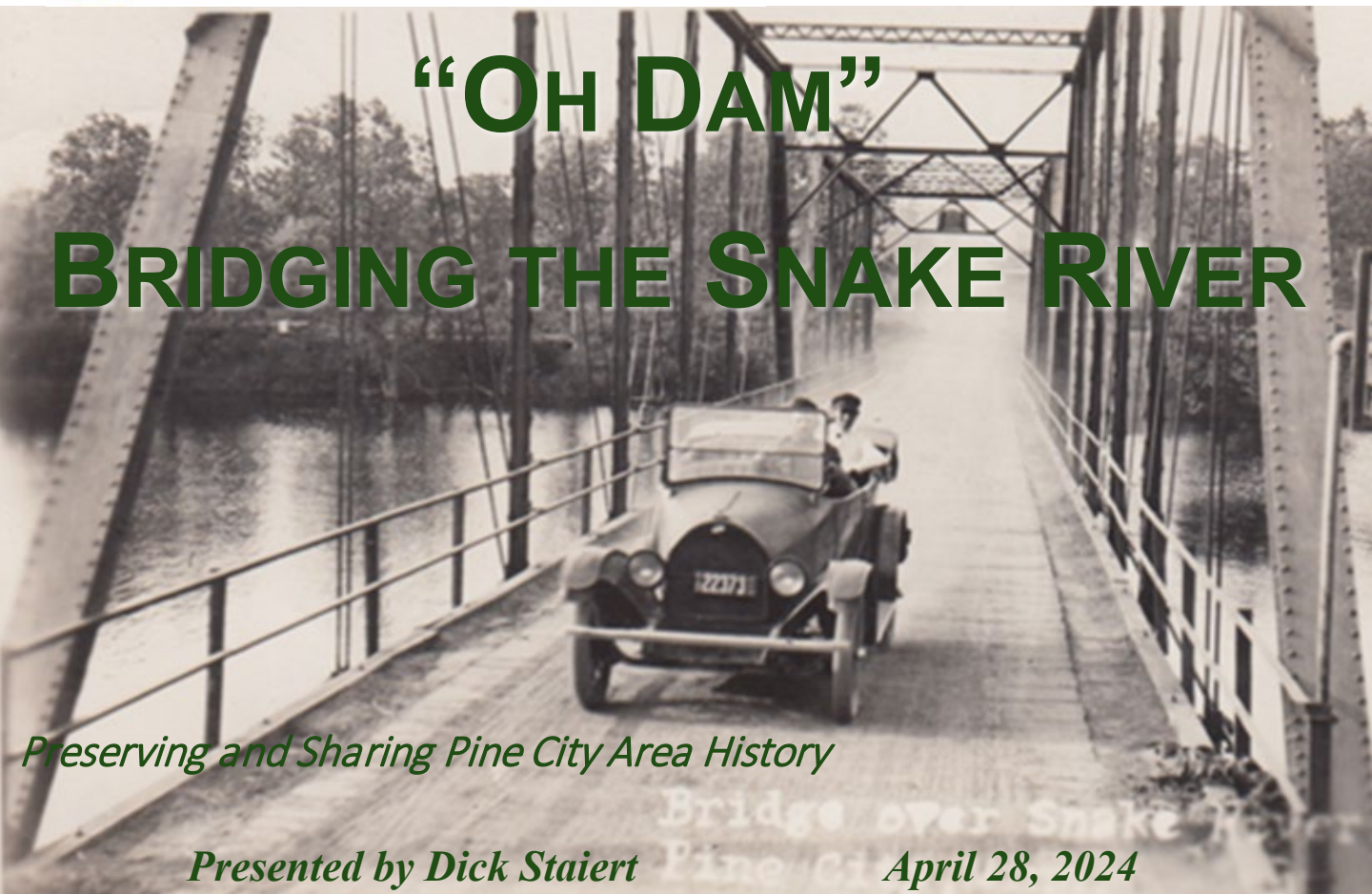




Pine City Area History Association

“OH DAM”

BRIDGING THE SNAKE RIVER



Preserving and Sharing Pine City Area History

Presented by Dick Staiert

April 28, 2024

“Oh Dam” - Bridging the Snake River: A Disclaimer

“When talking about the history of subjects around the outlet of Cross Lake, such as bridges, roads, dams, the town of Chengwatana, etc. you invariably have to talk about all the others, at least in part. Their histories are all so intertwined, that you can’t tell one’s story with out telling some of the stories of the others.”

“Hence the title of this presentation – That pun WAS intended. This story is going to include dams and bridges and more.”

----- Dick Staiert

Presentation Overview

- 1849 Logging Dam-Bridge*
- 1855 Wood Truss Government Road Bridge
- 1857 Logging Dam-Bridge**
- 1857 Wood Truss Gov't Road Replacement Bridge
- 1861 Logging Dam Bridge
- 1908 Steel Truss Bridge
- 1959 Reinforced Concrete Beam Bridge
- 2024 Reinforced Concrete Beam Bridge

** Logging dam operators needed some kind of bridge across the dam to operate the sluice gates, add/remove stop logs, conduct maintenance & repair, etc., but it may have only been a "catwalk" like affair, perhaps wide enough to lead a well trained horse. - In a brief reference in an 1856 letter to Charles P. Daly, Hermann Trott noted that the dam had the structure for a bridge from when it was built.*

*** By this time, anecdotal evidence strongly indicates that the dam-bridge-had been and was capable of team and wagon crossing, not just a man on foot with a led horse*

