L.B. HASSLER BRIDGE
State Route 42, spanning Obey River
Byrdstown Vicinity
Pickett County
Tennessee

HAER No. TN-34

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
Southeast Region
Department of the Interior
Atlanta, Georgia 30303

HISTORIC AMERICAN ENGINEERING RECORD

L.B. HASSLER BRIDGE HAER No. TN-34

Location:	State Route 42 Bridge spanning the Obey River, East of Dale Hollow Lake and South-West of Byrdstown, Pickett County, Tennessee U.S.G.S. 7.5 minute Byrdstown (333 SW) Tennessee Quadrangle, Universal Transverse Mercator Coordinates: 4044.5 to 664.5
Construction Date:	Begun 1943, interrupted by World War II, completed in 1946 or 1947
Builder:	Unknown, however, design specifications and construction was overseen by the U.S. Army Corps of Engineers
Present Owner:	State of Tennessee
Present Use:	Vehicular bridge; scheduled to be demolished
Significance:	The L. B. Hassler Bridge is a late example of metal truss design, which was a standard of the Tennessee Highway Department since 1920. The bridge is also a tangible artifact of the lifestyle and economic changes in Pickett County brought about by the construction of Dale Hollow Dam. The replacement of the small ferry by the large steel truss bridge mirrors the change from a strictly rural economy to a more diversed system based on industry, tourism, and agriculture.
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Date:	April, 1994

The L.B. Hassler Bridge was constructed between 1943 and 1947 to span the Obey River newly widened by the construction of the Dale Hollow Dam. The bridge connected Byrdstown, county seat of Pickett County, with Livingston, county seat of Overton County along relocated State Route 42. The Hassler Bridge is the third bridge to span the Obey River on SR-42 in this general location.

The first bridge to span the Obey River was completed in 1917 as a metal truss bridge.[1] Prior to the 1917 bridge, a ferry transported vehicles and people across the river. The second bridge, built in 1938, spanning the Obey River was a single span through metal truss bridge which was sufficient to span the Obey River with normal water levels. The Marion Construction Company completed this bridge in August, 1938, at a cost of over $87,000.[2] According to the 1942 Corps plan to dam the river and raise the water level, this bridge would be insufficient to clear the new water level of the Obey River. The Corps scheduled this bridge to be replaced as the dam was built. The construction of the new Obey River (Hassler) Bridge was planned about one mile upstream from the present bridge's location; SR-42 was relocated to the new bridge location.

The L.B. Hassler Bridge [see appendix 3] was begun in 1943 as the Dale Hollow Dam was being built [see appendix 1]. During the planning phase of the dam, a number of structures (houses, roads, bridges, ferries, etc.) were identified and inventoried using the river mile marker system.[3] The old SR-42 bridge was identified and included in this inventory which can be found in the manuscript section of the Tennessee State Library and Archives.

Whether the Corps of Engineers designed and built the bridge is not clear; however, it had the specifications prepared and the bridge constructed. Available records do not indicate the reasons why the Corps used a steel truss bridge rather than a concrete bridge since technology for building a concrete bridge to span the distance required for the Obey River had been around since about 1900. [see appendix 2]

Several factors may have influenced the Corps' selection of a steel truss bridge. First, this bridge appeared to be based on standard designs used by the Tennessee Highway Department during the 1930s. This action would have reduced design costs. Secondly, this was a transitional period when labor costs were still relatively low and concrete was expensive. Even using a truss bridge which was labor-intensive, the bridge would likely have been cheaper to build than concrete. Concrete also was not widely used in this country until after the Second World War.

Finally, concrete construction still often incorporated the arch in its design which would have reduced the clearance between the river and the bridge. Concrete girder construction required shorter spans and a corresponding increase in the number of piers. Additional piers would reduce the surface clearance through the bridge. Corps regulations require that bridges spanning corps controlled rivers be within certain specifications in height and length of spans. Perhaps only a steel truss bridge met all the requirements of Federal regulations.

For whatever reasons, the steel truss bridge was selected for construction. Construction began in early 1943 but was halted after the piers were completed. The war-time steel shortage delayed the completion of the new bridge. All available and non-essential steel and iron was redirected for use in the war industries. All non-essential metal structures spanning the Obey River, including the old SR-42 Obey River bridge, were scheduled for salvage and demolition concurrent with the construction of the dam.

