

# BSDMS Summary Report

10 Red River at U.S. 82 at Garland, AR

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## Site Location:

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**Site ID:** 10

**Site Name:** Red River at U.S. 82 at Garland, AR

**County:** LaFayette, Miller

**Nearest City:** Garland

**State:** AR

**Latitude:** 332121

**Longitude:** 934223

**USGS Station ID:** 7342000

**Route Number:** 82

**Route Class:** US

**Service Level:** Mainline

**Route Direction:** NA

**Highway Mile Point:**

**Stream Name:** Red River

**River Mile:**

**Contact:**  
U.S. Geological Survey, Arkansas  
District  
2301 Federal Office Building  
700 West Capitol Bldg.  
Little Rock, Ark. 72201

**Publication:**  
U.S. Geological Survey  
Water Resources Investigations  
Report  
"Scour around bridge piers on  
streams in Arkansas"  
by Rodney Southard

## Site Description:

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This site is located at the U.S. 82 bridge crossing the Red River at Garland, Arkansas, near the border with Texas and Louisiana. The site is in the Coastal Plain Province, which is underlain by alluvial deposits and other unconsolidated sediments. The channel bed consists primarily of fine sands, silts, and clays.

## Elevation Reference

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**Datum:** MSL

**MSL (ft):**

### Description of Reference Elevation:

Structure elevations given are from the bridge construction plans.

## Stream Data

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Drainage Area (sq mi):	52675	Floodplain Width:	Unknown
Slope in Vicinity(ft/ft):		Natural Levees:	Unknown
Flow Impact:	Unknown	Apparent Incision:	Unknown
Channel Evolution	Unknown	Channel Boundary:	Unknown
Armoring:	Unknown	Banks Tree Cover:	Unknown
Debris Frequency:	Unknown	Sinuosity:	Unknown
Debris Effect:	Unknown	Braiding:	Unknown
Stream Size:	Unknown	Anabranching:	Unknown
Flow Habit:	Unknown	Bars:	Unknown
Bed Material:	Unknown	Stream Width Variability:	Unknown
Valley Setting:	Unknown		

## Roughness Data

### Manning's n Values

	Left Overbank	Channel	Right Overbank
High:			
Typical			
Low:			

## Bed Material

## Bridge Data

Structure No:	6174
Length(ft):	1667.2
Width(ft):	47

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Number of Spans: 14  
Vertical Configuration: Curvilinear  
Low Chord Elev (ft): 237  
Upper Chord Elev (ft): 255  
Overtopping Elev (ft):  
Skew (degrees): 15  
Guide Banks: Unknown  
Waterway Classification: Main  
Year Built:  
Avg Daily Traffic:  
Plans on File: Yes  
Parallel Bridges No  
Upstream/Downstream: N/A  
Continuous Abutment: No  
Distance Between Centerlines:  
Distance Between Pier Faces:

## Bridge Description:

The bridge, 1667 ft long and 46.8 ft wide, is supported by 13 reinforced-concrete pile-bent piers. Each bent consists of two piles spaced at approximately 26 ft on centers with a pile-cap pedestal supporting the bridge deck. The abutments are pile bents with four piles. Piers 7, 8, and 10 (numbered from left bank when looking downstream), where scour depths were estimated, have 9.8-ft-diameter (minimum) drilled-shaft piles. Above grade, these piles taper to a 6-ft diameter. A 1.5-ft web wall extends between the piles at mid-level (elevation 212-238 ft).

## Abutment Data

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Left Station: 8168.08  
Right Station: 6500.92  
Left Skew (deg): 15  
Right Skew (deg) 15  
Left Abutment Length (ft): 46.8

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Right Abutment Length (ft) 46.8

Left Abutment to Channel Bank (ft): 650

Right Abutment to Channel Bank (ft): 380

Left Abutment Protection:

Right Abutment Protection

Contracted Opening Type: III

Embankment Skew (deg): 15

Embankment Slope (ft/ft): 4

Abutment Slope (ft/ft) 4

Wingwalls: Yes

Wingwall Angle (deg): 0

## Pier Data

Pier ID	Bridge			PierType	# Of Piles	Pile Spacing(ft)
	Station(ft)	Alignment	Highway Station			
10	1288	0	6878	Group	2	26
7	714	0	7453	Group	2	26
8	884	0	7283	Group	2	26
9	1118	0	7048	Group	2	26

Pier ID	Pier			Length(ft)	Protection	Foundation
	Width(ft)	Pier Shape	Shape Factor			
10	9.8	Round		35.8	Unknown	Piles
7	9.8	Round		35.8	Unknown	Piles
8	9.8	Square		35.8	Unknown	Piles
9	9.8	Round		35.8	Unknown	Piles

Pier ID	Top	Bottom	Foot or Pile	Cap Shape	File Tip
	Elevation(ft)	Elevation(ft)	Cap Width(ft)		Elevation(ft)
10				Square	110
7				Square	120

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8	Square	110
9	Square	110

## Pier Description

Pier ID 10

See pier 7.

Pier ID 7

Each bent has two piles spaced at approx. 26 ft on centers with a pile-cap pedestal supporting the bridge deck. Each pile is 9.8 ft in diameter below grade and extends into a stiff clay layer. Above grade, the piles taper to a 6-ft diameter. Mid-level, there is a 1.5-ft web wall (elev. 212-238 ft).

Pier ID 8

See pier 7.

Pier ID 9

See pier 7.

## Pier Scour Data

Pier ID	Date	Time	USOrDS
10	5/14/90	14:00	Downstream
7	5/14/90	14:00	Downstream
8	5/14/90	14:00	Downstream

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)
10	10.7	0.5	6.4	87	4.8	29.9	9.8	0
7	14.4	0.5	7.4	195	6.2	38.5	9.8	0
8	5.9	0.5	11.5	105	7.7	44.2	9.8	14

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PierID	Sediment Transport	Bed Material	BedForm	Trough (ft)	Crest (ft)	Sigma	Debris Effects
10	Live-bed	Unknown	Unknown				Unknown
7	Live-bed	Unknown	Unknown				Unknown
8	Live-bed	Unknown	Unknown				Unknown

PierID	D95 (mm)	D84 (mm)	D50 (mm)	D16 (mm)
10			0.32	
7			0.32	
8			0.32	

## Pier Scour Comments

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Pier ID	10	Time:	14:00	US/DS:	Downstream
Pier ID	7	Time:	14:00	US/DS:	Downstream
Pier ID	8	Time:	14:00	US/DS:	Downstream

## Abutment Scour

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## Contraction Scour

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## Stage and Discharge Data

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Peak Discharge			Flow (cfs)	Qacc	Peak Stage			Stage (ft)	Water Temp (C)	Return Period(yr)		
year	mo	dy			hr	mi	year				mo	dy
1990	5	14	14:00	0	222000	1000	1990	5	14	14:00	0	236.93

## Hydrograph

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

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