Board of County Commissioners - Staff Report

Meeting Date: July 26, 2021 **Presenter:** Amy Ramage

Submitting Dept: Public Works - Engineering **Subject:** Workshop for project update on Swinging Bridge

Statement / Purpose: Workshop meeting for project update

Background / Description (Pros & Cons): Swinging Bridge on Swinging Bridge Road south of Jackson has exceeded its design life. It is a three-span truss bridge originally fabricated around 1915 and moved to its current location in 1960. At the County's request, this bridge was added to the Bridge Replacement Off System (BROS) program administered by WYDOT, which helps local governments fund large-scale bridge projects. Planning and design work has proceeded, including the required NEPA work, which determined that the structure was eligible for listing in the National Register of Historic Places (NRHP). Stakeholders were engaged as part of that process, including the Teton County Historic Preservation Board and adjacent landowners, including the Bridger Teton National Forest. WYDOT staff has worked to develop alternatives and cost estimates for ways to address the historical nature of the bridge.

County Public Works and WYDOT staff are now looking to the Commission for input to proceed with the project. A presentation detailing the alternatives will be presented at the workshop meeting, and generally include:

Replace bridge with new bridge – Rehome old bridge to a different location or recycle steel

- New standard vehicle bridge with sidewalk, covered by BROS funding

Construct new vehicle bridge & use existing truss as a pedestrian bridge (option 1 in WYDOT memo)
There are 2 versions of this concept:

Keep road alignment where it is and shift old bridge south
Keep old bridge where is and build new bridge to the north

- Requires acquiring right-of-way, costs not covered by BROS funding
- Additional costs for retaining walls/road realignment, also not covered by BROS funding
- County would be responsible for future maintenance and inspection of old (pedestrian) bridge
- WYDOT considered the TCHPB request in their letter dated April 15, 2021 for another option to study and cost estimate the preservation of the existing bridge in its current location as a bike/ped bridge with a vehicular bridge immediately to the south. WYDOT determined that this is not a feasible alternative because any newly constructed bridge would need to be UPSTREAM of the old bridge due to long term higher risk of failure of the old bridge, particularly in a seismic or large flood event.

Construct a new vehicle bridge with aesthetic similarities over the sidewalk. Move or recycle the old bridge (option 2 in WYDOT memo)

- True replica is not feasible as thru truss bridges are prone to being damaged by large vehicles.
- No historical element would remain on site.
- Does not fully satisfy the mitigation of the removal of historical bridge.
- Significant additional cost to County as BROS funds do not cover extra aesthetic elements.
- Not easily inspected or maintained, which will induce long term additional cost.

Permanently close the bridge to vehicular traffic, maintain a bike/ped connection (option 3 in WYDOT memo), rely on Henry's Road for access to areas east of the Snake and north of the bridge at the south end of Hog Island

- This would require the County to take on all inspection and maintenance permanently.
- Cannot leave as-is even for bike/ped use without maintenance done in near future.

- The bridge as-is likely would not withstand a large seismic event.
- Lose a key road network link for residents and emergency services.
- Any improvements would not be eligible for BROS program so other funding source needed.

It is important to note that it has been determined by the bridge engineers that it is not feasible to retrofit or upgrade the existing bridge to continue to serve as a vehicular bridge in the long term so that is no longer being considered as an option.

Stakeholder Analysis & Involvement: WYDOT conducted a formal stakeholder engagement process, including several meetings related to historic preservation. Adjacent landowners and members of the Teton County Historic Preservation Board participated. All have expressed interest in preserving the bridge. The Bridger-Teton National Forest is the landowner on the east side and will continue to be involved. If additional right-of-way is required, there will be a formal process with B-TNF staff to facilitate additional space for the bridge and associated approaches.

Fiscal Impact: Staff is seeking direction from the County Commission about whether to preserve the bridge and, if so, if the County would assume covering the additional costs beyond what was agreed to in the BROS program (9.51% of total project costs). Current estimates for simple replacement and disposition of the old bridge are $3,000,000, of which the County's portion would be approximately $286,000.

Costs to preserve the bridge depend upon which option moves forward but are roughly approximated at an additional $500,000-$1,000,000. Please note that these estimates may vary from this depending upon right-of-way needs. The TCHPB has said that they could possibly help facilitate a private fundraising campaign or pursue grants to assist with the costs of preserving the bridge.

Staff Impact: There will be significant time required by both Engineering, Road & Levee, and possibly Pathways staff on facilitating the final design and construction of this project.

Legal Review: None at this time

Staff Input / Recommendation: Staff supports preserving the bridge in some manner or location, recognizing that there are significant long term financial obligations to the County, depending on the option pursued, which are not covered within existing Capital Improvement Planning or maintenance budgets.

Attachments:
Section 4(f) Alternatives Analysis and Historical Reporting
Letter from TC Historic Preservation Board
WYDOT Memo, Truss Mitigation Options Report

Suggested Motion: No official action anticipated at this time

Mark Gordon
Governor

WYOMING Department of Transportation
"Providing a safe, high quality, and efficient transportation system"
5300 Bishop Boulevard, Cheyenne, Wyoming 82009-3340

K. Luke Reiner
Director

January 15, 2021

Teton County Commissioners
Natalie D. Macker, Chairwoman
200 S Willow Street
Jackson, WY 83001

CN22036
Bridge over Snake River, County Rd 11
Structure DEY
Teton County

Dear Ms. Macker:

The Wyoming Department of Transportation (WYDOT), in conjunction with Teton County, is proposing to replace Structure DEY (48TE973), Bridge over Snake River. The bridge is considered to be structurally and functionally deficient (see attached Alternatives Analysis). 48TE973 is a three-span, pin-connected steel, Pratt through truss bridge. The bridge was placed in this location in 1960, and is owned by Teton County; more history can be found in the enclosures. The bridge has seen little modification since its construction, with the only modification taking place in 2015 after being hit by a truck. This bridge retains its character-defining features: the trusses and original wooden components dating to 1960. For these reasons, WYDOT has determined, and the State Historic Preservation Office (SHPO) has concurred that the bridge is eligible for inclusion in the National Register of Historic Places under Criteria C. The Federal Highway Administration (FHWA), WYDOT and SHPO have agreed that the proposed bridge replacement is an adverse effect under Section 106, warranting the negotiation of a Memorandum of Agreement (MOA).

Your organization has been identified as a possible interested party, and I would like to invite you to participate in the development of a MOA. Enclosed for your information, please find a copy of WYDOT's Alternatives Analysis, detailing the replacement of 48TE973 alongside of other possible alternatives to replacement, and a copy of the cultural report on the bridge, prepared by WYDOT's consultant.

Please let me know by February 15, 2021 if you wish to participate in this process. I will then organize a meeting where we can all discuss potential cultural mitigation measures. If you have any questions or concerns please do not hesitate to contact me. I can be reached by phone at 307-777-4346 or email Stephanie.Lowe1@wyo.gov, or at the address above.

Sincerely,

Stephanie Lowe

Stephanie Lowe
Cultural Resources Specialist
Environmental Services

Enclosures

CC: Sara Needles, SHPO
Bob Bonds, FHWA
Bob Hammond, WYDOT

Mark Gordon
Governor

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Director

January 11, 2021

CN22036
Bridge over Snake River
Structure DEY
Teton County

The attached alternatives analysis is produced in accordance with the *Programmatic Section 4(f) Evaluation and Approval for FHWA Projects that Necessitate the Use of Historic Bridges*. This sets forth the basis for a programmatic Section 4(f) approval that there are no feasible and prudent alternatives to the use of this historic bridge structure to be replaced with Federal funds and that the project includes all possible planning to minimize harm resulting from such use.

This approval is made Pursuant to Section 4(f) of the Department of Transportation Act of 1966, 49 U.S.C. 303, and Section 18(a) of the Federal-Aid Highway Act of 1968 23 U.S.C. 138.

Scott Gamo, PhD
Environmental Services Manager, WYOT — Jan 8, 2021
Date

For

Bryan Cawley, P.E.
Wyoming Division Administrator, FHWA — Date

Section 4(f) Alternatives Analysis
WYDOT Project CN22036
Snake River Bridge, Structure DEY
Teton County Road 11, Milepost 0.10
By Stephanie Lowe

Structure DEY (48TE973) is a three-span, pin-connected steel, Pratt through truss bridge. The bridge was placed in this location in 1960, and is owned by Teton County; a longer history will be provided below. A description of the bridge is provided by Rosenberg Historical Consultants (RHC) (2019):

> ...The overall dimensions of the site are 322' NS by 16' EW (back to back abutment length). The middle bridge span is 130' long, and the spans on either end are 92'10" each. The width of the top bridge from curb to curb is 15' (clear roadway width), and the roadway approach is 16' wide. The top chords consist of two channels by batten plates and lacing. The bottom chords consist of four angles connected by batten plates. The verticals consist of two channels connected by lacing. The diagonals consist of bars and rods. The bridge features lattice guardrails. The bridge has a wood timber deck and wooden stringers with steel floor beams. When the bridge was moved to this location in 1960, a new wooden deck and treated wooden stringers were constructed. The bridge has a minimum vertical clearance of 12'3". The structure has sill type concrete abutments with footings. Two tapered concrete piers support the bridge spans. The abutments and piers were also constructed in 1960.

Structure DEY (48TE973) was designed by the Wyoming State Highway Department and constructed by Charles M. Smith of Thermopolis, Wyoming. This structure's history extends beyond that, however, and the truss bridge spans were originally used as part of the Wilson Bridge that was built in 1915 and crossed the Snake River several miles upstream between the towns of Jackson and Wilson. There was a bridge that was built upstream of 48TE973 in 1938; it was a swinging bridge built by Charles McCrary that did not survive a reroute of the highway and a landslide. When the 1915 Wilson Bridge was demolished and replaced with a modern bridge, three truss spans were moved to this location and constructed with the new bridge components- a new wood timber deck and wooden stringers. Additionally, new concrete abutments were built in 1960 to support the relocated trusses and new deck. DEY was modified in 2015 when a truck hit and damaged the west span of the bridge. Sensitive rehabilitation of the west portal bracing and portal strut were completed during the summer of 2015. It retains its character-defining features, the trusses and original wooden components. 48TE973 has now been at this location long enough to be considered eligible for listing on the National Register of Historic Places (NRHP).

Structure DEY represents the themes of Transportation and Modern Historic Period. RHC have surveyed the bridge and determined that DEY is eligible to the NRHP under Criteria A because it is associated with events that have made a significant contribution to our history, more specifically the transportation development in Teton County, Wyoming. RHC also believes this structure is eligible to the NRHP under Criteria C, because it is the only three-span, pin-connected steel Pratt through truss bridge in the county, and on the state road system.

These types of structures are becoming rarer as the current load demands require bridges meet modern demands.

Structure DEY has been determined eligible for listing in the NRHP by WYDOT under Criterion C due to the structure's embodiment of distinctive characteristics of a type, period, and method of construction. After preliminary consultation with the State Historic Preservation Office (SHPO), it was decided that DEY was not eligible to the NRHP under Criterion A, given much of its original history was lost during the 1960 relocation (Brian Beadles personal communication to Jason Bogstie 2020). WYDOT's determinations of eligibility under Criterion C received concurrence by the SHPO on June 1, 2020.

Figure 1: Structure DEY (48TE973) view to west (Rosenberg 2019).

Purpose and Need

The intent of this project is to provide a safe crossing of the Snake River by means of a bridge that supports the weight of modern vehicles. DEY has a current weight restriction of 18 tons. The maximum weight limit of modern trucks is 40 tons (Brian Rentner, Personal Communication to Jason Bogstie, 2020). Inherent to their design, truss bridges have a lower weight capacity that is incompatible with modern vehicles and trailers. Additionally, DEY is fracture critical (WYDOT 2019). This term is used for bridges that contain a single element whose failure will result in a total bridge collapse. Use of this structure by heavier modern vehicles, trailers, and other equipment poses a risk of damage and possible catastrophic failure of the structure.

WYDOT's 2017 inspection report for DEY highlights a number of issues. The bridge deck is rated as being in 'fair' condition, the superstructure is rated as 'serious' condition, and the substructure is rated as 'fair' condition. The bridge deck itself is moderately worn, with the wooden deck runners showing decay and split. Regarding the serious condition of the superstructure, the truss diagonals are bent, twisted and loose and the bearing pins are worn. Additionally, some of the truss members are showing a 5/8" loss of steel. Furthermore, the concrete piers are heavily scaled with exposed reinforcing steel, the truss roller bearings are misaligned and the east abutment is beginning to undermine. There is also decay and structural issues in the footings under the water (WYDOT 2017).

