENTATION**

The Contractor Project Engineer shall record the frac-out event in his or her daily log. The log report will include the following:

1. Details on the release event including:
  - a. An estimate of the amount of bentonite released;
  - b. The location, date, and time of the release;
  - c. How the release occurred;
  - d. The type of activity that was occurring around the area of the frac-out;
  - e. Description of any sensitive areas and their location to the frac-out;
  - f. Description of the methods used to clean up or secure the site;
  - g. A listing of the current permits obtained for the project
  - h. The size of the area impacted; and
  - i. The success of cleanup action.

## **5.10 PROJECT COMPLETION AND CLEAN-UP**

1. All materials and any rubbish/construction debris shall be removed from the railroad property at the end of each workday.
2. Sump pits at bore entry and exits will be filled with clean material and returned to preexisting grade; and
3. All protective measures (fiber rolls, straw bales, silt fences, etc.) will be removed unless otherwise specified by the Amtrak Project Engineer.

 <b>ENGINEERING PRACTICES</b>	ORIGINAL ISSUE DATE <b>03/26/02</b>	NUMBER <b>EP3006</b>	
	REVISED DATE <b>N/A</b>		
TITLE <b>DESIGN AND CONSTRUCTION CRITERIA FOR OVERHEAD BRIDGES</b>	RECOMMENDED by <b>K.L. Kulick</b>	DATE <b>3/26/02</b>	PAGE <b>1</b>
	APPROVED by CHIEF ENGR, STRUCTURES <b>James S. Richter</b>	DATE <b>3/26/02</b>	OF <b>8</b>

### SCOPE AND NATURE

To establish uniform requirements for the design and construction of overhead bridges by outside agencies.

### SPECIAL REFERENCE

Standard Track Plan AM70050

ET Standard Plan ET1446-D

ET Standard Plan ET 1447-D

Engineering Practice 3003

Engineering Practice 3014 Section 02261

Engineering Practice 3014 Section 01520

Engineering Practice 3014 Section 01142

Engineering Practice 1604

AED-1 Procedures and Design Criteria to be Employed by Electrification Consultants Engaged in the Design of Electrification Facilities on the National Railroad Passenger Corporation

AREMA Manual for Railway Engineering – Chapter 8, Article 2.1.5

### SPECIAL MATERIALS

N/A



TITLE  <b>DESIGN AND CONSTRUCTION CRITERIA FOR OVERHEAD BRIDGES</b>	ORIGINAL ISSUE DATE <b>03/26/02</b>	NUMBER <b>EP3006</b>
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## PROCEDURE

### DESIGN AND CONSTRUCTION CRITERIA FOR OVERHEAD BRIDGES

New or reconstructed bridges over Amtrak Railroad tracks shall meet the following requirements:

#### I. CLEARANCES

- a. Horizontal and Vertical Clearances shall be in accordance with the current Standard Track Plan AM70050 – “Minimum Roadway Clearances”. When replacing existing bridges that have substandard clearances, every effort shall be made to improve the clearances.
- b. Temporary Construction clearances may be less if approved by Amtrak.
- c. Amtrak shall be furnished as-built drawings showing actual clearances as constructed.
- d. Horizontal clearances may need to be increased if a maintenance roadway is required by Amtrak.
- e. Clearances shall be adjusted to provide for any planned changes in the trackage, including the change in track centers and raising of the tracks. Amtrak shall be contacted to obtain information on planned track changes. If the track is in a sag at the proposed overhead crossing location, it should be anticipated that the track may be raised to improve the condition. Clearances shall be increased to provide for this track raise.

#### II. CRASH WALLS

AREMA Manual for Railway Engineering, Chapter 8, Article 2.1.5 Pier Protection, describes the requirements for the crash walls. Crash walls are required when face of the pier is closer than 25'-0" from centerline of the nearest track, measured perpendicular to the track, unless the size of the pier satisfies the criteria for piers of heavy construction as listed in Article II (d).

Crash walls shall meet the following requirements:

- a. Crash walls for piers from 12 feet to 25 feet clear from the centerline of the track shall have a minimum height of 6 feet above the top of rail. Piers less than 12 feet clear from the centerline of the track shall have a minimum crash wall height of 12 feet above the top of rail. Crash walls shall be at least 2'-6" thick and at least 12 feet long.
- b. For multi-column piers, the crash wall shall connect the columns and extend at least 1 foot beyond the outermost columns parallel to the track.
- c. Crash walls shall be anchored to the footings and columns as applicable and shall extend to at least four feet below the lowest surrounding grade.

<b>TITLE</b>  <b>DESIGN AND CONSTRUCTION CRITERIA FOR OVERHEAD BRIDGES</b>	ORIGINAL ISSUE DATE <b>03/26/02</b>	NUMBER <b>EP3006</b>
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- d. A pier shall be considered of heavy construction if it has a cross-sectional area equal to or greater than that required for the crash wall and the larger of its dimensions is parallel to the track.
- e. Consideration may be given to providing protection for bridge piers located more than 25 feet from the centerline of track as conditions warrant. In making this determination, account shall be taken of such factors as horizontal and vertical alignment of the track, embankment height, and an assessment of the consequences of serious damage in the case of a collision.

### III. BARRIERS

- a. In the territory where there is railroad electrification, barriers shall be designed and constructed on both faces of the bridge in conformance with the current ET Standard Plan ET-1446-D "Electrified Territory OH Bridge Typical Protection Barrier".
- b. In non-electrified territory, chain-link fence with 1" mesh fabric may be substituted for the solid barrier.

### IV. ELECTRIFICATION SYSTEMS.

- a. In electrified territory the agency responsible for the project shall be required to comply with AED-1 "Procedures and Design Criteria to be Employed by Electrification Consultants Engaged in the Design of Electrification Facilities on the National Railroad Passenger Corporation".

### V. DRAINAGE

It is essential to maintain good drainage of railroad right-of-way during construction and provide for good drainage after construction of the overhead crossing. The following guidelines shall be followed:

- a. Piers and end slopes shall be located such that they do not interfere with railroad drainage system, including, but not limited to, ditches, pipes, catch basins and detention basins.
- b. Drainage from the section of the bridge above railroad right-of-way shall be collected with drain pipes and drained away from the railroad right-of-way. No open scuppers are permitted on the portion of the bridge over the railroad right of way. Drainage from any scuppers shall be drained away from the railroad right-of-way.
- c. After completion of construction, railroad drainage ditches shall be cleaned of all debris to the satisfaction of Amtrak representatives.
- d. During construction, silt fences shall be provided to prevent silting of the ditches. All drainage from the construction site must be collected and directed away from railroad property.

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- e. If the project will alter drainage characteristics at the site of the crossing at any time during or after completion of the project, three sets of the drainage calculations and plans shall be submitted to Amtrak for approval. Approval of the drainage plans shall not relieve the submitting agency of responsibility for the drainage design.
- f. All disturbed areas on the railroad right-of-way shall be properly seeded and mulched to the satisfaction of Amtrak.

#### **VI. STRUCTURE EXCAVATION AND SHORING**

Shoring or sheeting protection shall be provided in conformance with the current Engineering Practice 3014 Section 02261 – “Requirements for Temporary Sheeting and Shoring to Support Amtrak Tracks”. Blasting is restricted and if required shall be in conformance with Engineering Practice 3003- “Blasting Procedures”.

- a. A construction procedure for temporary shoring shall be shown on the drawing.
- b. Safety railing meeting OSHA requirements shall be installed when temporary shoring is within 12 feet of track. When shoring is further than 12 feet from centerline of track, railing shall be provided if necessary for safety of workers and railroad personnel.

#### **VII. GENERAL REQUIREMENTS**

- a. The distance from the nearest milepost at intersection of centerline of the track and centerline of the bridge shall be shown on the General Plan.
- b. Horizontal and vertical clearances shall be marked clearly on the General Plan and Elevation.
- c. Soil parameters used in designing the shoring shall be based on soil and rock data obtained from test borings performed for the design of the proposed structure.
- d. It is the designer’s responsibility to ensure that a constructability analysis is performed to confirm that the structure, as designed, can be constructed in the applicable railroad environment.
- e. Piers, abutments and columns located within the railroad right-of-way shall have an anti-graffiti coating consisting of a three-coat system. Each of the three coats shall be a clear, two component, polyester type, aliphatic urethane. Each coat shall be applied at a minimum 2 mils DFT.

#### **VIII. DEMOLITION OF EXISTING STRUCTURES**

Railroad tracks shall be protected from damage during demolition of existing structure or replacement of deck slab. Either of the following methods may be used:

- a. During demolition of the decks, a protection shield shall be erected over the right-of-way to catch falling debris. The shield shall be designed and constructed in

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conformance with the current Engineering Practice 3014 Section 01520 – “Requirements for Temporary Protection Shields for Demolition and Construction of Overhead Bridges and Other Structures”.

- b. On light traffic density lines or when overhead protection shield cannot be installed due to limited clearance or type of superstructure, track may be protected by timber mats placed over the track structure, subject to approval by Amtrak. Timber mats shall be made in sections such that they may be lifted in and out quickly. Mats shall not rest on ties or rails.

Geo-fabric or canvas shall be placed over the track structure to keep the ballast clean.

The contractor shall submit detailed plans of the protection shield or the timber mats to the Project Engineer for approval prior to the start of demolition. The plans shall be prepared by a Registered Professional Engineer and shall bear his seal and signature.

Blasting will not be permitted to demolish a structure over or within the railroad right-of-way.

#### **IX. ERECTION PROCEDURE**

The contractor shall submit a detailed procedure for erecting the spans over railroad right of way. The procedure shall be in conformance with the current Engineering Practice 3014 Section 01142 – “Submission Documentation Required for Amtrak Review and Approval of Plans for Bridge Erection, Demolition, and Other Crane/Hoisting Operations over Railroad Right-Of-Way”.

#### **X. PIPELINES**

All pipelines occupying the bridge shall be designed and constructed in accordance with Engineering Practice 1604 Pipeline Occupancy – Requirements and Specifications.

#### **XI. CROSSING DATA**

Plans submitted for review by Amtrak shall contain, at the minimum, the following information:

- Roadway name or route number
- Amtrak bridge number
- Skew angle to the railroad center line
- Proposed foundation type and elevation of bottom of footing
- Pile type and depth (if applicable)
- Top of rail elevation for all tracks
- Drainage modifications
- Elevation and cross sections of existing and proposed structure

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- North arrow
- Railroad clearance information with dimensions in English units

The following "Overhead Bridge Crossing Data" sheet shall be completed and submitted, by the agency responsible for the project, with both the Preliminary and Final Plan submission to Amtrak.

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**OVERHEAD BRIDGE CROSSING DATA**

1. LOCATION: \_\_\_\_\_  
CITY
COUNTY
STATE

2. Distance from nearest Mile Post to Centerline of Bridge: \_\_\_\_\_

3. DOT Crossing Number: \_\_\_\_\_

4. State Project Number: \_\_\_\_\_

5. Description of Project:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

6. Minimum Horizontal Clearance from Centerline of nearest Track:

A. Proposed: \_\_\_\_\_ B. Existing (if applicable): \_\_\_\_\_

7. Minimum Vertical Clearance above top of high rail:

A. Proposed: \_\_\_\_\_ B. Existing (if applicable): \_\_\_\_\_

8. List piers where crashwalls are provided:

<u>Pier:</u>	<u>Distance from centerline of track:</u>
_____	_____
_____	_____

9. Describe how drainage from bridge is handled:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

10. List piers where shoring is required to protect track:

\_\_\_\_\_

\_\_\_\_\_

11. Plan Submittal: Preliminary: \_\_\_\_\_ Final: \_\_\_\_\_


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**REPORTING**

As detailed in procedure.

**RESPONSIBILITY**

Amtrak I&C Staff	Comply with Procedure
Director I&C	Assure Compliance
Amtrak Design Staff	Comply with Procedure
Amtrak Construction Staff	Comply with Procedure
Sr. Director Construction	Assure Compliance

 <b>ENGINEERING PRACTICES</b>	ORIGINAL ISSUE DATE <b>01/25/01</b>		NUMBER  <b>EP3014</b>																				
	REVISED DATE <b>10/01/2012</b>																						
TITLE <b>MAINTENANCE AND PROTECTION OF RAILROAD TRAFFIC DURING CONTRACTOR OPERATIONS</b>	RECOMMENDED by <b>John Brun</b>	DATE <b>10/01/12</b>	PAGE <b>1</b>																				
	APPROVED by CHIEF ENGR, STRUCTURES <b>James Richter</b>	DATE <b>10/01/12</b>	OF <b>2</b>																				
<p><b>SCOPE AND NATURE</b></p> <p>This practice provides procedures for Contractors to follow, when working on Amtrak Right-of-Way, adjacent to Amtrak tracks, to assure the protection of trains and maintenance of scheduled railroad operations.</p> <p><b>SPECIAL REFERENCE</b></p> <p>Note: This information was included under former Engineering Practice 1305.</p> <p>Contractors shall comply with procedures detailed in the following specifications, when applicable:</p> <table border="1"> <thead> <tr> <th>Section</th> <th>Title</th> <th>Revision No.</th> <th>Revision Date</th> </tr> </thead> <tbody> <tr> <td><b>01141A</b></td> <td>Safety and Protection of Railroad Traffic and Property</td> <td>4</td> <td>10/01/12</td> </tr> <tr> <td><b>01142A</b></td> <td>Submission Documentation Required for Amtrak Review and Approval of Plans for Bridge Erection, Demolition and Other Crane/ Hoisting Operations over Railroad Right-of-Way</td> <td>1</td> <td>12/15/05</td> </tr> <tr> <td><b>01520A</b></td> <td>Requirements for Temporary Protection Shields for Demolition and Construction of Overhead Bridges and Other Structures</td> <td>1</td> <td>08/07/01</td> </tr> <tr> <td><b>02261A</b></td> <td>Requirements for Temporary Sheeting and Shoring to Support Amtrak Tracks</td> <td>3</td> <td>06/20/08</td> </tr> </tbody> </table> <p><b>SPECIAL MATERIALS</b></p> <p>Not Applicable</p> <p><b>PROCEDURE</b></p> <ol style="list-style-type: none"> <li>1. The Contractor shall conform to the applicable specifications.</li> <li>2. Amtrak I&amp;C shall assure that agencies and other third parties proposing construction on or adjacent to Amtrak Right-of-Way conform to Amtrak requirements detailed herein.</li> <li>3. Amtrak Design and Construction shall review the Contractor's proposed design and construction procedures for conformance with specifications, with sound engineering design practice and with the procedures detailed in the applicable Engineering Practice documents.</li> </ol>				Section	Title	Revision No.	Revision Date	<b>01141A</b>	Safety and Protection of Railroad Traffic and Property	4	10/01/12	<b>01142A</b>	Submission Documentation Required for Amtrak Review and Approval of Plans for Bridge Erection, Demolition and Other Crane/ Hoisting Operations over Railroad Right-of-Way	1	12/15/05	<b>01520A</b>	Requirements for Temporary Protection Shields for Demolition and Construction of Overhead Bridges and Other Structures	1	08/07/01	<b>02261A</b>	Requirements for Temporary Sheeting and Shoring to Support Amtrak Tracks	3	06/20/08
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<b>TITLE</b>  <b>MAINTENANCE AND PROTECTION OF RAILROAD TRAFFIC DURING CONTRACTOR OPERATIONS</b>	ORIGINAL ISSUE DATE <b>01/25/01</b>	NUMBER <b>EP3014</b>
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4. Amtrak Construction shall monitor the activities of the Contractor on-site to assure compliance/ adherence to approved procedures throughout the construction period.

