Please do not include map in public documentation

SPRING HILL HISTORIC COMMISSION AGENDA APPLICATION

Date: 7-16-22

Name of Applicant: FITTS LAND PARTNERS & DEREK MERRILL Phone: 615.727.3399

Address: 2142 Sugar Ridge Rd PO Box 727, Spring Hill TN

Name of Property Owner: As Above Phone: As Above

Address: As Above

☒ Maury Co. ☐ Williamson Co. Tax Map: 043 Parcel # 005.00

3690 John Lunn Rd, Spring Hill

SECTION 1 – Request for Designation of Historically Significant Site:

We Alicia, Stephen Fitts, & Derek Merrill, pursuant to Municipal Code Title 2, Chapter 4, Section 2-406, request that the property and/or site located at 3690 John Lunn Rd Spring Hill, be designated by the City of Spring Hill as a Historically Significant Site.

The aforementioned property and/or site is (check all that apply, provide additional detail as necessary):

- ☒ Are associated with events that have made a significant contribution to the broad patterns of our history or is associated with the lives of persons significant in our past;
- ☐ A birthplace or grave of a historical figure of outstanding importance;
- ☒ Embody the distinctive characteristics of a type, period or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components lack individual distinction;
- ☐ A building or structure removed from its original location but which is significant primarily for architectural value, or which is the surviving structure most importantly associated with a historic person or event;
- ☐ A religious property with historic importance;
- ☐ A cemetery; or
- ☐ Other (Please specify); ______

This form, along with (7) copies of the description of the property or properties in question must be filed with any applicable fee, fourteen (14) days prior to the Historic Commission meeting in order to be placed on the agenda.

[signatures]

Applicant's Signature

(Derek Merrill / Tara Merrill)

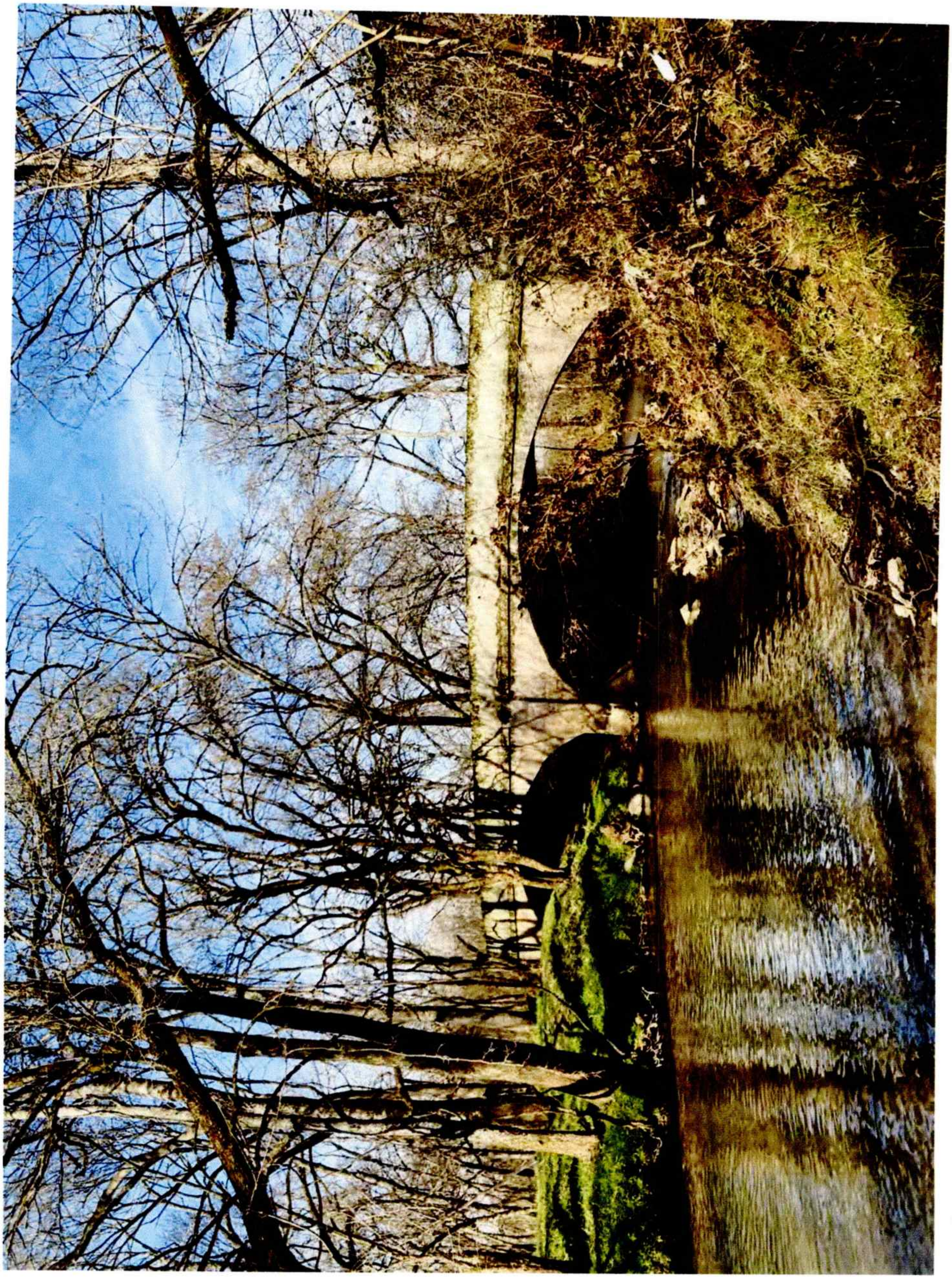
Date Received by Historic Commission: 7/26/22

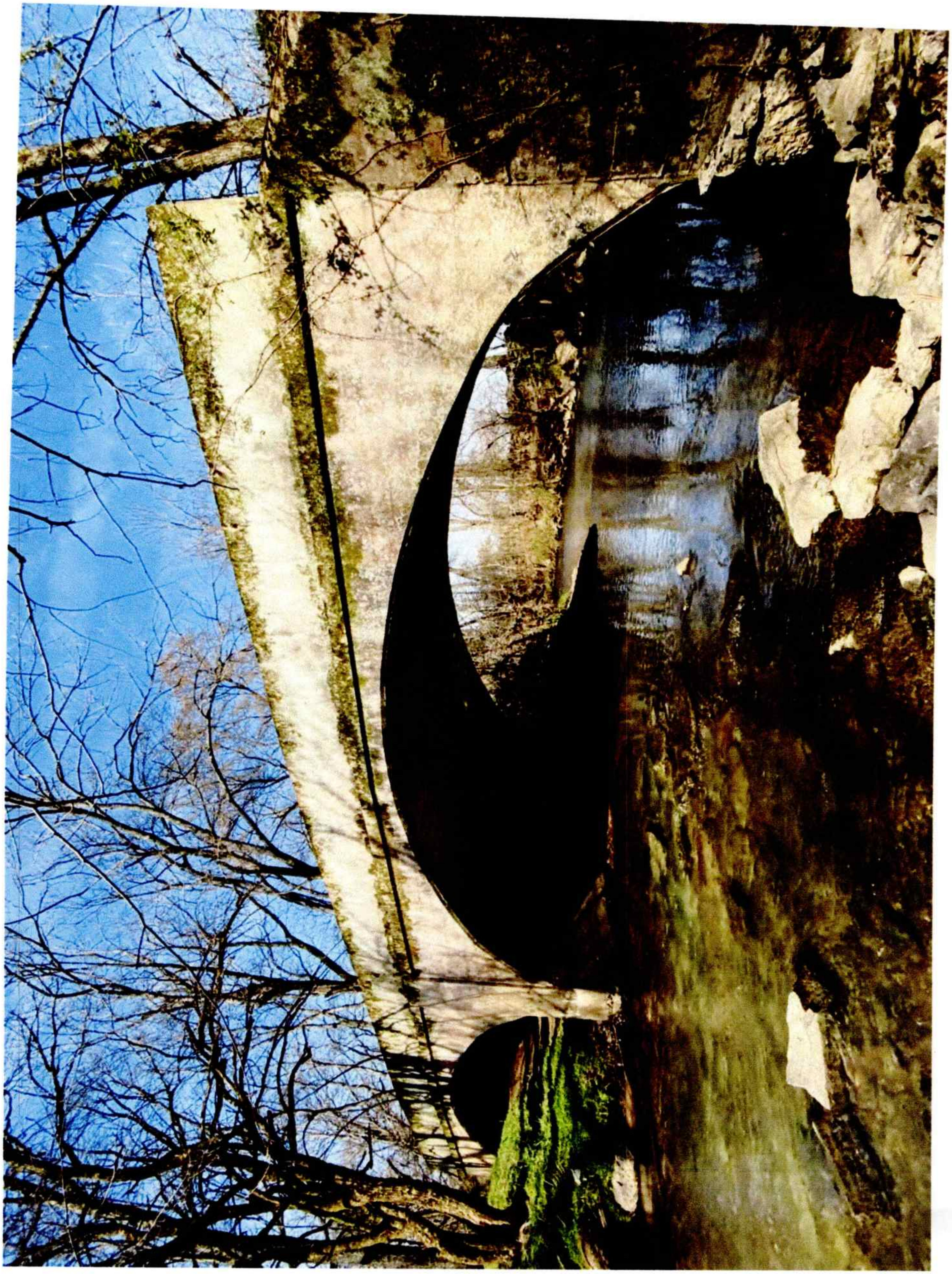
Placed on Historic Commission Agenda for meeting to be held on: August 4, 2022, at 6:00 **p.m.**

☐ **Recommended** ☐ **Not Recommended**

[signature]