Alternatives Analysis

DOT Section 4(f), provides substantive protection of historic properties, by prohibiting the use of a historic property for transportation projects unless no feasible and prudent alternative exists to meet the purpose and need of the project. When no feasible and prudent alternative exists to avoid the property, Section 4(f) mandates that the transportation agency take all possible measures to minimize harm to the affected property. If no alternative can be found that will result in the least overall harm to an affected property, then the agency must formulate a mitigation strategy for impacts to the affected historic property. The Federal Highway Administration, on July 5, 1983, established a programmatic protocol for the evaluation of historic bridges under Section 4(f). This protocol requires the analysis of three avoidance alternatives: 1) do nothing; 2) rehabilitate the structure without affecting the qualities of integrity that make it eligible to the NRHP; 3) build a new structure at a different location without affecting the historic integrity of the old bridge. These alternatives must be evaluated within the context of meeting the purpose and need of the transportation project, and are weighed with respect to impacts on all historic properties, and other resources and conditions.

Do Nothing

Under this alternative, WYDOT would not proceed with the project, and the bridge would be left undisturbed. This alternative would avoid the use of the bridge, and have no effect on those characteristics that qualify it for inclusion on the NRHP. However, the do nothing alternative does not provide a safe crossing of the Snake River for modern traffic, which is heavier than the vehicles on the road at the time DEY was constructed. It would leave a structurally deficient bridge in place for public use that cannot meet the weight demands of modern vehicles. This alternative does not meet the purpose and need of the project, and is therefore not feasible and prudent.

Rehabilitation without Affecting the Historic Integrity of the Bridge

Under this alternative, DEY would be rehabilitated in such a way as to not affect the historic integrity of the bridge. For a truss bridge, the historic integrity is derived predominantly from the trusses themselves. In order to meet the purpose and need, DEY requires replacement of all deck components and steel floor beams. All truss members would have to be replaced or modified; modification would require transporting the trusses away from the project site to a steel fabrication ship. The cost to rehabilitate the existing structure to current design and functional standards would likely exceed the cost to replace the existing structure (WYDOT Bridge Memo 2020). Teton County would also need to find an alternative path for the proposed 7’ sidewalk being proposed to cross the Snake River at this location with the proposed bridge. Given this, rehabilitation without affecting the historic integrity of 48TE973 is not possible and is tantamount to complete replacement of the structure. Replacement or substantive modifications of the character-defining features of this truss bridge (the trusses) is an adverse effect under Section 106, and does not avoid or minimize 4(f) use. For this reason, rehabilitation is not feasible and prudent.

Build a New Structure at a Different Location Without Affecting the Historic Integrity of the Old Bridge

Under this alternative, WYDOT would construct a new bridge on a new alignment, and leave the historic bridge in place. This would allow for the preservation of the historic bridge, and no 'use' of the bridge under Section 4(f).

Based upon a review of satellite imagery, construction of a new bridge upstream of the existing structure would require the taking of new right-of-way (ROW), and the demolition of several privately owned structures. This would result in additional project costs in attempts to purchase private lands, and if the owners were unwilling to sell at fair market value, additional issues and costs associated with eminent domain would result. Construction of a new bridge downstream of the current structure poses similar risks and issues. A new bridge constructed downstream is at risk should something catastrophic occur to the current structure, which is aging and at risk of eventual failure. Further, funds provided through the Bridge Replacement Off-System (B.R.O.S.) program would not cover these substantive costs, as they are restricted to bridge replacement and incidental road construction necessary to tie the existing road into the new bridge. In addition, a new alignment will cause unknown impacts to Type 2 and Type 6 wetlands and the Snake River, a Waters of the U.S. (WUS). This bridge is located in crucial winter range for both elk and moose. It is currently unknown at this time what the situation of raptor nests is; a survey is planned for the spring of 2021. Due to this bridge being located adjacent to U.S. Forest Service land, a biological survey will need to address Forest Service sensitive species. Given the above, construction on a new alignment is not feasible and prudent.

Finally, it is unlikely that maintenance would continue on DEY, which would result in an adverse effect under Section 106 through benign neglect. For all of the above reasons, this alternative is not feasible and prudent.

Construction of a New Bridge on the Existing Alignment

Under this alternative, WYDOT would construct a new bridge on the same alignment as the old bridge. Replacement on existing alignment requires the removal of DEY. This constitutes an adverse effect under Section 106, and a use of the historic property under Section 4(f). Construction on the existing alignment does not require additional private lands, though construction permits are anticipated, and does not impact any existing buildings. Construction on existing alignment does not risk additional impacts to the Snake River or to Type 2 or Type 6 wetlands. Although this project is located in a Section 7 ESA range for several listed species, there has been a high level of disturbance and a lack of suitable habitat that this project should have little to no effect on listed species. For these reasons, replacement on the existing alignment is both feasible and prudent.

Conclusions

Rehabilitation without loss of the historic integrity and adverse effects to Structure DEY is not possible without impacting historic integrity, and is not feasible and prudent. Construction of a new bridge to either side of the existing structure risks costly impacts to private landowners and existing buildings, and poses additional unknown risks to wetlands and a Waters of the U.S. A new bridge also results in adverse effects to DEY through benign neglect. Replacement of the structure on existing alignment still results in an adverse effect to the historic bridge, but minimizes effects to adjacent wetlands. For these reasons, constructing a new bridge on the existing alignment is the only feasible and prudent alternative of those under consideration.

References

Rosenberg, Robert and Elizabeth Rosenberg

2019 Report of Historical Investigations, Bridge over Snake River, Structure DEY. Teton County, Wyoming. Report on file, Wyoming Department of Transportation, Cheyenne, WY.

Rumsey, Carla J.

2020 *Aquatic Resources Inventory Report for County Road 11 Bridge over Snake River WYDOT Project No. CN22036 Teton County, Wyoming*. Report prepared by Hydro Logic, LLC. for the Wyoming Department of Transportation, Cheyenne.

Wyoming Department of Transportation

2017 Wyoming Department of Transportation Final Reconnaissance Report, Structure DEY. Report on file. Wyoming Department of Transportation, Cheyenne, WY.

2019 Wyoming Department of Transportation Inventory and Inspection Report, Structure DEY. Report on file. Wyoming Department of Transportation, Cheyenne, WY.

2020 Wyoming Department of Transportation Rehabilitation of Bridge Over Snake River, Structure No. DEY. Report on file. Wyoming Department of Transportation, Cheyenne, WY.

REPORT OF HISTORICAL INVESTIGATIONS
WYDOT PROJECT NO. CN22036/PE21
BRIDGE OVER SNAKE RIVER, STRUCTURE DEY
TETON COUNTY, WYOMING

10/3/2019

by
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prepared for
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April 2020

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April 2020

ABSTRACT

The Wyoming Department of Transportation (WYDOT) in conjunction with Teton County, is proposing to replace Bridge over Snake River, Structure DEY, on Teton County Road 11. Proposed replacement is part of WYDOT's Bridge Replacement Off-System (B.R.O.S.) Program. Proposed work entails demolishing the bridge and replacing it with a structure meeting modern design and safety standards. Minor roadwork will be needed at the bridge ends to tie the existing roadway into the replacement bridge.

As a result of the above project, WYDOT requested that Rosenberg Historical Consultants complete National Register of Historic Places (NRHP) documentation and evaluation of Structure DEY. The Consultants completed a full re-record and conducted research, survey, and National Register evaluations for this site and recommend the following:

1) a finding of **eligible** for Site 48TE973, Bridge over Snake River, Structure DEY. The proposed project will have an **Adverse Effect** on this historic resource.

UNDERTAKING/PROJECT DESCRIPTION

The Wyoming Department of Transportation (WYDOT) in conjunction with Teton County is proposing to replace Bridge over Snake River, Structure DEY, on Teton County Road 11. Proposed replacement is part of WYDOT's Bridge Replacement Off-System (B.R.O.S.) Program. Proposed work entails demolishing the bridge and replacing it with a structure meeting modern design and safety standards. Minor roadwork will be needed at the bridge ends to tie the existing roadway into the replacement bridge.

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1) a finding of **eligible** for Site 48TE973, Bridge over Snake River, Structure DEY. The proposed project will have an **Adverse Effect** on this historic resource.

In the *Inventory Results* section of this report, the historic site is discussed in detail, including physical description, historic background, and evaluation for the National Register of Historic Places. Site impacts are discussed, and representative photographs of the site are provided. A Wyoming Cultural Property Form (WYCPF) was completed for this resource and is appended.

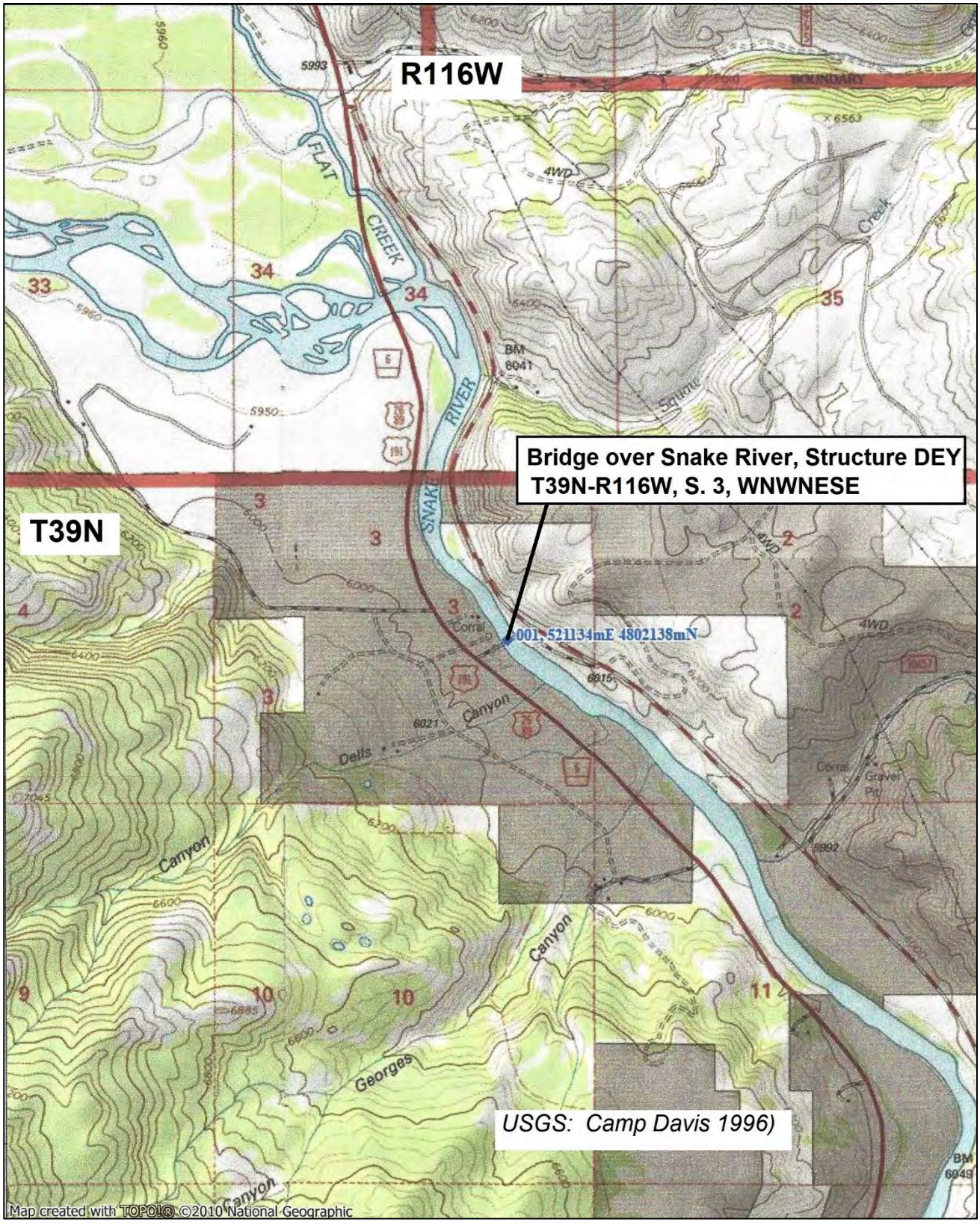

Figure 1. Portion of the Camp Davis WY 7.5' quadrangle (1996) showing location of Site 48TE973.