The 1849 Dam Bridge



Photo dates to ca.1900

PCAHA 2016-234 p2

- This photo (ca. 1900) shows the Chengwatana Logging “Dam-Bridge, with sluicing operations in progress with a “tainter” style sluice gate at full open and at least one or more logs having just come through the sluice gate (center of the picture.)
- The builders of the 1849 version of this Dam Bridge did not start out to build a bridge, but to build a dam for logging purposes.
- The bridge itself was a necessary ancillary to the logging dam operation:
 - It allowed the dam operators safe and ready access to the entire length of the dam for inspections and maintenance and so that they could add or remove the needed stop logs used to set or adjust the level of impounded water.
 - It also gave the operators essential access to quickly open the sluice gates to allow the rapid release of a large volume of water to carry the logs through the gates during sluicing operation. That same flood of water would flush them down the Snake River gorge to the St. Croix valley and from there to the sawmills below at Stillwater and beyond.
 - While tainter type sluice gates could be operated by one man (they weren’t invented until the 1880s), the first sluice gates on this dam required much more effort to operate, so there was a need for more men to have access.
- As a consequence, the same bridge meant to serve the dam operators provided a ready pathway across the Snake River for travelers and others with a need to cross the Snake River.
- It would serve as the only means of crossing the river from the time it was built until 1855, when the Government Road Bridge was built and then also for a brief period in 1857, when the first Government Road Bridge had to be replaced because it was destroyed by high water.
- It would also be the only means of crossing the river after 1861 (or possibly as late as 1867), when the Government Road bridge site was abandoned after the failure of the first, or possibly second replacement that was again destroyed by high water.

