BF 78204 Hwy 584 Over James River
Hydrotechnical Summary

Channel Capacity :

S = 0.0038
B = 24 m, h = 2.1 m, T_h = 40 m
Use AT equation

At Bank Height : Y = 2.1 m, V = 2.1 m/s, Q = 140 cms
At Channel Capacity : Y = 3.1 m, V = 2.9 m/s, Q = 310 cms

Historical Highwater Data :

DD812 refers to a HW event in June 1972 with Y = 2.1m and Qest = 140cms. HW was also observed in July 1986 with Y = 1.9m and V = 2.5m/s. The current bridge was designed based on Q = 250cms and Y = 3.0m.

WSC Gauge 05CA002 (DA = 821km^2, 1966 – Now) is located d/s and reports HW events in June 1990 (Q = 237cms), June 1972 (Q = 215cms), July 1981 (Q = 178cms), July 1986 (Q = 170cms), June 1970 (Q = 151cms), and July 1999 (Q = 139cms). The largest gauged flow is Q = 203cms in June 1990 (Y = 2.1m, T = 45m, A = 80m^2). The largest storms in the database for this area are June 1970 with 120mm of rainfall, and June 1928 and July 1965 with 105mm.

Basin Runoff Potential :

d = 70 mm, T_p = 20 hrs, q = 1.0 cms/km^2
Gross DA = 550 km^2.
Q_p = 550 cms.

Conclusion :

The channel capacity estimate is consistent with historic observations and is within the basin runoff potential.

Recommended parameters : Y = 3.1 m, V = 2.9 m/s, Q = 310 cms.