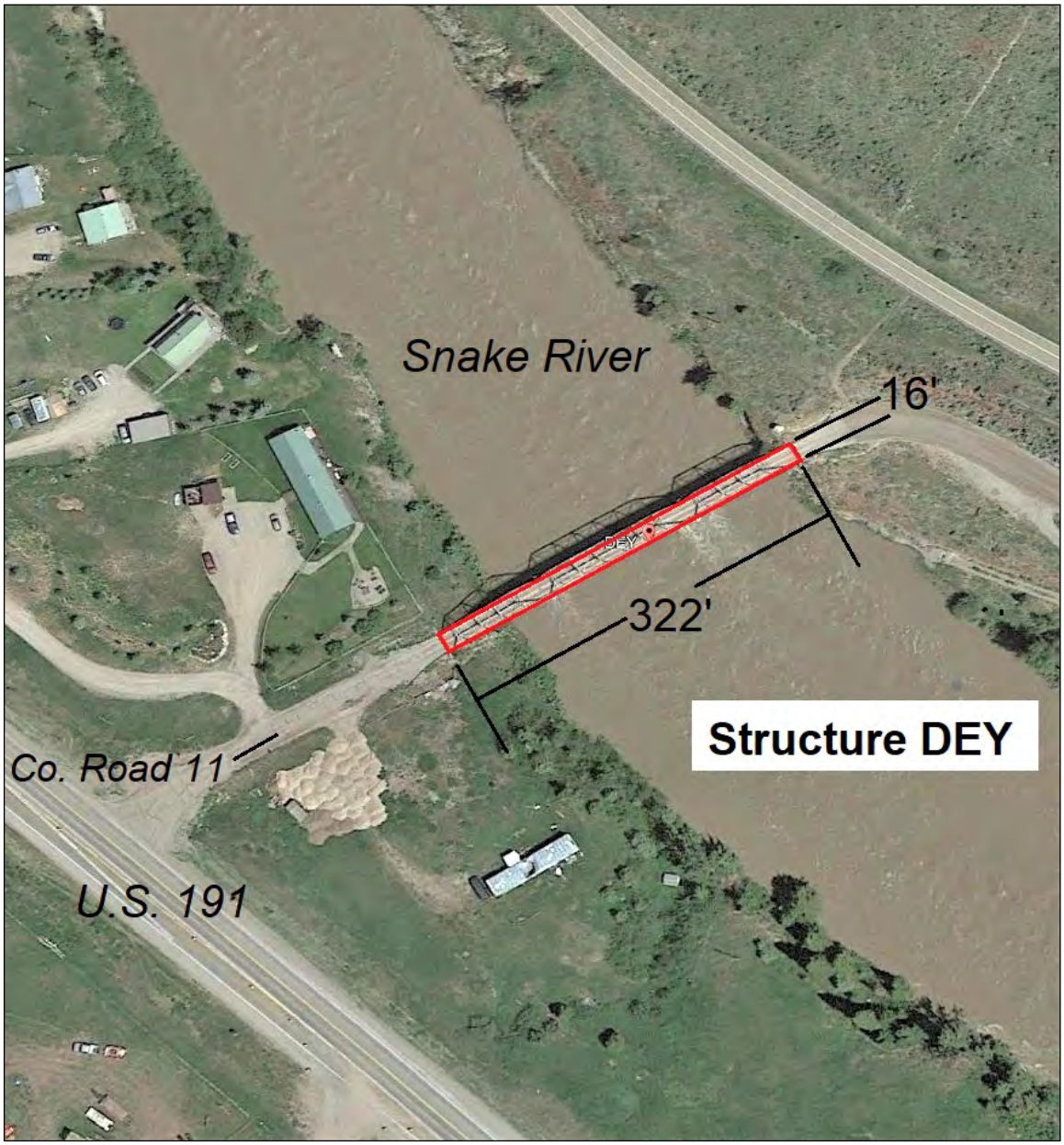

Figure 2. Aerial photo of Structure DEY, Bridge over Snake River.

REPRESENTATIVE PHOTOGRAPHS

(All photos by Rosenberg Historical Consultants, taken on 10/3/2019 as part of the re-record of Structure DEY for the Historic Bridge Inventory Statewide. Complete contemporary and historic photos and bridge plans are found at the end of this report.

Figure 3. Overview of Structure DEY, which crosses the Snake River about 4 miles north of Hoback Junction on Teton County Road 11. View to east-northeast.

Figure 4. View to west-southwest

Figure 5. View to west-northwest

PRESENT BUILT ENVIRONMENTAL SETTING

Site 48TE973, Bridge over Snake River, Structure DEY, is located about 7.5 miles south of Jackson, Wyoming on U.S. Route 191. The bridge is located about 400 feet east of the highway on County Road 11 (also called Swinging Bridge Road or Henry's Road.)

The general project area is located in the south portion of Jackson Hole within the Snake River Valley. The Snake River Range is located to the west, and the Gros Ventre Range is situated to the east of the Snake River Valley in this area. Munger Mountain is located about 3 miles southwest of the project area. Dells Canyon begins on the northeast slope of Munger Mountain; this ephemeral drainage flows northeasterly into the Snake River. The elevation is 5980 feet. The topography on the west side of the Snake River consists of steep, rounded wooded mountain slopes with open, sagebrush clad meadows. The east side of the Snake River consists of steep sagebrush covered hills. The slopes are incised by ephemeral and perennial drainages that flow into the Snake River. The relatively level river terrace on the west side of the river is occupied by residences, outbuildings, barns, and trailer homes associated with U.S. Route 191. The Snake River flows through a riparian area on both banks, and the vegetation is dominated by patches of narrow leaf cottonwood, aspen, conifers, and a variety of shrubs and bushes and grasses. Sagebrush generally dominates the open areas along the river.

BACKGROUND RESEARCH / CULTURAL RESOURCE REVIEW

The Consultants were requested to record and evaluate one site: Structure DEY, Bridge over Snake River on Teton County Road 11. No unanticipated resources were involved. In addition to the WYCRO File Search, the Consultants researched the *Biennial Reports* of the Wyoming State Highway Commission at the Wyoming State Library. Available bridge and highway data were provided by WYDOT.

Structure DEY, Site 48TE973, was recorded by Fraser Design for the Wyoming Truss Bridge Survey in 1981. Fraser Design recommended a finding of not eligible (with no SHPO review). In 2005, Michael Cassity re-recorded this site for the Teton County Historic Site Survey and conducted extensive research. Cassity determined that the bridge was eligible to the National Register of Historic Places under Criterion C for its engineering attributes.

SURVEY METHODOLOGY

Rosenberg Historical Consultants were requested to record and evaluate one specific bridge, Structure DEY; therefore, a formal Class III inventory with transects, collections, etc., was not conducted. The Consultants completed a full re-record in October 2019 as part of the Historic Bridge Inventory Statewide. It was mapped and photographed, and the surrounding environment was also photographed. No artifacts were inventoried or collected.

The site was recorded on a Wyoming Cultural Properties Form (appended) that includes Form 8I, Historic Structure/Object Description, photographs, maps, and graphics. The survey was conducted on October 3, 2019. Weather conditions were cool, sunny, and dry.

INVENTORY RESULTS

Site 48TE973: Bridge over Snake River, Structure DEY (T39N-R116W, Section 3, W/NW/NE/SE)

Physical description

(The bridge is oriented about 45 degrees but will be described using the four cardinal directions.)

Structure DEY is a three-span, pin-connected steel, Pratt through truss bridge over the Snake River about 7.5 miles south of Jackson, Wyoming. It is situated on Teton County Road 11, a gravel road. The overall dimensions of the bridge are 322’ NS by 16’ EW (back to back abutment length). The middle bridge span is 130’ long, and the spans on either end are 92’10” each. The width of the bridge from curb to curb is 15’ (clear roadway width), and the roadway approach is 16’ wide. The top chords consist of two channels by batten plates and lacing. The bottom chords consist of four angles connected by batten plates. The verticals consist of two channels connected by lacing. The diagonals consist of bars and rods. The bridge features lattice guardrails. The bridge has a wood timber deck and wooden stringers with steel floor beams. When the bridge was moved to this location in 1960, a new wooden deck and treated wooden stringers were constructed. The bridge has a minimum vertical clearance of 12’3”. The structure has sill type concrete abutments with footings. Two tapered concrete piers support the bridge spans. The abutments and piers were also constructed in 1960. The current physical condition of the superstructure of the bridge is rated as serious by WYDOT.

Historic Background

Pratt Truss

The Pratt Truss was patented in 1844 by Thomas and Caleb Pratt. It is identified by vertical members acting in compression and diagonals acting in tensions. This design feature reduced the length of the compression members to help prevent them from bending or buckling. The pin-connected Pratt through truss is the most common type of early twentieth-century truss bridge. The pony truss form was used for short spans and light vehicular traffic. Numerous variations of the basic Pratt design were later introduced, especially as increasing railroad traffic required a stronger bridge. The Parker truss altered the top and bottom chords, and the lenticular truss had curved upper and lower chords. The standard Pratt truss was strengthened in the 1870s with the implementation of sub-struts and sub-ties and met the requirements for heavier railroad locomotives and rolling stock. The Baltimore truss and the Pennsylvania truss are examples of this modification for railroad use. In 1847, Squire Whipple patented a truss that utilized the basic form of the Pratt, but lengthened the diagonals to extend across two panels, allowing long bridge spans (Parson Brinkerhoff and Engineering and Industrial Design 2005: 2-6 and 2-7; 2-11; Comp and Jackson 1977).

Bridge over Snake River, Structure DEY

The first bridge at this location was a swinging bridge built by Charles McCrary in 1938 (see Figure 6). It provided access over the Snake River to the property of Ora and Mary Grisamer on "Hog Island." It eventually succumbed to a reroute of the highway and a landslide and was replaced by the current bridge, Structure DEY, which was built a short distance downstream (No Author, "Bridges Through Time," 2008.)

In March 1960, the Wyoming State Highway Department contracted with Charles M. Smith of Thermopolis to construct the new bridge. Smith utilized plans drawn up by the Wyoming Highway Department (WHD Project SC CFM4968, Drawing No. 3399, see attached plans). The bridge was constructed using parts of an existing five-span truss bridge (the "first Wilson bridge") that was built in 1915 and crossed the Snake River several miles upstream between Jackson and Wilson on State Highway 22. (see Figure 7.) In 1959, this bridge was razed and replaced. Smith retained three of the five spans from the 1915 bridge and moved them to the current site in 1960. The bridge was pin-connected, so it was relatively easy to disassemble, move to the new location, modify the length of two of the spans, and reassemble. The bridge plans for the project indicate that it received a new wood

timber deck and wooden stringers when it was moved to its new location. In addition, new concrete abutments were built, and two concrete piers supported the truss spans (Cassity 2005; No Author, "Bridges Through Time," 2008; WHD Project SC CFM4968, Drawing No. 3399).

On April 16, 2015, a large truck damaged the west span of the bridge. The bridge was closed for repairs. Rehabilitation of the west portal bracing and portal strut were conducted using similar materials, and the bridge was opened to traffic on September 15, 2015 (Buhko 2015; Board of County Commissioners, Teton County 2019).

In 2014, Teton County requested that WYDOT consider Structure No. DEY for the Bridge Replacement Off-System program. WYDOT conducted a reconnaissance inspection in regard to that request on May 25, 2017. That report indicated that the bridge was structurally deficient (Board of Commissioners, Teton County, 2017). WYDOT and the Teton County Commission subsequently performed a Cooperative Agreement "…to establish the terms and conditions by which the County shall reimburse WYDOT for its expenditures related to the federally funded, WYDOT administered Bridge Replacement-Off System Program." According to the Board of County Commissioners Staff Report (2019), WYDOT has currently scheduled the bridge replacement for fiscal year 2023.

NATIONAL REGISTER STATUS: According to the *Wyoming Comprehensive Preservation Plan* (Massey 1989), the Bridge over Snake River, Structure DEY represents the Transportation Theme, and the Modern (1956-present) Historic Period. The geographical area is Teton County, Wyoming.

It is the opinion of Rosenberg Historical Consultants that Structure DEY is eligible to the National Register of Historic Places (NRHP) under Criteria A because it is associated with events that have made a significant contribution to our history, that is, the emerging transportation system in Wyoming and Teton County.

The site is not eligible to the National Register of Historic Places under Criterion B, because it is not associated with the lives of persons significant in our past.

Under Criterion C, this is the only three-span, pin-connected steel Pratt through truss in use in the county and state road system. Pin-connected structures are now uncommon. Structure DEY is a three-span, pin-connected steel Pratt through truss bridge. *The Vehicular Truss and Arch Bridges in Wyoming* National Register of Historic Places Nomination, completed by Clayton B. Fraser of Fraserdesign in 1982, utilized several specific criteria for determining the National Register eligibility of

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Finally, the site is not eligible to the NRHP under Criterion D. It is not likely that the site may yield information important in history that is not readily available in the written and oral record (National Park Service 1991:2, 21-24). It is not likely to possess configuration of artifacts, soil strata, structural remains, or other natural or cultural features that make it possible to test a hypothesis or hypotheses about events, groups, or processes in the past that are relevant to important research questions in the social or natural sciences or the humanities; or that corroborate or amplify currently available information suggesting that a hypotheses is either true or false (National Park Service 1991:21).

