

Harp Creek Bridge
Spanning Harp Creek at State Highway 7
Ten Miles south of Harrison
Newton County
Arkansas

HAER No. AR-9

HAER
ARK,
SI-HAR.V,
1-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD

HARP CREEK BRIDGE

HAER NO. AR-9

HAER
AR-9
ST-HARV,
1-

LOCATION: Spanning Harp Creek on State Highway 7, ten miles south of Harrison, Newton County, Arkansas.

UTM: 15/3992915/487650

Quad: Jasper, Arkansas

DATE OF
CONSTRUCTION: 1928

ENGINEER: Arkansas State Highway and Transportation Department.

BUILDER: Luten Bridge Company, Little Rock, Arkansas.

PRESENT OWNER: Arkansas State Highway and Transportation Department.

PRESENT USE: Vehicular bridge

SIGNIFICANCE: Erected as one of two bridges in a Newton County road project, Harp Creek Bridge is one of the more architectural of the small Highway Department bridges. It was built in 1928 by the Little Rock branch of the Luten Bridge Company, named after its renowned founder Daniel B. Luten, which specialized in reinforced concrete arch bridges. Harp Creek remains today as one of only ten unaltered open spandrel deck arches in Arkansas.

HISTORIAN: Sean O'Reilly

DESCRIPTION: Corinne Smith

Arkansas Historic Bridge Recording Project, 1988.

THE PROJECT

The bridge over Harp Creek on Route 7 in Newton County was built in 1928 as part of a single project involving two bridges on that route.(1) The bridge, a concrete deck arch of 65 feet with two approach spans, was let to contractors together with a second bridge, over Mill Creek, which consisted of three 31-foot deck girder spans.(2)

The project was undertaken to improve the scenic Highway No. 7, "a connection between No. 65 at Harrison and No. 70 near Hot Springs through Russellville, crossing the backbone of the Boston Mountains."(3) However, the improvement of Highway No. 7 was not the sole reason for undertaking the construction of these bridges. In a letter from Division Engineer W. M. Mitchell, to the bridge engineer of the State Highway Department, N. B. Garver, it was noted that "to date we have nothing going in this county except a small state project and it is very imperative we get some work underway."(4) Clearly, an appreciation of the balance of road projects throughout the state of Arkansas was an important, if hardly decisive factor in deciding which route developments should be undertaken.

THE SITES

The sites of the two projected bridges, over Mill Creek and Harp Creek, were surveyed early in September 1927.(5) As neither site was bridged at that time, the survey was necessary to determine the required specifications of the bridges. Both sites, set in the mountainous region of northern Arkansas, had solid rock available for the foundations of the bridges. The character of the Mill Creek site permitted the use of simple deck girder spans. In contrast, the Harp Creek site required the construction of a more substantial bridge and, consequently, a bridge with greater

architectural pretensions.

DESIGN, LETTING AND CONSTRUCTION

Designs for the projected bridge over Harp Creek were commenced on November 22, 1927, and completed on December 19.(6) The bridge design, for construction in reinforced concrete, was a simple deck arch with open spandrels containing vertical posts which carried the deck. An elaborate range of arch motifs adorned the surface and, though simplified in actual construction, the bridge, as built, retained the architectural character of the original designs. The bridge contract originally was intended for letting on January 15, 1928. However, the bridge contract was assigned in an apparently unscheduled letting on December 30, 1927.(7) The Little Rock offices of the Luten Bridge Company gained the contract for a low bid of \$8,706.12, some \$300 less than the cost estimated by the State Highway Department.(8)

On January 10, 1928, N. B. Garver gave notice to the Luten Bridge Company "to commence work on this project," a project which was to remain under Garver's own supervision.(9) Despite Garver's reminder that work should be commenced "within ten days of the date of this order," that is, by January 20,(10) work on the bridge did not begin until January 31. However, no complications arose due to the delay and, as far as can be ascertained, the project was completed within the contract time of 110 days.(11)

LUTEN BRIDGE COMPANY

The Little Rock branch of the Luten Bridge Company was one of a number of branches of a larger company which had its origins in 1900 under the engineering ingenuity of Daniel B. Luten.

Luten, born on December 26, 1869, in Michigan, graduated from the University of Michigan in Civil Engineering in 1894.(12) He began his career as an educator and instructor, and soon moved to Indianapolis, Indiana, to specialize in the design, patenting and erection of reinforced concrete bridges. In 1925 Luten was credited with fifty patents in the improvement of concrete bridges and over 1400 bridges of his design are in use.(13)

The Little Rock branch began in 1920 when the family of D. H. Dougherty arrived to work on the Broadway Bridge across the Arkansas River.(14) Its successful record of bridge contracts for reinforced concrete bridges continued into the 1930s. The company's decline began then, as the design of bridges using reinforced concrete arches was superseded by more modern designs.

