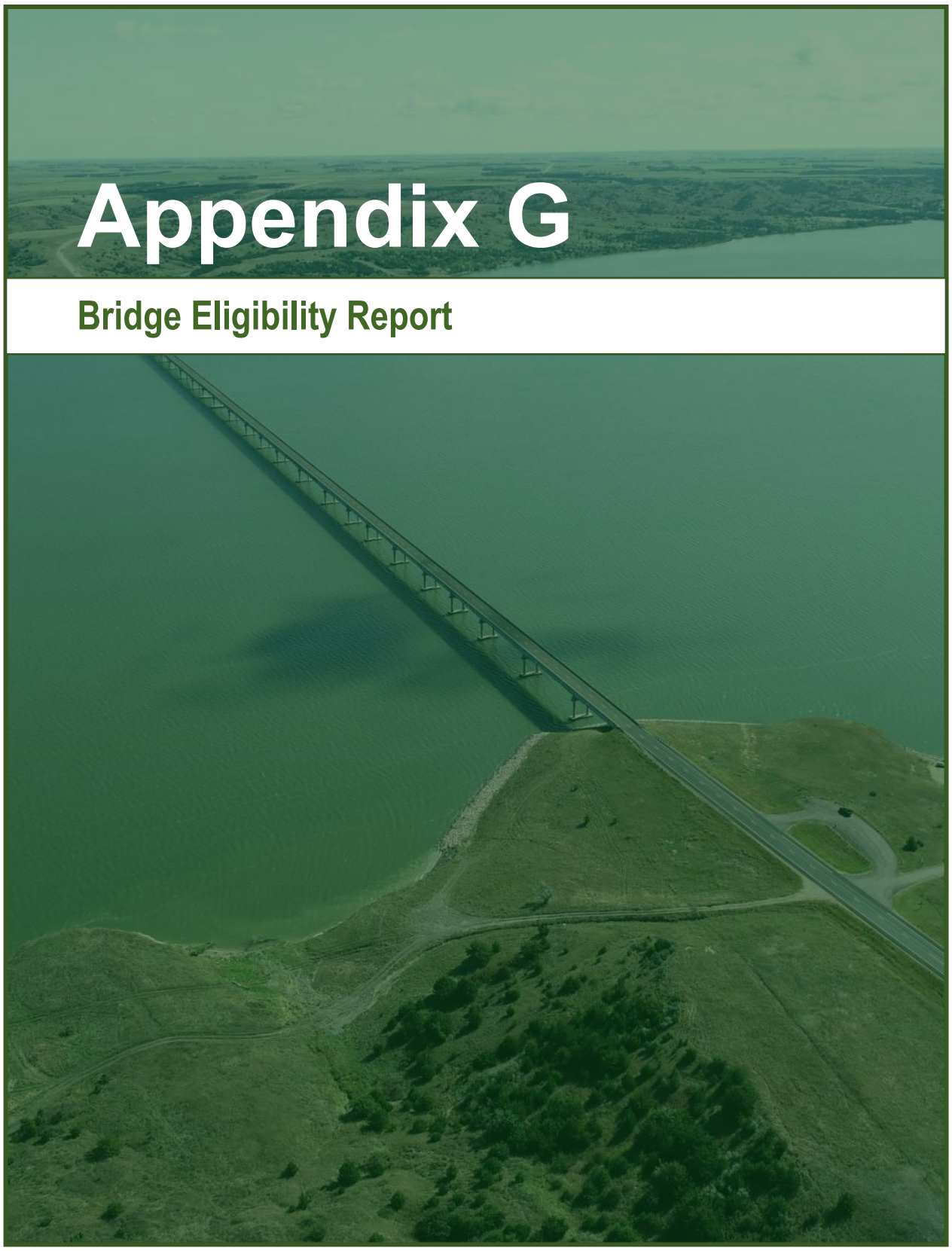

Appendix G

Bridge Eligibility Report

National Register of Historic Places Evaluation

Francis Case Memorial Bridge

Bridge No. 12-085-080

Report prepared for

South Dakota Department of Transportation

Report prepared by

Mead & Hunt

www.meadhunt.com

April 2019

Executive Summary

As part of the consultation process for Section 106 of the National Historic Preservation Act of 1966 (Section 106) for the proposed alignments for a new South Dakota Highway No. 44 (SD-44) Platte-Winner Bridge, Mead & Hunt, Inc. (Mead & Hunt) was requested to evaluate the Francis Case Memorial Bridge (Bridge No. 12-085-080 and commonly referred to as the Platte-Winner Bridge) and prepare a recommendation regarding eligibility for listing in the National Register of Historic Places (National Register).

The bridge carries SD-44 on a nominal east-west alignment over Lake Francis Case, a wide reservoir section in the Missouri River. The bridge crossing is located approximately 14 miles west of the city of Platte in Charles Mix County and approximately 51 miles east of the city of Winner in Gregory County. The bridge, completed in 1966, is a continuous welded plate-girder bridge with a total structure length of 5,655.5 feet and an out-to-out width of 30.3 feet, with a roadway width of 28.0 feet.

The Platte-Winner Bridge was evaluated for the National Register under *Criteria A, B*, *C*, and *D*. The broad and consistent representation of the Platte-Winner Bridge, alone among Missouri River bridges of the era, as joining east and west South Dakota to create a union rises to the level of National Register eligibility. The Platte-Winner Bridge is recommended eligible for the National Register under *Criterion A.* Additionally, the bridge's multiple features of bridge length, girder depth, early and extensive use of welded girder fabrication technology, and substructure design and construction are significant and rise to the level of National Register eligibility, resulting in the bridge being recommended eligible for the National Register under *Criterion C*.

The Platte-Winner Bridge retains sufficient integrity and is recommended eligible for the National Register under *Criteria A* and *C*.

Table of Contents

1. Introduction

As part of the consultation process for Section 106 of the National Historic Preservation Act of 1966 (Section 106) for the proposed alignments for a new South Dakota Highway No. 44 (SD-44) Platte-Winner Bridge, Mead & Hunt, Inc. (Mead & Hunt) was requested to evaluate the Francis Case Memorial Bridge (Bridge No. 12-085-080 and commonly referred to as the Platte-Winner Bridge) and prepare a recommendation regarding eligibility for listing in the National Register of Historic Places (National Register). Mead & Hunt cultural resource specialists conducted a site visit to inspect and photograph the bridge on February 25, 2019.

Research completed for the National Register evaluation of the bridge included the following:

- South Dakota Department of Transportation records, including bridge plans.
- Research at the State Library and State Archives in Pierre to review materials related to the history, design, and construction of the bridge, including archival records on the construction, construction issues, and the resulting legal issues.
- South Dakota newspapers from the period, including accounts of other related Missouri River bridges for context and comparison.
- Search of professional engineering journals and publications for related technical articles.

2. Description

The structure officially named as the Francis Case Memorial Bridge and generally identified as the Platte-Winner Bridge (Bridge No. 12-085-080) carries SD-44 on a nominal east-west alignment over Lake Francis Case, a wide reservoir section in the Missouri River (see Figures 1 and 2). The reservoir was originally named the Fort Randall Reservoir and is created by the Fort Randall Dam, located approximately 40 miles downstream and to the southeast. The bridge crossing is located approximately 14 miles west of the city of Platte in Charles Mix County and approximately 51 miles east of the city of Winner in Gregory County. Additional photographs of the bridge not provided in this report are included in Appendix A.

Figure 1. The Platte-Winner Bridge, view facing northeast. Mead & Hunt photograph, February 25, 2019.

Figure 2. The Platte-Winner Bridge, view facing southwest. Mead & Hunt photograph, February 25, 2019.

In terms of Missouri River crossings, the Platte-Winner Bridge is approximately midway between the top-of-dam highway crossing at Fort Randall to the south and the Interstate Highway 90 (I-90) bridge at Chamberlain to the north. The straight-line distance between those two crossings is approximately 65 to

70 miles, and longer if measured along highway routes or following the river itself. A general location map is provided in Figure 3.

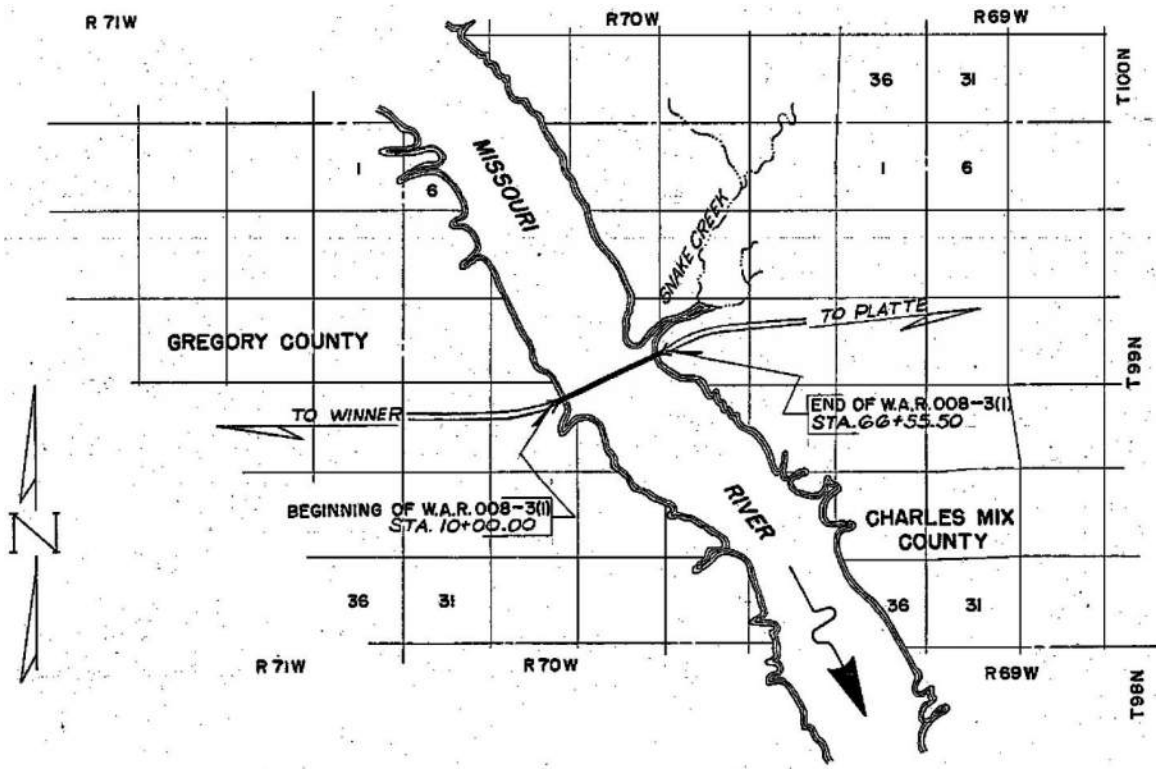

Figure 3. General location map of the Platte-Winner Bridge.[1]

The general location of the bridge is rural with low rolling prairie land along the east and west shores of the river and lake. The area is dotted with occasional clusters of trees. Beyond the immediate shoreline are agricultural fields to the east and west. There are no communities located at the bridge site, with the nearest being Platte to the east.

Surrounding the east approach to the bridge is the Snake Creek Recreation Area, named for Snake Creek that enters the reservoir a short distance to the north of the bridge. It is a 695-acre park with cabins, campground, and boating facilities. The park was created following the bridge construction as part of increased recreational use of the lake and surrounding area.

The bridge, completed in 1966, is a continuous welded plate-girder bridge with a total structure length of 5,655.5 feet and an out-to-out width of 30.3 feet, with a roadway width of 28.0 feet. It has 28 spans carried on 29 numbered piers, with numbers 1 and 29 identified as "sills" rather than abutments.[2] The deck and roadway are at elevation 1,409.0 feet with a 0.0-percent grade from end to end. As indicated

[1] State of South Dakota Department of Highways, "Plans for Proposed Federal Aid Project No. W.A.R 008-3 Sect. 1, Trunk Highway No. 44, Gregory-Charles Mix Counties, Substructure," November 1961, sheet 1 of 21, State of South Dakota Department of Transportation, Office of Project Development, Pierre, S.D.

[2] State of South Dakota Department of Highways, "Plans for Proposed Federal Aid Project No. W.A.R 008-3 Sect. 1, Trunk Highway No. 44, Gregory-Charles Mix Counties, Substructure."

on plan sheets, the navigation clearance is 30 feet from the bottom of the girders to the top of the reservoir's "maximum operating pool," which is at an elevation of 1,365 feet. The horizontal navigation opening is considered to be 225 feet wide, extending beneath a 250-foot span.