The reasons for the bridge's removal were two-fold. First, the dam was proceeding as a war industries power source and was likely to be completed prior to the war's end. Therefore, the old SR-42 bridge, if not removed, would have been inundated by the reservoir and left to obstruct the Obey River. Obstruction of the river would not have been permitted by the Corps. Secondly, salvage of the bridge became necessary to avoid obstruction of the river and to provide war-time needed scrap.

The salvage of the old bridge left no bridge to serve as a river crossing in the vicinity of the new bridge construction. To solve the river crossing problem, the Corps instituted a ferry service to transport vehicles across the flooded hollow until the new bridge, which sat unfinished, could be completed following the war. Historic photographs show the Corps producing a water safety demonstration in the reservoir on August 15-17, 1947, with the completed Hassler Bridge in the background.[4] Since the bridge was not completed during the war the soonest that construction could resume was August, 1945, with early 1946 being more probable.

Architecturally, and engineering design-wise, the Hassler Bridge is 1228 feet long and rests on a concrete substructure. Although built by the Corps, this bridge is virtually identical to truss bridges erected by the Tennessee State Highway Department in the 1930's to early 1940's, and represents a late example of steel truss bridge construction in Tennessee.

The Hassler Bridge contains ten spans, six riveted through trusses and four concrete deck girder approaches. The lay-out of the spans is asymmetrical. On the north end are three concrete deck girder approach spans, each 35 feet long. Next to these spans are three trusses, each a modified Parker with Petit influences. These spans are 182.2, 281.9, and 182.8 feet long. Next to these spans are three Warren with vertical trusses with polygonal top chords that are 142.0, 141.8, and 141.6 feet long. A single concrete deck girder span 50.1 feet long completes the southern end of the bridge. The curb-to-curb width of the Hassler Bridge is 24.0 feet, and the out-to-out width is 26.0 feet. Minimum vertical clearance is 14.0 feet. The 140-foot spans are 28.0 feet tall, the 180-foot spans are 36.8 feet tall, and the 280-foot span is 56 feet tall. The original guardrail is metal lattice which now has a "ribbon" metal guardrail placed between it and the traffic. The only feature that is different from typical State-designed bridges is the approach rail on the north end. This rail is a sweeping Art Moderne-influenced concrete rail with arched openings that follows the curve of the road around the hillside. This railing has suffered extensive traffic damage, and like the metal lattice railing on the bridge, has a modern ribbon metal guardrail between it and the traffic.

Composition of members is typical for bridges of this era. On the Warren trusses, the top chords and end posts are channels with lacing. The bottom chords are channels with lacing on the top and bottom. Diagonals in the center panels are channels with battens. Other diagonals and verticals are channels. On the Parker trusses, the top chords and end posts are channels with lacing. The bottom chords are channels with lacing. The diagonals are channels. The verticals are small channels with lacing except the hip verticals which are small channels without lacing.

Parker and Warren trusses were commonly built in Tennessee. These trusses reflect common techniques and features, and their dimensions (length, width, and depth) are well within the norm for truss bridges in Tennessee. Twenty-eight of the thirty-two remaining Parker truss bridges built between 1924 and 1943 in Tennessee, including this bridge, contain a variation in their design. This variation is the use in the center panels of the truss of a modified "K" design which creates a hybrid Parker-K truss.

According to Corps records and based on the TN-DOT bridge survey conducted by Martha Carver, this bridge is only one of three known truss bridges built by the Corps in Tennessee. Both of the other bridges span the Caney Fork River and were built in 1948

and 1949 as the Center Hill Dam was being completed. The Sligo Bridge (1948) #21-SR26-24.58 is located on SR-26. It is a five span Parker through truss bridge similar to other TN-DOT designed bridges. The Caney Fork River Bridge (1949) #21-SR56-15.40 is located on SR-56. It is constructed as a Warren continuous deck truss rather than separate truss spans. This continuous truss design is similar to TN-DOT designs. The Corps concern tended to be mission accomplishment rather than aesthetics. Unlike the TVA whose building and bridge designs were based on a design philosophy, the Corps lacked such guidance and did not seem to be concerned with developing a design philosophy to guide their architecture and design.

