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Historic Bridge Bulletin

From the Director's Desk

Dear Friends of Historic Bridges,

As we prepared the July issue of the *Historic Bridge Bulletin*, summer became official and thoughts of vacation are close at hand. As you travel, enjoy the many historic sites and bridges that tell the story of our nation. Tourism dollars help sustain communities and help fund projects that preserve our heritage. Please make an effort to visit some of the magnificent historic bridges scattered across the U.S. and take the time to photograph these engineering landmarks. Share your photos and stories with the Historic Bridge Foundation—we are always looking for great photographs and stories for the website and the newsletter. Happy Travels!

Kitty Henderson

Executive Director

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Withington Ford (Bend Road) Bridge near Pacific, Franklin County, Missouri, a 1916 pin-connected Pennsylvania through truss bridge built by Miller and Borcherding of St. Louis, Missouri. *Photo by Nathan Holth.*

Ohio DOT Cultural Resources Historic Bridge Riveting Guidance

By Thomas P. Barrett

In order to retain integrity of design, materials, workmanship, and original construction methods on National Register bridge projects, replacing the original rivets in kind may be preferable for historic accuracy. The *Ohio Department of Transportation Historic Bridge Riveting Guidance*, approved by the State Historic Preservation Office and made available online on December 2, 2014, can be used when planning and bidding on the restoration of riveted iron and early steel historic bridges.

The document is a historic bridge planning tool and supplemental to ODOT's *Ohio Historic Maintenance & Preservation Guidance* (TranSystems June 2010). The intent of the *Historic Bridge Riveting Guidance* is to assist in planning, design, and contract bidding processes for federalized historic bridge rehabilitation projects with riveted construction elements. The information will be useful when in-kind replacement of rivets is recommended on select members, components and details, or throughout the entire structure.

Currently, rivets are being reinstalled at the end connections of the 1872 Lisbon Bowstring Arch pony truss. The Massillon Bridge Co. bridge had been in storage for 50 years and is now getting a new life as a pedestrian bridge at the Columbiana County Fairgrounds, crossing the Middle Fork of Beaver Creek. *Photo courtesy of ODOT Historic Bridge Database Files.*

In 1996, rivets were reinstalled throughout the entire structure in the restoration of the Zoarville Station Bridge, a Fink through truss, located at Camp Tuscazoar in Tuscarawas County. *Photo courtesy of ODOT Historic Bridge Database Files.*

The *Historic Bridge Riveting Guidance* conforms to the department's ongoing initiatives defined in the *Section 106 Programmatic Agreement*, under *System Preservation and Environmental Stewardship*; and recommendations outlined in ODOT's individual Historic Bridge Management Plans.

The guidance was developed from a compilation of plan notes from projects in Ohio, Michigan, and Pennsylvania. A consortium of bridge engineers provided technical language and input. It was reviewed and approved by: the Federal Highway Administration, Ohio Division; the ODOT's Office of Environmental Services, and Office of Structural Engineering; the State Historic Preservation Office; the Ohio Historic Bridge Association; and HistoricBridges.org.

The comments and encouragement that ODOT received from bridge engineers, the Ohio Historic Bridge Association, FHWA, and restoration metal workers, prove that this guidance will enhance Ohio's efforts to help preserve of this important aspect of bridge construction heritage.

Tom Barrett is a cultural resource specialist with the Ohio Department of Transportation. He serves as the Historic Bridge Program Manager and State Byways Coordinator in the Office of Environmental Services. Tom can be reached at tom.barrett@dot.state.oh.us if you have any comments regarding the riveting guidance or other aspects of the Historic Bridge Program, such as ODOT's Reusable Bridges website.

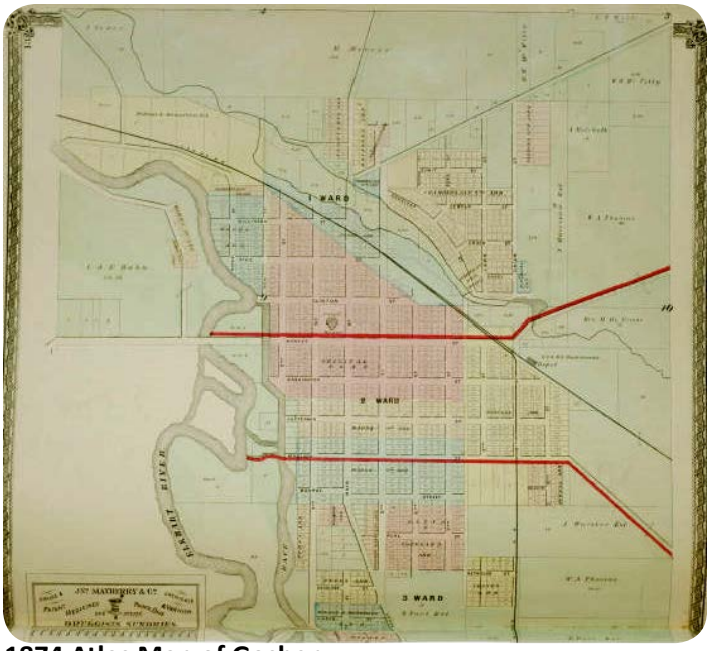
Murray Bridge:
An Orphaned Span Adopted in Goshen, Indiana

