Utility Specifications and Application Process - US

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Engineering Services
Projects & Public Works
120 S. 6th St., Ste. 700
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Utility Specifications and Application Process - US

1.1 General

Utility License Agreements are required when utility facilities are installed, relocated, removed, or maintained along or across all Canadian Pacific Railway (CPR) property.

These requirements shall apply to the design and construction of pipelines and wirelines encroaching on CPR property and facilities. These requirements shall also apply to tracks owned by others (sidings, industry tracks, etc.) over which CPR operates its equipment.

It is to be clearly understood that CPR owns its right-of-way for the primary purpose of operating a railroad. All utility occupancies shall therefore be designed and constructed so that rail 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.

A Utility Agreement License allowing a Utility Owner the privilege of placing its facilities in or on railroad property does not constitute permanent right for such usage. Whether required by CPR or not, any removal, remodeling, maintenance, or relocation of the facilities, will be accomplished promptly by the Utility Owner at no cost to CPR.

Replacement or relocation of an existing facility with the same facilities or facilities of a different type, or design, is to be considered as a new utility installation and all work shall adhere to these specifications. This includes such things as extension of an existing casing, replacing with a larger / smaller pipe diameter, etc.

It is the Utility Owner's responsibility to inform CPR, in writing, of any name, ownership or address changes.

Evidence of adequate liability insurance is to be on file with CPR for each agreement prior to any construction activity.

Exceptions to any design, location or methods of installation provisions contained in these specifications must be authorized by CPR. Requests for exceptions will be considered only where it is shown that extreme hardship and/or unusual conditions provide justification and where alternate measures can be prescribed in keeping with the intent of these specifications. All requests for exceptions shall be fully documented by identifying what variance is needed, and why, including design data, cost comparisons and other pertinent information. Please Note: CPR authorization may add up to 60 days additional processing time for the application.

Non-compliance with any terms of these Utility Specifications or Utility License Agreements may be considered as cause for discontinuance of construction or operations until compliance is assured. Continued non-compliance will result in the revocation of the license. The cost of any work required by CPR in the removal of non-complying construction will be assessed against the Utility Owner.

All underground installations of 12" or greater, casing or carrier, will require applicant to have prepared a geotechnical report as well as a plan for track monitoring per the CPR Geotechnical Protocol. All geotechnical and track monitoring plans will be at the expense of the applicant, and must be approved by a CPR approved vendor. Applicant must contact one of the approved vendors below and coordinate review and approval, at applicants expense. Contact information for approved vendors can be found below.

Contact Info for Approved Vendors:

CHA
Charles W. Symmes, PE*
Geotechnical Group Leader
Office: (518) 453-2824
Mobile: (518) 584-0215
Email: csymmes@chacompanies.com
Website: www.chacompanies.com
*NY, CT, GA, VT

GEI Consultants Inc.
Chia Tan
Tan, Chia
Senior Geotechnical Engineer, Principal
Direct: 312-898-7969
Email: ctan@geiconsultants.com

1.2 Applications

Approved requests to install, maintain, relocate, or remove a utility within the property of CPR shall be authorized by a Utility License Agreement. All applications for utility license agreements along with plans for the proposed installation shall be submitted to CPR through https://app.railpermitting.com and approved before construction has commenced. Any exceptions to these specifications will require the completion of an exception form and may add up to 60 days additional processing time.

1.3 Plans and Approvals

Approval of plans and application are required for all installations of utilities prior to initiation of work on railroad property.

All plans must be stamped by a Professional Engineer.

If surveying is necessary for the completion of an application, a “Right of Entry” or “Temporary Occupancy Permit” must be executed and referenced.

When a geotechnical study is required, the findings and protection plan shall be sealed by a Professional Engineer and included with the plans. The geotechnical crew will need a right of entry permit to enter CPR right-of-way and a CPR qualified flagman will be required when working within twenty-five (25) feet of the track.

1.3.1 Plan Requirements

1.3.1.1 A Plan view and Profile view must be included, and must show;

- Location of proposed utility crossing (shown in red) (Aerial image would be preferred)
- CPR property lines (shown in green)
- CPR trackage
- CPR subdivision name and mileage - if known
- Lat / Lon location of proposed crossing
- Street names
- Dimension from CPR property lines to the center of the nearest track
- Dimension of the distances between track centers
- Linear dimension of the full occupancy on CPR property
- Dimensions to the crossing or occupancy from some permanent reference such as the nearest street
- Location of markers
- North arrow
- Location of any adjacent building and/or bridges within 33 feet of the crossing
- Angle of the crossing in relation to the track (between 45 ° and 90 °)
- Angle of any change in direction of the conduit/conductor at the crossing location - if applicable
- Cross level of ground surface at the crossing or occupancy
- Elevation of top of rail at the crossing location (relative to elevation of proposed utility)

1.3.1.1.1 Underground Installations:

- Contents to be carried
- Dimension from base of rail to top of conduit/casing
- Length of casing pipe (must span the complete railway property/corridor)
- Sending and receiving pits locations (must be outside railway corridor/property)
- Method of installation
- Location, size and depth of handholes and/or manholes in relation to nearest track
- Shoring/bracing details, if applicable

1.3.1.1.1.1 Encasement Details

- Encasement material (steel, concrete, etc)
- Outside diameter and thickness of encasement - if pipe or conduit
- Structural strength of encasement material - if steel pipe or concrete
- Spacing, size and depth of cover of rebar - if concrete
- Number and spacing of conduits - if multiple conduits
- Method of support for pipes within casing
- Type of joints
- Casing pipe to be grout filled

1.3.1.1.1.2 Cathodic Protection

- Type of cathodic protection used (i.e. sacrificial anode, impressed current)
- Voltage, amperage, and location of the rectifier when impressed current is used

1.3.1.1.2 Overhead Installations:

- Length, class and depth of bury for poles at the crossing
- Dimension from top of rail to bottom conductor (minimum 27 ft (8.2 Meters))
- Dimensions between conductors
- Dimensions between poles and the nearest rail
- Ownership of poles
- Dimension from CPR communication lines to bottom of conductor
- Guy and anchor locations

1.3.1.2 Cross-Section View

- Should be shown on all drawings where utility crosses over / under any railway infrastructure
- Distance from edge of bridge, culvert, track switch or other major structure
- Installation should not be located within one-hundred fifty (150) feet of any railroad bridge, culvert, track switch or other major structure

- An Engineering report will be required for all proposed installations that fall within parameters' mentioned above.

