

BSDMS Summary Report

61 Great Miami River at S.R. 41 at Troy, OH

Site Location:

Site ID: 61

Site Name: Great Miami River at S.R. 41 at Troy, OH

County: Miami

Nearest City: Troy

State: OH

Latitude: 400150

Longitude: 841113

USGS Station ID:

Route Number: 41

Route Class: State

Service Level: Mainline

Route Direction: West

Highway Mile Point: 8.33

Stream Name: Great 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:

This site is located at the SR 41 bridge crossing the Great Miami River at Troy, Miami County, Ohio. The Ohio Department of Transportation (ODOT) bridge identification is "MIA-41-0833".

Site is located roughly 4500 feet downstream of USGS streamgage Great Maimi River at Troy (03262700). Streamgage data available from 1962 to current year. Bed-material samples were collected during an annual low-flow survey.

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:

RM1 - Chiseled square on right upstream abutment (northwest corner of bridge)
MSL elevation = 830.34 ft

Stream Data

Drainage Area (sq mi):	927	Floodplain Width:	Narrow
Slope in Vicinity(ft/ft):	0.00023	Natural Levees:	Little
Flow Impact:	Left	Apparent Incision:	None
Channel Evolution	Constructed	Channel Boundary:	Semi-alluvial
Armoring:	High	Banks Tree Cover:	Low
Debris Frequency:	Rare	Sinuosity:	Sinuuous
Debris Effect:	Local	Braiding:	None
Stream Size:	Medium	Anabranching:	Locally
Flow Habit:	Perennial	Bars:	Unknown
Bed Material:	Cobbles	Stream Width Variability:	Equiwidth
Valley Setting:	Low		

Roughness Data

Manning's n Values

	Left Overbank	Channel	Right Overbank
High:	0.028	0.032	0.028
Typical	0.028	0.03	0.028
Low:	0.028	0.028	0.028

Bed Material

Measurement Number	Yr	Mo	Dy	Sampler	D95 (mm)	D84 (mm)	D50 (mm)	D16 (mm)	SP	Shape	Cohesion
AP1	1991	8	21				27	4	2.65		Unknown
AP2	1993	7	28		71	63	28	7.5	2.65		Unknown

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AP3	1994	7	12		57	44	24.5	3.4	2.65	Unknown
BR1	1990	8	29		33	23	10.2	2.5	2.65	Unknown
BR2	1991	8	21		65	38	16.3	3.7	2.65	Unknown
BR3	1993	7	28		70	58	28	17	2.65	Unknown
BR4	1994	7	12		66	50	10.5	0.14	2.65	Unknown
P1-1	1990	8	29		0.18	0.05	0.02	0.003	2.65	Unknown
P1-2	1991	8	21	0	0.33	0.08	0.01		2.65	Unknown
P1-3	1992	9	10		5.4	0.2	0.06	0	2.65	Unknown
P1-4	1993	7	28		40	32	8.2	0.57	2.65	Unknown
P1-5	1994	7	12		34	24	5.3	0.6	2.65	Unknown
P2-1	1990	8	29		0.3	0.1	0.02	0.004	2.65	Unknown
P2-2	1991	8	21		0.96	0.7	0.01		2.65	Unknown
P2-3	1992	9	10		25	9.5	0.25	0.05	2.65	Unknown
P2-4	1993	7	28		43	33	18	3.5	2.65	Unknown
P2-5	1994	7	12		50	29	10.5	0.43	2.65	Unknown

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P3-1	1990	8	29	48	42	10	2.7	2.65	Unknown
P3-2	1991	8	21	72	64	36.3	2.2	2.65	Unknown
P3-3	1992	9	10	47	40	22.5	1.65	2.65	Unknown
P3-4	1993	7	28	71	65	21	4	2.65	Unknown
P3-5	1994	7	12	59	39	12.5	2.5	2.65	Unknown
P4-1	1990	8	29	32.5	23	10.1	3.3	2.65	Unknown
P4-2	1991	8	21	69	60	12.7	5	2.65	Unknown
P4-3	1992	9	10	41	36	14	1.4	2.65	Unknown
P4-4	1993	7	28	48	43	27	6.5	2.65	Unknown
P4-5	1994	7	12	56	39	23	3.7	2.65	Unknown
P5-1	1990	8	29	70	56	30	17	2.65	Unknown
P5-2	1991	8	21	38	10	4.1	1.6	2.65	Unknown
P5-3	1992	9	10	70	58	29	2.7	2.65	Unknown
P5-4	1993	7	28	63	53	32	4	2.65	Unknown
P5-5	1994	7	12	50	35	8.4	2.4	2.65	Unknown