By James L. Cooper, narrator with the assistance of Earlene Nofziger and Dale Garber of the Goshen Historical Society

In 2009, the City of Goshen hired the Troyer Group of Mishawaka to design the repair of the extant pedestrian bridge over the Mill Race Hydraulic Canal at the end of Murray Street. Maryo Pasarel of Troyer contacted the narrator, among others, for advice on historically-sensitive applications within the city's budget. Neither the city nor its consulting engineers apparently knew when the bridge was erected over the canal, who commissioned construction, or quite how the city became responsible for the structure. The narrator and local history detectives began the sleuthing on which the following interim report is based.

The Mill Race Hydraulic Canal and its Early Crossings

Having defeated the efforts of the southern confederacy to secede from the union, the industrial barons of the northern states focused their burgeoning production on the wide and deep civilian markets of a reunited nation. In 1866, eight Goshen entrepreneurs invested $100,000 for the construction of about two miles of hydraulic canal adjacent to the east side of the Elkhart River. By 1874, the canal



1874 Atlas Map of Goshen.

powered four mills – two flouring, a faxseed oil mill, and a sawmill – plus a pair of wood manufacturers, a door, sash & blind factory, and two furniture manufacturers with a combined total annual product of at least $1,000,000. Even then, less than half the water power available was being used.[1]

No economic development comes without consequent disruptions: Progress has its costs. Digging and watering a canal to the east of the Elkhart River along much of the western edge of Goshen added a second watercourse obstruction to east-west transportation into and out of town. Since township and county governments were responsible for most of the local public roadways in Indiana, the hydraulic canal burdened government budgets by adding some new bridges to its roadways on the western side of Goshen. The 1874 atlas map of Goshen shows three

The Jefferson Street Bridge. *Photo by James L. Cooper.*

public roadway crossings of the canal: Market Street, Madison Street, and Plymouth Avenue.[2]

For those living, farming, or manufacturing between the river and the canal who also lacked easy access to one of these public roadway crossings, the location was isolating enough to spur the construction of a number of private timber-beam bridges across the canal. In 1905, the Hawke Brothers, who were major promoters and users of the canal for their flour mill and furniture manufacturing, pushed the envelope for private bridges. They replaced the timber bridge they had built earlier to connect their factory on the west bank with Jefferson Street on the east with heavy-duty, stone-arch spans.[3]

Murray Timber-Beam Bridge

About a mile south of the Hawke Brothers operations, F. & L. Murray owned and worked a 15-acre farm between the canal and the river. Extended family members also lived on the east side of the canal along what was appropriately called Murray Street. In 1901, the Murrays negotiated the construction of a canal crossing here.

According to the contractual terms agreed to by the Murrays, Benjamin F. Daehl (the mayor of Goshen), and the Hawks Electric Company (owner/manager of the canal), Frank Murray, donated $75 "towards the construction of the bridge" on the understanding that "the city would forever keep the bridge in repair."[5]

Since inexpensive, uncovered timber bridges were standard for local Hoosier roadway crossings across Indiana, the mayor should have known the nature of the commitment he made for the city. Uncovered, untreated, timber does typically rot within one to two decades. Replacement of a rotted or broken board here and there is a frequent, periodic, and necessary maintenance activity. Rotting of the timber-pile foundation typically led to replacement of the whole structure. In 1924, Frank Murray approached the Goshen Board of Public Works about the deteriorated condition of the Murray Street canal crossing. "The Murray Bridge is unsafe having been badly damaged by ice and current and," the *Goshen News-Times* reporter noted, "is said to be badly in need of repair."

At first, the city authorities denied responsibility for the Murray Bridge. But after Frank Murray produced a copy of the 1901 contract, the Board of Public Works ordered Charles L. Kinney, the City Engineer, to inspect the bridge and to recommend what action to take. Apparently Engineer Kinney recommended replacement rather than repair of the bridge, for when Frank Murray was back before the Board in November, he "asked for action by the street [city] in *replacing* the bridge over the hydraulic canal" [emphasis added]. The Board referred Murray to the City Council.[6] In early December, City Councilman Leroy I. Baker reported that the contract Murray had referenced earlier had been located in the city's files. The Council then instructed the city engineer "to prepare an estimate of the cost of a new bridge."[7]

The scanning of Goshen newspapers for information on the Murray Bridge has not yet extended beyond 1925 to uncover the terms of its replacement. Some useful contextual information has, however, been gleaned. In mid-1925, for example, the Elkhart County Surveyor did reportedly condemn "an old wooden bridge [which was] probably the last of its kind in the county."[8] It had apparently become unfashionable to replace a county or – by extension – a city bridge in timber. Indeed, James Murray, grandson of Frank Murray, recalls that the metal-truss Murray Bridge was in place when the onset of

Historical photos showing the Murray Farm and the Murray Timber-Beam Bridge. [4]

the Great Depression in 1929 prompted his family to move from Elkhart back to the farm in Goshen.[9]

