

E. Middle Creek Road Bridge
Over Middle Creek
(S.N. 008-3907/Sequence No. 21962)
Lima Township
Carroll County
Illinois

HIER No. CA-2019-1

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic Illinois Engineering Record
State Historic Preservation Office
Springfield, Illinois

Prepared by the Illinois State Archaeological Survey
on behalf of the Illinois Department of Transportation

March 2024

HISTORIC ILLINOIS ENGINEERING RECORD
HIER No. CA-2019-1

E. Middle Creek Road Bridge
(REINFORCED CONCRETE, THROUGH-GIRDER)

- Location: E. Middle Creek Road Bridge over Middle Creek
Lima Township, Carroll County, Illinois
- USGS Quadrangle: USGS Brookville, 7.5 minute, Illinois
Latitude 042° 02' 18" N Longitude 089° 44' 30" W
- Universal Transverse Mercator Coordinates:
Zone 16 Easting 273036 Northing 4657459
- Present Owner: Carroll County
- Present Use: Vehicular Bridge (IDOT Structure No. 008-3907)
- Significance: The E. Middle Creek Road Bridge over Middle Creek is a single-span fabrication with a post-and-beam structural form. Its load is carried by reinforced concrete through girders that also serve as the bridge railings, to the bottom of which the deck is tied. This kind of structure was widely used in Illinois in the first thirty years of the twentieth century to replace late nineteenth century truss bridges with higher maintenance costs. The composition was built in 1925 and included on IDOT's Historic Bridge List as an example of its type that dates to the period in which reinforced concrete became a dominant bridge-building material. As such, and given its good condition, the structure was determined eligible for the National Register of Historic Places.

PART 1. HISTORICAL INFORMATION

- A. Physical History:
1. Date erected: 1925¹
 2. Designer: Illinois Division of Highways

¹ This date is taken from the bridge plate which remained on the structure and also acknowledged its builder. See Photograph #23 of 26 for an image of the plate.

3. Original and subsequent owners: Carroll County
4. Builder or contractor: O.H. Kleven
5. Alterations and additions: The design and character of the bridge have not been altered. There have been layers of tar and gravel applied to the deck and the grade of the roadway over time been increased east to west to accommodate a gentle hill immediately to the west. The result is that the railing at the east end of the bridge rises higher above the slightly sloped deck than that to the west.

B. Historical Context:²

Bridge Development in Illinois:

The first permanent bridges in Illinois include a few stone arches built in the 1830s when the National Road was extended west from Maryland. At least one other arch was built on the Chicago-Galena Road in the same period. Accounts from early travelers suggest that rudimentary ferries aided passage across some rivers. Timber structures crossing small water courses also helped travel. Little is known of the pile trestles or problematic floating platforms used. All were subject to risks and washouts.³

As pioneers moving west established settlements, technicians were attracted to the frontier to erect bridges, many of them covered. Between 1820 and 1900, an estimated two to three hundred such structures were built in Illinois, only a handful of which likely remain today.⁴

Railroads helped drive the need to improve early timber fabrications. Trains hauled heavier loads as time passed, a fact requiring by the late 1850s stronger bridges. Consequently were structures of iron developed. They were followed in the 1870s by others of steel that used wide flange beams as components. The use of steel contributed to the expansion of railroads, settlement and industrialization in a growing America.⁵

² The first three paragraphs of the “Bridge Development in Illinois” section was initially prepared (including footnotes) in the late 1980s and early 1990s by John Nolan of the Illinois Department of Transportation (IDOT). Most of that material has subsequently been reviewed against the sources cited, edited and expanded or modified as appropriate.

³ Keith A. Sculle and John A. Jakle, “From Terre Haute to Vandalia, Illinois,” in *A Guide to the National Road*, ed. Karl Raitz (Baltimore, MD: The Johns Hopkins University Press, 1996): 277; Milo M. Quaife, *Chicago’s Highways Old and New* (Chicago: D.F. Keller & Co., 1923): 187.

⁴ Russell M. Garrard, “Early Bridges in Central Illinois,” in *Heritage of Mid-Illinois Engineering* (Springfield, IL: Capital City Chapter of the Illinois Society of Professional Engineers, circa 1976): 14, 15.

⁵ For a general but brief acknowledgement of how important steel was in the physical expansion and industrial growth of the

Equally important in the evolution of bridge-building materials was the development of concrete that entered generally wide service around the turn of the twentieth century. Such structures were cheaper than those of stone, another early bridge-building material. Concrete fabrications were also stronger since the mortar used on stone bridges did not typically fill completely the joints between stones. Concrete was also used in many locations with short crossings that might have otherwise required steel structures. The versatility of concrete was further enhanced when it was reinforced with steel rods or used to encase rolled steel beams, thus protecting them from the weather. The use of concrete for shorter spans also facilitated the growing twentieth century inclination toward aesthetics, or essentially giving bridges a more pleasing appearance.⁶

Late 19th Century Bridges and the Illinois State Highway Commission:

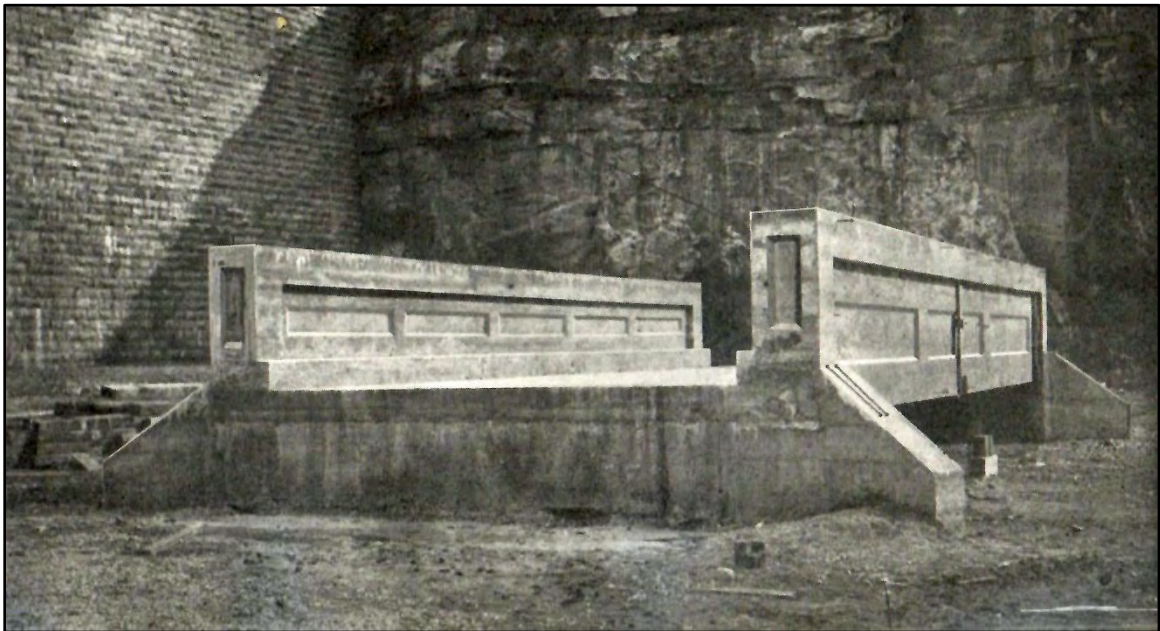


Figure 1: The 1907 test bridge constructed at the Southern Illinois Penitentiary in the community of Menard. This structure was built strictly for load-related testing (*Second Annual Report of the Illinois Highway Commission for the Year 1907* [Springfield, IL: State of Illinois, 1908]: 76A).

The use of steel implied a sense of strength and permanence appropriate for the United States as it emerged on the world stage in the last thirty years of the nineteenth century.

United States, see Walter V. Voss, “How New Materials Increased Man’s Building Ability,” in *Centennial Transactions* (New York: American Society of Civil Engineers, 1953): 829-830.

⁶ Walter M. Smith, Sr., and Walter M. Smith, Jr., “Concrete Bridges: Some Important Features in Their Design,” *Transactions of the American Society of Civil Engineers* 77 (December 1914): 695-696; Leslie R. Schureman, “Beauty in Short-Span Highway Bridges,” *Civil Engineering*, 8 (May 1938): 319.

