

**BUFFALO CREEK BRIDGE**  
**(Bellview Bridge)**  
**U.S. Route 19, spanning Buffalo Creek**  
**Near the confluence of the Monongahela River**  
**Fairmont**  
**Marion County**  
**West Virginia**

**HAER No. WV-66**

HAER  
WVA,  
25-FAIR,  
5-

**PHOTOGRAPHS**  
**WRITTEN HISTORICAL AND DESCRIPTIVE DATA**

**HISTORIC AMERICAN ENGINEERING RECORD**  
**National Park Service**  
**Philadelphia Support Office**  
**U.S. Custom House**  
**200 Chestnut Street**  
**Philadelphia, PA 19106**

HISTORIC AMERICAN ENGINEERING RECORD

BUFFALO CREEK BRIDGE (Bellview Bridge)

HAER  
WVA,  
25-FAIR,  
5-

HAER No. WV-66

Location: U.S. Route 19, spanning Buffalo Creek near the confluence of the Monongahela River, Fairmont, Marion County, West Virginia

UTM: 17.573850.4372000  
Quad: West Fairmont, West Virginia

Date of Construction: 1934

Engineer: L.L. Jemison

Architect: West Virginia State Road Commission

Present Owner: West Virginia Department of Transportation  
Capitol Complex, Room 109, Building 5  
Charleston, West Virginia 25305-0430

Present Use: Vehicular Bridge

Significance: The Buffalo Creek Bridge was constructed with funds appropriated under the National Industrial Recovery Act of 1933 (NIRA). Under the direction of the Public Works Administration (PWA), the NIRA was devised by the presidential administration of Franklin Delano Roosevelt to provide relief to the unemployed and to stimulate economic and industrial recovery during the Depression of the 1930s. Buffalo Creek Bridge is also a significant representative of the bold use of reinforced concrete in the construction of arch bridges. The bridge compares favorably with the most well known reinforced concrete bridges with its refinement of form, elegant appearance, and attention to architectural detail.

Project Information: This documentation was undertaken in 1996 in accordance with a Memorandum of Agreement signed by the West Virginia Department of Transportation and State Historic Preservation Office as a mitigative measure prior to the replacement of the bridge.

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## Overview

The Buffalo Creek Bridge, located in Fairmont, Marion County, West Virginia, carries U.S. Route 19 over Buffalo Creek, a tributary of the Monongahela River. The bridge was constructed between July 1934 and January 1936 and is a single span reinforced concrete open spandrel arch bridge with nine cast concrete T-beam girder spans. The structure has an overall length of 432' 6" and a roadway width of 30', with a 5' sidewalk on each side. The bridge was designed by the West Virginia State Road Commission and the construction work was completed by E.R. Mills of Charleston, West Virginia and Ralph W. Fimple of Fairmont, West Virginia at a cost of nearly \$132,000.<sup>1</sup>

## Summary Description of Bridge and Setting

When Herbert Hoover became president of the United States on March 4, 1929, Americans believed the economic boom of the 1920s, which had been stimulated by the production of automobiles, steel, and various electronic equipment and home appliances, would continue to last. Most Americans were unaware that the prosperity of the 1920s was precariously close to coming to a halt. When the stock market crashed on October 29, 1929, Americans were unprepared for the long economic depression that followed. The stock market collapse ushered in a period of business depression that was the most prolonged in American history. By early 1933 an estimated thirteen million Americans were unemployed.

In the absence of any economic recovery, and burdened with a public resentful of the mounting financial crisis, Herbert Hoover was defeated by Franklin Delano Roosevelt in the 1932 presidential election. Inaugurated in March 1933, the Roosevelt years began on a note of feverish activity and high excitement. Enjoying overwhelming Democratic majorities in Congress, Roosevelt proposed a wide array of emergency measures in his early months in office. Roosevelt's strategy involved three main components: industrial recovery, agricultural recovery, and short-term emergency relief for the unemployed. One such measure was the NIRA passed in June 1933. The NIRA appropriated some \$3.3 billion for a federal public works program that would employ the jobless and increase consumer purchasing power by pumping money into the economy. To oversee this vast program the NIRA created the Public Works Administration. Under the leadership of Secretary of the Interior, Harold Ickes, the PWA eventually spent more than \$4 billion on some thirty-four thousand public works projects, most of which involved the construction of dams, bridges, and public buildings.<sup>2</sup>

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1. *Annual Report of the State Road Commission of West Virginia, West Virginia 1934-1935* (Charleston, West Virginia: State Road Commission, 1935).