ENGINEERING DESCRIPTION

The Harp Creek Bridge is an open spandrel, concrete deck arch. The 117-foot-long, 23-foot-wide bridge is supported by two arched ribs 16 feet apart. The 69-foot-long arches spring from two piers 24 feet from the masonry abutments at either end of the bridge deck. The ribs thicken slightly toward the haunches from a 2-foot thickness at the crown. The arches are connected by beams midway from the springline to the crown.

Eight reinforced concrete spandrel columns and a pilaster at each pier, square in section with caps and bases, rise from each arch rib to support ten floor girders. Four stringers carry the load from the reinforced concrete slab deck to the girders. The outer stringers are directly over the ribs and hide the two spandrel columns nearest the arch crown. The other two stringers are 5 feet inside the ribs.

The arch of the bridge is continued as a motif in a pattern on the outer face of each pier and

on the posts on the deck directly above each pier. The original plans also called for a shallow arch motif between the verticals to echo the basic form of the bridge. Instead the stringers were made deeper, and a straight edge separates each vertical. A reinforced concrete balustrade with arched openings serves as a handrail.

ENDNOTES

1. "Notice to Bridge Contractors Job No. 904" issued by D. H. Blackwood, Chairman State Highway Commission, n.d., AHTD Microfilm Files.
2. *ibid.*
3. Murray, J.C. "State's Fine Transportation Facilities", Arkansas Centennial 1836-1936, Arkansas Democrat, 1936, p. 65.
4. W.M. Mitchell to N.B. Garver, November 30, 1927, AHTD Microfilm Files.
5. Survey Forms for Mill Creek (September 1, 1927) and Harp Creek (September 3, 1927). AHTD Microfilm Files.
6. Bridge 585. Card Index, AHTD. c.f. also "Bridge over Harp Creek" Drawing No. 512. AHTD Drawings.
7. Garver to Mitchell, December 1, 1927. AHTD Microfilm Files. Garver noted that Harp Creek and Mill Creek bridges would not be ready for December 15, 1927 letting, but that they would be completed for January 15, 1928 letting. Bridge 585 Card Index records letting on December 30, 1927.
8. Bridge 585. Card Index, AHTD. The builder's plate reads: "Harp Creek: Lutten Bridge Co. Contractor Arkansas State Highway Department: 1928".
9. Garver to Lutten Bridge Company, Little Rock, January 10, 1928. AHTD Microfilm Files.
10. Bridge 585. Card Index, AHTD.
11. *ibid.*
12. Leonard, J. W., Who's Who in Engineering 1925, New York, 1925.
13. *ibid.*
14. Conversation by telephone with D.H. Dougherty, Jr., August, 1988.

BIBLIOGRAPHY

Arkansas State Highway and Transportation Department, Bridge Section: Card Index
Microfilm and Drawings. Ref. Bridge No. 585, Job No. 904.

Builder's Plate: "Harp Creek Bridge".

D.H. Dougherty, Jr., telephone conversation, August 1988.

Hardaway, Billie Touchstone, These Hills My Home, Western Printing Co., Missouri, 1980.

Leonard, John William, Who's Who in Engineering, 1925, Who's Who Publication, New York, 1925.

Murray, J.C. "State's Fine Transportation Facilities", Arkansas Centennial 1836-1936, Arkansas Democrat, Little Rock, 1936. pp. 64-66.

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AR-9

DATE	BY	REVISION
1/19		

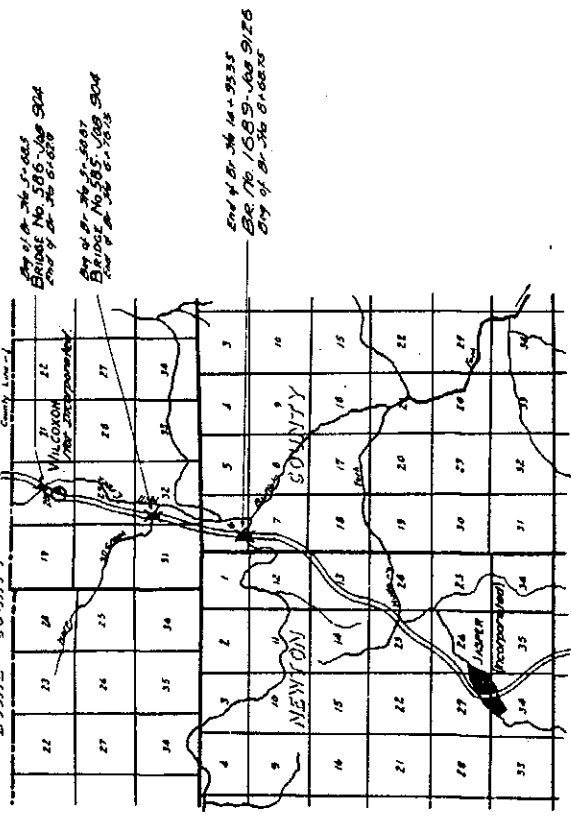
STATE OF ARKANSAS
STATE HIGHWAY DEPARTMENT

PLAN OF PROPOSED BRIDGES
OVER
HARP AND MILL CREEKS & BUFFALO RIVER
JASPER-HARRISON ROAD
ROUTE 7 - SEC 13
NEWTON COUNTY
JOB - 904 & 9126

