

EP 3005- PIPELINE OCCUPANCY- SPECIFICATION 02081A

TABLE OF CONTENTS

02081A — PIPELINE OCCUPANCY	
Part 1 – General	2
1.1 – Scope and Nature	2
1.2 – Application for Occupancy	2
1.3 – Submissions of Plans and Documentation	2
1.4 – Permit Approval – Notification to Proceed	4
1.5 – Modification of Existing Facilities	4
1.6 – Abandoned Pipelines and/or Facilities	4
1.7 – Conflict of Specifications	4
1.8 – Definitions	4
1.9 – Publication Standards	5
Part 2 – Technical Requirements	7
2.1 – Location of Pipeline on the Right-of-Way	7
2.2 – Carrier Pipe	7
2.3 – Casing Pipe	8
2.4 – Design Criteria	9
2.5 – Signs	11
2.6 – Emergency Shut-Off Valves	11
2.7 – Depth of Pipeline Installation	11
2.8 – Cathodic Protection	11
2.9 – Soil Investigation	12
Part 3 – Construction	13
3.1 – Construction Inspection Requirements	13
3.2 – Installation Methods	13
3.3 – Construction Operations	15
3.4 – Support of Tracks	16
3.5 – Pipelines in Roadways Under Bridges	16
3.6 – Pipelines on Bridges	17
3.7 – Bonding and Grounding of Pipelines on Bridges in Electrified Territory	17
3.8 – Drainage	17
3.9 – Inspection and Testing Requirements for Hazardous Materials	17
Part 4 – Information Sketches	18
Sketch 1	19
Sketch 2	20
Sketch 3	21
Sketch 4	22
Sketch 5	23
Sketch 6	24

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. 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 42nd Avenue, Miami, FL 33126-0567

ANSI – American National Standards Institute, Inc., 11 West 42nd 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)

Pipe Diameter	Coated or Cathodically Protected	Uncoated and Unprotected
Nominal Pipe Size (inches)	Nominal Wall Thickness (inches)	Nominal Wall Thickness (inches)
12 ³ / ₄ 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, 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.

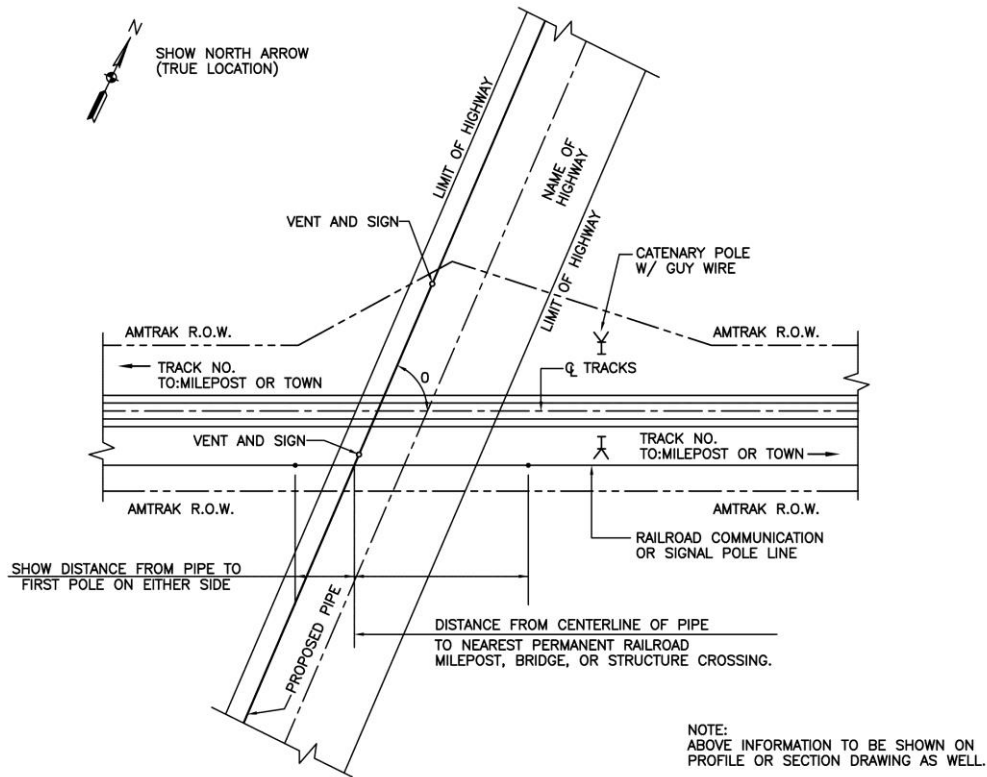
Sketch 2 – Information to be shown on Profile Section of drawing.

