

GAS/OIL AND WATER/SEWER PIPELINE CROSSINGS APPLICATIONS

NOTE:

Gas and Oil pipeline specific requirements shown in **red**.

Water and Sewer pipeline specific requirements shown in **green**

Applicants must submit THREE (3) copies of an acceptable plan. Plans must meet TC E-10 and CN Standards. **Additionally, Gas and Oil pipelines must meet CSA Standard Z662-07.**

Cost for reviewing the first plan received shall be included in the basic engineering application fee. The applicant may be charged an additional fee for each review after the initial application due to inadequate or missing information.

Plans Must Have:

- Plan Number & Date
- Revised plans must have a revision number & date of revision.
- Full company name & contact information of the owner of the pipeline.
 - can be on the application letter
- Land Description (legal description & or CN Subdivision & Mileage)
- Site Plan & Profile
 - width of Trillium right-of-way / number of tracks / angle of crossing
- If encased . . . a cross section or a note advising on spacers, etc.
- Drawing must be to scale or have all dimensions/measurement noted.
- **Gas/Oil: A note stating: “Installation and maintenance to be in accordance with TC E10 and the latest edition of applicable CSA standard (Z-662) ”.**
- **Water/Sewer: A note stating: “Installation and maintenance to be in accordance with TC E10.”**
- **“Signed”** stamp of a Professional Engineer.

SPECS Required on Plan:

- Contents of pipe must be noted.
- Crossing angle to be greater than 45 degrees.
- Warning Markers required on each side of the railway right-of-way
- Direction of flow.
 - **Not required for a gravity sewer pipe.**
- Emergency Shut-off Valve locations noted on each side of track.
 - **Not required for a gravity sewer pipe.**
- Method of Installation.
- **Gas/Oil: No gas pipeline under buildings, switches, etc.**
- **Gas/Oil: Hoop Strength calculation must be shown on uncased xings.**
- **Water/Sewer: 13.7m minimum clearance to any bridges, buildings, switches, etc.**

PIPE SPECS

Design Loading – Cooper E80 (TC E-10)

PIPE MATERIAL

Water/Sewer

- Type of Pipe, Wall Thickness, and Pressures (operating & max. test) of carrier & casing pipe.
- Must be **STEEL CASED** unless it is a non-pressure (under 700 kpa) gravity feed pipe (sewer) and then the following applies:
 - concrete pipe as per AREMA & CSA, minimum Class 5.
 - Coated corrugated metal pipe as per AREMA & CSA.
- **ALUMINUM PIPE** is not acceptable!

Gas/Oil

- Steel pipe is the only acceptable material for a carrier pipe when there is no casing.
- Steel pipe is the only acceptable material for a casing pipe.
- Must meet minimum wall thickness.
- Approved CSA material . . . ie. . . Z245.1, 359.11
 - Polyethylene pipe can be used as a carrier pipe if the following conditions are met:
 - If encased the entire width of the right-of-way.
 - Less than 168.3 mm outside diameter.
 - Less than 700 kpa design or test pressure.
 - Approved CSA material.
- **ALUMINUM PIPE** is not acceptable!
- Wall Thickness
 - minimum 4.8mm . . . unless no protective coat or it is not cathodically protected . . . ADD 1.6 mm. (TC E-10 & AREMA). . . ie . . . YJ-1 = yellow jacket coding
 - see Table 4.10 CSA Z662-07 for all sizes (Table 4.9 CSA Z662-99)
- Yield Strength (uncased)
 - Minimum Yield Strength 241 Mpa (the higher the #, the better).
 - With a Joint Factor of 1.00 (standard - welded)
 - Less than 50% for all tracks.
 - With a Joint Factor of less than 1.00
 - Less than 50% on secondary & industrial tracks.
 - Less than 30% on main tracks.

Casings:

- Carrier pipe less than 168.3 mm O.D. . . . casing pipe must be at least 50 mm O.D. larger.
- Carrier pipe more than 168.3 mm O.D. . . . casing pipe must be at least 75 mm O.D. larger.
- Carrier pipe shall be held clear of the casing pipe by properly designed supports, insulators, or centering devices. - CSA Standard 4.12.3.3 (c)

- Casing must extend the full width of the Railway’s core right-of-way and a minimum of 15 m on each side from outside track to accommodate for any future construction. Based on our standard 100’ right-of-way. NOTE: TC E-10 & Z662-07 states a 7 m minimum from center outside track.
- **Gas/Oil:** Casing pipe must be sealed to the carrier pipe.
- **Water/Sewer:** Casing pipe to be left open on the ends (not sealed) when the ends of the casing are at or above ground surface and above high-water level (AREMA 5.1.6.4).

Wall Thickness

- minimum 4.8mm . . . unless no protective coat or it is not cathodically protected . . . ADD 1.6
- mm. (TC E-10 & AREMA) . . ie . . . YJ-1 = yellow jacket coding
- see Table 4.10 CSA Z662-07 for all sizes (Table 4.9 CSA Z662-99)
- Water/Sewer protective coat or cathodically protected not required for concrete pipe

Minimum Depth of Burial

BELOW TRACK	Gas/Oil	Water/Sewer
Mainline Cased	1.68 m (5.5 ft)	1.68 m (5.5 ft)
Other Tracks/Uncased	3.05 m (10 ft)	1.37 m (4.5 ft)
BELOW RIGHT OF WAY	Gas/Oil	Water/Sewer
Mainline Cased	0.91 m (3.0 ft)	0.91 m (3.0 ft)
Other Tracks/Uncased	1.83 m (6.0 ft)	0.91 m (3.0 ft)

Geo-technical Report:

If installation is known or suspected to be a problem due to soil conditions at location or if this is a large bore pipeline (cased or uncased), a written recommendation from a Geo-technical Engineer, who has reviewed soil testing and water table results, will be required. The written recommendation is to note the following:

- That the method of installation is appropriate to the soil conditions.
- There will be no adverse affect to Trillium operations and property.
- The contingency plan if problems arise during construction at the site.

Nearest Point at which digging can take place:

Starting 10 (ten) feet from the gauge side of the nearest rail, calculate a slope to the bottom of the proposed pipe at 1.5:1. If a 1.5:1 slope cannot be maintained or more restrictive conditions occur, approved shoring will be required.