The primary engineer on the Platte-Winner Bridge design was Highway Commission bridge engineer Kenneth R. Scurr. In 1961, during the early project development phase, Scurr retired from the Highway Commission only to immediately return as a consultant on the Platte-Winner Bridge and other bridges crossing the reservoir. He remained involved throughout the course of the project. Scurr, who would sign the Platte-Winner bridge plans the next year (1962), reportedly "has helped in the design of every highway bridge the state has across the Missouri River," beginning with the first in the 1920s.[3] In 1980 Scurr participated in a formal oral history interview to provide a retrospective on his career and the history of South Dakota's Missouri River crossings from the 1920s to 1980, including comments on the Platte-Winner Bridge design and construction process.[4]

A. Superstructure

The girder superstructure is designed and constructed in four-span continuous units. The original plans identify two unit lengths including a "684.0-foot four-span unit" and a "900.0-foot four-span unit." The 684-foot unit is comprised of four spans in the following span-length sequence: 152-190-190-152 (see Figure 4). The 900-foot unit is comprised of four spans in the following span-length sequence: 200-250-250-200 (see Figure 5). Within each unit, the spans are continuous, and at the end of each unit is either an expansion device or the sill, if at the end of the bridge. These span lengths are nominal when used in the general plan drawings and are not necessarily identical in the drawings for the girder unit layouts. The 200-foot span is actually 198.9 feet in girder layout while the 250-foot span is 250 feet in girder layout.

The plan set of "General Drawings," depicting the general plan and elevation of the full length of the bridge, is divided into one four-span girder unit per sheet, with each sheet showing four spans and five piers or sills/abutments. The girder units are situated across the length of the bridge in the following sequence, from pier 1 (sill or abutment) and span 1 at the west end to pier 29 (sill or abutment) and span 28 at the east end:

- Spans 1-4, piers 1-5.....684-foot unit
- Spans 5-8, piers 5-9.....684-foot unit
- Spans 9-12, piers 9-13.....900-foot unit
- Spans 13-16, piers 13-17 .....900-foot unit
- Spans 17-20, piers 17-21.....900 foot unit
- Spans 21-24, piers 21-25.....900-foot unit
- Spans 25-28, piers 25-29.....684-foot unit

[3] "Kenneth Scurr's Service to S.D.," *Sioux Falls Argus-Leader*, July 21, 1961.

[4] Kenneth R. Scurr, Interview with Professor Emory Johnson, South Dakota State University, n.d., http://sddot.com/transportation/bridges/docs/Missouri_River_Bridges_1920.pdf.

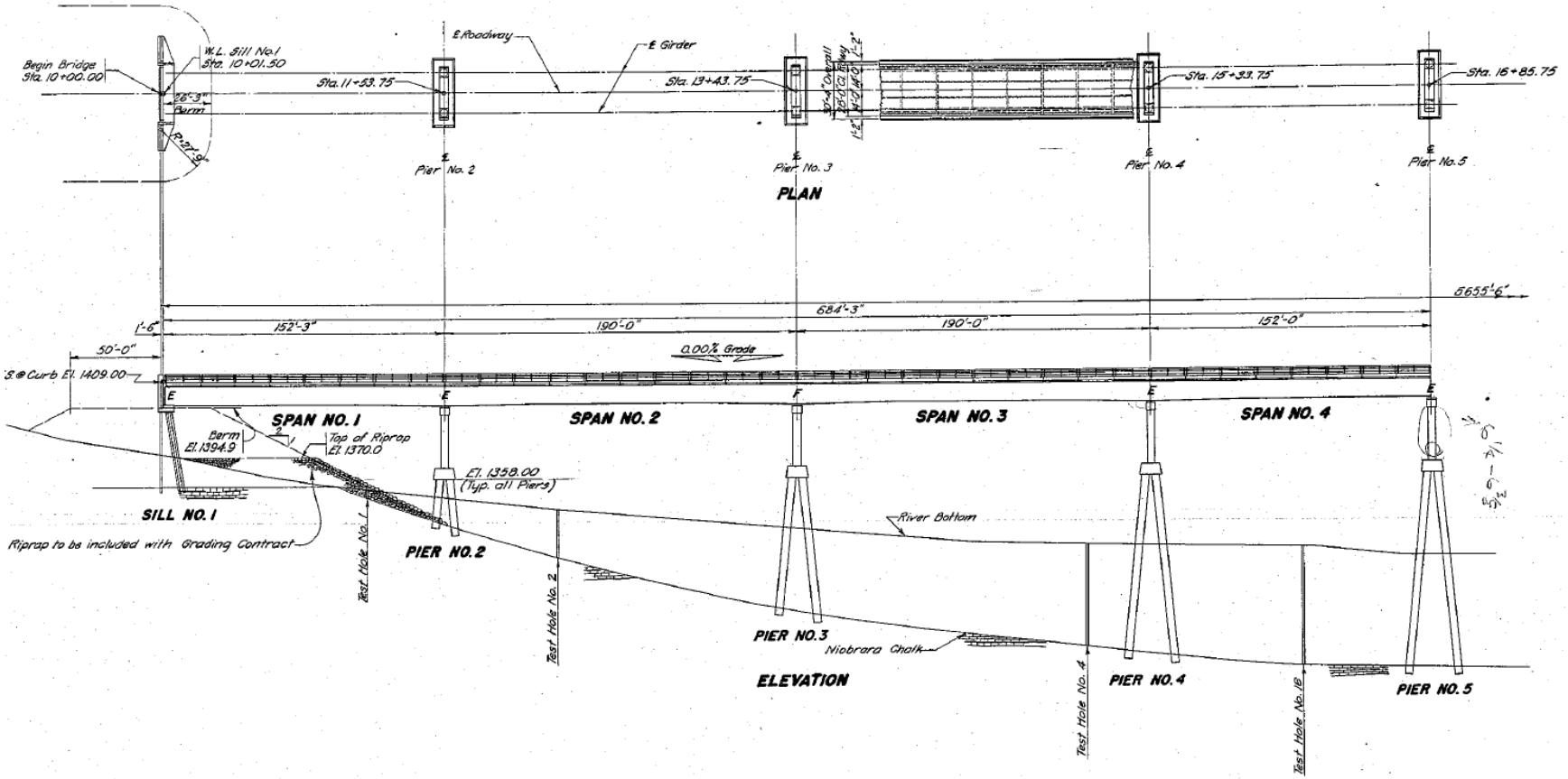

Figure 4. An example of the 684-foot, four-span girder unit, shown in plan and elevation.[5]

[5] State of South Dakota Department of Highways, "Plans for Proposed Federal Aid Project No. W.A.R 008-3 Sect. 2, Trunk Highway No. 44, Gregory-Charles Mix Counties, Superstructure," November 1962, sheet 3 of 44, State of South Dakota Department of Transportation, Office of Project Development, Pierre, S.D.

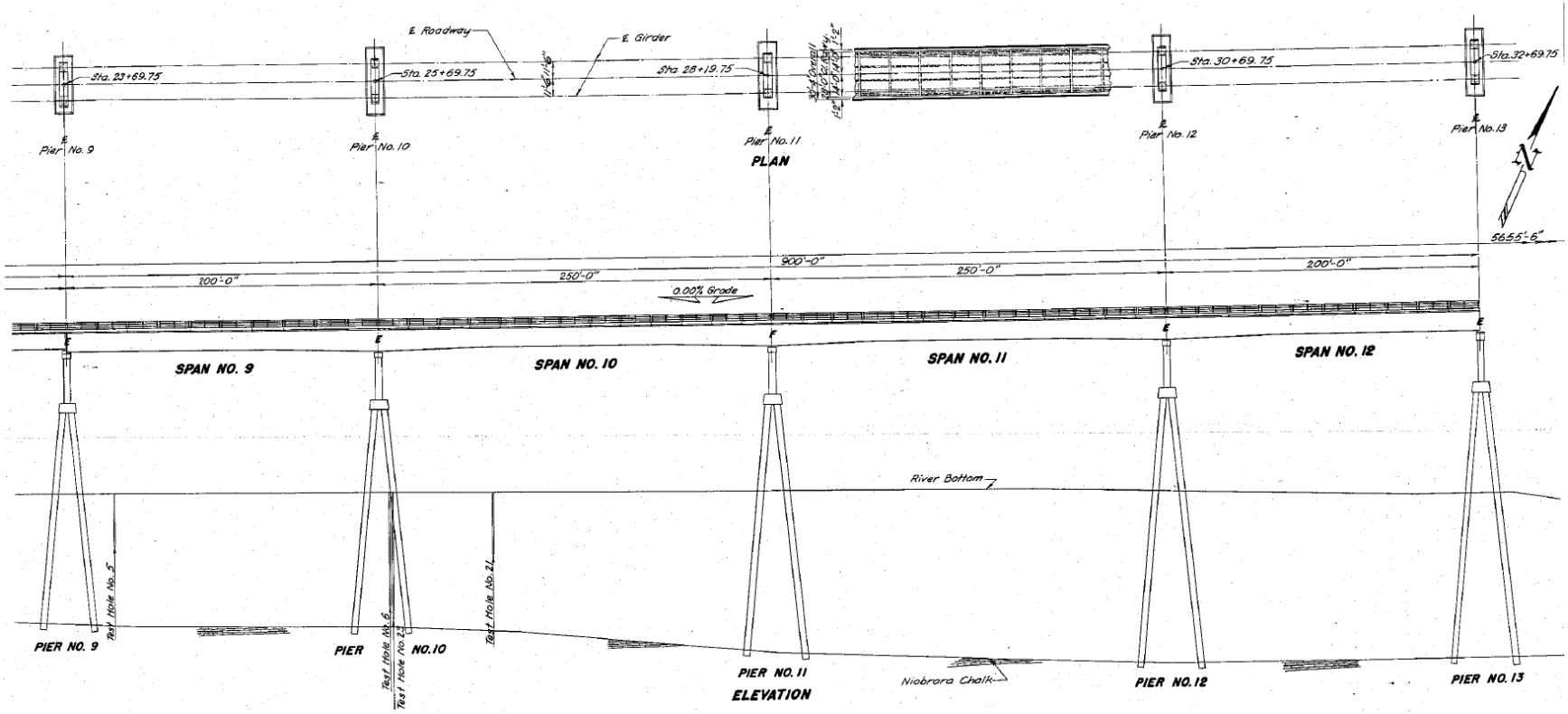

Figure 5. An example of the 900-foot four-span girder unit, shown in plan and elevation.[6]

[6] State of South Dakota Department of Highways, "Plans for Proposed Federal Aid Project No. W.A.R 008-3 Sect. 2, Trunk Highway No. 44, Gregory-Charles Mix Counties, Superstructure," sheet 5 of 44.

The four span lengths correspond with the center lines of five piers, but do not necessarily align with structural divisions within each unit since the units are continuous over the "interior" piers (the piers not located at the unit ends). For example, the 200-foot-span is comprised of a 133.9-foot length of continuous-depth, shop-welded plates and a 65.0-foot, shop-welded length that is one-half of a haunched section of the overall girder unit. These two sections are field-spliced with bolts. The haunch, which is completed by the adjoining 250-foot span, rests on an interior pier (see Figure 6). Construction photographs published in contemporary newspaper accounts show components of these units being raised onto piers, balanced on the haunched sections, with the two sides extending into space as temporary cantilever arms.[7] The girders have vertical steel stiffener elements welded at regular intervals.

[7] "Place Beam on Platte Bridge," *The Daily Republic (Mitchell, S.D.)*, July 3, 1965; "Platte-Winner Span Progresses," *Argus Leader (Sioux Falls, S.D.)*, August 8, 1965.

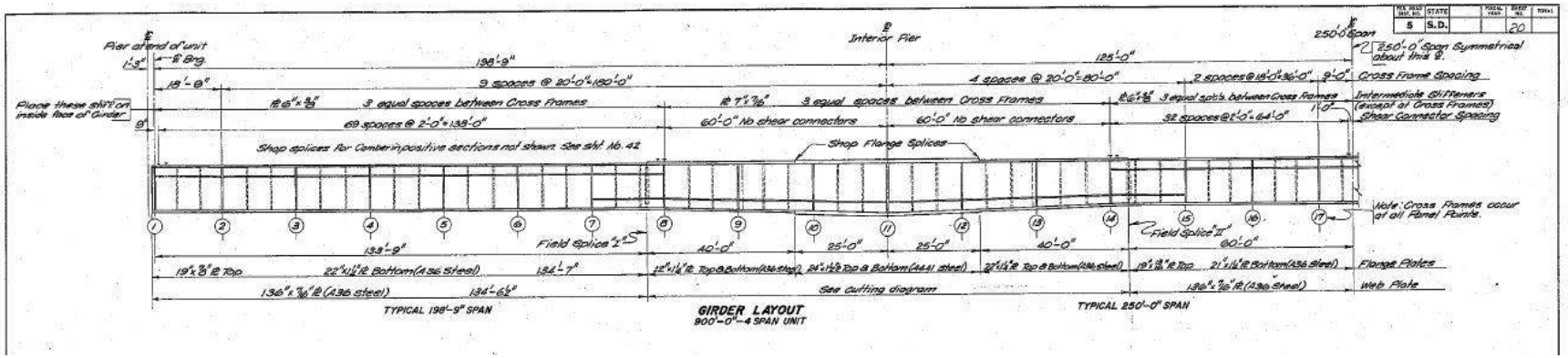

Figure 6. An example of part of a 900-foot girder unit, showing the components.[8]

[8] State of South Dakota Department of Highways, "Plans for Proposed Federal Aid Project No. W.A.R 008-3 Sect. 2, Trunk Highway No. 44, Gregory-Charles Mix Counties, Superstructure," sheet 33 of 44.