2. Anthony J. Badger, *The New Deal: The Depression Years, 1933-1940* (New York: The Noonday Press, 1989); Paul K. Conkin, *The New Deal*, (Harlington Heights, Illinois: Harlan Davidson, Inc, 1975).

The depression of the 1930s was deeply entrenched in West Virginia. Thousands of workers lost their jobs due to mine closures and declines in manufacturing and heavy industry. By 1934 the state unemployment rate approached forty percent. To help offset such high unemployment rates, West Virginia was the recipient of a large number of federal work programs. It was through funds allocated by the PWA that the Buffalo Creek Bridge was built. According to government records, the men who were hired to build the bridge were unemployed Marion County residents. Minimum wages were set at \$1 per day for skilled workers, \$.50 per day for intermediate skilled workers, and \$.40 per day for unskilled workers.

In August 1933 U.S. Public Works Project 155-H was created. The project called for designing and building a bridge to be called the Buffalo Creek Bridge to span Buffalo Creek on U.S. Route 19 in Marion County, West Virginia. The site location for the bridge crossing was determined by its importance in the regional transportation system of northern West Virginia. U.S. Route 19 was the primary north/south highway in the region, connecting Morgantown with Fairmont and Clarksburg. The lack of a viable crossing for automobiles and trucks over Buffalo Creek on U.S. Route 19 hindered the economic development of the area by separating downtown Fairmont with regional markets to its north, primarily Morgantown. The Buffalo Creek Bridge served as a vital link in the economic life of Marion County, West Virginia by allowing for the easy movement of people and products throughout the surrounding area.

The task of designing the bridge was placed in the hands of the West Virginia State Road Commission. The plans for the Buffalo Creek Bridge were drawn in the Fall of 1933 by Harry Carpenter, an engineer with the State Road Commission. As originally designed, the Buffalo Creek Bridge was to have six, 30' reinforced concrete girder spans, and one 120' reinforced concrete open spandrel arch. Although Carpenter was the primary designer of the bridge, other men, including L.L. Jemison, the engineer of the Buffalo Creek Bridge, and Mortimer W. Smith, chief engineer of the West Virginia State Road Commission, also influenced its appearance.

Another key influence on the design and appearance of the Buffalo Creek Bridge was Frank Duff McEnteer. McEnteer was named District Engineer in 1932 and assigned to the Fourth District Engineering Division based in Clarksburg, West Virginia. McEnteer has been recognized as a pioneer in the use of reinforced concrete for highway bridges. McEnteer came to Clarksburg, West Virginia in 1911 and in 1914, he and P.M. Harrison formed the Concrete Steel Bridge Company. The company specialized in reinforced concrete structures and by 1931 when the company was liquidated it had built over one thousand bridges in West Virginia. Following the dissolution of the company, McEnteer joined the West Virginia State Road Commission, serving as District Engineer from 1932 to 1938.

After several months, during which planning, design, and development of site specifications occurred, construction bids were received on June 12, 1934. Prior to the award of the contract, it was determined that street car tracks would not be placed on the bridge. Instead, street cars operated by the Monongahela West Penn Public Service Company would continue to use the "old Buffalo Creek bridge," which crossed the creek approximately two hundred feet downstream from the proposed site of the Buffalo Creek Bridge.<sup>3</sup> The "old Buffalo Creek bridge" was a 115' steel deck truss with four girders with an overall length of 283'.