The 1849 Dam Bridge

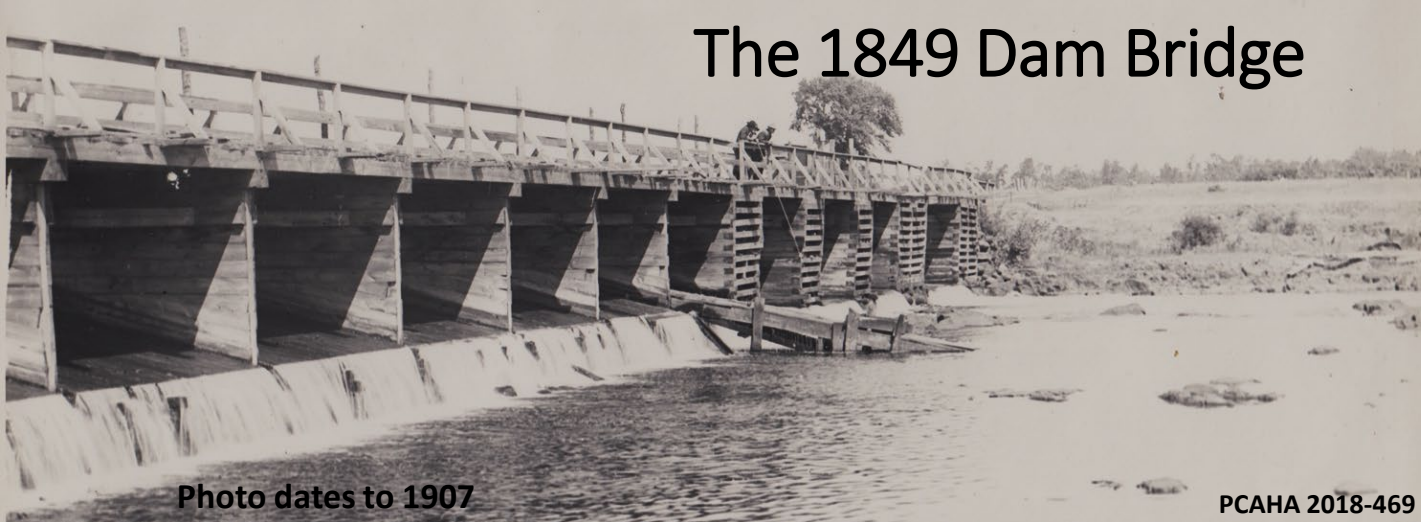


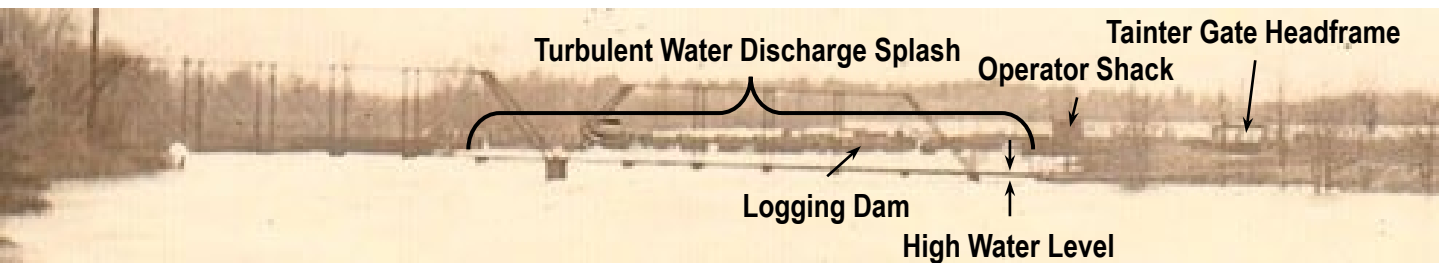
Photo dates to 1907

PCAHA 2018-469

- This photo provides a closer and better look at the details of both the dam and the bridge.
- The log box crib construction, that forms the bridge foundation, is clearly visible on the five northerly piers at the far end of the dam, as is the bridge structure itself.
- At the near end, the crib structure is replaced with a simple wall above the sloped plank floor that covers the box crib structure underneath. Stop logs are set into these openings on the upriver side of the dam. The crib structure is filled with rocks and gravel as ballast.
- The near part the dam is configured as a weir to allow excess water to overflow the top of the stop logs without damage to the dam and to keep the impounded water from overtopping the dam. Some water flow (leakage) is intentional. Continually wetted wood doesn't rot as quickly. Some wood that remains totally wet can last decades or longer.
- In 1908, the Dam-Bridge was surveyed to be 258.6 feet long. The roadway on top was 12 feet wide per 1899 contract between Adolph Munch and the supervisors of Pine City and Chengwatana Towns. This implies the Chengwatana dam structure was at least that deep (upriver to downriver), if not more. A wider dam is stronger & stabler.
- In 1888, Warren Upham reported that the bottom of the sluiceway was at 929.6 feet (asl) and that the top of the dam was at 939.0 feet (asl). The latter height is also interpreted as the maximum height of impounded water that could be achieved (Stop logs installed to that maximum height). The overall structure would be slightly higher.
- The bottom (929.6') of the sluiceway was at or near the top of the bedrock ledge on which the dam was built
- The dam was chartered to maintain a minimum pool level of 934.6 feet (5.5 feet above low water level). When raised to 937 feet, (6.4 feet above the bottom of the sluiceway), the near level pool would extend 16 miles upriver to the foot of Millet's Rapids near the southeast corner of section 5, Grass Lake Town in Kanabec County.
- If he stop logs were installed to the 939.0 feet, the head of water above the bottom of the Sluiceway would be 9.4 feet.
- This constant flooding of land upriver would haunt the dam in legal controversy throughout its life, but its logging charter protected it. That would change in 1909 when its owners and its use changed to a dam used to supply water for hydroelectric power.



- This photo may seem out of place, it was photographed to show the new 1912 Pine City Power Dam on a post card.
- However, in the background it documents both:
 - The last days in 1912 of the **old logging dam**, first built in 1849
 - The earliest known photograph of the 1908 high steel truss bridge that replaced it as a bridge. (See enlargement just below) The 1908 bridge will be addressed later.



- We know within days, the date this photographed was taken (early May 1912) based on the following:
 - It shows the power dam which had just been built in a six week period during February and March, 1912.
 - The gates of the **old logging dam** were opened wide (in compliance with the court order) on April 1st, 1912
 - On May 12, the local newspaper reported that water levels near the 1908 bridge was nearly touching the bridge planks at the north end of the bridge
- This appears to be confirmed by this photo (see enlargement) by the nearness of the water below the bridge planks at the far right of the bridge.
- Likewise, beyond the 1908 steel truss bridge, the **old logging dam** can still be seen in the background with all its gates apparently wide open given the turbulence of the water.
- The exact date of the complete removal of the **old logging dam** is unknown, just that it was court ordered “likely as soon as practical after the April 1st date”

The 1855 & 1857 Wood Truss Bridge

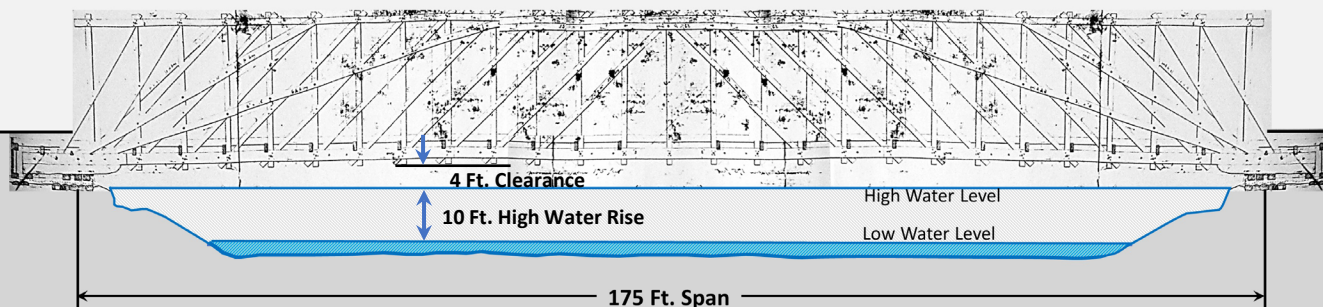
U. S. Government Roads Office St. Paul, MN Territory

Snake River Bridge at Chengwatana

Captain J. H. Simpson – Superintendent
William S. Payte – Surveyor, Field Engineer

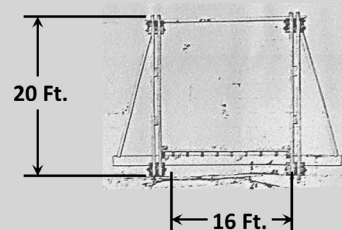
Minnesota Territory

Designer: J. S. Sewall - May 1855
Contractor: T. J. Frasier – October 1855



BRIDGE OVER SNAKE RIVER

- This bridge will be of a single span of from 160 to 180 feet, as may be required,
- have two trusses, each 20 feet high, a roadway 16 feet wide,
- the whole to be built principally of 3 inch plank, arranged in chords, posts and braces,
- all of which are to be fastened together by 2 inch treenails or pins, and $\frac{3}{4}$ inch bolts.
- The abutments, which will be of such height as may be required, say ten feet, will be made of large square timber, properly joined and pinned together.
- The amount of lumber required in the superstructure will be 55,000 feet, board measure, more or less.
- The amount of timber required in the abutments will be 500 running feet, more or less.
- The number of pins required in the bridge will be 1560, the number of spikes 600,
- the number of screw bolts 200, average length $21 \frac{1}{2}$ ', total weight inclusive of nuts, 637 lbs, number of cast iron washers 400, total weight 300 lbs; all more or less.