**REPORTING**

As detailed in the specifications.

**RESPONSIBILITY**

Amtrak I&C Staff	Comply with Procedure
Director Project Initiation & Development	Assure Compliance
Amtrak Design Staff	Comply with Procedure
Director Structures Design	Assure Compliance
Amtrak Construction Staff	Comply with Procedure
Deputy Chief Engineer Construction	Assure compliance

## SECTION 01141A – SAFETY AND PROTECTION OF RAILROAD TRAFFIC AND PROPERTY

## PART 1 - GENERAL

## 1.1 SCOPE

- A. This specification describes the safety procedures and protection provisions for Contractors and Permittees entering and working upon railroad property.
- B. Use of this specification is as required by Amtrak, as described in Amtrak Engineering Practice EP3014.

## 1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

## 1.3 DEFINITIONS

- A. CHIEF ENGINEER: Amtrak Chief Engineer
- B. RAILROAD: National Railroad Passenger Corporation (Amtrak), and/or the duly authorized representative
- C. ENGINEERING PRACTICE: Amtrak Engineering Practices establish a system of uniform practices, notices and instructions for the Amtrak Engineering Department, providing current, permanent and temporary, departmental procedures and policies.

## PART 2 - PRODUCTS (Not Used)

## PART 3 - EXECUTION

## 3.1 PRE-ENTRY MEETING

- A. Before entry of Permittee and/or Contractors onto Railroad's property, a pre-entry meeting shall be held at which time Permittee and/or Contractors shall submit for written approval of the Chief Engineer, plans, computations and a detailed description of proposed methods for accomplishing the work, including methods for protecting Railroad's traffic. Any such written approval shall not relieve Permittee and/or Contractor of their complete responsibility for the adequacy and safety of their operations.

### 3.2 RULES, REGULATIONS AND REQUIREMENTS

- A. Railroad traffic shall be maintained at all times with safety and continuity, and Permittee and/or Contractors shall conduct their operations in compliance with all rules, regulations, and requirements of Railroad (including these Specifications) with respect to any work performed on, over, under, within or adjacent to Railroad's property. Permittee and/or Contractors shall be responsible for acquainting themselves with such rules, regulations and requirements. Any violation of Railroads safety rules, regulations, or requirements shall be grounds for the immediate suspension of the Permittee and/or Contractor work, and the re-training of all personnel, at the Permittee's expense.

### 3.3 MAINTENANCE OF SAFE CONDITIONS

- A. If tracks or other property of Railroad are endangered during the work, Permittee and/or Contractor shall immediately take such steps as may be directed by Railroad to restore safe conditions, and upon failure of Permittee and/or 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 Permittee and/or Contractors, shall be paid by Permittee.

### 3.4 PROTECTION IN GENERAL

- A. Permittee and/or Contractors shall consult with the Chief Engineer to determine the type and extent of protection required to insure safety and continuity of railroad traffic. Any Inspectors, Track Foremen, Track Watchmen, Flagman, Signalmen, Electric Traction Linemen, or other employees deemed necessary by Railroad, at its sole discretion, for protective services shall be obtained from Railroad by Permittee and/or Contractors. The cost of same shall be paid directly to Railroad by Permittee. The provision of such employees by Railroad, and any other precautionary measures taken by Railroad, shall not relieve Permittee and/or Contractors from their complete responsibility for the adequacy and safety of their operations.

### 3.5 PROTECTION FOR WORK NEAR ELECTRIFIED TRACK OR WIRE

- A. 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 Railroad. **Permittee and/or 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.**

### 3.6 FOULING OF TRACK OR WIRE

- A. No work will be permitted within twenty-five (25) feet of the centerline of track or the energized wire or have potential of getting within twenty-five (25) feet of track wire without the

approval of the Chief Engineer's representative. Permittee and/or 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. When Permittee and/or Contractors desire to foul an active track, they must provide the Chief Engineer's representative with their site-specific work plan a minimum of twenty-one (21) working days in advance, so that, if approved, arrangements may be made for proper protection of Railroad. 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.

- B. If acceptable to the Chief Engineer's representative, a safety barrier (approved temporary fence or barricade) may be installed at fifteen (15) feet from centerline of track or overhead wire to afford the Permittee and/or Contractor with a work area that is not considered fouling. Nevertheless, protection personnel may be required at the discretion of the Chief Engineer's representative.

### 3.7 TRACK OUTAGES

- A. Permittee and/or Contractors shall verify the time and schedule of track outages from Railroad before scheduling any of their work on, over, under, within, or adjacent to Railroad's right-of-way. Railroad does not guarantee the availability of any track outage at any particular time. Permittee and/or Contractors shall schedule all work to be performed in such a manner as not to interfere with Railroad operations. Permittee and/or Contractors shall use all necessary care and precaution to avoid accidents, delay or interference with Railroad's trains or other property.

### 3.8 DEMOLITION

- A. During any demolition, the Contractor must provide horizontal and vertical shields, designed by a Professional Engineer registered in the state in which the work takes place. These shields shall be designed in accordance with the Railroad's specifications and approved by the Railroad, so as to prevent any debris from falling onto the Railroad's right-of-way or other property. A grounded temporary vertical protective barrier must be provided if an existing vertical protective barrier is removed during demolition. In addition, if any openings are left in an existing bridge deck, a protective fence must be erected at both ends of the bridge to prohibit unauthorized persons from entering onto the bridge.
- B. Ballasted track structure shall be kept free of all construction and demolition debris. Geotextiles or canvas shall be placed over the track ties and ballast to keep the ballast clean.

### 3.9 EQUIPMENT CONDITION

- A. All equipment to be used in the vicinity of operating tracks shall be in "certified" first-class condition so as to prevent failures that might cause delay to trains or damage to Railroad's property. No equipment shall be placed or put into operation near or adjacent to operating tracks without first obtaining permission from the Chief Engineer's representative. **Under no**

**circumstances shall any equipment or materials be placed or stored within twenty-five (25) feet from the centerline of an outside track, except as approved by the Site Specific Safety Work Plan.** To insure compliance with this requirement, Permittee and/or Contractors must establish a twenty-five (25) foot foul line prior to the start of work by either driving stakes, taping off or erecting a temporary fence, or providing an alternate method as approved by the Chief Engineer's representative. Permittee and/or Contractors will be issued warning stickers which must be placed in the operating cabs of all equipment as a constant reminder of the twenty-five (25) foot clearance envelope.

### 3.10 STORAGE OF MATERIALS AND EQUIPMENT

- A. No material or equipment shall be stored on Railroad's property without first having obtained permission from the Chief Engineer. Any such storage will be on the condition that Railroad will not be liable for loss of or damage to such materials or equipment from any cause.
- B. If permission is granted for the storage of compressed gas cylinders on Railroad property, they shall be stored a minimum of 25 feet from the nearest track in an approved lockable enclosure. The enclosure shall be locked when the Permittee and/or Contractor is not on the project site.

### 3.11 CONDITION OF RAILROAD'S PROPERTY

- A. 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.

### 3.12 SAFETY TRAINING

- A. All individuals, including representatives and employees of Permittee and/or Contractor, before entering onto Railroad's property and before coming within twenty-five (25) feet of the centerline of the track or energized wire must first attend Railroad's Contractor Orientation Computer Based Training Class. The Contractor Orientation Class will be provided electronically at [www.amtrakcontractor.com](http://www.amtrakcontractor.com). Upon successful completion of the course and test, the individual taking the course will receive a temporary certificate without a photo that is valid for three weeks. The individual must upload a photo of himself/herself that will be embedded in the permanent ID card. The photo ID will be mailed to the individual's home address and must be worn/displayed while on Railroad property. Training is valid for one calendar year. All costs of complying with Railroad's safety training shall be at the sole expense of Permittee and/or Contractor. The Permittee and/or Contractor shall appoint a qualified person as its Safety Representative. The Safety Representative shall continuously ensure that all individuals comply with Railroad's safety requirements. All safety training records must be maintained with the Permittee's and/or Contractor's site specific work plan.

3.13 NO CHARGES TO RAILROAD

- A. It is expressly understood that neither these Specifications, nor any document to which they are attached, include any work for which Railroad is to be billed by Permittee and/or Contractors, unless Railroad gives a written request that such work be performed at Railroad's expense.

END OF SECTION 01141A

SECTION 01142A – SUBMISSION DOCUMENTATION REQUIRED FOR AMTRAK REVIEW AND APPROVAL OF PLANS FOR BRIDGE ERECTION, DEMOLITION AND OTHER CRANE/ HOISTING OPERATIONS OVER RAILROAD RIGHT-OF-WAY

PART 1 - GENERAL

1.1 SCOPE

- A. Amtrak requires that a site-specific work plan for accomplishing hoisting operations be prepared for every applicable project, and for each type of lift on a project.
  - 1. The plan shall demonstrate adherence to Amtrak safety rules.
  - 2. The plan shall demonstrate constructibility.
  - 3. The plan shall minimize impact to rail operations.
  - 4. The approved plan will provide the basis for field inspection/ verification of the actual work.
- B. Preparation, review and approval of the Crane/ Hoisting site-specific work plan does not relieve the Contractor from meeting other Amtrak requirements for adequate planning and documentation of proposed work procedures within the Right-of-Way of the railroad..
- C. Current Amtrak safety rules shall be adhered to in every respect.
- D. Use of this specification is as required by Amtrak, as described in Amtrak Engineering Practice EP3014.

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.3 DEFINITIONS

- A. CHIEF ENGINEER: Amtrak Vice President, Chief Engineer
- B. RAILROAD: National Railroad Passenger Corporation (Amtrak), and/or the duly authorized representative
- C. ENGINEERING PRACTICE: Amtrak Engineering Practices establish a system of uniform practices, notices and instructions for the Amtrak Engineering Department, providing current, permanent and temporary, departmental procedures and policies.

1.4 SUBMISSION REQUIREMENTS

- A. Unless otherwise directed in the Contract, the Contractor shall submit five sets of plans and calculations to the authorized representative of the Chief Engineer, Structures, whose name and address will be provided at the project pre-construction meeting.
- B. Submitted calculations and plans shall be signed and sealed by a Professional Engineer, registered in the State in which the work will be performed.

- C. The Contractor shall revise and resubmit plans and calculations as many times as necessary, until a complete and correct site-specific work plan for crane/ hoisting operations has been approved.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

- 3.1 THE CONTRACTOR SHALL PROVIDE, AT A MINIMUM, THE FOLLOWING INFORMATION FOR REVIEW AND APPROVAL BY AMTRAK ENGINEERING STRUCTURES:
- A. Plan view showing location(s) of cranes, operating radii, with delivery and/or disposal locations shown. Provide all necessary dimensions for locating the elements of the plan.
  - B. Plans and computations showing the weight of the pick.
  - C. Crane rating sheets, demonstrating that cranes are adequate for 150% of the calculated pick weight. That is, the cranes shall be capable of picking 150% of the load, while maintaining normal, recommended factors of safety. The adequacy of the crane for the proposed pick shall be determined by using the manufacturer's published crane rating chart and not the maximum crane capacity. Crane and boom nomenclature is to be indicated.
  - D. Calculations demonstrating that slings, shackles, lifting beams, etc. are adequate for 150% of the calculated pick weight.
  - E. Location plan showing obstructions, indicating that the proposed swing is possible. "Walking" of load using two cranes will not be permitted. Rather, multiple picks and repositioning of the crane may be permitted to get the load to the needed location for the final pick, if necessary.
  - F. Data sheet listing types and sizes of slings and other connecting equipment. Include copies of catalog cuts for specialized equipment. Detail attachment methods on the plans.
  - G. A complete procedure, indicating the order of lifts and any repositioning or re-hitching of the crane or cranes.
  - H. Temporary support of any components or intermediate stages, as may be required.
  - I. A time schedule of the various stages, as well as a schedule for the entire lifting process.

END OF SECTION 01142A



## SECTION 01520A – REQUIREMENTS FOR TEMPORARY PROTECTION SHIELDS FOR DEMOLITION AND CONSTRUCTION OF OVERHEAD BRIDGES AND OTHER STRUCTURES

## PART 1 - GENERAL

## 1.1 SCOPE

- A. This engineering practice describes items to be included in the design and construction of temporary protection shields for construction overhead and near to Amtrak tracks.
- B. Use of this specification is as required by Amtrak, as described in Amtrak Engineering Practice EP3014.

## 1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

## 1.3 DEFINITIONS

- A. CHIEF ENGINEER: Amtrak Vice President, Chief Engineer
- B. RAILROAD: National Railroad Passenger Corporation (Amtrak), and/or the duly authorized representative
- C. ENGINEERING PRACTICE: Amtrak Engineering Practices establish a system of uniform practices, notices and instructions for the Amtrak Engineering Department, providing current, permanent and temporary, departmental procedures and policies.

## 1.4 SUBMISSION REQUIREMENTS

- A. Unless otherwise directed in the Contract, the Contractor shall submit five sets of plans and calculations to the authorized representative of the Chief Engineer, Structures, whose name and address will be provided at the project pre-construction meeting.
- B. Submitted calculations and plans shall be signed and sealed by a Professional Engineer, registered in the State in which the work will be performed.
- C. The Contractor shall revise and resubmit plans and calculations as many times as necessary, until a complete and correct site-specific work plan for crane/ hoisting operations has been approved.