A 1962 letter about the bridge design and construction, written by Scurr to the regional editor of *Engineering News-Record*, noted that "Maximum economy in this superstructure has been obtained by utilizing constant depth girders with A441 steel in the negative moment sections and A36 steel in the positive moment sections."[9] The notations for the two steels can be seen in plan details showing the steel of each type with shop-welded splices edge to edge creating a single girder panel comprised of the two steels, each in their correct locations relating to positive and negative moment (see Figure 7).[10]

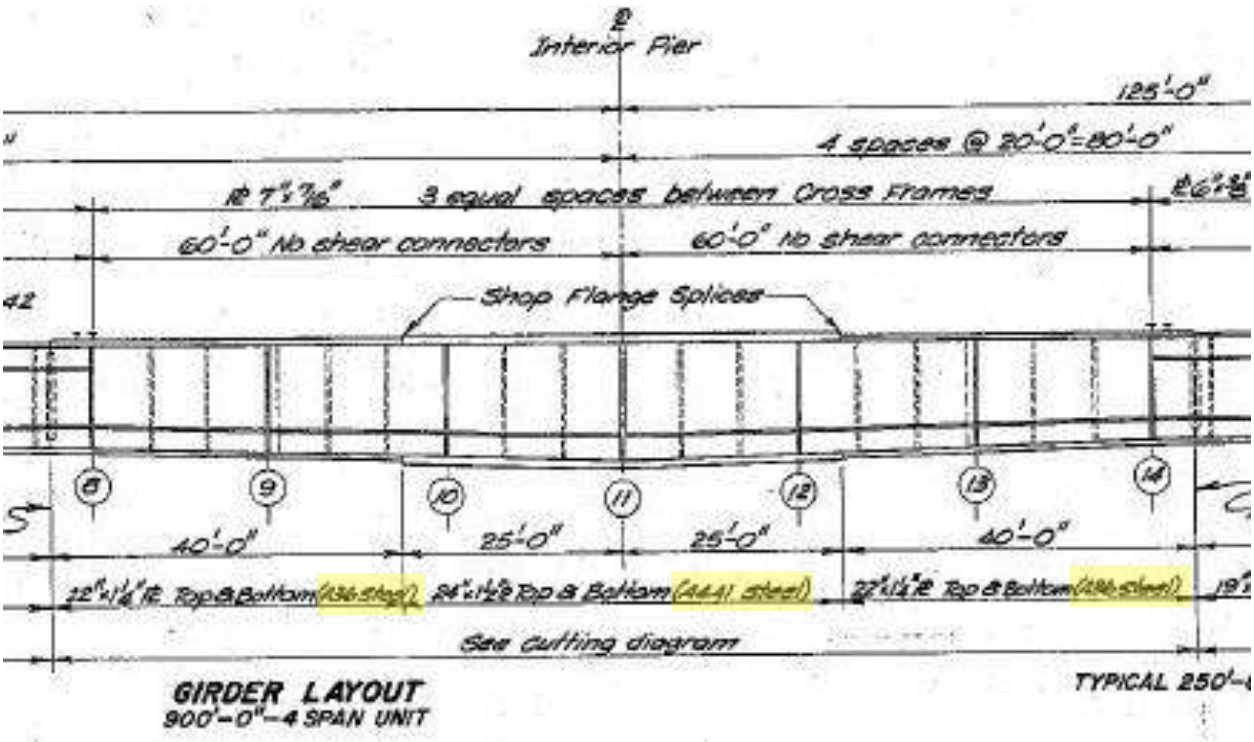

Figure 7. Details from superstructure plan sheet showing placement of A36 steel and A441 steel (highlighted in yellow) welded together into girder web.[11]

The girders are supported on bearings mounted on concrete rises on the pier caps. All bearings have self-lubricating bearing plates. The expansion bearings have a pin and lobe device with an adjustment slot.[12]

The floor system consists of steel "cross frames," similar to floor beams, extending approximately 23 feet between the two girders at regular intervals. The cross frames are fabricated like the larger girders, with

[9] K.R. Scurr, Consulting Engineer-Structures, "Letter to Roland Carr, Regional Editor, Engineering-News Record, Regarding WAR 008-3 Sec. 1 Charles Mix County Platte-Winner Bridge," March 2, 1962, South Dakota State Archives, Pierre, S.D.

[10] State of South Dakota Department of Highways, "Plans for Proposed Federal Aid Project No. W.A.R 008-3 Sect. 2, Trunk Highway No. 44, Gregory-Charles Mix Counties, Superstructure."

[11] State of South Dakota Department of Highways, "Plans for Proposed Federal Aid Project No. W.A.R 008-3 Sect. 2, Trunk Highway No. 44, Gregory-Charles Mix Counties, Superstructure," sheet 33 of 44.

[12] State of South Dakota Department of Highways, "Plans for Proposed Federal Aid Project No. W.A.R 008-3 Sect. 2, Trunk Highway No. 44, Gregory-Charles Mix Counties, Superstructure."

welded plates and welded vertical stiffeners. They are bolted to vertical stiffener flanges on the inside webs of the girders. Resting on top of the cross frames are two continuous lines of stringers, field-spliced end to end. Below the cross frames is a series of cross braces that extend diagonally from the girder flange below each cross frame to the girder flange below the opposite end of the neighboring cross frame, creating an X-brace pattern extending the length of each span unit. A vertical steel hanger extends from the midpoint of a cross frame to the X-point-center of the cross bracing below.

In his March 1962 letter to *Engineering News-Record*, Scurr described a possible deck system involving the:

> precasting of the floor sections in 20' panels which will include floor beams, joists, floor and curb . . . It is planned to cast these in a form upside down against a form surface which has the desired texture. This will eliminate the finishing of the curb and floor surface and will limit the finishing required to that on the under side of the slab between the joists.[13]

Scurr characterized this as "perhaps the most unusual feature of the superstructure." The evidence in the November 1962 plans and all subsequent discussions of the deck indicate that this precast system was abandoned during project development, not included in the superstructure plans, and never implemented.[14]

Regarding the adjustment for deadload, a note on the plans about structural steel states:

> "Dimensions on Superstructure plans show distances between center to center of bearings of Substructure units. Girders and Stringers must be fabricated in such a manner that they will be exactly such lengths at 45^0 F. The fabricator shall show on the shop plans how he proposes to achieve this."[15]

Currently, the bridge railing consists of concrete Jersey barriers. The original railing, removed and replaced in 1989, consisted of one C-section rail and one angle-section rail, both mounted on vertical H-section posts, bolted to the outside of the concrete curb. Surviving from the original rail installation are the four rectangular concrete endposts, which display the only ornamental detail on the original bridge (see Figure 8). Each post is 1 foot, 4 inches wide and 3.0 feet long, parallel to the roadway, and 3 feet high, with a beveled top edge. Each of the two long sides is ornamented with a set of five full-height vertical grooves.

[13] K.R. Scurr, Consulting Engineer-Structures, "Letter to Roland Carr, Regional Editor, Engineering-News Record, Regarding WAR 008-3 Sec. 1 Charles Mix County Platte-Winner Bridge."

[14] K.R. Scurr, Consulting Engineer-Structures, "Letter to Roland Carr, Regional Editor, Engineering-News Record, Regarding WAR 008-3 Sec. 1 Charles Mix County Platte-Winner Bridge."

[15] State of South Dakota Department of Highways, "Plans for Proposed Federal Aid Project No. W.A.R 008-3 Sect. 2, Trunk Highway No. 44, Gregory-Charles Mix Counties, Superstructure."

Figure 8. Endpost detail on northeast corner of the Platte-Winner Bridge, showing the set of five ornamental vertical grooves. Mead & Hunt photograph, February 25, 2019.

Drain openings through the curbs, added in the 1989 project, convey water from the roadway to the outside of the deck where added vertical pipes on the outside of the girders extend to the girder bottoms and open onto the reservoir. [Plan sheet 39 of 44, Slab details, 900' unit, Nov 1962]

B. Substructure

The Platte-Winner Bridge substructure consists of a concrete sill or abutment structure on each end and concrete pile-supported piers between the sills. Each pier is comprised of paired groups of hollow, prestressed-concrete cylinder piles, filled with sand and concrete after positioning, supporting a rectangular concrete "footing" above the water that ties the two pile groups into a single unit. Extending vertically from each footing is a pair of solid concrete columns that terminate in a "pier cap" carrying the bearings and the girder superstructure.

Similar to the two sizes of four-span girder units (684 and 900 feet long), there are two different pier pile groupings: piers with eight piles arranged in two groups of four piles each, and piers with 12 piles arranged in two groups of six piles each. The placement of each type corresponds with the size of the span units each supports. Piers 2-9 and 25-28 have eight-pile grouping, while piers 10-24 have the 12-pile grouping. Piers 1 and 29 are sills or abutments and of different design and construction.

Each of the 276 piles is the same design and construction: a hollow, 48-inch-diameter cylinder with a 5-inch-thick prestressed, post-tensioned, concrete wall (see Figures 9 and 10).

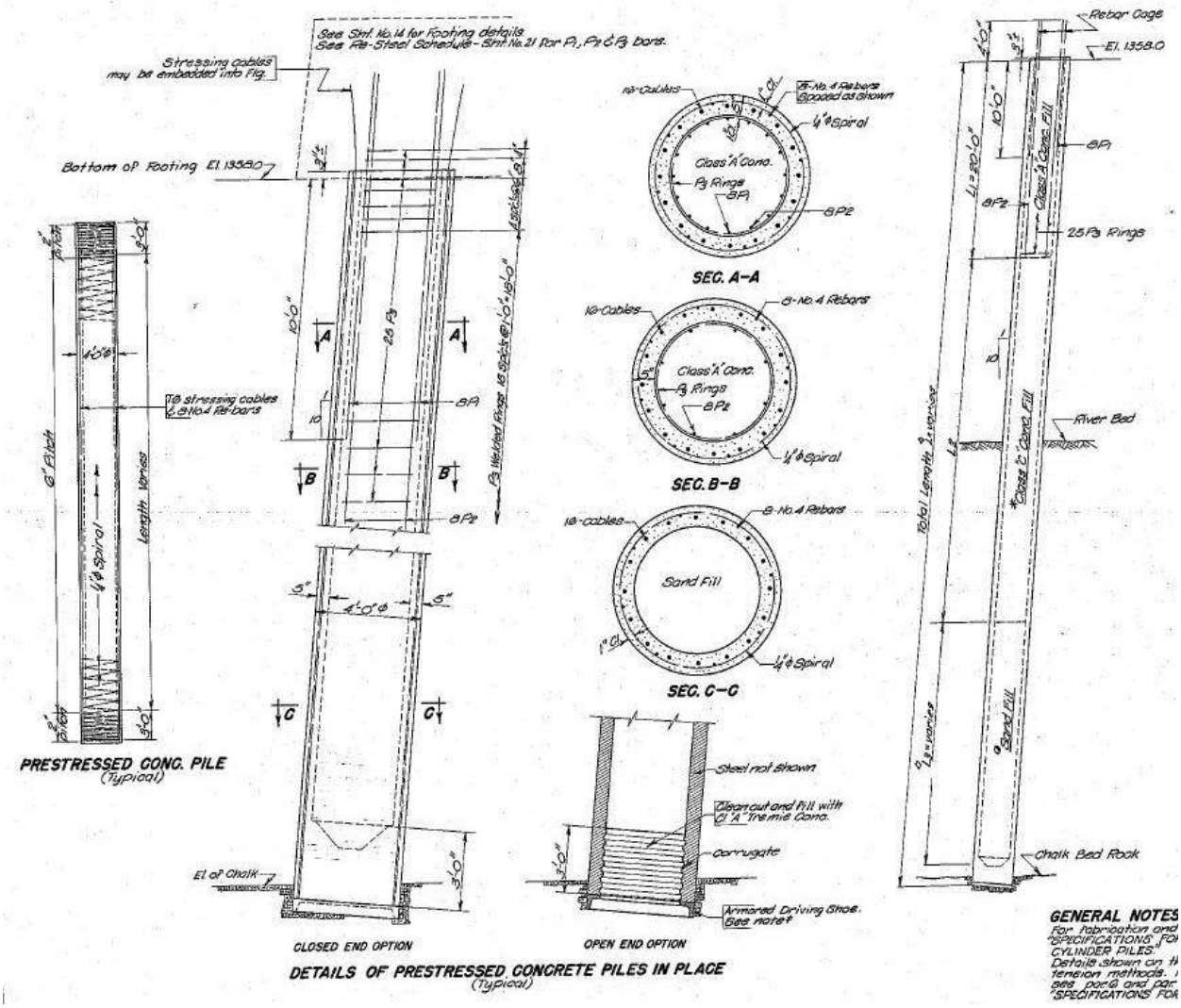

Figure 9. Details of prestressed post-tensioned concrete pile.[16]

[16] State of South Dakota Department of Highways, "Plans for Proposed Federal Aid Project No. W.A.R 008-3 Sect. 1, Trunk Highway No. 44, Gregory-Charles Mix Counties, Substructure," sheet 13 of 21.

