St. Louis-San Francisco Overpass
(Imboden Bridge)
Spanning the Spring River at U.S. Highway 62
Imboden
Lawrence-Randolph County Line)
Arkansas

HAER No. AR-26

HAER
ARK,
38-IMBO,
1-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
National Park Service
Department of the Interior
Washington, DC 20013-7127

HAER
ARK,
38-IMBO,
1-

HISTORIC AMERICAN ENGINEERING RECORD

ST. LOUIS SAN FRANCISCO OVERPASS

(Imboden Bridge)

HAER NO. AR-26

LOCATION: U.S. Highway 62, spanning the lines of the old St. Louis San Francisco Railroad Company and the Spring River, between Lawrence County and Randolph County, Imboden, Lawrence County.

UTM: 15/4008080/664320
QUAD: Imboden, Arkansas

DATE OF CONSTRUCTION: 1937

ENGINEER: Arkansas State Highway and Transportation Department.

BUILDER: C.F. Lytle

PRESENT OWNER: Arkansas State Highway and Transportation Department.

PRESENT USE: Pedestrian and vehicular bridge.

SIGNIFICANCE: Designed in 1936 and built in 1937 by C. F. Lytle of Sioux City, Iowa, the bridge at Imboden is an interesting example of State Highway Department bridge design in the later 1930s and may be compared with the bridge over the North Fork River (HAER NO. AR-10). Both involve the economical steel deck truss with concrete deck, though the Imboden bridge uses three pony trusses where it spans the river.

HISTORIAN: Sean O'Reilly

DESCRIPTION: Corinne Smith

Arkansas Historic Bridge Recording Project, 1988.

ROUTE 62

J.C. Murray, traffic manager of the Little Rock Chamber of Commerce commented as follows on the degree of vehicular traffic in the state of Arkansas in 1936:

> Recent survey by the United States Bureau of Public Roads shows an average of 307,732 vehicles of all types traveling over the State Highway system every 24 hours, operating a highway mileage of 3,000,000 vehicle miles per day.(1)

The demands made on the road system, demands which were continually increasing, led Murray to note that "these highways are of such construction that transportation via motor carrier has become a great factor in the movement of passenger and commerce..."(2) Listed as one of Murray's "principal highways", Highway 62, together with Highways 63 and 61, formed "a route east and west across the northern section of the state,...from...the vicinity of Fayetteville, Ark., to the Tennessee line at Memphis."(3)

At Imboden, a small town in Lawrence County at the border with Randolph County, Route 62 intersected the St. Louis-San Francisco Railroad and the Spring River. The intersection was particularly unsuitable for such an important route. Passing from Imboden the traveler crossed the three-track system of the railroad before reaching an inadequate bridge with a wooden deck.(4) Clearly, with increasing demands being made on the route, modern bridging involving a coordinated overpass of the tracks and a bridging of the river was, not only expedient, but imperative.

THE OLD BRIDGE

The old 760-foot bridge lay some 100 feet east and downstream from the site of the projected bridge.(5) It consisted of two main spans of 120 feet, six panel through steel trusses supported on 35-inch concrete-filled steel piers. It had eleven approach spans to the south (Imboden) side and fifteen spans to the northern approach, the latter supported on rubble masonry piers. The roadway had a deck formed of 3-inch oak planks and a clear width of only 11 feet on the main spans. One of the main spans was recorded as having oak stringers.

The precise date of the construction of this old bridge is not on record. However, its details of construction clearly indicated its unsuitability to modern traffic. The Arkansas State Highway Department of the mid-1930s could only have been dissatisfied with the old structure.

FRISCO LINES

The St. Louis-San Francisco Railway Company, the Frisco Lines, were described as having "made a very great contribution to the development of northwestern and eastern Arkansas, and both these territories yielded excellent returns to that property."(6) Operated in 1936 under the direction of its President, J.M. Kurn, the company had evolved from a consolidation of smaller railroads which began their development in the 1880s. The tracks, of the Frisco Lines at the time of the construction of the overpass at Imboden, extended from St. Louis through Missouri, Arkansas, and Oklahoma to Texas.