## PART 2 - PRODUCTS (Not Used)

## PART 3 - EXECUTION

## 3.1 CONTRACTORS WORKING ON OVERHEAD OR NEARBY DEMOLITION AND/OR CONSTRUCTION ADJACENT TO AMTRAK TRACKS, SHALL CONFORM TO THE FOLLOWING

## DESIGN AND CONSTRUCTION REQUIREMENTS FOR TEMPORARY PROTECTION SHIELDING:

- A. The Contractor shall maintain a specified level of protection to railroad facilities, during demolition and construction activities that occur overhead and nearby Amtrak tracks, as shown on the Contract Plans, as detailed in the Contract Specifications, and as described below.
- B. Prior to the start of construction, the Contractor shall submit to Amtrak for review and approval, detailed, site specific plans for temporary protection shields. The plans will be reviewed as to the methods of erection, and as to whether or not the proposed installation will provide the required level of protection. No construction shall proceed until the Contractor has received written approval of the Contractor's complete, site specific plans, from Amtrak.
- C. The Contractor shall design the protection shields to conform to all applicable and governing federal, state and local laws and regulations.
- D. Drawings for the proposed temporary protection shields shall be signed and sealed by a Licensed Professional Engineer. Complete design calculations, clearly referenced to the drawings, and easy to review, shall be provided with submission of drawings.
- E. Protection shields shall be designed for the following, minimum load and size criteria.
1. The horizontal shield design liveload on horizontal surfaces shall be the greater of a minimum of 100 pounds per square foot (psf) [5000 Pascals] or the anticipated liveload to be produced by the Contractor's anticipated operations. When determining the appropriate design live load, the designer shall consider factors such as the physical capacity of proposed debris-catching platforms to retain materials, and the type of equipment the platforms might support. Positive means of demolition and construction controls shall be provided to assure that debris that may collect on the shield will not exceed the design live load. The horizontal protection shield, in plan view, shall cover no less than the area directly over the tracks plus ten feet minimum beyond the centerline of the outermost tracks.
  2. The vertical shield shall be designed to carry a minimum 30 psf [1500 Pascals] allowance for wind load. The vertical shield shall extend a minimum of 6'-6" [1950 millimeters] above the top of the adjacent surface, such as curb or sidewalk. Anti-climb wings shall be installed at each end, as necessary, to restrict access to the railroad property.
- F. The vertical and horizontal clearance envelopes required for maintenance of railroad operations, shall be indicated on the site specific work plans. These clearances are subject to review and approval by Amtrak. If applicable, both temporary and permanent envelopes shall be indicated on the plans. The temporary protection shields shall be installed outside the limits of these minimum vertical and horizontal clearances shown on the site specific work plans.
- G. In electrified territory, temporary protection shields shall be bonded and grounded.
- H. Temporary protection shields shall be designed and constructed to prevent dust, debris, concrete, formwork, paint, tools, or anything else from falling onto the railroad property below.
- I. The temporary protection shields shall be attached to the structure in accordance with site specific work plans submitted by the Contractor and approved by Amtrak. Drilling in structural members and welding will generally not be permitted in members that are scheduled to remain in place in the reconstructed structure. For existing members scheduled for demolition or for later reconstruction, any proposed attachment shall be designed with consideration of potential existing, deteriorated conditions.
- J. The Contractor shall provide the Amtrak on-site representative, for review and approval prior to any construction activity in the effected area, a proposed construction schedule for the installation, maintenance and removal of the temporary protection shields.

- K. The temporary protection shields shall be installed prior to the start of any other work over the railroad in the effected areas. No construction shall proceed until the Amtrak on-site representative reviews and approves the Contractor's installed protection. Before proceeding with the work, Amtrak must be satisfied, in its sole judgment, that sufficient protection has been provided to proceed with the work.
- L. The Contractor shall install and remove temporary protection shields only when an Amtrak representative is on-site.
- M. The Contractor shall not install or remove temporary protection shields during train operations.
- N. Temporary protection shields shall remain in place for the duration of construction activities over and nearby the railroad in the effected areas. The Contractor may remove temporary construction only after approved by Amtrak on-site representatives.
- O. Where site specific conditions impose insurmountable restrictions to the design of temporary construction conforming to the limitations listed above, the design of temporary construction shall be developed in close coordination with Amtrak design review personnel. The Chief Engineer, Structures shall provide final approval of temporary construction that does not conform to the above limitations.

END OF SECTION 01520A

## SECTION 02261A – REQUIREMENTS FOR TEMPORARY SHEETING AND SHORING TO SUPPORT AMTRAK TRACKS

## PART 1 - GENERAL

## 1.1 SCOPE

- A. This engineering practice describes items to be included in the design and construction of temporary sheeting and shoring construction adjacent and proximate to Amtrak tracks.
- B. Use of this specification is as required by Amtrak, as described in Amtrak Engineering Practice EP3014.

## 1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

## 1.3 DEFINITIONS

- A. CHIEF ENGINEER: Amtrak Vice President, Chief Engineer
- B. RAILROAD: National Railroad Passenger Corporation (Amtrak), and/or the duly authorized representative
- C. ENGINEERING PRACTICE: Amtrak Engineering Practices establish a system of uniform practices, notices and instructions for the Amtrak Engineering Department, providing current, permanent and temporary, departmental procedures and policies.

## 1.4 SUBMISSION REQUIREMENTS

- A. Unless otherwise directed in the Contract, the Contractor shall submit five sets of plans and calculations to the authorized representative of the Chief Engineer, Structures, whose name and address will be provided at the project pre-construction meeting.
- B. Submitted calculations and plans shall be signed and sealed by a Professional Engineer, registered in the State in which the work will be performed.
- C. The Contractor shall revise and resubmit plans and calculations as many times as necessary, until a complete and correct site-specific work plan for temporary sheeting and shoring has been approved.

## PART 2 - PRODUCTS (Not Used)

## PART 3 - EXECUTION

## 3.1 CONTRACTORS INSTALLING TEMPORARY CONSTRUCTION SHEETING AND SHORING TO SUPPORT AMTRAK TRACKS SHALL CONFORM TO THE FOLLOWING:

- A. Footings for all piers, columns, walls, or other facilities shall be located and designed so that any temporary sheeting and shoring for support of adjacent track or tracks during construction, will not be closer than toe of ballast slope. The dimension from gage of rail to toe of ballast, along tangent track, is 7'-5"; see dimensions on Track standard plans for curved track dimensions.
- B. USE OF SHEETING: When support of track or tracks is necessary during construction of the above-mentioned facilities, interlocking steel sheeting, adequately braced and designed to carry Cooper E80 live-load plus 50 percent impact allowance is required. Soldier piles and lagging will be permitted for track support ONLY when required penetration of steel sheet piling cannot be obtained, due to site-specific conditions that make steel sheet piling placement impracticable, in the opinion of the authorized, Amtrak design review engineer.
1. For usual soil conditions and limited excavations, sheeting is required when the near-track excavation extends beneath or nearer to the track than the Theoretical Railroad Embankment Line. The Theoretical Railroad Embankment Line is defined as a line that starts at grade, ten foot from the centerline of the outer track, and extends downward, away from the track, at a slope of 1-1/2 horizontal to one vertical.
  2. For special soil conditions, such as soft organic soils and rock conditions, and for unusual excavation conditions, temporary supports for excavations may be necessary even when the limits fall beyond the Theoretical Railroad Embankment Line, requiring site specific analysis by a professional, geotechnical engineer.
  3. See Sketch SK-1, "Normal Requirements for Sheet Piling Adjacent to Tracks".
- C. Exploratory trenches, three feet deep and 15 inches wide in the form of an "H", with outside dimensions matching the proposed outside dimensions of sheeting, shall be hand dug, prior to placing and driving the sheeting, in any area where railroad or utility underground installations are known or suspected. These trenches are for exploratory purposes only, and shall be backfilled and immediately compacted, in layers. This work shall be performed only in the presence of a railroad inspector.
- D. Absolute use of track is required while driving sheeting adjacent to running track. Track usage shall be prearranged per standard procedures, through the Amtrak project representative.
- E. Cavities adjacent to sheet piling, created by pile driving, shall be filled with sand, and any disturbed ballast shall be restored and tamped immediately.
- F. Sheet piling cutoffs
1. During construction, sheeting shall be cut off at an elevation no higher than the top of tie.
  2. At the completion of construction activities involving the use of sheet piling, sheet piling may be pulled if there will be no adverse impact to the railroad track support bed, as determined by the Amtrak site engineer. This will generally be permitted when both of these conditions are met:
    - a. the sheeting face is at least ten feet distant from the centerline of track, and
    - b. the bottom of the excavation that the sheeting supported prior to backfilling, does not fall within an assumed influence zone under the tracks. The assumed influence

zone is defined as the area, as seen in cross-sectional view, falling beneath the Theoretical Underground Track Disturbance Line. This line is defined as a line that starts at the end and bottom of the ties, and extends from the track outward and downward at a one-to-one (45-degree) slope.

3. Sheet piling that is to be left in-place, shall be cut off below the ground line
    - a. at least eighteen inches below final ground line at the sheeting, and
    - b. no higher than 24 inches below the elevation of the bottom of the nearest ties
  4. See Sketch SK-1, "Normal Requirements for Sheet Piling Adjacent to Tracks".
- G. The excavation adjacent to the track shall be covered, ramped and protected by handrails, barricades and warning lights, as required by applicable safety regulations, and as directed by Amtrak.
- H. Final backfilling of excavation shall conform to project specifications.
- I. The Contractor shall provide Amtrak with a detailed schedule of proposed construction operations, detailing each step of the proposed temporary construction operations in proximity to Amtrak tracks, so that Amtrak may review and approve the proposed operations, and may properly inspect and monitor operations.
- J. Drawings for the proposed temporary sheeting and shoring shall be signed and sealed by a Licensed Professional Engineer. Complete design calculations, clearly referenced to the drawings, and easy to review, shall be provided with submission of drawings.
- K. Where site specific conditions impose insurmountable restrictions to the design of temporary construction conforming to the limitations listed above, the design of temporary construction shall be developed in close coordination with Amtrak design review personnel. The Chief Engineer, Structures shall provide final approval of temporary construction that does not conform to the above limitations.
1. When Amtrak grants approval for sheeting closer than standard minimum clearances, the Contractor shall develop a survey plan, if not already required by the project, for the adjacent tracks, to be conducted prior to, during, and after the temporary sheeting construction operations. If settlement is detected, construction operations shall be suspended until the track has been returned to its initial condition, and stabilized, as determined by the Amtrak project site representative.
2. The Contractor shall stockpile ten (10) tons of approved ballast at the project site, and maintain that amount in ready reserve, to allow for the possible need to restore track profile.
- L. Particular care shall be taken in the planning, design and execution of temporary construction, as relates to railroad slope protection and drainage facilities. Erosion and sediment control best management practices shall be designed and employed, as approved by Amtrak. Any unintended disruption to railroad drainage facilities, caused by the temporary construction, shall be promptly remedied, as directed by the Engineer, solely at the Contractor's cost.
- M. The following Information Sketch is attached:
1. Figure No. SK-1: Normal Requirements for Sheet Piling Adjacent to Track

END OF SECTION 02261A

**LEGEND**

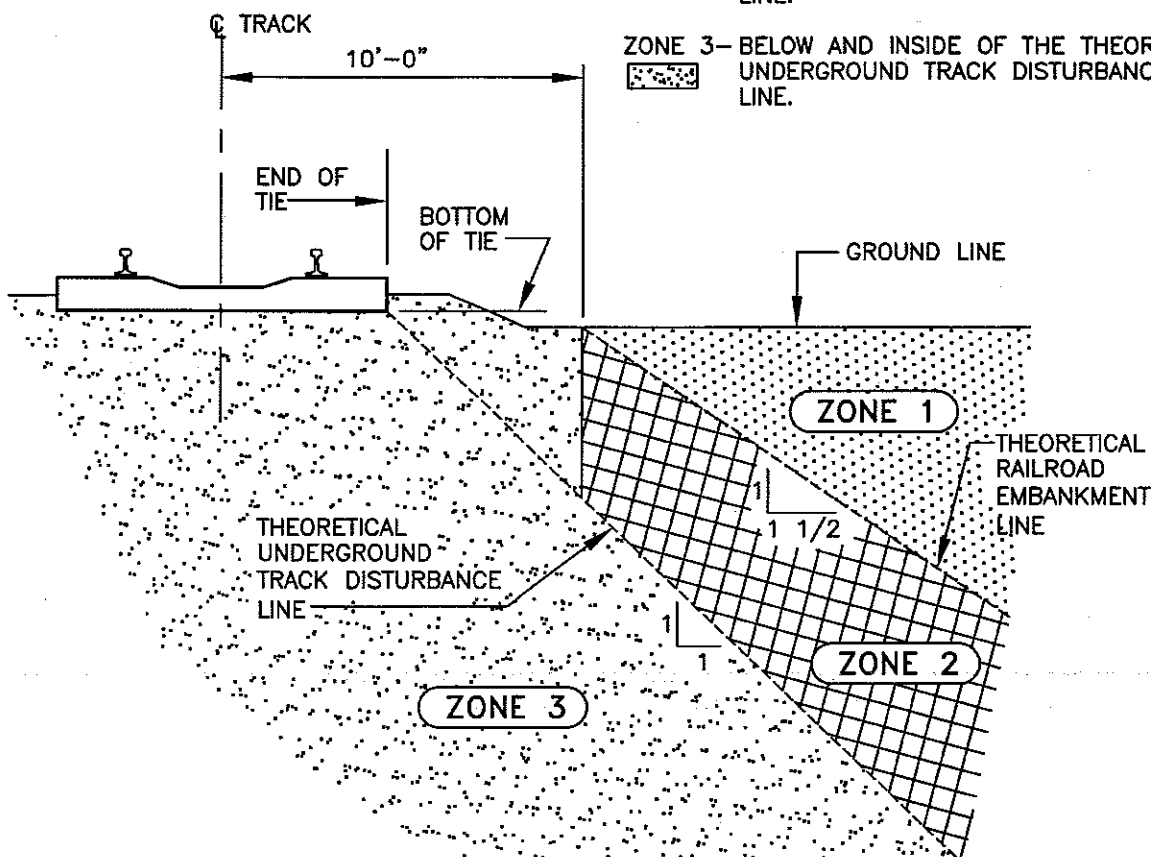
ZONE 1- ABOVE AND OUTSIDE THE THEORETICAL RAILROAD EMBANKMENT LINE.