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P6-1	1990	8	29	76	73	59	27	2.65	Unknown
P6-2	1991	8	21	70	62	35.5	1	2.65	Unknown
P6-3	1992	9	10	79	56	31	9.5	2.65	Unknown
P6-4	1993	7	28	65	55	34	9	2.65	Unknown
P6-5	1994	7	12	35	27	15.5	3.7	2.65	Unknown
P7-1	1990	8	29	4.5	2.5	1.2	0.4	2.65	Unknown
P7-2	1991	8	21	70	58	4.1	0.98	2.65	Unknown
P7-3	1992	9	10	90	80	56	7.8	2.65	Unknown
P7-4	1993	7	28	62	45	24	4.2	2.65	Unknown
P7-5	1994	7	12	45	28	9.8	1.3	2.65	Unknown
P8-1	1990	8	29	45	34	22.5	0.25	2.65	Unknown
P8-2	1991	8	21	70	61	7.1	0.21	2.65	Unknown
P8-3	1992	9	10	86	76	48	1.6	2.65	Unknown
P8-4	1993	7	28	64	50	27	2.3	2.65	Unknown
P8-5	1994	7	12	57	38	12.5	0.5	2.65	Unknown

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Bed Material Comments

Measurement No: AP1

Approach-section composite sample

Measurement No: AP2

Approach-section composite sample

Measurement No: AP3

Approach-section composite sample

Measurement No: BR1

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

Measurement No: BR2

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

Measurement No: BR3

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

Measurement No: BR4

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

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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

Measurement No: P3-1

Sample collected at the upstream face of pier 3

Measurement No: P3-2

Sample collected at the upstream face of pier 3

Measurement No: P3-3

Sample collected at the upstream face of pier 3

Measurement No: P3-4

Sample collected at the upstream face of pier 3

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Measurement No: P3-5

Sample collected at the upstream face of pier 3

Measurement No: P4-1

Sample collected at the upstream face of pier 4

Measurement No: P4-2

Sample collected at the upstream face of pier 4

Measurement No: P4-3

Sample collected at the upstream face of pier 4

Measurement No: P4-4

Sample collected at the upstream face of pier 4

Measurement No: P4-5

Sample collected at the upstream face of pier 4

Measurement No: P5-1

Sample collected at the upstream face of pier 5

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Measurement No: P5-2

Sample collected at the upstream face of pier 5

Measurement No: P5-3

Sample collected at the upstream face of pier 5

Measurement No: P5-4

Sample collected at the upstream face of pier 5

Measurement No: P5-5

Sample collected at the upstream face of pier 5

Measurement No: P6-1

Sample collected at the upstream face of pier 6

Measurement No: P6-2

Sample collected at the upstream face of pier 6

Measurement No: P6-3

Sample collected at the upstream face of pier 6

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Measurement No: P6-4

Sample collected at the upstream face of pier 6

Measurement No: P6-5

Sample collected at the upstream face of pier 6

Measurement No: P7-1

Sample collected at the upstream face of pier 7

Measurement No: P7-2

Sample collected at the upstream face of pier 7

Measurement No: P7-3

Sample collected at the upstream face of pier 7

Measurement No: P7-4

Sample collected at the upstream face of pier 7

Measurement No: P7-5

Sample collected at the upstream face of pier 7

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Measurement No: P8-1

Sample collected at the upstream face of pier 8

Measurement No: P8-2

Sample collected at the upstream face of pier 8

Measurement No: P8-3

Sample collected at the upstream face of pier 8

Measurement No: P8-4

Sample collected at the upstream face of pier 8

Measurement No: P8-5

Sample collected at the upstream face of pier 8

Bridge Data

Structure No: MIA-41-0833

Length(ft): 749

Width(ft): 60

Number of Spans: 9

Vertical Configuration: Horizontal

Low Chord Elev (ft): 826.3

Upper Chord Elev (ft): 830.3

Overtopping Elev (ft): 830.3

Skew (degrees): 50

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Guide Banks: None
Waterway Classification: Main
Year Built: 1960
Avg Daily Traffic: 4075
Plans on File: Yes
Parallel Bridges No
Upstream/Downstream: Unknown
Continuous Abutment: No
Distance Between Centerlines:
Distance Between Pier Faces:

Bridge Description:

The bridge is constructed of concrete and steel I-beams, and it has solid-wall sharp-nose piers. The site plans are dated 1959. The piers are referenced from the left to the right abutments when looking downstream.