Secretary of Historic Commission





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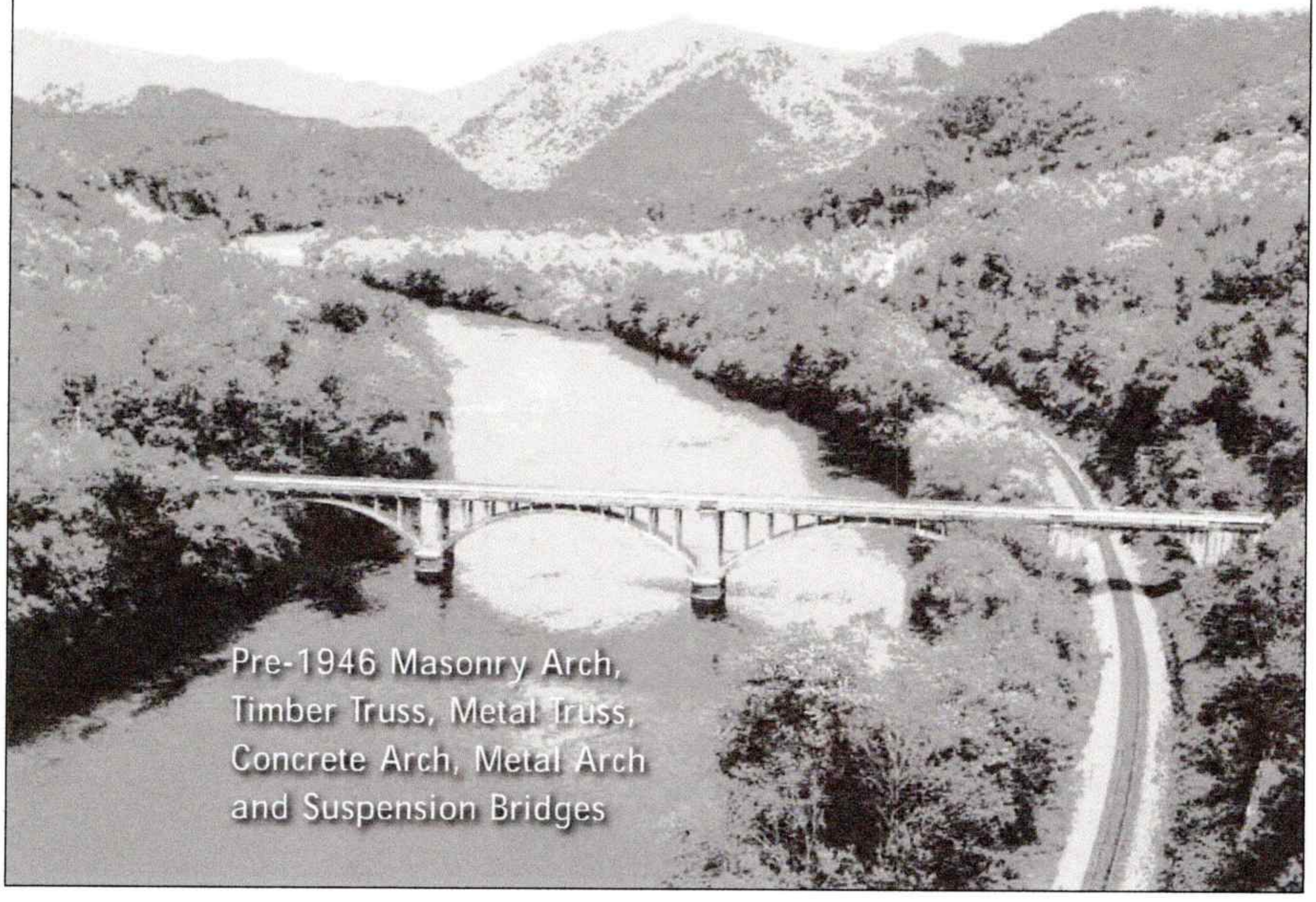
Tennessee's SURVEY REPORT for Historic Highway Bridges



Prepared by Martha Carver
Historic Preservation Specialist Manager
Tennessee Department of Transportation, 2008

Ambrose Printing Company, Nashville, Tennessee

Bridge's metal arch span is a double leaf bascule rolling lift. Only one other vehicular bridge in Tennessee, the Lenox Bridge (#92, 23-NonHighway-1), which contains a swing span, is a movable bridge.

Interestingly, the Market Street Bridge was under construction at the same time as the Hell's Gate Bridge in New York, one of the best examples of this type and, at 977 feet, the longest example in the world until 1931. At 310 feet, the Market Street Bridge as a steel arch does not compare in length to this bridge. However, in 1916, the Market Street Bridge was the longest double leaf bascule lift bridge in the world, a distinction it held until 1940 when a 333-foot double leaf bascule lift bridge was built in Ohio and the following year a 336-foot example was built in Michigan (Encyclopedia 1979).

TABLE IV-03: PRE-1946 METAL ARCH BRIDGES IN TENNESSEE

ELIGIBLE? # IN CH. 6	COUNTY	BRIDGE NUMBER	CROSSING	DATE BUILT	BRIDGE DESCRIPTION
Yes: #85	Hamilton	33-SR008-09.53	Tennessee River	1917	1 Double Leaf Bascule Arch and 6 Filled Spandrel Arches

GENERAL CHARACTERISTICS AND HISTORY OF CONCRETE BRIDGES:

Concrete, which is formed of natural products, is a malleable compound of an aggregate such as rock or gravel bound together by water and cement. Cement, a powder of limestone and clay, is the bonding component of concrete although the terms "concrete" and "cement" are often erroneously used interchangeably. Another misconception is that concrete hardens by drying, but it hardens through a chemical process called hydration in which the cement and water form hydrates that bind the concrete package together. These hydrates grow over time and actually increase the strength of concrete.

Examples of concrete construction date at least to early Roman times when Roman builders used it extensively in structures such as the Pantheon, the Coliseum, and in bridges. However, builders apparently ceased to use it again until the Middle Ages when it appeared in both Spain and Africa. In the 1500s, Spanish settlers introduced to the New World a form of concrete known as tabby, of which examples still exist in coastal areas.

Early builders used lime mortar, which initially hampered the widespread use of concrete because lime mortar, while a good binding material, often deteriorated under water. Natural cement rock was superior as a binding material, and even gained strength under water, but locating natural deposits limited its use. This limitation ended in the 1820s when an English bricklayer, Joseph Aspdin, developed an artificial cement mixture known as Portland cement. Aspdin named his mixture Portland Cement to capitalize on the popularity of limestone found on the isle of Portland. At that time, builders considered Portland limestone the best limestone in England. [The term "portland cement" has come to be viewed as a generic term used interchangeably with any type of cement and is now typically not capitalized.] Artificial cement proved superior to natural cement because builders could form concrete anywhere, without the additional cost of importing natural cement or depending on finding a deposit of it. It also enabled builders to produce concrete more consistently, thereby improving its quality. The government in 1871 granted a patent in the United States for this artificial or portland cement to David O. Taylor. With the development of an artificial cement as a binding agent, the availability and applicability of concrete in bridge construction increased. However, unreinforced concrete is relatively a weak building material and not appropriate for many structural applications.

In the United States in the latter half of the nineteenth century, Ernest Ransome and S.T. Fowler popularized the use of concrete, then known as "artificial stone" (Sedgwick 1991:70). Fowler laid the groundwork for extending its use when he patented a reinforced concrete wall in 1860. Strengthening concrete with the inclusion of metal bars greatly increased its tensile strength. However, Ransome, who formed a company in 1868 in San Francisco to manufacture concrete blocks, deserves much of the credit for its subsequent popularity (Condit 1960:226 227). Another factor that decreased the cost of concrete, and thus increased its availability, was the realization in the mid 1870s that builders could use blast-furnace slag, a by-product for which the iron and steel industries had a disposal problem, as an aggregate in cement. At first used for buildings, the use of concrete for other structures soon followed.

Concrete has compressive strength but low tensile strength that limited its usefulness for construction purposes. However, reinforcing concrete with imbedded steel members, which have high tensile strengths but are weak in compression, can alleviate this problem. Together, the steel strengthens the concrete and the concrete stiffens the steel. The increased strength of reinforced concrete eventually allowed engineers to develop innovative and aesthetically attractive designs for concrete bridges rather than simply replicating the form of masonry arch bridges or facing concrete arch bridges with masonry as many builders often did in the incipiency of concrete arch design.

French gardener Jean Monier, who in the 1860s used concrete reinforced with wire mesh for urns and flower pots, first patented a reinforcing system for concrete. While Monier was not a bridge builder, builders erected over two hundred bridges based on his patent (Plowden 1974:298). A variety of other patents followed, but the Austrian engineer Joseph Melan's patent had the most impact. In 1893 he introduced in the United States a new system that used parallel metal I beams embedded in concrete, somewhat like a metal arch with concrete covering (Plowden 1974:299).

The Cliftridge Bridge in New York, built in 1871-1872, is the first documented concrete arch bridge in the United States. Ransome built the country's first reinforced concrete arch bridge, scored and roughened to imitate stone, in 1879 in San Francisco's Golden Gate Park. However, reinforced concrete arch bridges were not immediately popular. Engineer Henry Tyrrell estimates that builders erected only about one hundred reinforced concrete bridges in this country before 1900 (Tyrrell 1909:104). Tyrrell argued that at this stage few engineers fully understood concrete designs, a problem that persisted until the Austrian government sponsored extensive experimentation on concrete arches between 1890 and 1895. American and European engineering journals published the reports from these experiments. About 1893-1894 the German born Fritz Von Emperger introduced to American builders the Melan reinforcing system that received considerable attention. Noted bridge engineer Edwin Thacher erected a number of major bridges based on this system around the turn of the century. In 1897 Thacher built the first large multispan concrete bridge in the United States, which spanned the Kansas River at Topeka, which for a time was the largest bridge of its type in the world (Plowden 1974:298).