The company was continually eager to improve its route. Any intersection of its tracks with a road was a potential source of danger to the public. The intersection of its lines with Route 62 at Imboden was a particular problem to the company due to the traffic density on the route.

One solution available to the Frisco Lines was to build a viaduct out of its own funds, as was the case with the Lincoln Avenue Viaduct built by the Missouri-Pacific Railroad Company some eight years earlier.(7) However, the geography of the route across the tracks meant that a company viaduct serving the tracks would have been too expensive.

In April 1935, the Frisco Lines "heard locally" that the State Highway Department was "contemplating building a new bridge over Spring River," and the company requested that it be built, in addition, as "a viaduct crossing."(8) When plans were underway for the development of a bridge at Imboden, crossing both the tracks and the river, the Frisco Lines were eager to help the project in any way possible.

On January 16, 1936, in reply to the State Highway Department,the Frisco lines forwarded an "estimate of cost that railway will do at States expense in connection with this job."(9) The total expense of work was estimated at $525.00.(10) However, it was the co-operation of the company and its acceptance of the plans that manifested the railroad companies eagerness.

CROSSING RAILROAD TRACKS

Two factors concerned the bridge engineers of the State Highway Department regarding the design of the bridge, the crossing of the railroad tracks of the St. Louis-San Francisco Railroad Company and the bridging of the Spring River. The former was of interest to the Department due

to the availability of Federal funds for the elimination of such crossings. The latter was of concern to them because the bridging of navigable waters required Federal approval.(11)

The elimination of the intersection of Highway 62 with the railroad tracks was a problem which concerned the engineers from the outset. It was, however, the railroad company who, on April 29, 1935, made the first representations regarding a rail overpass. They requested that "if the new bridge is built, possibly it could be carried over our tracks to afford a viaduct crossing."(12) The State Highway Department was also interested in acquiring Federal aid. Funds, administered by the Bureau of Public Roads, a section of the U. S. Department of Agriculture, were provided for such circumstances as were found at Imboden: the removal of the dangerous intersection of road and rail.(13) As route 62 crossed three tracks of the railroad, the construction of a "grade separation structure" passing over the tracks was "considered eligible to be financed by grade crossing funds."(14)

NAVIGABLE WATERS

The crossing of the Spring River was a minor problem which arose after the preliminary designs were submitted to the Bureau of Public Roads for approval. In reply to the query regarding the eligibility of the overpass for Federal funds, "it was noted that the project involves the construction of a bridge over the Spring River and it is not known whether this stream is a navigable water of the United States at the proposed point of construction."(15) The Bureau further suggested that the approval of the project be upon the condition that "before the project agreement is submitted for execution the record will be supplemented by satisfactory evidence showing that the plans and

locations of the bridge...have been approved by the Secretary of War and the Chief of Engineers."(16)

The erection of a bridge across the Spring River was dependent upon whether it was considered a "navigable water" or not. If it was so considered, a decision which had to be made by the War Department, it required the prior approval of that Department and the Chief of Engineers before it could be constructed legally.(17) However, on January 21, 1936, the War Department informed the Bureau that "..this stream is not a navigable water of the United States at the proposed point of construction."(18) Further approval was not, therefore, required.