SEALED PROPOSALS

- will be received by the undersigned, through the Post Office or otherwise, till 10 o'clock A. M. on the 12th of May next, for furnishing the materials for, and the construction
- The Snake River Bridge to be completed by the 1st of September next.

J. H. SIMPSON,
Capt. Corps Topographical Engineers.
Office General Government Roads
St. Paul, Minn., April 10, 1855

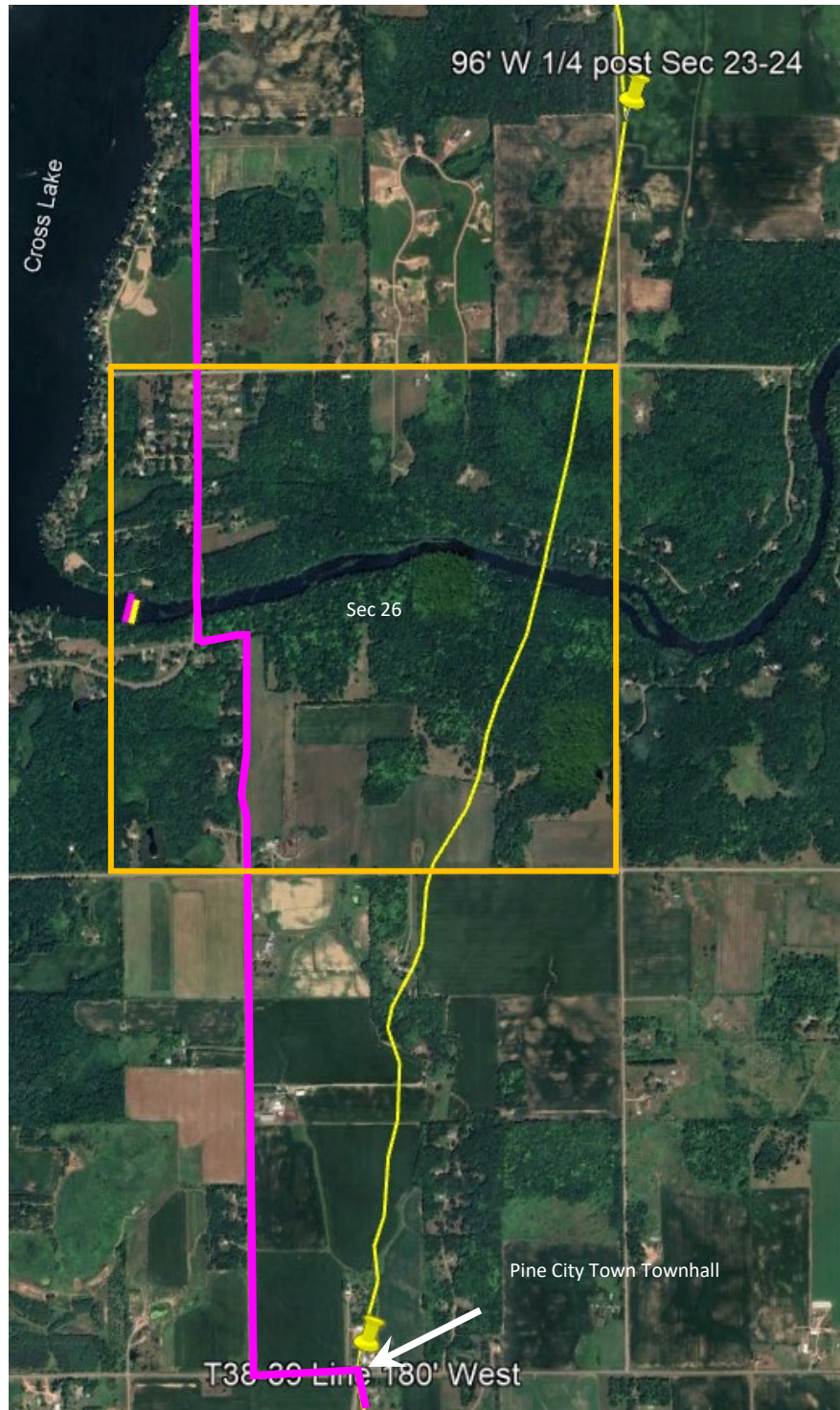
The above text is from the original bid solicitation published April 10, 1855

