

# BSDMS Summary Report

51 Bush River at U.S. 460 near Rice, VA

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## Site Location:

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**Site ID:** 51

**Site Name:** Bush River at U.S. 460 near Rice, VA

**County:** Prince Edward

**Nearest City:** Rice

**State:** VA

**Latitude:** 371642

**Longitude:** 782104

**USGS Station ID:** 2039550

**Route Number:** 460

**Route Class:** US

**Service Level:** Mainline

**Route Direction:** West

**Highway Mile Point:**

**Stream Name:** Bush River

**River Mile:**

**Contact:**  
USGS  
3600 West Broad Street Suite 606  
Richmond, VA 23230  
(804) 771-2427

**Publication:**  
Hayes, Donald C., 1993, Site  
Selection and Collection of Bridge-  
Scour Data in Delaware, Maryland,  
and Virginia:  
U.S. Geological Survey  
Water-Resources Investigations  
Report 93-4017, 23 p.

## Site Description:

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This site is located at the U.S. Highway 460 westbound two-lane bridge crossing the Bush River, about 3 miles west of Rice, Virginia. There are two bridges at this site. The eastbound bridge (also two lanes but older and narrower than the westbound bridge) is located 150 ft upstream (approximately the width of the westbound bridge opening). No measurements were made at the eastbound bridge because of the narrow width and traffic load. The westbound bridge is 187.5 ft long and is supported by four concrete piers on pile caps and steel piles. The 2.5-ft-wide, 43-ft-long piers are continuous webs and are spaced 37.5 ft apart. The roadway is elevated and there are no side channels, therefore all flow is under the bridge. The normal stream width is about 40 ft, but can spread to the full bridge width during high flows. The drainage area at this site is 64 square miles. Bush River joins Briery River 0.2 miles downstream. Briery River appears to cause some backwater and reduced velocities at the bridge site. The bed material at the bridge site, probably fill material, has more sand and clay than the bed material upstream from the bridge. This site was discontinued because of the small drainage area and backwater conditions.

## Elevation Reference

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**Datum:** MSL

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MSL (ft):

## Description of Reference Elevation:

USCGS Benchmark stamped F443 1965 is located about 2.8 miles east along U.S. highway 460 from the post office in Farmville, Virginia to the mark set in the top of the northeast wingwall of the eastbound bridge over the Bush River, 18.0 ft northeast of the centerline of the highway and about level with the highway. The elevation is 301.768 ft MSL.

RM1--A chiseled notch painted blue on the upstream handrail near the centerline of the main channel 89 ft west of the east end of the westbound bridge is at elevation 307.28 ft MSL.

RM2--A chiseled notch painted blue on the downstream handrail near the centerline of the main channel, 87 ft west of east end of the westbound bridge is at elevation 307.22 ft MSL.

RM3-- An HP nail in the powerline pole at the left downstream end of the westbound bridge, 35 ft from downstream edge of road and 2 ft above ground, is at elevation 293.66 ft MSL.

## Stream Data

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Drainage Area (sq mi):	64	Floodplain Width:	Narrow
Slope in Vicinity(ft/ft):	0.0011	Natural Levees:	Little
Flow Impact:	Straight	Apparent Incision:	None
Channel Evolution	Unknown	Channel Boundary:	Alluvial
Armoring:	None	Banks Tree Cover:	Medium
Debris Frequency:	None	Sinuosity:	Sinuous
Debris Effect:	None	Braiding:	None
Stream Size:	Small	Anabranching:	None
Flow Habit:	Perennial	Bars:	Narrow
Bed Material:	Sand	Stream Width Variability:	Equiwidth
Valley Setting:	Low		

## Roughness Data

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### Manning's n Values

	Left Overbank	Channel	Right Overbank
High:			
Typical	0.05	0.035	0.05
Low:			

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## Bed Material

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Measurement Number	Yr	Mo	Dy	Sampler	D95 (mm)	D84 (mm)	D50 (mm)	D16 (mm)	SP	Shape	Cohesion
1	1991	4	4	SCOOP	10.5	4.8	0.92	0.29	2.65		Non-Cohesive

## Bed Material Comments

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Measurement No: 1

## Bridge Data

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Structure No: 1031

Length(ft): 187.5

Width(ft):