The main construction contracts were awarded on June 19, 1934. E.R. Mills of Charleston, West Virginia was selected to construct the concrete substructure and superstructure at a cost of \$79,388.85. Ralph W. Fimple of Fairmont, West Virginia was awarded the contract to grade, surface, and gravel the approaches to the bridge at a cost of \$28,686.91.<sup>4</sup> The announcement of the building of the bridge was heralded in Fairmont. An editorial in the July 11, 1934 *Fairmont Times* applauded the jobs that the construction project would bring to the community.

Actual work on construction of the new bridge across Buffalo Creek at the bottom of Pennsylvania Avenue will start soon. Not a large force of workmen is being used right now but within a short time a force of between 30 and 40 men will be on the job. . . . the new bridge and the new road work at Bellview will be an improvement, the value of which we cannot appreciate until we see the project nearing completion. We are happy now that this new project creates work for almost two score workmen. We will be more than pleased with the result of their work.<sup>5</sup>

Construction of the bridge started on July 10, 1934. It was estimated that it would take approximately five months to complete the construction process. Weekly and bi-weekly newspaper reports in the *Fairmont Times* and the *West Virginian* kept the public informed on the rate of progress and the number of local men hired to work on the bridge. The number of men working on the bridge varied from week to week, although the highest number was 108, with 54 skilled workers, and 54 unskilled workers. In addition to the local economy, the construction of the Buffalo Creek Bridge pumped money into the regional economy, as building materials were secured from within a hundred mile radius. Steel for reinforcing the structure was obtained from the Bethlehem Steel Company in Carnegie, Pennsylvania; gravel was obtained from the McClain Sand Company at Point Marion,

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3. *The Fairmont Times*, July 10, 1934; *The West Virginian*, July 9, 1934.

4. *Annual Report of the State Road Commission of West Virginia, 1936-37*. Charleston, West Virginia: State Road Commission, 1937.

5. *The Fairmont Times*, July 11, 1934.

Pennsylvania; and bronze-bearing plates were procured from the National Bearing Metals Corporation in Pittsburgh, Pennsylvania.

Despite the optimistic public pronouncement that the bridge would be completed by December 1934, monthly inspection reports submitted to the United States Department of Agriculture Bureau of Public Roads and weekly bridge progress reports submitted to the State Road Commission of West Virginia highlighted a variety of problems which affected the construction process. Problems with construction crews and management, procurement of materials, and heavy rains and cold weather delayed the completion of the original design until June 1935.<sup>6</sup>

On June 8, 1935, several days before the bridge was to be opened to the public, two piers on the north end of the bridge were damaged by a slip in the fill. The *Fairmont Times* reported "a wet-weather spring, combined with the heavy rains Saturday afternoon, resulted in two piers of the new Buffalo Creek Bridge being broken by a slip in the fill at the Bellview end of the bridge."<sup>7</sup> According to original damage reports submitted by Ralph Fimple "the damage isn't great and that it will be repaired by strengthening the piers with a greater amount of cement than was first planned and used."<sup>8</sup> Bridge inspection reports written by Assistant Highway Bridge Engineer, A.L. Scott, and filed with the Bureau of Public Roads, however, detailed much more extensive damage to the bridge.

The backfilling was started Thursday, June 6. Friday it rained almost all night and Saturday morning it was observed that the two North East columns of this abutment were cracking from some force pushing towards the crack. The filling was stopped but the cracks continued to open up until a short time before noon of same day. The third or N.W. column apparently did not move at all, nor did the two columns supporting the two large end posts. The end center column cracked about 4 ft. below the top of the footer and again thru the 45 degree fillets at the top, and also punched thru the floor. The N.E. end column cracked about 6 ft. below top of footer and also at bottom of side strut. The construction joints at bottom of side webs in the two columns

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6. For further details of construction delays see monthly inspections reports for the Bureau of Public Roads, Bellview Bridge File, Division of Highways, Charleston, West Virginia.

7. *Fairmont Times*, June 11, 1935.

