

HYDROLOGY REPORT

The design and check discharges were provided by the Department's Environmental Office – Hydrology Section. These discharges are based on a drainage area of 6.00 mi² with 29.45 percent storage from the National Wetlands Inventory.

The available FEMA data was researched and no FIS exists for Northfield Township. There are no USGS stream gages in Washington County nor do the existing plans show a high-water mark; no historical flood data available.

Bog Stream is located over 18 miles from the Atlantic Ocean and is subsequently not subject to tidal influences.

Additional information can be found in Appendix E

SUMMARY

Drainage Area	6	mi ²
Q25	233.4	ft ³ /s
Design Discharge (Q50)	260.1	ft ³ /s
Check Discharge (Q100)	304.7	ft ³ /s
Scour Discharge (Q500)	392.5	ft ³ /s
Ordinary Highwater (Q1.1)	147.21	ft

Reported by: TranSystems
Date: April, 2018

HYDRAULIC REPORT

As previously stated, no FEMA floodway has been established and therefore no FEMA coordination is required. The source of Bog Stream is Bog Lake (located approximately 1.1 miles upstream of the project location). The area between Bog Lake to the project limits and the area downstream of the project limits is relatively flat; however, the slope increases significantly within the surveyed limits. Being such, both existing and proposed models are based on normal depth and the bridge lengths were shortened for effective flow based on the respective skew. Utilizing a longer span with the respective deeper beam will lower water surface elevations by 0.06 feet and provide 1.59 feet of clearance during the 50-Year Storm event. Both the existing and proposed conditions were modeled using the discharges reported previously.

Both the existing and proposed stream cross sections were modeled using project survey data and Washington County's 10ft contours.

Summary

The appropriate hydraulic and hydrological procedures were used in this study's development. No regulatory floodway has been established for Bog Stream. Therefore, no FEMA or Community coordination is required. The results are reasonable and within MaineDOT guidelines for backwater values, velocities and scour depths. The proposed bridge was selected as the minimum length bridge that provides a 20-degree skew, decrease in water surface elevations utilizing a deeper beam, and acceptable setback from the vertical abutments to the channel banks. The proposed bridge provides acceptable velocity values and 1.59 feet of clearance from the 50-Year Storm.

Headwater/Vel./Clearance	Existing Bridge <i>26 ft. span (65 degrees)</i>	Proposed Bridge <i>62 ft. span (20 degrees)</i>
Headwater El. @ Q50	148.98	148.92
Headwater El. @ Q100	149.25	149.18
Discharge Velocity @Q50	4.57	4.16
Discharge Velocity @Q100	4.93	4.41
Ordinary High Water (Q1.1)	147.21	147.21
Discharge Velocity @ Q1.1	2.06	2.05
Clearance @Q50	2.53	1.59
Clearance @ Q100	2.26	1.33