The Identity of the Extant Murray Bridge

The notation of "State Road 25" painted within a bordering outline of the state on the west end-post may also seem contradictory when taken together with the 1909 nameplate, since, first, there were no state roads until 1917-1919, and, second, there is no State Route [S.R.] #25 within Elkhart County today. *Right photo by Nathan Holth, left photo by James Cooper.*

Although information on the City of Goshen's contracting for the pinned Pratt pony-truss span has yet to be located, we are, fortunately, not altogether dependent on the written record to help us identify the mysterious stranger off Murray Street. The structure itself provides – at first glance – seemingly contradictory evidence of its paternity appended to the end-posts. The nameplate – now gone but shown on the east end in a 1998 inspection photograph – revealed that the Elkhart Bridge & Iron Company fabricated and erected this superstructure in 1909. But the erection couldn't have been over the canal just off Murray Street then, since a timber-beam structure provided the crossing at that date.

When the kaleidoscope is turned and the context shifted, the apparent signs supplement rather than contradict one another and point to a pony-truss span orphaned from its original home. The date on the nameplate suggests that the superstructure had to have been erected on a county road, and the stenciled route number tells us (a) the county road was later incorporated into the state highway system and (b), later still, the pony-truss span was moved to its current location. Scanning early state highway maps identifies a State Route #25 starting at the Ohio State line and heading westward through Angola, LaGrange, Elkhart, and South Bend. S.R. #25 had been elevated to U.S. #20 by 1927.[10]

On Becoming an Air Line

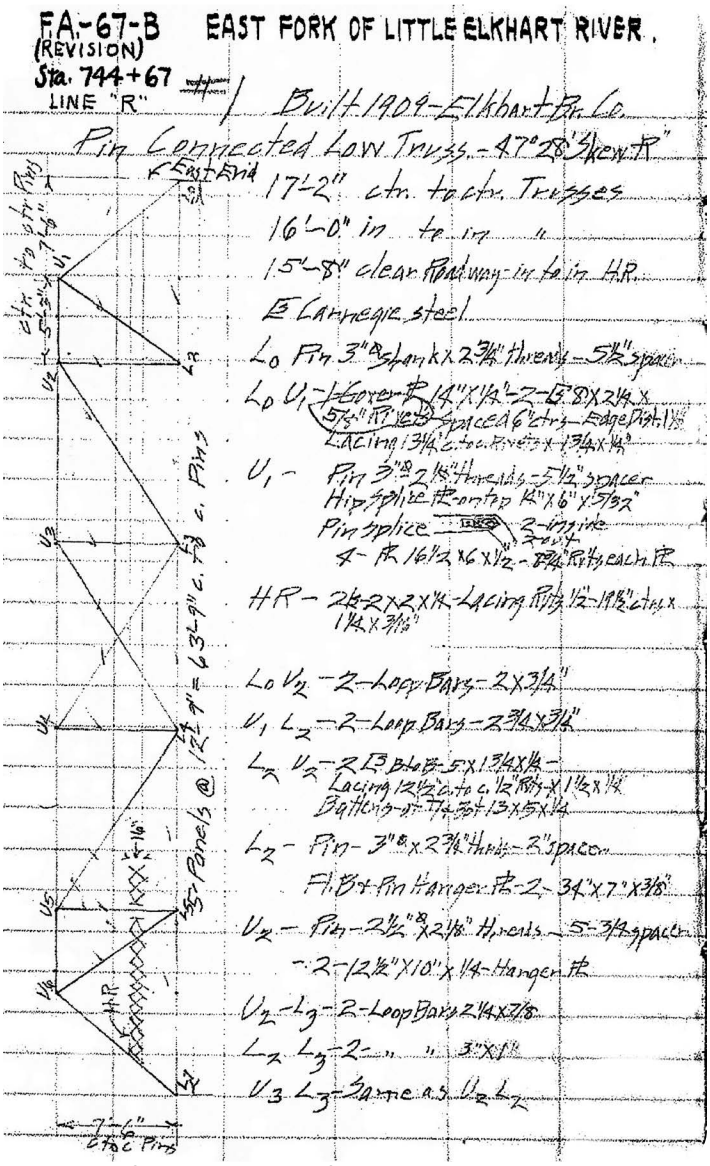
Indiana state highways were by and large formed from segments of county roadways. The state typically undertook careful and detailed surveys of these county road segments and their structures, including bridges. Deeply committed to designing their own roads and bridges, engineers within the federal-state highway alliance systematically removed the considerable diversity of structures that the counties had constructed largely to bridge company plans on a case-by-case basis.

S.R. #25 occupied an especially high priority. It was marked early for automobility, *i.e.*, refurbished with straight, wide, and concrete-paved surfaces and bridges to safely accommodate fast-moving, heavy, motorized vehicles. "Motorists can now [by the fall of 1925] travel from Elkhart to LaGrange on concrete pavement" except for a detour in Middlebury around an incomplete overhead rail crossing. When soon completed, S.R. #25 will be "an air line between Chicago and Toledo – the official route of the United States government for military purposes."[11] Old county bridges on this route would be very high on the state's list of priority replacements.