8. *Fairmont Times*, June 11, 1935.

supporting the large post opened up some but apparently due to a heaving action on the end of the bridge by the columns which cracked.<sup>9</sup>

According to Scott, when crews excavated the embankment around the abutment and footers of the cracked columns, it was revealed that large limestone boulders approximately eight feet below the tops of the footers had moved and were pressing against the footers. Scott wrote, "the center column footer has moved forward at the bottom 1 1/2 inches but the N.E. column did not move forward at the bottom. The top of center column footer was 6 1/2 inches forward from original position and the top of footer of N.E. column was 2 3/8 inches forward from original location."<sup>10</sup> Scott determined that three factors were the immediate cause of the slip: 1) overcharge of the embankment some several feet back of the abutment; 2) large amounts of rain and; 3) a fault in the ledge or shelf rock which had broken off from the main ledge at some previous time and when the fill was placed above this faulted section it slid down against the columns.<sup>11</sup>

After several weeks of bridge inspection, the original design of the bridge was modified by adding a complete span, or three additional 30' girder spans to the northern end of the bridge.<sup>12</sup> State Road Commission officials believed that the additional spans would eliminate any fill and overburden which would prevent future slips. On September 4, 1935, the contract for the additional spans was awarded to Ralph Fimple of Fairmont.

Fimple, who had previously been awarded the contract for grading and surfacing the approaches to the bridge, bid \$15,703.80 to construct the additional girder spans.<sup>13</sup> Construction began within days of the contract award and was completed in early January 1936. Officials from the Bureau of Public Roads made their final inspection of the bridge on February 21, 1936, and it was opened to traffic shortly thereafter.

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9. A.L. Scott, Assistant Highway Bridge Engineer to Bureau of Public Roads, June 14, 1935, Bellview Bridge File, Division of Highways, Charleston, West Virginia.

10. A.L. Scott, Assistant Highway Bridge Engineer, to Bureau of Public Roads, June 14, 1935, Bellview Bridge File, Division of Highways, Charleston, West Virginia.

11. A.L. Scott, Assistant Highway Bridge Engineer to Bureau of Public Roads, June 14, 1935, Bellview Bridge File, Division of Highways, Charleston, West Virginia; A.L. Scott, Assistant Highway Bridge Engineer to Bureau of Public Roads, June 24, 1935, Bellview Bridge File, Division of Highways, Charleston, West Virginia.

12. Frank D. McEnteer to Colonel H.O. Wiles, Assistant Chief Engineer, June 19, 1935, Bellview Bridge File, Division of Highways, Charleston, West Virginia.

13. *Fairmont Times*, September 5, 1935.

BUFFALO CREEK BRIDGE (Bellview Bridge)  
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The Buffalo Creek Bridge is composed of a single span reinforced concrete open spandrel arch and nine cast concrete T-beam spans. Beginning at the south end of the bridge is a series of three equal 30' "T" beams and girder spans which are carried on two reinforced concrete piers to the third pier. Historically, these spans carried the floor of the bridge over the tracks of the Baltimore and Ohio Railroad. From the third pier, the floor of the structure is carried over Buffalo Creek by one 120' reinforced concrete open spandrel arch. This span is abutted on the north end of the arch into a fourth pier and a series of six 30' "T" beams and girder spans which are carried on four reinforced concrete piers to the north abutment. Historically, these spans carried the floor of the bridge over a county road. A total of 185 tons of reinforcing steel and 2,927 cubic yards of concrete was used in building the bridge.

The integrity of the bridge has changed little since its construction, the only major change being the addition of modern sodium vapor lighting fixtures. The main arch span of the bridge has a clear span of 120', with a rise of arch of 54'. The top of the arch or crown point is 59' above normal water level and 72'6" from the creek bed. The arch span consists of two parallel ribs, each 2'2" thick at the crown x 6' wide, and spaced 15' apart. The ribs are reinforced with twenty 1" diameter steel bars. These bars are held in place by structural steel spacer frames which also strengthens the ribs against shearing stresses. The thickness of the skewback is 6'.