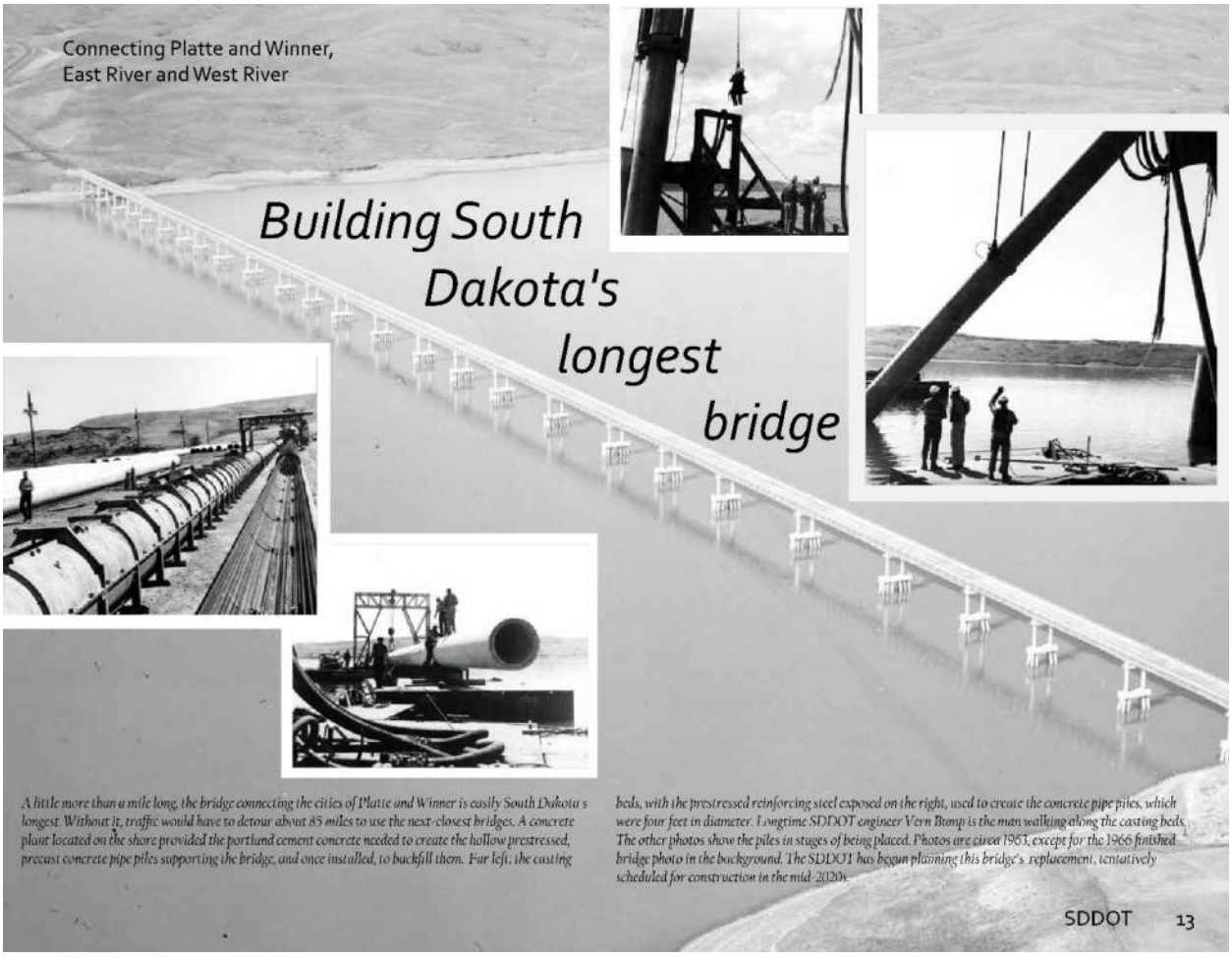

Figure 10. The South Dakota Department of Transportation report for 2016-2017 included a full page featuring photographs of the on-site pile fabrication for the Platte-Winner Bridge.[17]

The piles differ only in length, ranging from 50 to 176 feet, depending on where each will be placed in the reservoir bottom. Because of wind and ice loadings and the extreme depth of the reservoir, the exact location and angle of each pile required precise positioning for proper pile driving. Scurr explained the problem as follows:

> An unusual feature is that the requirement for applying an ice load of 15,000 pounds per lineal foot in any direction in combination with wind loads in the same direction has resulted in a requirement for a compound batter of the piling in order to resist these forces. This compound batter has presented some difficulties in positioning and holding the piling during their installation.[18]

Scurr went on to describe the contractor's use of scale models "of all members and equipment" to determine complicated methods for positioning and driving the piling. The procedure was described in a newspaper article at the time:

[17] South Dakota Department of Transportation, 2016-2017 Report (Pierre, S.D.: South Dakota Department of Transportation, 2017), 13.

[18] K.R. Scurr, Consulting Engineer-Structures, "Letter to Roland Carr, Regional Editor, Engineering-News Record, Regarding WAR 008-3 Sec. 1 Charles Mix County Platte-Winner Bridge."

> The pilings will be maneuvered into setting position by two large barges. They will be sunk through the river bottom by three water jets attached to the piling. Seating pilings in the strata of Niobrara Chalk (a medium hard rock) below the silt of the reservoir bottom will require the use of a compressed air hammer producing 50,000 foot pounds of energy. As many as 12 pilings will be used in some piers. As soon as the pilings are put into position, they will be capped to make ready for the final building of the superstructure.[19]

Some piles were jetted through 90 feet of mud and silt to reach the chalk rock layer. At that point the air hammer would drive the piling into the chalk to the point of refusal, where the process would stop.

The pilings were cast in 450-foot-long casting beds on the reservoir shore. A newspaper account reported that they may have been the longest ever cast in a single unit. Each pile could weigh up to 70 tons. The yard was capable of casting and pre-tensioning five piles at one time. The entire pile and foundation design and process was reported to be adapted from construction engineering practices used in deep-water work in the Chesapeake Bay, Texas, observation towers off the Atlantic coast, and projects in the Gulf of Mexico.[20]

After being driven into final position, each hollow pile was filled with a sequence of sand at the bottom, Class C concrete up past the river bed, and finally Class A concrete to the top.[21]

The abutments or concrete sills no. 1 and 29 are identical, with H-section piles supporting concrete backwalls and straight, sloped wingwalls. Centered on each backwall is a bridge seat for the span unit end.

Extending around one side and both ends of each pier cap is a steel walkway supported on brackets bolted to the concrete pier sides. The walkway, intended for inspections and maintenance access, has a grated floor and simple pipe railing.

[19] Les Helgeland, "Platte-Winner Bridge Will Be Largest Between Mississippi and West Coast," *The Daily Republic (Mitchell, S.D.)*, July 12, 1962.

[20] Dorothy Dancker, "Crews Sink Piling for Platte-Winner Bridge," *Rapid City (S.D.) Journal*, May 15, 1963.

[21] State of South Dakota Department of Highways, "Plans for Proposed Federal Aid Project No. W.A.R 008-3 Sect. 1, Trunk Highway No. 44, Gregory-Charles Mix Counties, Substructure," sheet 13 of 21.

3. History

A. The Fort Randall Dam and Reservoir

The history of the Platte-Winner Bridge has its roots in two large earlier projects: the Wheeler Bridge over the Missouri River and the construction of the Fort Randall Dam that created a new reservoir in the Missouri. The Wheeler Bridge, built in 1925, was one of five Missouri River crossings constructed in the 1920s. It was located northeast of Bonesteel, roughly halfway between today's Platte-Winner Bridge and the Fort Randall Dam, providing an east-west link for that area of the state. Its original name was the Rosebud Bridge, suggesting its importance to the Rosebud area.[22]

The Fort Randall Dam, authorized by the Flood Control Act of 1944, was under construction in the 1940s and completed in 1956. The dam created the Fort Randall Reservoir, and its upstream rising water caused the removal of several of the 1920s bridges, including the Wheeler Bridge. Some of the Wheeler's spans were floated farther upstream to become part of a reconstructed Chamberlain Bridge, but no replacement bridge was constructed at the Wheeler site. The federal government, responsible for the dam and reservoir, considered the highway across the top of the Fort Randall Dam to be the replacement for the original Wheeler bridge and therefore determined the federal obligation to the state of South Dakota. This was confirmed in an agreement between the state and the U.S. Army Corps of Engineers (USACE) in 1956 that certified the original contract of 1948 and relieved the USACE and the federal government of any further responsibility in the matter.[23]

Following the 1956 agreement, the South Dakota Highway Commission determined that the highway crossing at the dam was not a suitable replacement for the Wheeler Bridge and attempted to reopen the 1948 contract and have the USACE fund a new crossing, preferably between Platte and Winner. In refusing to reopen the matter, the USACE advised the Highway Commission and then-Senators Karl Mundt and Francis Case that the only way to get a new bridge was through Congressional action.[24]

Senator Francis Case went to work in Congress and by May 1, 1961, the State of South Dakota Highway Commission signed a contract with the USACE to build a bridge over the Missouri River at the Fort Randall Reservoir, to be funded by $4.5 million in federal money. The bridge would connect the city of Platte with the city of Winner via SD-44. In a June 25, 1960, letter to the Director of the Department of Highways, Senator Case explained that the new bridge would be "to provide adequate crossing facilities

[22] Mark Hufstetler, *Prairie Crossings: South Dakota's Historic Roadway Bridges* (Pierre, S.D.: South Dakota Department of Transportation, 2014), 60–62, 72.

[23] "Platte Bridge Subject," n.d., Platte-Winner Bridge Construction Files, 1960-1968, South Dakota State Archives, Pierre, S.D.

[24] "Platte Bridge Subject."

over [the Missouri] river for highway traffic in the area [west of Platte, South Dakota] and in replacement of the closure of the Wheeler Bridge by reason of construction of said reservoir . . . ."[25]

"Platte-Winner Bridge Work Starts in Fall," headlined the *Rapid City Journal* on May 25, 1961, quoting the state highway department that "the south central part of the state will have a new direct route across the Missouri River to Mitchell and Sioux Falls by 1963." The bridge's location would be "at Snake Creek over the Ft. Randall Reservoir, directly west of Platte." An "added bonus" would include the opening of new recreational areas along the reservoir.[26] *The Daily Republic* of Mitchell, South Dakota, quoted Scurr that "the economical design will utilize prestressed pile piers anchored in a chalk stratum underlying the reservoir, continuous deck plate girder spans, and prefabricated precast deck units." Scurr's comments implied that the bridge plans had already been completed, which they were. The story stated that the Platte-Winner, along with the Chamberlain Bridge, would become "the largest between the Mississippi River and the West Coast," a claim that would be repeated in the press regularly through to the bridge's eventual dedication several years in the future, never providing any evidence to back up the statement.[27]

At this point in the design process in 1961, Scurr retired and immediately returned as a consulting engineer on the project.[28]

B. Construction begins and the bridge is dedicated

The series of Platte-Winner Bridge plans titled "General Drawing" as well as plans for the substructure were dated November 1961 and signed by Scurr. The word "Consult'g" was added to "Bridge Engineer" beneath Scurr's signature in the title block for each of the plan sheets, recognizing his new status on the project following retirement from his state position.[29] The General Drawing set shows the elevation and plan views of the bridge across its entire length, four-span-unit by four-span-unit as mentioned above. The substructure set includes the details on the prestressed-concrete piling and other pier elements, along with the sills or abutments.

As the state moved to put the project out for bids, the *Argus Leader* (of Sioux Falls) in December 1961 published a full-page photograph story on "Transportation Progress: Vital Need for Growth." Centered on the page was a sketch of the "Proposed Pratte-Winner Bridge." The bridge design was still so new and as yet unpublicized that the sketch is only a rough representation. The general view of an endless series of identical low spans is correct, but the piers are not accurate and the spans appear to be concrete,

[25] "Contract with State for Construction of Highway Facilities: State of South Dakota, South Dakota State Highway Commission, Contract No. DA-25-066-CIVENG-61-614," July 15, 1960, South Dakota State Archives, Pierre, S.D.; Senator Francis Case, "Letter to E.F. McKellips, Director, Department of Highways," June 25, 1960, South Dakota State Archives, Pierre, S.D. Note: the letter from Case to McKellips is incorrectly dated 1950 on the original version.