- Grover Singley on page 19 in his "Tracing Minnesota's Old Government Roads" writes that "at least three new bridges have been built in this area (where the Government Road crosses the Snake River)."
 - The first bridge is the original bridge built in the summer/early fall of 1855.
 - The second bridge is the replacement of that bridge in the early winter of 1857.
 - The reference to what he meant by the third bridge is uncertain.
 - *We know about the second bridge from a letter that year by Hermann Trott, the local agent of Charles P. Daly, a major investor in the platted village of Chengwatana, informed him that the repair work on the damaged Government Road bridge was going to last into the winter of 1857 to complete. He noted that should be good for them, with the Government Road bridge out of action, all traffic would have to cross over the bridge over the dam.*
- In 1861, just four years after the original bridge had been replaced, the Pine County Commissioners approached Emil Munch to request that a bridge be built across the top of the dam.
 - While both the original 1855 bridge and the replacement 1857 bridge had been built with federal funds, by 1861, maintenance funding of the road and bridges had fallen to the local authorities.
 - Faced with an expenditure of \$6,000 to replace the Government Road bridge, it is likely that the commissioners were all too ready to accept Munch's proposal to charge them \$500 for the materials and labor would be provided at no charge.
- Altogether, the two Government Road bridges crossing of the Snake River only lasted six years from 1855 to 1861. The road itself would continue to function for its intended purpose up to 1870. The railroad between St. Paul and Duluth was completed that year. After that, much of the traffic just melted away, almost overnight. Where the road still served local needs, it continued to be maintained. In other areas it was either abandoned or realigned.

Author's Note: Both the Snake River Truss Bridge side elevation drawing and the section drawing above are reconstructed from an actual copy of the original bridge drawing.

Where was the 1855 Government Road Bridge?

- This a Google Earth image of the region east Cross Lake with Section 26 where Grover Singley locates it outlined in orange.
- The Magenta line shows the current Government Road alignment, **but this location is not the original alignment.**
- We have to ask the question, “Where did the road cross the river in 1855?”
- I believe one likely answer is found in the original Field Notes for the 1857 Government final survey of the road to document what was actually built.
- The light yellow line is a plot of that Field Note data.
- The 1855 bridge location should be where it crosses the Snake River.
- Unfortunately, the only two places on this line are precisely known. They are at the “stick pins” at the top and bottom.
- At these points, the surveyor noted the road’s location relative to the 1851 Public Land Survey sectional monuments in his field notes.

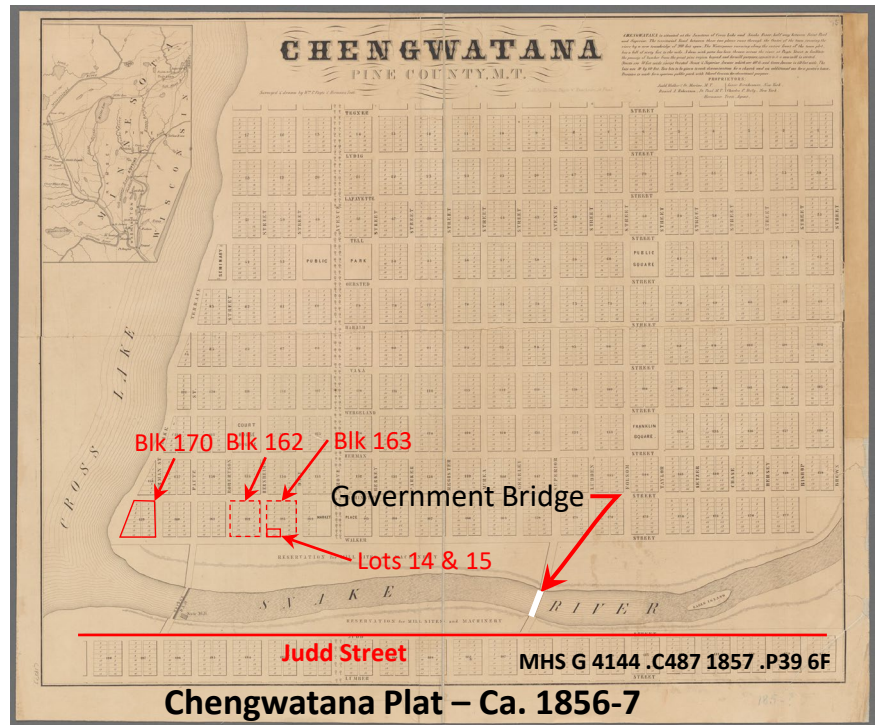


Google Earth Imagery obtain on 03-14-2024 showing Logging Dam, Government Road and Area

- In between these two points, **NO** point on the line is very far from the actual surveyed route, we just don't know its exact location like we do the two end points. The actual route may drift right or left of the portrayed line by a matter of feet or yards. It could be as much as several hundred feet, but it CANNOT be much further than that, if at all, for it to connect to the two known points at either end and still be consistent with the recorded survey data.

Where was the 1855 Government Road Bridge?

- The Chengwatana Plat (right), also provides a likely location for the Government Road Bridge



- Initially, we were unsure of how to relate this plat to modern maps so we could accurately identify the bridge location.

- That dilemma began to be resolved with the discovery of selected Chengwatana plat details that had been replicated in two separate Pine County Auditor records.

- These Subdivision plat records for section 26 & 27. recorded the physical location and size of Blocks

170, 162 & 163, as well as lots 14&15 in Blk 163 relative to specific locations & monuments on the mutual Public Land Survey boundary between sections 26 & 27.

- Further, two 1908 “Town Road Orders” provided direct evidence that parts of today’s Cross Lake Road, Cross Lake Trail and even ironically the Government Road were once part of “Judd Street” which is the first street south of the river on the plat.

- With this information, the plat can be located and properly oriented to accurately transfer the plat’s location for the Government Road Bridge to modern maps. It is shown as the white line.

- Had the plat bridge location fallen on the yellow line of the 1857 resurvey data, or if the survey data line would have crossed the river at the plat bridge location, we could say done.