The popularity of concrete greatly increased as builders publicized its advantages (Tyrrell 1909:1-2). For example, in 1907, Daniel Luten published a description of several concrete arch bridges he had built and listed several advantages of concrete arch bridges:

ADVANTAGE OF REINFORCED CONCRETE BRIDGES

A properly constructed concrete bridge is absolutely indestructible.
A concrete bridge is the only bridge that grows stronger with age.
As time passes, traffic on our highways grows heavier; steel and wooden bridges grow weaker; concrete bridges grow stronger. To build a concrete bridge then, is just plain common sense.
Portland Cement is the most perfect coating known for the protection of steel.
A concrete bridge provides a continuous gravel roadway. Wooden floors for bridges are an expensive nuisance. Concrete bridges require no floor renewals.
Concrete bridges are rust proof, frost proof, flood proof and fire proof.
Concrete bridges require neither painting nor repairs.
Concrete bridges are permanent improvements.
A concrete bridge can be widened at any time without re building.
To make a bridge flood proof, pave the bed of the stream to prevent scour, and then build the bridge in a solid monolithic mass so that it will stay.
A concrete bridge once built, is built for all time.
Concrete bridges are built with labor hired from the immediate vicinity of the bridge; with gravel or stone purchased in the immediate locality, and with cement secured from local agents. The greater part of the expense for such a bridge is thus returned to the county.
The money that tax payers expend for a concrete bridge is returned to the tax payers for labor and materials.
The beauty of horse shoe concrete arches lies in their common sense.
Concrete bridges are the handsomest for park bridges, the most durable for highway bridges, the most serviceable for railway bridges.

Bridges built of concrete will endure as monuments for all time (Luten 1907:92 93).

Publications such as Luten's convinced many people that concrete arch bridges were sturdier and more resistant to flood damage than truss bridges whose members were often damaged by floating debris. Many engineers also thought that concrete bridges could function more as low water bridges with the water flow just passing over them. Builders claimed that concrete was less expensive and required less skilled labor to erect than steel or masonry, and builders could hire local laborers rather than importing skilled masons. The materials to make concrete were readily available at nearly any site, bringing more profits to local suppliers than an out of state steel producer. Builders could easily mold concrete into any shape, from functional piers to elaborate decorative designs. Builders could pour and mold concrete in the air as well as under water, minimizing or eliminating the very dangerous underwater work in caissons. Builders claimed that concrete would harden with age, and thus the older the bridge, the stronger it would become, unlike steel bridges that would weaken with age and use. They claimed that concrete bridges required less maintenance and that municipalities would not have to paint concrete bridges as they did steel bridges. Since the deck was a continuous roadway above the arch, the bridges did not need wooden decks that the owner had to replace frequently. References in some of Tennessee's county court minutes indicate that the commissioners believed that concrete arch bridges would last a hundred years--far longer than the expected life span of a truss bridge.

The shape of these early concrete arch bridges replicated the form of masonry arch bridges, a logical design since both concrete and masonry are low in tensile strength but adequate for compressive stresses when used in an arch design. These early concrete arches, termed filled spandrel or barrel arches, had a solid barrel arch topped with vertical side walls (solid spandrel

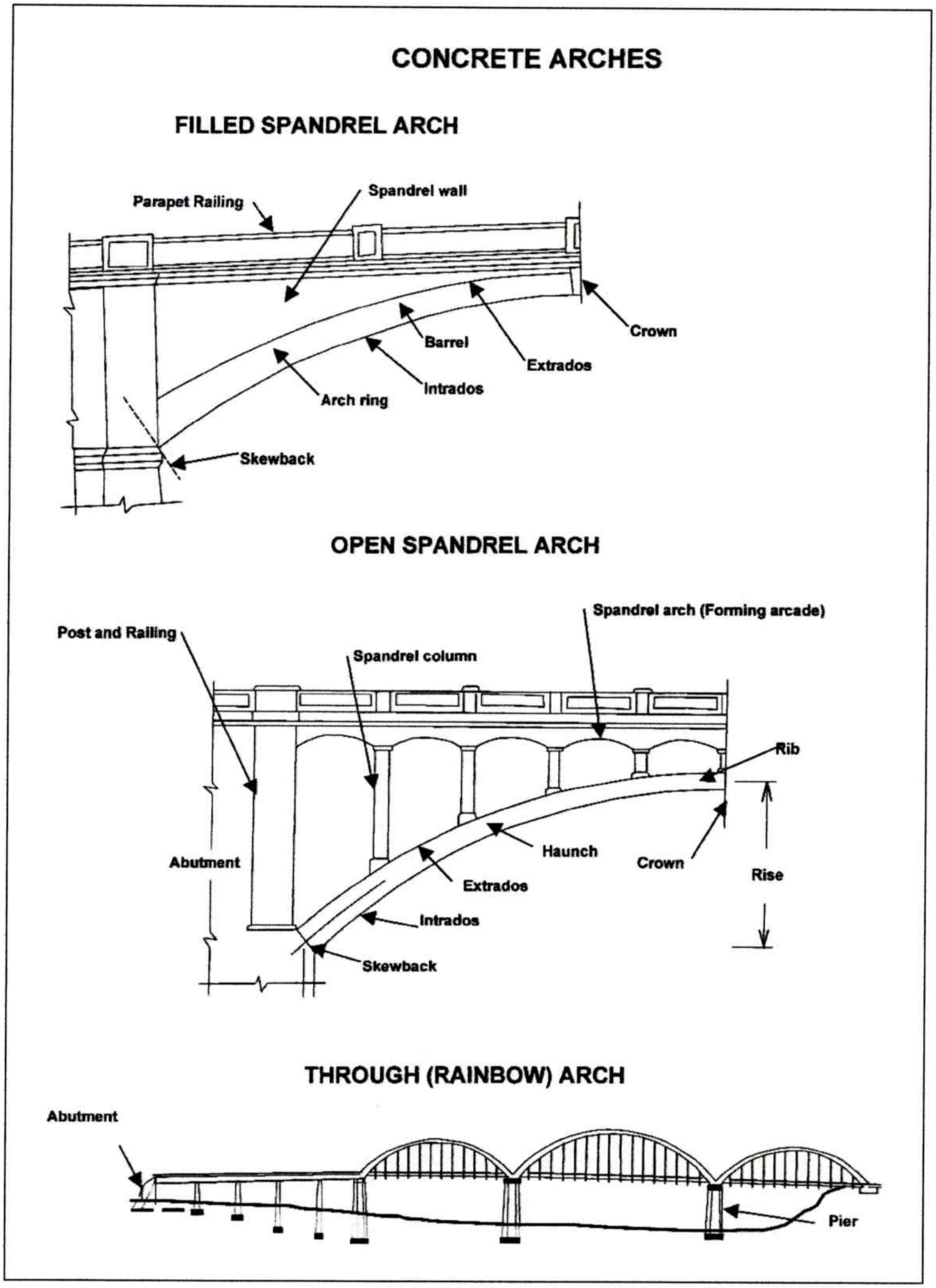


Figure IV-07: Types of Concrete Arch Bridges.

walls). This form created a cavity, and the spandrel walls basically served as retaining walls for a partial or total fill of earth or rocks. Small spans generally used solid earth filling. The spandrel walls and fill served as the foundation for the roadbed (driving surface) which crossed over the bridge. To support the roadbed, some arches contain a series of interior walls and arches, which might not be visible on the exterior, instead of fill.

In an arch bridge, the stresses are distributed throughout the bridge with only a minimal deflection of its deck (unlike a beam bridge that must deflect to distribute the load stresses). From the load crossing the deck, stresses are transferred down through the spandrel walls where they spread outward following the line of the arch. The forces then spread into the abutment where they are absorbed. Therefore, the abutments must be a solid foundation, preferably rock. For this reason, builders erected few concrete arches in West Tennessee where soils are not stable.

Builders can either pour concrete at a building site within falsework or framing, which is removed after the concrete hardens (cast in place), or builders can place concrete in molds off site and later erect the concrete forms at the site (pre cast).

Daniel Luten, the founder of the Luten Company of Indianapolis, took out many patents between 1900 and 1906 relating to concrete arch bridges. Although many national leaders such as Thacher built visible and monumental bridges, Luten's firm dominated the field of small scale bridges from about 1900-1920. During this period, many people used the term Luten Arch for any filled spandrel concrete arch. When competitors copied his designs, Luten frequently filed lawsuits which judges consistently settled in his favor that forced many other concrete arch builders to pay him royalties. However, James Marsh, an Iowa bridge builder challenged Luten in court in 1918 and an Iowa judge ruled Luten's patents invalid, saying that they were too broadly worded (Herbst and Rottman 1986:10). This ruling opened the field for numerous competitors with various concrete arch designs, and the construction of concrete arch bridges greatly expanded.

During the time Luten's company held a virtual monopoly on concrete arch designs, some philosophical changes occurred within the industry. Within the 1900-1910 period, engineers began to recognize concrete's great versatility and potential attractiveness as a building material itself and began experimenting with the form and appearance of concrete bridges. As historian Carl Condit wrote, "By 1910, however, the main line of evolution was moving away from massive construction, with its echoes of the masonry tradition, toward the flattened parabolic curves of narrow ribs, the slender spandrel posts, and the minimal piers that scientific reinforcing was to make possible" (Condit 1968:257).

In the early twentieth century, engineers achieved major advances in both the aesthetic design and technology of concrete bridge design. European engineers led in experimentation in both research and in construction of new and different bridge designs. However, due to the complexity of the research, most Americans did not pursue research in this field that resulted in "an arrested growth in structural art for American concrete bridges" (TRB 1991:74). Even so, while not daring, American concrete arches became more attenuated and slender, further differentiating the look of concrete arch bridges from masonry arch bridges.

Accordingly, two other early twentieth century types of concrete arches began to appear in Tennessee in the early 1920s: the open spandrel arch and the filled spandrel-ribbed arch. The open spandrel design dates to at least 1896 when Edwin Thacher patented such a bridge design. The open spandrel arch functioned similarly to a filled spandrel or barrel arch and carried the deck above the arch as did a barrel arch, but visually, the designs were substantially different. Rather than having a solid spandrel wall, this arch design contained an open spandrel area with vertical columns. These columns could either be straight or arched forming a small arcade. Although the barrel of the arch could be solid, the design typically contained two parallel ribs along the outside edges of the arch, usually connected with bracing. For more support, such as on wider bridges, the arch contained additional ribs. All of the open spandrel arches in Tennessee have the typical ribbed barrel; none use a solid barrel.

