



**CONSTRUCTION SPECIFICATION FOR
ROCKY RAMPS ON STREAMBEDS**

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822.01 SCOPE

This specification covers the requirements for the construction of rocky ramps on streambeds.

822.01.01 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.

822.01.02 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.

822.02 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

Ontario Provincial Standard Specifications, Material

OPSS 1005 Aggregates - Streambed Material

822.03 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.

Boulder Weir means a grade control structure to slow water behind it.

Boulder Weir Crest means the top of the boulder weir.

In-stream Obstruction means a barrier in a waterbody that prohibits fish passage.

Pool means as defined by OPSS 821.

Rocky Ramp means a longitudinal series of boulder weirs and pools creating a low slope that simulates a rocky streambed.

Streambed Material means as defined by OPSS 1005.

822.05 MATERIALS

822.05.01 Streambed Material

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

822.07 CONSTRUCTION

822.07.01 General

Rocky ramps shall be constructed in the dry.

822.07.02 Removal of In-Stream Obstructions to Fish Passage from Waterbodies

Pre-existing, in-stream obstructions to fish passage shall be removed from the waterbody as specified in the Contract Documents.

822.07.03 Streambed Excavation

Prior to construction of rocky ramps, the streambed shall be graded to create the slope and pools as specified in the Contract Documents.

The top layer of the excavated streambed material shall be stockpiled on-site and reused later as the top layer of the rocky ramp as specified in the Contract Documents.

822.07.04 Streambed Material

All imported streambed material shall be stockpiled within graded piles on-site adjacent to the rocky ramp construction location.

The downstream end of the rocky ramp shall be flatter than the rest of the ramp, approximately 10H:1V or as specified in the Contract Documents.

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 placed first in the centre of the boulder weir crest and then outwards toward the waterbody banks.

Each boulder weir shall be shaped like an arch so that adjacent streambed materials support each other along the length of the boulder weir. Individual pieces of streambed material shall be carefully placed in a manner that allows the material to be rotated for precise alignment and fitting during construction.

Anchor stones shall form the first layer of streambed material and be placed below the elevation of the final grade to support a second row of streambed material.

The top row of streambed material shall then be placed against the anchor stones and slightly upstream of them so that they are supported with multiple points of contact.

When the arch of the boulder weir is complete, each boulder shall bear against its downstream neighbour and against the two anchor stones below it.

Anchor stones shall also be placed at the ends of each boulder weir well into the waterbody banks to the high water level and backfilled as specified in the Contract Documents.

Each pool shall be lined with streambed material as specified in the Contract Documents.

The bottom of each subsequent boulder weir shall be equal to the elevation of the crest of the boulder weir immediately downstream as specified in the Contract Documents.

Well-graded streambed material with some fines shall be placed on the upstream side of the boulder weir as specified in the Contract Documents.

Upon completion of construction of the rocky ramp, the center stone of each boulder weir crest shall be removed to form a notch for a low flow channel.

822.07.05 Protection of Waterbodies and Waterbody Banks

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

822.07.06 Dewatering and Temporary Flow Control

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

822.07.07 Management of Excess Materials

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

822.09 MEASUREMENT FOR PAYMENT

822.09.01 Actual Measurement

822.09.01.01 Rocky Ramps

Measurement for rocky ramps shall be by horizontal area in square metres.

822.09.02 Plan Quantity Measurement

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

822.10 BASIS OF PAYMENT

822.10.01 Rocky Ramps - 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.