That implication of strength was also exploited at the time. Steel salesmen took advantage of the material's reputation for permanence simply to promote sales. The Illinois State Highway Commission, when created in 1906, recognized that fact and called the practice to people's attention in its *First Annual Report*. The publication explained that "bridge companies...are in the business primarily to sell as much steel as possible. It is to their immediate interest to advise in every instance, first, as large a bridge as they can possibly induce the local officials to undertake, and, where ever it is possible, to recommend steel in place of any other [building] material." The report went on to observe "that a bridge...made of steel oftentimes leads the public to place undue confidence in the structure." The Highway Commission was firm in its belief that the driving public needed to know about the pitfalls and problems associated with many of the state's later nineteenth century, steel bridges.⁷

There were several reasons bridge companies were so manipulative. Most county highway commissioners had little, if any, bridge-building education or knowledge. Consequently were they at the mercy of bridge companies and their recommendations. Additionally were project provisions many times inadequate, sometimes citing only the anticipated length and width of a proposed structure. Companies took advantage of the lack of detail. Instead of building concrete abutments, for example, they opted for less expensive choices that included anchoring bridges to steel legs or tubes driven into the ground which then required the construction of frequently deficient approach spans. As for the load requirements of a given bridge, companies in many cases designed structures for typical traffic loads at the expense of the occasional very heavy load that might collapse an inadequate fabrication. Yet companies charged as much for a bridge as they could. Some were simply overbuilt. Or more expensive structures were proposed for incompatible sites. Sometimes competitors even colluded and agreed on a minimum price for a given bridge that exceeded what a reasonable price might be.⁸

It was into this evolving environment that the Illinois State Highway Commission was thrust when it was established in 1906. One of its responsibilities dealt with bridges, in general, and furnishing "...to the various local commissioners such skilled advice as may be necessary in the erection of their bridges," in particular. The Commission was a statewide agency that, along with the development of standardized bridge plans and budgets, was to promote design and structural consistency at reasonable prices. Pooling

⁷ *First Annual Report of the Illinois Highway Commission For the Year 1906* (Springfield, IL: State of Illinois, 1907): 55-56; *Second Annual Report of the Illinois Highway Commission For the Year 1907* (Springfield, IL: State of Illinois, 1908): 77-81; Illinois State Highway Commission, *Modern Bridges for Illinois Highways* (Springfield, IL: Illinois State Journal Company, State Printer, 1912): 3-4, 49-53; *Third Report of the Illinois Highway Commission for the Years 1908-1909* (Springfield, IL: Illinois State Journal Co., 1911): 113.

⁸ *First Annual Report*, 56, 57.



Original Late 19th century, bowstring truss, Heepke bridge, Madison County, IL.



Newly built 1907, reinforced concrete, through girder, Heepke bridge, Madison County, IL.

Figure 2: The State of Illinois tried hard to replace older, late nineteenth century bridges with its newly designed, concrete structures, of which the Heepke bridge is an example (*Second Annual Report of the Illinois Highway Commission for the Year 1907* [Springfield, IL: State of Illinois, 1908]: 90A).

was eliminated, as was the fabricator's chance to overbuild structures or to erect an inappropriate structure-type for a given site. All of this impacted costs, an example of which is found in Henry County. It was observed in 1906 that the county anticipated the construction of four bridges at a total cost of \$30,000, a number based on experience gained through previous projects. To the county's surprise, after working with the Highway Commission, their project actually came in at a price of \$16,896!⁹

In addition to developing bridge plans, the Highway Commission built in 1907 at the Southern Illinois Penitentiary a bridge prototype for testing which occurred over the next three-and-one-half years. A reinforced concrete through girder bridge plan was selected for the test predicated on the belief it might be a popular short-span bridge-type for use around the state (see Figure 1, page 4). It accommodated the passing below of high water since there were no obstructions under the deck, which made it compatible for use in areas with generally flat terrain that otherwise limited headroom under a bridge as was the case in most of Illinois. The test structure was 40'-0" long and 18'-0" wide. The depth of its parapets (side railings) was 5'-6" while its deck was a reinforced concrete slab 12½" thick. The parapets were also the girders that reached from abutment-to-abutment and to which the floor was tied. Thus did the girders support both the structure's dead (weight of the bridge only) and live (weight of the bridge and the traffic on it at any given time) loads. During tests the bridge successfully carried for four days a load nine to thirteen times greater than it would ever have to carry with traffic. At one point, the structure accommodated for more than a year a load of 418 tons, or 1450 pounds per square foot. Testing results were positive and permitted the conclusion that "...bridges of concrete increase in strength and stiffness with a lapse of time and are all the better structures for having been exposed to the weather for several years." This was in contrast to bridges of steel that required as soon as the structure was built regular maintenance and care in order to avoid rust and deterioration.¹⁰

Concrete Bridges (in general) and Reinforced Concrete Through Girder Bridges (in particular):

Despite the Highway Commission's testing of the concrete bridge prototype between 1907 and 1910, three types of concrete bridges were actively built in Illinois by about 1910: slab, through girder and deck girder. In the case of slab structures, they were very short spans (typically eighteen feet long or less) in which the deck was tied to, and thus transferred its load to, the abutments directly. The deck carried its own weight (including

⁹ Ibid., 58.

¹⁰ *Proceedings of the Sixteenth Annual Meeting*, Volume XIII (Philadelphia, PA: American Society for Testing Materials, 1913): 884-885, 922.

that of the railings) as well as that of the traffic on it (dead and live loads, respectively). France claimed in 1893 the first concrete through girder bridge. A recognized bridge-type in the United States by the turn of the twentieth century, these structures varied in length between eighteen and sixty feet. As noted previously, with girders tied to the abutment tops and the deck tied to the girder bottoms (in contrast to slab bridges with the deck tied directly to the abutments), these fabrications accommodated the passage of water well since they had no obstacles below deck (see Figure 2, page 6). Deck girder bridges typically carried their loads on two girders placed below deck that then conveyed the load to the abutments. The operational success of this latter bridge-type required clearance between high water and the below deck girders above, without which the girders might impede water flow. Ultimately this bridge-type became the preferred statewide option (see Figure 3, page 9).¹¹

Concrete through girder bridges apparently met immediate expectations, a fact that led other states to adopt the bridge-type in the first thirty years of the twentieth century including Maryland, Pennsylvania and North Carolina, for example. The advantage it offered was the clearance provided by its flat bottom. But it was soon apparent that the flat bottom was a problematical advantage. A key matter was that concrete through girder bridges, with their massive railings and monolithic construction that tied the deck directly to them, could not easily be widened. And that was a disadvantage as lane-width grew nationwide between the mid-1910s and the late 1940s from 8 feet to 11 feet, thus permitting wider loads than the width-limited bridges could accommodate.¹²

There were also the matters of economy. George A. Hool, a University of Wisconsin Associate Professor of Structural Engineering, noted in a 1916 publication that deck girder bridges were more economical to construct than through girder structures, except for those instances where headroom matters “or other local conditions” made them unavoidable. Hool continued to make that argument in a 1928 second edition of his book.

¹¹ A good introduction to concrete bridges is found in David Plowden’s, *Bridges: The Spans of North America* (New York: Viking Press, 1974), 297-300; Parsons Brinckerhoff & Engineering and Industrial Heritage, *A Context for Common Historic Bridge Types* (Washington, D.C.: Transportation Research Board, 2005): 3/93; *Fourth Annual Report of the Illinois State Highway Commission for the Years 1910, 1911, 1912* (Springfield, IL: State of Illinois, 1913): 303-304, 324-325, 327-329; *Second Annual Report*, 86-87; *Third Report*, 113, 115, 119.

¹² Robert M. Frame III, “Reinforced-Concrete Highway Bridges in Minnesota,” National Register of Historic Places Multiple Property Documentation Form, Reference #64500291 (Washington, D.C.: U.S. Department of the Interior, National Park Service, 1989): Section E, Page 10; North Carolina DOT, “Reinforced Concrete Through Girder Bridges,” Viewed online at <https://www.ncdot.gov/initiatives-policies/Transportation/bridges/historic-bridges/bridge-types/Pages/reinforced-girder.aspx> on 31 January 2024; Pennsylvania Historic Preservation, “Pennsylvania’s Reinforced Concrete Thru Girder Bridges”, Viewed online at <https://pahistoricpreservation.com/pennsylvanias-reinforced-concrete-thru-girder-bridges/> on 31 January 2024; Parsons Brinckerhoff, *Context for Bridge Types*: 3/93. The statement about lane-width growth is based on an extensive study of Route 66 in Illinois completed for IDOT in the mid-1990s by historian John N. Vogel and archaeologist David Keene.