1.3.1.3 Cable/Conductor Information

- Type of Cable(s)
- Diameter of cable(s)
- number of fibers or conductors
- voltage(s) - if other than fiber
- type of voltage(s) AC/DC - if other than fiber

1.3.1.4 Construction/Work Plan

- Method of Installation
- Plan shall be in compliance with AREMA guidelines for the installation method
- Proximity to track
- Duration of work in proximity to track

1.4 IMPORTANT NOTES

If there are high voltage (> 750 volts) power cables within 3.3 horizontal feet of the proposed excavation, additional time and scheduling coordination may be required to de-energize the system.

All applicants who have equipment in excess of 200 kilovolts (kV) and 250 feet in length; parallel occupancies of over one mile in length with voltage >= 69 kV; and cathodic protection using impressed current, should there expect to be, or in the future appear to be electrical interference with CPR equipment (electromagnetic, electrostatic, or ground potential rise) from nearby electrical facilities, the applicant must participate with CPR in a joint Electrical Coordination Study to find a technically viable and reasonably economical solution.

Many of CPR's properties contain buried parallel fiber optic networks. CPR will supply the appropriate 1-800 numbers to call to ensure the protection of these fiber lines when crossing. The applicant must arrange with the various fiber maintenance providers for the proper hand digging and exposure of the fiber cable prior to commencing construction. No pipelines or cable crossings are to be installed at less than four (4) feet (1 meter) vertically above or below the fiber cables, and no buried parallel occupancies, poles or anchors are to be located within ten (10) feet (3 meters) horizontally of the fiber optic cables.

In absolutely no instance is the utility to be installed without receiving prior approval from CPR, and arranging with the Track Maintenance Supervisor for track protection. Any contractors entering the property prior to making these arrangements will be subject to prosecution for trespass and a maximum $10,000.00 fine. The Track Maintenance

Supervisor's name and contact numbers will be supplied to the applicant when an approved agreement is signed and executed.

1.5 License Procedures

Submit applications online by going to https://cp.railpermitting.com and completing the application process.

Upon completion of the application, an email confirmation will be forwarded acknowledging receipt and advising of the Permit & Contract file reference number that has been assigned.

Agreements will be required for all encroachments on railroad property.

Generally, agreement processing time will be thirty to sixty days. Please allow sufficient lead-time for document handling prior to desired construction date. Before construction begins, agreements must be executed by Utility Owner and returned. Verbal authorizations will not be granted or permitted. All work must be set up, in advance, with the CPR Utility Coordinator to coordinate the Flagging.

License fees must be paid at the time of the application online through https://cp.railpermitting.com in order for the agreement to be fully executed.

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PART 2 - DESIGN AND INSTALLATION OF BURIED FLAMMABLE OR HAZARDOUS SUBSTANCES

This section applies to all public and private utilities involving the design and installation of buried flammable or hazardous substances.

Installations crossing the property of the railroad, to the extent possible, are to be not less than forty-five (45) degrees to the centerline of track. Utilities shall not be placed within one-hundred fifty (150) feet of culverts, railroad bridges, track switches, buildings, or other important structures.

Utilities will be located to provide a safe environment and shall conform to the current "Federal Pipeline Safety Regulations," and "The American Railway Engineering and Maintenance Association (AREMA) Recommendations." Where laws or orders of public authority prescribe a higher degree of protection, then the higher degree of protection prescribed shall supersede the provisions of this document.

2.1 Pipelines Crossing the Railway

2.1.1 Steel Carrier Pipelines

2.1.1.1 Uncased Steel Carrier Pipelines:

Casing pipe is not required when the steel carrier pipe:

- Wall thickness conforms to E-80 loading, the pipe is coated and cathodically protected, and
- Is designed for the internal and external applied pressures and installed in accordance with American Railway Engineering and Maintenance-of-Way Association (AREMA) Manual for Railway Engineering Chapter 1 Part 5 Section 5.2, latest edition, and
- Has a maximum allowable hoop stress due to internal pressures of 60% of specified minimum yield strength (SMYS)

The minimum pipe cover for uncased pipelines carrying flammable substances across railway property shall be the greater of (see Figure A-1):

- Depth below frost line, or
- For Jack and Bore installation; six (6) ft below the flowline of the ditch or ground surface and ten (10) ft below the base or rail, or
- For Horizontal Directional Drilling (HDD) Installation; six (6) ft below the flowline of the ditch or ground surface and thirty (30) ft from base of rail.

2.1.1.2 Cased Steel Carrier Pipelines:

The Steel carrier pipe shall be in accordance with American Railway Engineering and Maintenance-of-way Association (AREMA) Manual for Railway Engineering Chapter 1 Part 5 Section 5.1, latest edition. The casing pipe shall be steel pipe.

The Steel casing pipe shall:

- Have a wall thickness conforming to E-80 loading requirements, coated and cathodically protected, and designed for external applied pressures and installed in accordance with American Railway Engineering and Maintenance-of-way Association (AREMA) Manual for Railway Engineering Chapter 1 Part 5 Section 5.1, latest edition, and
- Suitably sealed at both ends

Minimum pipe cover for cased pipelines crossing all railway tracks shall be the greater of (See Figure A-2):

- Depth below frost line, or
- For Jack and Bore installation; three (3) ft. below the flowline of the ditch or ground surface and five and one-half (5-1/2) ft from base of rail, or
- For Horizontal Drilling (HDD) installation; five (5) ft below the flowline of the ditch or ground surface and twelve (12) ft from base of rail.