In regard to the seven aspects of physical integrity, the bridge structure was moved from a different location in 1960; however, it has remained in place at the current location for over 50 years and therefore retains *integrity of location. Integrity of design, materials, and workmanship* are rated as good; three of the five spans were moved to this location in 1960, and the bridge appears to retain nearly all of its character-defining features. The current bridge structure is rusted and in need of painting. The west truss span was damaged by a large truck in 2015 and repaired (WYDOT Rehabilitation Plans, 2015; WYDOT Reconnaissance Report, 2017). The wooden deck and stringers are well-worn and weathered and date from 1960 when the bridge was moved to this location. According to WYDOT rehabilitation plans dated 2015, some of the wooden running planks and one curb section were replaced (WYDOT Rehabilitation Plans, 2017). *Integrity of setting* is rated as fair to good. There is some modern residential development located on the west side of the bridge that is associated with U.S. Route 191 and the relatively gentle topography there. However, the east side remains relatively pristine. The gravel county road that crosses the bridge is only lightly traveled. *Integrity of feeling and association* are rated as good, as the bridge retains fair integrity of setting and fair to good physical integrity for its age and has not been modified.

IMPACTS: WYDOT proposes to demolish Structure DEY, Bridge over Snake River, and replace it with a structure meeting modern design and safety standards.

SITE RECOMMENDATIONS: Site 48TE973 is considered eligible to the National Register of Historic Places by Rosenberg Historical Consultants. Therefore, the proposed project will have an **adverse effect** on this historically significant cultural resource, and it is recommended that a Memorandum of Agreement (MOA) be executed between the appropriate parties involved in order to mitigate the adverse effects to the site.

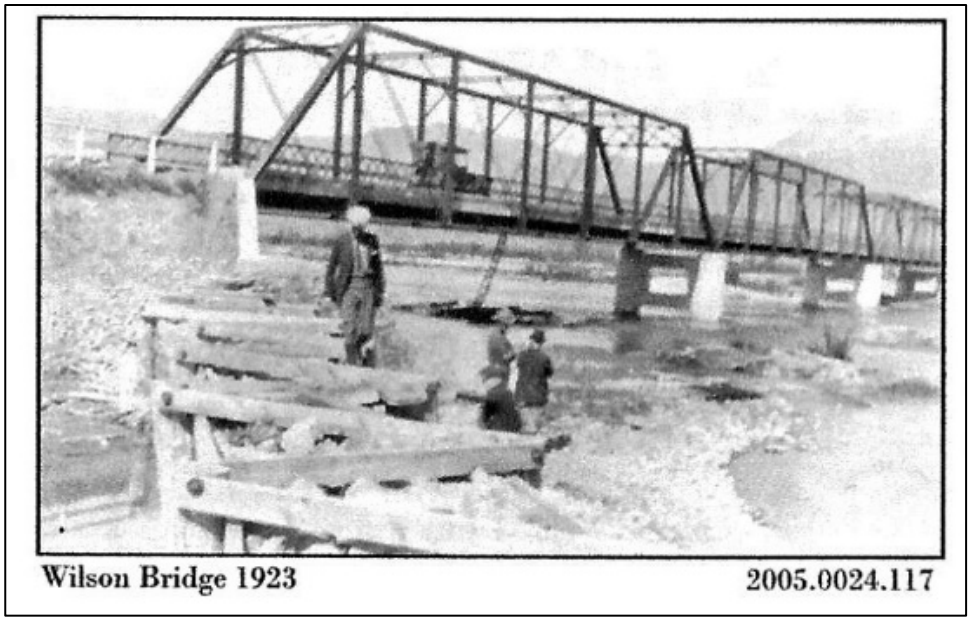

Figure 6. "The First Wilson Bridge" was built in 1915 and spanned the Snake River on the Jackson-Wilson Road. It was replaced in 1959, and parts of the bridge were used in the construction of Structure DEY in 1960. *(courtesy of "Bridges through Time," Jackson Hole Historical Society & Museum Chronicle, Vol. XXVIII, No. 1,Spring 2008)*

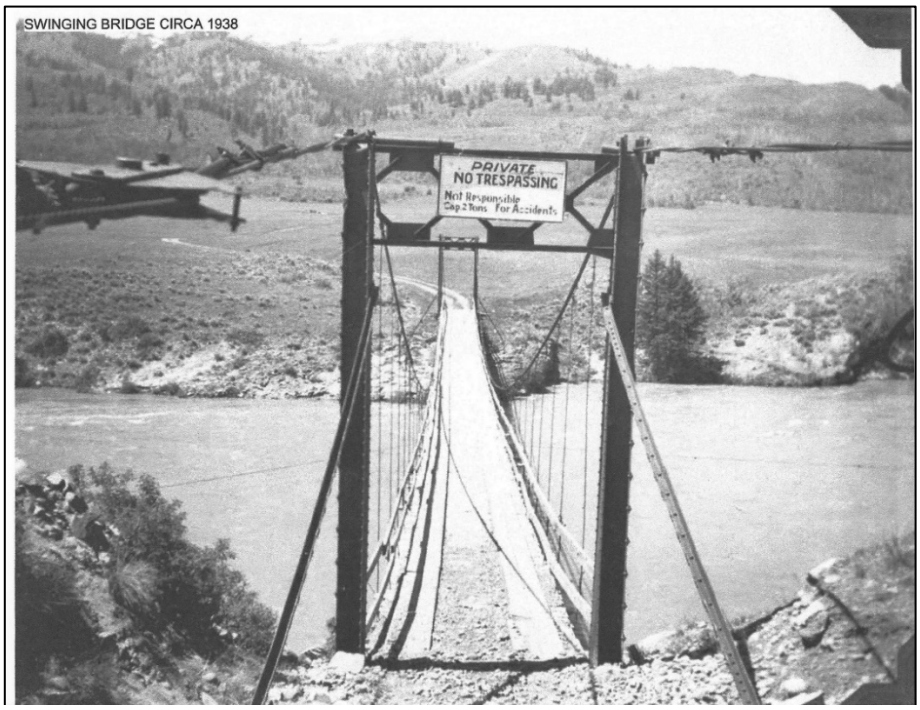

Figure 7. This swinging bridge was built in 1938 across the Snake River a short distance north of the current bridge, Structure DEY. After a reroute of the highway and a landslide, it was replaced in 1960 by the current bridge. *(courtesy of Teton County Board of County Commissioners, Staff Report, 2019)*

Figure 8. South side of Structure DEY, view to west. *(Photo by Rosenbergs, 10/3/2019)*

Figure 9. Close up of piers and trusses, view to west. *(Photo by Rosenbergs, 10/3/2019)*

Figure 10. Bridge deck, view to west-southwest. *(Photo by Rosenbergs, 10/3/2019)*

Figure 11. Detail of pier and underside of bridge, view to west. *(Photo by Rosenbergs, 10/3/2019)*

Figure 12. Underside of wood deck with wooden stringers and steel floor beams.
(Photo by Rosenbergs, 10/3/2019)

Figure 13. Underside of east end of bridge and the east abutments. *(Photo by Rosenbergs, 10/3/2019)*

Figure 14. Upstream from bridge, view to north-northwest. *(Photo by Rosenbergs, 10/3/2019)*

Figure 15. Downstream from bridge, view to south-southeast. *(Photo by Rosenbergs, 10/3/2019)*

Figure 16. In April 2015, a large truck damaged the west span. It was repaired and opened for traffic in September 2015. *(courtesy of Teton County Board of County Commissioners, Staff Report, 1/15/19)*

BRIDGE PLANS 1960

(WYOMING STATE HIGHWAY DEPARTMENT, PROJECT SC-CFM 4968, DWG. NO. 3399)

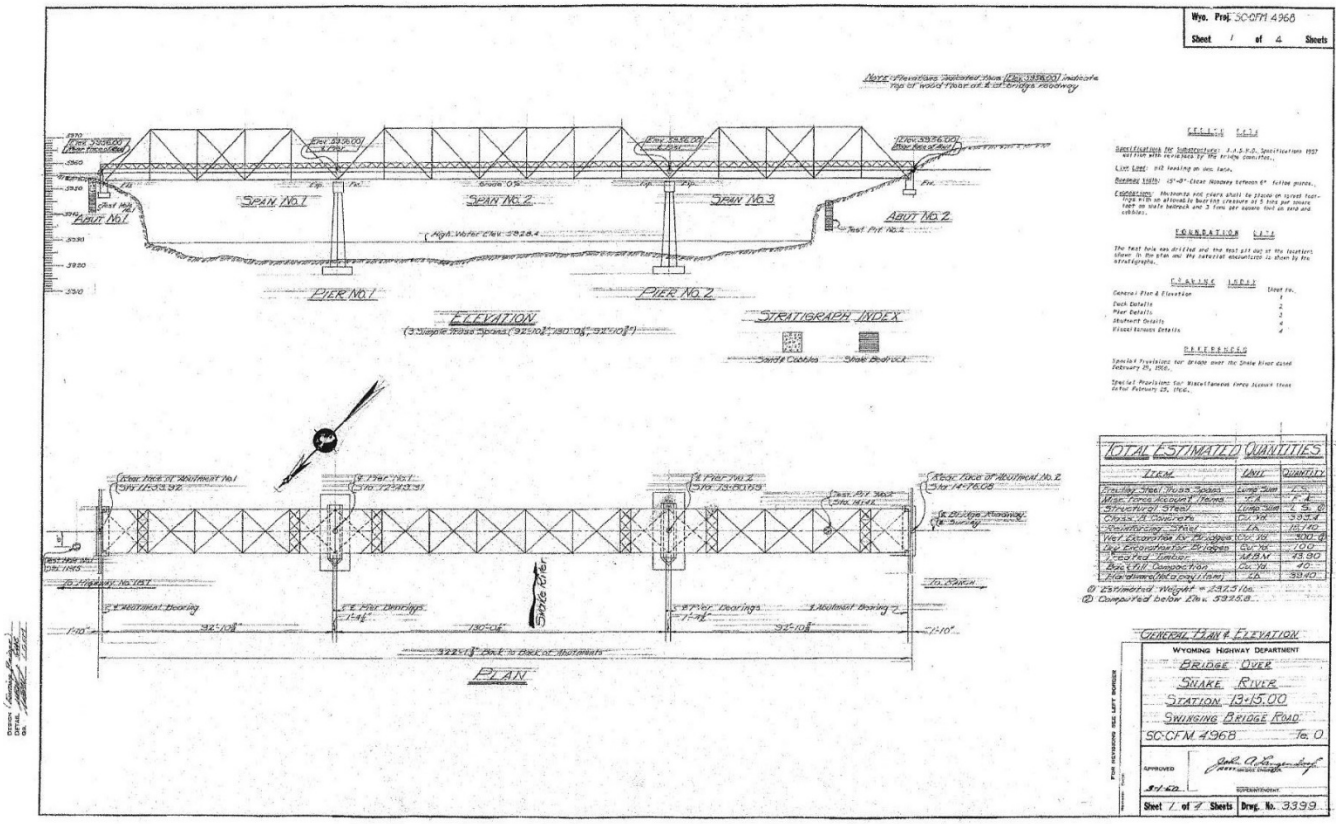

Figure 17.