Similarly did S.B. McCoullough, in his 1929 book *Economics of Highway Bridge Types*, suggest that clearance was the only justification for a through girder bridge as opposed to a deck girder structure. He went on to observe that raising the grade for a deck girder bridge was likely still more economical than building a through girder structure. Concrete through girder bridges, with their problematical fixed widths, generally lost through the 1930s whatever attraction they had. They were largely forsaken by 1939.¹³

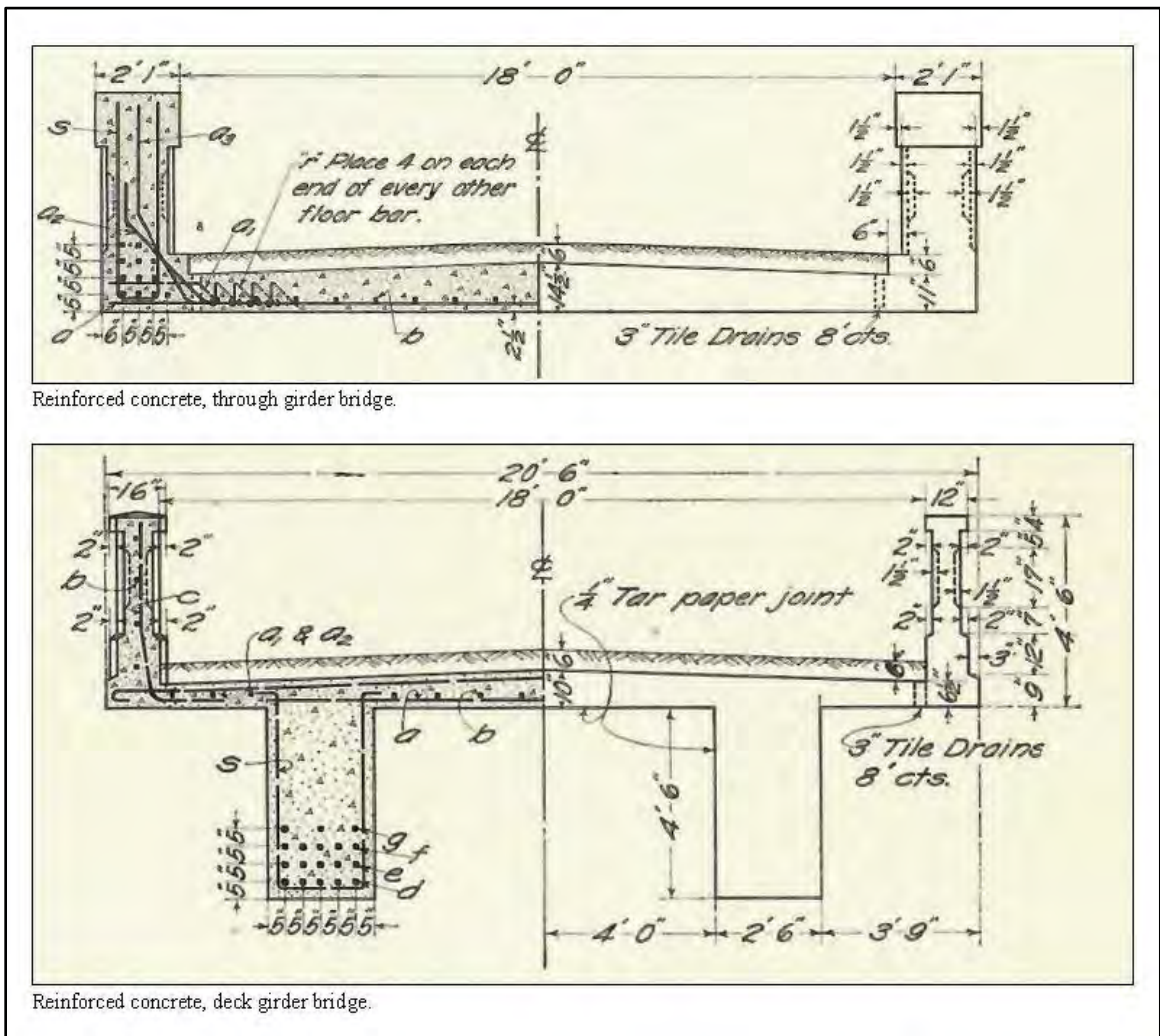


Figure 3: This illustration offers a direct comparison between the through girder bridge with its weight bearing railings versus the deck girder bridge with its below deck girders (*Fourth Report of the Illinois Highway Commission for the Years 1910, 1911, 1912* [Springfield, IL: Illinois State Journal Co., 1913]: 302, 304).

¹³ George A. Hool, *Reinforced Concrete Construction: Volume III, Bridges and Culverts* (New York, NY: McGraw-Hill Book Company, 1916 [First Edition]): 390; George A. Hool, *Reinforced Concrete Construction: Volume III, Bridges and Culverts* (New York, NY: McGraw-Hill Book Company, 1928 [Second edition]): 414; C.B. McCullough, *Economics of Highway Bridge Types* (Chicago, IL: Gillette Publishing Company, 1929): 54, 57; Frame, "Reinforced-Concrete Highway Bridges," E-10.

Carroll County, Lima and Rock Creek Townships¹⁴, and the Communities of Lanark and Milledgeville:

Carroll County, in the northwest corner of the state, was established in 1839 when it was separated from Jo Daviess County, itself organized in 1827. Within a year the county claimed 1,203 residents, 282 of which were farmers. The county grew rapidly, the number of residents having almost quadrupled by 1850 when population reached 4,596, of which 198 lived in Lima Township. Growth continued and residents totaled 11,733 in 1864. Fifty-six years later, in 1920, Carroll County's population had reached 19,345, a number that declined to 18,433 in 1930 when Lima Township claimed 248 residents and Rock Creek Township, immediately to the west, had 634. While occupants in the county dropped further in 1940, it rebounded to 18,924 in 1950, a time when Lima Township had 284 occupants and Rock Creek Township claimed 641.¹⁵

The county was comprised of 453 square miles, or 289,920 acres, 94% of which in 1910 was devoted to farming. The county was well suited to agriculture. Land was rolling and largely covered by tracts of prairie and timber, though more of the former than the latter. It was well watered by creeks, including the Elkhorn, Rush, Otter and Plum, all of which flowed east to west and terminated at the Mississippi River. Soil was noted in 1858 as "productive", on which was grown in 1860 corn yielding 1,630,150 bushels and wheat bearing 636,444 bushels. Livestock then included 8,954 swine, 10,076 head of cattle, 3,905 horses, and 923 sheep. Farming was a well-established industry by the 1860s.¹⁶

¹⁴ Note that while the subject bridge is located in Lima Township, it is only a few hundred feet east of Rock Creek Township, through which Middle Creek flows before entering Lima Township. Given this proximity, it was deemed appropriate to include Rock Creek Township in this contextual discussion.

¹⁵ Newton Bateman, et. al., eds., *Historical Encyclopedia of Illinois and History of Carroll County*, Volume II (Chicago, IL: Munsell Publishing Company, 1913): 628, 695; *Compendium of the Enumeration of the Inhabitants and Statistics of the United States as Obtained at the Department of State, from the Returns of the Sixth Census* (Washington, D.C.: Department of State, 1841): 84-87 [viewed online at <https://agcensus.library.cornell.edu> on 12 March 2024]; *The Seventh Census of the United States: 1850* (Washington, D.C.: J.D.B. DeBow, Superintendent of the United States Census, 1853): 704 [viewed online at <https://agcensus.library.cornell.edu> on 12 March 2024]; *Illinois State Gazetteer and Business Directory for the Years 1864-5* (Chicago, IL: J.C.W. Baily, pub., 1864) 58; Douglas C. Ridgley, *The Geography of Illinois* (Chicago, IL: University of Chicago Press, 1921): 348; *1930 Census: Volume 3 – Population, Reports by States, Part I*: 600 [viewed online at <https://www.census.gov/library/publications/1932/dec/1930a-vol-03-population.html> on 12 March 2024]; *1950 Census of Population: Preliminary Counts* (Washington, D.C.: US Department of Commerce, Bureau of the Census, 11 September 1950) [viewed online at <https://www.census.gov/library/publications/1950/dec/pc-01.html> on 12 March 2024]; U.S. Federal Census, Population (1930, 1950), viewed online at <http://www.ancestry.com> on 12 March 2024. Note that the population totals offered for each township in 1930 and 1950 were compiled by counting the entries in the census records for each of those years.

¹⁶ Ridgley, *Geography of Illinois*: 14; *Thirteenth Census of the United States Taken in the Year 1910: Volume VI, Agriculture* (Washington, D.C.: Department of Commerce, Bureau of the Census, 1913): 427 [viewed online at <https://agcensus.library.cornell.edu> on 12 March 2024]; George W. Hawes, comp., *Illinois State Gazetteer and Business Directory for the 1858 and 1859* (Chicago, IL: George W. Hawes, Pub., 1858): 30; *Illinois State Gazetteer, 1864-5*: 58.