CONTRACT AND LETTING

The bridge contract provided for a bridge of nine reinforced concrete girder spans, four I-beam spans and three truss spans with a concrete deck throughout.(19) Two further projects were required to be undertaken in conjunction with the construction of the bridge, the removal of the old bridge and the cleaning of the channel on the site of the projected bridge.(20)

A special provision was made for the "complete removal of existing 726-foot bridge."(21) Here the work was to include

> ...the removal of all substructure including abutments, bents, wings, piers and all other materials and obstructions to the ground surface.(22)

The second special provision was made for the excavation of a sand bank obstructing the site of the new bridge. This clearance was to consist of "the removing and satisfactory disposal of all materials taken from the existing island"(23)

It has not been ascertained if the letting of the contract included the special provisions outlined above. However, the only contractor recorded in the entire project was C.F. Lytle of Iowa; Lytle received the contract for the erection of the bridge on May 15, 1936, with a total contract price of $178,856.27.(24) As he was not a regular contractor with the Arkansas State Highway Department, the Department requested references and recommendations from the Iowa State Highway Commission. The Commission responded enthusiastically as follows: "We can recommend C.F. Lytle Construction Company, Sioux City as competent to satisfactorily perform any contract awarded them."(25)

C.F. LYTLE

Working from his own company, C.F. Lytle Construction Company, of Iowa, Charles F. Lytle was one of the most dynamic construction entrepreneurs in Iowa.(26) From the turn of the century he was "involved with construction work of all kinds" and, in the early days of his company he "...built practically all of the paved county roads of Woodburg (Iowa)".(27) Founded through his individual efforts, the Lytle Investment Corporation, incorporated in Iowa in 1915 and developed in association with Lytle's extensive construction work, had an authorized capital of $I million by 1923.(28)

The C.F. Lytle Company was described in I944 as "one of the oldest construction firms in the midwest." By then it had worked on a variety of river contracts, including dams.(29) Its later work ranged from oil exploration to bomber base construction, to a dam on the Rio Grande.(30)

The C.F. Lytle Company has put the stamp of Sioux City construction on some of the nations major dam and highway projects.(31)

ENGINEERING DESCRIPTION

The St. Louis-San Francisco Bridge has an overall length of 1050 feet, comprised of three steel Pratt deck trusses each 112 feet long, three steel Parker pony trusses 112 feet long, and 378 feet of reinforced concrete deck girder approach spans. Traveling from the south, the three 12-foot high deck trusses follow 138 feet of approach spans. The pony trusses are next, connected with pins to rigid steel posts on the deck truss pier. All piers and abutments are reinforced concrete. The road width is 24 feet from curb-to-curb. All six trusses have eleven panels, with double bracing in the center panel, identical members, and riveted connections throughout. All web members are 12-inch I-sections, oriented with webs transverse to the direction of the bridge. The bottom chord consists of two channels with batten plates. The top chord, two channels with a continuous top plate and double lacing on the bottom, reaches a maximum height of 13 feet in the pony truss.

The deck trusses, laid 20 feet apart, use angle sections for sway bracing and upper and lower lateral bracing. The pony trusses are only braced laterally below the road level. This bracing, like the upper lateral bracing on the deck trusses, spans two panels or three panels across the center of the span. The floor system consists of 30-inch-deep I-beam floor girders at each panel point and a concrete slab deck. The sidewalk on the east side of the bridge is supported on a triangular plate which is suspended from the chord near the road level.

The four concrete plaque posts, two on either end of the bridge, were cast according to a standard highway department design of the era. The art deco style features step backs and insets.

ENDNOTES

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

2. ibid.

3. ibid.

4. See below "The Old Bridge".

5. "Removal of Old Bridge", Special Provisions, Job No. 10187, February, 1936. AHTD Microfilm Files.

6. Murray, J.C. loc. cit. p.66.

7. Historic American Engineering Record, HAER Report AR-6: "Lincoln Avenue Viaduct," 1988.

8. H.B. Barry, Assistant Chief Engineer, St. Louis, San Francisco Railway Company to N.B. Garver, Bridge Engineer, State Highway Department. April 29, 1935. AHTD Microfilm Files.

9. Barry to Garver, January 16, 1936. AHTD Microfilm Files.

10. ibid.