[26] "Platte-Winner Bridge Work Starts in Fall," *Rapid City (S.D.) Journal*, May 25, 1961.

[27] "Cost of Platte-Winner Bridge Is Estimated at $4.5 Million," *The Daily Republic (Mitchell, S.D.)*, May 31, 1961.

[28] "Kenneth Scurr's Service to S.D."

[29] State of South Dakota Department of Highways, "Plans for Proposed Federal Aid Project No. W.A.R 008-3 Sect. 1, Trunk Highway No. 44, Gregory-Charles Mix Counties, Substructure."

although it is difficult to be sure what the sketch artist intended.[30] In a related story two weeks later about progress in the state's road program, the paper included this glowing claim: "'Comparable in size to the Golden Gate Bridge in San Francisco' is the description of the Platte-Winner bridge now in planning."[31]

The substructure bids were opened early in January 1961 and, after a brief delay because the lowest bid was higher than the engineers' estimate, the contract was awarded. The lack of assurance from the USACE that the reservoir level would remain low resulted in greater risk to the contractor and the slightly higher bid. The contract went to a three-firm group: Peter Kiewit Sons of Omaha, Nebraska; Massman Construction Company of Kansas City, Missouri; and Johnson, Drake and Piper of Minneapolis, Minnesota, for a total of $2,497,254.85.[32]

In anticipation of the start of construction, the Department of Highways announced plans for a July 17, 1962, groundbreaking event at the bridge site, termed the "Open House." Senator Case would be the speaker, along with Governor Archie Gubbrud, the mayors of Winner and Platte, and the USACE's district engineer, Colonel Harry Woodbury, from Omaha.[33] Unexpectedly on June 22 and just weeks before the event, Senator Case died of a heart attack in Washington, D.C., at age 65. Almost immediately, U.S. Representative Ben Reifel, who was born on the Rosebud Indian Reservation just west of Winner, drafted legislation to designate the Fort Randall reservoir as "Lake Case." He also suggested that the forthcoming Platte-Winner Bridge be named the "Francis Case Memorial Bridge."[34]

Meanwhile, both bridge construction and event planning continued. By mid-July 1962 the 460-foot-long casting beds for the prestressed, post-tensioned-concrete piling were in place. Cranes and barges had arrived on site. The *Daily Republic* (of Mitchell, South Dakota) documented the work with photographs and a description of the work.[35] The dedication on July 17 attracted 2,500 South Dakotans, many of whom travelled in an almost four-hour-long, well-publicized auto "caravan" that began in Sioux Falls at 9:00 a.m. and stopped at a dozen or more communities to add more attendees, ending up with some 200 vehicles. A western caravan started out from Winner and the arrivals were ferried across to the east bank on barges, while others arrived in their own boats. The afternoon's program at the bridge construction site included a free barbeque and multiple speakers as previously announced, along with the Platte and Winner high school bands. Even Miss South Dakota showed up for photographs with Governor Gubbrud and Colonel Woodbury. The late Senator Case was represented by his assistant from Pierre.[36]

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[30] "Transportation Progress: Vital Need for Growth," *Sioux Falls Argus-Leader*, December 21, 1961.

[31] "Road Program in S.D. Said 'Encouraging,'" *Sioux Falls Argus-Leader*, January 2, 1962.

[32] "Bids Opened for New S.D. River Bridge," *Sioux Falls Argus-Leader*, January 9, 1962; "Platte-Winner Bridge Contract Award Held Up," *The Daily Republic (Mitchell, S.D.)*, January 11, 1962; "$2.49 Million Contract Is Awarded for Platte Bridge," *Sioux Falls Argus-Leader*, January 25, 1962.

[33] "Plans Caravan to Missouri Bridge Event," *Sioux Falls Argus-Leader*, June 13, 1962.

[34] "Thousands Pay Last Respects to South Dakota's Sen. Case," *Lead (S.D.) Daily Call*, June 25, 1962.

[35] Helgeland, "Platte-Winner Bridge Will Be Largest Between Mississippi and West Coast."

[36] Les Helgeland, "Plans Complete for Open House Event July 17 at Platte-Winner Bridge Site," *The Daily Republic (Mitchell, S.D.)*, July 14, 1962.

In his speech, the governor implied statewide and even national importance for the bridge, stating that "it links together two great areas of our state." He continued, "they've developed the east coast, they've developed the west coast. We think that it's our turn now—and this bridge is just another means of helping develop South Dakota." The mayor of Winner, C.H. Sturges, described the bridge as linking "west river country" and "east river country." Colonel Woodbury added, "This bridge is just another step in the development of the Great Lakes of South Dakota," referring to the series of dammed reservoirs created along the Missouri in South Dakota.[37] As described in a report released a few months later, the "Lakes" were joined together in an integrated system of 1,100 miles of completed and planned roads connecting lake-related recreational area. Lake Francis Case, including the Platte-Winner Bridge, is one of four major reservoir lakes in the system; the others are Lake Oahe, Lake Sharpe, and Lewis and Clark Lake.[38] In his eulogy for Senator Case that was given around the time of the bridge dedication, South Dakota Senator Karl Mundt stated, "Francis Case played a prominent part in the development of this vast system of reservoirs."[39] At the dedication, the late senator's aide, Harold Schuler, detailed Senator Case's efforts.[40]

C. Substructure work

The detailed and tedious work of casting and then placing the 276 48-inch prestressed concrete pilings continued through the remainder of 1962 and all of 1963. In the summers, crews reportedly worked "around the clock," seven days a week.[41] There was a steep learning curve for drilling and coring crews as they mastered deep-water techniques for the unusual depths of the reservoir, the same situation that created the need for the adoption of piling from ocean and gulf construction methods. As described in one account, "Construction of the foundations is in 60 to 90 feet of water and involves techniques never used before in South Dakota, although these techniques have been used on mammoth bridges on Chesapeake Bay and the Gulf of Mexico.[42] The experience later proved valuable for initial soundings for the proposed I-90 bridge across the reservoir south of Chamberlain.[43] Scurr was credited in news accounts for working out the substructure techniques that used the deep-water technology instead of the conventional use of pneumatic caissons. He was also credited for adopting the use of welded-plate girders of high-strength steel in the superstructure and the composite deck design. Taken together, Scurr's plans and methodology reportedly saved the state approximately $2 million, making the project affordable within the funds allotted in the congressional allocation.[44]

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[37] "Over 2,500 Attend 'Open House' Event at Platte-Winner Bridge," *The Daily Republic (Mitchell, S.D.)*, July 18, 1962.

[38] Roy Jorgensen and Associates, Highway Engineering and Management Consultants, *South Dakota Highway Needs: An Engineering Appraisal* (Washington, D.C., November 1962), South Dakota State Library, Pierre, S.D.

[39] *Memorial Services: Held in the Senate and House of Representatives of the United States, Together with Remarks Presented in Eulogy of Francis H. Case* (Washington, D.C.: United States Government Printing Office, 1962), 22.

[40] "Over 2,500 Attend 'Open House' Event at Platte-Winner Bridge."

[41] Helgeland, "Platte-Winner Bridge Will Be Largest Between Mississippi and West Coast."

[42] "Public to See Unique Bridge Construction," *Rapid City (S.D.) Journal*, June 20, 1962.

[43] "Highway Dept. Crews Get Seasick on Drilling Job," *Argus Leader (Sioux Falls, S.D.)*, April 26, 1963.

[44] Helgeland, "Platte-Winner Bridge Will Be Largest Between Mississippi and West Coast." On the composite deck, see "Bridge Design in State Now Is Standard," *Rapid City (S.D.) Journal*, October 10, 1963.

In the midst of the substructure work, in early 1963, the U.S. Senate passed a resolution officially naming the Platte-Winner Bridge as the "Francis Case Memorial Bridge."[45] Around the same time, the Highway Commission awarded the superstructure contract to the U.S. Steel Corporation.[46]

In the winter months of 1963-1964, crews from the American Bridge Division of U.S. Steel began pouring grout pads on the concrete pier caps in the very early stages of the superstructure construction. At the same time, the substructure crews were finishing up the last of the work on the pilings.[47] Then, in January 1964 State Highway Director Don Haggar held a news conference in the governor's office to announce that state inspection crews had discovered large cracks in about ten percent of the 276 prestressed-concrete piles. "This is a spectacular thing," he said, reporting that the damaged piling was discovered by state engineers on December 31, 1963, weeks after the substructure was completed. The governor's involvement indicated the seriousness of the situation, since the state was rejecting the work and the contract, delaying the bridge completion date, and spending dollars on additional inspections. Sverdrup & Parcel and Associates, Inc., a major bridge engineering firm from St. Louis, was hired to carry out an investigation. The governor pointed out that, had highway engineers not discovered the cracks, the rising water level of the reservoir might have concealed them. Haggar seemed mystified by the situation, stating, "It seems inconceivable to me that a contractor would deliberately miss the specifications, he has too much to lose."[48]

The highway department soon announced that the completion date for the bridge would be moved back a year, to late 1965. As inspection crews reported finding clay inside the hollow pilings instead of concrete, the state initiated tests involving sonar and dive crews.[49] The sonar testing, using a new underwater device, was conducted by Prof. E.A. Whitehurst of the University of Tennessee. The sonar avoided the more conventional technique of drilling into every pile. Drilling then followed where sonar detected defects.[50] At the same time, divers inspected the pile exteriors to determine the extent of the cracking down the length of the pile. They also conducted underwater photography.[51]

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[45] "Berry Discusses Cuba in Talk Before S.D. Senate," *Argus Leader (Sioux Falls, S.D.)*, February 24, 1963.

[46] "State Awards Platte-Winner Bridge Job," *Argus Leader (Sioux Falls, S.D.)*, February 7, 1963. It was also reported that the highway department filmed some of the bridge construction work, although no film of the Platte Winner Bridge was found during any research for this project. "Engineers Voice Objection to Force Account Activity," *Rapid City (S.D.) Journal*, October 27, 1963.

[47] "Platte-Winner Bridge Job in Second Phase," *Argus Leader (Sioux Falls, S.D.)*, November 11, 1963.

[48] "Platte-Winner Bridge Substructure Cracking," *Rapid City (S.D.) Journal*, January 10, 1964; A.E. Smith, Sverdrup & Parcel and Associates, Inc., Consulting Engineers, "Letter to A.M. Young, Highway Engineer, South Dakota Department of Highways, Regarding the Platte-Winner Bridge Substructure," July 15, 1964, South Dakota State Archives, Pierre, S.D.

[49] "Clay Found in Pilings of Platte Bridge," *Argus Leader (Sioux Falls, S.D.)*, January 16, 1964; "Testing to Begin April 27 on Platte-Winner Bridge," *Argus Leader (Sioux Falls, S.D.)*, February 28, 1964.

[50] "Sonar Tests of Bridge Half Done," *Rapid City (S.D.) Journal*, May 15, 1964.

[51] "Divers Check Winner Bridge," *Rapid City (S.D.) Journal*, June 19, 1964.

In July 1964, with tests and investigations completed, the Highway Commission reported that 55 pilings were defective and another 76 were questionable. The contractors were directed to make repairs, but did not immediately agree to cover the cost, arguing that the damage was the result of "specifications which required use of undue force to drive the piling into the river bottom." Nevertheless, the state and the contractors reached an agreement in August 1964 outlining the extensive repair details. The agreement also established a three-member advisory board to recommend repairs necessary to meet state specifications and report to the State Highway Engineer on the probable causes of the failure.[52]

(1) The substructure damage and statewide political consequences

The piling damage and its cause were never fully explained in news reports at the time. In a detailed oral history interview conducted by Prof. Emory Johnson of South Dakota State University in 1980, Scurr described the situation in detail. Scurr explained that the special provisions accompanying the bridge plans required a sequence of fill inside each hollow pile to water penetrating the pile "at elevations that fluctuations of the Reservoir might expose." The sequence was: Class A concrete at the bottom, followed by sand, Class C concrete, and ending with the top 20 feet filled with Class A concrete and a cage of rebars. The positioning of each layer was specified, along with the requirement that the concrete be carefully deposited using a "tremie" or drop-bottom bucket. This particular bucket was required because of the "fact that concrete cannot be dropped, even in the air for more than a few feet without segregating into it components and losing its identity as concrete."[53]

The contractor, Scurr speculated, took advantage of the inexperience of those supervising the construction and decided that the use of the tremie was slow and meticulous work, so they convinced the inspectors they could drop the concrete a great distance with no problem or harm. As a result, the water in the concrete all came to the top and the remaining materials segregated themselves at the bottom, so no actual concrete ended up inside the pile. During an extremely cold spell during Christmas week of 1963, the water inside the piling froze, rupturing the concrete piling and "effectively destroying them for their intended purpose."[54]

In the fall of 1964, according to an Associated Press account in the *Argus Leader*, the entire issue was drawn into the current political campaign when the state Democratic Chairman, J.C. Noonan, accused the Highway Commission, and thereby the Republican administration of Governor Gubbrud, of "trying to cover up their mess in the construction of the Platte-Winner highway bridge." Noonan detailed a series of charges suggesting incompetence and mismanagement that was very costly to the state in time and money. Among other items, Noonan declared that the team of state inspectors "included an individual whose only qualification appeared to be that he was a nephew of state Rep. Ellen Bliss, R-Sioux Falls." State Highway Engineer A.M. Young rejected Noonan's charges as "an absolute lie."[55] Noonan, it turned out, further criticized the Highway Commission for using expensive private consulting firms when state

[52] "Bridge Investigation Finds 55 Pilings Are Defective," *Rapid City (S.D.) Journal*, July 25, 1964; "Platte-Winner Bridge Contractors Get Notice," *Rapid City (S.D.) Journal*, August 2, 1964; "3 Firms to Repair Piling on Platte-Winner Bridge," *Rapid City (S.D.) Journal*, September 3, 1964.