Abutment Data

Left Station: 592.37
Right Station: 584.8411
Left Skew (deg): 0
Right Skew (deg) 0
Left Abutment Length (ft): 72
Right Abutment Length (ft) 72
Left Abutment to Channel Bank (ft): 140
Right Abutment to Channel Bank (ft): 70
Left Abutment Protection:
Right Abutment Protection
Contracted Opening Type: I
Embankment Skew (deg): 0
Embankment Slope (ft/ft): 3
Abutment Slope (ft/ft) 2

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Wingwalls: No

Wingwall Angle (deg): 0

Pier Data

Pier ID	Bridge Station(ft)	Alignment	Highway Station	PierType	# Of Piles	Pile Spacing(ft)
1	70	0	585.58	Single	26	4.75
2	157	0	586.45	Single	26	4.75
3	244	0	587.32	Single	26	4.75
4	331	0	588.19	Single	26	4.75
5	418	0	589.06	Single	26	4.75
6	505	0	589.9302	Single	26	4.75
7	592	0	590.8	Single	26	4.75
8	679	0	591.67	Single	26	4.75

Pier ID	Pier Width(ft)	Pier Shape	Shape Factor	Length(ft)	Protection	Foundation
1	3	Sharp		57	None	Piles
2	3	Sharp		57	None	Piles
3	3	Sharp		57	None	Piles
4	3	Sharp		57	None	Piles
5	3	Sharp		57	None	Piles
6	3	Sharp		57	None	Piles
7	3	Sharp		57	None	Piles
8	3	Sharp		57	None	Piles

Pier ID	Top Elevation(ft)	Bottom Elevation(ft)	Foot or Pile Cap Width(ft)	Cap Shape	Pile Tip Elevation(ft)
1	808.5	805	7.5	Square	766
2	805.5	802	8	Square	763
3	804.5	801	8	Square	762

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4	804.5	801	8	Square	762
5	804.5	801	8	Square	767
6	808.5	805	7.5	Square	771
7	808.5	805	7.5	Square	771
8	808.5	805	7.5	Square	771

Pier Description

Pier ID 1

The concrete pier is a solid wall with sharp nose.

Pier ID 2

The concrete pier is a solid wall with sharp nose.

Pier ID 3

The concrete pier is a solid wall with sharp nose.

Pier ID 4

The concrete pier is a solid wall with sharp nose.

Pier ID 5

The concrete pier is a solid wall with sharp nose.

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Pier ID 6

The concrete pier is a solid wall with sharp nose.

Pier ID 7

The concrete pier is a solid wall with sharp nose.

Pier ID 8

The concrete pier is a solid wall with sharp nose.

Pier Scour Data

Pier ID	Date	Time	USOrDS
1	7/17/92	11:40	Upstream
1	11/13/92	12:10	Upstream
1	1/29/94	10:55	Upstream
2	7/17/92	11:40	Upstream
2	11/13/92	12:10	Upstream
2	1/29/94	10:55	Upstream
3	7/17/92	11:40	Upstream
3	11/13/92	12:10	Upstream
3	1/29/94	10:55	Upstream
4	7/17/92	11:40	Upstream
4	11/13/92	12:10	Upstream
4	1/29/94	10:55	Upstream
5	7/17/92	11:40	Upstream
5	11/13/92	12:10	Upstream
5	1/29/94	10:55	Upstream
6	7/17/92	11:40	Upstream
6	11/13/92	12:10	Upstream
6	1/29/94	10:55	Upstream
7	7/17/92	11:40	Upstream

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7 11/13/92 12:10 Upstream
 7 1/29/94 10:55 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	0.7	0.5	14	20	0.5	7.1	3	60
1	0.6	0.5	14.2	15	0.6	6	3	60
1	1.8	0.5	4.1	13	0.7	5.1	3	66
2	1.3	0.5	7.7	18.5	0.8	7.6	3	66.4
2	1.5	0.5	13.8	40	0.8	6.1	3	66.4
2	1.6	0.5	6.1	20	1	5.7	3	66
3	3.2	0.5	10.4	60	1.8	9.3	3	63.3
3	2.7	0.5	12.2	60	1.7	7.8	3	63.3
3	3.3	0.5	7.1	45	1.9	8	3	63
4	2.2	0.5	12.5	53	2.6	9.7	3	61.6
4	3.9	0.5	4.9	40	1.9	8.7	3	63.9
4	5	0.5	8	80	2.2	7.8	3	60
5	2	0.5	6.5	30	2.7	9.5	3	64.9
5	2.9	0.5	5.1	30	2	8.6	3	64.5
5	2.5	0.5	9.5	45	2	7.2	3	66
6	2.5	0.5	7.3	37	2.7	9.4	3	60
6	3.4	0.5	5.6	40	2.8	8.5	3	57.3
6	3.3	0.5	12.2	40	2.4	7.5	3	60
7	3	0.5	8	50	2.6	9.8	3	60
7	3.6	0.5	8	55	2.2	8.1	3	60
7	3.5	0.5	10	70	2.4	7.4	3	60

