Old Steel Bridge
Spanning the Flathead River
on FAS 317, (1½ Miles East of)
Kalispell VICINITY
Flathead County
Montana

HAER No. MT-21

HAER
MONT,
15 - KALSP.V,
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PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
National Park Service
Department of the Interior
Washington, D.C. 20240

HAER
MONT,
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HISTORIC AMERICAN ENGINEERING RECORD

Old Steel Bridge

MT-21

Location: Spanning the Flathead River on FAS 317, 1-1/2 miles east of Kalispell, Flathead County, Montana.

Date of Construction: 1894

Present Owner: Flathead County
Flathead County Courthouse
Kalispell, Montana 59901

Present Use: Vehicular Bridge

Significance: Flathead County was created by the third session of the Montana legislature in 1893. Kalispell, which became the county seat, was becoming the important trade center for the northwest corner of the State. The mountain slopes of the county produced large quantities of lumber and the Flathead Valley, with rich soil, low elevation, and mild climate, was producing award-winning fruits and vegetables. A spur of the Great Northern RR served Kalispell. In January of 1894, the county commissioners decided to build a bridge over the Flathead River near the site of the Kalispell Ferry, provided the city of Kalispell would share the costs. In March, Gillette & Herzog of Minneapolis were awarded the contract for $17,497.00 with the county paying $9,999.000 and the city paying the remainder. The three main spans of the multi-span bridge are pin-connected Pratt through trusses, the southern-most being 220 feet long, the other two each being 144 feet long. The spans are approached by wood stringer spans at each end and the total length of the bridge is 610 feet. The superstructures of the spans are as follows: lower chords are eyebars; verticals are two laced channel sections; diagonals are eyebars and turnbuckles; the upper chords are continuous steel plates riveted atop two channel sections with lacing bars (220 foot span) or batten plates (144-foot spans) riveted to their lower flanges. Wood stringers sit on the top flange of steel I-beam floor beams which are riveted to the superstructure. The deck and its double driving track are wood planks. The

main spans are supported by tubular concrete piers encased in riveted steel plate cylinders and the approach spans are supported by wood pile bents. The bridge was the first large steel bridge built in the NW corner of the State.

Transmitted by: Kevin Murphy, Historian HAER, 1984; from data compiled by Fredric L. Quivik, 1979

ADDENDUM TO
OLD STEEL BRIDGE
Spanning the Flathead River
on FAS 317, 1 1/2 miles east of Kalispell
Kalispell Vicinity
Flathead County
Montana

HAER No. MT-21

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National Park Service
Department of the Interior
P.O. Box 37127
Washington, D.C. 20013-7127

ADDENDUM TO
OLD STEEL BRIDGE
Spanning the Flathead River on Steel Bridge Road
Kalispell Vicinity
Flathead County
Montana

HAER No. MT-21

HAER
MONT,
15-KALSP.V,
1-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
Rocky Mountain System Support Office
National Park Service
P.O. Box 25287
Denver, Colorado 80225-0287

HISTORIC AMERICAN ENGINEERING RECORD

FLATHEAD RIVER BRIDGE

This report is an addendum to a two page report previously submitted to the Library of Congress in 1984.

I. INTRODUCTION

Location:	Spanning the Flathead River on Steel Bridge Road Kalispell vicinity Flathead County Montana.
Quad:	Kalispell, Montana (1982)
UTM:	11/703780/5343140
Date of Construction:	1894
Present Owner:	Flathead County Kalispell, Montana
Present Use:	Highway Bridge
Significance:	The Flathead River Bridge was the first large steel bridge constructed in northwestern Montana. As with many other late 19th century bridges, it replaced an earlier ferry operation. When completed, the structure provided access to Kalispell for the farmers and ranchers working the rich agricultural land in the upper Flathead Valley. The bridge itself is an excellent example of a pin-connected Pratt through truss of the type built in large numbers throughout Montana between circa 1891 and 1917. All of its structural components are intact and the bridge retains excellent integrity.
Historian:	Jon Axline, Montana Department of Transportation July, 2002