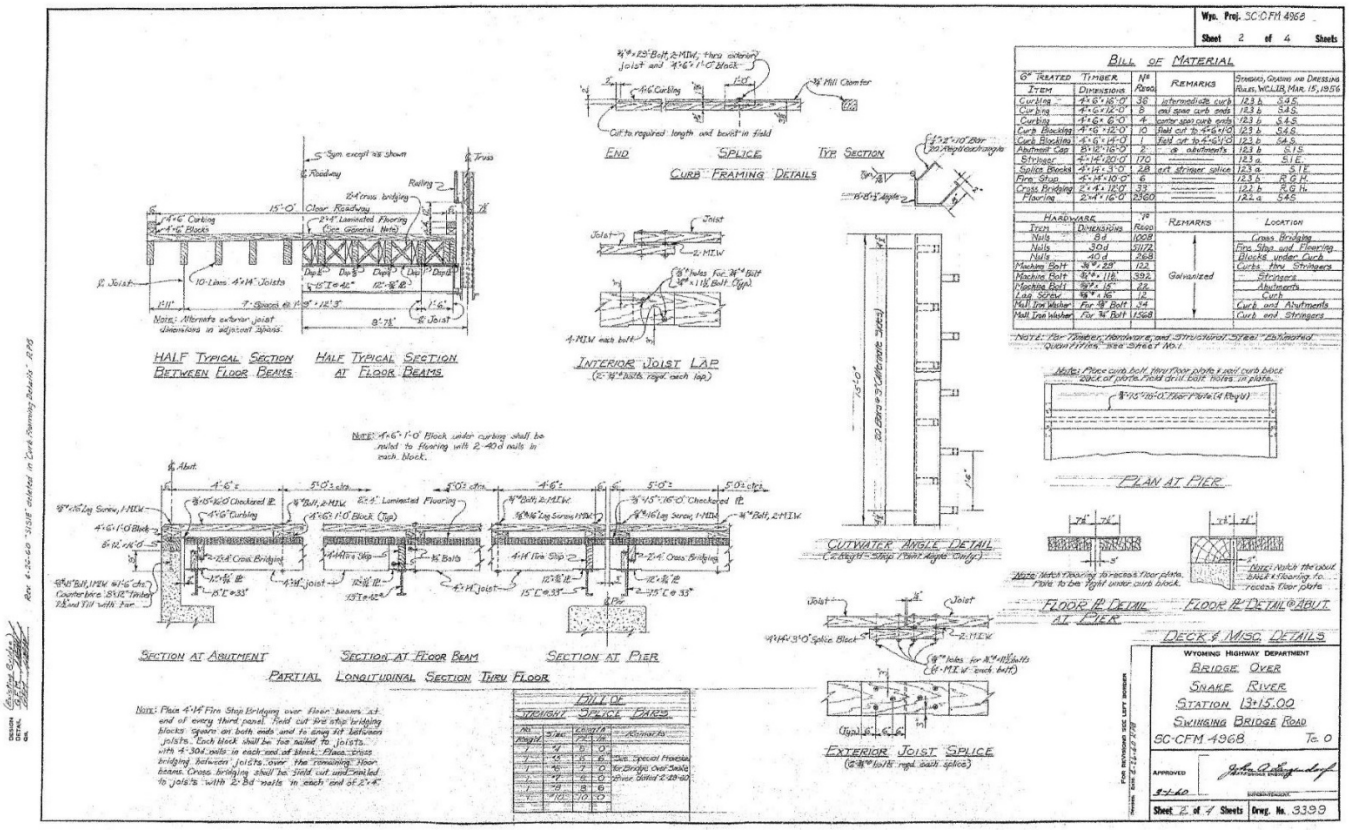
Wyo. Proj. SC-CFM 4968
Sheet 2 of 4 Sheets
BILL OF MATERIAL
HALF TYPICAL SECTION BETWEEN FLOOR BEAMS
HALF TYPICAL SECTION AT FLOOR BEAMS
INTERIOR JOIST LAP
CURB FRAMING DETAILS
CUTWATER ANGLE DETAIL
PLAN AT PIER
FLOOR R. DETAIL AT PIER
FLOOR R. DETAIL @ ABUT.
SECTION AT ABUTMENT
SECTION AT FLOOR BEAM
SECTION AT PIER
PARTIAL LONGITUDINAL SECTION THRU FLOOR
EXTERIOR JOIST SPLICE
DECK & MISC. DETAILS
WYOMING HIGHWAY DEPARTMENT
BRIDGE OVER SNAKE RIVER
STATION 13+15.00
SWINGING BRIDGE ROAD
SC-CFM 4968
Sheet 2 of 4 Sheets
Drwg. No. 3399

Figure 18.

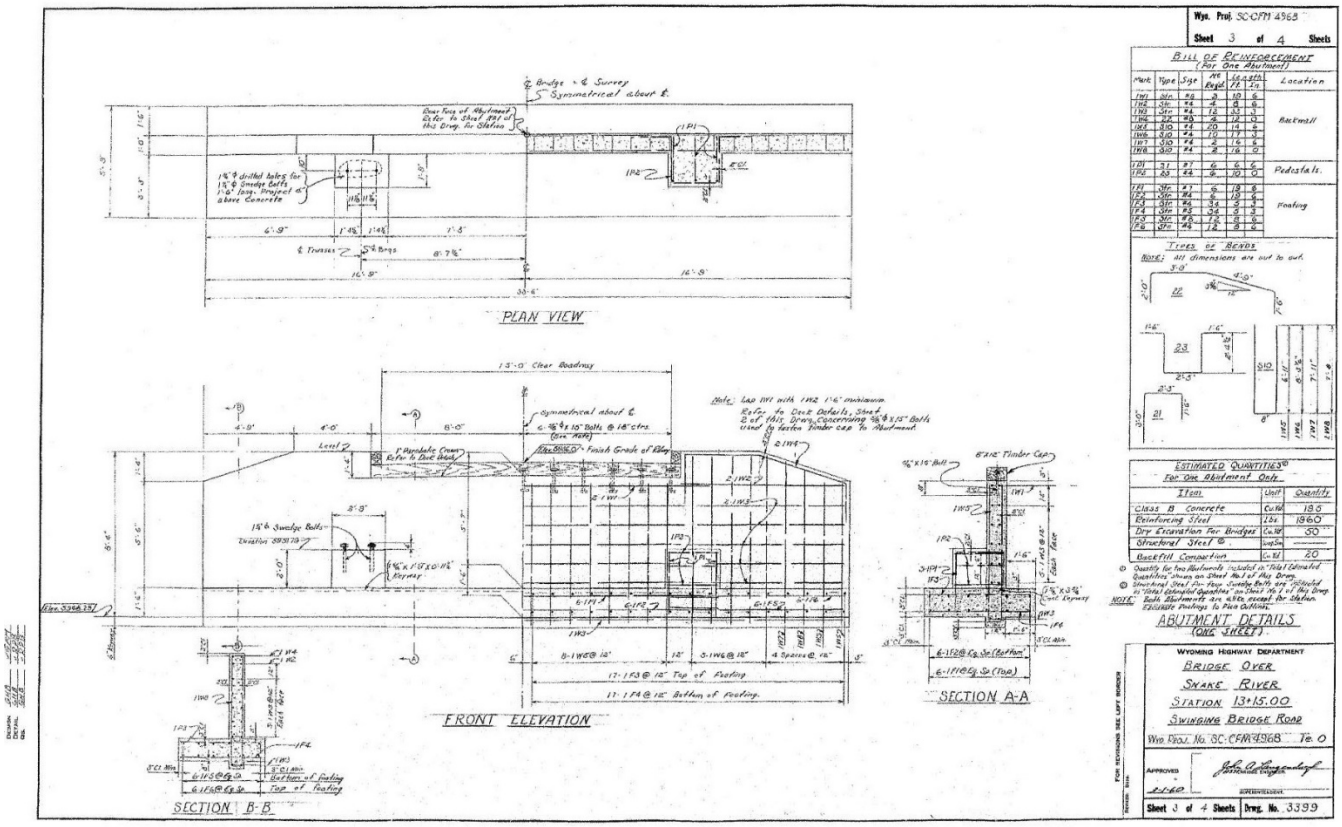
PLAN VIEW
FRONT ELEVATION
SECTION A-A
SECTION B-B
BILL OF REINFORCEMENT
(For One Abutment)
ESTIMATED QUANTITIES
For One Abutment Only
ABUTMENT DETAILS
(ONE SHEET)
WYOMING HIGHWAY DEPARTMENT
BRIDGE OVER
SNAKE RIVER
STATION 13+15.00
SWINGING BRIDGE ROAD
Wyo Proj. No. SC-CFM-4968 Te. 0
Sheet 3 of 4 Sheets
Sheet 3 of 4 Sheets Drwg. No. 3399

Figure 19.

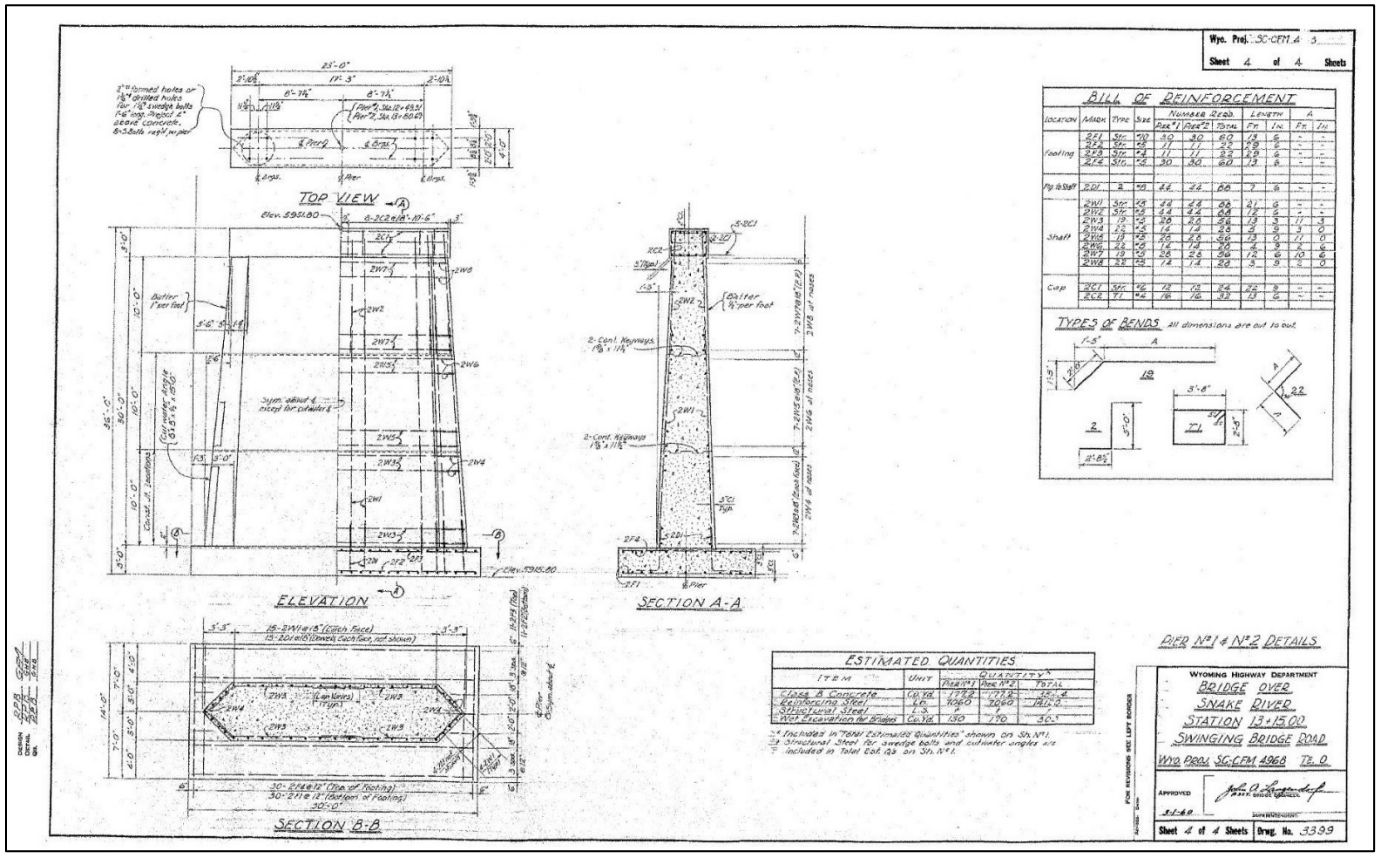
TOP VIEW
ELEVATION
SECTION A-A
SECTION B-B
BILL OF REINFORCEMENT
TYPES OF BENDS
ESTIMATED QUANTITIES
PIER N°1 & N°2 DETAILS
WYOMING HIGHWAY DEPARTMENT
BRIDGE OVER
SNAKE RIVER
STATION 13+15.00
SWINGING BRIDGE ROAD
WYO PROJ. SC-CFM 4968
Sheet 4 of 4 Sheets
Drwg. No. 3399

Figure 20.