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



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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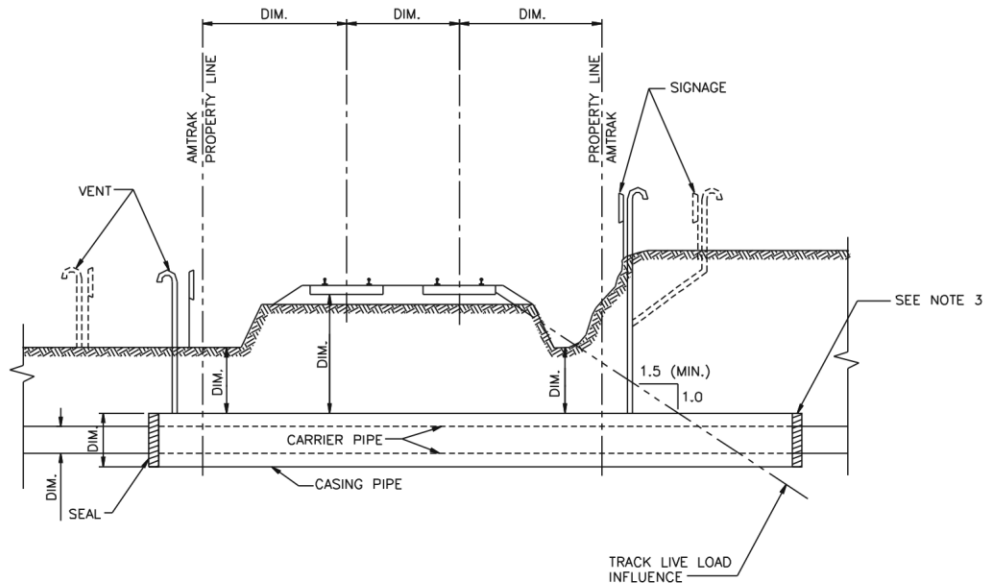
Office of Chief Engineer
STRUCTURES

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

SKETCH 1
EP3005 SPECIFICATION

Designed AEC Drawn JLM Date 3/01/02

File No:	
Design No:	
Sheet No.	1 of 6
SKETCH	SK-1



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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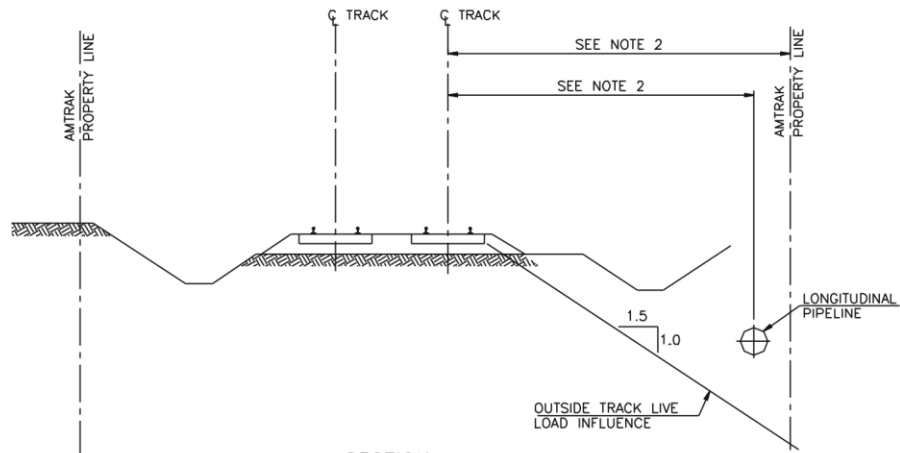
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SKETCH 2
EP3005 SPECIFICATION