Filled spandrel and open spandrel arches also differed in how they distributed stresses. A filled spandrel arch uniformly distributes the load throughout the spandrel wall before it spreads along the arch line. An open spandrel arch distributes the load downward through the vertical spandrel column over which it passed and not throughout all the columns. Open spandrel arches, which eliminated roadway fill and required smaller footings, used less material but were more labor intensive to build than filled spandrel arches. Therefore, filled spandrel or barrel arches were more economical for shorter spans, and open spandrel arches were better for longer spans or high crossings.

Filled spandrel arches originally had solid parapet rails, but with the open spandrel arch, an open rail of posts or balusters became common. Only one of Tennessee's extant open spandrel arches has a parapet rail. However, builders used both types on filled spandrel arches throughout the 1920s and 1930s in Tennessee. *Interestingly, the parapet railing could be a functional member* sharing the load with the arch, but the open rail merely served as a railing for pedestrians or vehicles. Its primary advantage was that it weighed less and thus reduced the dead load.

A variation of the open spandrel arch was a through (or pony) arch, which located the arch above the roadway and placed the roadway within the arch rather than on top of it, as is common on a deck arch. James Marsh of Des Moines, who patented his design, popularized this arch form. Marsh's design was essentially a steel bridge encased in concrete. Comparatively expensive, few builders used this design outside the Iowa region (Herbst and Rottman 1984:10). Although Marsh's patents termed his design a "Marsh Rainbow Arch," the term Rainbow Arch has come to be used generically for any through concrete arch bridge such as the McBee or Mascot Bridge (#133, 47-01262-04.68). The through arch basically functioned the same as an open spandrel arch

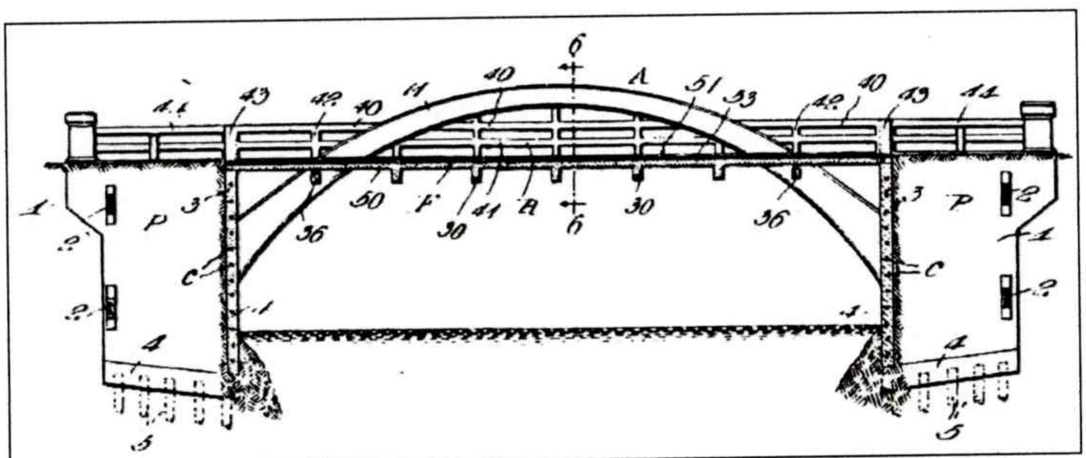


Figure IV-08: James B. Marsh's Patent for his "Rainbow Arch" bridge, 1912, Patent # 1,035,026.

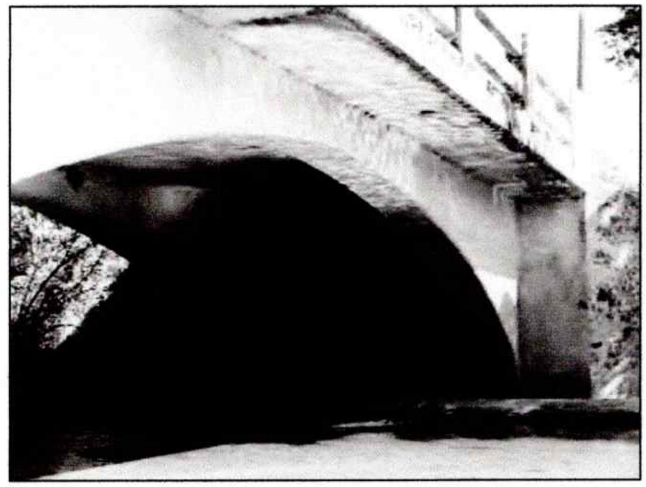


Figure IV-09: Photograph of a Filled Spandrel-Ribbed Arch Bridge in Wilson County; #124, 95-A0392-02.12, Built by Bell and Bell in 1928.

except that it contained an inverted arch that carried the deck along the bottom of the arch rather than on top of it. Some engineers such as Henry Tyrrell strongly opposed pony or through designs. Tyrrell felt the side supports were "a danger and menace to travel" and that builders should use them only when "the underneath clearance or structural requirements positively prohibit the rise of a deck bridge" (Tyrrell 1909:108). Builders rarely erected pony or through ("Rainbow") concrete arches in Tennessee. One example is known to have been built by John Steel in Lawrence County (see Figure III-12, not extant). Knox County chose a through arch design for the McBee Bridge in order to maintain the existing grade with nearby railroad tracks that would not have been possible with a deck arch.

A third major variation of the concrete arch, the filled spandrel ribbed arch, appeared in Tennessee in the early 1920s. Historians generally date this form to 1898 and attribute it to Pennsylvania Public Works Department Engineer F. W. Patterson (Spero 1984:5). From the side elevation, this variation appeared to have a filled spandrel and a solid barrel arch. On closer inspection, the design contained parallel ribbed arches below a filled spandrel creating a "hollow" look. None of Tennessee's examples contain a delineated arch ring along the ribs, but neither do many of the state's barrel arches. Usually, the arch contained two ribs along the outer edges that were flush with the spandrel walls, but for a wide bridge such as the Elizabethton Bridge in Carter County (#115, 10-03939-00.10), builders often used more ribs. This type of arch required less concrete material than a barrel arch but used more reinforcing materials and probably required more labor.

The haunched girder, a hybrid blending of the arch and girder, also reflected this change in design philosophy. Roughly a dozen examples built in the 1920s and 1930s remain in Tennessee. Still built today, but typically for comparatively short spans, haunched girder spans serve as a transitional design between the concrete arch bridges of the early twentieth century and modern bridges.

In assessing the significance of concrete arch bridges, one major difference between concrete arches and metal truss bridges is important to note. Historians can readily identify unique design features or patented elements on truss bridges as the entire truss is visible to the eye. While there are different types of concrete arch bridges (for example, open and filled spandrel), many unique identifying features are not visible. For instance, various bridge companies acquired a wide variety

Figure IV-10: Photograph of a Haunched Girder Bridge in Bradley County, Erected in the 1920s by Steel and Lebby.

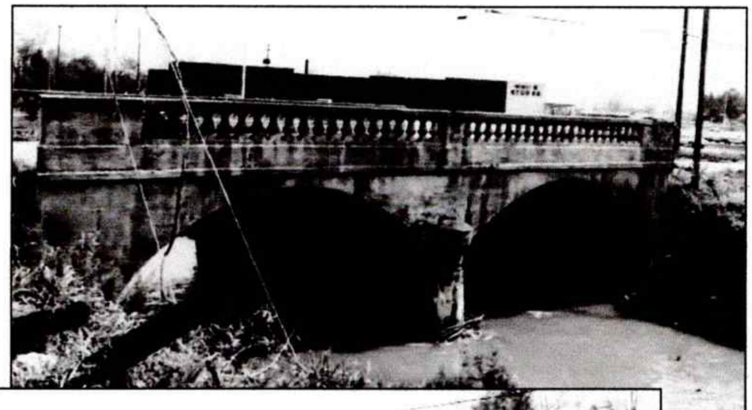
of patents dealing with abutments, ties, hinges, and especially the steel reinforcing. None of these features are normally visible, and thus the only way to determine if a concrete arch bridge contains a patented feature (other than an on site inspection during demolition) is through research, or if the bridge plaque identifies it. It is possible that some of the early Luten bridges in Tennessee could be considered patented, but county court minutes or newspaper articles contain no specific references to them as patented bridges. The only concrete arch bridge in Tennessee known to have patented features is the Clinch Avenue Viaduct in Knoxville (#48, 47-A0135-00.42). Nationally recognized Edwin Thacher prepared the plans for this bridge, and the bridge plaques identify specific patents by Thacher and Melan.

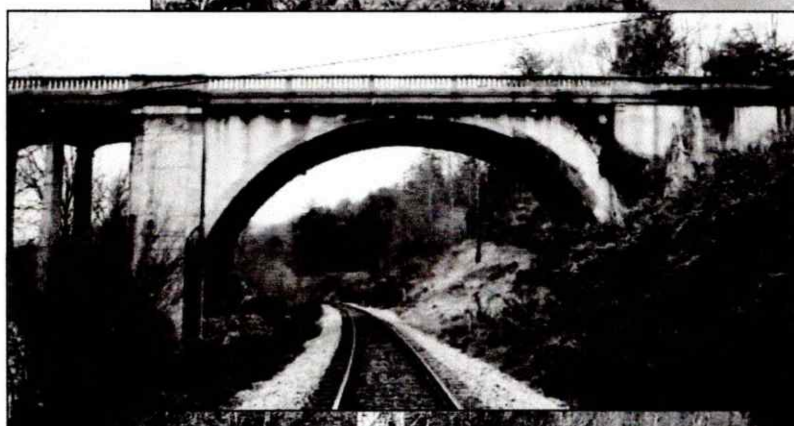
Builders could easily form concrete into a variety of shapes, and concrete was thus readily adaptable to decoration either through the surface finish or the inclusion of decorative motifs. Builders could, and often did, face concrete bridges with stone, brick, or plaster, especially during concrete's early use. One example is the stone faced Belle Meade Bridge in Nashville (#51, 19-B0983-01.61) which a landscape architectural firm included in exclusive residential development in 1906. Stone facing served two purposes. First, it reinforced the similarity of the forms of concrete arches and masonry arches while providing a reassuring transition to a new design. It was also a response to the City Beautiful Movement of the 1890s and early twentieth century that encouraged aesthetically attractive urban areas. For many people, only stone bridges were aesthetically attractive.