ZONE 2- FARTHER THAN 10 FEET FROM THE CENTERLINE OF TRACK, BELOW THE THEORETICAL RAILROAD EMBANKMENT LINE AND ABOVE THE THEORETICAL UNDERGROUND TRACK DISTURBANCE LINE.



ZONE 3- BELOW AND INSIDE OF THE THEORETICAL UNDERGROUND TRACK DISTURBANCE LINE.



**NORMAL REQUIREMENTS FOR SHEET PILING  
ADJACENT TO TRACK**

- ① EXCAVATIONS WITHIN ZONE 1 - ABOVE AND OUTSIDE OF THE THEORETICAL RAILROAD EMBANKMENT LINE - DO NOT NORMALLY REQUIRE SHEETING TO PROTECT RAILROAD ROAD BED. SHEETING MAY BE REQUIRED FOR OTHER REASONS.
- ② EXCAVATIONS WHOSE BOTTOMS EXTEND INTO ZONE 2 REQUIRE SHEETING, BUT THE SHEETING MAY NORMALLY BE PULLED AFTER THE EXCAVATION HAS BEEN BACKFILLED.
- ③ EXCAVATIONS WHOSE BOTTOMS EXTEND INTO ZONE 3 WILL NORMALLY REQUIRE THE SHEETING TO BE LEFT IN PLACE AND CUT-OFF PER REQUIREMENTS.

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Office of Chief Engineer  
STRUCTURES

National Railroad Passenger Corporation  
30th Street Station, Philadelphia, Pennsylvania 19104

**SKETCH 1**  
SPEC. 02261A - REV. 1

Designed CJR Drawn JLM Date 8/06/01

File No:	
Design No:	3501
Sheet No:	1 of 1
SK-1	

 <b>ENGINEERING PRACTICES</b>	ORIGINAL ISSUE DATE <b>04/24/01</b>	NUMBER  <b>EP3016</b>	
	REVISED DATE <b>N/A</b>		
TITLE <b>STORM WATER DRAINAGE AND DISCHARGE FROM ADJACENT PROPERTY ONTO AMTRAK RIGHT-OF-WAY</b>	RECOMMENDED by <b>Anthony Scorpio</b>	DATE <b>4/25/01</b>	PAGE <b>1</b>
	APPROVED by CHIEF ENGR, STRUCTURES <b>James Richter</b>	DATE <b>4/27/01</b>	OF <b>2</b>

## SCOPE AND NATURE

There are many areas along the railroad corridor that are receiving storm water from adjacent property that results in flooding during the smallest of storms. Increased storm water flow to the railroad property increases deposits of excessive amounts of sedimentation and could cause fouling of the track structure. With the introduction of the High Speed Rail Trains, passenger safety is of the utmost importance. Diminished track support from flooding and sedimentation will not be allowed.

It is Amtrak's policy to limit the resultant discharge and drainage of storm water from the development of adjacent properties to no more than pre-existing conditions, as demonstrated by engineering analyses through governmental regulatory processes.

It is Amtrak's policy to protect the railroad right-of-way from sediment, erosion and excess runoff during all stages of construction activities on adjacent properties, as demonstrated by engineering analyses through governmental regulatory processes.

## SPECIAL REFERENCE

The following policy is to augment Specification 02861 of EP3005, Pipeline Occupancy Requirements and Specifications, and other Amtrak I&C, design and construction standards.

## SPECIAL MATERIALS

N/A

## PROCEDURE

The discharge of storm water onto railroad property will be prohibited for all construction projects on or adjacent to Railroad property, unless the applicant can demonstrate that there will be a "zero net runoff" result in the peak flow and total volume based on a 100 Year Storm event, and that receiving waters downstream will not be impacted.

Computations indicating this design and suitable topographic plans, prepared by a Professional Engineer, licensed in the state in which the work will be performed, shall be submitted to the Chief Engineer for approval at least 60 days in advance of construction. If the drainage is to discharge into an existing drainage channel on or under the Railroad Right of Way, a hydraulic analysis of the existing structures must be included.

Formal approval of the proposed design, by the appropriate governmental agency or agencies, must be submitted with the computations. Control of soil erosion and sedimentation must be demonstrated on the design plans in accordance with the appropriate state and local regulations.



<b>TITLE</b>  <b>STORM WATER DRAINAGE AND DISCHARGE FROM ADJACENT PROPERTY ONTO AMTRAK RIGHT-OF-WAY</b>	ORIGINAL ISSUE DATE <b>04/24/01</b>	NUMBER <b>EP3016</b>
	REVISED DATE <b>N/A</b>	PAGE <b>2 OF 2</b>

The Contractor shall be responsible for control of the site and protection of railroad property during the entire construction project, through completion. The design of sedimentation, erosion and runoff control during construction shall accommodate conditions of every phase of construction.

Review, monitoring and approval process:

1. The Contractor shall conform to this Amtrak policy, and demonstrate conformance by standard Amtrak review submissions and approvals, as noted above.
2. Amtrak I&C shall assure that agencies and other third parties proposing construction on or adjacent to Amtrak Right-of-Way conform to Amtrak policy detailed herein.
3. Amtrak Design and Construction shall review the Contractor's proposed design and construction procedures for conformance with Amtrak policy, as demonstrated through appropriate engineering analyses and the government regulatory process.
4. Amtrak Construction shall monitor the activities of the Contractor on-site to assure compliance/ adherence to approved procedures throughout the construction period.

**REPORTING**

N/A

**RESPONSIBILITY**

Amtrak I&C Staff	Comply with Procedure
Director I&C	Assure Compliance
Amtrak Design Staff	Comply with Procedure
Director Structures Design	Assure Compliance
Amtrak Construction Staff	Comply with Procedure
Sr. Director Construction	Assure compliance



June 13, 2008

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**STORMWATER MANAGEMENT POLICY**

**Scope**

This specification is for designing stormwater management drainage facilities on property adjacent to Amtrak’s Right-of-Way. These requirements are closely allied with the needs associated with the safety of high-speed rail passenger service.

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## 1. Introduction

- 1.1. This specification has been developed to outline the National Railroad Passenger Corporation's (Amtrak) policies, criteria, and methodologies regarding hydrologic/hydraulic design of proposed developments adjacent to the Amtrak's right-of-way.
- 1.2. Reference to this specification will provide definitive guidelines for preparing thorough hydrologic/hydraulic design analyses in conformance with the requirements of Amtrak's Engineering Practices, Amtrak's Specification No. 63, and as specified herein. Close adherence to the provisions of this specification will reduce the review process time for hydrologic/hydraulics approval.

## 2. Policy

- 2.1. Amtrak reserves the right to review any development adjacent to the Amtrak ROW or facilities to ensure that: 1) the proposed development will not adversely affect the railroad and 2) improvements on Amtrak's land are in conformance with Amtrak's design criteria, construction specifications, and standard details.
- 2.2. Adverse impacts may include flooding, erosion, structural damage, and/or any safety hazard that may occur.
- 2.3. All submittals must be sent to Amtrak's Director of I&C Projects. The Director of I&C Projects will review the development plans and computations to confirm that:
  - All inlets, pipes, channels and other storm drain facilities constructed on Amtrak's property meet Amtrak criteria.
  - The hydraulic design of proposed drainage facilities, which connect directly to Amtrak drainage facilities either upstream or downstream, are adequate.
  - On-site drainage systems for proposed developments, which do not connect directly to Amtrak drainage facilities, will not indirectly result in an adverse impact to Amtrak facilities or ROW.
  - Proposed improvements do not create safety or erosion hazards.
  - Work within or adjacent to Amtrak does not cause an increase in flow or total runoff towards the railroad.
- 2.4. Amtrak's approval will not be issued until a complete set of final plans and computations as specified in these criteria has been received and reviewed.

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- 2.5. These plans and computations must also be reviewed and approved by the local stormwater management-approving agency (town, city, county, state, etc.). Amtrak is not an approving agency for stormwater management facilities.
- 2.6. All storm water facilities must be designed to accommodate a storm with a 100 year recurrence interval as determined by using either the Soil Conservation Service (SCS) or the Rational Method, whichever is appropriate.
- 2.7. The applicant must also supply Amtrak with copies of all of the other approvals that are required for the proposed development; e.g., Non-Tidal Wetland and Waterway Permits, Tidal Wetlands License, Army Corps of Engineers Permits, Point Discharge Permits etc.
- 2.8. Computations must be provided that demonstrate that discharge from the proposed development for storm intervals of a 2; 5; 10; 25; and 100 year storms does not raise the existing flood water levels on the railroad property.
- 2.9. All storm water retention or detention facilities constructed up-gradient of the Amtrak right of way that may pose a risk to train operations must be constructed, inspected and maintained in accordance with the latest edition of the United States Department of Agriculture, Soil Conservation Service - Technical Release 60. Impoundment structures shall be considered a Class "C" dam. Relief from this requirement can only be obtained by submission of a letter from the appropriate State agency that regulates dam safety stating that Technical Release 60 does not apply at this specific location. The State agency must then dictate the classification of the proposed structure and the level of inspection and maintenance required.

Amtrak does not consider the United States Department of Agriculture Natural Resources Conservation Service – Conservation Practice Standard – Pond No - Code 378 to be applicable unless it is dictated as noted above. Code 378 clearly states the following:

**“CONDITIONS WHERE PRACTICE APPLIES**

This standard establishes the minimum acceptable quality for the design and construction of low hazard (class “a”) ponds if:

1. Failure of the dam **will not result in loss of life**; damage to homes, commercial or industrial buildings, main highways, or **railroads**; or in interruption of the use or service of public utilities.”
- 2.10. Most importantly, Amtrak’s review or lack of review does not release the owner, developer or their consultant from liability.

### 3. Submittal Requirements

3.1. The following material (if appropriate) shall be submitted for hydrologic/hydraulic review by Amtrak:

1. County approved stormwater management (SWM) plans and computations or documentation from the County regarding their waiver of SWM.
2. Pre-development drainage area map for the entire watershed, clearly indicating the existing contours both on site and off site. (1"=200' scale or larger)
3. Post-development drainage area map for the entire watershed, clearly indicating the proposed contours both on site and off site. (1"=200' scale or larger)
4. A set of the latest approved post-development site plans, clearly indicating existing topographical features, proposed structure details, typical sections, pipe profiles, and contour grading.
5. Complete storm drainage plan and hydraulic gradient profiles of both the existing and proposed storm drainage system from the proposed development for storm intervals of 2; 5; 10; 25; and 100 year.
6. Complete hydraulic analyses for cross-culverts under Amtrak for the 100- year storm utilizing the Soil Conservation Service (SCS) Method.
7. Complete storm sewer design computations for proposed closed storm drainage system for the 100-year storm utilizing the Rational Method.
8. Complete hydraulic gradient computations for proposed and existing storm drainage systems for the 100-year storm, utilizing the Rational Method.
9. Complete analyses, utilizing the SCS Method, for:
  - a. Channels adjacent to the Amtrak ROW for the 100-year storm.
  - b. Inlet / outlet channels to culverts for the 100-year storm.
10. Complete hydrologic analysis/back-up data (eg.:  $t_c$ ,  $t_c$  path, curve numbers, soil types, TR-20 Schematic Diagrams, land uses, etc.).

3.2. The following standard programs can be used for the design computations:

- Culvert Analysis or HY-8 Computer Analysis
- Peak Discharge using TR-55 or TR-20 Computer Analysis

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- Rational or Modified Rational Methods may be used for areas less than 20 acres.
  - Alternative methods required by local governing or regulating authorities, provided they are more restrictive than the above and use the 100 year storm event as the design standard.
- 3.3. Calculation shall be provided to show the derivation of the Runoff Curve Number (RCN) for the TR - 20 computer input forms. Supplementary computations sheets showing the derivation of "times of concentration" ( $t_c$ ) must also be submitted. TR-55 worksheets may be used to show these computations.
- 3.4. All computations are to be neatly prepared, well organized, and appropriately labeled so they can be easily reviewed. The computations shall also include references to all design charts and publications used in the preparation of the computations.
- 3.5. The pre- and post-development drainage area information shall include:
- An outline of the total drainage area to the point being analyzed and all sub-areas within the total watershed that are pertinent to the computations. The drainage area shall not be limited to the development site.
  - The soil types within the watershed.
  - The land uses within the watershed.
  - All time-of-concentration ( $t_c$ ) flow paths investigated, showing the limits of overland flow, swale flow, ditch flow, pipe flow, stream flow, etc. The chosen path shall be clearly differentiated from all other paths investigated. When the  $t_c$  path changes with the recurrence interval, each path must be clearly identified.
  - Existing and proposed storm drain and stormwater management systems (both on site and off site) serving the development and surrounding watershed.
  - Drainage area and cross section numbers that agree with the design computations and computer output data.

**4. Methodology**

- 4.1. The following methods shall be used in performing hydrologic computations for development projects that are to be reviewed by Amtrak.

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1. The "United States Soil Conservation Service Hydrograph Method", utilizing either the TR-55 Tabular Hydrograph Method or the TR-20 program, shall be used for determining the discharges for design and analysis of culverts, SWM facilities, and open channels.
2. The Graphical Peak Discharge Method may be used only when development is within a homogeneous watershed (watershed subdivision not required), and reservoir routing is not required.
3. The Rational Method shall be used for determining the discharges for design and analysis of closed drainage systems (those consisting of pipes and similar structures). The Rational Method may also be used for areas of 20 acres or less. The Rational Method is defined by the following equation:  

$$Q=CiA$$
 Where :  
 Q - peak flow (cfs).  
 C - dimensionless runoff coefficient.  
 i - rainfall intensity (in/hr).  
 A - catchment area (acres).
4. Alternative methods that may be required by local governing or regulating authorities, provided they are more restrictive than the above and use the 100 year storm event as the design standard.

**5. Hydrology**

- 5.1. The hydrologic computations shall be performed in conformance with the Methodology noted in Section 4 above for the site and as specified herein.
- 5.2. The following analyses may be required depending on the resulting adequacy of the drainage facilities:
  1. Pre-development (existing).
  2. Post-development analysis for the project site with full potential development in accordance with existing zoning for the site. Should this analysis demonstrate adequacy of the existing and/or proposed drainage facilities, no further analysis is required.
- 5.3. The entire watershed to the point of investigation is to be included in the hydrologic computations.
- 5.4. The latest available version of TR-55 or TR-20 is to be used in determining runoff by the Soil Conservation Service Method unless a different method is allowed by the provisions of paragraph 3.2 above. The standard SCS 24 hr. Type II rainfall distribution (Table #2) is to be used for the TR-20 program. The selec-

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tion of sub-areas and cross sections for the reach routings for development of composite hydrographs shall be suitably justified and documented.