[53] Scurr, Interview with Professor Emory Johnson, South Dakota State University.

[54] Scurr, Interview with Professor Emory Johnson, South Dakota State University.

[55] "Platte-Winner Bridge Is Injected into Campaign," *Argus Leader (Sioux Falls, S.D.)*, October 24, 1964.

engineers could have done the work more economically. That brought a vigorous response from the Consulting Engineers Association of South Dakota. Very quickly things escalated into a larger political fight, with Republicans and Democrats exchanging points and counterpoints. Noonan reportedly "said if the Highway Department is as efficient as its spokesmen claim, then they should explain 'The collapsed bridge at Rapid City, the cracked and deserted pilings at the Platte-Winner bridge site, the roller coaster highways, the fall of the interstate bridge north of Sioux City on Interstate 29, and the low morale in the Highway Department.'" The Gubbrud administration, he added, "show only a desire to cover up the situation until after the election."[56]

The outside pressure may have prompted more action by the Highway Commission because a few weeks later Highway Director Don Haggar accompanied Governor Gubbrud and highway commissioners on a visit to the Platte-Winner construction site. Haggar reported that the pile repairs were moving quickly and "superstructure work will be completed about the same time as final construction on highways approaching the bridge, and utilization of the highway will be about on schedule, even though completion of the bridge itself has been delayed." In addition, he "emphasized that repair procedures being followed will insure that strength of the damaged piling will be greater, in most cases, than the original design strength."[57]

Following the 1964 election, in which Gubbrud's lieutenant governor, Nils Boe, was elected the new governor, Democratic representatives in the state legislature introduced a bill changing the composition of the Highway Commission, thanks to the Platte-Winner situation. The bill was intended to "put South Dakota highway construction on the basis of need rather than political payoff. The present commission is composed of members of only one party and this has resulted in misuse of construction monies and poor construction practices such as we have seen at the Platte-Winner bridge."[58] With that, the political debate disappeared from news about the Platte-Winner Bridge and reporting shifted back to the completion of the pile repairs, the superstructure construction, and finally to plans for the big dedication event for the completed bridge.

Behind the scenes, however, a new dispute arose over the payment for the repairs. Initially the contractor, Peter Kiewit Sons, was held responsible for the $2.5 million repair bill. Kiewit, however, filed claims with the Highway Commission for the amount. In his 1980 oral history interview, Scurr recalled that "There appeared to be a strange desire on the part of the Highway Director to accommodate the contractor and pay the claim." There were "several ploys," Scurr said, to facilitate the payment. Scurr said that he wrote to Governor Gubbrud "threatening a taxpayers suit if the claim was settled out of court. I got wind of other schemes to pay off the contractor and wrote a similar letter to Gov. Boe in 1965." Scurr detailed a complicated series of contentious meetings and legal maneuverings that culminated in a court case and a final ruling by Judge James R. Bandy in December 1969. By then the contractor's claim had risen to almost $3 million, of which Kiewit was awarded only $60,000 and remained responsible for the balance of the costs for which they would not be reimbursed by the state. In addition, there were

[56] "Engineers Are Concerned over Highway Plan Attack," *Rapid City (S.D.) Journal*, October 26, 1964; "Noonan Says Dept. Should Check Records," *Argus Leader (Sioux Falls, S.D.)*, October 26, 1964.

[57] "Haggar Says Bridge Repair Will Cause Little Delay," *Rapid City (S.D.) Journal*, November 18, 1964.

[58] "Bill Would Revamp Road Commission," *Argus Leader (Sioux Falls, S.D.)*, February 11, 1965.

financial losses to American Bridge caused by the delay in starting the superstructure work. Scurr was "positive that this loss must have been paid by the Peter Kiewit Company or its insurers."[59] Attorney General Gordon Mydland, who was involved in the case, underscored its significance in stating that "Judge Bandy should conclude a distinguished career with a case of this magnitude."[60]

D. Bridge completion and dedication event

In July 1965 an American Bridge Company derrick lifted the first superstructure girders into their cantilever position on the westernmost pier, on the Winner side of Francis Case Lake. Girder construction soon commenced on the east or Platte end as well.[61] A September 1965 aerial view of the full bridge shows girders across about half the piers, with deck placement beginning on the Platte end.[62] A construction photograph sequence published on November 2, 1965, shows the final girders lifted into position to complete the majority of the superstructure work.[63]

Judging from the few news accounts, all of which were positive, the placement of 3,050 tons of steel was problem-free. The earlier pile problems had created an anxiety in the public, however, and rumors persisted that new problems had been found and hidden. "There is absolutely no truth to such rumors," State Highway Department Engineer Bill Young said in April 1966. "We have no idea how they got started. We plan to go ahead to finish the construction."[64]

As crews worked on the deck installation, local groups and officials began planning a large bridge dedication and official opening. The deck was only half finished in June, but earlier in March the chambers of commerce and other civic groups in Winner, Platte, and Sioux Falls were making assignments among themselves for dedication duties on what they said would be "one of the largest celebrations of this type ever held in South Dakota." "We are planning to make this a national affair," the Sioux Falls chamber spokesman said, "in hopes to bring attention to this vital new artery that links the East and the West together on an even closer basis."[65]

Instead of reporting problems and errors and shortcomings, South Dakota newspapers now began featuring the advantages of the new crossing. The Sioux Falls livestock industry had been expanding rapidly, with one quarter "of the city's population . . . directly dependent upon the meat packing and livestock industry." John Morrell & Company, Sioux Falls Stockyards, and Greenlee Packing Company employed 5,000 city workers. In 1961 through 1964 the stockyards ranked ninth in the nation. The market now looked to livestock feeders on the west side of the new bridge to bring in new cattle. The

[59] Scurr, Interview with Professor Emory Johnson, South Dakota State University.

[60] "Mydland Lauds Bridge Case Verdict in Bandy's Court," *Argus Leader (Sioux Falls, S.D.)*, December 19, 1969.

[61] "Place Beam on Platte Bridge"; "Platte-Winner Span Progresses."

[62] "Platte-Winner Bridge," *Argus Leader (Sioux Falls, S.D.)*, September 22, 1965.

[63] "A Step in the Construction of a South Dakota Bridge," *Argus Leader (Sioux Falls, S.D.)*, November 2, 1965.

[64] Les Helgeland, "Highway Officials Deny Any Platte-Winner Bridge Faults," *The Daily Republic (Mitchell, S.D.)*, April 2, 1966.

[65] "S.F. Group Helps Plan Bridge Dedication," *Argus Leader (Sioux Falls, S.D.)*, March 15, 1966; "Winner Bridge Opening Planned," *Rapid City (S.D.) Journal*, March 28, 1966; "Deck Work on Platte Bridge Half Completed," *The Daily Republic (Mitchell, S.D.)*, June 13, 1966.

stockyards president stated, “The ground work has been laid to attract feeders in counties gaining from the bridge,” referring to Gregory and Tripp Counties. “Tripp County has the most cattle raised in the state,” the *Argus Leader* reported.[66] The president of the Rice Brothers Commission Firm at the Sioux Falls stockyards reported that “over ten years ago at Platte I attended a group meeting formed to push for the development of the bridge. It is gratifying to see the culmination of the efforts of many persons who worked to see this link to the Winner area completed.”[67]

Sioux Falls retailers had a similar message, planning to attract those who had been going to Sioux City, Iowa, instead of Sioux Falls, South Dakota. “The more business we can keep in South Dakota, the more we as South Dakotans will prosper,” said a Sioux Falls business president, referring to residents of counties west of the Missouri River. Another added, “I think we could compare the bridge to a glue pot. It is going to glue the people of the West River area to us in the East River country as never before.” Expanding the concept of development, the manager of the Sioux Falls K Mart said that those coming in from the west “will undoubtedly make use of local parks, the Great Plains Zoo and other recreational facilities,” as well as local hospitals and “medical specialists here.”[68] The *Argus Leader* summarized the importance of the new bridge in an editorial, stating:

> through the years the Missouri River has been a considerable barrier to travel . . . The bridge, however, will change the situation materially . . . the bridge will be a major asset to much of the state, offering better service to what is known as the Rosebud country and widening the sales and marketing opportunities of cities such as Sioux Falls.[69]

Another editorial a few weeks later was even stronger:

> “This is something big in our state—really big. The new bridge is the longest between the Mississippi River and the West Coast. It is in itself an extraordinary engineering feat. Primarily important, though is the service it will provide in offering another important link between western and eastern South Dakota.”[70]

The paper began running a cartoon titled “Howdy, Neighbor,” featuring a sketch of two men shaking hands and standing on a map of the state, one on each side of the Missouri River (see Figure 11). The one standing next to the site of Winner wore western garb with a broad-brimmed hat, while the one standing next to Platte and Sioux Falls was dressed as a businessman wearing a fedora. The sketch headed a promotion for the paper’s forthcoming series titled “Across the Wide Missouri” that featured a photo of the Platte-Winner Bridge.[71]

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[66] “Livestock Industry Plays Big Role in S.F.,” *Argus Leader (Sioux Falls, S.D.)*, April 5, 1966.

[67] “Livestock Notes,” *The Daily Republic (Mitchell, S.D.)*, September 27, 1966.

[68] “S.F. Retailers See Bridge as Helpful East-West Link,” *Argus Leader (Sioux Falls, S.D.)*, October 4, 1966.

[69] “New Bridge Useful,” *Argus Leader (Sioux Falls, S.D.)*, August 15, 1966.

[70] “Another Big Bridge Over Missouri,” *Argus Leader (Sioux Falls, S.D.)*, September 7, 1966.

[71] “Howdy, Neighbor,” *Argus Leader (Sioux Falls, S.D.)*, September 24, 1966.

Figure 11. The "Howdy, Neighbor," cartoon, published for the Platte-Winner Bridge completion and dedication, characterizing the joining of West River and East River by the new bridge, and extending the link to the city of Sioux Falls.[72]

Finally the big dedication event day arrived on September 27, 1966, preceded by multiple anticipatory news stories, including a full-page spread of photos of the construction and the new bridge in *The Daily Republic*. The captions excitedly reported the "giant concrete and steel Francis Case Bridge," the "panorama on the Charles Mix County side of the big bridge, the "almost breathtaking . . . bluffs and hills one view from the east edge of the bridge," the "giant casting area," and the "giant derrick." Trying again to express the extreme length of the bridge, the paper calculated that it had "the capacity of holding 679 cars lined bumper-to-bumper in both lanes."[73]

In preparation for the expected news coverage of the dedication, special telephone service was installed at the bridge site with four telephone booths and "the use of micro-wave equipment . . . to provide lines for radio stations."[74] KELO-Land television would run a special report on the dedication on channels 11, 6, and 3.[75]

The dedication day began early with the major guest, Secretary of Interior Stewart Udall, flying in to Mitchell, where he met Senator and future presidential contender George McGovern. They then attended an early event at the Corn Palace, accompanied by "just about every top politician in South Dakota," as well as the widow of Senator Francis Case.[76] They moved on to the bridge itself, where Udall spoke to the assembled crowd of 8,500 who came to witness the official ribbon cutting by Mrs. Francis Case, formally opening the bridge (see Figure 12). Four Air Force F102 "Delta Daggers" flew over the bridge at

[72] "Howdy, Neighbor," 10.

[73] "Francis Case Bridge Dedication Set Tuesday," *The Daily Republic (Mitchell, S.D.)*, September 24, 1966.

[74] "Special Phone Service Provided for Dedication," *The Daily Republic (Mitchell, S.D.)*, September 26, 1966.

[75] "Advertisement for KELO-LAND TV," *Argus Leader (Sioux Falls, S.D.)*, September 27, 1966.

