



CONSTRUCTION SPECIFICATION FOR LUNKERS

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812.01 SCOPE

This specification covers the requirements for the construction of LUNKERS for the stability of waterbody banks and fish habitat enhancement.

812.01.01 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.

812.01.02 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.

812.02 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 206	Grading
OPSS 517	Dewatering

Ontario Provincial Standard Specifications, Materials

OPSS 1005	Aggregates - Streambed Material
OPSS 1010	Aggregates - Base, Subbase, Select Subgrade, and Backfill Material
OPSS 1440	Steel Reinforcement for Concrete

812.03 DEFINITIONS

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

Cover Stone means one or more large stones used to create the top of stone LUNKERS.

Excavated Bank Material means the existing earth material removed from the streambed and waterbody bank prior to the installation of LUNKERS and replaced onto the streambed material when backfilling the installation.

LUNKERS means an acronym for Little Underwater Neighbourhood Keepers Encompassing Rheotactic Salmonids that are crib-like, wooden, or stone structures installed along the toe of a waterbody bank.

Spacer Stone means a stone installed under the cover stone of stone LUNKERS and on top of the streambed material to create space under the cover stone.

812.05 MATERIALS

812.05.01 General

All materials shall be free of deleterious substances.

812.05.02 Wood

Wood LUNKERS shall be constructed of local wood, untreated lumber or rough-hewn logs.

Wood LUNKERS planks, stringers, backboards, and posts shall be as specified in the Contract Documents.

Planks shall be placed side-by-side, without any gaps.

812.05.03 Streambed Material

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

812.05.04 Granular B Aggregate

Granular B aggregate shall be according to OPSS 1010, except that it may not contain reclaimed asphalt pavement, reclaimed concrete material, glass, ceramic, fly ash, any type of slag, or any other industrial by-product, and shall be made from unwashed, quarried bedrock.

812.05.05 Spacer and Cover Stones

Spacer and cover stones shall be as specified in the Contract Documents.

812.05.06 Reinforcing Steel

Reinforcing steel shall be according to OPSS 1440.

812.07 CONSTRUCTION

812.07.01 General

LUNKERS shall be installed in the dry.

812.07.02 Installation

812.07.02.01 Wood LUNKERS

Wood LUNKERS shall be constructed on land outside the waterbody as specified in the Contract Documents, prior to installation in the waterbody bank.

Installation of wood LUNKERS shall be completed in the following sequence:

- a) The waterbody bank and streambed shall be excavated to accommodate wood LUNKERS as specified in the Contract Documents. Excavated bank materials shall be reused for the final layer when backfilling.

- b) Wood LUNKERS shall be installed in the excavation as specified in the Contract Documents. Adjustments to level and stabilize wood LUNKERS shall be made by hand.
- c) Holes shall be drilled through the posts of wood LUNKERS to accommodate the reinforcing steel and the reinforcing steel shall be driven through wood LUNKERS and into the streambed.
- d) Streambed material shall be placed on wood LUNKERS and extend to the high water level of the waterbody to re-establish the waterbody bank as specified in the Contract Documents. Granular B aggregate shall be installed at the rear of the excavation as specified in the Contract Documents.

The previously excavated bank material shall be installed on top of the streambed material and Granular B aggregate as specified in the Contract Documents and graded according to OPSS 206.

Vegetative cover shall be applied to the graded area as specified in the Contract Documents.

812.07.02 Stone LUNKERS

Stone LUNKERS shall be installed in the dry.

Installation of stone LUNKERS shall be completed in the following sequence:

- a) The waterbody bank and streambed shall be excavated to accommodate stone LUNKERS as specified in the Contract Documents. Excavated bank material shall be reused for the final layer when backfilling.
- b) Streambed material shall be placed on the streambed to create a flat, stable base for stone LUNKERS as specified in the Contract Documents.
- c) Spacer stones shall be installed on the streambed material as specified in the Contract Documents. Spacer stones shall be installed to be at the mid-point and at each end of the length of the cover stone. The cover stone shall then be lowered onto the spacer stones. Adjustments shall be made to level and stabilize stone LUNKERS.
- d) Streambed material shall be placed on the cover stone of stone LUNKERS to re-establish the waterbody bank as specified Contract Documents. Granular B aggregate shall be installed on top of the streambed material and extend to the high water level of the waterbody as specified in the Contract Documents.
- e) The previously excavated bank material shall be placed over the Granular B aggregate as specified in the Contract Documents and graded according to OPSS 206.
- f) Vegetative cover shall be applied to the graded area as specified in the Contract Documents.

812.07.03 Protection of Waterbodies and Waterbody Banks

Protection of waterbodies and waterbody banks shall be as specified in the Contract Documents.

812.07.04 Dewatering and Temporary Flow Control

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

812.07.05 Management of Excess Materials

Management of excess materials shall be as specified in the Contract Documents.

812.09 MEASUREMENT FOR PAYMENT

812.09.01 Actual Measurement

**812.09.01 Wood LUNKERS
Stone LUNKERS**

Measurement of wood and stone LUNKERS shall be in linear metres, in place, as measured along the top of the waterbody bank.

812.09.02 Plan Quantity Measurement

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

812.10 BASIS OF PAYMENT

**812.10.01 Wood LUNKERS - Item
Stone LUNKERS - Item**

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