The minimum length of casing pipe, measured perpendicular to and on each side of the track, shall be the greater of:

- Two (2) ft beyond the toe of slope, or
- Three (3) ft beyond the ditch, or
- Twenty-five (25) ft beyond centerline of outside track, and
- If additional track is planned for future construction, casing must extend far enough to meet above distances given the additional track requirement.

2.1.2 Polyethylene Carrier Pipelines

2.1.2.1 Uncased Polyethylene Carrier Pipelines:

Uncased polyethylene carrier pipelines shall not be used crossing the railway.

2.1.2.2 Cased Polyethylene Carrier Pipelines:

Only cased polyethylene pipe shall be used to convey flammable or hazardous substances within the CPR right-of-way.

The polyethylene carrier pipe shall:

- Be of materials in accordance with American Railway Engineering and Maintenance-of-way Association (AREMA) Manual for Railway Engineering Chapter 1 Part 5 Section 5.1, and
- Have a maximum allowable operation pressure (MAOP) not exceeding one hundred (100) psi, and
- Have a maximum outside pipe diameter of six and five eighths (6-5/8) inches.

The steel casing pipe shall be:

- Designed for external applied pressures and installed in accordance with American Railway Engineering and Maintenance-of-way Association (AREMA) Manual for Railway Engineering Chapter 1 Part 5 Section 5.1, latest edition, and
- Adequately sealed at both ends.

Minimum pipe cover for cased pipelines crossing all railway tracks shall be the greater of (see Figure A-2):

- Depth below frost line, or
- For Jack and Bore installation; three (3) ft below the flowline of the ditch or ground surface and five and one-half (5-1/2) ft from base of rail.
- For Horizontal Directional Drilling (HDD) installation; five (5) ft below the flowline of the ditch or ground surface and twelve (12) ft from base of rail.

The minimum length of casing pipe, measured perpendicular to and on each side of the track, shall be the greater of:

- Two (2) ft beyond the toe of slope, or
- Three (3) ft beyond ditch, or
- Twenty-five (25) ft beyond centerline of outside track, or
- The entire width of the railroad right-of-way.

2.2 Pipelines Adjacent to the Railway

2.2.1 Steel Carrier Pipelines

Steel carrier and, if required to withstand external loads, casing pipes shall be designed in accordance with American Railway Engineering and Maintenance-of-way Association (AREMA) Manual for Railway Engineering Chapter 1 Part 5 Section 5.2, latest edition.

Minimum pipe cover below the flowline of the ditch or ground surface for pipelines parallel to any track on CPR right-of-way, shall be six (6) ft or depth below the frost line, whichever is greater.

2.2.2 Polyethylene Carrier Pipelines

Uncased flammable or hazardous substance polyethylene carrier pipelines shall not be used adjacent to the railway. Casing pipes shall be designed in accordance with American Railway Engineering and Maintenance-of-Way Association (AREMA) Manual for Railway Engineering Chapter 1 Part 5 Section 5.2, latest edition.

Minimum pipe cover below the flowline of the ditch or ground surface for pipelines parallel to any track on CPR right-of-way, shall be six (6) ft or depth below the frost line, whichever is greater.

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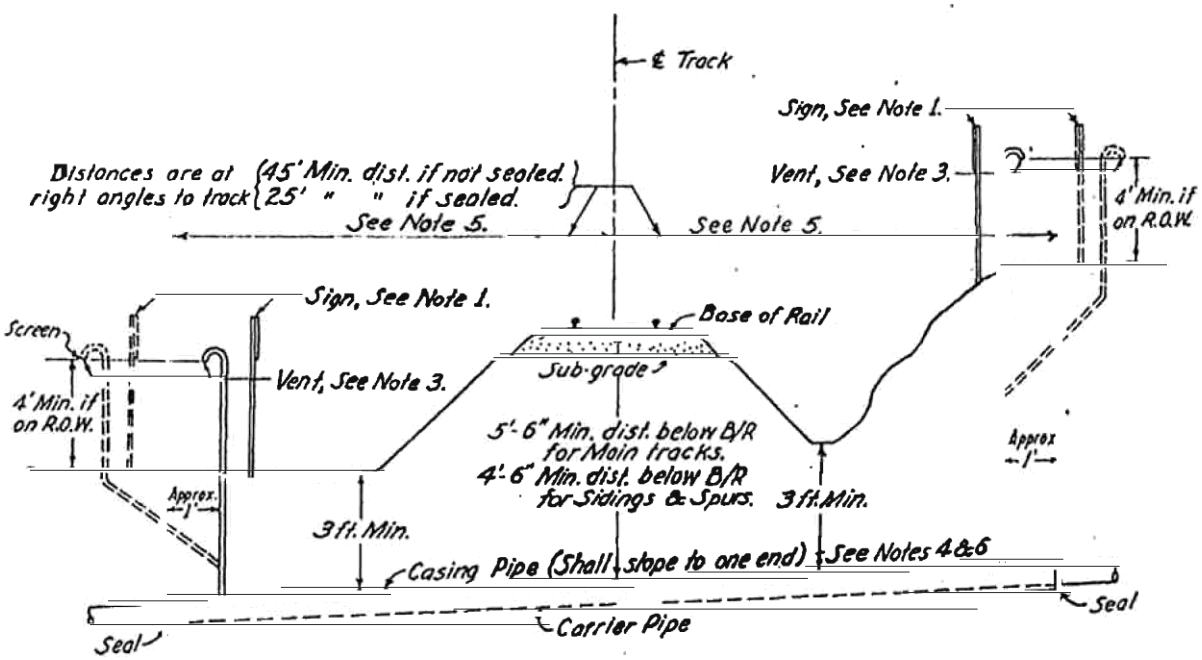
SPECIFICATIONS FOR PIPELINE CROSSINGS – FLAMMABLE SUBSTANCES