[76] "Top Politicians on Hand to See Udall," *The Daily Republic (Mitchell, S.D.)*, September 27, 1966.

that point. A single mass band, formed by high school students from four different cities, played, and there was a display of Sioux dancing by members of the "Truth Keepers" from the Rosebud Reservation. Then Udall, Mrs. Case, and Chief Jake Kills In Sight drove across the bridge in an antique automobile.[77]

WEDNESDAY, SEPTEMBER 28, 1966 TELEPHONE 336-1130 10 CENTS

JAM SITE — A crowd estimated at 8,500 jammed the Platte-Winner Bridge dedication site on the eastern shore of the Missouri River. The structure will also be referred to as the Francis Case Bridge. A mass band of high school mu- sicians from Platte, Gregory, Parkston and Winner opend the dedication program by playing the national anthem. (Photos by Fred Masek)

ACROSS THE WIDE MISSOURI

Sunny Skies Treat 8,500 at Platte-Winner Bridge Opener

By FRED MASEK
Argus-Leader Staff Writer

PLATTE, S.D. — The Platte-Winner Bridge Dedication Committee found it unnecessary to impose its rainy weather schedule Tuesday.

Generally sunny skies and limited overcast beckoned an estimated 8,500 persons to the official opening of an eighth crossing across the wide Missouri.

When rain fell in several areas of South Dakota Monday an alternate plan was made to move ceremonies from the bridge site to the Community Hall if necessary.

Visitors traveled over oiled Highway 44 either from Platte or from the Highway 47 junction east in Gregory County to reach the dedication site on the east bank.

A speaker's platform was constructed on the north side of Highway 44 a few hundred feet from the bridge.

The day for dedication speaker, Secretary of Interior Stewart Udall, began at 4 a.m. when he arose at Billings, Mont.

The secretary flew to Mitchell where he and Sen. George

CROSSING OVER — An antique auto driver crosses over the Platte-River Bridge with Secretary of Interior Stewart Udall; Chief Jake Kills In Sight of St. Francis, and the widow of the late Sen. Francis Case who spearheaded a drive in Congress for approval of project funds.

Figure 12. Headline and photographs of the Platte-Winner Bridge opening and dedication event, September 27, 1966.[78]

The *Argus Leader* followed up the dedication with its series of in-depth articles reporting on the new relationship of the Rosebud area to the west of the bridge and the area on the east. The first story in the series noted, "For some, an 1½ drive has been reduced to 30 minutes," traveling from west to east, before going on to describe all the reduced distances of various routes.[79]

[77] "Bridge Future for S.D. Is Seen by Udall," *Argus Leader (Sioux Falls, S.D.)*, September 28, 1966; "Sec. Udall Dedicates 'Francis Case Bridge,'" *South Dakota Department of Highways/Pierre Newsletter* 39 (September 30, 1966): n.p.

[78] "Bridge Future for S.D. Is Seen by Udall," 1.

[79] "Rosebud Population Similar to Aberdeen Linked by Bridge," *Argus Leader (Sioux Falls, S.D.)*, September 29, 1966.

E. Work on the Platte-Winner Bridge following original construction

In 1985 modifications were made to expansion devices, girder and stringer ends, and bearings.[80] Modifications were made to the plates and cross frames and stiffeners in 1988.[81] In 1989, based on 1988 plan sheets, the original metal railings and concrete curbs were removed and replaced with concrete Jersey barriers. During the same project, new deck drains were drilled through the deck and drains were added. The superstructure was painted.[82]

In 1997 repairs were made to the pier caps and footings.[83] In 2007 the existing rubberized asphalt chip seal (RACS) for the deck was removed and the deck was ground.[84] The deck work was followed in 2007-2008 by an inspection and evaluation of the deck reinforcing steel to determine the extent of salt contamination.[85] An epoxy chip seal overlay was placed in 2009.[86] In 2011, rewelding was performed on cracked gusset plates and floor beams.[87]

F. Contextual discussion of other 4,000-foot-plus bridges in South Dakota

The 5,655.5-foot-long Platte-Winner Bridge is one of four 4,000-foot-plus bridges in South Dakota, three of which are over the Missouri River and the other of which is over the Grand River at Oahe Lake, almost at the Missouri River. The Platte-Winner Bridge is the longest of the group, the longest in the state when built, and the longest in the state today. Although South Dakota highway sources, including South Dakota newspapers, referred to Platte-Winner as the longest bridge between the Mississippi River and

[80] State of South Dakota Department of Transportation, "Plans for Proposed Project No. 0445-288, PDEMS NO. 8079, S.D. Highway No. 44, Gregory-Charles Mix Counties, Bridge Repair," 1985, State of South Dakota Department of Transportation, Office of Project Development, Pierre, S.D.

[81] State of South Dakota Department of Transportation, "Plans for Proposed Project No. BRF 004(86)291, S.D. Highway No. 44, Gregory-Charles Mix Counties, Superstructure Fatigue Retrofit," February 1988, State of South Dakota Department of Transportation, Office of Project Development, Pierre, S.D.

[82] State of South Dakota Department of Transportation, "Plans for Proposed Project No. BRF 004(86)291, Project No. BRF 0044(92)291, S.D. Highway No. 44, Gregory-Charles Mix Counties, Superstructure Fatigue Retrofit, Painting, Replace Rail, Add Deck Drains, Repair Columns, Guardrail," November 1988, State of South Dakota Department of Transportation, Office of Project Development, Pierre, S.D.

[83] State of South Dakota Department of Transportation, "Plans for Proposed Project No. ER 0044(103)291, S.D. Highway No. 44, Gregory and Charles Mix Counties, Pile Cap Repair - Piers 16 and 17," May 1997, State of South Dakota Department of Transportation, Office of Project Development, Pierre, S.D.

[84] State of South Dakota Department of Transportation, "Plans for Proposed Project No. BRF 0044(72)291, S.D. Highway No. 44, Gregory and Charles Mix Counties," January 2007, State of South Dakota Department of Transportation, Office of Project Development, Pierre, S.D.

[85] Vector Corrosion Technologies, Inc. and Vector Construction Ltd., *Concrete Corrosion Evaluation, Platte-Winner Bridge* (Prepared for the South Dakota Department of Transportation, January 2008).

[86] State of South Dakota Department of Transportation, "Plans for Proposed Project No. BRF 0044(77)291, S.D. Highway No. 44, Gregory and Charles Mix Counties, Bridge Deck Epoxy Chip Seal," January 2009, State of South Dakota Department of Transportation, Office of Project Development, Pierre, S.D.

[87] State of South Dakota Department of Transportation, "Plans for Proposed Project No. BRF 0044(78)291, S.D. Highway No. 44, Gregory and Charles Mix Counties, Structure Rehabilitation," July 2011, State of South Dakota Department of Transportation, Office of Project Development, Pierre, S.D.

the Pacific Ocean, it was never close to being the longest. Without even considering the Lake Pontchartrain Causeway in Louisiana, which is 24 miles long, the 1937 Golden Gate Bridge in San Francisco is 9,155 feet in length. In the Bridgehunter.com list of the 100 longest bridges in the United States, the Golden Gate Bridge is number 93 and the 100th bridge on the list is more than 8,000 feet long.[88] No evidence or original source for the Platte-Winner claim was ever provided by any article or speaker, despite the fact that the claim was repeated often throughout the bridge's construction and at its 1966 dedication.

That leaves the claim that the Platte-Winner Bridge was the longest bridge in South Dakota when built, a claim also made during the construction process, although not as often as the longest-in-the-West claim. It is true that Platte-Winner was the longest in the state when built and, using the 2019 database of the South Dakota Department of Transportation, it remains the longest bridge in the state.

The second longest bridge in South Dakota in 2019 is the U.S. Highway 12 (US 12) bridge at Mobridge (Bridge No. 65-000-020), built in 1959. This is a 5,058.5-foot-long steel cantilever through-truss. It is not a comparable bridge type to the Platte-Winner Bridge in either superstructure or substructure.

The third longest bridge in South Dakota in 2019 is the Forest City Bridge (Bridge No. 54-056-158), the US 212 Missouri River crossing, built in 1958. This is a 4,619.30-foot-long cantilever through-truss. It is not a comparable bridge type to the Platte-Winner Bridge in either superstructure or substructure.

The fourth longest bridge in South Dakota in 2019 is the SD-1806 Grand River Bridge (Bridge No. 16-737-253), the Grand River crossing, built in 1963. This is a 4,001.33-foot-long continuous stringer/girder bridge. It has a similar, but not identical, superstructure and a different substructure.

Despite the fact that these bridges are in deep water, a review of their original plans indicates that none of them used the substructure design employed in the Platte-Winner Bridge, with the extremely long and deep prestressed post-tensioned hollow pilings, designed after coastal deep-water substructure designs.[89]

The use of plate girders for bridge superstructures originated in the nineteenth century, so the plate girder generally is a common historical bridge superstructure type. The Platte-Winner Bridge is a welded plate girder, however, and that is a much more recent and important variation on the type. *A Context for Common Historic Bridge Types* states, "welded girders replaced riveted built-up beams as fabrication and welding techniques improved. Design, detailing, and fabrication of welded steel girders became much simpler when welding was accepted as a quality connection technique." The "first generation" of welded girders emerged in the 1950s, just prior to the Platte-Winner Bridge. In the 1970s, however, "weld flaws were discovered in the first generation" and many have been replaced. That would leave the 1960s examples, including the Platte-Winner Bridge, as the second generation of improved welded plate girders.

[88] "Longest Bridges Based on Total Length," *Bridgehunter.Com: Historic and Notable Bridges of the U.S.*, accessed April 18, 2019, http://bridgehunter.com/nation/report/longest/.

[89] State of South Dakota Department of Transportation, "Section E: Structure Plans," 2016, State of South Dakota Department of Transportation, http://apps.sd.gov/HC65C2C/EBS/lettings/electronicplans/02A6_SectionE.pdf.

The 1960s bridges are not as rare as the 1950s examples, but do demonstrate importance as early examples of the improved welding processes and techniques that corrected the problems of the first welded girder bridges of the preceding decade.[90] The Platte-Winner Bridge completed in 1966 is one of these examples.

G. Comparative dedication events

A review of the dedication events for the four longest bridges, plus the one Chamberlain Bridge (Bridge No. 08-068-084), completed in 1953, that predated the Platte-Winner Bridge clearly indicates that the Platte-Winner Bridge received a public celebration far exceeding that of any of the others. In both event size and nature of celebratory rhetoric, none of the other bridges inspired similar festivities, political representation, or expressions of regional and statewide importance to those involved. The one similarity, however, was the interest in declaring each in turn to be the largest bridge in the state, although none of the group was thought to be the longest in the West. In declaring each to be largest or longest, however, those involved usually recognized that the claim would be short-lived, with another and longer example to soon follow.

The Chamberlain Bridge was the first to be built as a result of the rising pool level of the new Fort Randall Reservoir. The Chamberlain Bridge received the spans from the Wheeler Bridge, which was forced to be removed because of the reservoir level. As the dedication was being planned, the press declared, "Structure Largest in S. Dakota," but made no claims about being largest in the West, nor did any announced plans make any reference to joining west with east or to any developmental advantages the bridge might bring to even the city of Chamberlain. The interest was limited to the construction of the bridge itself and the ways in which it incorporated spans of another bridge. Ironically, days before the planned dedication in October 1953, a sudden rise in the water forced the cancellation of the formal dedication ceremony. A companion temporary bridge was closed and the new bridge opened sooner than expected. Judging from the lack of any newspaper accounts, the planned formal dedication ceremony was never rescheduled and no event ever occurred.[91]

Approximately 15 years after the Chamberlain Bridge was completed, the Forest City Bridge (Bridge No. 54-056-158) over the Missouri River was dedicated. One of the pre-dedication news stories was headlined "Ceremonies Tuesday for Largest Bridge in Region," but the first line of the story stated: "The distinction will be temporary but the largest bridge between the Mississippi River and the West Coast is ready for dedication Tuesday." The story noted that the soon-to-be-finished Mobridge Bridge would be longer, although no evidence was presented for the largest-in-the-West claim. At the dedication, the speakers ranked no higher than the Highway Director, the president of the U.S. Highway 212 Association, and the secretary of the State Historical Society. Beyond a note that the state historian would "give a

[90] Parsons Brinckerhoff and Engineering and Industrial Heritage, *A Context for Common Historic Bridge Types* (prepared for The National Cooperative Highway Research Program, Transportation Research Council, and National Research Council, October 2005), 3–110, 3–111, http://onlinepubs.trb.org/onlinepubs/archive/NotesDocs/25-25(15)_FR.pdf.