EMERGENCY FINANCIAL EAR No. 286-A

INDEX OF SHEETS

SHEET No	Drawing No	TITLE OF SHEETS
1	511	LAYOUT-BRIDGE No 385
2	512	DETAILS CONV. ARCH AND APPROX SPANS BR No 585
3	513	DETAILS END BENTS BR No 585
4	514	LAYOUT-BRIDGE No 586
5	515	DETAILS OF SPANS BR No 586
6	516	DETAILS OF ABUTMENTS BR No 586
7	517	REVISED DECK OF ARCH SPAN BR No 585
8	518	REVISED PLAN ABUTMENT No. 1 - BR. No 586
9	518A	LAYOUT-BRIDGE No 1689
10	519	DETAILS PIERS C&3 - BR No 1689
11	520	DETAILS OF ABUTMENT No. 2 - BR No 1689
12	521	TRUSS DETAILS - BR No 1689
13	522	TRUSS DETAILS - BR No 1689
14	523	TRUSS DETAILS - BR No 1689
15	524	STANDARD 30' A.C.G.-20 ROADWAY PLAN & PROFILE - BR. No 1689
16	525	
17		
18		
19		



LAYOUT
Scale: 1" = 100'

GROSS LENGTH OF PROJECT - 386.57 A - 0.111 Miles
NET LENGTH OF PROJECT - 386.57 A - 0.111 Miles

QUANTITIES

ARTICULATING IN SUPER STR. BRIDGE

Item No	Description	Quantity	Unit
13	D7 Excavation for 3rd	250.29	Cu Yds
13	Art. Excavation for 3rd	446.12	-
31	Solid Rock Exc. for 3rd	249.44	-
34	Class 3 Concrete	101,450	-
34	Class 3 Concrete	478.40	-
35	Reinforcing Steel	194,690.0	-
36	Structural Steel	319,746	-
69	40# Rip 1" Thick	102	Sq Yds
74	Concrete Abutling	819.67	Sq Yds

CONCRETE ABUTTING IN SUPER STR. BRIDGE

Item No	Description	Quantity	Unit
11	Clearing	4.11	Acres
11	Grubbing	1.94	-
34E12	Common Excavation	1,597.0	Cu Yds
34E12	Solid Rock Excavation	198.6	-
37	Removal of Existing Str.	1	044
13	Gravel	741.6	Sq Yds