REHABILITATION PLANS ("SWINGING BRIDGE REPAIRS") 2015

(TETON COUNTY PROJECT 10-15-M,
BUCHKO STRUCTURAL ENGINEERING, LLC, JACKSON, WY)

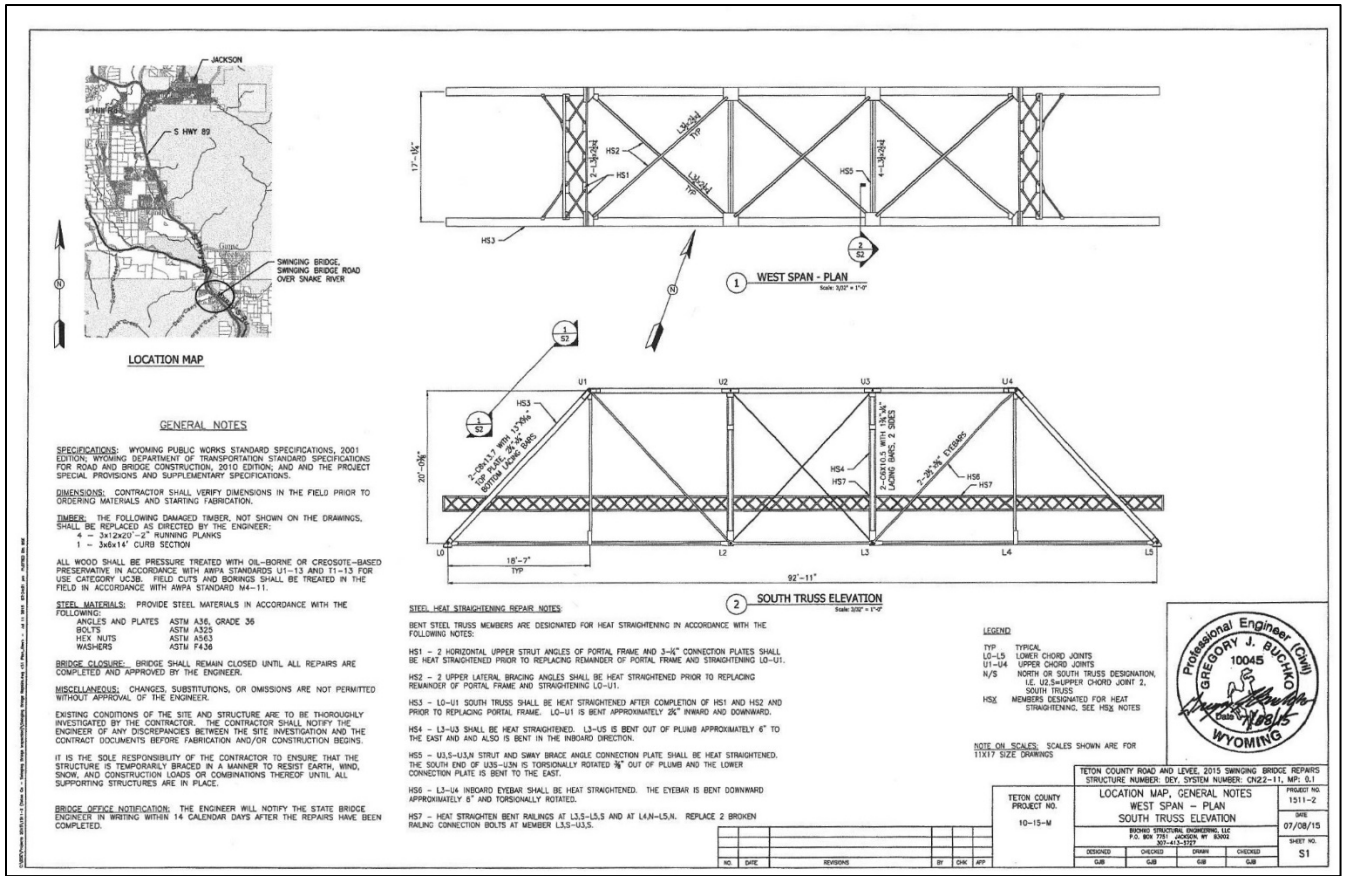

Figure 21.

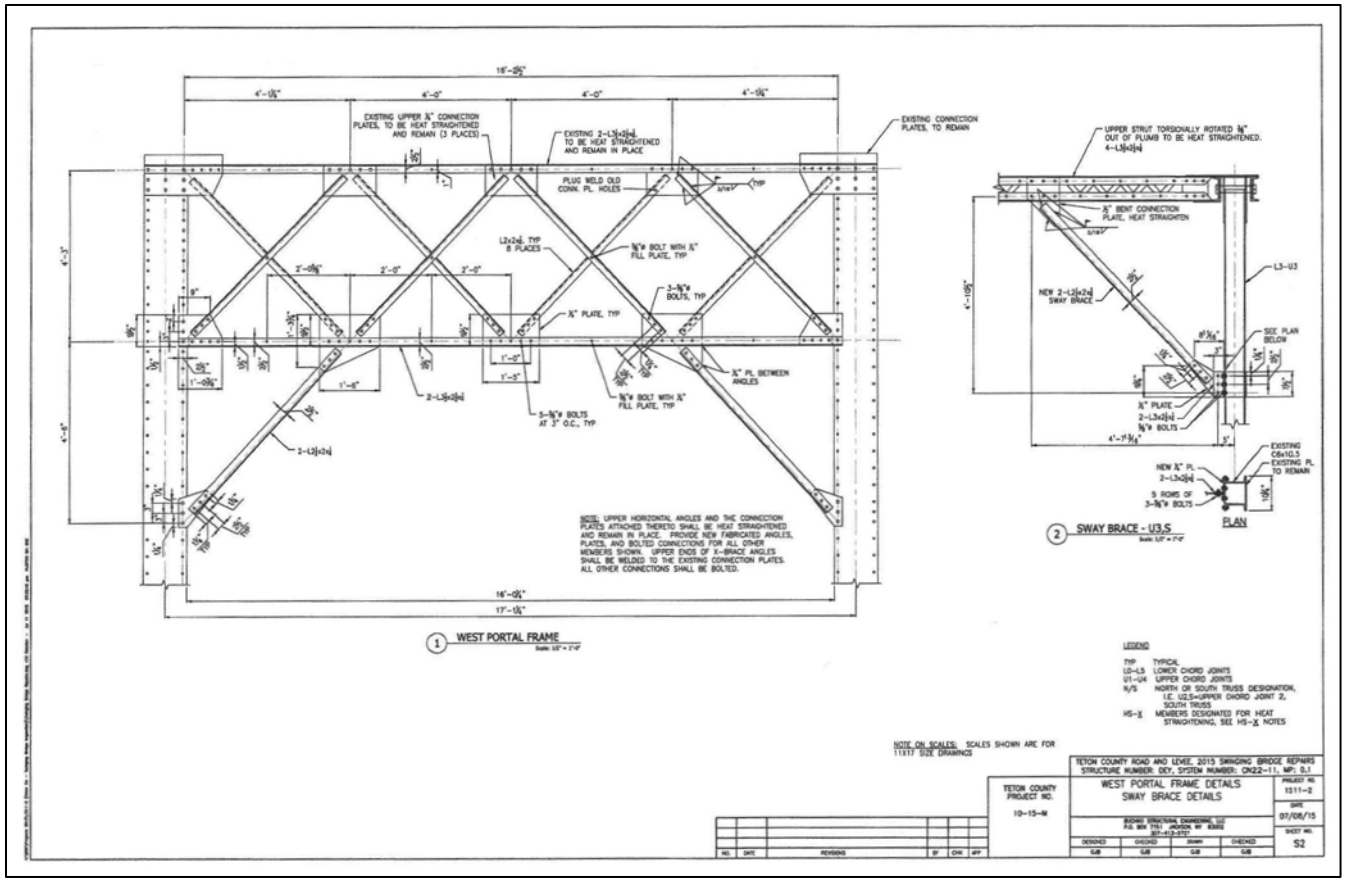
EXISTING UPPER ½" CONNECTION PLATES, TO BE HEAT STRAIGHTENED AND REMAIN (3 PLACES)
EXISTING 2-L3½x2½x¼ TO BE HEAT STRAIGHTENED AND REMAIN IN PLACE
EXISTING CONNECTION PLATES, TO REMAIN
PLUG WELD OLD CONN. PL. HOLES
L2x2x¼ TYP 8 PLACES
¾"ø BOLT WITH ½" FILL PLATE, TYP
¾"ø BOLTS, TYP
½" PLATE, TYP
½" PL BETWEEN ANGLES
2-L3½x2½x¼
3-¾"ø BOLTS AT 3" O.C., TYP
¾"ø BOLT WITH ½" FILL PLATE, TYP
2-L3½x2½x¼
NOTE: UPPER HORIZONTAL ANGLES AND THE CONNECTION PLATES ATTACHED THERETO SHALL BE HEAT STRAIGHTENED AND REMAIN IN PLACE. PROVIDE NEW FABRICATED ANGLES, PLATES, AND BOLTED CONNECTIONS FOR ALL OTHER MEMBERS SHOWN. UPPER ENDS OF X-BRACE ANGLES SHALL BE WELDED TO THE EXISTING CONNECTION PLATES. ALL OTHER CONNECTIONS SHALL BE BOLTED.
1 WEST PORTAL FRAME
UPPER STRUT TORSIONALLY ROTATED ⅜" OUT OF PLUMB TO BE HEAT STRAIGHTENED.
4-L3½x2½x¼
½" BENT CONNECTION PLATE, HEAT STRAIGHTEN
NEW 2-L2½x2½x¼ SWAY BRACE
L3-U3
SEE PLAN BELOW
½" PLATE
2-L3x2½x¼
¾"ø BOLTS
EXISTING C6x10.5 EXISTING PL TO REMAIN
NEW ½" PL
2-L3x2½x¼
5 ROWS OF 3-¾"ø BOLTS
PLAN
2 SWAY BRACE - U3,S
LEGEND
TYP TYPICAL
L0-L5 LOWER CHORD JOINTS
U1-U4 UPPER CHORD JOINTS
N/S NORTH OR SOUTH TRUSS DESIGNATION, I.E. U2.5=UPPER CHORD JOINT 2, SOUTH TRUSS
HS-X MEMBERS DESIGNATED FOR HEAT STRAIGHTENING, SEE HS-X NOTES
NOTE ON SCALES: SCALES SHOWN ARE FOR 11x17 SIZE DRAWINGS
TETON COUNTY ROAD AND LEVEE, 2015 SWINGING BRIDGE REPAIRS
STRUCTURE NUMBER: DEY, SYSTEM NUMBER: CN22-11, MP: 0.1
TETON COUNTY PROJECT NO. 10-15-M
WEST PORTAL FRAME DETAILS
SWAY BRACE DETAILS
PROJECT NO. 1511-2
DATE 07/08/15
SHEET NO. S2
DESIGNED GJB
CHECKED GJB
DRAWN GJB
CHECKED GJB
NO. DATE REVISIONS BY CHK APP

Figure 22.

CONCLUSIONS/SUMMARY

The Wyoming Department of Transportation (WYDOT) in conjunction with Teton County is proposing to replace Structure DEY, Bridge over Snake River, on Teton County Road 11. Proposed replacement is part of WYDOT's Bridge Replacement Off-System (B.R.O.S.) Program. Proposed work entails demolishing the bridge and replacing it with a structure meeting modern design and safety standards. Minor roadwork will be needed at the bridge ends to tie the existing roadway into the replacement bridge.

As a result of the above project, WYDOT requested that Rosenberg Historical Consultants complete National Register of Historic Places (NRHP) documentation and evaluation of Structure DEY. The Consultants completed a full re-record and conducted research, survey, and National Register evaluations for this site and recommend the following:

1) a finding of **eligible** for Site 48TE973, Bridge over Snake River, Structure DEY. The proposed project will have an **Adverse Effect** on this historic resource.

REFERENCES CITED

Buchko, Gregory J.

2015 *Location Map, General Notes, West Span – Plan, South Truss Elevation, West Portal Frame Details, 2015 Swinging Bridge Repairs. Gregory J. Buchko, P*rofessional Engineer. Plans on file at WYDOT, Cheyenne.

Cassity, Michael

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Fraser, Clayton B.

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1982 *Wyoming Truss Bridge Survey.* Fraserdesign, Loveland, Co.

2000 *Highway Bridges of Colorado.* National Register of Historic Places Multiple Property Documentation form, March 30, 2000. Fraserdesign, Loveland, Colorado.

Massey, Rheba

1989 *Wyoming Comprehensive Historic Preservation Plan*. Prepared for Archives, Museums and Historical Department, Wyoming SHPO, Cheyenne.

National Park Service

1991 *How to Apply the National Register Criteria for Evaluation. National Register Bulletin No. 15*. U.S. Department of the Interior, National Park Service, Government Printing Office, Washington, D.C.

No Author

2008 "Bridges through Time," *Jackson Hole Historical Society & Museum Chronicle,* Vol. XXVIII, No. 1 (Spring 2008), 6 pages.

Parsons Brinkerhoff and Engineering and Industrial Heritage

2005 *A Context for Common Historic Bridge Types.* NCRP Project 25-25, Task 15, Keck Center of the National Academies Transportation Research Board, Washington, D.C.

Seiler, J.F.

1925 "A Review of Bridge Design and Construction on Wyoming State Highways." *Wyoming Roads,* Vol. 1 (March 1925) No. 7:1-7, 12-13.

Teton County Board of County Commissioners

2019 *Board of County Commissioners – Staff Report,* meeting date: January 15, 2019; Subject: Consideration of a cooperative agreement with the Wyoming Department of Transportation for replacement of the "Swinging Bridge", (Structure DEY).