11. Historic American Engineering Record, HAER Report AR-8: "Black River Bridge," 1988.

12. Barry to Garver, April 29, 1935. AHTD Microfilm Files.

13. C.W. Boyle, Solicitor, to Thomas H. MacDonald, Chief, Bureau of Public Roads, January 11, 1936, AHTD Microfilm Files.

14. C.E. Swain, District Engineer, Bureau of Public Roads to W. W. Zass, Chief Engineer, State Highway Commission, November 13, 1935. AHTD Microfilm Files.

15. Boyle to MacDonald, January 11, 1936, AHTD Microfilm Files.

16. ibid.

17. Historic American Engineering Record, HAER Report AR-8" "Black River Bridge," 1988.

18. Boyle to MacDonald, January 21, 1936, AHTD Microfilm Files.

19. Bridge 1984, Card Index AHTD.

20. "Channel Excavation and Removal of Existing Bridge": Special Provisions, Job No. 10187, February 10, 1936, AHTD Microfilm Files.

21. ibid.

22. ibid.

23. ibid.

24. Bridge 1984, Card Index AHTD.

25. Iowa State Highway Commission to N. B. Garver, May 6, 1936, AHTD Microfilm Files.

26. Sioux City Tribune, Sioux City, Iowa: August 7, 1938; January 20, 1944; December 23, 1945; December 14, 1957; February 2, 1958.

27. Three Quarters of a Century of Progress, Sioux City, Iowa, p. 189.

28. ibid.

29. Sioux City Tribune, "Reveal Lytle Firm Change", December 14, 1957, p. 1.

30. Sioux City Tribune, "Lytle Firm's Major Jobs Span Globe," February 2, 1958, p. 13.

31. ibid.

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Arkansas State Highway and Transportation Department, Bridge Section: Card Index, Microfilm Files and Drawings. Ref. Bridge No. 1986, Job No. 10187.

Historic American Engineering Record, HAER Report AR-6: "Lincoln Avenue Viaduct," 1988.

Historic American Engineering Record, HAER Report AR-8: "Black River Bridge," 1988.

McLeod, Walter E. "Centennial Memorial History of Lawrence County", Russellville Printing Co., Russellville, Arkansas, 1936.

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

Sioux City Tribune, Sioux City Iowa. "Lytle Named in Answer to Ouster Action", August 7, 1938, p. 1.; "Lytle in New Partnership", January 20, 1944, p. 12; "Lytle to take in Exploration for Oil in Alaska", December 23, 1945, p. 2; "Reveal Lytle Firm Change", December 14, 1957, p. 1.; "Lytle Firm's Mayor Jobs Span Globe", February 2, 1958, p. 13. December 23, 1945; December 14, 1957; February 2, 1958.

Three Quarters of a Century of Progress, Verstegen Printing Company, Sioux City, Iowa, 1923.