Builders could create other finishes from concrete itself with such methods as "cement washing, tooling, sandblasting, rough casting or slap dashing, scrubbing, cold water painting, and acid treating" (Tyrrell 1909:60). For instance, the 1925 Indian Creek Bridge in rural Hardin County (#114, 36-A0446-00.04) has bush hammered depressed panels in the spandrels as a decorative *feature. The Chickasaw Gardens Bridge in Memphis (#117, 79-B0741-00.01), which a developer* built in 1926 for an exclusive subdivision, has a washed rock finish that creates a rough exposed aggregate appearance.

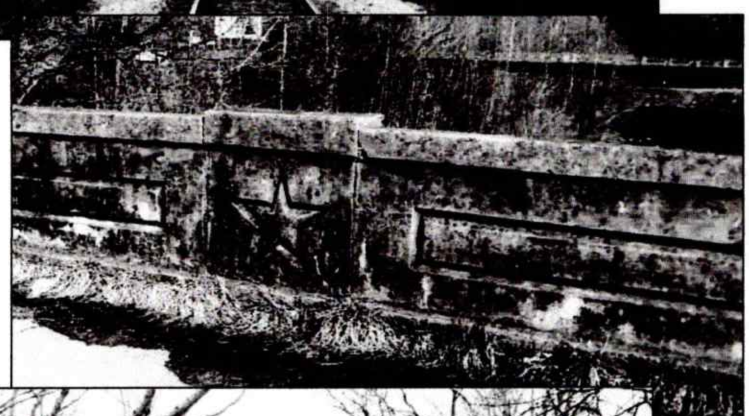
In addition to the type of finish, concrete bridges often contained some type of decorative motif. The railing usually featured on both sides an incised decorative design, most commonly rectangular

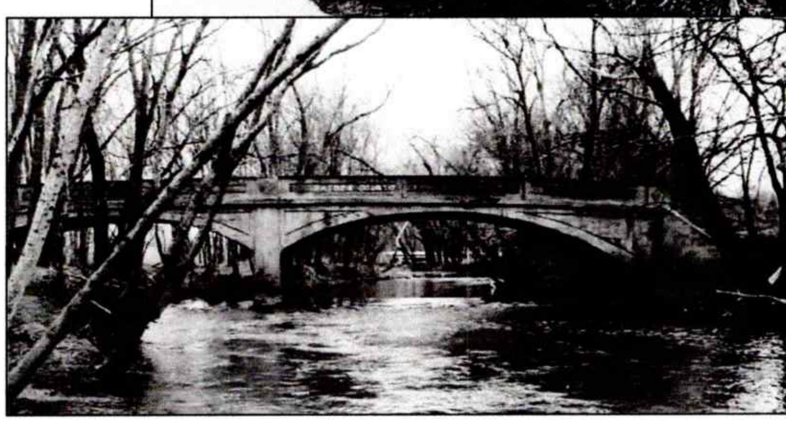
Figure IV-11, Various Decorative Treatments on Concrete Arch Bridges: *Top,* urn shaped balusters on the rail, (#103, 95-02036-01.51, Main Street in Watertown), built by Luten in 1921; *below,* modillions, incised lines in a chevron pattern, and a band along the arch; on a few bridges, this line was scored to imitate masonry, (#118, 15-SR009-21.60, built 1928, east of Newport;





right, incised star and rectangular designs (#98, 05-NonHighway-1, the Walland Bridge east of Maryville in Blount County), built by Luten in 1918; and *bottom,* incised rectangular, diamond, and triangular designs; (#79, 28-01891-04.77, northwest of Pulaski in Giles County), built by Luten in 1914.





in shape. Other shapes included diamond, hexagonal, and star patterns or a combination. The Clinch Avenue Viaduct in Knoxville (#48, 47-A0135-00.42) contained an unusually elaborate rail treatment, a fleur-de-lis design. Builders occasionally used urn shaped balusters rather than a plain post and rail railing. All of Tennessee's extant examples are located in towns, and a possible conclusion is that builders or cities perceived this feature as an urban amenity, related to the City Beautiful movement. Some builders placed elaborate light fixtures such as Ionic columns on rails. Again, all of Tennessee's extant examples are located in urban areas. Many builders defined the barrel of the arch with a single incised line along the curve of the arch, delineating the extrados. This decorative feature resembled a ring-course of voussoirs on a masonry arch. From a practical standpoint, it may also have allowed additional room for the metal reinforcing rods within the arch. Occasionally, builders delineated an incised triangle in the spandrel area or added a string course at road level. Arched columns that created a colonnade effect formed another decorative feature.

Possibly because concrete itself was so easy to form into decorative shapes, bridge plaques on these bridges are normally quite plain. However, another factor may have been the post-Victorian time period when even truss plaques were relatively simple. Another difference is that builders normally placed plaques on concrete arch bridges on the inside of the railing (rather than at the portal). Plaques located on the inside of the rail, either at the end posts or at mid point of the bridge, are not as readily visible as plaques on most trusses.

In the 1930s, it was common for many New Deal projects to face concrete structures for aesthetic appearances. An example is the 1936-1938 Cumberland Mountain State Park Dam in Cumberland

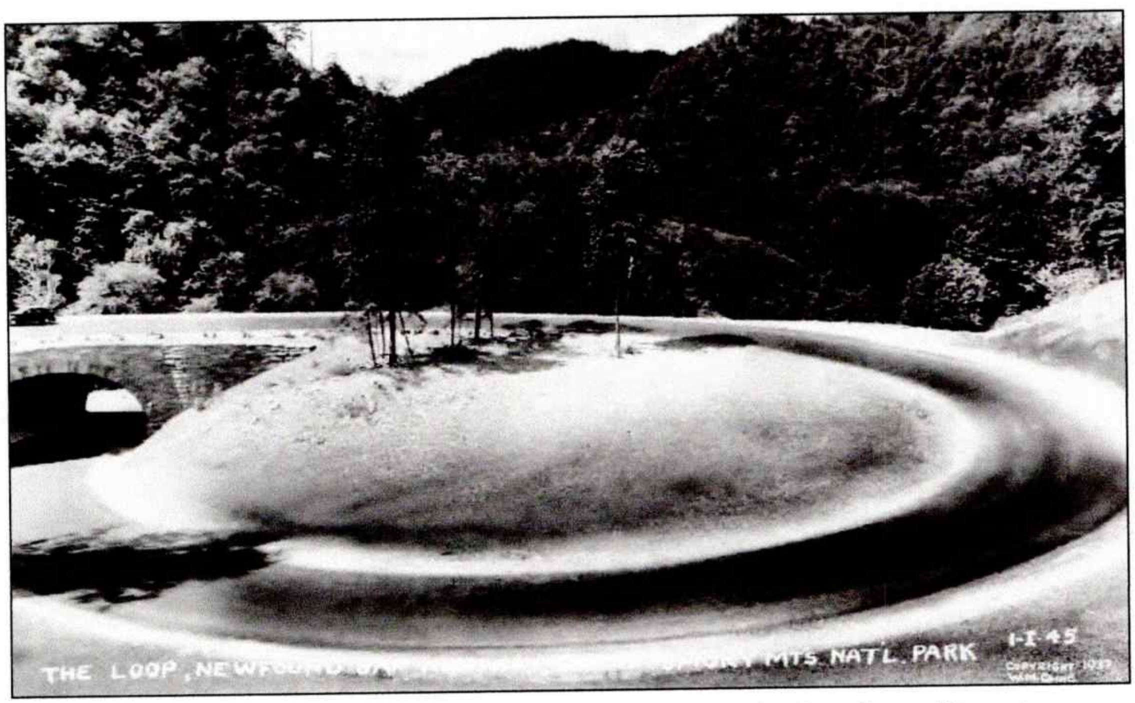


Figure IV-12: 1930s Photograph of the Loop Bridge on State Route 71, Great Smoky Mountains National Park, Sevier County (#141, 78-SR071-05.85) (Author's Collection).

County (#147, 18-01166-03.59), a concrete arch structure faced with stone. The "Parkitecture" movement in the 1920s and 1930s expanded on the judgmental view that masonry was more attractive than concrete and espoused stone as an ideal finishing material that blended man made structures with the natural environment. The seven concrete and stone bridges on Newfound Highway in Sevier County within the Smoky Mountain State Park (#s141-146, 148; 78-SR71), built through the National Park Service as New Deal projects in 1937, are an excellent example of this movement. The bridges, culverts, tunnels, curbs, and retaining walls along the highway form a cohesive unit through the use of natural stone materials that blend the roadway with the surrounding terrain. Of note is the "Loop Bridge" (or "pig-tail" bridge) that crosses over and under itself. This bridge replaced two steep switchbacks (or "hair-pin" curves) which Park Service philosophy deemed as unsightly and, from a practical standpoint, allowed the motorist to easily navigate a steep slope.

However, notwithstanding the Parkitecture movement, an understanding and appreciation of concrete's building potential and aesthetic value evolved. This trend became evident in both the graceful and soaring arch designs, which clearly proclaimed that the bridges were concrete, as well as in the finishing touches of decorative details.