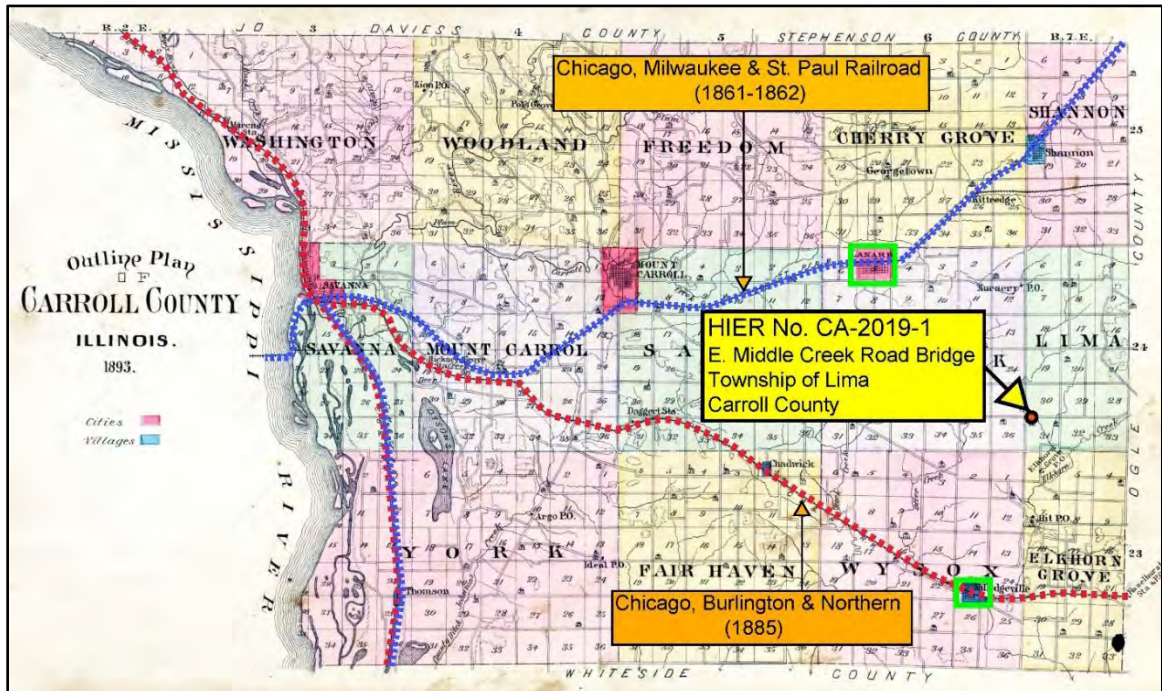


Figure 4: Illustrated on this 1893 map are the two, primary railroad lines framing the area that included the Middle Creek bridge and its surrounding vicinity, as well as the north/south railroad lines on the far west side of the county to which the subject lines connected. The two closest communities to the bridge, Lanark (to the north) and Mill-edgeville (to the south), are framed in green. Do know that other rail lines in the county then existed, or were built later. But they are not relevant to the story of the Middle Creek bridge (*Plat Book of Carroll County, Illinois* [no city: D.W. Ensign & Co., 1893]: 16).

Given its early agricultural growth, continued increases in Carroll County farming were not surprising. By 1880, farms accounted for 271,464 of the county's acreage, 230,858 acres of which were improved while 40,606 were not. There were then 1,785 farms, the average size being 152 acres, the vast majority of which were between fifty and 500 acres though some were smaller and a few much larger. Horses, milk cows, cattle, sheep and swine were prominent among animals then in the county. Twenty years later, in 1900, Carroll County had 1,852 farms, their average size being 149.3 acres. The county hosted 1,697 farms on 267,918 acres in 1930 with an average size per farm of 157.87 acres. More specifically did Lima Township then claim fifty-six farms on 9,485 acres for an average size of 169.37 acres per farm while Rock Creek Township had 172 farms on 23,149 acres, an average size of 134.59 acres per farm.¹⁷

¹⁷ United States Census Office, *Report of the Productions of Agriculture as Returned at the Tenth Census* (Washington, D.C., Government Printing Office, 1883): Statistics of Agriculture, 44, 111, 149 [viewed online at <https://agcensus.library.cornell.edu> on 13 March 2024]; William R. Merriam, Director, *Twelfth Census of the United States Taken in the Year 1900: Agriculture, Part I, Farm, Live Stock and Animal Products* (Washington, D.C.: United States Census Office, 1902): 72 [viewed online at <https://agcensus.library.cornell.edu> on 13 March 2024]; *Fifteenth Census of the United States: 1930-Agriculture Volume I, Farm Acreage and Farm Values* (Washington, D.C.: Bureau of the Census Library, 1931): 145 [viewed online at <https://>

Farmers needed support communities from which supplies could be acquired and to which crops grown could be taken for export. Acquiring supplies meant having nearby towns that offered general stores, blacksmiths, lumber and hardware dealers, grocers, harnessmakers and grain dealers, in addition to various specialty merchants. Delivering crops for export meant the availability of a railroad for hauling those crops to market. Built in 1861-1862 and known as the Western Union Railroad by 1866, and later as the Chicago, Milwaukee and St. Paul Railroad, that first line entered Carroll County at its northeast corner and extended west southwest to Shannon, Lanark, Mount Carroll and on to Savanna on the Mississippi River. Similarly did the Chicago, Burlington & Northern Railroad enter in 1885 the southeast corner of the county, thereafter extending west to Milledgeville then northwest to Chadwick, Mount Carroll and Savanna. Lanark, on the 1861-1862 line, was about eight-and-one-half miles northwest of the Middle Creek bridge farming vicinity while Milledgeville was about six-and-one-half miles south southwest of it (see Figure 4, page 11).¹⁸

Lanark was founded in 1861 as the railroad arrived. It grew rapidly and had approximately 500 residents in 1864, along with twenty stores, seven warehouses, two hotels, churches and schools. Set within “first-class agricultural country,” the city of Lanark was incorporated in 1876. Two years later it had a population of 1,200 and shipped large amounts of livestock and grain. The city’s number of inhabitants had further grown to 1,700 by 1888, a time at which it had a wide variety of general and specialty merchants and still shipped significant quantities of grain and livestock. Additionally did the city then have three newspapers and industry that included a manufacturer of grain separators and a producer of fruit vinegar. Population declined shortly after the turn of the twentieth century. It dropped to 1,175 in 1910. As late as 1969, when the city’s population was 1,473, it was observed that “farm housewives trade here, farm children attend high school in town, and a canning factory buys the farmer’s vegetables.” Agricultural support was clearly the economic driver in Lanark. And things were little different in Milledgeville, except that its founding predated the arrival of the railroad by about twenty years. Indeed, in its early years, the community was supplied by the railroad at Lanark, about twelve-and-one-half miles to the north. An advantage the siting of Milledgeville had, however, was its location on Elkhorn Creek and the waterpower it offered. Barthell Harmon took advantage of that feature which he used to power his flour and sawmill. Milledgeville had in 1864 a population of about 300 that included four carpenters, three blacksmiths, two masons, three physicians, two hotels and one general store. The number of local residents appears to have varied little over the next twenty-

agcensus.library.cornell.edu on 12 March 2024].

¹⁸ E. George Thiem, ed., *Carroll County – A Goodly Heritage* (Mt. Carroll, IL: Kable Printing Company, 1968): 72, 196.

five years, there being still 300 community inhabitants in 1878. Joining the flour mill was an iron foundry. Consistent with Lanark is the fact that grain and livestock were important exports. Milledgeville was incorporated in 1887, its number of residents having grown to 446 in 1888 and to 630 in 1910. The town had 1,208 residents in 1969 when farming and raising livestock were still prominent economic drivers, as was a Kraft Foods facility and a fertilizer producer.¹⁹

Middle River Road and Middle River Road Bridge History:

