BSDMS Summary Report

71 Walnut Creek at C.R. 17 near Ashville, OH

Site Location:

Site ID: 71

Site Name: Walnut Creek at C.R. 17 near Ashville, OH

County: Pickaway

Nearest City: Ashville

State: OH

Latitude: 394609

Longitude: 825442

USGS Station ID:

Route Number: 17

Route Class: County

Service Level: Alternate

Route Direction: North

Highway Mile Point:

Stream Name: Walnut Creek

River Mile:

Contact:

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Publication:

Jackson, K.S., 1996, Evaluation of bridge-scour data at selected sites in Ohio: U.S. Geological Survey Water-Resources Investigations Report 97-4182.

Site Description:

This site is located on CR 17 (Walnut Cr. Pike Rd) over Walnut Cr., Ashville, Pickaway County, Ohio. Bridge is maintained by Pickaway County Engineers Office. Bridge is located within a relatively straight reach of Walnut Creek. Bed-material samples were collected during annual low-flow surveys.
Notes: All piers are referenced numerically, increasing from left to right, when viewing the upstream face of the bridge while facing in the downstream direction.
Slope in Vicinity (reported in Stream Site Data) is estimated from USGS 7.5-minute quadrangle topographic maps.
Water-surface slope (if reported in Pier Scour Data comments section) is the measured slope between water surfaces at the approach and bridge sections during the scour measurement.

Elevation Reference

Datum: MSL

MSL (ft):

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Description of Reference Elevation:

RM1 - Chiseled square on streamward side of left upstream wingwall.
MSL elevation = 714.83 ft

Stream Data

Drainage Area (sq mi):	216	**Floodplain Width:**	Narrow
Slope in Vicinity(ft/ft):	0.00068	**Natural Levees:**	Unknown
Flow Impact:	Straight	**Apparent Incision:**	None
Channel Evolution	Premodified	**Channel Boundary:**	Alluvial
Armoring:	Partial	**Banks Tree Cover:**	Medium
Debris Frequency:	Occasional	**Sinuosity:**	Sinuous
Debris Effect:	Local	**Braiding:**	Locally
Stream Size:	Small	**Anabranching:**	None
Flow Habit:	Perennial	**Bars:**	Unknown
Bed Material:	Gravel	**Stream Width Variability:**	Equiwidth
Valley Setting:	Low		

Roughness Data

Manning's n Values

	Left Overbank	Channel	Right Overbank
High:	0.08	0.055	0.08
Typical	0.07	0.045	0.07
Low:	0.06	0.038	0.06

Bed Material

Measurement Number	Yr	Mo	Dy	Sampler	D95 (mm)	D84 (mm)	D50 (mm)	D16 (mm)	SP	Shape	Cohesion
AP-1	1993	10	7		27	20	8	0.9	2.65		Unknown
AP-2	1994	6	20		13.9	11	1.29	0.17	2.65		Unknown

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BR-1	1990	9	25	17	8.5	1.4	0.3	2.65	Unknown
BR-2	1991	6	18	15	7.7	1.93	0.59	2.65	Unknown
BR-3	1992	6	27	13	3	1.5	0.15	2.65	Unknown
BR-4	1993	10	7	65	50	1.4	0.57	2.65	Unknown
BR-5	1994	6	20	10.5	4.7	0.9	0.18	2.65	Unknown
P1-1	1990	9	25	12	5.7	1.65	0.57	2.65	Unknown
P1-2	1991	6	18	29	17	5.69	0.48	2.65	Unknown
P1-3	1992	6	27	23	16	6.8	1.2	2.65	Unknown
P1-4	1993	10	7	16	9.6	2.6	0.59	2.65	Unknown
P1-5	1994	6	20	9.2	5.4	1.85	0.07	2.65	Unknown
P2-1	1991	6	18	0.34	0.2	0.04	0.007	2.65	Unknown
P2-2	1992	6	27	0.26	0.1	0.03	0.005	2.65	Unknown
P2-3	1993	10	7	0.29	0.1	0.05	0.009	2.65	Unknown
P2-4	1994	6	20	5.4	0.5	0.09	0.01	2.65	Unknown

Bed Material Comments

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Measurement No: AP-1

Approach-section composite sample

Measurement No: AP-2

Approach-section composite sample

Measurement No: BR-1

Bridge-section composite sample, collected along the upstream bridge face.

Measurement No: BR-2

Bridge-section composite sample, collected along the upstream bridge face.

Measurement No: BR-3

Bridge-section composite sample, collected along the upstream bridge face.

Measurement No: BR-4

Bridge-section composite sample, collected along the upstream bridge face.

Measurement No: BR-5

Bridge-section composite sample, collected along the upstream bridge face.

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Measurement No: P1-1

Sample collected at the upstream face of pier 1

Measurement No: P1-2

Sample collected at the upstream face of pier 1

Measurement No: P1-3

Sample collected at the upstream face of pier 1

Measurement No: P1-4

Sample collected at the upstream face of pier 1

Measurement No: P1-5

Sample collected at the upstream face of pier 1

Measurement No: P2-1

Sample collected at the upstream face of pier 2

Measurement No: P2-2

Sample collected at the upstream face of pier 2

Measurement No: P2-3

Sample collected at the upstream face of pier 2

Measurement No: P2-4

Sample collected at the upstream face of pier 2

Bridge Data

Structure No: PIC-CR7-15

Length(ft): 155

Width(ft): 26

Number of Spans: 3

Vertical Configuration: Horizontal

Low Chord Elev (ft): 704

Upper Chord Elev (ft): 707

Overtopping Elev (ft): 707

Skew (degrees): 40

Guide Banks: None

Waterway Classification: Unknown

Year Built: 1953

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:

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This bridge is constructed of concrete and steel I-beams, and has solid-wall round-nose piers. Plas state constructed in 1953. All piers are referenced from the left to right abutments when looking downstream.