PierID	Sediment Transport	Bed Material	BedForm	Trough (ft)	Crest (ft)	Sigma	Debris Effects
1	Clear-water	Non-cohesive	Unknown				Insignificant
1	Clear-water	Non-cohesive	Unknown				Insignificant
1	Clear-water	Non-cohesive	Unknown			7.5	Unknown
2	Clear-water	Non-cohesive	Unknown				Insignificant
2	Clear-water	Non-cohesive	Unknown			14.1	Insignificant
2	Clear-water	Non-cohesive	Unknown			3.1	Unknown
3	Clear-water	Non-cohesive	Unknown			5.39	Insignificant
3	Clear-water	Non-cohesive	Unknown			4.89	Insignificant
3	Clear-water	Non-cohesive	Unknown			4.03	Unknown

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4	Clear-water	Non-cohesive	Unknown	3.46	Insignificant
4	Clear-water	Non-cohesive	Unknown	5.07	Insignificant
4	Clear-water	Non-cohesive	Unknown	2.57	Unknown
5	Clear-water	Non-cohesive	Unknown	6.44	Insignificant
5	Clear-water	Non-cohesive	Unknown	4.63	Insignificant
5	Clear-water	Non-cohesive	Unknown	3.64	Unknown
6	Clear-water	Non-cohesive	Unknown	7.87	Insignificant
6	Clear-water	Non-cohesive	Unknown	2.43	Insignificant
6	Clear-water	Non-cohesive	Unknown	2.47	Unknown
7	Clear-water	Non-cohesive	Unknown	7.69	Insignificant
7	Clear-water	Non-cohesive	Unknown	3.2	Insignificant
7	Clear-water	Non-cohesive	Unknown	3.27	Unknown

PierID	D95 (mm)	D84 (mm)	D50 (mm)	D16 (mm)
1	0.33	0.083	0.0115	
1	5.4	0.184	0.058	
1	40	32	8.2	0.57
2	0.96	0.7	0.01	
2	25	9.5	0.25	0.048
2	43	33	18	3.5
3	72	64	36.3	2.2
3	47	39.5	22.5	1.65
3	71	65	21	4
4	69	60	12.7	5
4	41	36	14	1.4
4	48	43	27	6.5
5	38	10.3	4.1	1.6
5	70	58	29	2.7
5	63	53	32	4

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6	70	62	35.5	1
6	79	56	31	9.5
6	65	55	34	9
7	70	58	4.1	0.98
7	90	80	56	7.8
7	62	45	24	4.2

Pier Scour Comments

Pier ID 1 **Time:** 11:40 **US/DS:** Upstream

Bed-material sample collected during low flow 8/21/91.

Pier ID 1 **Time:** 12:10 **US/DS:** Upstream

Bed-material sample collected during low flow 9/10/92.

Pier ID 1 **Time:** 10:55 **US/DS:** Upstream

Pier ID 2 **Time:** 11:40 **US/DS:** Upstream

Bed-material sample collected during low flow 8/21/91.

Pier ID 2 **Time:** 12:10 **US/DS:** Upstream

Bed-material sample collected during low flow 9/10/92.

Pier ID 2 **Time:** 10:55 **US/DS:** Upstream

Pier ID 3 **Time:** 11:40 **US/DS:** Upstream

Bed-material sample collected during low flow 8/21/91.

Pier ID 3 **Time:** 12:10 **US/DS:** Upstream

Bed-material sample collected during low flow 9/10/92.

Pier ID 3 **Time:** 10:55 **US/DS:** Upstream

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Pier ID 4 Time: 11:40 US/DS: Upstream

Bed-material sample collected during low flow 8/21/91.

Pier ID 4 Time: 12:10 US/DS: Upstream

Bed-material sample collected during low flow 9/10/92.

Pier ID 4 Time: 10:55 US/DS: Upstream

Pier ID 5 Time: 11:40 US/DS: Upstream

Bed-material sample collected during low flow 8/21/91.

Pier ID 5 Time: 12:10 US/DS: Upstream

Bed-material sample collected during low flow 9/10/92.

Pier ID 5 Time: 10:55 US/DS: Upstream

Pier ID 6 Time: 11:40 US/DS: Upstream

Bed-material sample collected during low flow 8/21/91.

Pier ID 6 Time: 12:10 US/DS: Upstream

Bed-material sample collected during low flow 9/10/92.

Pier ID 6 Time: 10:55 US/DS: Upstream

Pier ID 7 Time: 11:40 US/DS: Upstream

Bed-material sample collected during low flow 8/21/91.

Pier ID 7 Time: 12:10 US/DS: Upstream

Bed-material sample collected during low flow 9/10/92.

Pier ID 7 Time: 10:55 US/DS: Upstream

Abutment Scour

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ContractionScour

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			
1994	1	29	10:55		9960							0.7	1	
1992	11	13	12:10		9540							2	1	
1992	7	17	11:40		12400							22	2	

Hydrograph

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Supporting Files