II. HISTORY

British-Canadian fur trappers and traders were the first white men to visit the upper Flathead Valley. In 1810, Hudson's Bay Company Factor Joseph Howse built a post on the Flathead River northeast of Kalispell to trade with the Kootenai and Pend d'Oreille Indians. Unfortunately for Howse, the trading post also drew the less-than-appreciative Piegans, who did not approve of the company's sale of weapons to their enemies. Consequently, the trading post was abandoned in 1811. In 1812, North West Fur Company trader and explorer David Thompson became the first white to document Flathead Lake. For the next decade there was fierce competition between the two Canadian companies as each vied for the lucrative Kootenai-Pend d'Oreille-Piegan trade in the upper valley. The merging of the two companies in 1821 initiated a more systematic exploitation of the region by the Canadians. As a result, there was virtually no American presence in the area until the discovery of gold near the Kootenai River on Libby Creek in 1864.[1]

The first known Euro-American settlement near the Flathead River Bridge occurred in 1845 when two French-Canadian trappers built cabins on nearby Ashley Creek and tried to farm rich bottomland. Hostility from the neighboring Piegans eventually forced the men out of the area. The Hellgate Treaty of 1855 established the Flathead Reservation in the Jocko Valley south of Flathead Lake. Although the territory north of the lake and encompassing the project area was not included within the reservation boundaries, its remoteness precluded any large-scale development. It was also frequented by Kootenai Indians until well into the 20th century. Even the proximity of the gold mines near Libby and the abundance of timber failed to stimulate the exploitation of the region. By the early 1870s, the federal government had mapped the area, but desultory hostilities by the Kootenai against the few Euro-American settlers in the region, coupled with its isolation proved to be a barrier to settlement.[2]

Before the arrival of the Great Northern Railway in 1892, the residents of the valley were dependent on a system of poor roads and an abundance of river ferries. Although a road had been constructed along the west side of Flathead Lake in 1880, it was barely passable and open only seasonally. The road was improved somewhat in 1884 and 1889, but it did not significantly break down the natural barriers that happened the development of the region. The author of the 1890 promotional booklet *Flathead Facts* described the trail between Demersville and Egan as a "beautiful wagon road," a "more romantic drive can not be imagined and the gigantic task accomplished can only be appreciated by riding through it." More often-than-not, however, the roads were abysmal, generating frequent appeals by the local residents to the county commissioners for their repair. The Flathead River was also a barrier to development as its wide and deep character precluded the construction of any bridges across it as beyond the technology available to them and because of the great expense. River ferries, thus, were critical to the development of the valley not only for transportation. The communities that grew up around them were important economic and social centers before 1892.[3]

In 1880, "Honest John" Dooley established a boat landing and trading post on the Flathead River about two miles above Flathead Lake. Originally called Dooley's Landing, the post was the first substantial Euro-American settlement in the upper Flathead Valley. In 1881, the settlement was granted a post office and renamed Selish. A couple years later, Canadian immigrant Henry Therriault established a ferry crossing of the Flathead River about one-half mile north of Selish. By 1885, the site had grown to include a general store, blacksmith shop, hotel and saloon. Therriault's ferry and Selish were the first important community centers for the steadily growing population of the region in the 1880s.[4]

William J. Egan constructed a ferry across the Flathead River about three miles southeast (downriver) of the future site of the Flathead River Bridge in 1883. Constructed without the aid of steel nails or bolts, the craft was pinned together with wooden pegs and propelled by a large sweep oar. The steep banks flanking the river channel were dug out and graded to provide easy access to the boat. Seeing the opportunities afforded by the ferry, Egan established a small settlement on public land he was squatting on about one mile north of the ferry. By 1885, the fledgling village included a general store, hotel, boarding house, post office (opened in 1888), livery stable, restaurant, school, and two saloons. Its inhabitants believed that their

> Central situation in the best agricultural belt of Montana, which is as yet only in the infancy of its development, will support a dense population as soon as the adjoining . . . lands are thrown open for sale and settlement.

