

# BSDMS Summary Report

56 North Fork Holston River at S.R. 633 near North Holston, VA

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## Site Location:

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**Site ID:** 56

**Site Name:** North Fork Holston River at S.R. 633 near North Holston, VA

**County:** Smyth

**Nearest City:** North Holston

**State:** VA

**Latitude:** 365429

**Longitude:** 814208

**USGS Station ID:** 3487990

**Route Number:** 633

**Route Class:** State

**Service Level:** Mainline

**Route Direction:** NA

**Highway Mile Point:**

**Stream Name:** North Fork Holston 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 S.R. 663 bridge crossing the North Fork Holston River, 1 mile southeast of North Holston, Virginia and 2 miles southwest of Broadford, Virginia. The bridge, 208 ft long and 29 ft wide, has three concrete piers spaced approximately 50 ft apart. The three piers, 2 ft wide and 29.5 ft long, are continuous webs supported by footers on bedrock. The abutments are supported by piles and are protected by flow-through riprap aprons.

## Elevation Reference

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**Datum:** MSL

**MSL (ft):**

### Description of Reference Elevation:

RM1--Elevation 1748.42 ft msl. Chiseled square on northwest abutment of bridge, top at northwest corner.

MP1--elevation 1752.06 ft MSL. Chiseled V on upstream concrete rail 74 ft from south end (left bank) of bridge.

MP2--Elevation 1751.98 ft msl. Chiseled V on downstream concrete rail 74 ft from south end (left bank) of bridge.

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MSL elevations were computed from elevation of top of piers from bridge plans and field survey.

## Stream Data

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|  |            |  |            |
|--|------------|--|------------|
| <b>Drainage Area</b><br>(sq mi):           |            | <b>Floodplain Width:</b>                   | Narrow     |
| <b>Slope in</b><br><b>Vicinity(ft/ft):</b> | 0.001      | <b>Natural Levees:</b>                     | Little     |
| <b>Flow Impact:</b>                        | Straight   | <b>Apparent Incision:</b>                  | None       |
| <b>Channel Evolution</b>                   | Unknown    | <b>Channel Boundary:</b>                   | Alluvial   |
| <b>Armoring:</b>                           | None       | <b>Banks Tree Cover:</b>                   | High       |
| <b>Debris Frequency:</b>                   | Occasional | <b>Sinuosity:</b>                          | Meandering |
| <b>Debris Effect:</b>                      | Local      | <b>Braiding:</b>                           | None       |
| <b>Stream Size:</b>                        | Medium     | <b>Anabranching:</b>                       | None       |
| <b>Flow Habit:</b>                         | Perennial  | <b>Bars:</b>                               | Narrow     |
| <b>Bed Material:</b>                       | Gravel     | <b>Stream Width</b><br><b>Variability:</b> | Equiwidth  |
| <b>Valley Setting:</b>                     | Moderate   |  |            |

## Roughness Data

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### Manning's n Values

|         | Left Overbank | Channel | Right Overbank |
|---------|---------------|---------|----------------|
| High:   |               |         |                |
| Typical |               | 0.045   | 0.035          |
| Low:    |               |         |                |

## Bed Material

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| Measurement<br>Number | Yr   | Mo | Dy | Sampler | D95<br>(mm) | D84<br>(mm) | D50<br>(mm) | D16<br>(mm) | SP   | Shape | Cohesion     |
|-----------------------|------|----|----|---------|-------------|-------------|-------------|-------------|------|-------|--------------|
| 1                     | 1992 | 9  | 21 | GRID    | 180         | 75          | 37          | 18          | 2.65 |       | Non-Cohesive |

### Bed Material Comments

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Measurement No: 1

## Bridge Data

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Structure No: 6042  
Length(ft): 208  
Width(ft): 29  
Number of Spans: 4  
Vertical Configuration: Unknown  
Low Chord Elev (ft): 1745.4  
Upper Chord Elev (ft): 1746  
Overtopping Elev (ft): 1749  
Skew (degrees): 0  
Guide Banks: None  
Waterway Classification: Main  
Year Built: 1977  
Avg Daily Traffic:  
Plans on File: Yes  
Parallel Bridges No  
Upstream/Downstream: Unknown  
Continuous Abutment: No  
Distance Between Centerlines:  
Distance Between Pier Faces:

### Bridge Description:

The bridge, 208 ft long and 29 ft wide, has three concrete piers spaced approximately 50 ft apart. The three piers, 2 ft wide and 29.5 ft long, are continuous webs supported by footers on bedrock. The piers are aligned with the flow at most stages. The abutments are supported by piles and are protected by flow-through riprap aprons.