Abutment Data

Left Station: 301.8341

Right Station: 303.4659

Left Skew (deg): 0

Right Skew (deg) 0

Left Abutment Length (ft): 93.2

Right Abutment Length (ft) 44.7

Left Abutment to Channel Bank (ft): 20

Right Abutment to Channel Bank (ft): 50

Left Abutment Protection:

Right Abutment Protection

Contracted Opening Type: I

Embankment Skew (deg): 0

Embankment Slope (ft/ft): 1.5

Abutment Slope (ft/ft) 2

Wingwalls: Yes

Wingwall Angle (deg): 50

Pier Data

Pier ID	Bridge Station(ft)	Alignment	Highway Station	PierType	# Of Piles	Pile Spacing(ft)
1	48	0	302.35	Single	16	4.5
2	108	0	302.95	Single	16	4.5

Pier ID	Pier Width(ft)	Pier Shape	Shape Factor	Length(ft)	Protection	Foundation
1	2	Round		33.33	None	Piles

2	2	Round	33.33	None	Piles

Pier ID	Top Elevation(ft)	Bottom Elevation(ft)	Foot or Pile Cap Width(ft)	Cap Shape	Pile Tip Elevation(ft)
1	691	688	5.66	Square	674
2	691	688	5.66	Square	674

Pier Description

Pier ID 1

This concrete pier is a solid wall with round nose.

Pier ID 2

This concrete pier is a solid wall with round nose.

Pier Scour Data

Pier ID	Date	Time	USOrDS
1	7/13/92	12:30	Upstream
1	7/17/92	15:00	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)
1	1.5	0.5	7.3	20	2.8	6.7	2	0
1	0.9	0.5	7.2	13	3.8	10.1	2	0

PierID	Sediment Transport	Bed Material	BedForm	Trough (ft)	Crest (ft)	Sigma	Debris Effects
1	Live-bed	Non-cohesive	Unknown			3.65	Insignificant
1	Live-bed	Non-cohesive	Unknown			3.65	Moderate

PierID	D95 (mm)	D84 (mm)	D50 (mm)	D16 (mm)
1	23	16	6.8	1.2
1	23	16	6.8	1.2

Pier Scour Comments

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Pier ID 1 **Time:** 12:30 **US/DS:** Upstream

Bed-material sample collected during low flow 6/27/92

Pier ID 1 **Time:** 15:00 **US/DS:** Upstream

Bed-material sample collected during low flow 6/27/92

Abutment Scour

ContractionScour

Measurement Number	Contracted Date	Contracted Time	Uncontracted Date	Uncontracted Time	US/DS	Scour Depth(ft)
1	7/13/92	12:00	6/22/93			0.8
2	7/17/92	15:00	6/22/93			0.8

Measurement Number	Accuracy	Contracted Avg Vel(ft/s)	Contracted Discharge(cfs)	Contracted Depth(ft)	Contracted Width(ft)
1	0.5	2.44	1510	7.5	75
2	0.5	2.79	2450	10.3	75

Measurement Number	Uncontracted Avg Vel(ft/s)	Uncontracted Discharge(cfs)	Uncontracted Depth(ft)	Uncontracted Width(ft)	Channel Contraction Ratio
1	2.91	1890	6.8	92	0
2	3.21	3180	9.5	92	0

Measurement Number	Pier Contraction Ratio	Scour Location	Eccent-ricity	Sediment Transport	Bed Form	Debris Effects
1	0.035	Main Channel	0	Live-bed	Unknown	Unknown

2	0.031	Main Channel	0	Live-bed	Unknown	Unknown

Measurement Number	D95 (mm)	D84 (mm)	D50 (mm)	D16 (mm)	Sigma Bed Material	Bed Material
1	13	3	1.5	0.15	4.47	Non-cohesive
2	13	3	1.5	0.15	4.47	Non-cohesive

Contraction Scour Comments

Measurement No. 1

The data for the contracted section were measured from the bridge deck during the flood event on the specified date. The geometry of the reference uncontracted section was measured during low flow. The hydraulic data for the uncontracted section were estimated using WSPRO to estimate the approach hydraulics for the reference channel geometry and the flood discharge observed on the date of the contracted section measurement.

Measurement No. 2

The data for the contracted section were measured from the bridge deck during the flood event on the specified date. The geometry of the reference uncontracted section was measured during low flow. The hydraulic data for the uncontracted section were estimated using WSPRO to estimate the approach hydraulics for the reference channel geometry and the flood discharge observed on the date of the contracted section measurement.

Stage and Discharge Data

Peak Discharge					Flow		Peak Stage					Stage	Water	Return
year	mo	dy	hr	mi	(cfs)	Qacc	year	mo	dy	hr	mi	(ft)	Temp (C)	Period(yr)
1992	7	17	15:00		3450								22	2
1992	7	13	12:30		1970								20	2

Hydrograph

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Supporting Files