Scanning the state highway survey books for S.R. #25 produced a quick and persuasive identification of the likely original home of the soon to be adopted Murray Bridge. In October 1924, a state road survey party documented a bridge over the East Fork of the Little Elkhart River in Middlebury township close to the LaGrange County line and recommended its replacement:[12]

In addition to the state surveyor's report that the bridge was built by the Elkhart Bridge & Iron Company in 1909 – likely from a nameplate – the span-length and all the truss member sizes of the sentenced structure match those of the Murray Bridge. The trusses did sit 16-feet apart and were on a very considerable skew over the Little Elkhart, while the Murray Bridge deck is 12-feet wide and the trusses

are set square. Relocation to Goshen would have required some alteration in the floor-beams and lateral bracing. Even then, original materials could have been adjusted and reused.



A sketch of the East Fork of the Little Elkhart River Bridge in an October 1924 S.R. #25 state road survey.

In late March 1925, the state highway commission announced a letting for the replacement of the Little Elkhart River's East Fork bridge on S.R. #25. The new pony-truss span of state design would be slightly shorter, a little less skewed, and – with a 20-foot deck – considerably wider. At the end of April letting, the Elkhart Bridge & Iron Company secured a combination contract for this and two other bridges. The state allowed $8,805.70 for the new Little Elkhart bridge. Construction was successfully completed by December 1925.[13]

The Elkhart Bridge & Iron Company took ownership of the superstructure it had designed and fabricated for the county in 1909. As the state surveyors had noted, the superstructure was in good condition. Not surprisingly, Elkhart Bridge dismantled and carried off the discarded superstructure to its shop yard about 15 miles away. The company would not have to wait long before it could sell the quite serviceable used superstructure for a profit to the City of Goshen.

The Murray Bridge. *Photo by James Cooper.*

Back to the Beginning...at the End

In March 1909, the Elkhart County Board of Commissioners had, indeed, received and approved a petition for the construction of a bridge over the Little Elkhart River at D. D. Miller's on a road "now being opened" in Middlebury township. In April, the Board ordered plans and specifications for nine new bridges and three repairs and set the letting for May. Specifications for the Little Elkhart structure at Miller's called for a span of 65 feet and a deck width of 16 feet. The Elkhart Bridge & Iron Company brought in the lowest and therefore 'the best' bid at $1,700.[14]

And so the paternity of the extant Murray Bridge is now essentially established, although the terms of its adoption remain to be documented.

Notes

1. "History of the City of Goshen," Higgins, Belden & Company, *Illustrated Historical Atlas of Elkhart Co., Indiana* (1874), 52; Sue Simerman, "Goshen Hydraulic Canal and River Preserve Park," Canal Society of Indiana, *Newsletter* (December 1998), 2-5.

2. Higgins, Belden & Company, *Illustrated Historical Atlas of Elkhart Co., Indiana* (1874), 12-13.

3. See the *Goshen Daily News-Times*, 26, 29 July 1904; *Goshen Daily Democrat*, 29 July 1904.

4. Photos courtesy of Jerry Lapp, Red Bridge Bed & Breakfast, 212 Murray St., Goshen and Marilyn (Murray) Kehr, 18 Fairfield Park, Goshen; scanning by Earlene Nofziger.

5. "Find City Bound to Make Bridge Repair," *Goshen Daily News-Times*, 1 August 1924.

6. "North Fifth Street Accepted by Board," *Goshen Daily News-Times*, 20 November 1924: p1c2.

7. "Council Will Fix Salaries of Employe[e]s," *Goshen Daily News-Times*, 2 December 1924: p1c1.

8. "County Board Requested to Build Bridge," *Goshen Daily Democrat*, 24 July 1925: p1c2.

9. Conversation of Earlene Nofziger with James Murray of 19745 Old Port Cove, Bristol, Indiana, as reported in an email message to the narrator.

10. Indiana State Highway Commission, *State Highway System of Indiana* maps (1924, 1927).

11. "Paving Contractors End Work for Season," *Goshen Daily News-Times*, 9 October 1925.

12. Indiana State Highway Commission, survey logs (Records Department, INDOT, Indianapolis), Bridge Book (1924), #127: 1-15

13. Indiana State Highway Commission, "Notice to Bridge Contractors" (30 March 1925), "Tabulation of Awards" (24 April 1925): Contract 2-25, Division of Construction, Bridge Department; "Bridge Contract Log," SR #20H, Structure FA 67-B-1-A.

14. Elkhart County, 'Commissioners Record," 20: 241, 250, 252-254.

James L. Cooper, professor emeritus of history at DePauw University, is a bridge historian who specializes in the history of Indiana's bridges. He is the author of several books about historic bridges, and has been a consultant for the Indiana Division of Historic Preservation and Archaeology, Historic Landmarks Foundation of Indiana, and past board president for the Historic Bridge Foundation. To request a complete, unabridged copy of the report or to discuss contents, please email jlcooper@ccrtc.com.