WALL THICKNESS TABLE FOR STEEL CASING PIPE, E-80 LDG.	
Min. Thickness	**Diameter of Pipe**
0.188”	14” and under
0.219”	16”
0.250”	18”
0.281”	20” & 22”
0.312”	24”
0.344”	26”
0.375”	28”
0.406”	30”
0.438”	32”
0.469”	34” & 36”
0.500”	38”
0.531”	40”
0.562”	42”
Min. Yield Strength of Steel Pipe to be 35,000 p.s.i. **NOTE:** Without protective coating and cathodic protection, wall thickness shown above shall be increased to nearest standard size which is a min. of 0.063” greater for all diameters except those under 12 ¾”	

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General Notes

1. **Signs**: All pipe lines, except those in streets, shall be prominently marked at the right-of-way (on both sides of track for undercrossing) by signs substantially worded thus: **"High Pressure……Main…..ft. Under."**

Vents:

2. Vent pipes shall be of sufficient diameters but in no case less than two (2) inches in diameter.

3. Vent pipes shall project through ground surface at right-of-way lines or not less than forty-five (45) ft (at right angles) from center line of track.

Casings:

4. Inside diam. of casing pipe shall be at least two (2) inches greater than the largest outside diam. of all carrier pipes less than eight (8) inches diam., three and one-fourth (3-1/4) inches greater for carrier pipes eight (8) inches to sixteen (16) inches diam. inclusive and four and one-half (4-1/2) inches greater for carrier pipes eighteen (18) inches and over-large enough for carrier pipe to be removed.

5. In fill sections, casing shall extend to two (2) ft. beyond the toe of slope, and in cut sections, it shall extend three (3) ft. beyond the outside edge of the ditch. In no case shall casing be less than distances shown on diagram, above.

6. Casing pipe to be installed by boring or jacking method.

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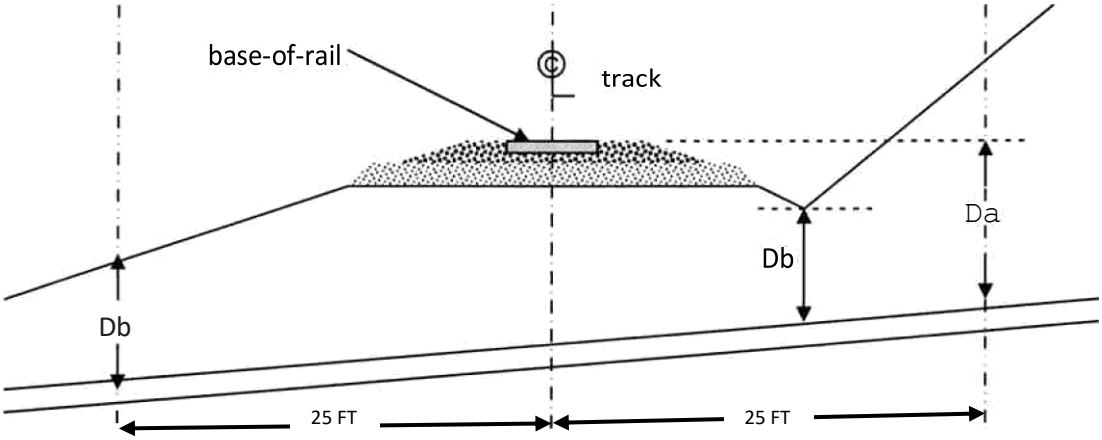
CANADIAN PACIFIC RAILWAY (CPR) SPECIFICATION NO. SP-TS-2.40: PIPELINE AND UTILITY INSTALLTIONS BURIED WITHIN CANADIAN PACIFIC RAILWAY RIGHT-OF-WAY

FIGURE A-1

UNCASED BURIED PIPELINES



Da = minimum depth of cover below base-of-rail within twenty-five (25) ft of track centerline.
Db = minimum depth of cover below grade within twenty-five (25) ft of track centerline or below ditch invert
Minimum depth of cover, Da or Db, shall not be less than frost depth.

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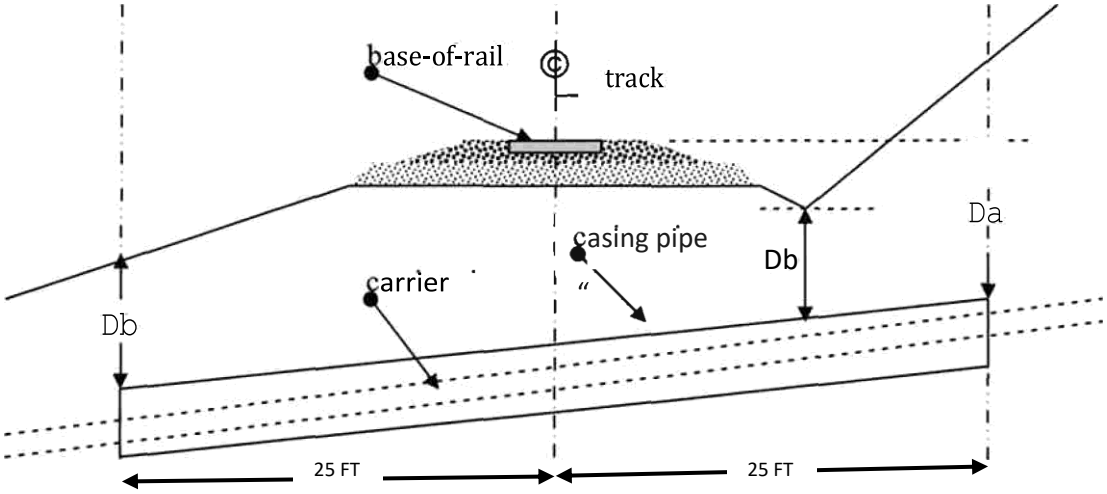
FIGURE A-2

CASED BURIED PIPELINES AND UTILITIES



Da = minimum depth of cover below base-of-rail within twenty-five (25) ft of track centerline.
Db = minimum depth of cover below grade within twenty-five (25) ft of track centerline or below ditch invert
Minimum depth of cover, Da or Db, shall not be less than frost depth.