Supporting the floor system above the arch ribs are slender transverse walls connected at the top by girders. Reinforced concrete brackets are cast with this girder section. The brackets overhang 5' from the outside faces of the girder in order to support the sidewalk sections. The girders are 2' thick and are reinforced with 1" steel bars. The floor system of the bridge is composed of 10" reinforced concrete, with 7/8" transverse slab bars, and 1/2" longitudinal slab bars. Historically, the roadway was paved with asphalt with a crowned slope ranging from 4 1/2" to 2" to assist with drainage. The roadway is 30' from curb to curb, with two 5' sidewalks carried on reinforced concrete brackets. A 3'1" x 12" cast concrete ornate balustrade occupies the outside foot of the bridge.

Historically, the bridge roadway was lighted by ten concrete lamp standards, five on the east side and five on the west side. Each lamp standard was 8'6" high x 6" wide at its peak and 16" wide at its base. The standards were attached to four end posts, two at the north end of the bridge and two at the south end and six chamfered piers. The end posts measured 4' high x 5' long. The piers measured 6' by 6' wide. Within each lamp standard a 1 1/2" electrical conduit carried wiring to the lamp. Today, the bridge roadway is lighted by modern, standard sodium-vapor lighting fixtures.

The Buffalo Creek Bridge is significant because of its association with public work relief projects initiated during the Great Depression of the 1930s. The Buffalo Creek Bridge was constructed with funds appropriated under the NIRA. Under the direction of the Public Works Administration, the NIRA was devised by the presidential administration of Franklin Delano Roosevelt to provide relief to the unemployed to stimulate economic and industrial recovery during the Depression of the 1930s.

In addition, the Buffalo Creek Bridge is representative of the bridge builders' art developed in the early twentieth century. As such, it compares very favorably in every way with contemporary reinforced concrete arch bridges being erected at the time. The use of reinforced concrete as a building material gained favor in the United States in the late nineteenth century. The most important early use of reinforced concrete in the United States occurred in the 1880's and 1890's. Engineers utilized reinforced concrete to build monolithic structures in which the floor slabs, beams, and columns were all cast without joints. In addition, engineers experimented with reinforced concrete to build flat slabs, and three dimensional shells in reinforced concrete. These developments paved the way for the use of reinforced concrete in bridge building. The first reinforced concrete arch bridge of significance was built in 1894 by Edwin Thatcher.

During the next decade, numerous systems were developed using various patented reinforcing bars. By the 1920s, hundreds of reinforced concrete arch bridges were constructed around the country. Bridges were custom designed by highway departments and built by bridge contractors. There were numerous local firms active in building concrete bridges during this period. A number of significant fixed arch bridges were built in West Virginia during this time, although few are extant. The Buffalo Creek Bridge is significant for its refinement of form, elegant appearance, and attention to architectural detail. The Buffalo Creek Bridge is a significant representative of the bold use of reinforced concrete in the construction of arch bridges.

## SOURCES OF INFORMATION/BIBLIOGRAPHY

### A. Engineering Drawings

Institute for the History of Technology and Industrial Archeology, West Virginia University, Morgantown, West Virginia

### B. Historic Views

West Virginia Regional History Collection, West Virginia University, Morgantown, West Virginia

### C. Bibliography

#### Manuscript Collections

Bellview Bridge File, West Virginia Department of Transportation, Division of Highways, Charleston, West Virginia.

#### Primary Sources

*Annual Report of the State Road Commission of West Virginia, West Virginia 1934-1935.* Charleston, West Virginia: State Road Commission, 1935.

*Annual Report of the State Road Commission of West Virginia, West Virginia 1936-1937.* Charleston, West Virginia, 1937.

*Fairmont Times*, 1934-1936.