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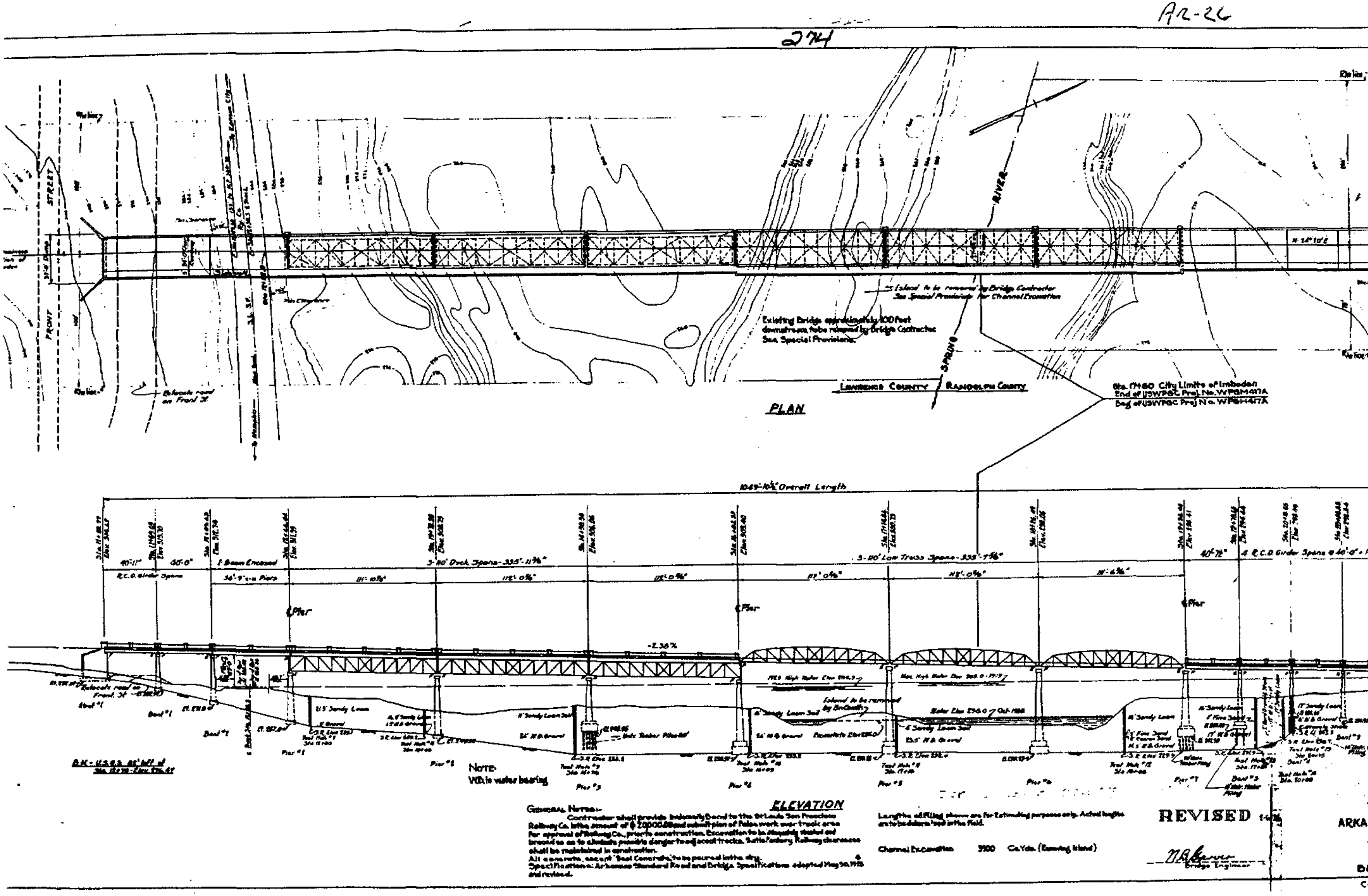
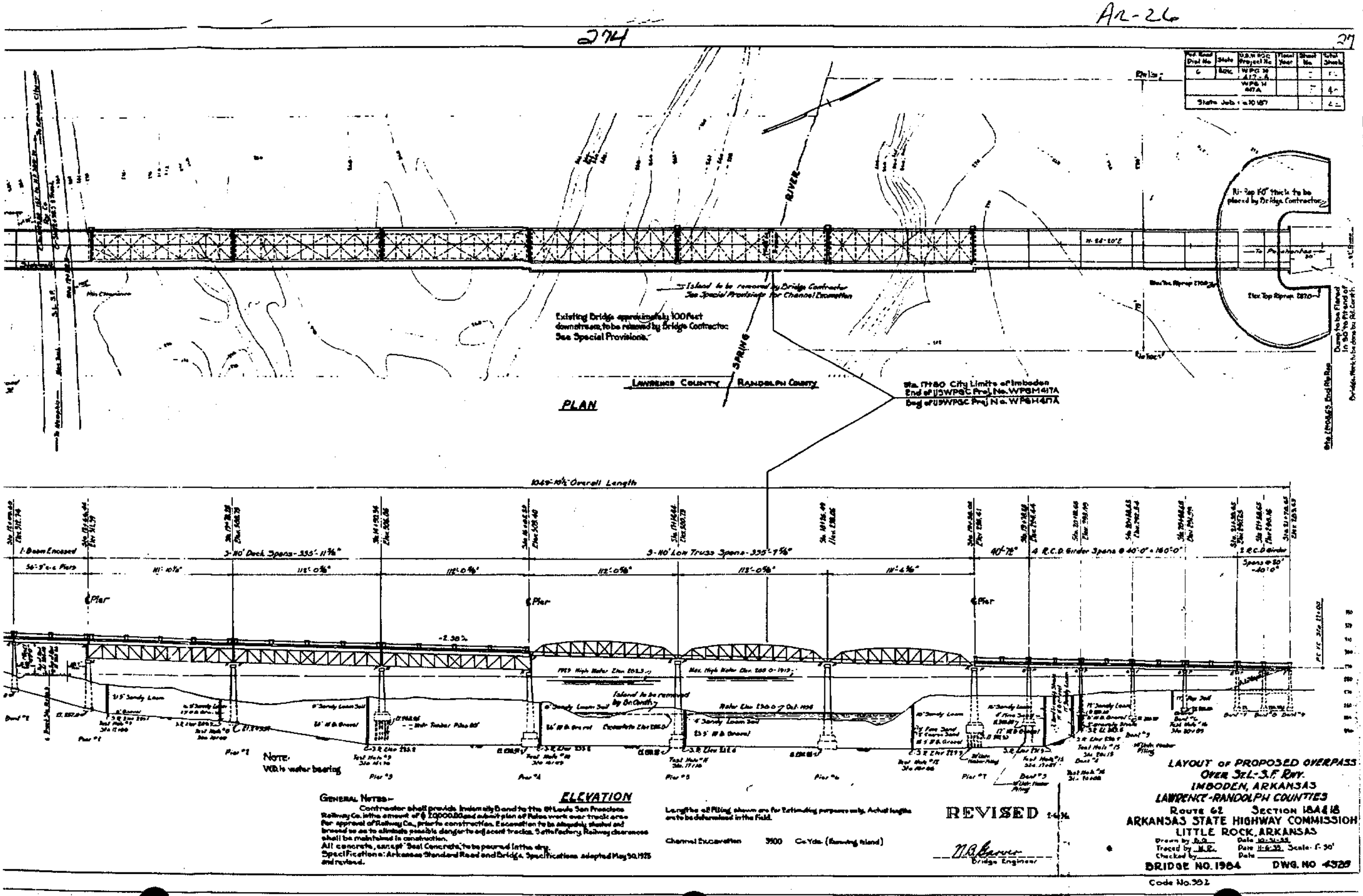