Number of Spans: 5

Vertical Configuration: Unknown

Low Chord Elev (ft): 300.58

Upper Chord Elev (ft): 301.57

Overtopping Elev (ft): 303.71

Skew (degrees): 0

Guide Banks: None

Waterway Classification: Main

Year Built: 1965

Avg Daily Traffic:

Plans on File: Yes

Parallel Bridges: Yes

Upstream/Downstream: Downstream

Continuous Abutment: No

Distance Between Centerlines: 150

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Distance Between Pier Faces: 150

## Bridge Description:

The westbound bridge is 187.5 ft long and is supported by four concrete piers on pile caps and steel piles. The 2.5-ft-wide, 43-ft-long piers are continuous webs and are spaced 37.5 ft apart. The roadway is elevated and there are no side channels, therefore all flow is under the bridge. There are two bridges at this site. The eastbound bridge (also two lanes but older and narrower than the westbound bridge) is located 150 ft upstream (approximately the width of the westbound bridge opening). No measurements were made at the eastbound bridge because of the narrow width and traffic load.

## Abutment Data

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Left Station: 185  
Right Station: 0  
Left Skew (deg): 0  
Right Skew (deg) 0  
Left Abutment Length (ft): 64  
Right Abutment Length (ft) 64  
Left Abutment to Channel Bank (ft): 0  
Right Abutment to Channel Bank (ft): 100

Left Abutment Protection:

Right Abutment Protection

Contracted Opening Type: IV  
Embankment Skew (deg): 0  
Embankment Slope (ft/ft): 0  
Abutment Slope (ft/ft) 0  
Wingwalls: Yes  
Wingwall Angle (deg): 30

## Pier Data

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Pier ID	Bridge Station(ft)	Alignment	Highway Station	PierType	# Of Piles	Pile Spacing(ft)
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1	150	0	14420	Single
2	112.5	0	14460	Single
3	75	0	14500	Single
4	37.5	0	14540	Single

Pier ID	Pier Width(ft)	Pier Shape	Shape Factor	Length(ft)	Protection	Foundation
1	2.5	Round		43	None	Piles
2	2.5	Round		43	None	Piles
3	2.5	Round		43	None	Piles
4	2.5	Round		43	None	Piles

Pier ID	Top Elevation(ft)	Bottom Elevation(ft)	Foot or Pile Cap Width(ft)	Cap Shape	Pile Tip Elevation(ft)
1	285.75	282.75	5	Square	265
2	285.56	282.56	5	Square	262
3	285.36	282.36	5	Square	259
4	285.17	282.17	5	Square	258

## Pier Description

**Pier ID** 1

Each pier, 2.5 ft wide and 43 ft long, is a continuous web resting on a pile cap. Piles are arranged in two rows of seven piles (seven pairs of piles). The two rows of piles are 2.5 ft apart, and the pile pairs are 7.0 ft apart.

**Pier ID** 2

See pier 1.

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Pier ID 3

See pier 1

Pier ID 4

See pier 1

## Pier Scour Data

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Pier ID	Date	Time	USOrDS
2	5/29/90	12:00	Upstream

Pier ID	Scour Depth	Accuracy (ft)	Side Slope (ft/ft)	TopWidth (ft)	Apprch Vel (ft/s)	Apprch Depth(ft)	Effective Pier Width	Skew to Flow(deg)
2	2.5	1	3.5	17	2.1	8.9	2.5	0

PierID	Sediment Transport	Bed Material	BedForm	Trough (ft)	Crest (ft)	Sigma	Debris Effects
2	Unknown	Unknown	Unknown			4.1	Unknown

PierID	D95 (mm)	D84 (mm)	D50 (mm)	D16 (mm)
2	10.5	4.8	0.92	0.29

## Pier Scour Comments

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Pier ID	2	Time:	12:00	US/DS:	Upstream
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The scour depth is probably not valid where the velocity is zero (remnant hole).

## Abutment Scour

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## ContractionScour

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## Stage and Discharge Data

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Peak Discharge					Flow (cfs)	Qacc	Peak Stage					Stage (ft)	Water Temp (C)	Return Period(yr)
year	mo	dy	hr	mi			year	mo	dy	hr	mi			

## Hydrograph

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Hydrograph Number	Year	Month	Day	Hr	Min	Sec	Stage(ft)	Discharge (cfs)
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## Supporting Files

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