From a technological standpoint, engineers began to experiment with pre-stressing concrete in the early twentieth century although they did not widely use this method until the 1940s. Pre-stressing *is a method to introduce internal stresses, such as with steel reinforcing bars stretched or stressed* while curing within concrete, which counteract any external loading stresses and thus compensate for the low tensile strength of concrete. Prior to pre-stressing, the weight of concrete limited its use for long spans. With this innovation, concrete became even more widely used leading to its popularity today.

Although concrete arch bridges originally imitated the shape and appearance of masonry arch bridges, they gradually found their own identity, first as veneered or unfaced barrel arches and later as open spandrel arches and ribbed arches. As experimentation and technological advances continued in concrete, this evolution resulted in the increased use of concrete for long and short girder spans. These new forms of concrete bridges were more economical and practical for substantially longer spans and soon replaced concrete arches of any style. Thus, the experimentation that brought concrete arches into their own as a form paradoxically led to their demise as more efficient and cost effective concrete designs replaced them.

CONCRETE ARCHES IN TENNESSEE: Tennessee builders were slow to adapt the use of concrete arches for vehicular bridges. Other than several railroad overpasses, the survey inventoried only five pre-1910 concrete arch bridges in Tennessee. The 1903-1905 Evergreen Cemetery Bridge in Memphis (#44, 79-E0578-00.21), built as a cooperative project by several railroads, contains one unique 100-foot span. The 1905 Clinch Avenue Viaduct in Knoxville (#48, 47-A0135-00.42), built by the railroads and the city, is a fifteen span viaduct with an elaborately decorated railing. Landscape gardeners O. G. Simonds and Company of Chicago designed the 1906 Belle Meade Bridge in Nashville (#51, 19-B0983-01.61), a one span bridge faced with masonry, located at the entrance to an exclusive residential development. The Dixie Portland Cement Company built the Cumberland Avenue Bridge in Richard City in Marion County (#53, 58-A0443-00.50) *in 1906 as part of a planned town designed by an engineering firm.* The Centennial Park Bridge in Nashville (#66, 19-NonHighway-4) is a small one span structure built in 1909. No city or county government built these bridges as a typical vehicular bridge. In each case, atypical building circumstances (a railroad as the lead agency, a landscaping or engineering firm's involvement, or the location in a major urban park) influenced the innovative design.

One noteworthy experiment in concrete is the concrete deck trusses on the 1909 Shelby Street Bridge in Nashville (#58, 19-03245-01.47). Designed by local engineer Howard Jones, the bridge's two approach spans each contained three parallel arched deck trusses. While arched in appearance, each functions as a concrete truss; the concrete only acts as a stiffener and as protection for the steel rods within the concrete that comprise one tenth of the arch area. As one engineering publication explained, the "bottom chords act as ties to take the horizontal components of the end thrusts of the arched top chords" (Creighton 1909:200). Thus, while the spans are trusses and partially function as trusses, they also distribute the forces or stresses within the span similar to the way an arch does.

The novel design caused some local engineers to question its stability. To test his design, (and, hopefully, to quieten his critics), Jones built an eleven-foot model, one-tenth the size of the longest truss. He planned to load it with bricks until it collapsed. However, after the load reached 17,000 pounds it became too top heavy to continue loading. His design was obviously structurally sound (Nolen 1983:20). Even so, skepticism remained, and when the county opened the bids for the contract, one firm had bid $100 per cubic yard as opposed to the $17.25 bid by the Foster-Creighton firm that received the contract.

Wilbur Creighton of the Foster-Creighton Company wrote that while he was outwardly confident about building these spans, he was somewhat worried since he knew of nothing else similar to them. By trial and error, he developed a system to pour the "bowstring" upper chord. One morning during their construction, as Creighton traveled to work, he heard a thunderous crash from the bridge site. Believing that the trusses had collapsed he hurried to the site only to discover, to his relief, that a water tank from a nearby building had fallen to the ground (Nolen 1983:1-2).

Research by Canadian historians indicates that a 1909 bridge in Ontario and the Shelby Street Bridge are the two oldest extant tied concrete trusses in North America (Morrison 1985:1). It is possible that these two bridges were the first of this type built, or at least among the earliest built. While builders never extensively erected the concrete arched truss, its design is significant as an innovative experiment in concrete that broke with the traditional imitation of masonry arch bridges.

Not until the 1910s did concrete arch bridges become widespread in Tennessee. About 1912 the national leader in concrete arch bridges, the Luten Company of Indianapolis, briefly opened a branch office in Nashville before moving it to Knoxville where it operated under the supervision of George Daugherty until 1946. With Luten's arrival in Tennessee, many counties began to contract for concrete arch bridges and a few local builders copied Luten's designs. Some counties even passed resolutions in their county court minutes stipulating a preference for concrete over steel truss bridges. Although concrete arch bridges became popular in Tennessee, they did not dominate the bridge industry, and most counties continued to primarily build steel truss bridges. Prior to 1920 in Tennessee, builders erected only the filled spandrel design, which duplicated the form of masonry arch bridges. Examples of the filled spandrel arch, the most prevalent concrete arch design in Tennessee, date from 1903 through 1951. Of Tennessee's 307 pre-1946 concrete arch bridges, 256 or 83% are filled spandrel arches. See Table IV-04. Three post 1945 concrete arch bridges remain in Tennessee and all are filled spandrel arches; see Appendix A. Railroads introduced the filled barrel arch to Tennessee around the turn of the century. In the 1910s the Luten Bridge Company dominated the field in Tennessee, but from about 1920 until the early 1930s, Luten shared the field with the Steel-Roehl-Lebby firm. A variety of other firms practiced to a lesser extent in the state. Twenty-nine of these 256 bridges (11%) are eligible for the National Register.

Table IV-04: Pre-1946 Filled Spandrel Arches in Tennessee

ELIGIBLE? # in CH. 6	COUNTY	BRIDGE NUMBER	CROSSING	DATE BUILT and BUILDER	# ARCH SPANS and RAIL
Yes: #44	Shelby	79-E0578-00.21	Railroads	1903-1905 Frisco RR	1-Parapet
No	Humphreys	43-A0195-00.63	Roads	1905 L& N RR	1-None
Yes: #48	Knox	47-A0135-00.42	Railroads	1905 Edwin Thacher	10-Parapet
No	Hawkins	37-A0337-00.24	Road	1905 est; Southern RR	1-None
No	Hawkins	37-A0461-00.05	Road	1905 est; Southern RR	1-None
No	Hawkins	37-A0830-00.06	Road	1905 est; Southern RR	1-None
Yes: #51	Davidson	19-B0983-01.61	Richland Creek	1906	1-Parapet
Yes: #53	Marion	58-A0443-00.50	Poplar Springs Branch	1906	1-Parapet
No	Polk	70-A0356-02.40	Road & Mason Branch	1906 est; L & N RR	1-None
No	Hamilton	33-A0838-00.41	Road	1907 Southern RR	1-None
No	Hamilton	33-A0851-00.29	Road	1907 Southern RR	1-None
No	Sullivan	82-B0194-00.38	Road	1907 Clinchfield RR	1-None
No	Washington	90-03964-03.95	Road	1907 Clinchfield RR	1-None
No	Washington	90-04237-04.23	Road	1907 Clinchfield RR	1-None
No	Washington	90-04242-00.48	Road	1907 Clinchfield RR	1-None
No	Hamilton	33-E0068-01.54	Road	1909 est; Southern RR	1-None
No	Hamilton	33-E0073-00.87	Road	1909 est; Southern RR	1-None
Yes: #66	Davidson	19-NonHighway-4	Duck Pond	1910 Foster-Creighton	1-Parapet
No	Davidson	19-B0269-01.17	Hogan Road	1910 est; L & N RR	1-None
No	Hawkins	37-A0603-02.92	Road	1910 est; Clinchfield RR	1-None
No	Lauderdale	49-01482-00.04	Road	1910 est; ICG RR	1-None
No	Lauderdale	49-A0485-01.85	Road	1910 est; ICG RR	1-None
No	Monroe	62-A0384-01.77	Road	1910 est; L & N RR	1-None
No	Monroe	62-A0810-00.18	Road	1910 est; L & N RR	1-None
No	Bedford	02-A0260-00.36	Flat Creek	1913 Luten	2-Parapet
No	Davidson	19-F0209-00.18	Branch	1913 Luten	1-Parapet
No	Grundy	31-A0249-01.03	Little Fiery Gizzard	1913 Silica	3-Curb
No	Maury	60-B0021-01.59	Snow Creek	1913	2-Parapet
No	Maury	60-A0424-00.04	Curry Branch	1913 est	1-Parapet
Yes: #79	Giles	28-01891-04.77	Big Creek	1914 Luten	2-Parapet
No	Loudon	53-SR072-03.01	Fork Creek	1914 Luten	1-Parapet
No	Loudon	53-SR072-08.78	Clear Creek	1914 Luten	1-Parapet
Yes: #80	Loudon	53-02507-08.23	Pond Creek	1914 Luten	1-Parapet

