



Note: The MUNI implemented in November 2017 replaces OPSS 913 COMMON, November 2014 with no technical content changes.

CONSTRUCTION SPECIFICATION FOR EMBEDDED WORK IN STRUCTURES FOR ELECTRICAL SYSTEMS

TABLE OF CONTENTS

913.01	SCOPE
913.02	REFERENCES
913.03	DEFINITIONS - Not Used
913.04	SUBMISSION AND DESIGN REQUIREMENTS - Not Used
913.05	MATERIALS
913.06	EQUIPMENT - Not Used
913.07	CONSTRUCTION
913.08	QUALITY ASSURANCE - Not Used
913.09	MEASUREMENT FOR PAYMENT - Not Used
913.10	BASIS OF PAYMENT

APPENDICES

913-A	Commentary
--------------	-------------------

913.01	SCOPE
---------------	--------------

This specification covers the requirements for the installation of electrical and communication materials to be embedded in structures.

913.01.01 Significance and Use of Appendices

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

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

913.01.02 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.

913.02 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:

Ontario Provincial Standard Specifications, Construction

OPSS 603 Installation of Ducts
OPSS 616 Footings and Pads for Electrical Equipment

CSA Standards

C22.2 No. 85-14 Rigid PVC Boxes and Fittings
C22.2 No. 40-M1989 (R2009) Cutout, Junction, and Pull Boxes
C22.2 No. 211.2-06 (R2011) Rigid PVC (Unplasticized) Conduit
C22.2 No. 227.1-06 (R2011) Electrical Nonmetallic Tubing

913.05 MATERIALS

913.05.01 Junction Boxes and Fittings

Junction boxes and fittings shall be according to CSA C22.2 No. 85.

913.05.02 Rigid Ducts

Rigid ducts to be embedded shall be according to OPSS 603, Table 1.

Ducts less than 60 mm diameter shall be rigid PVC and according to CSA C22.2 No. 211.2. The associated cleaner and solvent cement shall be according to the duct manufacturer's recommendations.

913.05.03 Flexible Ducts and Fittings

Flexible ducts and fittings shall be according to CAN/CSA C22.2 No. 227.1.

913.05.04 Fish Line

Fish line shall be nylon or polypropylene materials with a minimum test strength of 400 N.

913.05.05 Anchorage Assemblies and Hardware

Anchorage assemblies and hardware shall be according to OPSS 616.

913.05.05.01 Anchor Assembly Struts

Anchor assembly struts shall be according to OPSS 616.

913.05.05.02 Studs, Nuts, and Washers

Studs, nuts, and washers shall be according to OPSS 616.

913.05.05.03 Ferrules

Ferrules shall be according to OPSS 616.

913.07 CONSTRUCTION

913.07.01 Embedded Work in Structure

All components shall be installed at locations specified in the Contract Documents. Components shall be secured and supported in place so that shifting or deflection of the components does not occur during the placing of concrete or under other such loads as may be encountered during construction.

913.07.01.01 Junction Boxes

Junction boxes shall be installed so that the outside faces of the covers are flush with the finished surface of the concrete, except for barrier walls. Junction boxes shall be recessed 50 mm in barrier walls and have grounded galvanized steel treaded covers according to CSA C22.2 No. 40 and the Contract Documents.

Junction boxes shall be drilled to accept conduit fittings as specified in the Contract Documents. Ducts and conduit fittings shall be connected to junction boxes using appropriate solvent cement.

913.07.01.02 Ducts

Ducts shall be installed using CSA approved fittings, couplings, and accessories for the type of duct used. Adapter couplings shall be installed between ducts of dissimilar materials. Expansion and deflection fitting assemblies or wobble joints shall be installed at structural expansion joints.

Expansion and deflection coupling joints shall be according to the Contract Documents and manufacturer's specifications. Duct to couplings and fittings connections shall be made with a cleaner and solvent cement suitable for the type of duct installed.

Ducts ending at vertical concrete faces shall be terminated with fittings as specified in the Contract Documents.

Ducts shall be free of debris, water, breakage, and distortion and verified by pulling a mandrel through the ducts.

All open ends in ducts shall be plugged with plastic plugs.

913.07.01.03 Fish Line

A fish line shall be installed in all duct systems. A 1.5 m length of fish line shall be left coiled in each junction box and at each duct termination at a concrete face by bringing the fish line out of the duct beside the plastic plug.

913.07.01.04 Anchorage Assemblies

Anchorage assemblies shall be installed according to OPSS 616.

913.07.02 Embedded Work in Structure for Other Than Owner

The work for embedded work in structure for other than the Owner shall be according to subsection Embedded Work in Structure and as specified in the Contract Documents.

When material supplied by others to the Contractor is specified in the Contract Documents, the Contractor shall notify the Contract Administrator in writing of the need for the material a minimum of 30 Days in advance of the date when the material is required.

913.10 BASIS OF PAYMENT

913.10.01 Embedded Work in Structure - Item

Payment at the Contract price for the above tender item shall be full compensation for all labour, Equipment, and Material to do the work.

Appendix 913-A, Commentary for OPSS 913, November 2017 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:

- Locations of components for embedded work in structures. (913.07.01)
- Drilling requirements for junction boxes. (913.07.01.01)
- Fittings for conduits ending at vertical concrete surfaces. (913.07.01.02)
- Additional requirements for embedded work in structures for other than the Owner. (913.07.02)

The designer should determine if there is material supplied by the Owner or by others to the Contractor. If so, this should be specified in the Contract Documents. (913.07.02)

The designer shall incorporate embedded work in structures according to CAN/CSA S6-00, Canadian Highway Bridge Design Code.

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 2101.020	Extension of Existing Rigid Ducts Encased in Concrete
OPSD 2102.01	Underground Rigid Duct Connection at Concrete Structure
OPSD 2200.070	Pole Footing in Earth for Cast-In-Place Concrete Barrier
OPSD 2200.080	Pole Footing in Rock for Cast-In-Place Concrete Barrier
OPSD 2215.02	Anchorage Assembly
OPSD 2216.010	Anchorage Assembly for Pole Footing in Concrete Barrier
OPSD 2300.010	Rigid PVC Junction Box, Type P1
OPSD 2300.020	Rigid PVC Junction Box, Type P2
OPSD 2300.030	Rigid PVC Junction Box, Type P4
OPSD 2302.010	Embedded Work Detail for Rigid PVC Junction Box, Type P3-1, for Use in Concrete Barrier Wall
OPSD 2302.020	Expansion and Deflection Fitting Assembly for 50 and 75 mm Rigid Ducts
OPSD 2302.040	Embedded Work in Structure, New Jersey Type Concrete Barrier Wall
OPSD 2456.010	High Mast Lighting Pole Anchorage Assembly Details for Double Base Plate