



**CONSTRUCTION SPECIFICATION FOR
RIFFLES ON STREAMBEDS**

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820.01 SCOPE

This specification covers the requirements for the construction of riffles on streambeds.

820.01.01 Specification Significance and Use

This specification is written as a provincial-oriented specification. Provincial-oriented specifications are written to reflect the administration, testing, and payment policies, procedures, and practices of the Ontario Ministry of Transportation.

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

820.01.02 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.

820.02 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.

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

Ontario Provincial Standard Specifications, Construction

OPSS 517 Dewatering
OPSS 823 Low Flow Channels

Ontario Provincial Standard Specifications, Material

OPSS 1005 Aggregates - Streambed Material

820.03 DEFINITIONS

For the purpose of this specification, the definitions in OPSS 182 and the following definitions apply:

Anchor Stones means large streambed material used to create a stable base.

Interstitial Space means an empty space or gap between spaces full of structure or matter.

Low Flow Channel means as defined by OPSS 823.

Riffle means shallow areas of a waterbody with the steepest streambed slopes and shallowest depths where streambed material that break up the flow of water.

Riffle Crest means the highest point of a riffle at its upstream end.

Streambed Material means as defined by OPSS 1005.

820.05 MATERIALS

820.05.01 Streambed Material

Streambed material shall be according to OPSS 1005 and as specified in the Contract Documents.

820.07 CONSTRUCTION

820.07.01 General

Riffles shall be constructed in the dry.

820.07.02 Streambed Excavation

All required streambed excavation shall be carried out as specified in the Contract Documents.

820.07.03 Streambed Material

The streambed material shall be blended on site and as specified in the Contract Documents. Approximately 10 - 20% of the largest size of streambed material to be used shall be set aside and positioned on top of the smaller streambed material to direct the stream flow.

Streambed material placement shall commence at the downstream end of the waterbody as specified in the Contract Documents and progress to the upstream end. Streambed material shall be compacted and interstitial spaces shall be filled as specified in the Contract Documents.

The riffle crest shall be constructed across the streambed with large diameter streambed material backed up with the next largest streambed material size downstream. Anchor stones shall be placed on the streambed to create the upstream slope of the riffle and shall extend to the high water level on both sides of the waterbody as specified in the Contract Documents. The thickness of each riffle crest shall be two to three times the diameter of the largest streambed material size.

The surface of the downstream face of the riffle shall have large streambed material placed so that they are spaced 20 - 30 cm apart to form gaps as specified in the Contract Documents.

Once placed, the streambed material shall form a non-uniform surface with larger stones protruding above smaller stones.

820.07.04 Low Flow Channel

A low flow channel shall be installed within the riffle according to OPSS 823.

820.07.05 Protection of Waterbodies and Waterbody Banks

Protection of waterbodies and waterbody banks shall be according to the Contract Documents.

820.07.06 Dewatering and Temporary Flow Control

Dewatering and/or temporary flow control shall be according to OPSS 517.

820.07.07 Management of Excess Materials

Management of excess materials shall be according to the Contract Documents.

820.09 MEASUREMENT FOR PAYMENT

820.09.01 Actual Measurement

820.09.01.01 Riffles

Measurement for riffles shall be by horizontal area in square metres.

820.09.02 Plan Quantity Measurement

When measurement is by Plan Quantity, such measurement shall be based on the units shown in the clauses under Actual Measurement.

820.10 BASIS OF PAYMENT

820.10.01 Riffles - 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.