274
FRONT
STREET
PLAN
Existing Bridge approximately 100 Feet downstream, to be removed by Bridge Contractor. See Special Provisions.
Island to be removed by Bridge Contractor. See Special Provisions for Channel Excavation
SPRING
RIVER
LAWRENCE COUNTY
RANDOLPH COUNTY
Sta. 17+60 City Limits of Imboden
End of USWPGC Proj. No. WPGM417A
Beg. of USWPGC Proj. No. WPGH417A
1049'-10¾" Overall Length
3-110' Low Truss Spans - 335'-7⅝"
-2.38%
ELEVATION
Note:
W.B. is water bearing
General Notes:
Contractor shall provide Indemnity Bond to the St. Louis San Francisco Railway Co. in the amount of $20000.00 and submit plan of False work over track area for approval of Railway Co. prior to construction. Excavation to be adequately sheeted and braced so as to eliminate possible danger to adjacent tracks. Satisfactory Railway clearance shall be maintained in construction.
All concrete, except "Seal Concrete," to be poured in the dry.
Specifications: Arkansas Standard Road and Bridge Specifications adopted May 20, 1925 and revised.
Lengths of Piling shown are for Estimating purposes only. Actual lengths are to be determined in the field.
Channel Excavation 3500 Cu. Yds. (Removing Island)
REVISED
Bridge Engineer
ARKAN


