BF 71710 Hwy 8 Over Elbow River Side Channel
Hydrotechnical Summary

Channel Capacity :

This channel is a side channel of the Elbow River with the main channel flowing through BF02143 about 100m to the west. The flow through the structure will be defined by the geometry of the structure and the elevation of the tailwater and headwater based on the overall Elbow River hydraulics. Therefore, channel capacity has less meaning than for single or main channels. This side channel appears to have a top-width of about 15m d/s while the main channel is in flood.

Historical Highwater Data :

Headwater for this bridge should be similar to that of BF02143 which has recorded runoff response in 1932, 1967, 1990, and 1995. 1990 HW observations at this structure indicate a significant drop at the inlet and an additional drop at the outlet where the tailwater was lower than the flow in the pipe. Also, airphotos taken close to the 1995 flood peak show a waterfall at the point where water from d/s of the bridge joins the outlet of the culvert, indicating that the tailwater from the channel at this point is lower than at the d/s side of BF02143. A large scour hole formed as a result in 1990 and was filled in with rock.

Basin Runoff Potential :

As this is a side channel, the overall response is governed by the Elbow River (see BF02143).

Conclusion :

A range of structure sizes could be installed at this site and the flow in this side channel will change based on the structure. The existing 4.3m pipe provides freeboard during large runoff responses, but has very high outlet velocities due to the culvert size and the high elevation of the outlet relative to the d/s tailwater. An option to consider for replacement would be a larger round SP with the same crown elevation but lower inverts. This would result in less contraction of the flow and more tailwater influence.