[91] "New Highway Bridge Will Be Opened Soon," *Argus Leader (Sioux Falls, S.D.)*, October 26, 1953; "New Chamberlain Bridge Open; Dedication Rites Off for President," *Rapid City (S.D.) Journal*, October 30, 1953.

history of Missouri River bridges," there were no comments, either by speakers or the news media, about east-west relationships or any local or regional economic developments.[92]

The dedication of the US 212 Missouri River bridge at Mobridge in July 1959 featured Senator Karl Mundt and the Mobridge mayor, and included a ribbon-cutting ceremony. A photograph of the event shows Mundt cutting the ribbon in a group of a dozen or two people and a couple of flags. Mundt's reported remarks included a reference to the future holding "great potential for Mobridge," and the recreational possibilities of the Missouri Lakes for southern South Dakota. Mundt said nothing about the symbolic joining of west and east by the new bridge, or even any reported references to the bridge at all. The comments of any other speakers were not included in the relatively brief articles in the press.[93]

The Grand River Bridge at Mobridge was opened with a dedication ceremony on August 27, 1964, as the Platte-Winner Bridge was under construction. Although Governor Gubbrud was slated to make the main address and cut a ribbon, there was almost no coverage at all. In fact, no news accounts were found that covered the event and only a couple of brief notes about the schedule and the speaker. None of the accounts included any rhetoric about the meaning or importance of the bridge.[94]

Considering that the bridge dedication events were the primary opportunities for both the news media and the political representatives to express any thoughts or opinions about the bridges being opened and dedicated, there is a very clear difference between the perceived importance of the Platte-Winner Bridge and its similarly sized and situated companions. All of the bridges investigated, other than the Chamberlain Bridge, were large enough to be considered the longest in the state or even in the West. But none of them, other than Platte-Winner, were invested by the public with any particular meaning or significance for the region or the state. Only in the Platte-Winner Bridge did they see larger meaning, and in that bridge the meaning they perceived was very large, expansive, and symbolic.

H. The Platte-Winner Bridge in the context of South Dakota's East River-West River traditional divide

The concepts of west with east reflect a traditional and longstanding understanding of South Dakota as divided into West River and East River. In those terms, the Missouri River divides the state between the west region and the east region. The East River and West River division has roots in the Missouri River-divided landscape, but also in political divisions that extend as far back as the 1803 Louisiana Purchase and subsequent federal administration of the Upper Missouri Agency in the nineteenth century. During the Dakota Territory, prior to South Dakota statehood in 1889, settlement patterns reflected the landscape division of East River and West River. This included tribal settlements as well as American and western

[92] "Ceremonies Tuesday for Largest Bridge in Region," *Rapid City (S.D.) Journal*, October 19, 1958; "New S.D. Bridge to Be Dedicated," *Argus Leader (Sioux Falls, S.D.)*, October 19, 1958; "Forest City Bridge Is Dedicated," *Argus Leader (Sioux Falls, S.D.)*, October 23, 1958.

[93] "Mobridge Has Great Future Potential--Mundt," *The Daily Republic (Mitchell, S.D.)*, July 3, 1959; "Ribbon Cutting Ceremonies," *Argus Leader (Sioux Falls, S.D.)*, July 9, 1959.

[94] "Grand River Bridge Opening Due Aug. 27," *Rapid City (S.D.) Journal*, August 22, 1964; "Mobridge Bridge to Be Opened," *Argus Leader (Sioux Falls, S.D.)*, August 23, 1964.

and northern European settlements of immigrants. As one recent commentary on South Dakota history stated, "Even today . . . South Dakotans still often identify themselves as 'East River' and 'West River.'"[95]

The Platte-Winner Bridge represented the joining or "bridging" of West River and East River, of western and eastern South Dakota. Furthermore, it represented the joining in both economic development terms and in larger, almost mythological terms, as readily seen in the "Howdy Partner" cartoon used in conjunction with the Platte-Winner Bridge. The bridge's name itself perfectly embodies the east-west linkage, as Platte is the East River city and Winner is the West River city. That simple alignment may help explain why the Platte-Winner name has been so persistent, despite the official designation as the Francis Case Memorial Bridge, which is rarely encountered outside some formal documents on the bridge.

[95] Herbert T. Hoover, "South Dakota," in *The American Midwest: An Interpretive Encyclopedia* (Bloomington, Ind.: Indiana University Press, 2007), 47. East-west distinctions and differences also discussed in Dirk Johnson, "Gold Divides Dakotans as River Did," *The New York Times*, October 9, 1988, 28.

4. Evaluation

The Platte-Winner Bridge was evaluated for the National Register under *Criteria A, B*, *C*, and *D*.

A. *Criterion A*

To be eligible under *Criterion A: Event* in the area of History, a property must be associated in an important way to a significant historic event or broad pattern in history, as well as demonstrate that the event was important to the development of South Dakota, or the city of Platte in Charles Mix County and the city of Winner in Gregory County. As demonstrated in the evidence of the 1962 groundbreaking event through to the 1966 formal dedication, the Platte-Winner Bridge was consistently and strongly identified by politicians, the news media, and the general public as representing a joining of the traditional two areas of South Dakota: the West River and the East River. The Platte-Winner Bridge was viewed as joining east and west both physically and symbolically. No other major Missouri River bridge constructed and opened in the same era of the 1950s and 1960s presented any evidence of being represented in the same literal and symbolic manner, despite the fact that by bridging the Missouri River, they also linked east and west. The evidence found in journalistic analyses and in extended comments and interviews of business owners, particularly in the Sioux Falls area, indicates an additional economic-development linkage expected to come from the east-west bridging by the Platte-Winner Bridge. Among other developments, the business community envisioned a recapture by Sioux Falls businesses of the market and trade that had gone south to Sioux City, Iowa, because of east-west transportation difficulties within South Dakota.

The broad and consistent representation of the Platte-Winner Bridge, alone among Missouri River bridges of the era, as joining East River and West River to create a union rises to the level of National Register eligibility. The Platte-Winner Bridge is recommended eligible for the National Register under *Criterion A.*

B. *Criterion B*

Criterion B recognizes bridges that illustrate the important achievements of a person who was significant in the past. Structures must be compared to other properties associated with the work of the individual to identify those that best represent a person's historic contributions. Architects, artisans, artists, and engineers are often represented by their works, which are eligible under *Criterion C*. Therefore, the significant works of engineers or bridge-building firms are generally eligible under *Criterion C*, not *Criterion B*, and it is unlikely that bridges from the subject period would be significant under *Criterion B*.

The relationships of engineer Kenneth Scurr and Senator Francis Case to the Platte-Winner Bridge have been reviewed for significance under *Criterion B*. While Senator Case was closely involved in securing the funding for the bridge itself, he is far more noteworthy for his involvement with the larger Missouri River reservoir system. Kenneth Scurr also was closely involved in the design and construction oversight of the Platte-Winner Bridge, but he was closely involved with many other South Dakota bridges throughout his long career. The Platte-Winner Bridge is not viewed as having a more significant connection with Scurr than any other bridges, nor has it been identified in any existing studies as being an especially notable example of his engineering design work in relationship to his larger career.

C. *Criterion C*

To be eligible under *Criterion C: Architecture*, a property must represent the work of a master, possess high artistic value, and/or embody the distinctive characteristics of type, period, or method of construction. The Platte-Winner Bridge has two notable features that represent high artistic or engineering value in the state of South Dakota. It was the longest bridge in the state when constructed in the 1960s and remains the longest bridge in the state in 2019. In addition, the bridge substructure utilized a feature unusual in inland waters and unusual in South Dakota: the extended, prestressed, pre-tensioned, concrete piling placed with high-pressure water jets.

The extraordinary length of the bridge at 5,655.5 feet was cited as a significant engineering feature in the state, along with the very deep girders, in the South Dakota State Historic Preservation Office Historic Sites Survey Bridge Form. Based on the 2004 bridge survey by Renewable Technologies Inc., the bridge was considered not eligible at that time only because it was then less than 50 years old, the cutoff for National Register designation. In 2019, the features of extraordinary length and very large girders remain unaltered and the bridge continues to be "an outstanding example of the steel girder bridge type at a major river crossing," as it was in 2004.

In the case of Platte-Winner, the relatively early date of the welded construction should be viewed in relationship with the extraordinary length of the structure as well as the complex nature of the shop welding and field bolting to create the multi-span units of the superstructure. Understood together, these features add to the significance of the bridge.

New research in the design and construction of the bridge has indicated that the system of extremely long, hollow, prestressed, post-tensioned, concrete pilings used in the substructure is very unusual, if not unique, in South Dakota's Missouri River bridges. It was not used in the other 4,000-foot-plus Missouri River crossing examples reviewed for this evaluation. Multiple sources, including an oral history interview with Kenneth Scurr, the principal engineer involved, have confirmed that the substructure design and construction were adapted from deep-water technologies typically used in coastal areas and not in inland waterways. The reason for using this system in the Platte-Winner Bridge derives from the fact that the reservoir being spanned by the bridge had largely filled to its required pool level by the time of the construction. This meant the bridge could not be constructed in shallow water in advance of the pool increase. The deep-water system required a significant penetration of piling to the reservoir bottom and an additional considerable distance to a rock level below the silt and mud. The pile then was required to penetrate the rock to assure a secure footing. The extreme depth and pile length to be maneuvered from the reservoir surface required complex positioning to assure accurate placement for closely clustered piling in tight groups of four and six per side for each pier.

These multiple features of bridge length, girder depth, early and extensive use of welded girder fabrication technology, and substructure design and construction are significant and rise to the level of National Register eligibility. As such, the Platte-Winner Bridge is recommended as eligible for the National Register under *Criterion C*.

D. *Criterion D*

Properties may be eligible under *Criterion D: Information Potential* if they have yielded, or may be likely to yield, information important in prehistory or history. Based on research, the Platte-Winner Bridge does not appear to have the potential to yield information important in prehistory or history under *Criterion D*.

E. Integrity

The Platte-Winner Bridge retains all original elements of design and construction other than the 1989 removal of the original railings and their replacement with concrete Jersey barriers. While this alteration affects the appearance and aesthetic of the bridge, it does not alter the significant engineering features of the bridge, which remain unchanged.

F. Recommendation

The Platte-Winner Bridge is recommended eligible for the National Register under *Criteria A* and *C*.

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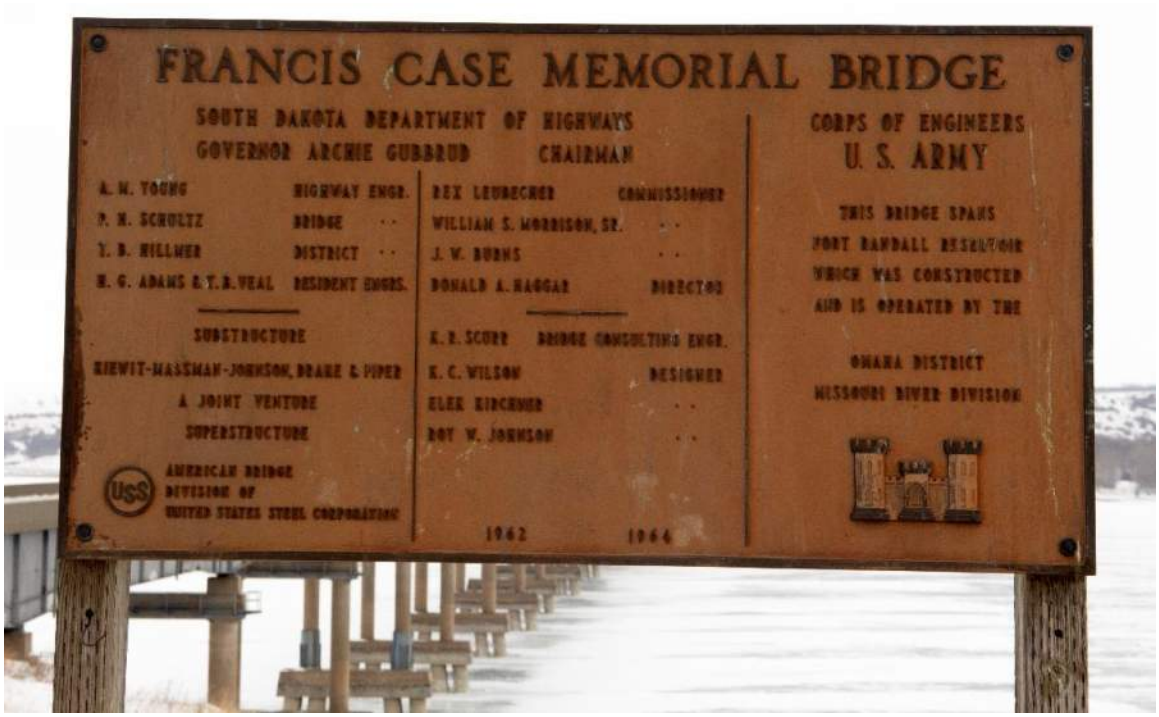
Appendix A. Additional Photographs (Mead & Hunt, Inc., February 25, 2019)

Appendix A. Additional Photographs (Mead & Hunt, Inc., February 25, 2019)

East roadway approach to the Platte-Winner Bridge, view facing west.



Francis Case Memorial Bridge official information plaque mounted at the east approach. An identical plaque is mounted at the west approach.

Below-bridge view of the east sill (abutment) area, view facing east.

View of the area on the north side of the east approach, showing the small chapel located there, view facing southwest.

View below easternmost spans of the Platte-Winner Bridge showing the floor system of floor beams, stringers, underside of deck, and the supporting eight-pile pier, view facing west.