

BSDMS Summary Report

45 Ottawa River at Township Road 122 at Lima, OH

Site Location:

Site ID: 45

Site Name: Ottawa River at Township Road 122 at Lima, OH

County: Allen

Nearest City: Lima

State: OH

Latitude: 404257

Longitude: 840815

USGS Station ID: 4187100

Route Number: 122

Route Class: County

Service Level: Mainline

Route Direction: NA

Highway Mile Point: 0.71

Stream Name: Ottawa River

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:

The site is located at the Adgate Road (Shawnee Township Rd. 122) bridge crossing the Ottawa River, west of the intersection with Collett Street in Lima, Ohio. The site is approximately 1000 ft downstream from the USGS streamflow gage Ottawa River at Lima, Ohio (04187100). Gage data are available from June 1988 to the current year (1994). The Adgate Rd. bridge is maintained by the Allen County Engineers Office (phone 419-228-3196). The bridge identification is SHA-122-0.71. The bridge is in a straight portion of a meandering channel.

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 measurements.

Elevation Reference

Datum: MSL

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MSL (ft):

Description of Reference Elevation:

BM (COE OR-2 831.637-1965) S.W. of Lima, Allen County, on the S.E. corner of Standard Oil outfall near Adgate Rd. bridge over the Ottawa River, near the S. 1/4 post of Sec. 2, T4S, N6E, Shawnee Twp.
BM established by Corps. of Eng. 1965, Floodplain Info. Report, Ottawa R. 1967
Standard disk stamped OR-2.
MSL elevation = 831.637 ft

Stream Data

Drainage Area (sq mi):	130	Floodplain Width:	Narrow
Slope in Vicinity(ft/ft):	0.00144	Natural Levees:	Little
Flow Impact:	Straight	Apparent Incision:	None
Channel Evolution	Premodified	Channel Boundary:	Semi-alluvial
Armoring:	Unknown	Banks Tree Cover:	Low
Debris Frequency:	Rare	Sinuosity:	Meandering
Debris Effect:	Unknown	Braiding:	None
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:	0.055	0.032	0.05
Typical	0.05	0.03	0.045
Low:	0.04	0.03	0.04

Bed Material

Measurement Number	Yr	Mo	Dy	Sampler	D95 (mm)	D84 (mm)	D50 (mm)	D16 (mm)	SP	Shape	Cohesion
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AP-1	1993	7	7		42	29	13	1.8	2.65	Unknown
AP-2	1994	6	22		40	27	5	0.41	2.65	Unknown
BR-1	1990	9	7	HAND	30	19	6.4	0.61	2.65	Non-Cohesive
BR-2	1991	7	9		68	34	7.65	1.12	2.65	Unknown
BR-3	1992	6	29		33.5	21	6.4	0.68	2.65	Unknown
BR-4	1993	7	7		59	35	4.4	0.56	2.65	Unknown
BR-5	1994	6	22		68	35	2.8	0.24	2.65	Unknown
P1-1	1990	9	7	HAND	45	26	4	0.9	2.65	Non-Cohesive
P1-2	1991	7	9		24	18	12.2	7.2	2.65	Unknown
P1-3	1992	6	29		44	31	6.8	0.66	2.65	Unknown
P1-4	1993	7	7		40	29	11.1	2.1	2.65	Unknown
P1-5	1994	6	22		39	27	4.3	0.9	2.65	Unknown
P2-1	1990	9	7	HAND	7.9	5	0.25	0.08	2.65	Non-Cohesive
P2-2	1991	7	9		0.6	0.3	0.17	0.08	2.65	Unknown
P2-3	1992	6	29		7.2	2.7	0.57	0.12	2.65	Unknown

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P2-4	1993	7	7	7.4	2.5	0.17	0.07	2.65	Unknown
P2-5	1994	6	22	0.6	0.3	0.19	0.05	2.65	Unknown

Bed Material Comments

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.

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Measurement No: BR-5

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

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.

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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

Measurement No: P2-5

Sample collected at the upstream face of pier 2

Bridge Data

Structure No: SHA-122-0.71

Length(ft): 148.26

Width(ft): 36

Number of Spans: 3

Vertical Configuration: Horizontal

Low Chord Elev (ft): 835.8

Upper Chord Elev (ft): 838.5

Overtopping Elev (ft): 838.5

Skew (degrees): 10

Guide Banks: None

Waterway Classification: Main

Year Built: 1973

Avg Daily Traffic:

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Plans on File: Yes

Parallel Bridges No

Upstream/Downstream: Unknown

Continuous Abutment: No

Distance Between Centerlines:

Distance Between Pier Faces:

Bridge Description:

The bridge was constructed of reinforced concrete and steel beams. The site plans are dated 1972, and it is assumed construction was completed in 1973. The left abutment is a vertical wall with wingwalls that extend upstream and downstream from the bridge. The right abutment is a sloping abutment with spill-through-shaped embankments.