The open prairie on the east side of the river was fertile with abundant crops grown by Egan. The ferry and community of Egan flourished during the 1880s before the arrival of the railroad centralized the valley's economy at Kalispell. By the late 1880s, William Penny was operating a ferry a short distance downstream of Egan's operation.[5]

One of the last Flathead River ferries established near the site of the Flathead River Bridge was also the longest-lived. Built sometime between 1885 and 1889 by Alvin Lee, Lee's Landing was located just northwest of the community of Bigfork near the existing Montana Highway 82 bridge across the river. Within a few years, a community had grown up around the ferry. By 1890, it included a saloon, blacksmith shop, store, and dance hall. In 1890, local residents voted to change the name of the community to Holt after a popular neighbor named Joe Holt. That same year, the federal government authorized the establishment of a post office in Eugene Sears' general store, which was described as one the "most picturesque places in the valley, and will soon have valuable and desirable summer resort." Holt lost its post office in 1908, but regained it for a short time in 1912. Importantly, Gabe Rouselle operated a stage line between Holt, Demersville, and Ashley that utilized the Egan and Penny ferries until the completion of the Flathead River Bridge in 1894/ Today, Holt Stage Road is the eastern approach to the bridge. The Holt ferry remained in operation until 1942 when it was replaced by a bridge.[6]

It was not until the establishment of Demersville near the mouth of the Flathead River that the ferries and roads really had any significant place to serve. By 1891, Demersville had become the primary trading center in the valley and also served as a steamboat port for Flathead Lake. The 1880 census showed only 27 Euro-Americans living in the upper Flathead Valley; by 1890, that number had risen to 3,000 individuals, half of whom lived in Demersville. Founded in 1887 by a French-Canadian businessman named Telesphere J. Demers, the community was the hub of a number of smaller communities, including the ferry crossings, that served the farmers, ranchers and loggers in the area. On the eve of the arrival of the railroad in 1891, Demersville was the most important community in the region with a population of 1,500. Within two years, however, the once-thriving town had all but disappeared.[7]

Before the 1890s, the upper Flathead Valley was mostly dependent on subsistence agriculture and logging for its economic survival. During the 1880s, the valley was heavily wooded with scattered meadows and many small lakes and marshes created by the meandering river. The area first settled encompassed the high ground bordering Ashley Creek at present-day Kalispell. The abundant and nutritious grasses provided excellent fodder for cattle and horses. Some subsistence farming was also conducted, but the lack of a good transportation network and profitable markets prevented any large-scale farming. Even though the isolation of the valley was somewhat eased by the completion of the Northern Pacific Railway in 1883, only 65 homesteads had been developed in the valley by 1890. Until the arrival of the Great Northern Railway into the valley in 1892, the economy of the upper Flathead was localized, the farmers and ranchers raising products primarily for their own use.[8]

While the natural landscape caused problems for transporting goods and services into and out of the region, nearby Flathead Lake provide just the opposite with the initiation steamboat traffic on it in 1883. That year, the first steamboat, the *Swan*, began regular freight and passenger service between Dooley's Landing, Demersville, Holt, and Polson at the south end of the lake. At its height in 1887, seven steamboats plied the waters of the lake on regular passenger and freight schedules. Once safely off the boats, however, travels were still reliant on the system of "simple wagon tracks" that were "literally hewn through solid timber." The ferries remained critical to the survival of the system before the arrival of the Great Northern Railway in January, 1892. They provided access to Demersville and Ashley from the outlying agricultural and logging districts north and east of Flathead Lake. With the establishment of Kalispell in 1891, they served the new city but were not efficient enough to adequately handle the amount of traffic and goods that were necessary to support it. Accordingly, most of the ferries were eventually replaced by modern steel bridges. All but one of the ferries had ceased operations by the mid-1890s.[9]

The arrival of the Northern Pacific Railway to Ravalli south of Flathead Lake in 1883 sparked a minor population boom in the region north of the lake. The railroad somewhat eased the

isolation of the area when people, drawn by stories of vast natural resources began to arrive in the area. Pilgrims arrived in the valley from the south along a barely passable wagon road along the west side of the lake or through Bad Rock Canyon to the east. In 1857, Joe Ashley appropriated a ramshackle creek-side cabin left behind by French-Canadian trappers in the late 1840s. It is not clear what kind of enterprise Ashley was involved in, but by 1883 he left the country apparently because of the influx of new neighbors. That year, five individuals filed on 40, 80 and 160-acre homestead and timber tracts along Ashley Creek on what later would become the City of Kalispell. They were followed by four others in 1884. One of those was William J. Egan who squatted on public land about three miles southeast of the Flathead River Bridge site in Sections 24 and 25, T28N, R21W.[10]