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## Abutment Data

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Left Station: 0  
Right Station: 198  
Left Skew (deg): 0  
Right Skew (deg): 0  
Left Abutment Length (ft): 55  
Right Abutment Length (ft): 45  
Left Abutment to Channel Bank (ft): 20  
Right Abutment to Channel Bank (ft): 45  
Left Abutment Protection:  
Right Abutment Protection:  
Contracted Opening Type: III  
Embankment Skew (deg): 0  
Embankment Slope (ft/ft): 1.5  
Abutment Slope (ft/ft): 1.5  
Wingwalls: No  
Wingwall Angle (deg): 0

## Pier Data

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| Pier ID | Bridge Station(ft) | Alignment | Highway Station | PierType | # Of Piles | Pile Spacing(ft) |
|---------|--------------------|-----------|-----------------|----------|------------|------------------|
| 1       | 50                 | 0         | 1951.08         | Single   | 0          |                  |
| 2       | 102                | 0         | 2001.08         | Single   | 0          |                  |
| 3       | 150                | 0         | 2051.08         | Single   | 0          |                  |

  

| Pier ID | Pier Width(ft) | Pier Shape | Shape Factor | Length(ft) | Protection | Foundation |
|---------|----------------|------------|--------------|------------|------------|------------|
| 1       | 2              | Round      |              | 29.5       | None       | Poured     |
| 2       | 2              | Round      |              | 29.5       | None       | Poured     |

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| 3       | 2                 | Round                | 29.5                       | None      | Poured                 |
|---------|-------------------|----------------------|----------------------------|-----------|------------------------|
| Pier ID | Top Elevation(ft) | Bottom Elevation(ft) | Foot or Pile Cap Width(ft) | Cap Shape | File Tip Elevation(ft) |
| 1       | 1729.1            | 1726.1               | 4                          | Square    |                        |
| 2       | 1728.8            | 1725.8               | 4                          | Square    |                        |
| 3       | 1726.7            | 1723.7               | 4                          | Square    |                        |

## Pier Description

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Pier ID 1

The three concrete piers, 2 ft wide and 29.5 ft long, are continuous webs supported by square footers keyed into bedrock. The piers are aligned with the flow at most stages.

Pier ID 2

See pier 1.

Pier ID 3

See pier 1.

## Pier Scour Data

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| Pier ID | Date    | Time  | USOrDS   |
|---------|---------|-------|----------|
| 1       | 5/29/90 | 11:00 | Upstream |
| 2       | 5/29/90 | 11:00 | Upstream |
| 2       | 3/30/91 | 10:00 | Upstream |
| 2       | 2/26/92 | 10:00 | Upstream |
| 2       | 3/4/93  | 13:30 | Upstream |
| 2       | 3/4/93  | 17:30 | 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) |
|---------|-------------|---------------|--------------------|---------------|-------------------|------------------|----------------------|-------------------|
| 1       | 0.2         | 1             | 47                 | 19            | 4.08              | 7.1              | 2                    | 0                 |

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|   |     |   |    |    |      |      |   |   |
|---|-----|---|----|----|------|------|---|---|
| 2 | 0.4 | 1 | 19 | 15 | 4.6  | 7.9  | 2 | 0 |
| 2 | 0.8 | 1 | 10 | 17 | 4.47 | 8.5  | 2 | 0 |
| 2 | 1   | 1 | 10 | 20 | 4.6  | 9.7  | 2 | 0 |
| 2 | 0.8 | 1 | 12 | 20 | 4.79 | 9.9  | 2 | 0 |
| 2 | 1.2 | 1 | 8  | 19 | 5.1  | 10.7 | 2 | 0 |

| PierID | Sediment Transport | Bed Material | BedForm | Trough (ft) | Crest (ft) | Sigma | Debris Effects |
|--------|--------------------|--------------|---------|-------------|------------|-------|----------------|
| 1      | Unknown            | Non-cohesive | Unknown |             |            | 2     | Unknown        |
| 2      | Unknown            | Unknown      | Unknown |             |            | 2     | Unknown        |
| 2      | Unknown            | Unknown      | Unknown |             |            | 2     | Unknown        |
| 2      | Unknown            | Unknown      | Unknown |             |            | 2     | Unknown        |
| 2      | Unknown            | Unknown      | Unknown |             |            | 2     | Unknown        |
| 2      | Unknown            | Unknown      | Unknown |             |            | 2     | Unknown        |

| PierID | D95 (mm) | D84 (mm) | D50 (mm) | D16 (mm) |
|--------|----------|----------|----------|----------|
| 1      | 180      | 75       | 37       | 18       |
| 2      | 180      | 75       | 37       | 18       |
| 2      | 180      | 75       | 37       | 18       |
| 2      | 180      | 75       | 37       | 18       |
| 2      | 180      | 75       | 37       | 18       |
| 2      | 180      | 75       | 37       | 18       |

## Pier Scour Comments

Pier ID 1 Time: 11:00 US/DS: Upstream

Accuracy of local scour estimate is probably 1 foot. Estimate is maximum scour for this cross section only and may not represent the maximum local scour at the pier.

Pier ID 2 Time: 11:00 US/DS: Upstream

Pier ID 2 Time: 10:00 US/DS: Upstream



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## Hydrograph

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| Hydrograph<br>Number | Year | Month | Day | Hr | Min | Sec | Stage(ft) | Discharge<br>(cfs) |
|----------------------|------|-------|-----|----|-----|-----|-----------|--------------------|
|----------------------|------|-------|-----|----|-----|-----|-----------|--------------------|

## Supporting Files

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