Abutment Data

Left Station: 17.4101

Right Station: 15.9275

Left Skew (deg): 0

Right Skew (deg) 0

Left Abutment Length (ft): 41

Right Abutment Length (ft) 45

Left Abutment to Channel Bank (ft): 0

Right Abutment to Channel Bank (ft): 23

Left Abutment Protection:

Right Abutment Protection

Contracted Opening Type: Unknown

Embankment Skew (deg): 10

Embankment Slope (ft/ft): 2

Abutment Slope (ft/ft) 2

Wingwalls: Yes

Wingwall Angle (deg): 20

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Pier Data

Pier ID	Bridge Station(ft)	Alignment	Highway Station	PierType	# Of Piles	Pile Spacing(ft)
1	49	10	16.9159	Single	0	
2	98	10	16.4217	Single	0	

Pier ID	Pier Width(ft)	Pier Shape	Shape Factor	Length(ft)	Protection	Foundation
1	2.5	Round		37.3	None	Poured
2	2.5	Round		37.3	None	Poured

Pier ID	Top Elevation(ft)	Bottom Elevation(ft)	Foot or Pile Cap Width(ft)	Cap Shape	Pile Tip Elevation(ft)
1	817.5	815	5	Square	
2	817.5	815	5	Square	

Pier Description

Pier ID 1

The concrete pier is a solid wall with a rounded nose.

Pier ID 2

The concrete pier is a solid wall with a rounded nose.

Pier Scour Data

Pier ID	Date	Time	USOrDS
1	8/22/90	10:40	Upstream
1	12/30/90	14:30	Upstream
1	7/17/92	14:15	Upstream
2	8/22/90	10:40	Upstream
2	12/30/90	14:30	Upstream

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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	2.5	0.5	4.4	20	2.5	5.4	2.5	0
1	2.2	0.5	7.8	35	4.2	10.4	2.5	0
1	1.8	0.5	4.9	17	4	7.4	2.5	0
2	0.5	0.5	2.1	4	0.8	4.9	2.5	0
2	0.5	0.5	6.1	11	2.2	10.2	2.5	0

PierID	Sediment Transport	Bed Material	BedForm	Trough (ft)	Crest (ft)	Sigma	Debris Effects
1	Clear-water	Non-cohesive	Unknown			5.7	Unknown
1	Clear-water	Non-cohesive	Unknown			5.7	Unknown
1	Clear-water	Non-cohesive	Unknown			6.8	Moderate
2	Clear-water	Non-cohesive	Unknown			8	Insignificant
2	Clear-water	Non-cohesive	Unknown			8	Insignificant

PierID	D95 (mm)	D84 (mm)	D50 (mm)	D16 (mm)
1	45	26	4	0.9
1	45	26	4	0.9
1	44	30.5	6.8	0.66
2	7.9	5	0.245	0.079
2	7.9	5	0.245	0.079

Pier Scour Comments

Pier ID 1 **Time:** 10:40 **US/DS:** Upstream

The top width of the scour hole at pier 1 (20 ft) seems quite wide--yet from a check of the data, this value appears reasonable. Possibly, a large debris pile may have been on pier 1 prior to data collection. The bed-material sample was collected during low flow.

Pier ID 1 **Time:** 14:30 **US/DS:** Upstream

The large top width of the scour hole (35 ft) was doubled checked. Refer to comment on 8/22/90 pier 1 measurement. Submerged debris may possibly have reduced the scour depth that occurred with the increased flow and velocity. The bed sample was collected during low flow. W.S. slope was 0.00135.

Pier ID 1 **Time:** 14:15 **US/DS:** Upstream

The bed-material sample was collected during low flow on 6/29/92. The water-surface slope was 0.00060.

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Pier ID 2 Time: 10:40 US/DS: Upstream

Pier ID 2 Time: 14:30 US/DS: Upstream

The water-surface slope was 0.00135.

Abutment Scour

Contraction Scour

Stage and Discharge Data

<u>Peak Discharge</u>				<u>Flow</u> (cfs)	<u>Qacc</u>	<u>Peak Stage</u>				<u>Stage</u> (ft)	<u>Water</u> Temp (C)	<u>Return</u> Period(yr)
year	mo	dy	hr mi			year	mo	dy	hr mi			
1992	7	17	14:15	1840						15	2	
1990	12	30	14:30	30 4440	5				0	4	25	
1990	8	22	10:40	40 1060	5				0	18	2	

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Hydrograph

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