- 5.5. The applicant shall determine a representative time of concentration based upon land use, slopes, and soil groups. Several paths should be investigated in the process and the path representing the greatest contribution of runoff chosen (the most representative time is not necessarily the longest time). All flow paths shall be indicated on the drainage area maps and supported by backup computations.
- 5.6. Special considerations in unique circumstances may require other additional methods of analysis. Contact with the Amtrak's Director of I&C Projects is recommended when the designer is considering special cases.

## **6. Culvert Analyses**

- 6.1. The applicant shall provide an analysis for all proposed culverts under Amtrak and for all existing culverts that may be affected as a result of the proposed development. This may include culverts that are located beyond the property boundaries. These analyses shall include a review of the stability/capacity of the downstream channel and design of outfall protection measures.
- 6.2. Definition of a culvert: Any culvert under the railroad with or without a headwall, end section or protective end, whose primary function is to convey off-site runoff through the railroad, is considered to be a culvert. This definition applies even if an extended downstream storm drainage system is connected to the culvert. In addition, an entrance culvert parallel to the railroad with a downstream storm drainage system connected to it may also be considered a culvert. In these cases, a hydraulic gradient based upon the SCS methodology discharges will be required to determine the tailwater for the upstream culvert.
- 6.3. The headwater pool elevation for the design flood must not be higher than the bottom of the railroad tie based upon the proposed development and existing conditions for the off-site portion of the watershed. The bottom of the railroad tie is approximately 1.43 feet below the top of the rail.
- 6.4. The post-development headwater pool elevations shall be determined taking into consideration the following:
  - Storage at the inlet of the culvert if appropriate.
  - Overflow into or from an adjacent drainage basin.
  - Tailwater elevations from downstream drainage, headwater pools, floodplains, and storm-water management facilities.
  - Extension of the culvert to accommodate railroad embankment widening.



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- Outflow from upstream storm-water management facilities.
- 6.5. Storm drain extensions that are proposed downstream of an existing culvert under Amtrak shall be adequately sized to handle the ultimate development of the watershed, as allowed by zoning, regardless of the capacity of the culvert. The plans must include profiles of all proposed culvert extensions.
- 6.6. Any development adjacent to an Amtrak facility must ensure that an existing flooding problem on the Amtrak facility will not be worsened as a result of the proposed development. In the event of increased discharges, applicants may (subject to county and state approval) upgrade or supplement an existing culvert to reduce the runoff to pre-development levels or below. Adequacy of the outfall must be addressed should this option be pursued. Should this prove to be infeasible, a storm-water management facility may be required.
- 6.7. Headwalls shall be provided on pipes. All culverts must have a minimum diameter of 18 inches for a length of less than 60 feet and 24 inches for a length of 60 feet or greater. As with all drainage design, railroad safety and stability are paramount in considering the location of culvert headwalls and end sections.
- 6.8. With any other special circumstance, coordination with Amtrak Engineering is recommended.

**7. Off-site Drainage Design**

- 7.1. All proposed development adjacent to Amtrak shall include a storm drainage system along Amtrak's property that will intercept existing and proposed flows and discharge the system in accordance with Amtrak criteria. Waivers to this policy must be reviewed and approved by Amtrak Engineering.
- 7.2. The applicant shall prepare a pre- and post-development analysis for water-courses when runoff from the proposed development is directed toward the Amtrak property. Additional detention or diversion will be required if the peak discharge (cfs) from the development increases.
- 7.3. The applicant shall utilize one of the following options if Amtrak's review finds that an adequate drainage system has not been specified:
1. Provide additional inlet capacity;  
and/or
  2. Revise the site plan to reduce runoff to Amtrak. This may include re-grading for the proposed development and/or additional inlets or detention on-site.

## 8. Closed Storm Drainage Systems

- 8.1. The applicant shall provide an analysis for all existing and proposed storm drainage systems under or adjacent to Amtrak which may be affected as a result of the proposed development. This frequently includes systems that are located beyond the property boundaries.
- 8.2. The 100-year post development storm, utilizing the Rational Method, shall be used for storm drainage pipe designs. Pipes should be initially sized to convey this discharge at or below full flow.
- 8.3. The submittal for review shall include the following:
  - Plans, profiles and construction methods for the proposed system to meet the design requirements of Amtrak's EP 3005- Pipeline Occupancy – Specification 02081A.
  - Completed Storm Sewer Design for the 100-year storm frequency.
  - Hydraulic gradient computations for a 100-year storm. This must be plotted on the pipe profiles and be below the top of grate or manhole cover.
- 8.4. Channel conditions downstream from the storm drain outlet pipe and/or the Hydraulic Grade Line (HGL) of an existing downstream storm drain shall be carefully reviewed to determine the beginning elevation for the hydraulic gradient computations. Additionally, when a proposed system is directed toward a stormwater management facility, the 100-year water surface elevation must be used as the controlling tailwater elevation. A complete discussion of assumptions and backup computations shall be provided.
- 8.5. The 100-year storm hydraulic gradient shall be developed for the proposed storm drainage systems for post-development conditions to determine if flooding of the Railroad is exacerbated by the post development runoff. An analysis of the existing system must be performed to determine if flooding occurs or worsens as a result of the proposed development. If so, appropriate design revisions must be made.
- 8.6. The surface overflow flood route shall be plotted for all projects for the pre- and post-development conditions to identify potential flooding hazards.
- 8.7. General design requirements for designing pipes within the Amtrak ROW are found in Amtrak's Engineering Practice EP 3005 – "Pipeline Occupancy – Specification 02081A.

## 9. Open Channels

- 9.1. The applicant shall provide an analysis for all proposed channels adjacent to Amtrak and any existing channel that may be affected as a result of the proposed development. This may include channels that are located beyond the property boundaries. All proposed channels are to be designed such that no adverse impact to the Railroad occurs.
- 9.2. The water surface elevations for new open channels for a 100-year frequency storm shall be at least 1 in. below the bottom of the railroad tie elevation.
- 9.3. Open channels shall be checked for velocity, depth of flow and type of lining for the design storm including locations in the channel where:
  - Other swales and ditches outlet into the channel.
  - The typical section of the channel changes significantly (eg: the channel changes from a “vee” section to a trapezoidal section, the bottom width increases 2 feet or more, etc.). No “vee” ditches will be permitted on railroad property.
  - The grade of the channel changes (either flattens or steepens).
- 9.4. Specific items, that the design and analysis of the channels must include are:
  - Depth limitations as stated above.
  - All channels must have linings, which will not erode at design velocities.
  - Tributary channels shall be designed to intersect the railroad side ditch at an angle of between 30° and 60°.
  - Ditches must not change percent of grade in close proximity to headwalls or end sections. Changes in slopes at these locations may cause undermining or clogging of the structure, due to changes in velocity, and are therefore not allowed.

## 10. Stormwater Management (SWM)

- 10.1. SWM approval is the responsibility of the local approving agency. Amtrak is not an approving agency for SWM facilities. Amtrak is solely concerned with potential impacts to Amtrak facilities due to inadequate SWM.

**SPEC NO. 150 ©**

- 10.2. The applicant shall provide complete design computations and construction plans for all proposed SWM facilities that are adjacent to Amtrak. All SWM facilities are to be designed or analyzed with the SCS Hydrograph Method. No other methods will be allowed. The SCS "Short-cut Method" is not acceptable. The SWM computations shall address the appropriate pre- and post-development discharge rates. In addition, computations based on the functional storm may be required so that Amtrak can perform a complete evaluation of the development. All soils data (soil type, runoff coefficient, etc) for water quality management shall be included with the SWM computations.
- 10.3. All SWM facilities for private development must be located outside Amtrak property.
- 10.4. The following should be considered when designing SWM facilities:
- Ponds downstream of railroad facilities must be adequately sized so that the hydraulic operation of upstream drainage systems for the railroad is not impacted.
  - Emergency spillways directing flow onto Amtrak will not be allowed. The emergency spillway must discharge flow away from Amtrak or into an adequate channel where flow will not impact railroad operations.
  - All detention facility designs must comply with the requirements contained in the Soil Conservation Service Publication TR – 60
  - All dams adjacent to and upstream of Amtrak are to be Class "C" per TR-60 unless as determined in paragraph 2.9 above.
  - A breach routing plan is required. A breach routing plan must route water away from Amtrak.
  - Use of existing Amtrak SWM, such as detention basins, facilities by private applicants is not allowed.

**AMTRAK SPECIFICATION - AED-1**

**PROCEDURES AND DESIGN CRITERIA TO BE  
EMPLOYED BY ELECTRIFICATION CONSULTANTS  
ENGAGED IN THE DESIGN OF  
ELECTRIFICATION FACILITIES  
ON THE  
NATIONAL RAILROAD PASSENGER CORPORATION**

PREPARED BY:  
AMTRAK - OFFICE OF THE DEPUTY CHIEF ENGINEER - ET  
PHILADELPHIA, PA  
(REVISED Nov. 2006)

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**I. QUALIFIED CONSULTANTS LIST**

- A. Amtrak maintains a list of “Qualified Electrification Consultants” for its own convenience and to facilitate the process of selecting firms to perform electrification design on Amtrak property. Consulting firms are included on Amtrak’s “Qualified” list based on the experience and knowledge of their key personnel, their past performance on electrification projects in general, and past performance on specific Amtrak projects.
- B. A Consultant may be removed from Amtrak’s “Qualified” List if it is determined the he no longer meets the requirements for inclusion as specified in paragraph “A” above.
- C. Application for inclusion on Amtrak’s “Qualified Electrification Consultants” list shall be submitted to:

R. G. Verrelle  
 Director - ET Design & Standards  
 National Railroad Passenger Corporation 30<sup>th</sup> Street Station, 4<sup>th</sup> Floor - South Tower  
 Philadelphia, PA 19104

Applications shall be the in form of a letter of interest and shall have attached the following information:

- 1. Key Personnel and their qualifications.
- 2. Past and current electrification projects (other than Amtrak) with the names and telephone numbers of their clients.
- 3. Past and current Amtrak electrification projects.
- D. A Consultant may be included on the “Qualified” list on a probationary basis pending performance on an Amtrak Electrification Project.
- E. Consultants must re-apply for inclusion on Amtrak's Qualified List each calendar year. Submissions must be made prior to October 1<sup>st</sup> of the preceding year in order to be considered.

**II. PROCEDURES**

- A. Whenever the Term “Engineer” is used in this specification, it shall mean the Deputy Chief Engineer, ET of Amtrak or an authorized representative.
- B. Upon receipt of notice to proceed with design work, the Electrification Consultant shall so inform the Director of Design - Electric Traction of Amtrak, and shall also provide the name of the Consultants Personnel responsible for the project management. Any changes in the Electrification Consultant’s key personnel shall be approved by the Director - ET Design
- C. Consultant’s personnel, before entering Railroad property, shall execute an Amtrak “Permit to Enter Upon Property”, and attend Amtrak’s Contractor’s Safety Class.
- D. Prior to proceeding with the final design, the Consultant shall submit to Amtrak, for review and discussion, preliminary conceptual plans for the proposed electrification modifications. This is especially important in work involving changes to the catenary configuration, sectionalizing,

transmission lines, and signal power lines. The plans shall indicate the preliminary design concepts in sufficient detail for Amtrak design personnel to provide definitive direction in which to proceed with the design.

In conjunction with the conceptual submission, a field meeting shall be held between representatives of the Electrification Consultant and Amtrak's ET Design and Construction Departments to evaluate alternatives and establish an acceptable conceptual plan.

Following approval of the conceptual plans, submissions at the 30%, 60%, 90%, and final level, shall be provided for Amtrak's review and comment per the agreed upon schedule of submissions. Design calculations shall be submitted at all levels of submissions. The Electrification Consultant shall also provide an electrification cost breakdown at the 60% level and upon submission of final plans. Unless otherwise directed, submittals shall be sent to the attention of the Engineer.

- E. It shall be the responsibility of the Consultant to verify the information contained on Amtrak record drawings pertaining to the project work by on-site inspection.
- F. It shall be the responsibility of the Electrification Consultant to perform exploratory trenching to establish all underground Amtrak facilities such as ducts, pipes, and footings in all areas that excavation is required by the design. Hand dug exploratory trenches shall be as described in Section IV of this specification.
- G. Final drawings, specifications and calculations shall be submitted to Amtrak for approval prior to being issued for bidding or construction. Each drawing shall bear the stamp of a Professional Engineer, registered in the state in which the work will be performed.
- H. When it is necessary to revise existing Amtrak bonding and grounding plans, and sectionalizing plans, these Amtrak plans showing the revisions shall be submitted to the railroad upon completion of construction.
- I. Unless otherwise instructed, the Consultant shall utilize the current standard Amtrak structural, catenary, and electrical details and materials in the design of the project.
- J. The project sponsor (if other than Amtrak) shall be responsible for all liaison and coordination between all agencies and utilities that may be involved in the project work.
- K. The Electrification Consultant shall be responsible for review of all shop and manufacturers drawings for all structures, catenary material or electrical equipment designed or specified by him in connection with the project.



### III. DESIGN DRAWNGS

The design drawings prepared by the Consultant for the proposed electrification system modifications shall include, but not be limited to the following, and shall be arranged as described below.

- A. The first drawing of the design set shall be a location plan sheet. The drawing shall contain, in addition to a plan of construction limits (scale not less than 1" = 100') the following information:
- 1) General notes - steel, concrete, excavation, etc.
  - 2) List of abbreviations used.
  - 3) Division of work and material supply legend.
  - 4) List of reference drawings.
  - 5) List of design drawings in set.
  - 6) Construction sequence.
- B. The next plan sheet shall be a profile drawing indicating the modifications to existing overhead lines (other than catenary) if required, and the relationship of the proposed construction to existing facilities. This profile drawing shall be drawn to a vertical scale 1" = 20' and a horizontal scale of 1" = 100'.
- C. The next plan sheets shall be wiring plan drawings indicating all existing and new information pertaining to the catenary system, its supporting structures and ancillary conductors. These wiring plan drawings shall be drawn to a scale 1" = 20', 1"=30' or 1"=40' (depending upon project size).
- D. The next plan sheets shall be the catenary profile drawings indicating the new and/or modifications to existing catenary wires and (if required) the relationship of the proposed construction to existing facilities. These profile drawings shall be drawn to a vertical scale 1" = 4' and a horizontal scale of 1" = 40'.
- E. The next group of design drawings shall present erection diagrams for all new permanent and temporary structures and existing modified structures. Erection diagrams shall be drawn to a scale of 1" = 10, and shall be accompanied by a structure loading diagram (on the same drawing) drawn to a scale of 1" = 20, indicating all design loads (vertical, wind, side pull) applied to the structure. Erection diagrams shall also be presented to indicate the total or partial removal of existing structures and steps that may be required to accomplish the removal. Each erection diagram sheet shall contain a bill of material listing assembled items required per structure such as poles, crossbeams, sag braces, cross arms, insulator assemblies, guy anchors and foundation types. All listed items shall be marked and the drawings showing those details shall also be listed. Modified structures must have erection diagrams that have all of the information from the original document transposed onto them. These drawings will supercede the original drawings. The drawings must be drawn so that existing and new material can be differentiated.