Truss bridges from the same period erected by the Tennessee Valley Authority (TVA) tended to be clearly different from bridges designed by the State. TVA-designed bridges tend to use different truss types and a different composition of members that usually differentiated them from State Highway Department bridges.

[Appendix 1]

History of Dale Hollow Dam and Reservoir.

The U.S. Army Corps of Engineers had conducted numerous studies and reports on the development of the Cumberland River for commercial and agricultural development, navigation, and flood control since the early 19th century. Federal activity in the Cumberland River valley, however, remained uneven and without a coordinated management plan until the 20th century.

Decisive steps in flood control, land management, and power generation were not taken by the federal government until the 1930s. The Tennessee Valley Authority project (1933) represented the first major federal land management operation for the south. But this project was limited only to the Tennessee River basin. The enactment of the Flood Control Act of 1936 established a federal policy of flood control which specifically mandated federal involvement. The Flood Control Act of 1938 reaffirmed the federal role in flood control and authorized the U.S. Army Corps of Engineers to develop comprehensive plans for flood control and other such projects in the Ohio River and Cumberland River valleys.[5]

The Flood Control Act of 1938 was enacted largely as the result of the record flood of the Ohio River in 1937. This law directed the construction of tributary reservoirs as a measure to provide flood control in the Ohio River basin. Consequently, six sites were investigated by the Nashville District Corps of Engineers that included: Wolf Creek on the upper Cumberland River, Dale Hollow on the Obey River, Center Hill on the Caney Fork River, Stewart's Ferry (J. Percy Priest) on Stone's River, Three Islands on the Harpeth River, and Rossview on the Red River. Wolf Creek was selected as the immediate project to be completed in 1941.[6]

Meanwhile, by the mid-1930s, citizens from counties affected by the Cumberland River valley began to organize into the Cumberland Valley Association (CVA), a lobby group organized specifically to get the Cumberland River Basin incorporated into the TVA system. By 1936 the CVA had organized several local county chapters of counties influenced by the Cumberland River. Membership in the Association crossed state borders and included members from counties in Kentucky and Tennessee. In Tennessee, at least Davidson, Montgomery, Clay, Jackson, and Pickett Counties had organized chapters.[7]

Each chapter selected directors and called on its membership of businessmen, politicians, merchants, and farmers to lobby to get

Congress to amend the Tennessee Valley Authority Act (1933) to include the CVA into the TVA system. The members of CVA saw the benefits that counties under TVA management were receiving; they too wanted to reap the benefits of federal land management and energy production.[8] The various directors contacted national politicians, TVA, and the Corps of Engineers for support. While TVA supported the plan, the Corps balked at granting so much authority to one organization. Many Congressmen and private citizens agreed with the sentiment of the Corps, while officials in the Roosevelt Administration supported the measure. For example, Cordell Hull in a March 30, 1937, letter to Mr. J. P. Owen of Nashville, offered his support to the association.[9]

The aggressive lobbying practiced by the CVA supporters was not necessarily supported by all the members of their respective counties. In Pickett County, there were many who did not want the Dale Hollow Dam to be built. Most of the opponents to the CVA plan were farmers and other rural folks who opposed the dam because most of the good arable land, and many old family homesteads would be inundated by the reservoir's flooding waters. Family and community would be displaced; the social fabric of the region would be disrupted. Further, they felt that the introduction of new technological advances such as electrical power, better roads, and industrialization would significantly alter their present lives and the way life would be led by future generations of Pickett Countians.[10]

Regardless of the hostility to the proposal by some of the local populace, the incorporation of the Cumberland Valley into the TVA received some support in Congress. Representative J. Percy Priest introduced a bill (H.R. 2294) on January 16, 1941, to expand TVA control over the Cumberland River. His bill was referred to the House Committee on Military Affairs. Senator George W. Norris also submitted a bill (S. 1539) on May 19, 1941, that would grant TVA authority over the Cumberland Valley. His bill was referred to the Senate Committee on Agriculture and Forestry which he chaired. Both bills, despite Franklin D. Roosevelt's support, failed to be enacted as law, leaving the control of the Cumberland River to the Corps of Engineers.[11]

Corps plans for flood control and hydroelectric power generation proceeded with the design of Wolf Creek Dam in Russell County, Kentucky. The dam was designed to impound a reservoir (Cumberland Lake) extending over 100 miles up the Cumberland River and "have the capacity to generate power equal to the remainder of the power generators in Kentucky."[12] On September 1, 1941 a ground breaking ceremony for Wolf Creek occurred at