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DESIGN AND INSTALLATION OF BURIED NON-FLAMMABLE SUBSTANCE PIPELINES

This section applies to all public and private utilities involving the design and installation of buried non-flammable substances.

Installations crossing the property of the railroad, to the extent possible, are to be not less than forty-five (45) degrees to the centerline of track. Utilities shall not be placed within one-hundred fifty (150) feet of culverts, railroad bridges, track switches, buildings, or other important structures.

Utilities will be located to provide a safe environment and shall conform to the current "Federal Pipeline Safety Regulations," and "The American Railway Engineering and Maintenance Association (AREMA) Recommendations." Where laws or orders of public authority prescribe a higher degree of protection, then the higher degree of protection prescribed shall supersede the provisions of this document.

Tunneling requires special approval of materials and methods by CPR's Chief Engineer.

3.1 Pipelines Crossing the Railway

3.1.1 Steel Carrier Pipelines

3.1.1.1 Uncased Steel Carrier Pipelines:

Casing pipe is not required when the steel carrier pipe:

- wall thickness conforms to E-80 loading requirements, the pipe is coated and cathodically protected, has a maximum allowable operating pressure (MAOP) of less than or equal to one hundred (100) psi, and is designed and installed in accordance with American Railway Engineering and Maintenance-of-way Association (AREMA) Manual for Railway Engineering Chapter 1 Part 5 Section 5.3, latest edition, or
- Is a non-pressure sewer crossing under any railway track(s) that is designed for the external applied pressures and installed in accordance with American Railway Engineering and Maintenance-of-way Association (AREMA) Manual for Railway Engineering Chapter 1 Part 5 section 5.3, latest edition.

The minimum pipe cover for uncased pipelines carrying non-flammable substances across railway property shall be the greater of (see Figure A-1):

- Depth below frost line, or
- For Jack and Bore installation; three (3) ft below the flowline of the ditch or ground surface and five and one-half (5-1/2) ft from base of rail, or

- For Horizontal Directional Drilling (HDD) installation; five (5) ft below the flowline of the ditch or ground surface and thirty (30) ft from base of rail.

3.1.1.2 Cased Steel Carrier Pipelines:

3.1.1.2.1 Reinforced Concrete Casing Pipe

Reinforced concrete casing pipe may be used when the steel carrier pipe has a maximum allowable operating pressure (MOAP) of less than or equal to one hundred (100) psi. The reinforced concrete casing pipe shall be designed for the external applied pressures and installed in accordance with American Railway Engineering and Maintenance-of-way Association (AREMA) Manual for Railway Engineering Chapter 1 Part 5 Section 5.3, latest edition.

3.1.1.2.2 Coated Corrugated Metal (CMP) Casing Pipe

Corrugated metal (CMP) casing pipe may be used when the steel carrier pipe has a maximum allowable operating pressure (MAOP) of less than or equal to one hundred (100) psi. The CMP casing pipe shall be in accordance with CPR Standard Plan B-1-4950-2, latest edition.

3.1.1.2.3 Steel Casing Pipe

Steel casing pipe shall be designed for the external applied pressures and installed in accordance with American Railway Engineering and Maintenance-of-way Association (AREMA) Manual for Railway Engineering Chapter 1 Part 5 Section 5.3, latest edition.

Minimum pipe cover for cased pipelines carrying non-flammable substances across all tracks shall be the greater of (See Figure A-2):

- Depth below frost line, or
- For Jack and Bore installation; three (3) ft below the flowline of the ditch or ground surface and five and one-half (5-1/2) ft from base of rail, or
- For Horizontal Directional Drilling (HDD) installation; five (5) ft below the flowline of the ditch or ground surface and twelve (12) ft from base of rail.
- Where CMP casing pipe is used, depth of cover shown on plan B-1-4950-2, latest edition, within CPR right-of-way.

The minimum length of casing pipe, measured perpendicular to and on each side of any track, shall be the greater of :

- Two (2) ft beyond the toe of slope, or
- Three (3) ft beyond ditch, or
- Twenty-five (25) ft beyond centerline of outside track, or
- The entire width of the railroad right-of-way.

3.1.2 Reinforced Concrete Carrier Pipelines

Uncased Class IV or V reinforced concrete pipes, designed for the external applied pressures and installed in accordance with American Railway Engineering and Maintenance-of-way Association (AREMA) Manual for Railway Engineering Chapter 1 Part 5 Section 5.3, latest edition, may be used under mainline tracks for non-pressure sewer crossings.

Minimum pipe cover for reinforced concrete pipelines crossing all tracks shall be the greater of (see Figure A-2):

- Depth below frost line, or
- For Jack and Bore installation; three (3) ft below the flowline of the ditch or ground surface and five and one-half (5-1/2) ft from base of rail, or

The minimum length of casing pipe, measured perpendicular to and on each side of any track, shall be greater of (see Figure A-2):

- Two (2) ft beyond the toe of slope, or
- Three (3) ft beyond ditch, or
- Twenty-five (25) ft beyond centerline of outside track, or
- The entire width of the railroad right-of-way.

3.1.3 Coated Corrugated Metal (CMP) Carrier Pipelines

Corrugated Metal (CMP) pipes in accordance with CPR Standard plan B-1-4950-2, latest edition, may be used under all tracks for non-pressure sewer crossings.

Minimum pipe cover for corrugated Metal (CMP) pipelines crossing all tracks shall be the greater of (see Figure A-2):

- Depth below frost line, or
- For Jack and Bore installations; three (3) ft below the flowline of the ditch or ground surface and five and one-half (5-1/2) ft from base of rail, or
- For Horizontal Directional Drilling (HDD) Installation; five (5) ft below the flowline of the ditch or ground surface and thirty (30) ft from base of rail, or

- Depth of cover shown on plan B-1-4950-2 within twenty-five (25) ft of track centerline measured perpendicular to track centerline, latest edition.

The minimum length of casing pipe, measured perpendicular to and on each side of any track, shall be the greater of (see Figure A-2):

- Two (2) ft beyond the toe of slope, or
- Three (3) ft beyond ditch, or
- Twenty-five (25) ft beyond centerline of outside track, or
- The entire width of the railroad right-of-way.

