BF 77547 Hwy 22X Over Bow River
Hydrotechnical Summary

Channel Capacity:

S = 0.002
B = 105 m, h = 4.0 m, T_h = 141 m
Use AT equation

Above parameters based on Bridge Conceptual Design Report (AE, June 2017)

At Bank Height: Y = 4.0 m, V = 2.7 m/s, Q = 1350 cms
At Channel Capacity: Y = 5.0 m, V = 3.2 m/s, Q = 2020 cms

Historical Highwater Data:

AEP surveyed on June 3, 1982, HWL = 995.22 m. As constructed drawing 6480-C showed design Q = 3700 cms and design HWL = 999.44 m.

WSC Gauge 05BH004 on the Bow River (DA ~ 7870 km^2, 1911 – Now) reports Q ~ 1840 cms (2013), 1520 cms (1932), 1320 cms (1929) and 1130cms (1915). The gauging record in 1929 at Q ~ 1320 cms shows a stage rise ~ 3.5 m and a mean depth ~ 4 m. Historic photos from Calgary show higher events in 1879, 1897, and 1902, with estimates of Q > 2000 cms.

WSC Gauge 05BJ001 on the Elbow River (DA ~ 1240 km^2, 1908 – Now) reports Q ~ 700 cms (2013), 382 cms (1929), and 331 cms (1923). Dam inflow estimates in 2013 (Q ~ 1240 cms).

The combined peak Q of 05BH004 and 05BJ001 at the bridge site in 2013 was estimated ~ 2540 cms. July 2013 measured HWL ~ 998.54 m.

Basin Runoff Potential:

Gross DA = 10700 km^2, runoff potential method is not applicable.

Golder Associates completed a hydrologic assessment in 2014 and a calibrated hydraulic model in 2015. The 1:100 year flood peak = 3360 cms and the corresponding water elevation = 999.21 m.

Conclusion:

Historical observations govern. Recommended parameters based on the recent hydrologic assessment and hydraulic model:

Design HWL = 999.21 m, V = 4.35 m/s, Q = 3360 cms