JOB 904

Approved by Chief Engineer of the State Highway Department

End of Br. 34 14-1-1935
Br. No. 1089 - Job 9126
City of Newton

SPECIAL PROVISIONS

See Art. 1000 of the Arkansas Constitution

APPROVED	
DESIGNED BY	
CHECKED FOR APPROVAL	
REVIEWED FOR APPROVAL	
REVIEWED FOR APPROVAL	
REVIEWED FOR APPROVAL	

M.A. Jones
Chief Engineer

Gross No. 585256 Drawing No. 511

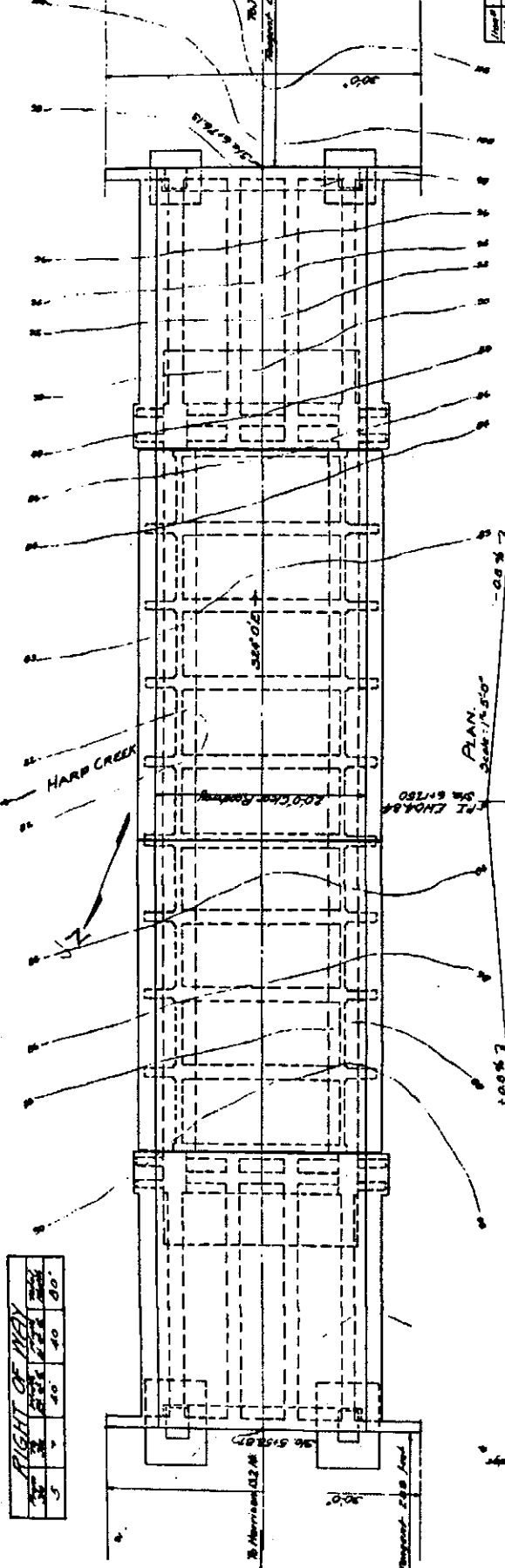
AR-9

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RIGHT OF WAY

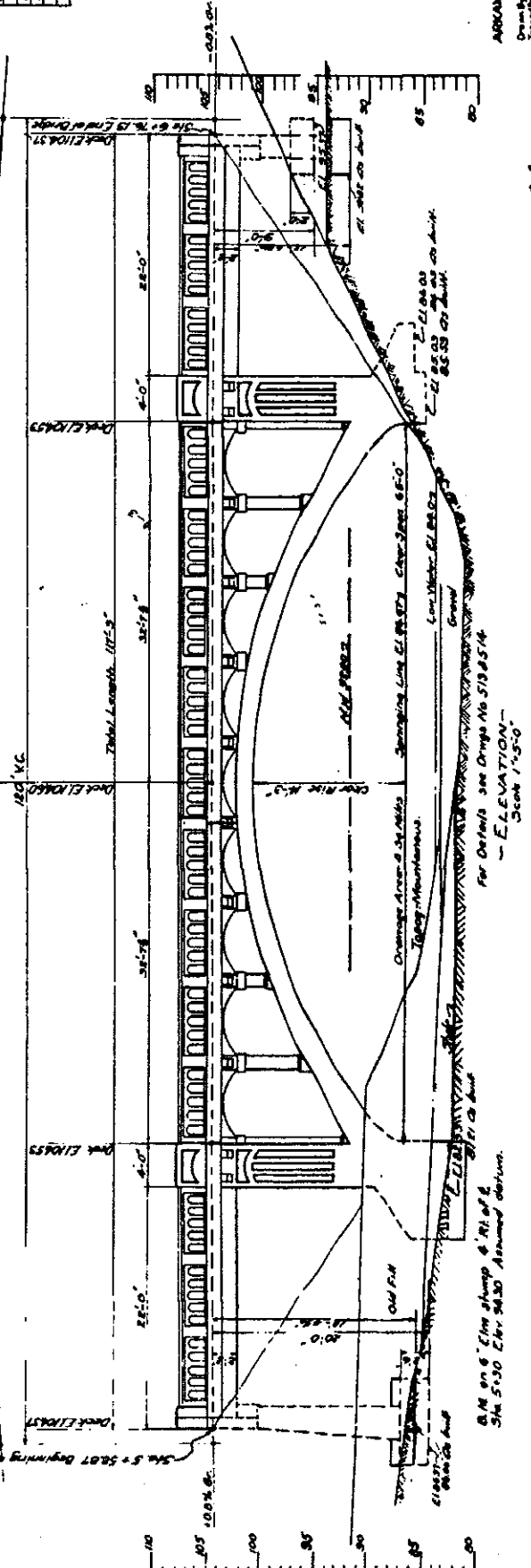
5	10	20	40	80
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1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10



QUANTITIES FOR BR 505

1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10



LAYOUT OF BRIDGE OVER HARD CREEK.
 ROUTE 7 SECTION 17
 ARKANSAS STATE HIGHWAY DEPARTMENT
 LITTLE ROCK, ARK.
 Drawing No. 512
 Drawing No. 505

Z.B. Rogers
 Bridge Engineer

For Details see Drawings No. 512 & 514
 - ELEVATION -
 Scale 1/50

G.M. on 6' Cms along @ R/L of S
 Sta. 5+30 Elev. 54.30 Assumed datum.