Rowena, Kentucky, initiated what local leaders, Congressmen and Corps of Engineers officials viewed as a "new era of industrial independence for the Cumberland plateau."[13]

The Japanese attack on Pearl Harbor, Hawaii, on December 7, 1941, thrust the U.S. into war significantly causing the U.S. to alter its economy from peace-time to war material production. The Corps was directed to rush construction of the Wolf Creek project in order to benefit from the power it would generate for needed war industries. The Center Hill and Dale Hollow projects also were rushed.[14] The work on Dale Hollow Dam began in March 1942.

Unfortunately the enormity of the war effort the Corps was ordered to fulfill required that priorities be re-evaluated and re-established. Consequently, a redistribution of manpower and material required the cessation of one or more major reservoir projects then underway. In 1942, the Wolf Creek project was only 3% complete, the Center Hill project was 8% complete, and the Dale Hollow project was about 19% complete. Because Dale Hollow had the most work complete it was selected as the logical project to continue, with the other two projects placed on hold until the end of the war. The powerhouse for the Dale Hollow Dam was also temporarily discontinued once the substructure was complete. The hopes of Federal Government, locals and the Corps to complete the three dam projects by 1944 had been frustrated by the manpower and material shortages. All the available material and human resources were reallocated from the other two projects and focused on the Dale Hollow Dam. During the height of construction, 926 men were employed on the project by Morrison-Knudsen Company of Boise, Idaho, the company that held the Dale Hollow Dam contract (#W-612-eng-676). Dale Hollow Dam was completed on June 30, 1943, in time to control a major flood in the spring of 1945 at Celina, Tennessee. Although flooding did occur, it was not as severe as it could have been because the reservoir held much of the runoff.[15] In 1948 the powerhouse was completed and the hydroelectric power generated by the Dale Hollow Dam (which was delivered to the Southeastern Power Administration) became the first hydroelectric power generated by a Corps of Engineers project in the Cumberland Valley.

The other two dams placed on hold during the war were reactivated and scheduled for completion. The Center Hill Dam finally closed on November 27, 1948, followed by the Wolf Creek Dam in 1951.[16]

The value of the Dale Hollow Dam as a power source for war material manufacture is dubious at best. No hydroelectric power could be generated until the powerhouse and generators were installed in 1948, three years after the end of the war. As a

flood control system, it served well as evidenced by the 1945 Celina Flood. Unless the U.S. Government was willing to commit resources to complete the powerhouse and generators, it had a reverse effect by actually consuming material and human resources that could have been directed elsewhere in the country's war effort.

There is also no connection between Dale Hollow Dam and energy requirements for atomic research at Oak Ridge. Dale Hollow Dam was being built about 80 to 90 miles from Oak Ridge. The proximity of Dale Hollow Dam from Oak Ridge was too great to be of value. The TVA had already constructed hydroelectric power generators for Oak Ridge along the Tennessee River and its tributaries, notably the Clinch River, to support the facility's energy needs. Moreover, several power generators could have been built within a 30 mile radius of Oak Ridge that would have produced more than enough energy for the atomic facility. Therefore, the assertion that Dale Hollow Dam was constructed to provide power for Oak Ridge is unsubstantiated.

The only connection that Dale Hollow Dam had with Oak Ridge was the use of federal appraisers. Indeed, the land acquisition and surveying for Dale Hollow Dam consumed manpower that could have been used to survey land for Oak Ridge. When the Corps of Engineers began the surveying of the over 56,000 acres for the atomic facility, the Corps had all their appraisers and surveyors committed to the Dale Hollow Dam project. Therefore, the Corps had to request real estate staff from the TVA and Federal Land Bank in order to complete the Oak Ridge survey.[17]

[Appendix 2]

Reinforced Concrete Building Technology

Reinforced concrete building technology was developed by Robert Maillart, a Swiss engineer by the late 19th to early 20th centuries. Wide gorges in the Swiss, Austrian, and German Alps were spanned by bridges employing this technique of construction. Unfortunately, however, when the wood molds were removed from the structure, the weight of the concrete structure caused stress that eventually developed into cracks. Although this was a major technological weakness in this type of concrete construction, this technology continued to be used until about 1940.[18]