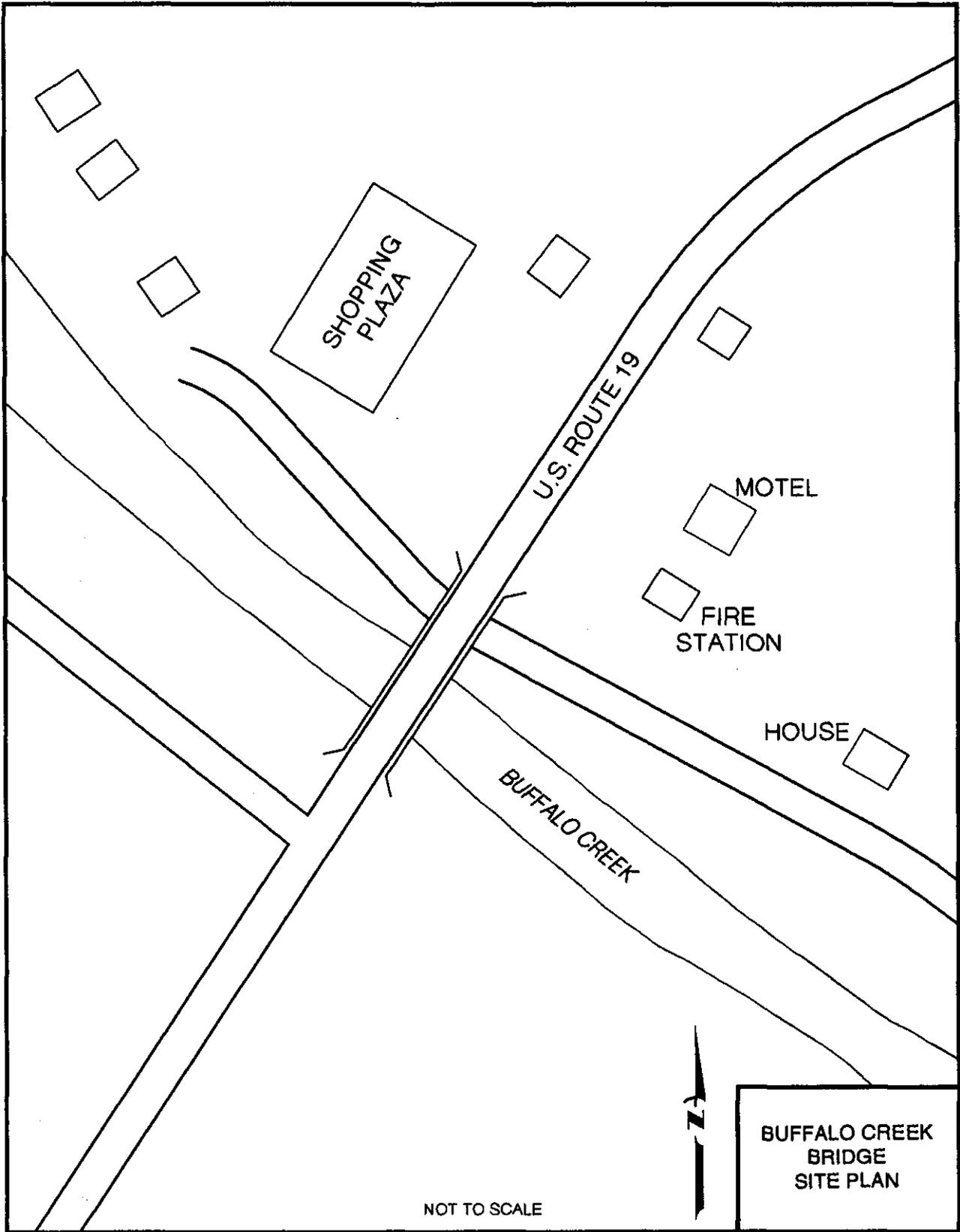
*The West Virginian*, 1934-1936.

#### Secondary Sources

Badger, Anthony J. *The New Deal: The Depression Years, 1933-1940.* New York: The Noonday Press, 1989.