- F. Erection diagram sheets shall be followed by:
- 1) Structural steel design detail drawings.
  - 2) Foundation and guy anchor design detail drawings.
  - 3) Hardware and insulator assembly details which shall have bills of material identifying the various assembly components, including the manufacturers' name, and Amtrak AMMS number.
  - 4) Wire sags and tension charts, as required.
  - 5) Miscellaneous details as required.
  - 6) Underground duct relocation plan, profile and detail drawings if required.
  - 7) Electrical design drawings.
  - 8) Master Bill of Material indicating mark number, Amtrak reference drawing number, AMMS number, description, manufacturer, unit of measurement, and ordering totals of the material being used.
- G. On overhead bridge projects, drawings shall be prepared in accordance with Amtrak standard drawings ET1120-C, ET-1446-D, and ET-1447-D. These drawings shall indicate the temporary and permanent bonding and grounding of the bridge and shall contain a plan of the bridge crossing and all necessary details, clearances and elevations required to clearly show all of the work involved. Warning signs shall also be indicated and shall conform to current Amtrak standards as to location, size, and type used. An itemized bill of material (including Amtrak AMMS number) shall be included for all Railroad work.
- H. Existing Amtrak structure bonding and ground plans, sectionalizing plans, and other related drawings shall be revised (where applicable) to indicate modifications and submitted in accordance with Section II of this specification.
- I. Final structural and catenary drawings shall be accompanied by a suggested construction procedure outlining a step-by-step sequence to be followed to accomplish the project. This suggested procedure will be prepared to minimize electrical outages, track occupations, and interruptions to Railroad traffic and to maintain the safety of the workmen and the integrity of the transmission, catenary and signal systems during the proposed construction. All construction activities related to the project shall be integrated into the sequence of construction.
- J. Unless otherwise directed, plan submissions prior to the final plan submittal shall consist of (1) CD ROM containing all pertinent design documents in PDF file format. All submittals are to be sent to the Director – ET Design.
- K. Unless otherwise directed, after final plans are accepted and released for construction and material purchase, submit five (5) half-size sets of plans and (1) CD ROM containing all drawings in AutoCAD format. Submit material list and specifications, in their original file formats. Submittals shall be sent to the Director – ET Design.

#### IV. STRUCTURAL DESIGN CRITERIA

- A. All structural design shall be in accordance with the current Amtrak specifications for the Design of Catenary Supporting Structures with the following amendments:
- 1) Current AISC specifications shall be used for the design fabrication and the erection of structural steel, except that allowable stresses shall not be increased one-third above stress values given in specifications when produced by wind loading unless specifically approved by Amtrak.
  - 2) Current ACI Building Code Requirements for Reinforced Concrete shall be used for the design and construction of reinforced concrete structural elements of any structure.
  - 3) Soil boring information including location of borings shall be provided on the design drawings, preferably on the foundation drawings if possible. A soil boring shall be taken at each new foundation location of any modified or proposed new structure. When the number of foundations makes it impracticable to provide a boring for every foundation, a proposed boring plan must be submitted to the Engineer for approval. Foundations shall be designed in accordance with allowable soil bearing values of materials encountered.
  - 4) All design drawings shall be done under the supervision of a Professional Engineer, registered in the state where the work will be performed, who shall seal drawings submitted for final approval.
- B. The Consultant is advised that the following criteria is to be included in the design and construction of all permanent and temporary facilities adjacent to Amtrak tracks:
- 1) On electrification projects involving modifications to existing facilities, a minimum of 12'-0" (plus curvature allowance) is to be maintained from centerline of track to face any new pole or guy strand.
  - 2) On new electrification extensions or independent pole transmission lines a clearance of 18'-0" from centerline of track to face of pole or guy is required.
  - 3) New anchors and foundations shall be located and designed so that any temporary sheeting required for their construction will not be closer than toe of slope shown for standard track section (7'-5" is dimension from gage of rail to toe of ballast slope for tangent track; see dimension on Standard Plan No. 70003B for dimensions on curved track).
- Note: Minimum clearances less than those stated above must be approved by the Chief Engineer ET of Amtrak.**
- 4) Exploratory trenches (3) three feet deep and fifteen (15) inches wide in the form of an "H" with outside dimensions matching the outside sheeting dimensions, are to be hand dug to determine the presence of any underground installation. The design drawings shall show an outline of the exploratory trenches. All work must be done in accordance with Amtrak requirements for temporary sheeting and shoring to support Amtrak's facilities.

- 5) The following should be included in the general notes on all drawings for temporary sheeting, shoring and excavation to be performed adjacent to Amtrak's tracks:
- a) The Contractor (if applicable) is to provide a schedule of each operation and obtain approval of Amtrak so that it may be properly supervised by Amtrak personnel.
  - b) Exploratory trenches are to be hand dug to determine the presence of any underground installation. Before proceeding, these trenches are to be back filled and immediately compacted. This work must be done in the presence of a railroad inspector.
  - c) Absolute use of track is required while driving sheeting adjacent to running track.
  - d) Cavities created by driving of sheet piling shall be filled with sand and any disturbed ballast should be restored and tamped immediately.
  - e) Sheet piling shall be cut off at top of tie during construction and then, after construction, shall be cut off eighteen (18) inches below existing ground line or grade and left in place.
  - f) The excavation should be covered and ramped each night and barricades and warning lights provided as directed by Amtrak.
  - g) Final back filling shall be as required by specifications.
  - h) When support of track or tracks is necessary during construction of above-mentioned facilities, interlocking steel sheeting adequately braced and designed to carry E-80 live load plus 50% impact is required. Soldier piles and lagging will be permitted for supporting adjacent track or tracks only when required penetration of steel sheet piling cannot be obtained or when in the opinion of the Engineer, steel sheet piling would be impracticable to place.
- 6) All drawings for temporary sheeting and shoring shall be prepared and stamped by a Professional Engineer and shall be accompanied by complete design computations when submitted for approval. The need for a Consultant to include details of temporary sheeting on design drawings will be determined when reviewing drawings submitted to Amtrak for structural approval.
- 7) Particular care shall be taken to avoid erosion or filling of Railroad's drainage facilities. Erosion and sediment control in the vicinity of the Railroad shall be as approved by the Engineer and the Railroad. Disrupted Railroad drainage facilities shall be corrected promptly as directed by the Engineer at the Contractor's sole expense.

**V. ELECTRICAL DESIGN CRITERIA**

- A. Electrical Clearances shall be in accordance with applicable, current Amtrak and AREMA specifications. Any deviation from the established Railroad standards must be approved by Amtrak. Vertical clearances between overhead electrical transmission lines and roadways must also meet state and local municipal requirements.
- B. The catenary gradient should be designed not to exceed the value  $1/(5 \times \text{Speed})$  where practicable. As an alternate the catenary gradients specified in Chapter 33 of the AREMA Manual may be considered.

**VI. CONSTRUCTION RELATED SERVICES**

- A. The A/E shall provide a qualified on-site (E.T.) inspector for the duration of the construction of the project. The E.T. inspector shall be responsible for the following:
  - 1) Responding to Contractor's requests for information (R.F.I.'s).
  - 2) Evaluating Contractor's submittals.
  - 3) Reviewing shop drawings, calculations, and technical requirements.
  - 4) Preparing as-built drawings.
  - 5) Providing technical assistance during construction, testing and turnover.
  - 6) Attending project meetings.
  - 7) Participating in on-site inspections.
  - 8) Preparing revised design documents to clarify or modify drawings during construction.
  - 9) Assisting with preparation and resolution of punch list items.
  - 10) Other Construction Related Services as required.

The Inspector shall keep the Director E.T. Design or his representative apprised of all transactions related to the above Construction Related Services.

**VII. RECORD TRACINGS**

- A. Upon completion of the construction, the Consultant shall provide Amtrak with "as-built" or record drawings. This work will include the following.
- 1) Revisions to existing Amtrak tracings as required. These tracings include, but are not limited to, erection diagrams, overhead bridge drawings, track maps, bonding and grounding plans, catenary sectionalizing plans, impedance diagrams, and transmission profiles.
  - 2) Four (4) mil Mylar tracings shall be prepared for all new permanent facilities such as catenary structures at overhead bridges. These drawings shall be prepared on appropriate standard Amtrak tracings – four (4) mil Mylar. Permanent drawing numbers shall be obtained from Amtrak.
  - 3) One (1) CD ROM containing all electronic documents (except plans) in their original file format. Plans shall be submitted in AutoCAD format.
  - 4) Unless otherwise directed, final “as-built” documents are to be sent to the following address:

R. G. Verrelle

Director ET Design & Standards

National Railroad Passenger Corporation

30<sup>th</sup> Street Station, 4th Floor South Tower- Box 41

Philadelphia, Pa 19104

**VIII. APPROVALS**

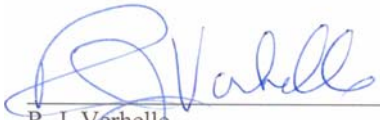
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R. G. Verrelle Jr.

Director E.T. Design and Standards

12/5/07

DATE

  
\_\_\_\_\_  
R. J. Verhelle  
Deputy Chief Engineer Electric Traction

2/10/06  
DATE

**NATIONAL RAILROAD PASSENGER CORPORATION**  
**ELECTRIFIED TERRITORY**  
**SPECIFICATION**  
**FOR**  
**WIRE, CONDUIT AND CABLE OCCUPATIONS**

National Railroad Passenger Corporation



**Contact:**

**Effective Date: October 1, 2014**

For more information regarding this document, please contact:

Ray Verrelle, Jr. P.E.

Deputy Chief Engineer Electric Traction

Amtrak Engineering Department

National Railroad Passenger Corp.

30<sup>th</sup> Street Station, 4<sup>th</sup> Floor

Philadelphia, PA 19104



C.E. 4

October 2014

**Revision Record**

<b>Revision Number</b>	<b>Date</b>	<b>Description</b>	<b>By</b>	<b>Checked</b>
0	10/15	Specification replaces March 1997 version		

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October 2014

**1. SCOPE**

- A. These specifications apply to the design of electric transmission wires, cables, and conduits (power communications) which are to be located over, under, across or upon Railroad property and facilities and tracks owned by others over which the Railroad operates its equipment.

**2. APPLICATION FOR OCCUPANCY**

- A. Individuals, corporations, municipalities, (known as the owner) desiring occupancy of Railroad property by such wire, cable, or conduit occupations must agree, upon approval of the construction drawings by the office of the Chief Engineer of the Railroad, to execute an appropriate occupational agreement and pay any required fees and/or rentals outlined therein.

- B. Application for an occupancy shall be by letter addressed to:

Commercial Development  
National Railroad Passenger Corporation  
30<sup>th</sup> and Market Streets, 5<sup>th</sup> Floor South  
Philadelphia, PA 19104

1. Name of individual, corporation or municipality desiring the occupancy.
  2. Complete mailing address of applicant.
  3. Name and title of person who will sign the agreement.
  4. The State in which the applicant is incorporated.
- C. All applications shall be accompanied with eight (8) copies of all construction plans and three (3) copies of specifications and computations concerning the proposed occupancy.

**3. APPROVAL OF PLANS**

- A. No entry upon Railroad property for the purpose of conducting surveys, field inspections, obtaining soil information, or any other purpose associated with the design and engineering of the proposed occupancy, will be permitted without a proper entry permit (Form CR-17) prepared by the office of the Chief Engineer of the Railroad and executed by the applicant. It is to be clearly understood that the issuance of such a permit does not constitute authority to proceed with the actual construction which cannot begin until a formal agreement is finally executed by the Railroad Company and permission is received by the owner from the designated inspection agency of the

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Railroad to proceed.

- B. Plans for proposed wire, cable, or conduit occupations shall be submitted to and meet the approval of the Chief Engineer of the Railroad prior to start of construction. These plans are to be prepared in sizes as small as possible and are to be folded to an 8 ½ inch by 1 inch size (folded dimensions) with a 1 ½ inch margin on the left-hand side and a 1 inch margin on the top so that they can be secured in a file at the upper left-hand corner and still be unfolded to full size without being removed from the file.

Also, after folding, the title block and other identification of the plans shall be visible without the necessity of unfolding at the lower right-hand corner. Each plan shall bear an individually identifying number and an original date, together with subsequent revision dates, clearly identified on the plan so as to be readily apparent as to just what revisions were made and when.

All plans are to be individually folded and where more than one plan is involved, they shall be assembled into complete sets before submission to the Railroad.

- C. Plans shall be drawn to scale and show the following: (See Plates I, II, IIA, III, IV and V, hereto attached)
1. Plan review of crossing or occupation in relation to all Railroad facilities (See Plate I)
  2. Location of wire, cable, or conduit (in feet) from nearest Railroad Mile Post, centerline of a Railroad bridge (giving bridge number), or center line of an existing or former passenger station. In all cases, the name of the County in which the proposed facilities are located must be shown. In States where Townships, Ranges and Sections are used, give distance in feet to the nearest Section line and identify the Section number, Township and Range.
  3. Profile of ground on center line of pole or tower line, showing clearances between top of rail and bottom of sag, as well as clearance from bottom wire or cable to top wire or cable of the Railroad's static, transmission, signal, trolley feeder and communications lines, catenary, and third rail, when present. If none of these facilities are in existence at the point of crossing, the plan should so indicate. Actual under-clearances are to be shown (See Plate V for the minimum required clearances in non-electrified territory).
  4. Show all known property lines. If wires, cables or conduits are within public highway limits, such limits should be clearly indicated with dimensions from center line.
  5. The plan must be specific, as to:
    - a. Base diameter, height, class and bury of poles. Poles shall be

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set no closer than 18'-0" from face of pole to center line of nearest track. When necessary, however, each location will be analyzed to consider speed, traffic, etc.