Historic Bridges:
Qualifying for the National Register of Historic Places

By Mario Sanchez, PhD

Historic bridges are important resources in the history of our communities. Often overlooked, historic bridges may qualify for listing in the National Register of Historic Places (NRHP). The register is the official list of recognized historic properties in the U.S. It is maintained by the National Park Service, the federal agency for historic preservation, on behalf of the Secretary of the Interior. A nomination to the NRHP can be completed by an individual who is experienced in historical research, and who can write a convincing narrative of a property's significance. In order to be listed in the National Register, a bridge, must meet the following requirements:

1. It must be 50 years of age or older
2. It must have significance
3. It must retain a sufficient level of integrity

I. Determining Age:

The date of construction for a bridge is a key piece of information in your research. In many bridges a "bridge plate," or plaque, commemorating its construction will be found on the structure itself. Dates can often be located in the meeting minutes or annual reports of the government entity that

This bridge plaque in Michigan provides a researcher with a variety of information. *Photo by Nathan Holth.*

originally built the bridge, such as a township board, county commissioners, public works department, or state highway department. An index for these records can assist in searching for information on a specific bridge. In addition, a Clerk's Office will often contain older maps of the county. An online Google search may also reveal available historic maps, such as Sanborn Fire Insurance Maps, sometimes available for free viewing online as well. A series of dated maps will help you establish a general date for the construction of a bridge.

Newspapers are another source of information to determine date of construction. Bridge dedications were often covered in local newspapers. Long-time local residents, or retired county officials, may also provide insight into the history of the bridge.

Google Books: books.google.com/advanced_book_search?hl=en has digitized some annual reports, and some newspapers have been digitized by Google: news.google.com/newspapers?hl=en and the Library of Congress: chroniclingamerica.loc.gov.

The 50-year requirement is a general estimate of the time needed to develop historical research and analysis to conduct an appropriate evaluation of a property. It should be noted that the register allows under certain criteria (Criteria Consideration G) for the listing of a property that achieved significance in less than 50 years if it is determined to be of exceptional importance.

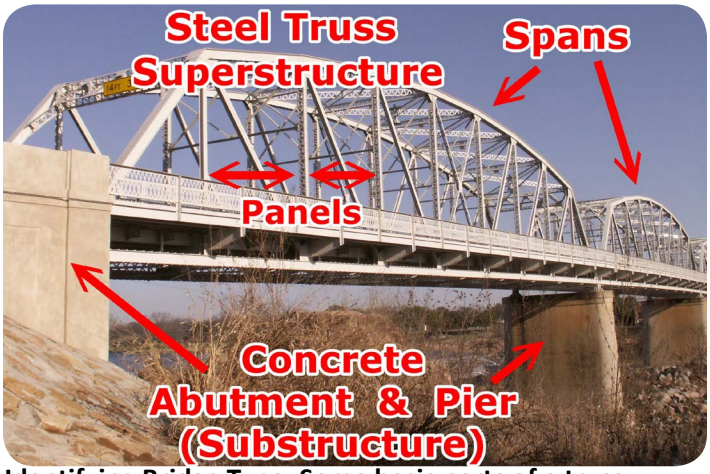
II. Determining Historic Significance:

In order to determine the significance of a bridge, it is essential to understand why the structure was built and its original purpose. It is also important to determine how a bridge fits within the overall history of a community or region, and why it was built at a particular time. The following questions should be researched to establish significance:

1. What specific roadway does the bridge currently serve? What was the roadway at the bridge's construction (i.e. farm-to-market, county road)?
2. What river or creek does it cross, and what is the physical setting in the vicinity of the structure?
3. Does the bridge provide access to a particular community or site (i.e. school or cemetery)? Compare this information with similar bridges in the area.
4. What was the cost of the bridge?
5. Who was the bridge engineer? Was the bridge designed by the builder of the bridge, designed in-house by a government agency, or was an outside engineering consultant hired?
6. What company constructed the bridge?
7. Is the bridge company or contractor important in the history of bridge construction at a local or at a statewide level? Did the company build any other bridges in the area, and how does this bridge compare with their other designs?
8. Was the bridge built by the state highway department? If so, was it part of a roadway system constructed with special funds provided by a federal road improvements project, such as the Works Progress Administration in the 1930s?
9. Was the bridge and road part of a boom development period in a county or city? Was it tied to a county bond issue?
10. Did the bridge connect a particular community to other areas of the county, and did this allow for the ensuing development of agriculture or settlement?
11. Is the bridge associated with a larger event, such as the development of the Rural Free Delivery Program of the US Post Office or a regional transportation network?
12. Was the bridge necessary for the establishment and development of the public school system or a later consolidation of numerous small rural schools?

13. Who were the officials (such as city council members, county/township commissioners, state highway department commissioners) who were in office at the time of funding? Did any of them make other significant contributions to the history of the county and city?

14. Was the bridge noted or discussed in engineering periodicals of the time, indicating a new or record-breaking development in bridge design and construction? Many periodicals are scanned and available for free online at Google Books, or the Internet Archive's Texts: archive.org/details/texts. Some of the more popular periodicals include the *Engineering News-Record*, *Journal of the Western Society of Engineers*, and the *Transactions of the American Society of Civil Engineers*.



