Channel Modification Design and Submission Requirements
Development and Engineering Services
September 2017

Prior to proceeding with a proposed alteration to a watercourse (i.e. channel realignment), a permit must be obtained as these works are regulated under Ontario Regulation 166/06. The following outlines submission requirements in support of a permit to be obtained at the detailed design stage. Submissions in at other planning stages should demonstrate that the following objectives can be met.

OBJECTIVES

1. Preserve and enhance the physical and ecological function of the watercourse and the natural system.
2. Ensure no adverse impacts on the watercourse upstream or downstream of the proposed alteration.
3. Ensure no increase in upstream and downstream flooding.
4. Ensure no decrease in riparian/floodplain storage.
5. Preserve and/or restore natural vegetation such as trees and shrubs to the maximum possible extent.
6. Implement adequate erosion and sediment control (in-stream and off-stream) during and after construction.
7. Protect sensitive species during and after construction, including critical life processes.
8. Ensure no net loss of the productive capacity of the watercourse for fisheries.

SUMISSION REQUIREMENTS

The following is a list of the detailed documentation, calculations and plans that the proponent must provide in support of the permit application. It is recommended that a pre-application meeting take place between the proponent and TRCA staff to identify pertinent issues and study requirements. The level of detail required for the submission may be adjusted at this point to reflect the level of project complexity. This meeting may provide an opportunity for TRCA staff to provide the proponent with available data for the study area. Channel modification plans must be prepared by a professional engineer with final documents stamped and signed.

I. Design Brief/Report

A design brief is required, either separately or as part of another reporting requirement (e.g Storm Water management Design Brief, Fisheries Act documentation).Typical components that comprise a Design Brief report are provided below. Calculations and field data, if applicable, should be included in appendices. Previous correspondence should be noted and if possible, meeting minutes attached. For re-submissions, provide a table that outlines previous comments and how they have been satisfied and where in the report and/or plans the issues have been addressed. This will facilitate a faster review.

a. *Introduction*

i. Background Information (e.g. proponent, location)
ii. Project Description (including rationale for proposed modification

b. ***Existing Conditions***

i. Fluvial Geomorphology
   - Channel Morphology
   - Substrate Characterization
   - Hydrology and Sediment Regime (including baseflow)
   - Channel Stability
   - Upstream and Downstream Conditions
   - Historical Channel Condition and Change

ii. Terrestrial Resources
   - Vegetation Assessment (ELC mapping and location of species of concern)
   - A tree inventory will be required where the project is in or adjacent to a wooded area, or where there are a number of mature trees present

iii. Fisheries (*see Fisheries Act submission requirements if applicable*)
   - Aquatic Habitat Assessment
   - Fisheries Community Inventory

c. ***Proposed Watercourse Alteration***

i. Geomorphic Basis for Design
ii. Proposed Channel Morphology (plan form, cross-section, bed profile)
iii. Proposed Substrate (provide calculations to support size)
iv. Bank Stabilization
v. Erosion Protection (if applicable)
vi. Connection to Existing Channel
vii. Hydraulic Analysis
   - Flood Elevations (existing vs. proposed - 2 year to Regional)
   - Riparian Storage (existing vs. proposed - to Regional Flood elevation)
   - Baseflow Estimates
   - Velocity Calculations

d. ***Environmental Preservation and Mitigation***

i. Terrestrial Resources
   - Preservation and Removal of Vegetation (including timing)
   - Restoration Plan
   - Access Routes
   - Working and Staging Areas

ii. Fisheries (*see also Fisheries Act submission requirements if applicable*)
   - Timing Windows
   - Fish Passage (assess expected velocities and potential for various species to pass)
   - Substrate
   - Morphologic Diversity
   - Riparian Cover Restoration Plan
   - Fish Rescue Plan
   - Compensation Measures (if applicable)
   - Monitoring Plan

e. ***Erosion and Sediment Control during Construction***
(see also Erosion and Sediment Control Guideline for Urban Construction 2006)

i. Construction Timing and Phasing Plans
ii. In-Stream Construction Practices
- By-Pass or Diversion Method(s)
- Dewatering

iii. Erosion Control
- Topsoil and Materials Stockpile Locations and Stabilization
- Stabilization of Disturbed Areas (following construction)

iv. Sediment Control
- Perimeter Controls
- Settling Controls
- Filtration Controls

iv. In-Stream Controls
v. Inspection and Maintenance Requirements

2. Figures

The following is a list of figures and their associated requirements for an alteration to a watercourse permit submission:

Figure	**Description/Requirements**
Context Plan	Site location
	Location of the watercourse (and any required re-alignment)
	Regional Flood and Fill Lines
Design Drawings	Layout/configuration of the channel in plan and profile (including existing alignment and profile) and typical cross sections
	Identification of low flow channel and bankfull channel
	Details on in-water works, if required, including 'working in the dry', dewatering of work area, fish rescue plan and fisheries timing window
	Details of Compensation Features and fisheries mitigation, if required
	Details on erosion protection works in support of all proposed treatment types
Tree Removal/ Preservation Plan	Identification of vegetation type within work area, location of trees to be removed and preserved, and protection measures for remaining stand
Landscape/ Restoration Plans	Detailed plan identifying species (including scientific names) and quantities for trees, shrubs and seed mixes, and location size and condition of plant material (See also TRCA Post-Construction Restoration Guidelines) Details on erosion control and/or bioengineering treatment type
Hydraulic Analysis Plan	Location plan of all model cross-sections used in the analysis (i.e., if new sections are required over and above the existing conditions model)
	Existing and proposed Regional and 100 year floodlines

Erosion and Sediment Control Plans	Location of control techniques, i.e. silt fences
	Detail drawings for control techniques
	Notes on maintenance of control techniques
	Notes on construction procedure and/or phasing including timing
	Construction access

Note: *All design briefs, drawings and supported hydraulic calculations are to be submitted, stamped and signed by a professional engineer. All geomorphic analyses and channel realignment designs are to be completed by a professional engineer or professional geoscientist qualified to practise fluvial geomorphology.*