WATERCOURSE CROSSINGS



When pipelines cross a watercourse, there are many considerations that route designers must consider, such as if the watercourse is a fish-bearing source or if there are riparian habitats that could be disturbed by construction, and physical features that could be negatively impacted, like its banks. In order to minimize effects to the watercourse and riparian area, the Construction Team will determine the watercourse crossing method that is most effective in reducing environmental effects and provide the most suitable construction methodology.

In addition to the provincial regulatory guidelines that inform how we construct, we also follow our internal Site-Specific Watercourse Crossing Plan (SSWCP). The site-specific plan provides a description of environmental mitigation measures per location and cover activities such as construction, equipment crossing methods and other activities that can impact a watercourse. The project SSWCP plans are stored within the project and according to project data management guidelines and available through site leadership.

Watercourse Governance

Provinces may classify and direct watercourse construction differently. Surerus Murphy strictly follows the watercourse guidelines as governed by the provinces in which we operate. In Alberta, the class of watercourse is determined by fish habitat and distribution and are rated as Classes A - D with classes A - C being fish bearing. A watercourse Class determines the timing and conditions that a crossing can be constructed, replaced, or removed. In Alberta, watercourse crossings are regulated by the Code of Practice for Watercourse Crossings. In British Columbia, watercourses are classified by their average channel width as well as if they are fish bearing and are labelled as S1 – S6 with S1-S4 being fish bearing. In British Columbia, watercourses are regulated by the Water Sustainability Act. Fisheries and Oceans Canada (DFO) is the federal regulator for all watercourses in Canada.

Defining Watercourses

A watercourse is a natural channel where water flows between defined banks. To be considered a watercourse, the flow of water does not have to be constant, but it must be a permanent landmark. The watercourse may spread over a level area without defined banks before flowing again as a defined channel. A watercourse can be seasonal – either dry or frozen. Rivers, streams, brooks are common watercourses that are frequently encountered and accounted for on projects.

Wetlands have different characteristics than watercourses, but they still require planning prior to construction as some wetlands provide habitat for fish, amphibians, beavers, and more.



General Mitigation Measures Employed at Watercourse Crossings

Compliance:

Surerus Murphy will:

- Comply with the fisheries protection provisions of the Fisheries Act by applying DFO Measures to Protect Fish and Fish Habitat and DFO Standards and Codes of Practice (DFO 2019a, 2019b).
- Some significant DFO Codes of Practice (and Interim Codes of Practice) to watercourse crossings include Ice Bridges and Snow Fills (2022), End-of-pipe fish screens (2020) and Temporary Stream Crossings (2022).
- Comply with all provincial regulatory requirements.
- · Comply with all regulatory, permit and approval conditions.

Habitat and Wildlife:

- In-stream works are conducted outside of Restricted Activity Periods (RAPs) and within Least-Risk Timing Windows (LRWs) to minimize risk to fish eggs, juveniles, and habitats.
- Beaver dams can be a feature on a watercourse, but they are typically associated with wetlands. They are identified prior to construction in the Site-Specific Environmental Plan (SSEP). If a beaver dam(s) or lodge(s) are present on a watercourse the responsible regulatory agency will be notified prior to disturbance or removal.
- If an isolated method is employed at fish-bearing watercourses and drainages, a fish salvage led by an aquatics specialist is conducted.
- Fish salvage is conducted in accordance with permit conditions, using appropriate methods and equipment. All captured fish are released to areas which provide suitable habitat.
- A Water Quality Monitoring Plan (WQMP) is developed where warranted with input from an aquatics specialist that includes monitoring for Total Suspended Solids (TSS) and turbidity if trenchless methods are used.
- The WQMP is designed to monitor for effects related to the introduction of sediment into fish-bearing waters that may be caused by construction activities.

Methods of Isolation

Dam and pump, and flume, are techniques that attempt to control streamflow and divert all flows around the worksite. These techniques attempt to provide a dry work area isolated from streamflow as well as prevent the release of sediment, minimizing the impact on the environment.

Dam and Pump

The Dam and Pump method involves creating a dam on either side of the work area to block the water flow. High volume pumps are used to divert the water around the work area to create a dry work area for construction activities. Once construction is completed, the water is allowed to flow back into the original path.

Flume

Flume is a method used when it's necessary to block the watercourse from one bank to the other. In this method, a pipe is used to maintain downstream flow and water conveyed downstream by the force of gravity.

Methods of Reclamation

Willow Staking

Willow stakes are cuttings from willow trees planted directly into the soil. The stakes grow roots and shoots, which stabilize streambanks, restores riparian vegetation, and provides habitat. Willow stakes also play a crucial role in erosion and sediment control by stabilizing the soil.

Coir Logs

Coir logs are useful in watercourse reclamation primarily for erosion control and vegetation development. They help prevent soil slippage in streambanks that are at a high-risk of erosion or damage by holding the water until sediment settles. In situations where vegetation has been lost along streambanks, coir logs can encourage vegetation development.

Other methods of reclamation include bank armoring with rock (rip rap), erosion control blankets, reseeding, wooden post bank supports. Species at Risk Act (SARA) stream reclamation may include placing deadfall on or over the stream bank to create shade for fish and placing large rocks in the stream to create features and resting spots for aquatic wildlife.



Wooden Post Bank Supports



SARA Watercourse Reclamation

Stories from the Field

Surerus Murphy considers multiple factors such as biosecurity, spill prevention, and erosion and sediment control prior to commencing a watercourse crossing. The preparation of site includes activities such as ensuring all equipment and materials required for the crossing arrive onsite before any in-stream activity commences, as well as limiting vegetation removal, topsoil salvage and grading within riparian areas to what is necessary.

The Coldstream Creek Crossing, a significant watercourse on CGL, was classified as an S3 channel, which is a fish bearing watercourse. The channel was isolated 24/7 throughout the performance of the job with monitoring of the water and pumps around the isolation. At its completion, the crossing was 170m long, with 24.7mm thick pipe, and weighing roughly 125 tons. Watercourse crossings have many environmental factors to consider so making sure that the flow and habitat are faced with minimal disruption is of utmost importance.



Surerus Murphy Key Contacts:

QHSE@surerus-murphy.com

• HR:

recruitment@surerus-murphy.com

- Media & Issues: marketingcommunications@surerus-murphy.com
- Local & Indigenous Engagement: indigenouslocalengagement@surerus-murphy.com



www.surerus-murphy.com | 403.930.1358