

BSDMS Summary Report

44 Little Miami River at S.R.350 at Fort Ancient,OH

Site Location:

Site ID: 44

Site Name: Little Miami River at S.R.350 at Fort Ancient,OH

County: Warren

Nearest City: Fort Ancient

State: OH

Latitude: 392424

Longitude: 840604

USGS Station ID:

Route Number: 350

Route Class: State

Service Level: Mainline

Route Direction: NA

Highway Mile Point: 2.85

Stream Name: Little Miami 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 State Route 350 bridge crossing the Little Miami River at Fort Ancient, Warren County, Ohio. The drainage area for the site is 675 sq. mi., and drainage from approximately 35 percent of this basin is regulated by Caesar Creek Lake reservoir. The site is in a straight reach of the Little Miami River.

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): 0

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Description of Reference Elevation:

RM2 - chiseled square in left upstream concrete abutment.
Assumed elevation = 111.29 ft
MSL elevation = 679.12

Stream Data

Drainage Area (sq mi):	675	Floodplain Width:	Narrow
Slope in Vicinity(ft/ft):	0.00084	Natural Levees:	Little
Flow Impact:	Straight	Apparent Incision:	None
Channel Evolution	Premodified	Channel Boundary:	Alluvial
Armoring:	Partial	Banks Tree Cover:	High
Debris Frequency:	Rare	Sinuosity:	Sinuous
Debris Effect:	Local	Braiding:	None
Stream Size:	Medium	Anabranching:	None
Flow Habit:	Perennial	Bars:	Unknown
Bed Material:	Gravel	Stream Width Variability:	Unknown
Valley Setting:	Moderate		

Roughness Data

Manning's n Values

	Left Overbank	Channel	Right Overbank
High:	0.075	0.034	0.075
Typical	0.065	0.032	0.065
Low:	0.045	0.03	0.045

Bed Material

Measurement Number	Yr	Mo	Dy	Sampler	D95 (mm)	D84 (mm)	D50 (mm)	D16 (mm)	SP	Shape	Cohesion
AP-1	1991	7	30		64	44	12.7	0.13	2.65		Unknown

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AP-2	1993	7	15	40	27	11	1	2.65	Unknown
AP-3	1994	7	11	27	17	0.7	0.13	2.65	Unknown
BR-1	1990	8	31	46	37	10.2	0.56	2.65	Non-Cohesive
BR-2	1991	7	30	69	58	17.9	4.1	2.65	Unknown
BR-3	1992	7	2	38	27	5.1	0.03	2.65	Unknown
BR-4	1993	7	15	43	35	13	1.3	2.65	Unknown
BR-5	1994	7	11	46	34	15	2.9	2.65	Unknown
P1-1	1991	7	30	39	38	35	14.7	2.65	Unknown
P1-2	1992	7	2	68	38	13.5	2.1	2.65	Unknown
P1-3	1993	7	15	40	28	12	0.33	2.65	Unknown
P1-4	1994	7	11	71	60	35	7.8	2.65	Unknown
P2-1	1990	8	31	75	71	60	12	2.65	Non-Cohesive
P2-2	1991	7	30	44	28	7.6	0.3	2.65	Unknown
P2-3	1992	7	2	35	19	5.6	0.77	2.65	Unknown
P2-4	1993	7	15	45	36	20	7.5	2.65	Unknown

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P2-5 1994 7 11 60 37 12.8 2.6 2.65 Unknown

Bed Material Comments

Measurement No: AP-1

Approach-section composite sample

Measurement No: AP-2

Approach-section composite sample

Measurement No: AP-3

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: P2-1

Sample collected at the upstream face of pier 2.

Measurement No: P2-2

Sample collected at the upstream face of pier 2

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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: WAR-350-0285

Length(ft): 213

Width(ft): 24

Number of Spans: 3

Vertical Configuration: Curvilinear

Low Chord Elev (ft): 676.4

Upper Chord Elev (ft): 680

Overtopping Elev (ft): 680

Skew (degrees): 0

Guide Banks: None

Waterway Classification: Main

Year Built: 1984

Avg Daily Traffic: 1645

Plans on File: Yes

Parallel Bridges: No

Upstream/Downstream: Unknown

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Continuous Abutment: No

Distance Between Centerlines:

Distance Between Pier Faces:

Bridge Description:

The bridge has arched, steel I-beams with reinforced-concrete deck, abutments, and piers.

Abutment Data

Left Station: 12.7

Right Station: 10.55

Left Skew (deg): 0

Right Skew (deg) 0

Left Abutment Length (ft): 43

Right Abutment Length (ft) 43

Left Abutment to Channel Bank (ft): 35

Right Abutment to Channel Bank (ft): 35

Left Abutment Protection:

Right Abutment Protection

Contracted Opening Type: III

Embankment Skew (deg): 0

Embankment Slope (ft/ft): 2

Abutment Slope (ft/ft) 2

Wingwalls: No

Wingwall Angle (deg): 0

Pier Data

Pier ID	Bridge Station(ft)	Alignment	Highway Station	PierType	# Of Piles	Pile Spacing(ft)
1	60	0	12.1	Single	0	

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2 150 0 11.2 Single 0

Pier ID	Pier Width(ft)	Pier Shape	Shape Factor	Length(ft)	Protection	Foundation
1	2.5	Round		24.3	None	Piles
2	2.5	Round		24.3	None	Piles

Pier ID	Top Elevation(ft)	Bottom Elevation(ft)	Foot or Pile Cap Width(ft)	Cap Shape	File Tip Elevation(ft)
1	650.5	647	10.5	Square	622
2	650.5	647	10.5	Square	622

Pier Description

Pier ID 1

This is a concrete solid-wall pier with rounded nose.

Pier ID 2

This is a concrete solid-wall pier with rounded nose.

Pier Scour Data

Pier ID	Date	Time	USOrDS
1	5/16/90	14:30	Upstream
1	12/19/90	10:10	Upstream
2	12/19/90	10:10	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	0.6	0.5	4.9	5.7	4.6	8.4	2.5	0
1	2.7	1	9.9	30	4.8	7.6	2.5	0
2	0.7	0.5	7	5.2	3.7	5.6	2.5	0

PierID	Sediment Transport	Bed Material	BedForm	Trough (ft)	Crest (ft)	Sigma	Debris Effects
1	Clear-water	Non-cohesive	Unknown			1.61	Insignificant

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1	Clear-water	Non-cohesive	Unknown	1.61	Insignificant
2	Clear-water	Non-cohesive	Unknown	2.4	Insignificant

PierID	D95 (mm)	D84 (mm)	D50 (mm)	D16 (mm)
1	39	38	35	14.7
1	39	38	35	14.7
2	75	71	60	12

Pier Scour Comments

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

The bed-material sample for pier 1 could not be analyzed because of standing water. For the 5/16/90 scour measurement, the bridge-section composite bed-material sample D50 value of 10.2 mm was used for pier 1. Water-surface slope was 0.00153.

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

Refer to comments for pier 1 scour measurement of 5/16/90, as the same situation is applicable for this scour measurement, (Use D50 of 10.2 mm). The accuracy of the 12/19/90 scour-hole depth was estimated to be 1.0 foot, because of ambient-bed elevation uncertainty. Water-surface slope was 0.00158.

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

The bed-material sample was collected on 8/31/90. The water-surface slope was 0.00158.

Abutment Scour

Contraction Scour

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Stage and Discharge Data

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			
1990	12	19	10:10	10	4620	5				0		4	2	
1990	5	16	14:30	30	4590	5				0		15.5	2	

Hydrograph

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