AR-26
274
PLAN
Existing Bridge approximately 100 feet downstream, to be removed by Bridge Contractor. See Special Provisions.
Island to be removed by Bridge Contractor. See Special Provisions for Channel Excavation
SPRING
RIVER
LAWRENCE COUNTY
RANDOLPH COUNTY
Sta. 17+80 City Limits of Imboden
End of U.S.W.P.G.C. Proj. No. WPGM417A
Beg. of U.S.W.P.G.C. Proj. No. WPGH417A
Rip-Rap 1'0" thick to be placed by Bridge Contractor
Dump to be Flared in 90° to fit end of Bridge. Work to be done by Rd. Contr.
1049'-10½" Overall Length
I-Beam Encased
3-110' Deck Spans-335'-11⅛"
3-110' Low Truss Spans-335'-7⅝"
4 R.C.D. Girder Spans @ 40'-0" = 160'-0"
2 R.C.D. Girder
℄ Pier
-2.38%
ELEVATION
Note: W.B. is water bearing
General Notes:-
Contractor shall provide Indemnity Bond to the St. Louis San Francisco Railway Co. in the amount of $20000.00 and submit plan of False work over track area for approval of Railway Co. prior to construction. Excavation to be adequately sheeted and braced so as to eliminate possible danger to adjacent tracks. Satisfactory Railway clearances shall be maintained in construction.
All concrete, except Seal Concrete, to be poured in the dry.
Specifications: Arkansas Standard Road and Bridge Specifications adopted May 30, 1925 and revised.
Lengths of Piling shown are for Estimating purposes only. Actual lengths are to be determined in the Field.
Channel Excavation 3500 Cu. Yds. (Removing Island)
REVISED
Bridge Engineer
LAYOUT OF PROPOSED OVERPASS
OVER St.L.-S.F. RWY.
IMBODEN, ARKANSAS
LAWRENCE-RANDOLPH COUNTIES
Route 62 Section 18A & 18
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARKANSAS
BRIDGE NO. 1984
DWG. NO. 4328
Code No. 382