- b. Number of size, and material of power wires, as well as number of pairs in communication cables.
- c. Nominal voltage of line.
- d. Number of, location, size of, material of anchors and all guying for poles and arms.

NOTES: Double cross-arms are required on poles adjacent to track. Any tower designs must be accompanied by engineering computations and data.

#### 4. CONSTRUCTION REQUIREMENTS

- A. Power and communication lines shall be constructed in accordance with Amtrak's Electrification Standards and "Safety Rules for the Installation and Maintenance of Electric Supply and Communications Lines, National Electrical Safety Code Handbook", (current issue). Casing pipes to contain power or communication wires or cables having an outside diameter of over four (4) inches shall be constructed in accordance with the current issue of Amtrak's "Requirements and Specifications for Pipeline Occupancy", USA, ENG 1604, dated November 1987.
- B. Aerial crossings consisting of communication lines and power lines below 115,000 volts are not permitted to cross the Railroad in electrified territory. Power lines below 115,000 volts and communication lines shall cross the Railroad through underground means.

#### 5. LONGITUDINAL OCCUPATIONS

- A. Wires and cables running longitudinally along Railroad right of way shall be constructed as close to Railroad property lines as possible. For electrical power wires and cables with voltages of 34,500 or over and communication cables containing over 1800 pairs, the following information must be submitted in addition to the detail of the pole top configuration as called for on Plate IV of these specifications:
  - 1. Voltage of circuit(s) or number of pairs.
  - 2. Phase of electrical circuit(s).
  - 3. Number of electrical circuits.
  - 4. Size (AWG or CM) and material of wires or cables.

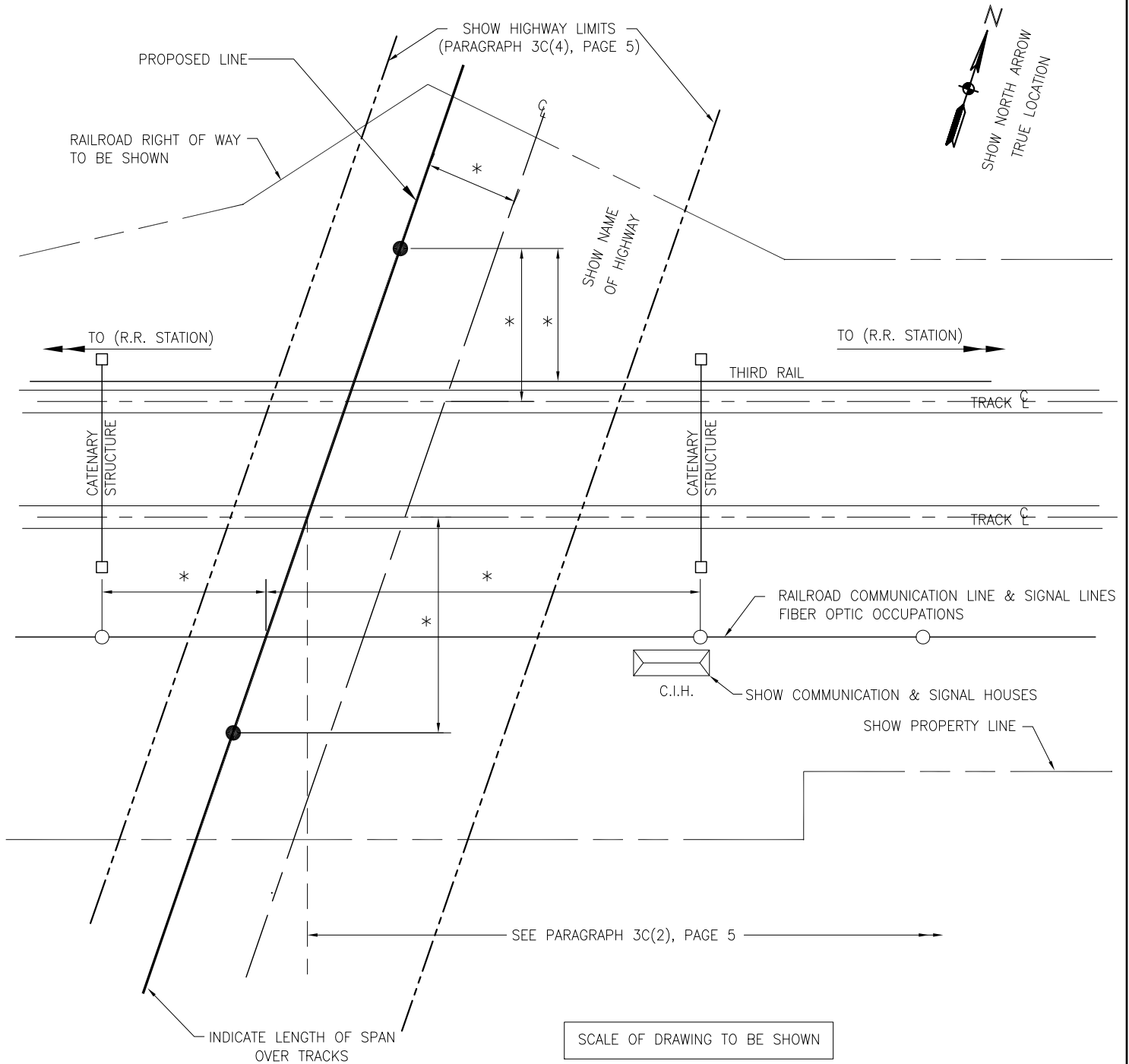
5. Length of spans clearly indicated on drawing.

Any facilities overhanging Railroad property must have approval of the Railroad and appropriate rental charges will be applied.

**6. INDUCTIVE INTERFERENCE**

- A. On agreements covering occupations, provisions will be included that the applicant will conduct appropriate EMI/EMF studies and provide appropriate remedies, at his own expense, to correct any inductive interference with Railroad facilities.

INFORMATION TO BE SHOWN ON PLAN SECTION OF DRAWINGS



NOTES:

ALL RAILROAD ELECTRIFICATION FACILITIES MUST BE SHOWN IN RELATION TO PROPOSED LINE.

IF THE PROPOSED LINE IS TO SERVE A NEW DEVELOPMENT, A MAP SHOWING THE AREA IN RELATION TO ESTABLISHED AREAS AND ROADS IS TO BE SENT WITH THE REQUEST.

IF THE PROPOSED LINE IS NOT WHOLLY (OR PARTIALLY) WITHIN HIGHWAY LIMITS, THE SAME INFORMATION IS REQUIRED AS SHOWN ON THIS PLATE.

\* DIMENSIONS TO BE SUPPLIED BY OWNER



Office of Chief Engineer

National Railroad Passenger Corporation  
30TH Street Station—Philadelphia, Pennsylvania 19104

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C.E. SPECIFICATIONS

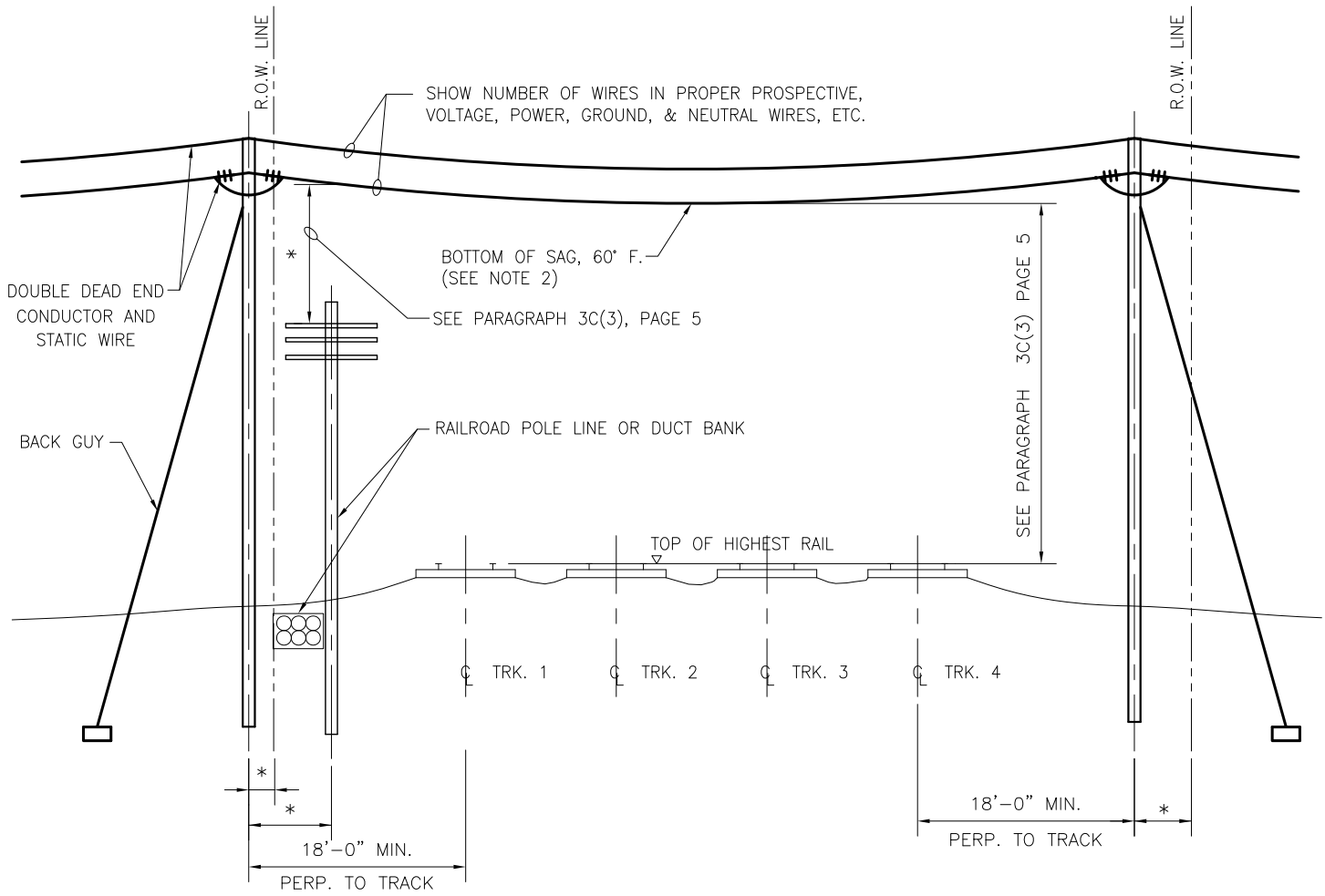
PLATE I

WHEN FACILITY IS A CROSSING

GENERAL

ADDENDUM NO. 3

INFORMATION TO BE SHOWN ON PROFILE SECTION OF DRAWINGS



SECTION LOOKING \_\_\_\_\_ (DIRECTION)

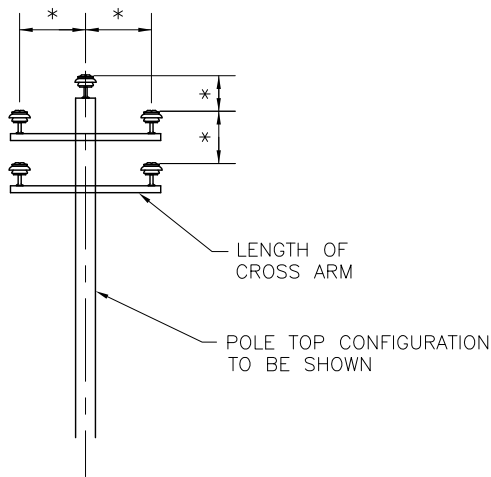
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SCALE: V \_\_\_\_\_

NOTES:

1. ALL TRANSMISSION, STATIC, CATENARY, FEEDERS, COMMUNICATION LINES AND THIRD RAIL SHOULD BE INDICATED AND THE PROPER CLEARANCES SHOWN. (SEE PLATE IIA)
2. SHOW MAXIMUM SAG INCREASE OF POWER WIRES OVER TRACKS IF THE SPAN EXCEEDS 175 FEET IN LENGTH. (SEE PLATE IIB FOR CALC.)
3. DOUBLE DEAD END ALL CROSSING WIRES ON BOTH SIDES OF THE RAILROAD AND PROVIDE BACK GUYS AWAY FROM THE RAILROAD.

\* DIMENSIONS TO BE SUPPLIED BY OWNER



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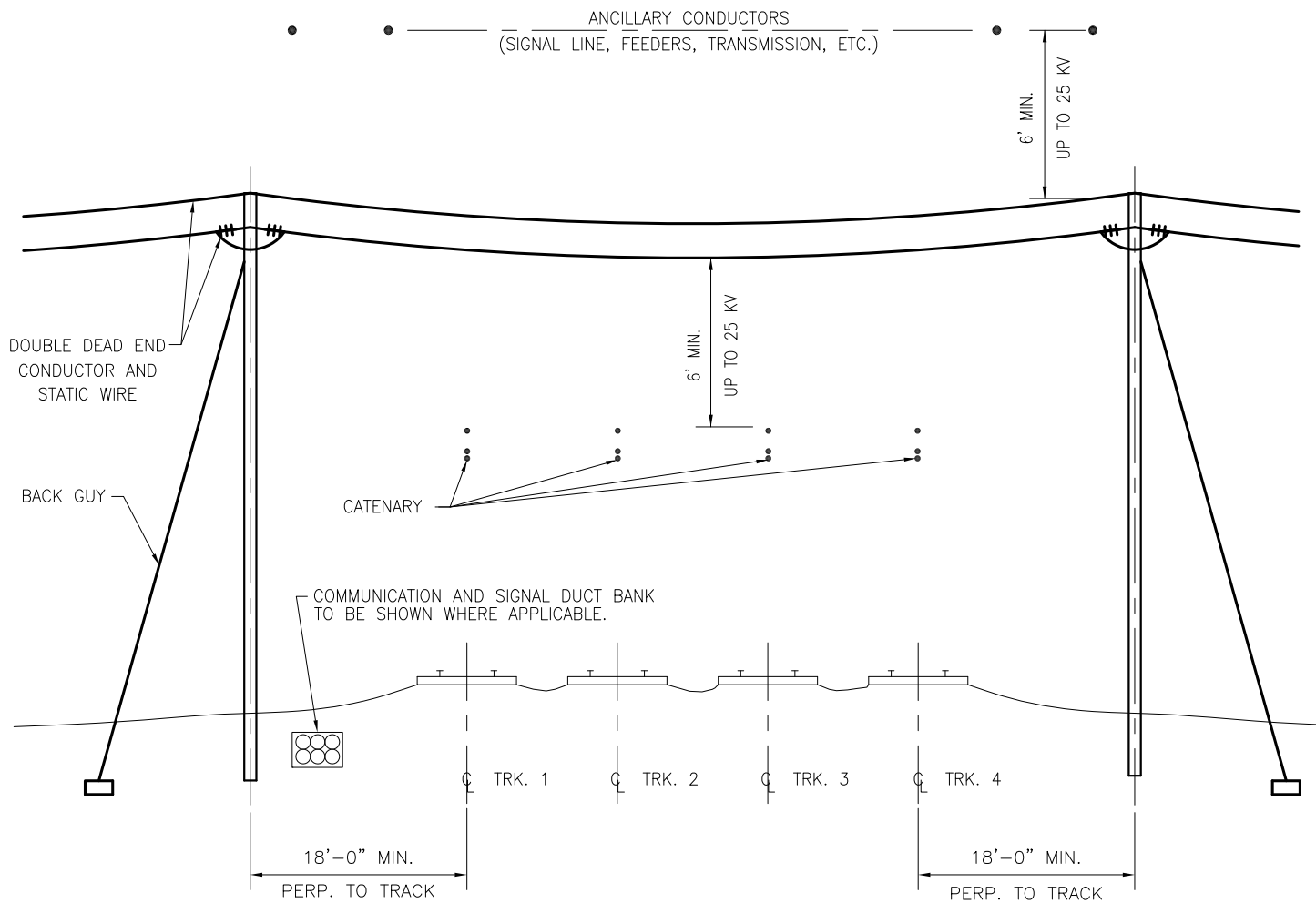
PLATE II

