

## Elbow River Bridge Crossing

Alberta Transportation's Southwest Calgary Ring Road project is underway and includes the construction of a highway bridge crossing over the Elbow River. The crossing is located within the Province's Transportation Utility Corridor (TUC) that is upstream of Weaselhead Park and The City's Glenmore Reservoir.

The City and The Province have maintained dialogue throughout the implementation of this project to ensure that flood resiliency is maintained, and that Calgary's drinking water supply is protected. In 2015, The City hired a professional engineering consulting firm to assess river flows, dam safety, erosion and watershed management aspects for the river crossing. This work was performed under direction of The City and funded by the Province.

In order to answer a number of frequently asked questions we have prepared the following FAQ.

### **What is the flow capacity of the bridge opening and channel?**

Provincial criteria require that flow capacity of the bridge channel is greater than the 100 year flood flow. This is estimated to be 954 m<sup>3</sup>/s. The proposed bridge has sufficient capacity to convey the 2013 flood flow rate (1240 m<sup>3</sup>/s) with at least 1 m of clearance between floodwaters and the bridge deck.

If you have any questions, or would like more information about the Southwest Ring Road Project, please **contact 311** or visit **[calgary.ca/swrr](http://calgary.ca/swrr)**.

### **Is there a risk that the embankment could fail during a flood event?**

The embankment is stable up to an extreme flood flow rate of 3500 m<sup>3</sup>/s which is greater than the probable maximum flood (the theoretical maximum flow rate that is physically possible).

### **Will the bridge crossing cause back-up of water during a flood event, increasing risk to Discovery Ridge?**

The proposed bridge opening is wide enough to convey a flood flow rate up to 3500 m<sup>3</sup>/s with no increase to flood levels at Discovery Ridge.

### **Will the opening be blocked by debris during a flood?**

Flood debris such as dislodged trees is not likely to cause a blockage at the bridge opening because the proposed spacing between the bridge piers is wide enough to permit passage of large debris. In addition, the design allows for 10% of the opening area to be blocked while conveying a 100 year flood event.

### **How will the bridge crossing affect the Elbow River in Weaselhead Park?**

The Elbow River changes naturally (i.e. meanders) over time. Continued meandering is expected both upstream and downstream of the bridge crossing. It is anticipated that the natural meandering rate will increase slightly as the channel adapts to the proposed realignment. A baseline assessment has been completed so any potential changes and the rate of

natural channel meandering can be assessed. The City will monitor the Elbow River within Weaselhead Park annually.

### **Will runoff from the bridge and embankment drain to the Elbow River?**

Yes. Drainage from the bridge surface will be collected in two stormwater ponds located in the river valley that will treat runoff before releasing it to the Elbow River. Water discharged back to the river must meet Provincial water quality guidelines.

### **What happens if there is a release of pollutants from vehicles using the bridge?**

The stormwater ponds will be equipped with automated gates that can be closed immediately and remotely in the event of a spill.

### **Can the stormwater ponds be washed-out during a flood?**

The containment dykes surrounding the stormwater ponds will be high enough to prevent overtopping and wash-out up to a 1:200 year flood event. Also, erosion protection is designed to accommodate changes to the river channel.

### **Will the constructed highway embankment and stormwater ponds within the floodplain cause an increase in river flow rates during flood events?**

No. The footprint of the proposed embankment is too small in comparison to the overall catchment area, and the total floodplain storage of the Elbow River to have an impact on flow rates during a flood. In addition, the stormwater ponds will mimic the natural watershed process of collecting and holding runoff from the road and hard surfaces before gradually releasing it to the river. The ponds also protect water quality by reducing the release of sediment and pollutants.

## **Glossary of flood terms**

**Design Flood** – The size of flood that flood-related policies and structures are designed to protect against. In Alberta, flood-related policies, such as Calgary bylaws, are based on a 1:100 year flood. The design flood for structural design depends on the structure, but it is often the 1:100 year flood.

**Flow Rate** – Flow is a measure of the amount of water traveling past a point in a given amount of time. In rivers, the flow of water is typically reported in cubic metres per second ( $m^3/s$ ). A cubic meter is the volume of water contained in a cube of one metre high, one meter wide, and one metre deep. It is equivalent to 1000 litres of water and weighs a metric tonne. Typical flow rates on the Elbow River are 25  $m^3/s$  in spring and 3  $m^3/s$  in winter.

**Watershed** – The entire land area that drains to a river. The Elbow River watershed extends up into the Rocky Mountains beyond Bragg Creek. Calgary gets its water from both the Elbow River and Bow River watersheds.

**1 in 100 year flood** – A large flood that has a one per cent chance of occurring in any given year. It can also be called a 1 per cent-flood or a 100-year flood, and is often written as “1:100 year flood”. Although called a “1 in 100 year flood” there will not necessarily be one every 100 years. It is even possible to have more than one 1 in 100 year flood in the same year. On the Elbow River, the estimated flow rate coming into the Glenmore Reservoir in a 1:100 year flood is about 950  $m^3/s$ .

For more information on The City's flood mitigation activities, visit [calgary.ca/floodinfo](http://calgary.ca/floodinfo)