No	Wilson	95-A0328-00.12	Beech Log Creek	1914 Luten	2-Parapet
No	Wilson	95-A0731-00.02	Branch	1914 Luten	2-Parapet
No	Wilson	95-A0328-01.25	Branch	1914 est	1-Parapet
No	Blount	05-A0004-00.51	Baker Creek	1915 Luten	1-Parapet
No	Blount	05-A0782-00.05	Little Nine Mile Creek	1915	1-Parapet
No	Blount	05-A0863-01.30	Nine Mile Creek	1915 Sullinger-Ferris	2-Parapet
No	Knox	47-02407-05.46	Stock Creek	1915 Luten	1-Parapet
No	Knox	47-03771-00.34	Fourth Creek	1915 Luten	1-Parapet
No	Knox	47-A0040-01.43	Stock Creek	1915 Luten	1-Parapet
No	Knox	47-D0841-00.61	Roseberry Creek	1915 Luten	2-Parapet
No	Knox	47-D0959-01.98	Stock Creek	1915 Luten	1-Parapet
No	Maury	60-SR247-02.50	Turkey Creek	1915	1-Parapet
No	Sevier	78-02421-09.85	Birds Creek	1915 Luten	1-Parapet
No	Sevier	78-A0491-00.56	W Prong Little Pigeon	1915 Luten	3-Parapet
No	Shelby	79-J0125-00.26	Gayoso Bayou	1915	1-Curb
No	Wilson	95-A0265-01.33	Round Lick Creek	1915 Luten	3-Parapet
No	Wilson	95-A0282-00.23	Neal Branch	1915 Luten	1-Parapet
No	Blount	05-A0024-02.39	Floyd Creek	1915 est	1-Gone
No	Blount	05-A0770-00.40	Centenary Creek	1915 est	1-Parapet
No	Carter	10-A0273-00.13	Little Doe Creek	1915 est	3-Parapet
No	Carter	10-A0327-00.02	Doyle Creek	1915 est	4-Parapet
No	Carter	10-A06242-01.44	Doe River	1915 est	3-Parapet
No	Cocke	15-NonHighway-1	Branch	1915 est	1-Parapet
No	Davidson	19-D0480-00.20	Litton Street	1915 est; L & N RR	1-Parapet
No	Grainger	29-SR092-09.16	Richland Creek	1915 est	2-Parapet
No	Hawkins	37-SR066-01.76	Walkers Creek	1915 est	1-Gone
No	Hawkins	37-SR066-02.60	Branch	1915 est	1-Gone
No	Knox	47-A0122-01.33	Road	1915 est; Southern RR	1-None
No	Knox	47-NonHighway-1	Roseberry Creek	1915 est	1-None
No	Maury	60-A0200-00.01	Silver Creek	1915 est	2-Parapet
No	Maury	60-NonHighway-8	Beech Creek	1915 est	1-Parapet
No	Roane	73-A0017-00.45	Branch	1915 est	1-Parapet
No	Sevier	78-B0006-00.07	W Prong Little Pigeon	1915 est	3-Urn/Gone
No	Williamson	94-A0054-00.00	Road	1915 est; L & N RR	1-Parapet
No	Maury	60-A0224-02.16	Hurricane Creek	1915-1916	1-Parapet
Yes: #86	Roane	73-01226-00.50	Emory River	1915-1918 Luten	7-Parapet
No	Carter	10-A0273-03.15	Doe River	1916 Luten	4-Parapet

No	Carter	10-A0702-00.81	Buck Creek	1916 Luten	2-Parapet
No	Maury	60-A0008-00.83	Greenlick Creek	1916	1-Parapet
No	Maury	60-A0116-00.44	McCutcheon Creek	1916	1-Parapet
No	Maury	60-A0116-00.98	McCutcheon Creek	1916	2-Parapet
No	Maury	60-A0230-00.01	Fountain Creek	1916	2-Parapet
Yes: #88	Maury	60-A0358-00.42	Big Bigby Creek	1916 W. B. King	5-Parapet
No	Maury	60-A0392-00.08	Scotts Creek	1916	2-Curb
Yes: #89	Unicoi	86-A0068-00.89	Nolichucky River	1916 Luten	5-Parapet
No	Blount	05-A0545-01.17	Ellejoy Creek	1916 est	1-Parapet
No	Carter	10-NonHighway-1	Doe River	1916 est	3-Parapet
No	Carter	10-NonHighway-2	Doe River	1916 est	3-Parapet
No	Sumner	83-A0086-00.01	Station Camp Creek	1916-1917 Luten	3-Parapet
No	Cocke	15-SR160-05.04	Dry Fork Creek	1917 Luten	1-Parapet
No	Grainger	29-01213-02.49	Richland Creek	1917 Luten	1-Parapet
Yes: #94	Maury	60-NonHighway-4	Beard Creek	1917	1-Parapet
No	Roane	73-03698-00.10	Black Creek	1917 Luten	1-Urn
No	Unicoi	86-SR107-03.27	Indian Creek	1917 Luten	1-Parapet
No	Unicoi	86-A0020-00.17	South Indian Creek	1917 ca.	2-Parapet
No	Unicoi	86-A0038-00.10	Rocky Fork Creek	1917 ca.	1-Parapet
No	Maury	60-SR247-15.76	Carter's Creek	1917 est	2-Parapet
No	Cocke	15-SR160-09.00	Slate Creek	1917-1919 Luten	1-Parapet
Yes: #98	Blount	05-NonHighway-1	Little River	1918 Luten	3-Parapet
No	Cocke	15-SR160-03.50	Clay Creek	1918 Luten	2-Parapet
No	*Giles*	*28-A0057-01.43*	*Big Creek*	*1918 Luten*	*2-Parapet*
No	Maury	60-01905-07.40	Knox Creek	1918	3-Parapet
No	Unicoi	86-A0049-00.02	South Indian Creek	1918 Luten	2-Parapet
No	Knox	47-D0982-00.87	Stock Creek	1918 est	1-Parapet
No	Maury	60-A0171-01.48	Hurricane Creek	1918 est	2-Post
No	Maury	60-A0171-03.33	Goose Creek	1918 est	1-Par/Gone
No	Maury	60-A0378-00.19	Sugar Creek	1918 est	1-Parapet
No	Cocke	15-SR035-08.17	Clear Creek	1919 Luten	1-Parapet
No	Cocke	15-SR035-09.65	Clear Creek	1919 Luten	1-Parapet
No	Rutherford	75-A0195-02.19	Fall Creek	1919 Luten	1-Parapet
No	Blount	05-A0003-00.91	Baker Creek	1920 Luten	2-Parapet
No	Giles	28-A0401-00.03	W Fork Shoals Creek	1920 Luten	1-Parapet
Yes: #100	Smith	80-01068-03.16	Hickman Creek	1920 Luten	4-Parapet
No	Wilson	95-A0727-00.03	Stoners Creek	1920 Luten	1-Parapet

No	Benton	03-A0275-04.01	Road	1920 est; L & N RR	1-None
No	Benton	03-A0439-01.25	Road	1920 est; L & N RR	1-None
No	Blount	05-NonHighway-2	Nine Mile Creek	1920 est	1-Parapet
No	Cocke	15-SR032-21.47	English Creek	1920 est	1-Gone
No	Dickson	22-A0338-00.02	Road	1920 est; L & N RR	1-None
No	Dyer	23-SR020-14.49	Branch	1920 est	1-Parapet
No	Greene	30-02578-03.13	Meadow Creek	1920 est	1-None
No	Greene	30-A0486-01.86	Road	1920 est; Southern RR	1-None
No	Greene	30-A0824-01.25	Richland Creek	1920 est	1-Post
No	Hamilton	33-B0515-00.66	Road	1920 est; Southern RR	1-None
No	Knox	47-01124-00.94	Williams Creek	1920 est	1-Parapet
No	Knox	47-02424-04.42	Tuckahoe Creek	1920 est	1-Parapet
No	Knox	47-A0106-01.01	First Creek	1920 est	1-Parapet
No	Knox	47-C0491-00.01	Love Creek	1920 est	2-Parapet
No	Knox	47-E0582-00.30	First Creek	1920 est	2-Post
No	Loudon	53-02362-01.45	Muddy Creek	1920 est	1-Parapet
No	Maury	60-A0446-00.90	Kettle Branch	1920 est	1-Parapet
No	Maury	60-NonHighway-4	Beard Branch	1920 est	1-Parapet
No	Monroe	62-A0033-00.22	Sweetwater Creek	1920 est	1-Parapet
No	Monroe	62-A0081-01.20	Sweetwater Creek	1920 est	1-Parapet
No	Sevier	78-B0271-00.77	E Prong Little Pigeon	1920 est	1-Parapet
No	Shelby	79-J0126-00.10	Bayou	1920 est	1-Curb
No	Union	87-A0317-02.46	Flat Creek	1920 est	1-Post
No	Wilson	95-01950-02.99	North Creek	1920 est	1-Gone
No	Wilson	95-A0213-04.17	Jennings Creek	1920 est	3-Parapet
No	Wilson	95-NonHighway-1	Cedar Creek	1920 est	1-Parapet
No	Wilson	95-NonHighway-2	Spencer Creek	1920 est	2-Parapet
No	Wilson	95-NonHighway-3	Spencer Creek	1920 est	4-Parapet
No	Blount	05-A0551-00.05	Little River	1920-1921	1-Parapet
No	Hawkins	37-A0355-00.18	Bradley Creek	1920-1922 State	1-Gone
No	Campbell	07-SR009-24.12	Big Creek	1921 Luten	1-Parapet
No	Giles	28-01902-03.23	Little Bradshaw Creek	1921 Nashville Bridge	1-Parapet
No	Giles	28-A0218-00.15	Little Creek	1921	1-Parapet
No	Greene	30-02592-05.86	Guest Creek	1921 Steel & Roehl	1-Post
No	Greene	30-A0988-01.21	Little Chucky Creek	1921 Steel & Roehl	1-Post
No	Jefferson	45-A0145-00.01	Lost Creek	1921 Luten	1-Parapet
No	Perry	68-A0302-03.85	Poole Lake	1921 Nashville Bridge	2-Parapet