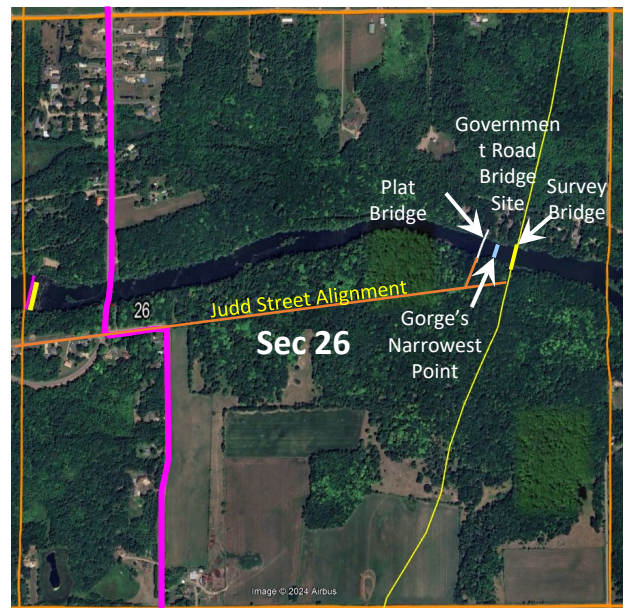
- But they didn’t, but even so they ARE, close!

- Given all the variables needed to portray each, and a limited/no ability to control for:

- The accuracy of the original plat and/or road surveys
- The degree of precision achievable within Power Point and Google Earth.

- The two bridge locations are ~ 350 feet apart. While not zero, it is not an excessive difference.

- Further, I don’t think it is a coincidence that the river gorge’s narrowest point below Cross Lake (based on Google Earth transects) happens to fall between both the Plat and Survey bridges. I am comfortable that this location is the site of the Government Road Bridge.



The 1908 Steel Truss Bridge



- The building of the 1908 Steel Truss Bridge was the culmination of many other events.
- For many years from 1861 to the 1908, the only bridge across the Snake River was a bridge built on top of the logging dam, but it was a point of controversy and was the subject of lawsuits to remove it almost from the beginning.
- The lawsuits all failed because the owners of the dam were protected by its original charter as a logging dam, Passed by the Minnesota Territorial Legislature in 1848.
- But, the townsmen of Pine City and Chengwatana Towns could see the handwriting on the wall. Logging was coming to an end. The dam was being offered for sale. They would eventually lose the bridge on the dam.
- Preemptively, the Chengwatana and Pine City Town supervisors held a referendum in January of 1908 for a bonding bill to build a Steel Truss Bridge over the Snake River.
- The bonding referendum was passed and the bridge was built that same year.
- In the first of two Town Road Orders, also in 1908, the road using the bridge over the dam was officially abandoned by the Pine City and Chengwatana Towns. In the second, new roads were created to connected to the new steel truss bridge. The southern ends of both the abandoned and new roads terminated on the former townsite, Chengwatana's "Judd Street."
- In 1909 the owners of the dam changed, turning the logging dam into a hydroelectric dam, that sealed its doom. The court order issued in 1910-1911 directed the old dam be deactivated (all stop logs and gates removed) by April 1, 1912 and that the remaining structure to be removed as soon as practical thereafter.

The 1908 Steel Truss Bridge

PCAHA 2014-070

May 1912 view of Bridge during a highwater event that almost touches the bridge planks at the north (right) end

Two views of the 1908 High Steel Truss Bridge showing the incline from north to south

This photo, circa 1928, appears to be an intentional “water off” event that drained the pool of the power dam. 11 ft. rise?

PCAHA 2017-419 RPA-1-097-0

- Unfortunately, neither of these view are very high quality, but no better ones have been found
- Hewitt Bridge Co. of Minneapolis was selected as the builder for a sum of \$5,987.00 for construction and \$265.00 for the approach. All costs to be shared between Pine City and Chengwatana Towns(ships).
- The site was approximately 720 feet downstream from the logging dam and 750 feet below today’s dam.
- It had three spans (124’ south, 100’ mid, 16’ north) with an overall length of 240 feet and roadway width of 17’.
- The south truss had a chord height of 20 feet and the mid river truss had a height of 18 feet. Both spans were a “Pratt Truss” configuration. The 16’ north span was as simple beam configuration using 12” timber stringers.
- Records show that periodic rust removal and painting of the steel structure were performed throughout its life. The planking on its roadway was also renewed as required.
- The single lane bridge was in constant use from 1908 until 1959 when the new steel reinforced concrete bridge was completed in 1958 and 1959.
- Upon completion of the 1959 bridge, the superstructure and decking of the 1908 bridge were removed, but the bridge abutments and pier were left until 2023 when they were removed* in advance of the 1959 bridges replacement.

* Historical tidbit: A short steel beam section from the east steel truss near the south abutment remained attached to the south abutment until the 2023 demolition of its successor and its piers and abutments. It was hidden in the brush for all these years.