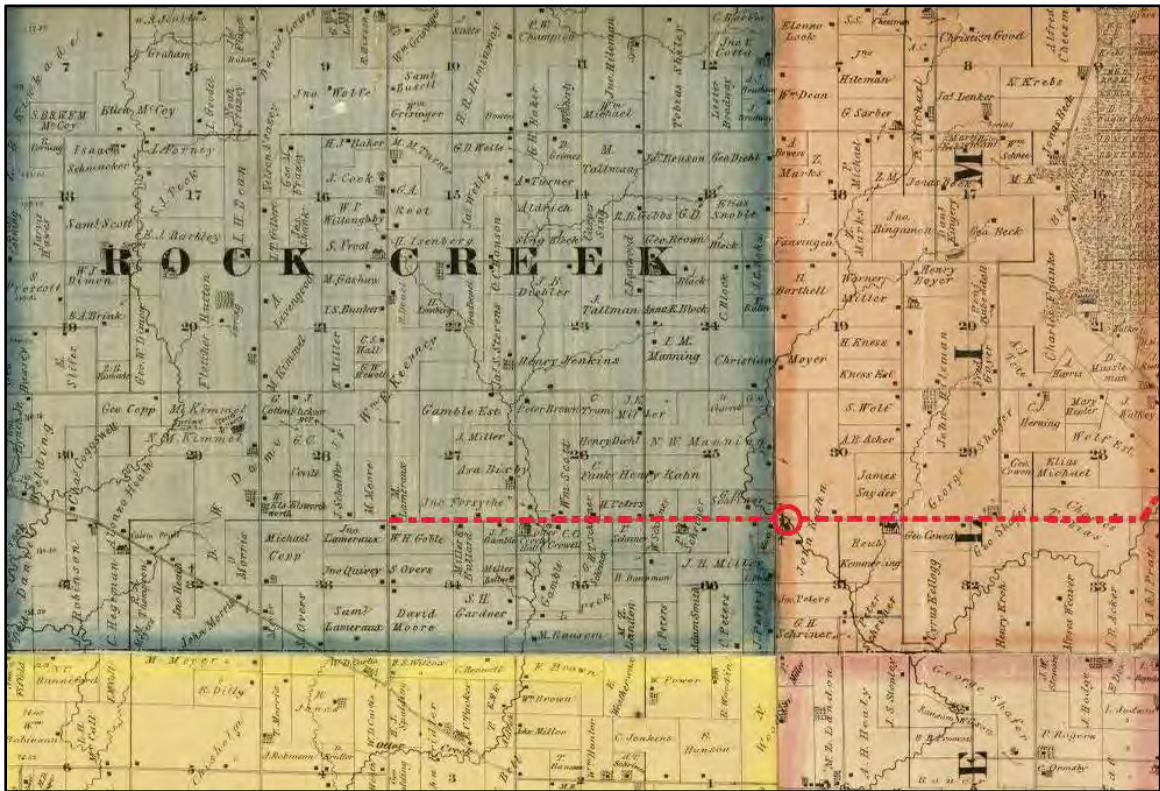


Figure 5: This map clearly demonstrates that a predecessor of today’s E. Middle Creek Road, as well as a bridge over the creek (the red circle), existed in 1869. The road then ended (and does today) three miles into Rock Creek Township (*Map of Carroll County, Illinois* [Geneva, IL: Thompson & Everts, 1869]: map).

It is apparent that Lanark and Milledgeville were significant transportation points in the southeastern and central eastern parts of Carroll County, in between which was Middle Creek and its surrounding farmland. This is to suggest that the bridge over the creek was a vital part of the local transportation network that enabled area farmers to reach the

¹⁹ *Illinois State Gazetteer, 1864-5*: 428, 459; *Illinois State Gazetteer and Business Directory, 1878*, Volume I (Chicago, IL: R.L. Polk & Co., 1878): 735-736, 807; *Illinois State Gazetteer and Business Directory, 1888* (Chicago, IL: R.L. Polk & Co., 1888): 945-946; Bateman, ed., *Encyclopedia of Illinois and History of Carroll County*, 699, *Illinois: Guide & Gazetteer* (Chicago, IL: Rand McNally & Company, 1969): 335, 368.

nearby communities of Lanark and Milledgeville. The eastern half of the county was notable for its north/south and east/west roads, one of the latter of which extended as early as 1869 along the baseline of the Town of Lima's sections 28, 29 and 30, as well as the base line of the Town of Rock Creek's sections 25, 26 and 27, at which point the road ended. It is unknown of what the road was made, if anything other than dirt. That road crossed Middle Creek which means that at least one bridge – perhaps two – preceded the subject 1925 structure at its current location (see Figure 5, page 13). Once the new reinforced concrete, through girder bridge was constructed in 1925, the structure carried in 1937 zero to twenty-five cars a day, the road at either end of the bridge being gravel or stone adhered with an adhesive. In 1947 the bridge and its connecting roadways carried twenty-five to forty-nine vehicles per day. In both years the roadway on the north/south section line immediately to the west (a matter of about a couple of hundred feet) carried State Aid Route 19 which, at its intersection with Middle Creek Road, turned west for a mile before turning and continuing south. The 1925 bridge, with its fixed width, served almost 100 years before being replaced in the first years of the 2020 decade.²⁰

The bridge was constructed by contractor Ole H. Kleven, a Norwegian who immigrated to the United States in 1904 as a twenty-three year old with his wife, Anna. The Klevens initially settled in the city of Eau Claire, Wisconsin, thereafter moving in 1908 to the village of Elk Mound, Dunn County, immediately to the west. Ole was identified in the 1910 census as a mason. While Dunn County appears to have been the family's recurrent and final home, Kleven spent considerable time in northwest Illinois. He was identified on his World War I draft registration card in 1918 as a stone mason, then contracting in the city of Lanark, Carroll County, though the 1920 census placed him back in Dunn County, as did the 1930 census when his occupation was noted as a bridge contractor. Ten years later, however, in 1940, the Klevens were recognized as residents of Carroll County, a fact confirmed by Ole's World War II draft registration card. Indeed, they must have moved to Illinois sometime in the first half of the 1930s as Kleven was described as a resident of the city of Mount Carroll in a newspaper article about a street improvement project he received in 1935. That same year Kleven was awarded a culvert project in Washington Township and a small bridge project in Wysox Township. That notwithstanding, he appears to have been in Carroll County throughout the 1920s on a recurring basis, a fact consistent with his building the Middle Creek Bridge in 1925.

²⁰ *Map of Carroll County, Illinois* (Geneva, IL: Thompson & Everts, Map Publisher, 1869): map; *Plat Book of Carroll County, Illinois* (no city: D.W. Ensign & Co., 1893): 16; *Standard Atlas of Carroll County, Illinois* (Chicago, IL: Geo. A. Ogle & Co., 1908): 37, 39; *Traffic Map Carroll County Illinois* (Springfield, IL: Department of Public Works & Buildings, Division of Highways, 1937): map; *Traffic Map Carroll County Illinois* (Springfield, IL: Department of Public Works & Buildings, Division of Highways, 1947): map. Note that IDOT's Carroll County bridge contract files, located in Record Group 242.28 at the State Archives in Springfield, were reviewed for information about the Middle Creek Road bridge project. No bridge-specific material was found in the file.

Kleven seems to have worked in the Carroll County vicinity through the second War, returning to Elk Mound likely in the late 1940s. He died in nearby Chippewa Falls in 1973 at the age of 92.²¹

PART II: ARCHITECTURAL INFORMATION

A. General Statement:

1. Architectural Character:

The Middle Creek Road Bridge was constructed in 1925. It is a 43'-0" long, 21'-2" wide, reinforced concrete, through-girder structure that carries the road over Middle Creek.

2. Condition of Fabric:

The historical integrity of the structure is good and appears to have been most affected by the periodic addition of tar and gravel paving that elevated over time the roadway across the bridge. Deteriorating concrete is also apparent as is exposed and rusting rebar in various places.

B. Description:²²

The E. Middle Creek Road Bridge is a single-span fabrication with a post-and-beam structural form. The abutments (posts) are of reinforced concrete, as are the bridge deck and its railings (beams). The bridge is 43'-0" long and skewed. The north railing projects 16'-0" farther west than the south railing, while that to the south projects 16'-0" farther east than the north railing (thus is the bridge essentially a parallelogram). It is also 21'-2" wide, outer-edge-of-railing-to-outer-edge-of-railing. The traffic deck is 18'-3" wide. Wingwalls extend to the northeast, southeast and southwest are generally 10'-2", 15'-6" and 10'-7" long, respectively. The length of that to the northwest was undetermined due to fill and plant-related cover obscuring it. The projecting angles of the wingwalls are not consistent and vary due to placement and deterioration. That to the northeast

²¹ U.S. Federal Census – Population (1910, 1920, 1930, 1940), accessed at www.ancestry.com on 11 June 2020; Ole Kleven, U.S., World War I Draft Registration Cards, 1917-1918, accessed at www.ancestry.com on 11 June 2020; Ole Kleven, U.S., World War II Draft Registration Cards, 1942, accessed at www.ancestry.com on 11 June 2020; "Carroll Man Gets Contract," *Freeport Journal-Standard* (Freeport, IL), 03 June 1935, 2; "New School Head to Assume Duties at Mt. Carroll," *Freeport Journal-Standard* (Freeport, IL), 31 July 1935, 2; "Ole H. Kleven," *Leader-Telegram* (Eau Claire, WI), 20 August 1973, 5.

²² The measurements used to describe this bridge were taken from the structure itself during field investigations. Activities were limited to components that could be reached from the deck, slopes around and ground beneath the deck without aid of ladders, boats or other equipment.

extends from the bridge at an approximate angle of 109°, while the angle of that to the southeast is 163°, that to the southwest is 120°, and that to the northwest is 156°. All four wingwalls are 12' thick.

The elevation of the bridge's traffic deck increases as the structure is crossed east to west. On the bridge's east end, the distance between the roadway and the top of the railing's top chord is 34½" while on the west end it is only 27½". Thus does the angle of the roadway increase by about 1½° as it passes over the structure east to west.

The built-up nature of the roadway obscures the lower half of the inside of the bridge railings which are load bearing and consist of concrete featuring four inset panels facing the road. Each panel is about 8'-0" long and framed by 2" recessed, canted corners. The panels are 15" apart. Three such, but 11'-4" long, inset panels are located on the railings' exterior sides. The railing is anchored on each end of the bridge by an 18" long, 17" wide, concrete endpost. Capping the railing and its endposts is a 17" high, 20" wide top chord. The depth of the railing, from the bottom of the deck to the top of the top chord is 64".

There are no decorative elements on the structure, though the bridge plate remains and identifies it as the Middle Creek Bridge with a construction date of 1925 (see Photo 23 of 26).

