

BSDMS Summary Report

20 White River at S.R. 157 at Worthington, IN

Site Location:

Site ID: 20

Site Name: White River at S.R. 157 at Worthington, IN

County: Greene

Nearest City: Worthington

State: IN

Latitude: 390637

Longitude: 865748

USGS Station ID:

Route Number: 157

Route Class: State

Service Level: Mainline

Route Direction: NA

Highway Mile Point: 8.34

Stream Name: White River

River Mile:

Contact:
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Publication:

Site Description:

This site is located about one mile southeast of the town of Worthington, and about half a mile south of the confluence with the Eel River. The site has a steep right bank that is wooded. The left overbank is low-lying farm fields with a strip of woods between the fields and the river. The road embankment is low enough left (east) of the bridge that during high flows a significant amount of flow will bypass the bridge. The measurement on 1-1-93 had 43,400 cubic ft per second (cfs) in the bridge opening, but the total discharge is estimated at 64,000 cfs. If this estimate is accurate, the flood on 1-3-93 had a 10-year recurrence interval.

Elevation Reference

Datum: MSL

MSL (ft):

Description of Reference Elevation:

INDOT bronze tablet on the northwest end (upstream right) of the bridge, elevation = 528.06 ft.
RP-1: Mark on the guard rail at bridge station 622 on the upstream side of the bridge, elevation = 530.02 ft.

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RP-2: Mark on the guard rail at bridge station 622 on the downstream side of the bridge, elevation = 530.04 ft.

Stream Data

Drainage Area (sq mi):	4392	Floodplain Width:	Wide
Slope in Vicinity (ft/ft):	0.0002	Natural Levees:	Little
Flow Impact:	Straight	Apparent Incision:	None
Channel Evolution	Premodified	Channel Boundary:	Alluvial
Armoring:	Unknown	Banks Tree Cover:	Medium
Debris Frequency:	Frequent	Sinuosity:	Meandering
Debris Effect:	Unknown	Braiding:	None
Stream Size:	Medium	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:			
Typical	0.037	0.032	0.034
Low:			

Bed Material

Measurement Number	Yr	Mo	Dy	Sampler	D95 (mm)	D84 (mm)	D50 (mm)	D16 (mm)	SP	Shape	Cohesion
1	1993	12	14	BM-54	7	4.2	0.9	0.24	2.65		Unknown
2	1993	12	14	Clamshell	25	14	1.7	0.36	2.65		Unknown

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Bed Material Comments

Measurement No: 1

Sample 1 is a composite sample for the site, collected using a BM-54.

Measurement No: 2

Sample 2 was collected at station 555 using a clamshell sampler.

Bridge Data

Structure No: 157-28-6589

Length(ft): 734

Width(ft): 47

Number of Spans: 5

Vertical Configuration: Sloping

Low Chord Elev (ft): 518.5

Upper Chord Elev (ft): 522

Overtopping Elev (ft): 508.8

Skew (degrees): 10

Guide Banks: None

Waterway Classification: Main

Year Built: 1984

Avg Daily Traffic: 1000

Plans on File: Yes

Parallel Bridges: No

Upstream/Downstream: N/A

Continuous Abutment: No

Distance Between Centerlines:

Distance Between Pier Faces:

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Bridge Description:

This bridge has a sloping left abutment and embankment, but the right abutment is a steep bank with rip rap. The right end of the bridge is high enough that it really does not have an embankment. There are also some levees/spoil banks on the right bank that would eliminate the effect of sloping embankments. The bridge type is coded as Type III, but both abutments do not meet this criteria.

The piers are numbered 1 through 4, with pier 1 closest to the left abutment (looking downstream). The abutments and piers are skewed 10 degrees right relative to the bridge deck.

Abutment Data

Left Station: 0
Right Station: 723
Left Skew (deg): 0
Right Skew (deg) 0
Left Abutment Length (ft): 47
Right Abutment Length (ft) 47
Left Abutment to Channel Bank (ft): 375
Right Abutment to Channel Bank (ft):
Left Abutment Protection:
Right Abutment Protection
Contracted Opening Type: III
Embankment Skew (deg): 10
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	File Spacing(ft)
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1	100	10	0	Single	0
2	209	10	0	Single	0
3	367	10	0	Single	0
4	564	10	0	Single	0

Pier ID	Pier Width(ft)	Pier Shape	Shape Factor	Length(ft)	Protection	Foundation
1	2	Round		46.25	None	Poured
2	3	Round		47.5	None	Poured
3	3	Round		43	Unknown	Poured
4	2	Round		42	Unknown	Poured

Pier ID	Top Elevation(ft)	Bottom Elevation(ft)	Foot or Pile Cap Width(ft)	Cap Shape	File Tip Elevation(ft)
1	501	498	8	Square	
2	492.75	490	6.25	Square	
3	482.95	477.95	13.75	Square	
4	482.32	478.07	10.75	Square	

Pier Description

Pier ID 1

Pier 1 is on the left overbank during low flows.

Pier ID 2

Pier 2 is on the left overbank during low flows.

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Pier ID 3

Pier 3 is near the left edge of water at low flows.

Pier ID 4

Pier 4 is in the main channel near the thalweg. This pier frequently has log jams piled on it.

Pier Scour Data

Pier ID	Date	Time	USOrDS
2	1/3/91	12:30	Upstream
2	1/4/91	12:00	Upstream
2	1/4/91	13:00	Downstream
3	1/3/91	12:30	Upstream
4	1/3/91	12:30	Upstream
4	1/4/91	12:00	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)
2	1.2	0.5	9.5	24	3.6	11.3	3	5
2	1.3	0.5	6.7	14	3.3	10.4	3	5
2	0.8	0.5	11.4	19	3.3	10.4	3	5
3	2.2	0.5	6.7	56	4.2	16.7	3	0
4	3.5	0.5	5.7	91	5.4	21.5	2	10
4	4.1	0.5	5.7	78	6.1	20.2	2	10

PierID	Sediment Transport	Bed Material	BedForm	Trough (ft)	Crest (ft)	Sigma	Debris Effects
2	Live-bed	Non-cohesive	Unknown			4.2	Unknown
2	Live-bed	Non-cohesive	Unknown			4.2	Unknown
2	Live-bed	Non-cohesive	Unknown			4.2	Unknown
3	Live-bed	Non-cohesive	Unknown			4.2	Unknown
4	Live-bed	Non-cohesive	Unknown			4.2	Unknown
4	Live-bed	Non-cohesive	Unknown			4.2	Unknown

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Abutment Scour

Contraction Scour

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			
1991	1	3	12:30	30	43400	none	1991	1	3	12:30	30	510.5		
				0		none	1991	1	4	13:00	0	510.4		
				0		none	1991	1	4	12:00	0	510.4		
				0		none	1991	2	12	14:45	45	498.7		
				0		none	1991	2	12	14:00	0	498.7		
				0		none	1990	6	21	9:00	0	497.9		
				0		none	1990	6	20	14:30	30	497.2		
				0		none	1990	9	10	15:00	0	492.9		
				0		none	1990	9	10	14:30	30	492.9		
				0		none	1992	6	12	10:30	30	491.7		

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0 none 1992 6 12 11:00 0 491.7

Hydrograph

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