



**MATERIAL SPECIFICATION FOR
NON-PRESSURE POLYETHYLENE (PE) PLASTIC PIPE PRODUCTS**

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1840.01 SCOPE

This specification covers the requirements for non-pressure polyethylene plastic pipe products to be used for sanitary or storm sewers, pipe culverts, and subdrains.

1840.01.01 Specification Significance and Use

This specification has been developed for use in provincial- and municipal-oriented Contracts. The administration, testing, and payment policies, procedures, and practices reflected in this specification correspond to those used by many municipalities and the Ontario Ministry of Transportation.

Use of this specification or any other specification shall be according to the Contract Documents.

1840.01.02 Appendices Significance and Use

Appendices are not for use in provincial contracts as they are developed for municipal use, and then, only when invoked by the Owner.

Appendices are developed for the Owner's use only.

Inclusion of an appendix as part of the Contract Documents is solely at the discretion of the Owner. Appendices are not a mandatory part of this specification and only become part of the Contract Documents as the Owner invokes them.

Invoking a particular appendix does not obligate an Owner to use all available appendices. Only invoked appendices form part of the Contract Documents.

The decision to use any appendix is determined by an Owner after considering their contract requirements and their administrative, payment, and testing procedures, policies, and practices. Depending on these considerations, an Owner may not wish to invoke some or any of the available appendices.

1840.02 REFERENCES

When the Contract Documents indicate that provincial-oriented specifications are to be used and there is a provincial-oriented specification of the same number as those listed below, references within this specification to an OPSS shall be deemed to mean OPSS.PROV, unless use of a municipal-oriented specification is specified in the Contract Documents. When there is not a corresponding provincial-oriented specification, the references below shall be considered to be to the OPSS listed, unless use of a municipal-oriented specification is specified in the Contract Documents.

When the Contract Documents indicate that municipal-oriented specifications are to be used and there is a municipal-oriented specification of the same number as those listed below, references within this specification to an OPSS shall be deemed to mean OPSS.MUNI, unless use of a provincial-oriented specification is specified in the Contract Documents. When there is not a corresponding municipal-oriented specification, the references below shall be considered to be the OPSS listed, unless use of a provincial-oriented specification is specified in the Contract Documents.

This specification refers to the following standards, specifications, or publications:

CSA Standards

- B182.6-11 Profile Polyethylene (PE) Sewer Pipe and Fittings for Leak-Proof Sewer Applications
[Part of B1800-11, Thermoplastic Nonpressure Pipe Compendium]
- B182.8-11 Profile Polyethylene (PE) Storm Sewer and Drainage Pipe and Fittings
[Part of B1800-11, Thermoplastic Nonpressure Pipe Compendium]

ASTM International

- F 405-05 Corrugated Polyethylene (PE) Pipe and Fittings
- F 667-06 Large Diameter Corrugated Polyethylene Pipe and Fittings
- F 894-07 Polyethylene (PE) Large Diameter Profile Wall Sewer and Drain Pipe

American Association of State Highway and Transportation Officials (AASHTO)

- M252-09 Corrugated Polyethylene Drainage Pipe
- M294-10 Corrugated Polyethylene Plastic Pipe, 300 to 1500 mm Diameter**

1840.03

DEFINITIONS

For the purpose of this specification, the following definitions apply:

Certification Body means an independent 3rd party agency, accredited by the Standards Council of Canada that has the qualifications, skills, and expertise required to confirm that a pipe manufacturer produces pipe products to the quality and requirements of an accepted standard and that has the mandate to certify the pipe products produced.

Certified means pipe products that have been marked with a certification body's logo confirming that the production of the pipe product is in accordance with the quality and requirements of CSA B182.6, CSA B182.8, AASHTO M294 Type S, or ASTM F 894.

Closed Profile Pipe means a pipe product that has a hydraulically smooth waterway reinforced circumferentially or spirally with corrugations that are joined integrally by an essentially smooth outer wall.

Corrugated Pipe means a single-walled pipe where the wall is formed into a series of alternating crests and valleys.

Delivered Quality means the pipe products' physical condition upon arrival at the construction site in terms of the extent and degree of dents, scratches, cracks, pipe coating integrity, etc., that appear on the pipe products delivered.

Open Profile Pipe means a pipe product that has a hydraulically smooth waterway reinforced circumferentially or spirally with outside corrugations.

Polyethylene Plastic means plastics based on virgin polymers made with ethylene as essentially the sole monomer.

Profile means a pipe wall construction that presents an essentially smooth surface in the waterway but includes ribs or other shapes, which can be either solid or hollow that helps brace the pipe against diametrical deformation.