Identifying Bridge Type: Some basic parts of a truss bridge in Llano, Texas. *Photo by Nathan Holth.*

a. Identifying Bridge Type --

Next, your research should establish the type of bridge construction, which technologically represents a particular period in time. To define type, the physical attributes of the bridge must be identified by answering the following:

1. What is the bridge's structural system? If a metal truss bridge, what type of truss is used? If concrete, what is the type of concrete construction? Is it a common, variation of a common, or a rare bridge type?

2. Was the bridge constructed from the "ground up" in its current location, or were stock building materials utilized that were shipped and assembled on site?

3. What is the length of the bridge? How many spans are contained within the bridge? If it is a truss bridge, how many panels are within each truss? (A panel is the area of a truss between two vertical members).

4. What is the substructure of the bridge? Is it supported by concrete or masonry piers?

5. Are there any important decorative or technological features?

b. Applying National Register Criteria --

Once you answer these questions and analyze the compiled research, you are ready to establish significance by applying one or more of the National Register criteria. The criteria serve as standards to evaluate properties nominated to the NRHP:

Criterion A: Association with events that have made a significant contribution to the broad patterns of our history.

Criterion B: Association with the lives of persons significant in our past.

Criterion C: Embodiment of the distinctive characteristics of a type, period, or method of construction, or that represents the work of a master or possesses high artistic values.

Criterion D: Its potential to yield information important in prehistory or history. (This area is generally used for archeological sites and is not generally used for bridges.)

c. Identifying Area and Level of Significance --

Under Criterion A, a common application of the National Register criteria will be in the area of "Transportation" based on the connection of the structure to the local development of roadways and railways. Transportation, however, is only one link to the much larger historic context of a community. A broader historical analysis may identify significance for a bridge under Criterion A in the areas of Community Planning and Development; Agriculture; Commerce; or Politics and Government.

For Criterion B, the identity of important individuals or designers associated with the construction of

the bridge must be documented, as indicated in the questions above.

Under Criterion C, a local bridge may be eligible to the National Register for its unique design and construction representing technological advances in bridge construction or design. It should be noted that the historic role of a local bridge in the overall history of design and engineering is difficult to document. It requires comparison with similar bridges in your area to prove the importance of your structure in the advancement of bridge design and construction.

Based on the area of significance and historic role you have established, determine whether the level of significance for your bridge is at the local, state or national level. Most historic bridges will qualify for the register at the local level.

III. Determining Integrity:

It is only after significance is established that you can address integrity. Historic integrity is the ability of a property to convey its significance in its current appearance. In order to determine if a bridge retains a sufficient level of integrity for listing in the NRHP, it is important to understand its physical features and how these features relate to its significance. A basic integrity test for a property is whether a contemporary of the time period would recognize it as it exists today.

The National Register of Historic Places utilizes "seven aspects of integrity" to evaluate whether a property is eligible to be listed in the register. A bridge must retain a majority of these seven aspects to qualify for listing:

1. Location: the place where the historic property was constructed. The actual location, combined with its setting, is important in giving a bridge its sense of place. Is the bridge in its original location, or has it been relocated?

2. Setting: the physical environment surrounding the bridge. It involves how a property is situated in the landscape and its relationship to the surrounding features, such as roads, rivers, and open space. Has the approach to the bridge been changed? Is the bridge still used to transport people or vehicles across a waterway? Is there new development encroaching on the immediate surroundings of the bridge? In an urban setting, have the roadways and circulation patterns changed? Is the bridge located in a designated scenic or historic area?

Design: A bolted, galvanized diagonal member (right) is a replacement that contrasts with the original vertical member (left) of this rivet-connected truss bridge. *Photo by Nathan Holth.*

3. Design: the combination of elements that create the form, plan, space, and structure of a property. With reference to a bridge, design applies to its particular technology and function, including the arrangement of the components.

Does the bridge still have the original features and elements that are characteristic of its particular type, including its structural connection system and configuration of members? Have any important supports or piers been replaced? Has the structural system been altered due to safety considerations? The structural system should continue to function as initially designed. For example, a truss that no longer functions to support a bridge has lost its integrity of design. Have the bridge approaches remained the same, or have they been widened? Are there changes to the bridge including new abutments, new decking, or new railings? The replacement of decking and rails is very common and may not be essential to the integrity of the overall design. Preferably, a distinctive rail design should still be present in the structure being nominated.

4. Materials: the actual elements used in the construction of a bridge. The choice of materials reveals the availability of particular types of materials and their technologies. Has the bridge retained its original materials? Are there any modern materials used to replace those made of wrought iron or steel? If it was constructed of concrete, to what extent

Materials: This stone-faced concrete arch bridge in South Bend, Indiana with extensive ornamentation was sensitively repaired. *Photo by Nathan Holth.*

has it been patched with other materials? Have some materials been insensitively and extensively replaced during repair and maintenance? Are the new materials compatible with those used in the original construction?