PART III: SOURCES OF INFORMATION

A. Primary and Unpublished Sources:

1930 Census: Volume 3 – Population, Reports by States, Part 1. Viewed online at <https://www.census.gov/library/publications/1932/dec/1930a-vol-03-population.html> on 12 March 2024.

1950 Census of Population: Preliminary Counts. Washington, D.C.: US Department of Commerce, Bureau of the Census, 11 September 1950. Viewed online at <https://www.census.gov/library/publications/1950/dec/pc-01.html> on 12 March 2024.

“Carroll Man Gets Contract.” *Freeport Journal-Standard* (Freeport, IL), 03 June 1935.

Compendium of the Enumeration of the Inhabitants and Statistics of the United States as Obtained at the Department of State, from the Returns of the Sixth Census. Washington, D.C.: Department of State, 1841. Viewed online at <https://agcensus.library.cornell.edu> on 12 March 2024.

Fifth Report of the Illinois State Highway Department for the Years 1913, 1914, 1915, 1916. Springfield, IL: Illinois State Journal Co., State Printer, 1917.

Fifteenth Census of the United States: 1930-Agriculture Volume 1, Farm Acreage and Farm Values. Washington, D.C.: Bureau of the Census Library, 1931. Viewed online at <https://agcensus.library.cornell.edu> on 12 March 2024.

First Annual Report of the Illinois Highway Commission for the Year 1906. Springfield, IL: State of Illinois, 1907.

Fourth Annual Report of the Illinois State Highway Commission for the Years 1910, 1911, 1912. Springfield, IL: State of Illinois, 1913.

“Good Roads Bill Passed by House.” *Chicago Daily Tribune*, 6 June 1913.

Hawes, George W., comp. *Illinois State Gazetteer and Business Directory for 1858 and 1859.* Chicago, IL: George W. Hawes, Pub., 1858.

Illinois Department of Transportation Contract Files. Record Group 242.28. Illinois State Archives, Springfield, IL.

Illinois Historical Aerial Photography, 1937-1947. Image #BWP-1-104, 11 July 1939. Viewed at <http://clearinghouse.isgs.illinois.edu/data/imagery/1937-1947-illinois-historical-aerial-photography> on 10 June 2020.

Illinois State Gazetteer and Business Directory, 1878, Volume 1. Chicago, IL: R.L. Polk & Co., 1878.

Illinois State Gazetteer and Business Directory, 1888. Chicago, IL: R.L. Polk & Co., 1888.

Illinois State Gazetteer and Business Directory for the Years 1864-5. Chicago, IL: J.C.W. Baily, pub., 1864.

Illinois State Highway Commission. *Modern Bridges for Illinois Highways.* Springfield, IL: Illinois State Journal Company, State Printer, 1912.

Kleven, Ole. U.S., World War I Draft Registration Cards, 1918. Viewed online at www.ancestry.com on 11 June 2020.

Kleven, Ole. U.S., World War II Draft Registration Cards, 1942. Viewed online at www.ancestry.com on 11 June 2020.

Map of Carroll County, Illinois. Geneva, IL: Thompson & Everts, 1869.

Merriam, William R., Director. *Twelfth Census of the United States Taken in the Year 1900 Agriculture, Part 1, Farm, Live Stock and Animal Products.* Washington, D.C.: United States Census Office, 1902. Viewed online at <https://agcensus.library.cornell.edu> on 13 March 2024.

“New School Head to Assume Duties at Mt. Carroll.” *Freeport Journal-Standard* (Freeport, IL), 31 July 1935.

“Ole H. Kleven” (Obituary). *Leader-Telegram* (Eau Claire, WI), 20 August 1973.

Plat Book of Carroll County, Illinois. No City: D.W. Ensign & Co., 1893.

Proceedings of the Sixteenth Annual Meeting, Volume XIII. Philadelphia, PA: American Society for Testing Materials, 1913.

Second Annual Report of the Illinois Highway Commission for the Year 1907. Springfield, IL: State of Illinois, 1908.

Standard Atlas of Carroll County, Illinois. Chicago, IL: Geo. A. Ogle & Co., 1908.

The Seventh Census of the United States: 1850. Washington, D.C.: J.D.B. DeBow, Superintendent of the United States Census, 1853. Viewed online at <https://agcensus.library.cornell.edu> on 12 March 2024.

Third Report of the Illinois Highway Commission for the Years 1908-1909. Springfield, IL: State of Illinois, 1911.

Thirteenth Census of the United States Taken in the Year 1910: Volume VI, Agriculture. Washington, D.C.: Department of Commerce, Bureau of the Census, 1913. Viewed online at <https://agcensus.library.cornell.edu> on 12 March 2024.

Traffic Map Carroll County Illinois. Springfield, IL: Department of Public Works & Buildings, 1937.

Traffic Map Carroll County Illinois. Springfield, IL: Department of Public Works & Buildings, 1947.

U.S. Federal Census – Population (1910, 1920, 1930, 1940, 1950). Viewed online at <http://www.ancestry.com> on 10 June 2020.

United States Census Office. *Report of the Productions of Agriculture as Returned at the Tenth Census*. Washington, D.C.: Government Printing Office, 1883. Viewed online at <https://agcensus.library.cornell.edu> on 13 March 2024.

C. Secondary and Published Sources

Bateman, Norman, et. al., eds. *Historical Encyclopedia of Illinois and History of Carroll County*, Volume II. Chicago, IL: Munsell Publishing Company, 1913.

Garrard, Russell M. “Early Bridges in Central Illinois.” In *Heritage of Mid-Illinois Engineering*. Springfield, IL: Capital City Chapter of the Illinois Society of Professional Engineers, circa 1976.

Frame, Robert M., III. “Reinforced-Concrete Highway Bridges in Minnesota.” National Register of Historic Places Multiple Property Documentation Form, Reference #64500291. Washington, D.C.: U.S. Department of the Interior, National Park Service, 1989.

Hool, George A. *Reinforced Concrete Construction: Volume III, Bridges and Culverts*. New York, NY: McGraw-Hill Book Company, 1916 (First Edition).

_____. *Reinforced Concrete Construction: Volume III, Bridges and Culverts*. New York, NY: McGraw-Hill Book Company, 1928 (Second Edition).

Illinois: Guide & Gazetteer. Chicago, IL: Rand McNally & Company, 1969.

McCullough, C.B. *Economics of Highway Bridge Types*. Chicago, IL: Gillette Publishing Company, 1929

North Carolina Department of Transportation. “Reinforced Concrete Through Girder Bridges.: Viewed online at <https://www.ncdot.gov/initiatives-policies/Transportation/bridges/historic-bridges/bridge-types/Pages/reinforced-girder.aspx> on 31 January 2024.

Parsons Brinckerhoff & Engineering and Industrial Heritage. *A Context for Common Historic Bridge Types*. Washington, D.C.: Transportation Research Board, 2005.

- Pennsylvania Historic Preservation. “Pennsylvania’s Reinforced Concrete Thru Girder Bridges.” Viewed online at <https://pahistoricpreservation.com/pennsylvanias-reinforced-concrete-thru-girder-bridges/> on 31 January 2024.
- Plowden, David. *Bridges: The Spans of North America*. New York: Viking Press, 1974.
- Quaife, Milo M. *Chicago’s Highways Old and New*. Chicago: D.F. Keller & Co., 1923.
- Ridgley, Douglas C. *The Geography of Illinois*. Chicago, IL: University of Chicago Press, 1921.
- Schureman, Leslie R. “Beauty in Short-Span Highway Bridges.” *Civil Engineering*, 8 (May 1938): 318-319.
- Sculle, Keith A. and John A. Jakle. “From Terre Haute to Vandalia, Illinois.” In *A Guide to the National Road*, ed., Karl Raitz. Baltimore, MD: The Johns Hopkins University Press, 1996: 256-308.
- Smith, Sr., Walter M. and Walter M. Smith, Jr. “Concrete Bridges: Some Important Features in Their Design.” *Transactions of the American Society of Civil Engineers* 77 (December 1914): 695-744.
- Thiem, E. George, ed. *Carroll County – A Goodly Heritage*. Mt. Carroll, IL: Kable Printing Company, 1968.
- U.S. Geological Survey. *Forreston Quadrangle* [map], 1945. 1:62500, 15 Minute Series. Reston, VA: United States Department of the Interior, USGS, 1945.
- U.S. Geological Survey. *Brookville Quadrangle* [map], 1983. 1:24000, 7.5 Minute Series. Reston, VA: United States Department of the Interior, USGS, 1983.
- Voss, Walter V. “How New Materials Increased Man’s Building Ability.” In *Centennial Transactions*. New York: American Society of Civil Engineers, 1953: 823-835.