Wyoming Department of Transportation

2015 Structure Inventory and Appraisal Sheet, Structure DEY. WYDOT, Cheyenne, Wyoming.

n.d. Wyoming Highway Department Historical Bridge Survey and Inventory Form. WYODT, Cheyenne, WY.

2017 Wyoming Department of Transportation, Final Reconnaissance Report for Bridge Over Snake River, Structure No. DEY, County Road, Teton County, December 7, 2017.

Wyoming State Archives. *Teton County Road Plat Books.* Teton County Clerk's Records (microfilm), Cheyenne, Wyoming.

Wyoming State Archives. *Teton County Commissioners' Proceedings, 1920-1930.* Teton County Clerk's Records (microfilm), Cheyenne, Wyoming.

Wyoming State Highway Commission

1917-1930 *First to Seventh Biennial Reports of the State Highway Commission of the State of Wyoming* (each report covered a two-year period extending from October 1 through September 30).

Wyoming State Highway Department

1960 *Bridge over Snake River Station 13-15.00, Swinging Bridge Road. Project SC-CFM 4968, Drawing No. 3399.* On file at Wyoming Department of Transportation, Cheyenne, WY.

WYOMING CULTURAL PROPERTIES FORM 48TE973

BRIDGE OVER SNAKE RIVER, STRUCTURE DEY

RECORD TYPE: __ First-recording X Full Re-record, _ Update, ___ Condition Report, ___ Site Lead
PROPERTY CATEGORY: ___Prehistoric Site X Historic Site, _ Building, X Structure, __Object,__ District, ___Landscape, ___Lithic Landscape, ___TCP

1. IDENTIFICATION/OWNERSHIP

Consultant Project Number RHC-2018-9
Agency Project Number(s) SHPO ID No.
Associated Project Name WYDOT Project No. CN20070/PE21, Historic Bridge Inventory Statewide
Site Name **Bridge over Snake River, Structure DEY**
Temporary Field Number RHC-2018-9-38
Other Common names: _____
Agency Site Number _____ Other Site Number _____
Landowner (at time of this reporting, specify agency/district, if private give name and address): ___ check here if site information is confidential:

Teton County
Teton County Courthouse
300 S. Willow Street
Jackson, WY 83001

2. LOCATION (repeat as needed on continuation sheets; ____ check here if additional locational information is on continuation sheet)
Street address: Teton County Road 11 Town: 7.5 miles south of Jackson, WY.
Lot-Block: N/A County: Teton
USGS 7.5' Map: Camp Davis, WY 7.5' 1996
Legal Location (Township/Range/Section/¼'s/template anchored): T39N-R116W, S. 3, WNWNESE (anchored SE corner)

Elevation (ft.): 5980
UTM Coordinates (center point is required; bounding UTM(s) required for sites > 200m in any dimension)
UTM centerpoint: Zone 12 E 521134 m N 4802138 m Datum used to calculate: _NAD 27 _X_NAD 83
Bounding UTMs: N/A
UTM source: ___corrected GPS/rectified survey (<5m error), _ uncorrected GPS, X map template,
_x_other: AllTopo Maps software

Notes pertaining to access: The bridge is located about 7.5 miles south of Jackson, Wyoming. From U.S. Route 191, the bridge is located about 400 feet east on County Road 11 over the Snake River.

3. NATIONAL REGISTER STATUS (check all that apply in each category)
ENROLLED STATUS ___Landmark/Monument, ___Enrolled on NRHP

FACTORS AFFECTING INTEGRITY (check all that apply; indicate specific areas of disturbance and vandalism on a copy of the site map)
Disturbance/Vandalism : _ none, __ erosion, __vandalism, __collection, __structural damage, __ manual excavation, __mechanical excavation, __vehicle traffic, X structural decay, __grazing, __ construction/development, __defacement, __imminent destruction, __unknown
Percent of property badly disturbed as of this recording date, to nearest 10%): 0

NATIONAL REGISTER OF HISTORIC PLACES SIGNIFICANCE
Periods of Significance: Modern (1956-present)
Themes: Transportation

NATIONAL REGISTER OF HISTORIC PLACES ELIGIBILTY RECOMMENDATIONS (check all applicable):
Recorder NRHP Evaluation: X Eligible under criteria X a, __b, X c, __ d ; __ Not Eligible, ___ Unevaluated
Contributing Components: ___ Prehistoric, X Historic Associated person for criterion b property_____

Justification: (Include in justification a statement of significance; discussion of contributing components (indicate spatial extents on maps); and integrity (location, design, setting, materials, workmanship, feeling, association); discuss how significant periods and themes were determined)*:

According to the *Wyoming Comprehensive Preservation Plan* (Massey 1989), the Bridge over Snake River, Structure DEY, represents the Transportation Theme, and the Modern (1956-present) Historic Period. The geographical area is Teton County, Wyoming.

Structure DEY is a three-span, pin-connected steel Pratt through truss bridge. *The Vehicular Truss and Arch Bridges in Wyoming* National Register of Historic Places Nomination, completed by Clayton B. Fraser of Fraserdesign in 1982, utilized several specific criteria for determining the National Register eligibility of truss bridges in Wyoming, including typicality or uniqueness, date of erection, level of available information, span length, present state of integrity, probability of preservation, and historical association. *A Context for Common Historic Bridge Types* written by Parsons Brinckerhoff and Engineering and Industrial Heritage prepared for the National Cooperative Highway Research Program, stated that "The Pratt trusses are among the most common nineteenth and early twentieth century bridge types…. They are, however, significant in the evolution of bridge technology, particularly early examples …while later, more common examples are less significant. The latter examples can still be significant if they retain character-defining features and are good examples of the type. Character-defining features include the truss form, method of connection, top and bottom chords, vertical and diagonal members, floor beams and stringers. (2005:3-25, 26).

It is the opinion of Rosenberg Historical Consultants that Structure DEY is eligible to the National Register of Historic Places (NRHP) under Criteria A because it is associated with events that have made a significant contribution to our history, that is, the emerging transportation system in Wyoming and Teton County.

The site is not eligible to the National Register of Historic Places under Criterion B, because it is not associated with the lives of persons significant in our past.

Under Criterion C, this is the only three-span, pin-connected steel Pratt through truss in use in the county and state road system. Pin-connected structures are now uncommon.

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Agency Determination: ___ Eligible under criteria ___a, ___b, ___c, ___ d ; ___ Not Eligible, ___ Unevaluated
Date/initials: _____
Justification:

SHPO Concurrence: ___ Eligible under criteria ___a, ___b, ___c, ___ d ; ___ Not Eligible, ___ Unevaluated
Date/initials: _____
Justification:

4. INVESTIGATIVE HISTORY (Check all that apply, use property narrative for additional information as appropriate)

Recorded by: Robert and Elizabeth Rosenberg Organization: Rosenberg Historical Consultants
Field Dates: October 3, 2019

DISCOVERY METHOD (describe in site narrative description)
X Exposed on surface __ Exposed subsurface __Construction discovery X Documentary sources _ Informant

WORK PERFORMED (as part of this recording ONLY; describe numbers and dimensions of sampling/excavation units in narrative section)

X Surface recorded	__Tested with probe device	__Materials sourcing	__Lab analyses
__Shovel tested	__Controlled Trench/Blade	__Remote sensing	__Material sample program
__Formal test unit(s)	__Geomorphology study	X Photos/Sketches/Video	__C-14 dating
__Block excavation	__Paleo-environmental study	__Collections research	X Other (describe in narrative)

MATERIALS COLLECTED AS PART OF THIS RECORDING? ___ yes, x no, ___ unknown
Repository: ___ U. W. Archaeological Repository (UWAR), ___Western Wyoming College, ___Other:_____

CITATIONS, REFERENCES (if applicable, use MLA or American Antiquity style in citations), ADDITIONAL INFORMATION SOURCES:

Buchko, Gregory J.
2015 *Location Map, General Notes, West Span – Plan, South Truss Elevation, West Portal Frame Details, 2015 Swinging Bridge Repairs. Gregory J. Buchko, P*rofessional Engineer. Plans on file at WYDOT, Cheyenne.

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Wyoming State Archives. *Teton County Road Plat Books.* Teton County Clerk's Records (microfilm), Cheyenne, Wyoming.

Wyoming State Archives. *Teton County Commissioners' Proceedings, 1920-1930.* Teton County Clerk's Records (microfilm), Cheyenne, Wyoming.

Wyoming State Highway Commission

1917-1930 *First to Seventh Biennial Reports of the State Highway Commission of the State of Wyoming* (each report covered a two-year period extending from October 1 through September 30).

Wyoming State Highway Department

1960 *Bridge over Snake River Station 13-15.00, Swinging Bridge Road. Project SC-CFM 4968, Drawing No. 3399.* On file at Wyoming Department of Transportation, Cheyenne, WY.

5. PROPERTY DESCRIPTION

PHYSICAL DIMENSIONS

Length 322' NE-SW Width 16' NW-SE Area: 5152 sq ft __estimated X measurement method: measuring tape and plans

Boundary estimates based on: __ feature/artifact distribution, ___ modern features or disturbance, _ property boundaries, ___ topography, X other (bridge structure dimensions) _ unknown.

Property datum? _ yes X no (describe if yes):

RECORDS INVENTORY (check all appropriate attachments associated with this recording)

Required attachments*:

___6) Prehistoric/Historic Archaeological Site Setting, Topography, Depositional Environment (*not required for urban and rural buildings, structures, objects, or historic districts)
X (7) Site Narrative Description
__ (8) Prehistoric/Historic Site Matrix
X site map w/scale,orientation.,key
X location map (USGS 1:24,000 base)
X photographs/images

Additional Attachments:

(One or more of the next 8 are required)
___ (8A) artifacts associated with prehistoric component
___ (8B) features associated with prehistoric component
___ (8C) artifacts associated with historic component
___ (8D) features associated with historic component
___ (8E) historic and/or prehistoric rock art/inscription component
___ (8F) historic architecture description
___ (8G) linear feature description
___ (8H) lithic landscape sample description
X (8I) historic structure/object description

Optional Attachments:

__ (8J)TCP description
__ artifact illustrations
__ stratigraphic profile
__ field notes
__ artifact catalog
__ electronic data
X other (describe): 1960 WSHD Plans, 2015 Rehabilitation Plans

7. SITE NARRATIVE DESCRIPTION

Physical description
(The bridge is oriented about 45 degrees but will be described with the four cardinal directions.)

Structure DEY is a three-span, pin-connected steel, Pratt through truss bridge over the Snake River about 7.5 miles south of Jackson, Wyoming. It is situated on Teton County Road 11, a gravel road. The overall dimensions of the bridge are 322' NS by 16' EW (back to back abutment length). The middle bridge span is 130' long, and the spans on either end are 92'10" each. The width of the bridge from curb to curb is 15' (clear roadway width), and the roadway approach is 16' wide. The top chords consist of two channels by batten plates and lacing. The bottom chords consist of four angles connected by batten plates. The verticals consist of two channels connected by lacing. The diagonals consist of bars and rods. The bridge features lattice guardrails. The bridge has a wood timber deck and wooden stringer with steel floor beams. When the bridge was moved to this location in 1960, a new wooden deck and treated wooden stringers were constructed. The bridge has a minimum vertical clearance of 12'3". The structure has sill type concrete abutments with footings. Two tapered concrete piers support the bridge spans. The abutments and piers were also constructed in 1960. The current physical condition of the superstructure of the bridge is rated as serious by WYDOT.

Historic Background

Pratt Truss

The Pratt Truss was patented in 1844 by Thomas and Caleb Pratt. It is identified by vertical members acting in compression and diagonals acting in tensions. This design feature reduced the length of the compression members to help prevent them from bending or buckling. The pin-connected Pratt through truss is the most common type of early twentieth-century truss bridge. The pony truss form was used for short spans and light vehicular traffic. Numerous variations of the basic Pratt design were later introduced, especially as increasing railroad traffic required a stronger bridge. The Parker truss altered the top and bottom chords, and the lenticular truss had curved upper and lower chords. The standard Pratt truss was strengthened in the 1870s with the implementation of sub-struts and sub-ties and met the requirements for heavier railroad locomotives and rolling stock. The Baltimore truss and the Pennsylvania truss are examples of this modification for railroad use. In 1847, Squire Whipple patented a truss that utilized the basic form of the Pratt, but lengthened the diagonals to extend across two panels, allowing long bridge spans (Parson Brinkerhoff and Engineering and Industrial Design 2005: 2-6 and 2-7; 2-11; Comp and Jackson 1977).