CROSSINGS - NON-ELECTRIFIED RAILROAD  
GENERAL

ADDENDUM NO. 3



INFORMATION TO BE SHOWN ON PROFILE SECTION OF DRAWINGS



TYPICAL ARRANGEMENT OF RAILROAD CONDUCTORS

WIRE CLEARANCES FOR VOLTAGES ABOVE 25 KV	
VOLTAGE	MINIMUM VERTICAL CLEARANCE (TOP OF CONDUCTOR TO BOTTOM OF SAG)
115,000	11'-6"
138,000	12'-0"
230,000	15'-0"
345,000	19'-0"
500,000	24'-0"
745,000	32'-6"
765,000	33'-0"

NOTES:

1. MINIMUM CLEARANCE IS CALCULATED AT WORST CASE WIRE SAG. (RESULT OF MAXIMUM OPERATING TEMPERATURE, ICE LOADING, ETC.)
2. THE ABOVE DIAGRAM SHOWS A TYPICAL HIGH VOLTAGE UTILITY CROSSING ON THE NEW YORK TO WASHINGTON CORRIDOR. ALL UTILITY CROSSINGS ON THE NORTHEAST ELECTRIFICATION PROJECT WILL BE ABOVE THE HIGHEST RAILROAD CONDUCTOR.
3. STEEL POLES OR TOWERS THAT CAN SUPPORT BROKEN CONDUCTOR LOADS MAY NOT NEED TO BE GUYED PENDING APPROVAL FROM AMTRAK. WOODEN STRUCTURES ARE NOT PERMITTED.



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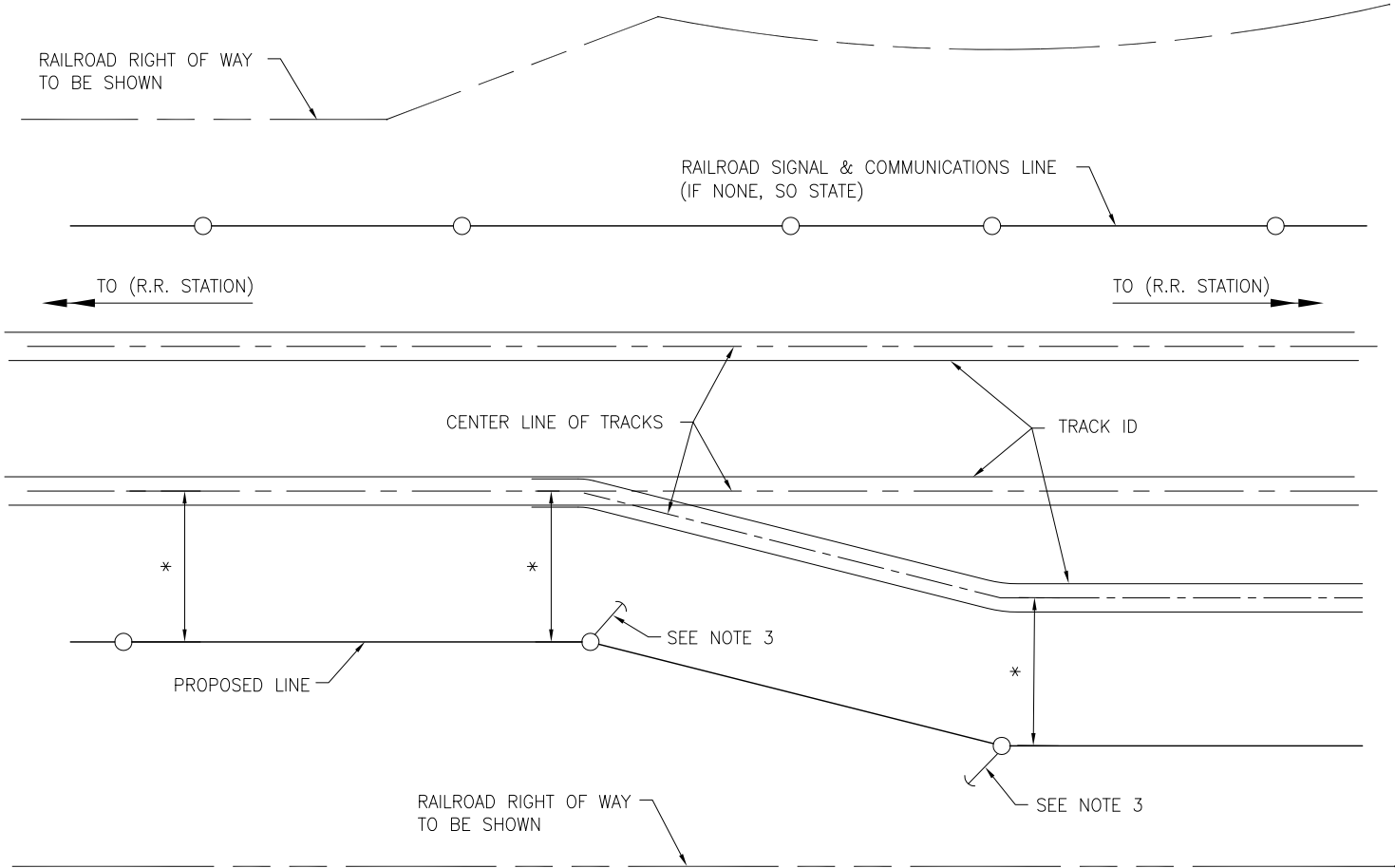
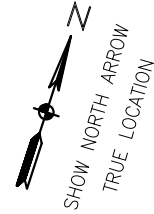
PLATE IIA

CROSSINGS – ELECTRIFIED RAILROAD

GENERAL

ADDENDUM NO. 3

INFORMATION TO BE SHOWN ON PLAN SECTION OF DRAWINGS



SCALE OF DRAWING TO BE SHOWN

NOTE:

- (1) EACH END OF THE LINE MUST SHOW MEASUREMENTS AS CALLED FOR IN PARAGRAPH 3C(2), PAGE 5
- (2) IF POWER LINE CROSSES ANY TRACK, THEN THE INFORMATION SHOWN ON PLATE I IS ALSO REQUIRED.
- (3) WHERE ANCHOR GUYS ARE REQUIRED, SEE PARAGRAPH 3C(3), PAGE 5.
- (4) THE DISTANCE BETWEEN EACH POLE IS TO BE SHOWN.
- (5) ASSIGNED POLE NUMBERS TO BE SHOWN AT EACH POLE.

\* DIMENSIONS TO BE SUPPLIED BY OWNER



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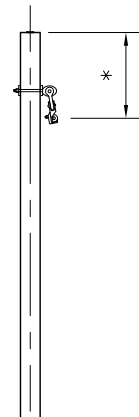
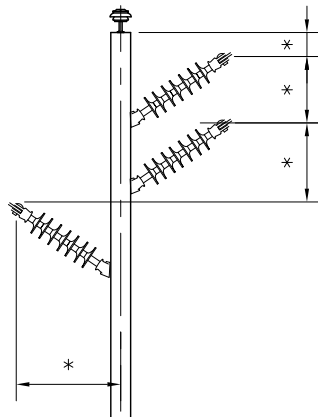
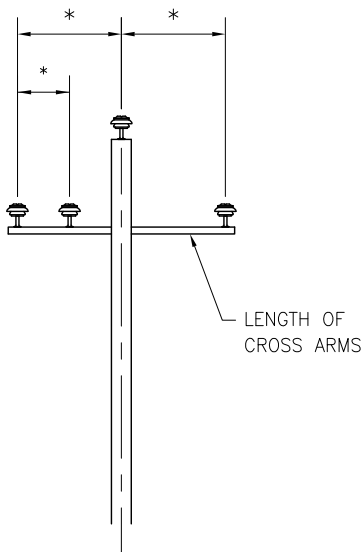
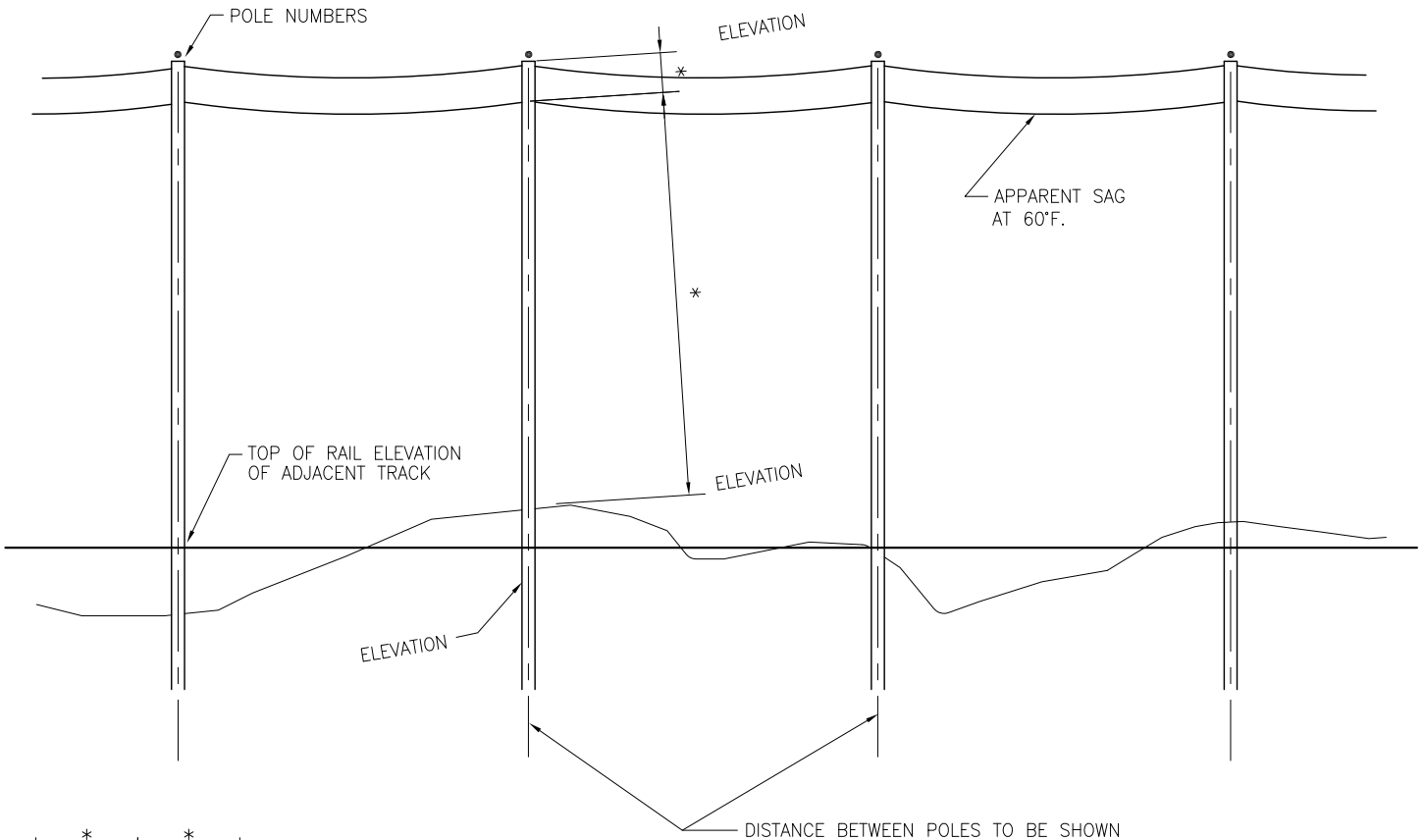
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C.E. SPECIFICATIONS  
**PLATE III**  
LONGITUDINAL OCCUPATIONS

GENERAL

ADDENDUM NO. 3

INFORMATION TO BE SHOWN ON PROFILE SECTION OF DRAWINGS



POLE TOP CONFIGURATION TO BE SHOWN SIMILAR TO SAMPLES ABOVE

NOTE:  
IF POWER LINE CROSSES ANY TRACK, THEN INFORMATION SHOWN ON PLATE II IS ALSO REQUIRED.

\* DIMENSIONS TO BE SUPPLIED BY OWNER



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C.E. SPECIFICATIONS

PLATE IV

LONGITUDINAL OCCUPATIONS

GENERAL

ADDENDUM NO. 3

NON – ELECTRIFIED TERRITORY

VOLTAGE	OVERHEAD CLEARANCE (TOP OF RAIL TO BOTTOM OF SAG)
0-750	27'-0"
751-15,000	28'-0"
15,001-50,000	30'-0"
69,000	30'-8"
115,000	32'-2"
138,000	33'-0"
345,000	39'-10"
500,000	45'-0"
745,000	53'-2"
765,000	53'-10"

CALCULATION IS 30'-0" + 0.4" PER 1,000 VOLTS OVER 50,000 VOLTS



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C.E. SPECIFICATIONS

PLATE V

CROSSINGS – NON-ELECTRIFIED RAILROAD  
GENERAL

ADDENDUM NO. 3