No	Van Buren	88-A0015-01.75	Laurel Creek	1921 Concrete	1-Post
Yes: #103	Wilson	95-02036-01.51	Round Lick Creek	1921 Luten	2-Urn
No	Wilson	95-NonHighway-5	Spring Creek	1921	1-Parapet
No	Greene	30-02521-00.36	College Creek	1921 ca.	1-Gone
No	Maury	60-A0424-02.16	Baptist Creek	1921 est.	2-Parapet
Yes: #104	*Giles*	*28-A0334-00.33*	*Jenkins Branch*	1921-22; Nashville Bridge	1-Parapet
No	Campbell	07-02425-03.64	Cove Creek	1922	1-Parapet
No	Campbell	07-02425-06.24	Cove Creek	1922	1-Parapet
No	Greene	30-02391-16.03	Union Temple Creek	1922 Steel & Roehl	1-Post
No	Greene	30-A0163-03.17	Hoover Creek	1922 Steel & Roehl	1-Post
No	Greene	30-A0653-05.20	Mud Creek	1922	1-Post
No	Knox	47-C0590-00.66	First Creek	1922	1-Parapet
Yes: #106	Sevier	78-01284-00.56	Birds Creek	1922 Steel & Roehl	1-Post
No	Sevier	78-01284-00.89	Birds Creek	1922 Steel & Roehl	1-Post
No	Warren	89-A0425-00.86	W Fork Hickory Creek	1922 Nashville Bridge	2-Parapet
No	Grainger	29-01213-11.98	Bethel Branch	1923 Steel & Roehl	1-Post
No	Grainger	29-01328-00.91	Branch	1923 Steel & Roehl	1-Post
No	Grainger	29-02473-00.24	Richland Creek	1923 Steel & Roehl	1-Post
No	Grainger	29-02473-00.38	Rocky Creek	1923	1-Gone
No	Grainger	29-A0412-00.22	Branch	1923 Steel & Roehl	1-Post
No	Greene	30-A0309-01.23	Lick Creek	1923 Steel & Roehl	1-Post
No	Greene	30-A0309-02.19	Lick Creek	1923 Steel & Roehl	1-Post
No	Greene	30-A0949-01.50	Little Chucky Creek	1923 Steel & Roehl	1-Post
No	Wilson	95-01067-14.07	Lick Creek	1923 Luten	1-Parapet
No	Blount	05-SR035-05.34	Little River	1924 Luten	3-Parapet
No	Greene	30-A0309-00.62	Lick Creek	1924 Steel & Lebby	1-Post
No	Maury	60-A061-02.91	Duck Creek	1925 Luten	3-Parapet
No	Montgomery	63-00973-02.06	Branch	1925 State	1-Spindle
No	Smith	80-A0174-03.05	Hickman Creek	1925 Bell & Bell	2-Parapet
No	Campbell	07-2425-05.60	Cove Creek	1925 est	1-Parapet
No	Davidson	19-C0300-00.14	Road	1925 est; L & N RR	1-None
No	Davidson	19-C0301-00.18	Road	1925 est; L & N RR	1-None
No	Giles	28-01875-02.72	E Fork Shoals Creek	1925 est	1-Parapet
No	Giles	28-A0302-00.05	Blue Creek	1925 est	1-Parapet
No	Polk	70-SR030-08.09	Branch	1925 est	1-Parapet
No	Polk	70-SR030-08.24	June Bug Creek	1925 est	1-Parapet
No	Roane	73-A0069-01.12	Hurricane Creek	1925 est	1-Parapet

No	Wilson	95-A0320-05.89	Rocky Branch	1925 est	1-Parapet
Yes: #114	Hardin	36-A0446-00.43	Indian Creek	1925-1926 State	1-Parapet
No	Davidson	19-SR006-20.11	Dry Creek	1926 State	2-Gone
No	Maury	60-01916-00.09	Little Bigby Creek	1926	1-Post
Yes: #117	Shelby	79-B0741-00.01	Cypress Creek	1926	3-Post
No	Sullivan	82-A0456-01.50	Beaver Creek	1926 est	1-Gone
No	Maury	60-B0029-00.01	Little Bigby Creek	1926-1927	1-Parapet
No	Morgan	65-SR029-19.94	Rock Creek	1926-1928	2-Curb
No	Carter	10-A0317-00.01	Doe River	1927	2-Post
No	Knox	47-01262-01.99	Flat Creek	1927	1-Gone
No	Maury	60-SR245-09.92	Little Bigby Creek	1927	2-Parapet
No	Wilson	95-A0725-00.29	Branch	1927 Luten	1-Post
No	Wilson	95-SR141-00.89	Branch	1927 est	1-Post
No	Wilson	95-02038-01.91	Spring Creek	1927 est	3-Parapet
No	Dickson	22-00967-05.11	Branch	1928 est	2-Curb
No	Greene	30-02590-05.30	Gap Creek	1928 est	1-None
No	Roane	73-02366-05.52	Paw Paw Branch	1928 est	1-Post
No	Davidson	19-SR024-16.34	Mill Creek	1928-1929 State	1-Parapet
No	Giles	28-SR015-09.71	Branch	1928-1929 State	1-Curb
Yes: #126	Campbell	07-A0080-00.49	Stinking Creek	1929 Steel & Lebby	2-Post
No	Campbell	07-A0080-00.80	Stinking Creek	1929 Steel & Lebby	2-Post
No	Maury	60-01903-00.03	Bear Creek	1929	2-Parapet
No	Dickson	22-SR048-24.06	Furnace Creek	1929-1930 State	2-None
No	Maury	60-A0433-00.01	Catheys Creek	1930	2-Parapet
No	Maury	60-B0027-00.01	Little Bigby Creek	1930	1-Parapet
No	Williamson	94-SR011-07.73	Wilson Branch	1930 State	1-None
No	Carter	10-03990-00.34	Buffalo Creek	1930 est	1-Parapet
No	DeKalb	21-02148-02.30	Smith Fork Creek	1930 est	3-Parapet
No	Franklin	26-A0589-00.10	Crow Creek	1930 est	1-Post
No	Giles	28-A0116-00.09	Robertson Fork Creek	1930 est	1-Parapet
No	Greene	30-02527-01.27	Sinking Creek	1930 est	1-Post
No	Greene	30-B0059-00.15	Gap Creek	1930 est	1-Parapet
No	Knox	47-SR001-17.64	Third Creek	1930 est	1-Gone
No	Knox	47-C0199-01.42	Beaver Creek	1930 est; Steel & Lebby	1-Post
No	Maury	60-A0229-00.05	Fountain Creek	1930 est	1-Parapet
No	Maury	60-A0229-01.50	S Fork Fountain Creek	1930 est	1-Parapet
No	Maury	60-A0418-01.77	Dog Branch	1930 est	1-Parapet

No	Monroe	62-SR072-05.17	Branch	1930 est	1-Parapet
No	Sumner	83-A0616-00.09	Donaho Branch	1930 est	3-Curb
No	Warren	89-02171-05.90	Hickory Creek	1930 est	2-Post
Yes: #134	Anderson	01-A0136-01.96	Hinds Creek	1931 Luten	1-Post
No	Maury	60-A0091-02.00	Fountain Creek	1931	1-Parapet
No	Shelby	79-SR057-02.72	Cypress Creek	1931 State	1-Spindel
No	Maury	60-A0089-03.18	Terrell Branch	1932	1-Parapet
No	Shelby	79-SR003-12.73	Gayoso Branch	1932-1933 State	1-Curb
No	Hamilton	33-SR002-03.33	Wauhatchie Pike	1933 est; Southern RR	1-None
No	Scott	76-A0063-00.84	Roaring Paunch Creek	1933 est	1-Spindle
Yes: #136	Anderson	01-SR071-04.79	Hinds Creek	1934 TVA	1-None
Yes: #141	Sevier	78-SR071-05.85	State Route 71	1935 NPS	1-Parapet
No	Campbell	07-A0090-00.01	Terry Creek	1935 est	1-Parapet
Yes: #142	Sevier	78-SR071-08.54	W Prong Little Pigeon	1936 NPS	1-Parapet
Yes: #143	Sevier	78-SR071-05.65	Cole Branch	1936-1937 NPS	1-Parapet
Yes: #144	Sevier	78-SR071-05.23	Walker Camp Prong	1936-1937 NPS	2-Parapet
Yes: #145	Sevier	78-SR071-02.83	W Prong Little Pigeon	1936-1937 NPS	1-Parapet
Yes: #146	Sevier	78-SR071-01.98	Walker Camp Prong	1936-1937 NPS	1-Parapet
Yes: #147	Cumberland	18-01166-03.59	Byrds Creek & Lake	1936-1938 CCC	15-Parapet
No	Bedford	02-SR016-13.08	Dry Creek	1937 State	1-Curb
Yes: #148	Sevier	78-SR071-13.31	W Prong Little Pigeon	1937 NPS	3-Parapet
No	Sevier	78-SR071-15.85	Roaring Fork Creek	1938 State	1-Spindle
No	Dickson	22-SR001-15.42	Wildcat Branch	1939 State	1-None
No	Dickson	22-SR001-15.64	Branch	1939 State	1-None
No	*Hickman*	*41-SR050-29.62*	*Boat Branch*	*1939 State*	*1-None*
No	Knox	47-SR001-04.10	N Fork Turkey Creek	1939 State	1-Spindle
No	Dyer	23-A0282-00.85	Branch	1940 est	1-Curb
No	Madison	57-03046-01.29	Sandy Branch	1940 est	1-None
No	Madison	57-03047-01.28	Sandy Branch	1940 est	1-Curb
No	Madison	57-B0145-00.63	Sandy Branch	1940 est	1-Curb
No	Marshall	59-SR106-03.22	Wrights Branch	1940 est	1-Post
No	Maury	60-SR247-18.46	Branch	1940 est	1-Gone
No	Shelby	79-04386-00.30	Ditch	1940 est	1-None
No	Shelby	79-B0594-02.91	Cypress Creek	1940 est	3-Post
No	Tipton	84-01476-00.28	Road	1940 est; ICG RR	1-None
No	Tipton	84-A0252-01.33	Road	1940 est; ICG RR	1-None
No	Sumner	83-SR109-14.96	Tuckers Creek	1941 State	1-Curb
No	Davidson	19-SR001-19.20	Browns Creek	1942	1-Spindle

4/3/1959 Millard Mitchem Sr

has blown [illegible]
I am real sleepy. The state
engineers were stakeing out
the new road through Greenpastures
3690 Johns [illegible]
to day. It passes within about
8 feet of west end of Concrete
bridge and goes over the
branch and on between
Spring House and branch
and or new Branch which
is to be made just East of
old Branch, after old Branch
is completely covered up with
new Road. The new Road
will only front on our farm
a little more than 650 feet.
They & we agreed that 900.00
cash would settle the amount
of damages.

Discussion of rerouting of Kedron Pike