5. Workmanship: the physical evidence of the craftsmanship of a particular period. It can apply to the property as a whole (the overall aesthetics of a bridge type) or to its individual components. It can reflect either common traditions or innovative techniques. What was the method of construction? If a metal truss, was it pin-connected or riveted-and-bolted? Does the bridge have any ornamental detailing, such as decorative railing, a nameplate over the entrance, or decorative embellishment on any of the metal or concrete work?

6. Feeling: a property's expression of the aesthetic or historic sense of a particular period in time. Feeling is a very subjective judgment, but it can be determined by analyzing the presence of physical features that, taken together, convey the bridge's historic character.

7. Association: the direct link between an important historic event and a historic bridge. A property retains association if it is the place where the event or activity occurred. Is there still a roadway that crosses the bridge? Bridges with no roads leading to them will appear disconnected and out of place. Has the river or stream been diverted, or otherwise radically changed?

IV. Listing Properties in the National Register:

Once you have established that your bridge is significant and that it has integrity you are ready to compile a nomination form to the National Register. The National Park Service publishes bulletins for listing a property in the register, including *How to Complete the National Register Registration Form*, and *How to Apply the National Register Criteria for Evaluation*. These are available free of charge from the State Historic Preservation Office, or you may obtain them online at cr.nps.gov/nr/publications. As you undertake your research, it is also helpful to read National Register nominations for other bridges, particularly those that are of a similar type to your bridge. In Texas, for example, these nominations are available on-line in the "Texas Historic Sites Atlas" (atlas.thc.state.tx.us).

Guides for identifying different bridge types are available on the web, and in many books. The Historic Bridge Foundation website has a basic list of bridge types: historicbridgefoundation.com/construction-types.

Once completed, expect a thorough review of the nomination form by the staff and the State Board of Review of your State Historic Preservation Office. Revisions may be required on your part before final approval and submittal to the National Park Service for the official listing of the bridge in the National Register of Historic Places.

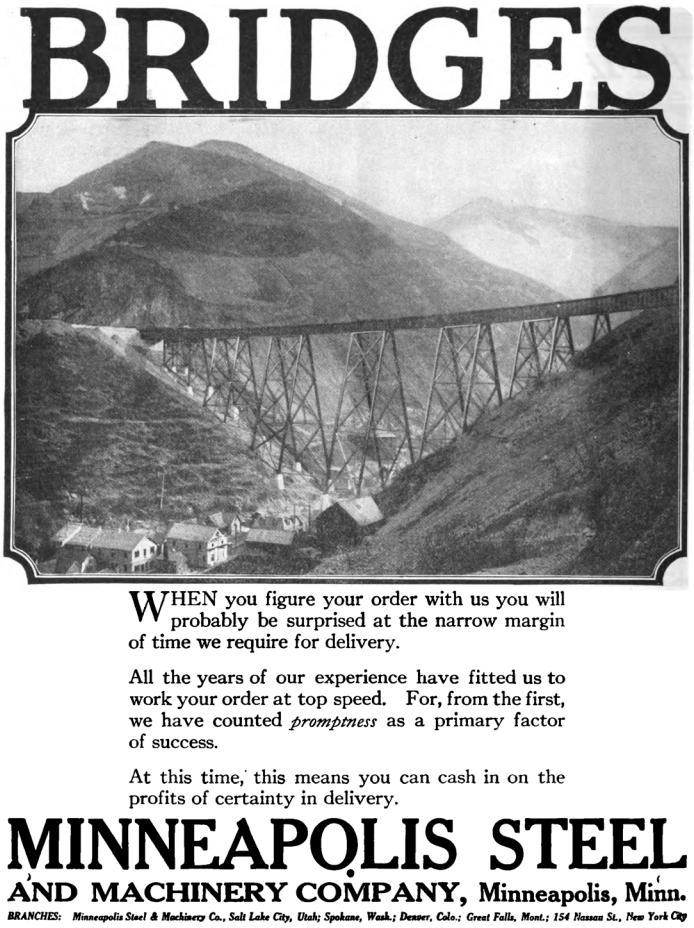
Mario L. Sanchez serves as historical architect and historian at the Environmental Affairs Division of the Texas Department of Transportation. This is a revised version of Dr. Sanchez's original article published in the Historic Bridge Foundation Newsletter in Summer 2006.

Focus Bridge:
Rockville Bridge, Utah

In the small town of Rockville, located in the scenic southwestern corner of Utah, stands a 220 foot, 11 panel single lane Parker Through Truss bridge. The bridge was constructed in 1924 for the National Park Service as a crossing for the Virgin River and as part of a regional road network to connect the newly created Zion National Park with Bryce Canyon National Park and Grand Canyon National Park.

The bridge's components were fabricated by the Minneapolis Steel & Machinery Company and assembled on site by the C.F. Dinsmore Company from Ogden, Utah. The bridge was erected at a cost of $42,000. As the name implies, the Minneapolis Steel and Machinery Company was a producer not only of structural steel for buildings and bridges, but also produced machinery. The company was a major manufacturer of Corliss steam engines, as well as equipment used in mining such as conveyors. The company had a number of branches nationwide, including one in Salt Lake City, Utah.