1959 Steel Reinforced Concrete Bridge

Decision to Replace the 1959 Bridge



Pine City Pioneer Oct 12, 2023

- A view from the north with the bridge as it has looked for the past 65 summers
- Photo courtesy with permission of the Pine City Pioneer

- During design studies in 2022, it was noted that the County Road 9 bridge , which had been built 63 year prior in 1959, was already at 84% of its design life of 75 years which was typical for bridges built in that era.
- In addition to the short life span remaining, the design firm WSB, also noted:
 - The bridge railings did not meet current standards.
 - The bridge was narrow, with two 12-foot lanes and no shoulders.
 - The bridge design had no capacity for widening.
 - Bridge rehab costs would be high
- A new bridge, with a wider 43 foot design and built with with prestressed concrete beams and substructures similar to the existing bridge was developed.
- The new design could also be expected to last 100 plus years
- Trade-off studies between building a new bridge, rehab, as well as other options, determined that replacement with a new bridge was the best option. ¹¹

1959 Concrete Bridge



May 05, 2023

- Construction of the substructure began in 1958 before winter set in with the superstructure being completed during the summer of 1959.
- The road approach from the south to the new bridge was changed to eliminate a hard turn at the bridge for CSH 9 traffic from both directions
- This was accomplished with long curve that first swerved away to the south from the original alignment of County Highway 9 before making a wide lefthand curve that aligned with the new bridge.
- At the time, the cost of the new bridge was estimated to be about \$100,000, with \$35,000 Pine County's share. The balance of the necessary funds came from federal and state appropriations.
- The 285 foot bridge crossed the river with 5 spans of prestressed concrete beams.
- In turn, the beams were supported on four concrete piers and two end abutments
- The 24 foot wide deck was also constructed of steel reinforced concrete.
- This bridge had been constructed about 40 feet upstream from the 1908 bridge so that the old bridge could be used for traffic while the new one was completed.
- Two piers and the north abutment for the 1908 bridge are visible just downstream from the 1959 bridge.
- If you looked while driving, the latter could be seen from the northbound lane.
- With the construction of the 2024 bridge, both the 1959 bridge and 1908 piers were demolished.

The 2024 Bridge



Pine City Pioneer Jan 18, 2023

This is a rendering of what the new bridge will look like when it is completed in 2024



April 14, 2024

- Since construction began in early December, significant progress has been made to advance the work to eliminate the need for “in river work” ahead of the April 15th permit deadline and to allow the most other work to continue.

The 2024 Bridge History & Design

- The Pine County Public Works Department began final preparations for the replacement of the then current CSAH 9 bridge over Snake River in 2022.
- The new bridge would be built as part of a project that would resurface and add wider shoulders to County Road 9 as well as the construction of an eight-foot wide paved bike trail along the south side from its intersection with County Road 8 out to the Snake River.
- The new bridge is expected to last 100 plus years and will be a similar structure with prestressed concrete beams and substructures
- The roadway surface will be forty feet wide with two traffic lanes, each 12 feet wide, as well as an eight foot shoulder on each side.
- Two 18” thick by 36” high guardrails will be added to the roadway for a total width of 43 feet.
- The traffic lanes and shoulders are separated by painted striping.
- When completed, the new bridge will be 298 feet end to end.
- Instead of five spans like its predecessor, the new bridge will employ three spans supported by two in river piers and two end abutments.
- The two in-river piers are 135 feet apart center to center. In turn, each pier center is 81.5 feet from the outside of their respective end bridge abutment
- The eight prestressed center beams are each 54” deep, 135’ long, and weigh 112,000 lbs.
- The ten (five each side) side span prestressed concrete beams are 36” deep and 80 feet long.
- The bridge decking and guard rails are poured in place steel reinforced concrete.
- Like its predecessor, the new bridge piers, foundations, abutments and bridge structure are made of steel reinforced concrete.
- The foundations of the two in-river piers are secured to the bedrock with ten rock dowels each.
- The south abutment foundation is also pinned to the bedrock with ten rock dowels. Because of the rock under the north abutment is not suitable for the use of rock dowels, it rests on a foundation embedded two feet into the weathered rock.
- Aesthetics to enhance the bridge will be added and a wildlife crossing under the bridge at the abutments will be part of the design.
- No lighting will be added as the bridge is in a rural area.
- The design will allow for the trail to effectively cross the bridge on the eight-foot shoulder.
- The \$2.5 million bridge project will be paid for with state aid and local sales tax funds.
- The improvements to County Road 9 include trail construction from County Road 8 to the Snake River on County Road 9 will cost an additional \$3 million.
- The whole project is expected be finished by Fall 2024.

Conclusion/Summary

Chronologically, the bridges are

- 1849 Logging Dam-Bridge*
- 1855 Wood Truss Government Road Bridge
- 1857 Logging Dam-Bridge*
- 1857 Wood Truss Gov't Road Replacement Bridge
- 1861 Logging Dam-Bridge*
- 1908 Steel Truss Bridge
- 1959 Reinforced Concrete Beam Bridge
- 2024 Reinforced Concrete Beam Bridge – In Progress

** It is unknown how many iterations of logging dam "renewal" (maintenance/repair) had been conducted on the dam during its 63 year life span. It is possible that some of the logs at the bottom were still there from 1849 when it was first built, but logs that were above water and exposed to frequent wet/dry cycles had to be replaced as frequent as every 5-7 years (or earlier).*

Sources

15

The following list is not all inclusive, but only lists the primary sources consulted:

1. Tracing Minnesota's Old Government Roads – Grover Singley MHS, 1974
2. Historical and Archaeological Survey of "Old Chengwatana" – Douglas Birk, 1988
3. Charles P. Daly Papers – New York Public Library/MHS Microfilm
4. The Geology and Natural History of Pine County – Warren Upham 1888
5. A Biological Reconnaissance of the Snake River – Donald C Reedstrom, 1964
6. Historic Newspaper Articles
 1. PCAHA Catalog – Ann Vach Clippings
 2. Pine City Library – Historic Newspapers on Microfilm
 3. Newspapers.com
 4. MHS – Online Historic Newspapers
7. Pine City Pioneer – Editor T. A LeBrun
8. Pine County Public Works Engineer – Mark LeBrun
9. Minnesota Historical Society – Gale Family Library
10. Pine City Area History Association – Catalog and Board
11. Pine County Historical Society & Museum & Staff

Snake River Bridge Contract Solicitation

Published April 10th 1855 In St. Paul, Minnesota Territory

BRIDGES OVER SNAKE AND KETTLE RIVERS.