Designed AEC Drawn JLM Date 9/10/02

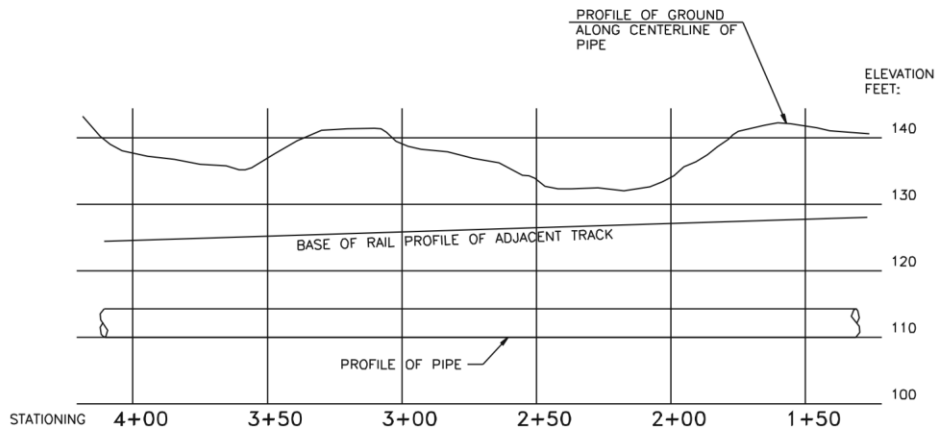
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Design No:	
Sheet No.	2 of 6
Dwg. No.	SK-2
	REV 1



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



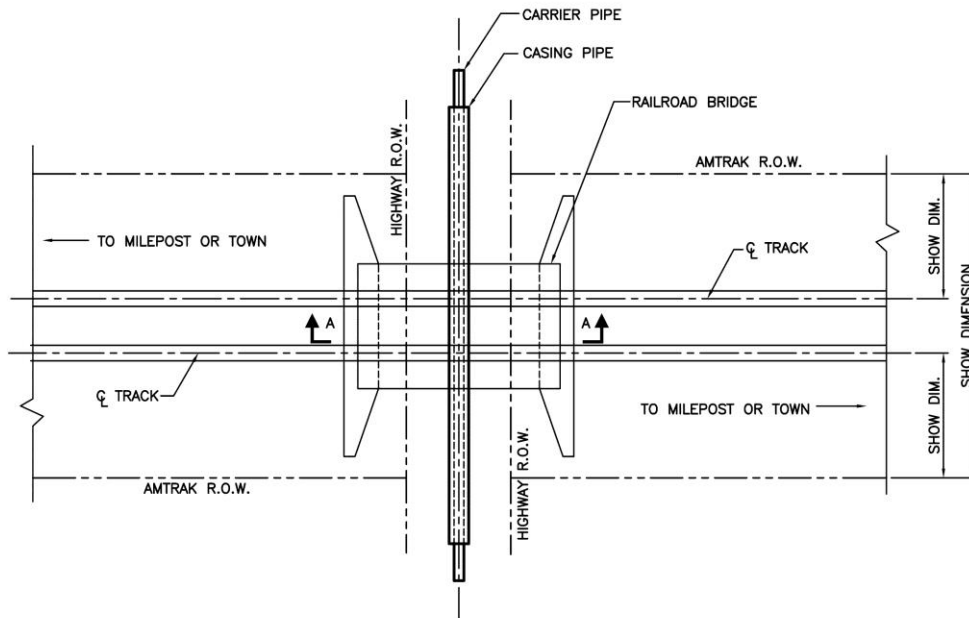
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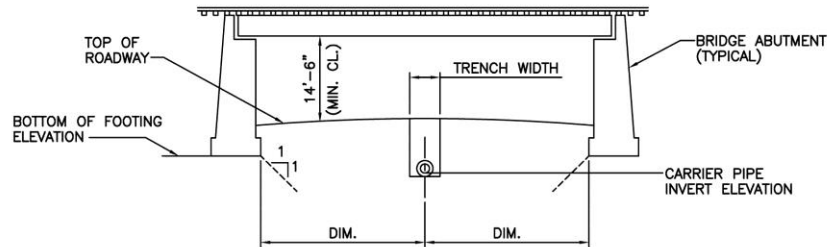
SKETCH 3
EP3005 SPECIFICATION