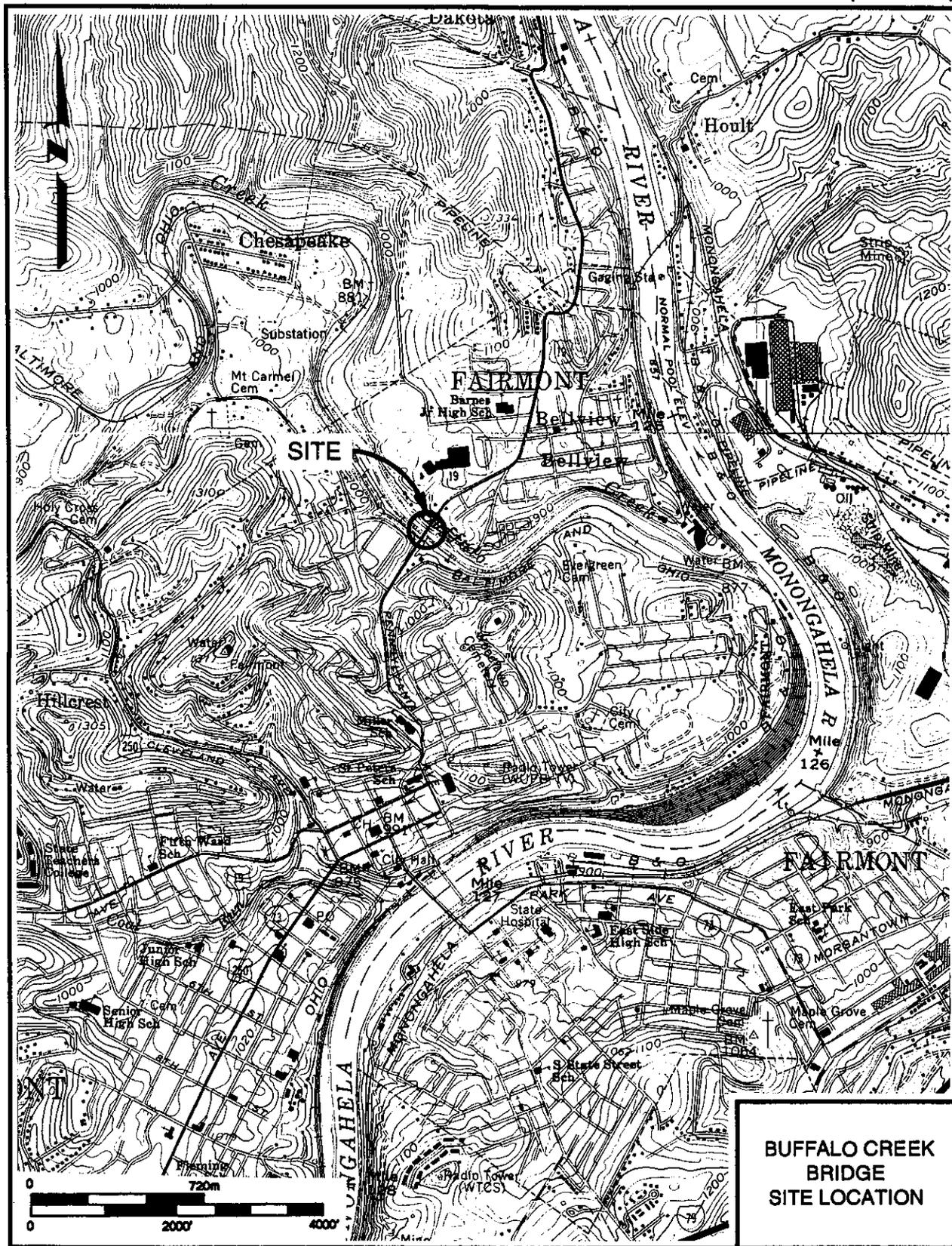
Conkin, Paul K. *The New Deal.* Harlington Heights, Illinois: Harlan Davidson, Inc., 1975.

Hayden, Martin. *The Book of Bridges.* New York: Galahad Books, 1983.



NOT TO SCALE

BUFFALO CREEK  
BRIDGE  
SITE PLAN



Source: USGS, West Fairmount, West Virginia Quad