3.1.4 **Polyethylene Carrier Pipelines**

3.1.4.1 Uncased Polyethylene Carrier Pipelines:

Uncased polyethylene carrier pipelines shall not be used crossing the railway.

3.1.4.2 Cased Polyethylene Carrier Pipelines:

Only cased polyethylene carrier pipe shall be used to convey non-flammable substance pipelines within the CPR right-of-way.

3.1.4.2.1 Reinforced Concrete Casing Pipe

Reinforced concrete casing pipe may be used when the polyethylene carrier pipe has a maximum allowable operating pressure (MAOP) of less than or equal to one hundred (100) psi. The casing pipe shall be designed for the external applied pressures and installed in accordance with American Railway Engineering and Maintenance-of-way Association (AREMA) Manual for Railway Engineering Chapter 1 Part 5 Section 5.3, latest edition.

3.1.4.2.2 Coated Corrugated Metal (CMP) Casing Pipe

Corrugated metal (CMP) casing pipe may be used when the polyethylene carrier pipe has a maximum allowable operating pressure (MAOP) of less than or equal to one hundred (100) psi. The CMP casing pipe shall be in accordance with CPR Standard Plan B-1-4950-2, latest edition.

3.1.4.2.3 Steel Casing Pipe

Steel casing pipe shall be designed for the external applied pressures and installed in accordance with American Railway Engineering and Maintenance-of-way Association (AREMA) Manual for Railway Engineering Chapter 1 Part 5 Section 5.3, latest edition.

Minimum pipe cover for polyethylene pipelines crossing all tracks shall be the greater of (see Figure A-2):

- Depth below frost line, or
- For Jack and Bore installation; three (3) ft below the flowline of the ditch or ground surface and five and one-half (5-1/2) ft from base of rail, or
- For Horizontal Directional Drilling (HDD) Installation; five (5) ft below the flowline of the ditch or ground surface and twelve (12) ft from base of rail, or
- Where CMP casing pipe is used, depth of cover shown on plan B-1-4950-2, latest edition.

The casing pipe, measured perpendicular to and on each side of the track, shall extend the full width of the railroad right-of-way.

3.2 Pipelines Parallel to the Railway

3.2.1 Steel and Reinforced Concrete Carrier Pipelines

Steel and reinforced concrete carrier and, if required to withstand external loads, steel, reinforced concrete and CMP casing pipes shall be designed to meet E-80 loading requirements in accordance with American Railway Engineering and Maintenance-of-way Association (AREMA) Manual for Railway Engineering Chapter 1 Part 5 Section 5.3, latest edition.

Minimum pipe cover for steel and reinforced concrete carrier cased pipelines parallel to any track and on railroad right-of-way shall be six (6) ft or depth below frost line, whichever is greater.

3.2.2 Corrugated Metal (CMP) and Polyethylene Carrier Pipelines

Uncased corrugated metal (CMP) and polyethylene carrier pipelines shall not be used parallel to the railway. Steel, concrete, or CMP casing pipes shall be designed in accordance with American Railway Engineering and Maintenance-of-way Association (AREMA) Manual for Railway Engineering Chapter 1 Part 5 Section 5.3, latest edition.

Minimum pipe cover for CMP and Polyethylene carrier cased pipelines parallel to any track and on railroad right-of-way shall be six (6) ft or depth below frost line, whichever is greater.

SPECIFICATIONS FOR PIPELINE CROSSINGS – NON-FLAMMABLE SUBSTANCESWALL THICKNESS TABLE FOR STEEL CASING PIPE, E-80 LDG.	
Min. Thickness	**Diameter of Pipe**
0.188”	14” and under
0.219”	16”
0.250”	18”
0.281”	20” & 22”
0.312”	24”
0.344”	26”
0.375”	28”
0.406	30”
0.438”	32”
0.469”	34” & 36”
0.500”	38”
0.531”	40”
0.562”	42”

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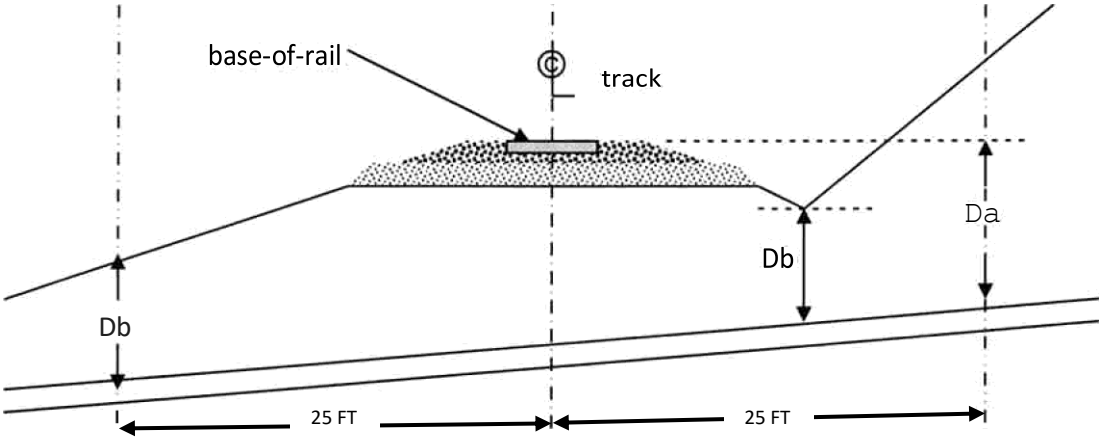
CANADIAN PACIFIC RAILWAY (CPR) SPECIFICATION NO. SP-TS-2.40: PIPELINE AND UTILITY INSTALLTIONS BURIED WITHIN CANADIAN PACIFIC RAILWAY RIGHT-OF-WAY

FIGURE A-1

UNCASED BURIED PIPELINES



Da = In fill sections, two (2) ft beyond the toe of slope, or
Db = In cut sections, three (3) ft beyond ditch, or
The entire width of the railroad right-of-way, whichever is greater.
Da or Db, shall not be less than frost depth.