Designed AEC Drawn JLM Date 9/10/02

File No:	
Design No:	
Sheet No:	3 of 6
Drawn No:	SK-3
Rev:	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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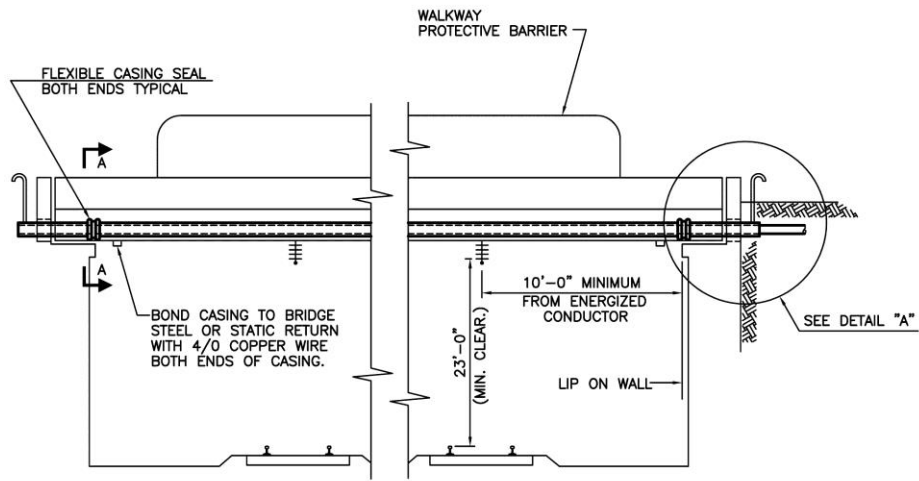
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SKETCH 4

EP3005 SPECIFICATION

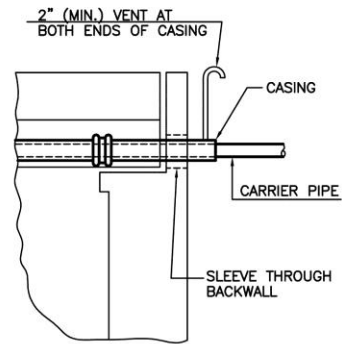
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Draw. No:	SK-4



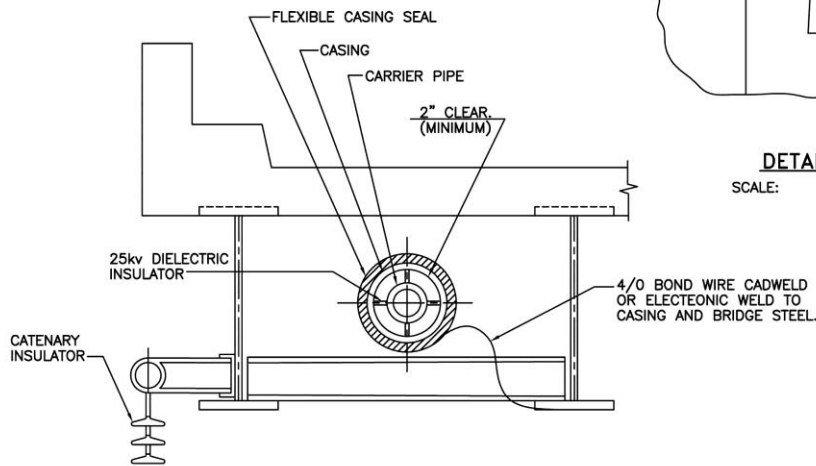
ELEVATION

SCALE:



DETAIL "A"

SCALE:



SECTION A-A

SCALE:

DETAILS FOR BONDING AND GROUNDING OF PIPELINE

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SKETCH 5

EP3005 SPECIFICATION

Designed AEC Drawn JLM Date 3/01/02

File No:	
Design No:	
Sheet No.	5 of 6
Dist. No.	SK-5


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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		Design No:					
		Sheet No.	6 of 6				
		<p>SK-6</p>					
		Designed	AEC	Drawn	JLM	Date	3/01/02