1840.05

MATERIALS

1840.05.01

Polyethylene Plastic Pipe Products

The moulding and extrusion material shall be polyethylene plastic according to:

- a) ASTM F 405 or ASTM F 667 for corrugated sub-drainage tubing.
- b) AASHTO M252 for corrugated interior flexible culvert pipe.
- c) CSA B182.6, CSA B182.8, or AASHTO M294 Type S for open profile sewer and drainage pipe.
- d) ASTM F 894 for closed profile sewer and drainage pipe.

1840.07

PRODUCTION

1840.07.01

Requirements

The pipe diameter, stiffness, material, and type for all polyethylene plastic pipe products shall be as specified in the Contract Documents.

Polyethylene plastic pipe products shall be produced according to the following:

- a) ASTM F 405 and ASTM F 667 for corrugated sub-drainage tubing and fittings.
- b) AASHTO M252 for corrugated interior flexible culvert pipe.
- c) CSA B182.6, CSA B182.8, or AASHTO M294 Type S for open profile sewer and drainage pipe and fittings.
- d) ASTM F 894 for closed profile sewer and drainage pipe.

All polyethylene plastic pipe products used on the Contract for sewers and culverts shall be certified and supplied from a manufacturer that produces the polyethylene plastic pipe products according to CSA B182.6, CSA B182.8, AASHTO M294 Type S, or ASTM F 894.

Where the delivered quality of certified polyethylene plastic pipe products is deemed to be unacceptable by the Contract Administrator, the products shall be rejected.

1840.08 QUALITY ASSURANCE

1840.08.01 Testing

Test methods for corrugated polyethylene plastic pipe products shall be according to ASTM F 405, ASTM F 667, or AASHTO M252, as applicable.

Test methods for open and closed profile polyethylene plastic pipe products shall be according to CSA B182.6, CSA B182.8, AASHTO M294 Type S, or ASTM F 894, as applicable.

1840.08.02 Markings

Markings for certified polyethylene plastic pipe products shall be according to CSA B182.6, CSA B182.8, AASHTO M294 Type S, or ASTM F 894, as applicable.

As a minimum, the following markings shall be placed, notwithstanding any other required markings, in accordance with the applicable standard:

- a) Pipe nominal size.
- b) Pipe or ring stiffness.
- c) Standard designation (e.g., CSA B182.6).
- d) Manufacturer.
- e) Accredited certification body's logo.

Accepted certification body logos confirming certified polyethylene plastic pipe products shall be as shown in Figures 1, 2, and 3.

1840.08.03 Certificate of Compliance

When requested by the Owner, the Contractor shall provide a certificate of compliance for subdrains to indicate that the product was produced and tested according to the appropriate specification requirements.

When requested by the Owner, the Contractor shall provide a copy of the certificate of compliance from the manufacturer for storm sewers and pipe culverts. The manufacturer's certificate of compliance shall be issued by the certification body confirming that the manufacturer produces certified polyethylene plastic pipe products.

1840.09 OWNER PURCHASE OF MATERIAL

Measurement of non-pressure polyethylene plastic pipe shall be by length in metres along the centreline of the pipe.

For measurement purposes, a count shall be made of the non-pressure polyethylene plastic pipe fittings supplied and delivered as noted on the purchasing order.

Payment at the price specified in the purchasing order shall be for the supply of non-pressure polyethylene plastic pipe products delivered to the destination on the date and time specified.

The cost of all testing, except that performed by the Owner, shall be included in the price.



FIGURE 1
CSA Standards Certification Logo



FIGURE 2
Warnock Hersey - Intertek Certification Logo



FIGURE 3
NSF International Certification Logo

**Appendix 1840-A, April 2011
FOR USE WHILE DESIGNING MUNICIPAL CONTRACTS**

Note: This is a non-mandatory Commentary Appendix intended to provide information to a designer, during the design stage of a contract, on the use of the OPS specification in a municipal contract. This appendix does not form part of the standard specification. Actions and considerations discussed in this appendix are for information purposes only and do not supersede an Owner's design decisions and methodology.

Designer Action/Considerations

The designer should specify the following in the Contract Documents:

- Pipe diameter, stiffness, material, and type. (1840.07.01)

The designer should ensure that the General Conditions of Contract and the 100 Series General Specifications are included in the Contract Documents.

Related Ontario Provincial Standard Drawings

OPSD 802.010	Flexible Pipe Embedment and Backfill, Earth Excavation
OPSD 802.013	Flexible Pipe Embedment and Backfill, Rock Excavation
OPSD 802.014	Flexible Pipe Embedment in Embankment, Original Ground: Earth or Rock
OPSD 806.020	Height of Fill Table, Dual Wall Corrugated Polyethylene Gravity Sewer Pipe, 210 and 320 kPa
OPSD 806.021	Height of Fill Table, Closed Profile Wall Polyethylene Pipe, RSC 160 and 250
OPSD 806.022	Height of Fill Table, Dual Wall Corrugated Polyethylene Gravity Sewer Pipe RSC 100 and RSC 160