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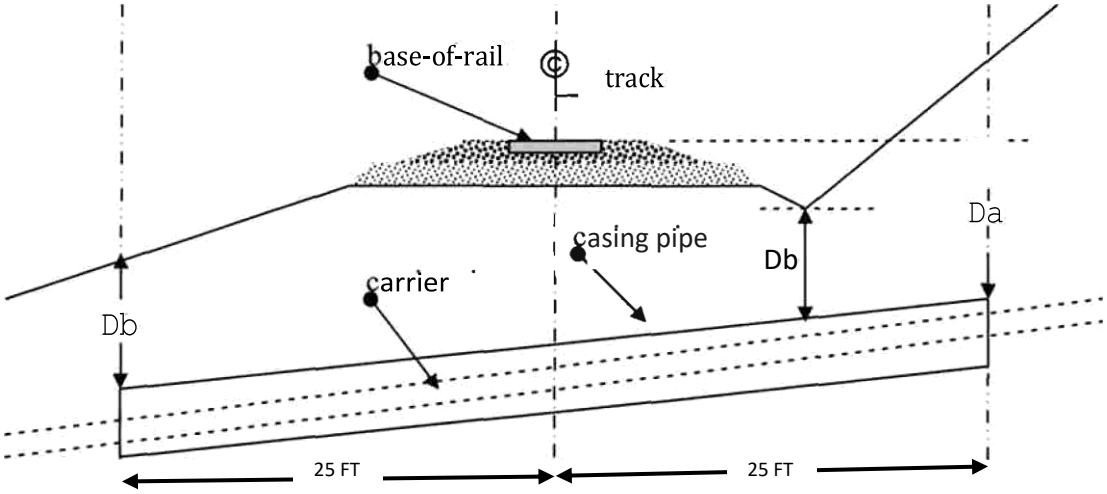
FIGURE A-2

CASED BURIED PIPELINES AND UTILITIES



Da = In fill sections, two (2) ft beyond the toe of slope, or
Db = In cut sections, three (3) ft beyond ditch, or
The entire width of the railroad right-of-way, whichever is greater.
Da or Db, shall not be less than frost depth.

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SPECIFICATIONS FOR OVERHEAD WIRE CROSSINGS

This section applies to all public and private utilities involving the design and installation of overhead wire crossings.

Installations crossing the property of the railroad, to the extent possible, are recommended to cross the track ninety (90) degrees from the centerline of the track. In no case shall it cross less than forty-five (45) degrees to the centerline of track. Utilities shall not be placed within one-hundred fifty (150) feet of culverts, railroad bridges, track switches, buildings, or other important structures.

Utilities will be located to provide a safe environment and shall conform to the current "National Electrical Safety Code," and "The American Railway Engineering and Maintenance Association (AREMA) Recommendations." Where laws or orders of public authority prescribe a higher degree of protection, then the higher degree of protection prescribed shall supersede the provisions of this document.

4.1 Clearance above rails:

Overhead wire crossings must provide a minimum clearance of twenty-seven (27) feet above top of rail (ATR). High voltage power lines will require additional clearance as follows:

- </= 750 volts (includes fiber optic) = 27'0" ATR (NESC + 3')
- > 750 V and < 50,000 V = 29' 6" ATR (NESC + 3')
- >/= 50,000 V = 27' (NESC) + 3 = 30' 0" ATR plus 0.4" per 1,000 V over 50kV

4.2 Poles and anchors:

Poles must be located fifty (50) feet out from the centerline of railroad main, branch and running tracks, CTC sidings, and heavy tonnage spurs. Pole locations adjacent to industry tracks; must provide at least ten (10)-foot clearance from the centerline of the nearest track, when measured at right angles. If located adjacent to curved track, then said clearance must be increased at a rate of one and one-half (1-1/2) inches per degree of curved track.

Regardless of the voltage, un-guyed poles shall be located a minimum distance from the centerline of any track, equal to the height of the pole above the ground-line plus ten (10) feet. If guying is required, the guys shall be placed in such a manner as to keep the pole from leaning / falling in the distance of the tracks.

Poles (Including steel poles) must be located a minimum distance from the railroad signal and communication lines equal to the height of the pole above the ground-line or else be guyed at right angles to the lines. High voltage towers (34.5 kV and higher) must be located off railroad right-of-way.

4.3 Clearance to Railroad Wires:

Poles, cross arms and anchors must provide at least a ten (**10)-foot side** clearance and four (4) feet above existing signal and communication lines. Every effort must be made to keep improvements as far from railroad poles and wires as possible.

For proposed electrical lines crossing tracks, CPRR may request that an inductive coordination study be performed at the expense of the utility owner. Inductive interference from certain lines have the potential to disrupt the signal system in the track causing failures in the track signals and highway grade crossing warning devices. The General Director of Signals will determine the need for a study on a case-by-case basis.

4.4 Public Thoroughfares:

All improvements crossing railroad tracks, property, or right-of-way, whether in public thoroughfare or not, must be reviewed by Canadian Pacific Railway.

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DESIGN AND INSTALLATION OF BURIED WIRELINE UTILITIES

5.1 Utilities Crossing the Railway

All buried wireline utilities crossing the CPR shall be cased as outlined below.

Installations crossing the property of the railroad, to the extent possible, are to be not less than forty-five (45) degrees to the centerline of track. Utilities shall not be placed within one-hundred fifty (150) feet of culverts, railroad bridges, track switches, buildings, or other important structures.

5.1.1 Cased Utilities

When cables operate at 120V per cable or less the utilities may be cased with steel, reinforced concrete, or polyethylene pipe. These pipes must have a wall thickness conforming to E-80 loading requirements, be coated or cathodically protected if steel, and designed for the external applied pressures and installed in accordance with American Railway Engineering and Maintenance-of-way Association (AREMA) Manual for Railway Engineering Chapter 1 part 5 Section 5.1, latest edition. Polyethylene casing pipes shall not have an outside diameter greater than four and one-half (4-1/2) inches. Corrugated metal (CMP) casing may also be used in accordance with CPR Standard plan B-1-4950-2.