Ar-26

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STATE OF ARKANSAS

STATE HIGHWAY COMMISSION

PLAN OF PROPOSED BRIDGE

OVERPASS OVER ST. LOUIS-SAN FRANCISCO RAILWAY AT IMBODEN, ARKANSAS

LAWRENCE AND RANDOLPH COUNTIES

ROUTE 62 SEC. 18A & 18

JOB No 10187

U.S. WORKS PROGRAM GRADE CROSSING PROJECT NO. W.P.G.M. 417 - A & W.P.G.H. 417-A

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5	[illegible]	Details of Intermediate Bents Nos. 1-3-4-5 & 6
6	[illegible]	Details of Intermediate Bent No. 2
7	[illegible]	Details of Tower Bents Nos. 7-8 & 9
8	[illegible]	Details of Pier No. 1
9	[illegible]	Details of Pier No. 2
10	[illegible]	Details of Pier No. 3
11	[illegible]	Details of Pier No. 4
12	[illegible]	Details of Piers Nos. 5 & 6
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[illegible]	[illegible]	Details of 110' Deck Truss
[illegible]	[illegible]	Details of Support for 110' Thru Truss Span at Pier No. 4
[illegible]	[illegible]	Details of Curb Truss, 110' Thru Truss Span
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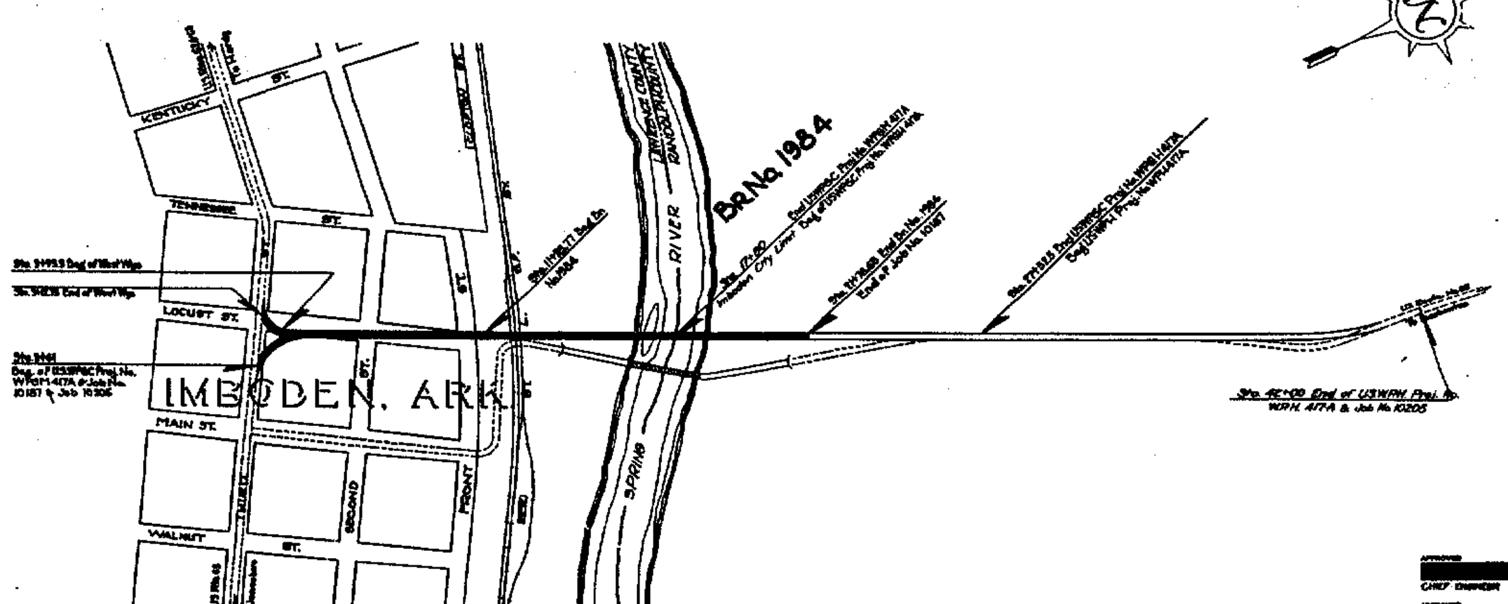
SPECIAL PROVISIONS

[illegible]



LAYOUT

Scale: 1" = 200'

	U.S.W.P.G.C. Proj. No. WPGM 417A	U.S.W.P.G.C. Proj. No. WPGH 417A	Job No. 10187
Gross Length of Project	[illegible] Mi.	972.5' or 0.185 Mi.	
Net Length of Project	[illegible] Mi.	972.5' or 0.185 Mi.	
Net Length of Roadway	[illegible] Mi.		[illegible] Mi.
Net Length of Bridge	[illegible] Mi.	[illegible] Mi.	[illegible] Mi.
Length of Job			[illegible] Mi.

N.B. Garver

BRIDGE NO. 1984

DRAWING NO. [illegible]

APPROVED [redacted]

CHIEF ENGINEER U.S. Bureau of Public Roads

APPROVED [redacted]

DISTRICT ENGINEER U.S. Bureau of Public Roads

APPROVED [redacted]

APPROVED [redacted]

APPROVED [redacted]

State Highway Engineer