

HYDROLOGIC AND HYDRAULIC ANALYSIS REPORT

LOCATION

Project : Route 619 over Saylers Creek
Route : 0619-073-569
County/City : Prince Edward County
Waterway : Saylers Creek

PREPARED BY

Name : John H. Matthews P.E.
Organization : VDOT
Date : 11/24/14

STRUCTURE DESCRIPTION

Abutment A Station: 513+11 Finished Grade Elevation 282.27 ft.

Abutment B Station: 514+18 Finished Grade Elevation 281.90 ft.

Minimum Low Chord Elevation 279.0 ft.

Skew 90 to centerline 0 to flood flow

Span Length: 106.75'

Abutment Type: Vertical Abutment

Number/Type Piers: None

HYDROLOGIC/HYDRAULIC DATA

Drainage Area 22.8 Sq. Mi.

HISTORICAL DATA

High Water Elevation 290.6 ft. Date of Occurrence August 1940

Estimated Discharge >>11,300 cfs.

Estimated Exceedence Probability <<0.2 %

HYDRAULIC PERFORMANCE

The data presented herein is the result of statistical analysis and indicates an approximate estimate of the performance of this facility.

Discharge (cfs)	Estimated Exceedence Probability (%)	Change in existing flood levels (ft.)	Flood stage upstream of bridge (ft.)	Velocity thru Bridge Structure (ft/s)
1,010	50%	-0.2	275.7	2.4
1,940	20%	-0.2	277.7	3.2
2,780	10%	+0.1	278.9	3.8
4,110	4%	-0.1	279.4	4.1
5,290	2%	-0.2	279.7	6.0
6,640	1% Natural	-0.7	280.0	6.5
	1% Floodway			
11,300	0.2%	+0.2	281.8	6.8

DESIGN SUMMARY

	Exceedence Probability (%)	Stage Elevation (ft.)	
Design Flood	NA		
Overtopping Flood	10	278.9	
Base Flood	1	280.0	
Ordinary High Water		271.1	

DEBRIS POTENTIAL

While the upstream flood plain is wooded there is only limited evidence that debris is a concern at this bridge. At the existing old crossing on Little Sayers Creek there is an accumulation of some large woody debris.

ABUTMENT SLOPE PROTECTION RECOMMENDATIONS

26" Class I Dry Riprap over 4" no. 25 or 26 aggregate over filter cloth will be hydraulically satisfactory.

SCOUR PLOTS

No plot provided as DGN file was not available see table below.

Estimated Bridge Scour Bed Elevation

Event	Abutment A		Abutment B	
	+ Cont.	Only	+ Cont.	Only
5 yr	273.0	273.5	274.3	274.8
10-yr	270.0	273.5	271.3	274.8
50-yr	269.0	271.4	272.7	272.7
100-yr	268.1	270.7	272.0	272.0
500-yr	265.9	266.9	268.2	268.2

CAUSEWAYS

Not determined at this time

STREAM BANK STABILIZATION

The banks should reestablish themselves to the natural conditions. Disturbed areas outside the bridge should be seeded.

COMMENTS

This analysis is only applicable to the structures(s) and approaches described. Any changes in these conditions may invalidate this analysis and should be reviewed by this office.

This design represents the smallest structure practicable for use at this site.

If this project is an interstate or other **NHS** project and is expected to be in excess of \$1,000,000.00, please notify the **FHWA** that (1) no hydraulic impacts are anticipated or (2) the following hydraulic impacts are anticipated:

If you have any questions or need additional information, please contact John Matthews at 804-786-4031 or via electronic mail at John.Matthews@VDOT.Virginia.gov. The completed "**CONFIRMATION OF DESIGN**" should also be sent to John Matthews.

HYDROLOGIC DATA SHEET

The information presented hereon is to be transcribed to the Hydrologic Data sheet contained in the plan assembly.

LOCATION

Project : Route 619 over Saylers Creek
Route : 619
County/City : Prince William County
Waterway : Saylers Creek

DESCRIPTION

Sheet No. 513+11 Station

Drainage Area 22.8 sq. mi.

Structure Size 1 span at 160.5 feet

BASE FLOOD

Discharge 6,640 cfs

Stage Elevation 208.0 ft.

1' Freeboard Event

Discharge 2,780 cfs

Estimated Exceedence Probability 10 %

Stage Elevation 278.9 ft.

OVERTOPPING FLOOD

Stage Elevation 278.9 ft.

Estimated Exceedence Probability 10 %

HISTORICAL DATA

Date August 1940

Stage Elevation 290.6 ft.

Estimated Exceedence Probability <<0.2 %

REMARKS

CONFIRMATION OF DESIGN

The bridge designer will complete this form and forward it to the Hydraulics Unit confirming that the design that was analyzed is being used.

LOCATION

Project : Route 619 over Saylers Creek
Route : 619
County/City : Prince Edward
Waterway : Saylers Creek

STRUCTURE DESCRIPTION

Abutment A Station: _____ Finished Grade Elevation _____ ft. (m)

Abutment B Station: _____ Finished Grade Elevation _____ ft. (m)

Minimum Low Chord Elevation _____ft. (m)

Skew _____ to centerline _____ to flood flow

Span Length

Abutment Type

Number/Type Piers