PART IV: METHODOLOGY OF RESEARCH

A. Research Strategy

Research objectives were to place the bridge in its geographic, historic and engineering contexts. A strategy was developed to accomplish those goals that investigated local,

regional and statewide documentary sources, as well as general works on the history of bridges. On-site observation and investigation of the bridge were also parts of the research plan.

B. Research Process

1. Visited bridge to review conditions, photograph, and measure it.
2. Searched sources for data relating to the development of Carroll County and the Middle Creek Road bridge in the University of Illinois Library (Urbana, IL), Illinois State Library, and Illinois State Archives. Digital sources consulted include the Hathi-Trust Digital Library, and newspapers.com.
3. Completed research and prepared report draft.
4. Document draft internally reviewed.
5. Document draft reviewed by IDOT and SHPO.
6. Completed all revisions and submitted to IDOT.

C. Archives and Repositories Used/Consulted:

•Libraries

University of Illinois Library
1408 W. Gregory Drive
Urbana, Illinois 61801
(Illinois State Gazetteers)

Illinois State Archives
Norton Building
State Capitol Complex
Springfield, Illinois 62756
(IDOT Record Group 242, Local Government Records Index and Maps)

Illinois State Library
300 S. 2nd Street
Springfield, Illinois 62701-1796
(Plat Map & Illinois Transportation Map Collections)

Wisconsin Historical Society
816 State Street
Madison, Wisconsin 53706
(Carroll County History Books)

•On-Line Sources:

HathiTrust Digital Library
(Carroll County & Local History Books, Engineering Journals and Other Resources)

Library of Congress
(Historic-period County Plat Maps)

historicmapworks.com
(Historic-period County Plat Maps)

D. Research Staff

1. Researcher/Preparer/Initial Editor:

John N. Vogel, Ph.D.
Illinois State Archaeological Survey
Prairie Research Institute
University of Illinois
23 Stadium Drive
Champaign, Illinois 61820
jnunnv16@illinois.edu

2. Photographer:

John N. Vogel, Ph.D.
Illinois State Archaeological Survey
Prairie Research Institute
University of Illinois
23 Stadium Drive
Champaign, Illinois 61820
jnunnv16@illinois.edu

3. Supplemental Research in Urbana:

Michael E. Smith, M.A.

Senior Architectural Archaeologist
Illinois State Archaeological Survey
Prairie Research Institute
University of Illinois
23 Stadium Drive
Champaign, Illinois 61820
mesmith4@illinois.edu

4. Editor:

Emilie Land, M.A.
Architectural Historian
Cultural Resource Unit
Bureau of Design & Environment
Illinois Department of Transportation
2300 S. Dirksen parkway
Springfield, Illinois 62764
emilie.land@illinois.gov

PART V: PROJECT INFORMATION

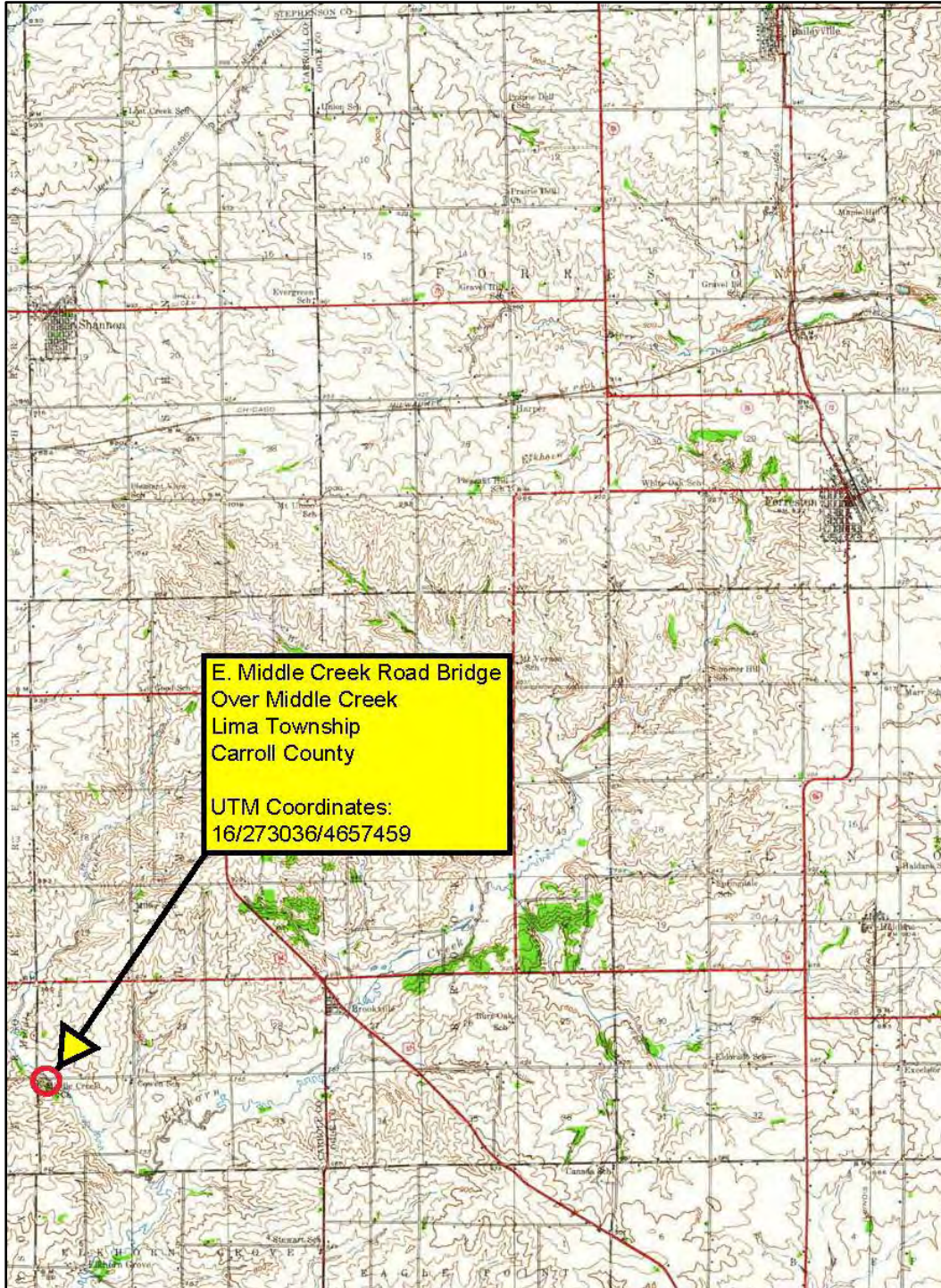
This HIER archival documentation is submitted in compliance with a stipulation of a Memorandum of Agreement (MOA) between the Federal Highway Administration, Illinois Division, and the Illinois State Preservation Officer, with final signature on 16 May 2019. The MOA was executed in compliance with CFR 36 800.6(b)(1)(iv) of the National Historic Preservation Act of 1966, as amended.