When cables operate at greater than 120V per cable the utilities shall be cased with steel pipe conforming to E-80 loading requirements and designed for the external applied pressures and installed in accordance with American Railway Engineering and Maintenance-of-way Association (AREMA) Manual for Railway Engineering Chapter 1 Part 5 Section 5.3, latest edition.

Minimum pipe cover for cased utilities crossing all tracks shall be the greater of (see Figure A-3):

- Depth below frost line, or
- For jack and bore installation; thee (3) ft below the flowline of the ditch or ground surface and five and one-half (5-1/2) ft from base of rail, or
- For Horizontal Directional Drilling (HDD) installation; five (5) ft below the flowline of the ditch or ground surface and twelve (12) ft from base of rail, or
- Where CMP casing pipe is used, depth of cover shown on plan B-1-4950-2, latest edition.

Steel, concrete, or CMP casing pipe, measured perpendicular to and on each side of the track, shall extend 25 ft beyond the centerline of nearest track or the full width of the right-of-way, whichever is greatest. Polyethylene casing pipe, measured

perpendicular to an on each side of the track, shall extend the full width of the right-of-way.

5.2 Utilities Parallel to the Railway

All utilities parallel to the CPR tracks shall be cased as outlined below.

5.2.1 Cased Utilities

Steel casing pipes shall have a wall thickness conforming to E-80 loading requirements, be coated, and designed for the external applied pressures and installed in accordance with American Railway Engineering and Maintenance-of-way Association (AREMA) Manual for Railway Engineering Chapter 1 part 5 Section 5.1, latest edition. Corrugated metal (CMP) casing may also be used in accordance with CPR Standard plan B-1-4950-2.

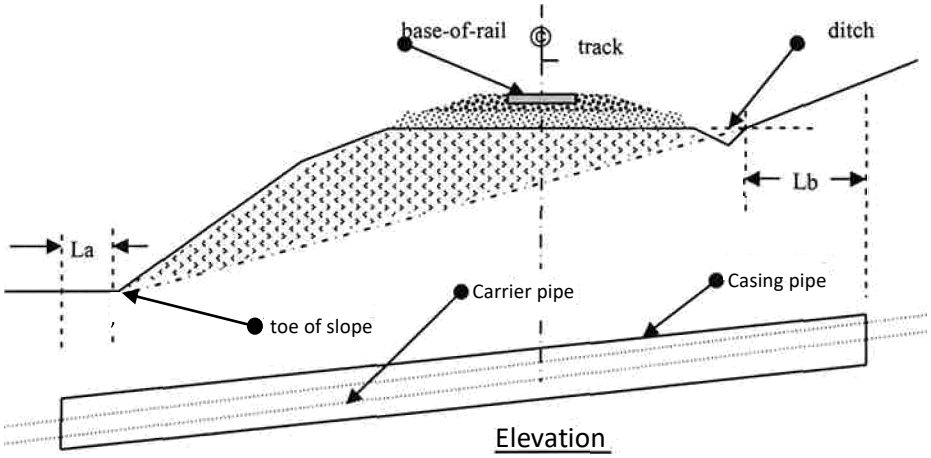
Polyethylene casing pipes shall have a wall thickness conforming to E-80 loading requirements and designed for the external applied pressures and installed in accordance with American Railway Engineering and Maintenance-of-way Association (AREMA) Manual for Railway Engineering Chapter 1 part 5 Section 5.1, latest edition. Polyethylene casing pipes shall not have an outside diameter greater than four and one-half (4-1/2) inches

Minimum pipe cover for steel and polyethylene pipe cased utilities parallel to any track shall be six (6) ft or depth below frost line, whichever is greater.

WALL THICKNESS TABLE FOR STEEL CASING PIPE, E-80 LDG.	
Min. Thickness	**Diameter of Pipe**
0.188”	14” and under
0.219”	16”
0.250”	18”
0.281”	20” & 22”
0.312”	24”
0.344”	26”
0.375”	28”
0.406”	30”
0.438”	32”
0.469”	34” & 36”
0.500”	38”
0.531”	40”
0.562”	42”
Min. Yield Strength of Steel Pipe to be 35,000 p.s.i.	

NOTE: Without protective coating and cathodic protection, wall thickness shown above shall be increased to nearest standard size which is a min. of 0.063" greater for all diameters except those under 12 ¾"

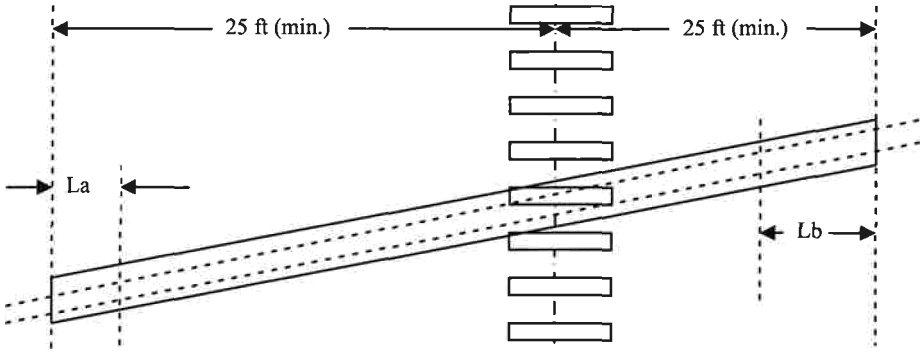
Figure A-3 – Cased Buried Pipelines and Utilities



Elevation

The minimum length of casing pipe, measured perpendicular to and on each side of any track, shall be the greater of:

- La = In fill sections, two (2) ft beyond the toe of slope, or
- Lb = In cut sections, three (3) ft beyond ditch, or
- 25 ft beyond centerline of nearest track, or
- The entire width of the railroad right-of-way.



Plan