A ca. 1925 photo of the newly-built Rockville Bridge (top) and the Rockville Bridge today (bottom). *1925 Photo courtesy Town of Rockville and present-day photo by Joe Motter.*



Appearing in a 1920 issue of the *Salt Lake Mining Review* was this advertisement for the Minneapolis Steel and Machinery Company showcasing a railroad bridge fabricated by the company.

Visitors traveling to and from Zion Park in automobiles heavily used the bridge in its early years. In 1926, tour buses began daily service between the three National Parks and the railroad in Cedar City, Utah. This continued until 1930 when the Zion-Mt. Carmel tunnel was completed and automobile traffic had a shorter, all-weather route to Zion.

Today, the Rockville Bridge is used more than ever. Tourist visitation to Zion National Park is growing and even though the bridge is no loner used as a primary access to the park, people cross it daily to visit the ghost town of Grafton and Gooseberry Mesa – a popular mountain biking and camping destination. The bridge is also on a National Scenic Byway,

On the Rockville Bridge. *Photo by Joe Motter.*

connecting State Highways 9 and 59. The town of Rockville has grown to occupy both sides of the Virgin River and the bridge is the most practical way to cross the river.

The Rockville Bridge was listed on the National Register of Historic Places in 1995. The National Register Nomination Form states:

"*Constructed in 1924, the Rockville Bridge is architecturally and historically significant. The bridge incorporates distinctive characteristics in its method of construction and is the only surviving example of a rigid Parker through truss type bridge in the state of Utah. As such, it is one of the most technologically significant transportation spans in the state. In addition to its architectural significance, the Rockville Bridge is historically significant in the region. As the first direct link between Zion National Park and the North Rim of the Grand Canyon, the bridge was built in response to and then contributed to the development of tourism in the area. The Rockville Bridge retains its historic design, material, workmanship, setting, and association.*"

Overview of the Rockville Bridge. *Photo by Joe Motter.*

A brief review of metal truss highway bridges listed online and in the state Historic Bridge Inventory appears to confirm that the Rockville Bridge is indeed the only surviving Parker highway truss bridge in Utah. Moreover, the bridge appears to be one of only approximately nine highway through truss bridges of any kind remaining in Utah, with only six of those open to highway traffic.

A 1903 issue of Iron and Machinery World featured this photo of the structural shops of the Minneapolis Steel and Machinery Company, where the steel members of a bridge like the Rockville Bridge were fabricated. Built-up beams of the type used in the Rockville Bridge can be seen in the lower right corner of the photo.

Although the historic bridge is a focal point of the town, the Rockville Bridge has been taken for granted. Through the years, the bridge has seen minimal maintenance. At some point in time, the original wooden deck was replaced with asphalt over corrugated steel, and the roller bearings have been frozen in place for over twenty years. The bridge has never been repainted or carefully cleaned. In 2013 the Utah Department of Transportation downgraded the load limit on the bridge from 25 tons to 14 ton, and put the town on notice that something had to be done about the bridge. In recent discussions with

The plaque on the bridge credits the owner and builders of the bridge. Cast iron plaques like this were fabricated by arranging letters in a mold. For some reason, the fabricator of this plaque used a "zero" in place of "O" for the smaller letters on the plaque. *Photo by Steve Conro.*

UDOT, the Historic Bridge Foundation learned that the county has hired a national bridge firm to develop an engineering feasibility study and after completion of the study, the federal mandated Section 106 process will begin. The Historic Bridge Foundation plans to serve as a consulting party.

Local bridge enthusiasts are currently working on a variety of fundraising projects, including developing a flier that tells the story of the bridge, setting up donation jars in the nearby tourist town of Springdale, and soliciting large contributions. The town of Rockville has a website devoted to the bridge (rockvilleutah.org) and a Facebook page, Historic Rockville Bridge, has been created as well.

Thank you to Joe Motter for contributing information about the history and current status of this bridge.

Last light on Mt. Kinesava of Zion National Park, with the Rockville Bridge in the foreground. *Photo by Joe Motter.*

Upcoming Conferences

5th International Congress on Construction History
Location: Chicago IL
Date: July 3-7, 2015
Website: 5icch.org

Section 106 Essentials Training
Location: Various
Date: Various
Website: achp.gov/106essentials.html

Advanced Section 106 Seminar
Location: Various
Date: Various
Website: achp.gov/106advanced.html

2015 Massachusetts Historic Preservation Conference
Location: Worcester MA
Date: August 14, 2015
Website: mapreservationconference.org

Heritage Ohio Annual Revitalization and Preservation Conference
Location: Columbus OH
Date: October 5-7, 2015
Website: heritageohio.org/category/workshops/annual-conference

National Trust Canada Conference 2015: Heritage Energized
Location: Calgary AB
Date: October 22-24, 2015
Website: heritagecanada.org/en/get-involved/conferences

National Trust PastForward Conference
Location: Washington DC
Date: November 3-6, 2015
Website: pastforwardconference.org