SEALD PROPOSALS will be received by the undersigned, through the Post Office or otherwise, till 10 o'clock A. M. on the 12th of May next, for furnishing the materials for, and the construction of,

A BRIDGE OVER SNAKE RIVER ;

and of

A BRIDGE OVER KETTLE RIVER ;

On the Point Douglas and St. Louis River Road.
BRIDGE OVER SNAKE RIVER.

This bridge will be of a single span of from 160 to 180 feet, as may be required, have two trusses, each 20 feet high, a roadway 16 feet wide, the whole to be built principally of 3 inch plank, arranged in chords, posts and braces, and to be strengthened by the addition of arch braces, all of which are to be fastened together by 2 inch treenails or pins, and 3-4 inch bolts.

The abutments, which will be of such height as may be required, say ten feet, will be made of large square timber, properly joined and pinned together.

The amount of lumber required in the superstructure will be 55,000 feet, board measure, more or less. The amount of timber required in the abutments will be 500 running feet, more or less. The number of pins required in the bridge will be 1560, the number of spikes 600, the number of screw bolts 200, average length 21 1-2 inches, total weight, inclusive of nuts, 637 lbs, number of cast iron washers 400, total weight 300 lbs ; all more or less.

BRIDGE OVER KETTLE RIVER.

This bridge will be composed of two portions, the first to be of a single span of 96 feet, have two trusses 16 feet high, a roadway 16 feet wide, the whole to be built of middling sized timbers, which may all be either sawed or hewed, as may be most convenient, arranged in chords, posts and braces, and to be joined together by means of mortices, pins and wedges. The second portion to be simple trestle work of 2 spans of 15 feet each, a roadway 16 feet in width, and to include the trestle pier for support of north end of main bridge.

The amount of lumber required in the truss portion exclusive of the bolsters at the extremities, will be 25,000 feet, board measure, more or less ; number of 1 1/2 inch pins 220, number of 3-4 inch bolts 44, weighing, with nuts, 152 lbs ; number of cast iron washers 88, weight 66 pounds ; all more or less.

The amount of lumber required in the trestle portion, inclusive of the bolsters of the truss portion, and the trestle pier of main bridge, will be 11,863 feet. board measure, more or less, number of 1 1/2 inch pins 40, more or less.

It being impossible to give in a few words a sufficiently clear description of the manner in which these bridges are to be built, persons desirous of bidding will call and see the drawings and specifications of the same at the office of the undersigned.

The materials for the tresses of each bridge must be white pine, of a good quality, free from sap, shakes, dead knots, or any imperfections calculated to diminish their strength or durability. The pins, blocks, and wedges must be white or burr oak, of the best quality, and well seasoned. The abutments and trestles may be of pine, white or burr oak.

The whole construction to be under the direction of the engineer or agent in charge on the part of the United States, and to be subject to such alterations and modifications by him as the case in his judgment may require.

For the sake of economy, and at the same time for the benefit of the contractor, the two bridges will be let in one contract, and will be bid for separately, as follows.

Snake River Bridge.

1. The superstructure of this bridge by the thousand feet of lumber, board measure, built in the bridge.
2. The abutments by the running foot of timber built in the abutments.
3. The bolts used in the bridge, inclusive of the nuts, by the pound.
4. The cast iron washers used in the bridge, by the pound.

Kettle River Bridge.

1. The truss portion of this bridge, exclusive of the bolsters at the extremities, by the thousand feet of lumber, board measure, built in the truss portion.
2. The trestle portion, inclusive of the bolsters, and trestle pier of main bridge, by the thousand feet of lumber, board measure, built in the trestle portion.
3. The bolts, inclusive of the nuts, used in the truss portion of the bridge, by the pound.
4. The cast iron washers, by the pound.

The Snake River Bridge to be completed by the 1st of September next. The Kettle River Bridge by the 1st of November next.

The contract will be given to the lowest responsible bidder on the two Bridges, and in case he should decline or fail to sign the contract after due notice that his bid has been accepted, the right is reserved of granting the contract to the next lowest responsible bidder, or to re-advertise for proposals. Bonds will be given, if required.

The contract will be subject to the approval of the Secretary of War.

The proposals should be endorsed "Proposals for Bridges over Snake and Kettle Rivers."

J. H. SIMPSON,

Capt. Corps Top'l Eng'rs.

Office Gen'l Gov't Roads, St. Paul, Minn., April 10, 1855.
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As a retired engineer, I found this contract solicitation for bids very compact, specific and understandable. Prospective bidders would know exactly how to write their proposals and what items to bid. It also made their responses easy to compare and evaluate – "apples to apples." There would be no guess work as to what the bidder was actually bidding and whether all material and labor were included.

Source: Newspapers.com – Saint Paul - The Daily Minnesota Pioneer, May, 02, 1855, as well as several earlier dates