Bridge over Snake River, Structure DEY

The original "swinging bridge" was built by Charles McCrary at this location in 1938. The swinging bridge provided access over the Snake River to the property of Ora and Mary Grisamer on "Hog Island" (Owen 2018).I

In March 1960, the Wyoming State Highway Department contracted with Charles M. Smith of Thermopolis to construct the new bridge. Smith utilized plans drawn up by the Wyoming Highway Department (WHD Project SC CFM4968, Drawing No. 3399, see attached plans). The bridge was constructed using parts of an existing five-span truss bridge (the "first Wilson bridge") that was built in 1915 and crossed the Snake River several miles upstream between Jackson and Wilson on State Highway 22. In 1959, this bridge was razed and replaced. Smith retained three of the five spans from the 1915 bridge and moved them to the current site in 1960. The bridge was pin-connected, so it was relatively easy to disassemble, move to the new location, modify the length of two of the spans, and reassemble. The bridge plans for the project indicate that it received a new wood timber deck and wooden stringers when it was moved to its new location. In addition, new concrete abutments were built, and two concrete piers supported the truss spans (Cassity 2005; No Author, "Bridges Through Time," 2008; WHD Project SC CFM4968, Drawing No. 3399).

On April 16, 2015, a large truck damaged the west span of the bridge. The bridge was closed for repairs. Rehabilitation of the west portal bracing and portal strut were conducted using similar materials, and the bridge was opened to traffic on September 15, 2015 (Buhko 2015; Board of County Commissioners, Teton County 2019).

In 2014, Teton County requested that WYDOT consider Structure No. DEY for the Bridge Replacement Off System program. WYDOT conducted a reconnaissance inspection in regard to that request on May 25, 2017. That report indicated that the bridge was structurally deficient (Board of Commissioners, Teton County, 2017). WYDOT and the Teton County Commission subsequently performed a Cooperative Agreement "…to establish the terms and conditions

by which the County shall reimburse WYDOT for its expenditures related to the federally funded, WYDOT administered Bridge Replacement-Off System Program." WYDOT has currently scheduled the bridge replacement for fiscal year 2023 Board of County Commissioners – Staff Report, 2019).

HISTORIC PRESERVATION BOARD

TETON COUNTY WYOMING

Stephanie Lowe, Cultural Resources Specialist
WYDOT Environmental Services
5300 Bishop Blvd.
Cheyenne, WY 82009-3340

April 15, 2021

Dear Ms. Lowe,

Thank you for including the Teton County Historic Preservation Board (TCHPB) in the mitigation meeting on March 8, 2021 regarding the Swinging Bridge Replacement Project in Teton County. As noted in your minutes, TCHPB looks forward to being an active participant and stakeholder in the design and planning process.

In the meeting minutes you identify two action items for follow up:

1. WYDOT to study relocating the existing historic bridge immediately to the south of a new bridge for use as a pedestrian bridge.
2. WYDOT to study the costs of building a new faux "truss bridge" over the pedestrian portion of the new bridge.

TCHPB is formally requesting that WYDOT include a third option in the design studies. We would like to see an engineering study, with costs attached, of the preservation of the existing historic bridge in its current location as a bike/pedestrian bridge to be connected to the Teton County Pathway system, along with a smaller vehicular-only bridge immediately to the south. In a recent conversation with Amy Ramage, Teton County Engineer, she mentioned a recently completed county bridge that was constructed as a narrow 20-foot, one-way bridge. This may be a useful precedent to study and we urge you to contact her for more information.

While the TCHPB recognizes the improbability of rehabilitation of the existing bridge for emergency vehicular use, we continue to assert that the bridge represents a unique historic resource both for Teton County and the State of Wyoming. We are committed to finding creative ways to preserve this important resource, including finding other partner organizations and funding resources.

Thank you for your work on this project and our board looks forward to a collaborative effort with Teton County and WYDOT.

Sincerely yours,

Michael Stern, President
Teton County Historic Preservation Board
CC. Amy Ramage, Teton County

Mark Gordon
Governor

WYOMING Department of Transportation
"Provide a safe and effective transportation system"
5300 Bishop Boulevard, Cheyenne, Wyoming 82009-3340

K. Luke Reiner
Director

June 18, 2021

MEMORANDUM

TO: Michael E. Menghini, P.E., State Bridge Engineer

FROM: Brian T. Rentner, P.E., Principal Bridge Engineer

SUBJECT: Truss Mitigation Options Report

PROJECT: CN22036, Swinging Bridge Road, (County Road 11, CN22-11, ML8655B), Bridge Over Snake River, Teton County

References

Rehabilitation of Bridge Over Snake River, Structure No. DEY; December 22, 2020
MOA Meeting Minutes; March 8, 2021

General Background

Mitigation for the removal of the truss bridge on Swinging Bridge Road was discussed at a virtual meeting on March 8, 2021. As discussed in Rehabilitation of Bridge Over Snake River, Structure No. DEY report, rehabilitation of the existing truss is not feasible. Three mitigation options were discussed:

1. Construct new piers south (downstream) of the new bridge and reset the existing truss on the new piers. The truss would be used solely as a pedestrian bridge. The Teton County Historic Preservation board noted a similar option in a letter on April 15, 2021. This option requested evaluation of the existing truss bridge for pedestrian use and placing the new vehicular bridge adjacent to the existing bridge.

2. Remove the existing bridge and construct a new bridge with a sidewalk on the south side. Erect “faux” thru-truss elements, similar in appearance to existing truss members, adjacent to, and above, the sidewalk for aesthetics.
3. Close the existing bridge to vehicular traffic and leave it in place as a pedestrian bridge. Do not construct a new vehicular bridge.

Option No. 1: Reset Existing Truss And Use As A Pedestrian Bridge

The existing truss would be re-set on new abutments and piers south (downstream) of the new bridge. The bridge would be limited to pedestrians only and have no provisions for vehicles. Teton County would maintain ownership of the bridge and be responsible for future maintenance and inspection costs. The estimated cost to design and construct new substructures and move the truss from its current location to the new substructures is $700,000. This cost does not include any rehabilitation work for the existing truss. The BROS program would fund removing the truss from its current location and stockpiling it at the project site. The BROS program would not fund any of the costs associated with designing and constructing new substructures and/or rehabilitating and erecting the truss on the new substructures.

If the existing bridge is only used as a pedestrian bridge, consideration should be given to leaving the existing bridge in its current location and constructing a new vehicular bridge next to it on a new alignment, as was proposed by the Teton County Historic Preservation Board. An alignment shift will cause impacts to existing right-of-way and Forest Service access on the east bank. See attached for a preliminary roadway alignment showing the impacts.

Determining the adequacy of the existing truss bridge to serve as a pedestrian facility is outside the scope of work for this program. WYDOT recommends that Teton County hire an engineering firm to review the existing structure to determine necessary rehabilitation strategies and costs associated with this option. Teton County would maintain ownership and responsibility for the inspection, maintenance and repair of the existing bridge. A new alignment would be to the south, or downstream, of the existing bridge due to the tight constraints to the north of the bridge. Placing a new structure downstream of the existing bridge is not desirable if the existing truss were to fail during an extreme event. If the existing bridge is left in place, the new structure would not have sidewalks. At the east end, the bridge would have to be lengthened or retaining walls would need to be constructed to tie the new alignment into the existing terrain. Teton County requested a grade raise at the west end of the bridge to improve the grade coming into the bridge. For this option, the grade raise is not feasible without a significant horizontal alignment

shift. It is assumed that impacts to R/W would be too severe so this option was not analyzed. The estimated cost for constructing a new bridge without sidewalks on a new alignment with retaining walls is $2,500,000 ($2,380,000 for bridge and $120,000 for retaining walls). The estimated cost for acquiring right-of-way for the new alignment is $200,000 and would be the responsibility of Teton County. For comparison, the estimated cost of a new bridge with a sidewalk placed in the same location as the existing bridge is $3,000,000.

Option No. 2: Construct A Replica Thru-Truss Over Sidewalk On New Bridge

A replica "faux" thru-truss would be constructed over the sidewalk portion of the new bridge. The faux truss would be anchored to the bridge deck and located behind the bridge guardrail on one side and behind the pedestrian railing on the other side. The faux truss would be a purely decorative addition to the bridge and would not be a load-carrying member. The estimated cost to design, fabricate, and install a faux thru-truss on the new bridge is $200,000. The BROS program would not fund any of the cost associated with designing, fabricating, and installing a faux truss on the new bridge.

An adjacent landowner discussed adding faux pony-trusses to the outside edges of the new bridge, instead of placing a faux thru-truss solely over the sidewalk. The cost of faux pony-trusses is comparable to the cost of the faux thru-truss over the sidewalk. Having trusses at the exterior edges of the bridge deck would not allow for bridge inspections using WYDOT's under bridge inspection vehicle. A rope inspection would be required to inspect the underside of the deck as the reach of the inspection vehicle would not be able to go over the faux pony-trusses and reach the underside of the bridge.

These "faux" truss options would not satisfy the historical bridge requirements and the disposition of the existing bridge would still need to be determined.

The above costs for bridge construction include removing the existing bridge and stockpiling it at the project site. Costs associated with moving and erecting the bridge in a new location will not be paid for under the BROS program and will be the responsibility of Teton County or a new bridge owner.

Option No. 3: Close Bridge To Vehicular Traffic

The county suggested closing the existing bridge permanently to vehicular traffic and using the bridge for pedestrian access only. The county stated this is not their preference as they are concerned about having redundancy in their road system for emergency response. Barricades would need to be placed at the ends of the bridge and all future maintenance and inspection of the existing bridge would be the responsibility of the county.

Approved by:_____
Jeffrey R. Booher, P.E.
Assistant State Bridge Engineer - Design

Enclosures

BTR

cc: Keith R. Fulton, P.E., Assistant Chief Engineer, Engineering and Planning, Cheyenne
Tory Thomas, P.E., Interim District Engineer, Rock Springs
Peter Stinchcomb, P.E., District Construction Engineer, Rock Springs
Robert Hammond, P.E., Resident Engineer, Jackson
Jeff E. Brown, P.E., State Highway Development Engineer, Cheyenne
Andrea T. Allen, P.E., Project Development Engineer, Cheyenne
Meadow Ridley, P.E., Project Development Design Team Leader, Cheyenne
Scott Gamo, Ph.D., Environmental Services Manager, Cheyenne
Natalia D. Macker, Chairwoman, Teton County Board of County Commissioners nmacker@tetoncountycountywy.gov
Amy Ramage, P.E., Teton County Engineer, Teton County Engineering Services aramage@tetoncountywy.gov
David Gustafson, Road & Levee Manager, Teton County Road & Levee dgustafson@tetoncountywy.gov

STATE OF WYOMING	PROJ. NO.	SHEET NO.	TOTAL SHEETS
	CN22036	X	·

T 39 N R 116 W
SECTION 3

PI STA. 101+95.65
N = 1,375,509.6008
E = 2,450,910.6079
Δ = 28° 38' 52.4"
T = 33.34'
L = 66.07'
R = 200.00'

BEGIN PROJECT
STA. 100+00.00
RM 0.100
N 1375439.9085
E 2450730.1739

PI STA. 100+93.51
N = 1,375,488.8929
E = 2,450,809.8102
Δ = 22° 55' 05.9"
T = 41.80'
L = 82.84'
R = 250.00'

PI STA. 106+74.39
N = 1,375,753.1529
E = 2,451,323.4749
Δ = 32° 44' 25.6"
T = 115.74'
L = 204.51'
R = 175.00'

POT 100+00.00
PI 100+46.51
PI 100+93.51
PC 101+62.31
PT 102+28.38
PC 100+51.71
PT 101+34.54
PI 101+95.65
PC 105+58.65
PI 106+74.39
PT 107+63.16
POT 107+96.49

N 57° 23' 30.5" E
N 59° 24' 22.4" E
N 78° 23' 26.3" E
N 59° 27' 48.4" E
S 33° 34' 46.7" E

60'

"Coordinates are based on the Wyoming Coordinate System NAD 83/93, WY West Zone, and have been multiplied by a project factor of: 1.000314839. Labeled plan data (coordinates, curve data, bearings, distances, and stationing) exceed survey accuracy. Existing land lines, property lines and easement lines not surveyed or tied to the alignment should be considered approximate. The vertical datum is NAVD 88."

6' OFFSET OPTION

ELEV. 5,985.86'
-12.66%
VPI 100+61.41
ELEV. 5,978.09'
V.C. 25.00'
K = 4
-6.46%
VPI 101+54.02
ELEV. 5,972.11'
V.C. 130.00'
K = 29
-2.00%
VPI 106+37.37
ELEV. 5,962.44'
V.C. 140.00'
K = 28
-2.00%
+2.99%
ELEV. 5,967.20'

END PROJECT
STA. 107+96.49
RM 0.100
N 1375664.6536
E 2451443.4232

5990 5985 5980 5975 5970 5965 5960 5955 5950

100+00 101+00 102+00 103+00 104+00 105+00 106+00 107+00

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