By 1925 a French engineer, Eugene Freyssinet, developed pre-stressed concrete technology to combat the post-stress of reinforced concrete construction. The innovation required that the steel reinforcing bars be stretched (stressed) while curing in the concrete. This technology permitted limited flexibility in the concrete structure to prevent cracking due to stress when the wood molds were removed from the structure. This technology continues to dominate concrete construction today.[19]

[Appendix 3]

L. B. Hassler

The SR-42 bridge spanning the Obey River, was named L. B. Hassler Bridge (Hassler Bridge) in honor of Mr. Landon Bedford Hassler. Hassler was born on August 27, 1877, at Oakhill community in Overton County, Tennessee. Landon "Lannie" or "Spike" grew up in the Oakhill community and later moved to the Lady Love community for a while where he received his early education. Later he moved to Cumberland County where he received his final grade school education. His early life was touched with family tragedy with his mother's death when he was twelve and his father's death when he was fifteen. Following his education, he began work with the Tennessee Central Railroad. He then moved to Texas and worked as a cowboy in Comanche County and later for the Swift Packing Company in Fort Worth.[20]

In the early nineteen-teens, Hassler returned to Tennessee. He married Laura Autie Gunnels, born on June 24, 1885 in Hunters-ville, Kentucky, in August 1913. Hassler began teaching in Pickett County schools shortly thereafter and continued for the next 35 years. For several years he served as a County Judge in Pickett County and 12 years as a Chancery Court Clerk. While he served as a County Judge, he was very active in road construction and improvement in Pickett County. He regarded an improved road network as an economic benefit for Pickett Countians for improved commercial trade and getting crops to market easier. Better roads allow travellers to move about more freely within and without Pickett County. He lived his final years in Pickett County and died on October 12, 1960. His aggressive support of highway construction earned Landon B. Hassler memorialization with the naming of the SR-42 bridge in his honor.[21]

NOTES

[1]Pickett County Book Committee. History and Genealogy of Families in Pickett County. (No Publisher or Location indicated, 1991), pp. 10-11.

[2]Report of the State Highway Commissioner of Tennessee for the Biennium ending June 30, 1942. (Nashville: Tennessee Department of Highways and Public Roads, 1943), p. 99.

[3]Survey and Inventory of Dale Hollow. Cumberland Valley Association Papers, Tennessee State Library and Archives Manuscript Section, Nashville, TN.

[4]Corps of Engineers. Dale Hollow Dam Project. Photograph Album, 1942. On microfilm at the Tennessee State Library and Archives, Nashville, TN, pp. 112, 117, 152-154, 185-186.

[5]Leland R. Johnson, Engineers on the Twin Rivers: A History of the Nashville District Corps of Engineers - United States Army, 1769-1978. (Nashville: U.S. Army Engineer District, 1978), p. 194.

[6]Ibid, p. 197.

[7]Ibid.

[8]Livingston Enterprise, November 14, 1941 and April 3, 1942.

[9]Johnson, Twin Rivers, p. 198.

[10]William Lynwood Montell, Don't Go Up Kettle Creek: Verbal Legacy of the Upper Cumberland. (Knoxville: University of Tennessee Press, 1983), pp. 184-191.

[11]Johnson, Twin Rivers, p. 198; Livingston Enterprise, July 25, 1941.

[12]Ibid, p. 197.

[13]Ibid, p. 198; Livingston Enterprise, September 1, 1941.

[14]Johnson, Twin Rivers, p. 198.

[15]Ibid, p. 200.

[16]Ibid, pp. 215-217.

[17]Vincent C. Jones, Manhattan: The Army and the Atomic Bomb. U.S. Army in World War II series. (Washington: United States Government Printing Office, 1972). p. 320.

[18]Martin Hayden. The Book of Bridges: The History, Technology and Romance of Bridges and Their Builders. (New York: Galahad Books, 1976), p. 136; David P. Billington. The Tower and the Bridge: The New Art of Structural Engineering. (New York: Basic Books, Inc., 1983), pp. 155-163.

[19]Hayden, Bridges, pp. 137-40; Billington, Tower, pp. 194-204.

[20]Pickett County Book Committee. History, p. 596.

[21]Ibid, pp. 30 and 596.

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