1941 Aerial Photographic Image Identifying Bridge Location:



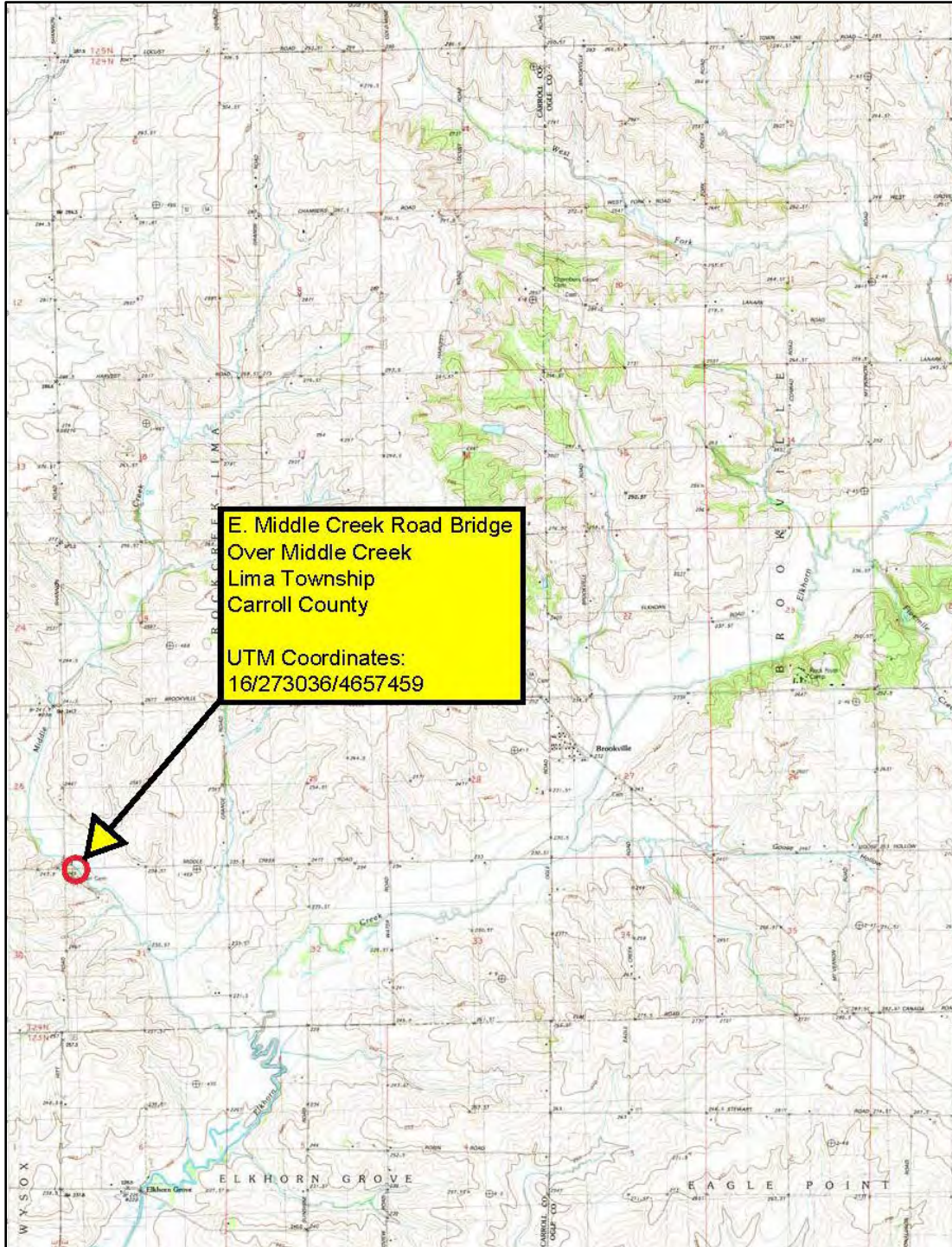
The agricultural nature of the Lima and Rock Creek township area is unmistakable. (Note that the red circle identifies the location of the subject bridge.) Illinois Historical Aerial Photography: 1937-1947, Image BWP-1-104, 11 July 1939, Viewed at <http://maps.isgs.illinois.edu/ilhap/> on 10 June 2020.

USGS Map (1945) Identifying Bridge Location:



U.S. Geological Survey, *Forreston Quadrangle* [map], 1945, 1:62500, 15 Minute Series (Reston, VA: United States Department of the Interior, USGS, 1945).

USGS Map (1983) Identifying Bridge Location:



U.S. Geological Survey, *Brookville Quadrangle* [map], 1983, 1:24000, 7.5 Minute Series (Reston, VA: United States Department of the Interior, USGS, 1983).

HISTORIC ILLINOIS ENGINEERING RECORD

INDEX TO PHOTOGRAPHS

E. Middle Creek Road Bridge
Over Middle Creek
(S.N. 008-3907/Sequence No. 21962)
Township of Lima
Carroll County
Illinois

HIER No. CA-2019-1

Documentation: 26 Exterior Photographs (2020)
24 Data Pages
01 15 Minute USGS Map (1945)
01 7.5 Minute USGS Map (1983)

John N. Vogel, Ph.D., Associate Degree - Professional Photography, Photographer

HIER No. CA-2019-1.1	DISTANT VIEW TO EAST.
HIER No. CA-2019-1.2	VIEW TO EAST.
HIER No. CA-2019-1.3	VIEW TO EAST NORTHEAST.
HIER No. CA-2019-1.4	VIEW TO NORTHEAST.
HIER No. CA-2019-1.5	VIEW TO NORTH.
HIER No. CA-2019-1.6	DISTANT VIEW TO NORTH.
HIER No. CA-2019-1.7	VIEW TO NORTH.
HIER No. CA-2019-1.8	VIEW TO NORTH.
HIER No. CA-2019-1.9	VIEW TO NORTHWEST.
HIER No. CA-2019-1.10	VIEW TO WEST NORTHWEST.
HIER No. CA-2019-1.11	VIEW TO WEST NORTHWEST.
HIER No. CA-2019-1.12	VIEW TO WEST.

PHOTOGRAPHS

HIER No. CA-2019-1.13	VIEW TO WEST SOUTHWEST.
HIER No. CA-2019-1.14	VIEW TO SOUTHWEST.
HIER No. CA-2019-1.15	VIEW TO SOUTH.
HIER No. CA-2019-1.16	VIEW TO SOUTHEAST.
HIER No. CA-2019-1.17	VIEW TO EAST SOUTHEAST.
HIER No. CA-2019-1.18	VIEW TO WEST SOUTHWEST. OUTER SIDE OF NORTH RAILING AND WEST ABUTMENT.
HIER No. CA-2019-1.19	VIEW TO NORTHEAST. NORTHSIDE RAILING.
HIER No. CA-2019-1.20	VIEW TO NORTHWEST. NORTHSIDE RAILING.
HIER No. CA-2019-1.21	VIEW TO EAST NORTHEAST. OUTERSIDE OF SOUTH RAILING.
HIER No. CA-2019-1.22	VIEW TO WEST NORTHWEST. OUTERSIDE OF SOUTH RAILING.
HIER No. CA-2019-1.23	VIEW TO NORTH. BRIDGE PLATE.
HIER No. CA-2019-1.24	VIEW TO EAST. BRIDGE DECK.
HIER No. CA-2019-1.25	VIEW TO NORTHWEST. UPSTREAM FROM BRIDGE.
HIER No. CA-2019-1.26	VIEW TO SOUTHEAST. DOWNSTREAM FROM BRIDGE.

PHOTOGRAPHS



Photo #1 of 26



Photo #2 of 26

PHOTOGRAPHS



Photo #3 of 26



Photo #4 of 26

PHOTOGRAPHS



Photo #5 of 26



Photo #6 of 26

PHOTOGRAPHS



Photo #7 of 26



Photo #8 of 26

PHOTOGRAPHS



Photo #9 of 26



Photo #10 of 26

PHOTOGRAPHS



Photo #11 of 26



Photo #12 of 26

PHOTOGRAPHS



Photo #13 of 26



Photo #14 of 26

PHOTOGRAPHS



Photo #15 of 26



Photo #16 of 26

PHOTOGRAPHS



Photo #17 of 26



Figure #18 of 26

PHOTOGRAPHS



Figure #19 of 26



Figure #20 of 26

PHOTOGRAPHS



Figure #21 of 26



Figure #22 of 26

PHOTOGRAPHS

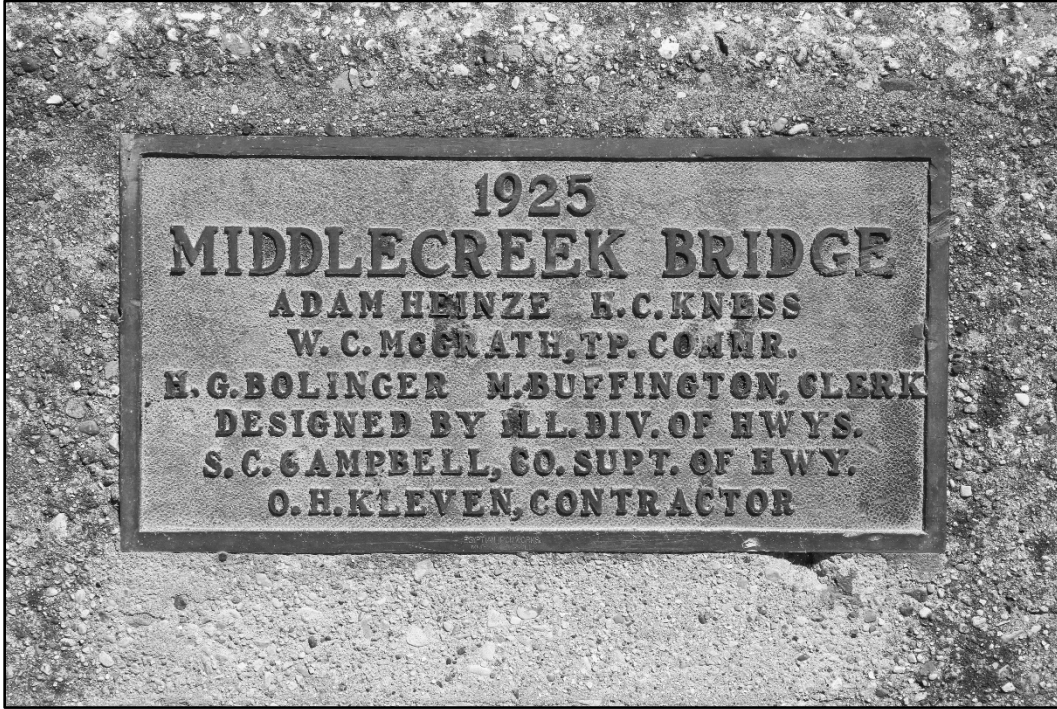


Figure #23 of 26



Figure #24 of 26

PHOTOGRAPHS



Figure #25 of 26



Figure #26 of 26