The course of development on the upper Flathead Valley changed in 1892 with the arrival of the Great Northern Railway. In 1889, Great Northern magnate James J. Hill directed his agents to "investigate and secure possession of the likely sites for stations, divisions and shops." Consequently, they purchased land in Sections 17 and 18, T28N, R21W and formed the Kalispell Townsite Company. The first lots were sold in April, 1891 and the community of Kalispell was established the following month. With the founding of Kalispell on the main line of the new transcontinental railroad, Demersville was doomed. The steamboats were unable to compete with the symbol of 19th century progress and prosperity – the railroad. The Great Northern opened the valley up to national markets and effectively ended the isolation of the region. Kalispell was touted by its new residents as the center of a vast region "abounding in untold wealth." Within months of its establishment it boasted a population of over 2,000 and vibrant commercial district that provided services to the surrounding farms, ranches and logging operations.[11]

Beginning in 1891, the upper Flathead Valley experienced a population and economic boom caused by the railroad. While 65 homesteads were established in the township from 1883 to 1890, between 1891 and 1902, 128 homesteads were filed on by would-be yeoman farmers with nearly half of those established in 1891 alone. Starting in 1892, the Kalispell Board of Trade published annual promotional brochures about the valley, boasting of its agricultural, mineral, and timber potential. Described as "the most fertile and prolific section of the New Northwest" by H. J. Mock in 1892, the valley and Kalispell was ballyhooed as the Eden of Montana. The fertile land along the rivers were good for raising wheat, barley, oats, vegetables, and some fruits (especially strawberries and cherries), while rich harvests of hay could be had on the bench lands – all without the aid of irrigation. Prior to 1892, farming was restricted to the vicinity of the towns, while cattle grazed freely in the bunchgrass meadowlands further away. The railroad and the subsequent arrival of homesteaders drawn to the region by the promotional literature altered the agricultural landscape of the valley. While cattle played an important part in its early development, by 1894 "experts" claimed that the large-scale cattle days were over as "diversified farming is intrenching [sic] on the ranges so there is no room for large herds . . . ."[12]

The railroad also signaled a significant change in the secondary transportation system in the upper valley. The wide and deep nature of the Flathead River made the construction of timber bridges across it an expensive and technologically difficult proposition for northwest Montana entrepreneurs. The Great Northern Railway, however, provided access to the region for the Minnesota-based bridge contracting companies. While timber was in great supply, the technology of the time was not suited to the construction of multi-span bridges across treacherous Flathead River. Steel, however, was perfect for the task.[13]

The Old Steel Bridge was the first of several steel truss bridges to be constructed in and around Kalispell from 1894 to 1911. Local agitation for the construction of a steel bridge at a central point in the upper valley began in May, 1893. Led by the Kalispell Townsite Company and newspaper publisher H. J. Mock, boosters advocated a special election to fund a $30,000 bond for the construction of a steel bridge. By early 1893, the Townsite company had established a ferry at the site of the proposed bridge. High water, however, frequently rendered the ferry inoperable and forced "eastsiders" to cross the river by whatever means they could find. The townsite company was also opposed by residents living at near the mouth of Bad Rock Canyon who believed the bridge would only benefit Kalispell and not them. In June, 1893, Kalispell businessmen and entrepreneurs held a meeting at the City Hall in regards to the proposed bond election. The attendees determined that

> This bridge . . . would benefit every person on the fertile east side as well as people from the west side. Kalispell is the nearest trading point for the majority of eastsiders, and a bridge across the river would be a great benefit to every rancher in this county. . . . The county treasurer's books show that there is paid into the treasury every quarter over $3,000 in licenses, of which Kalispell donates 4/5th, while Columbia Falls pays only 1/5th and is trying to make the people that they should vote against a proposition that will be a benefit to every taxpayer in Flathead [C]ounty.

To prove its point, the townsite company and county commissioners hired the San Francisco Bridge Company to provide an estimate of the cost of a bridge across the Flathead River. It estimated that a steel bridge at the site of the Kalispell Ferry would cost $21,000, well below the $50,000 estimate claimed by the Bad Rock Canyon malcontents.[14]

The Kalispell Townsite Company was the driving force behind the construction of the bridge. Formed in 1890, the company's board of directors was composed of local entrepreneur Charles E. Conrad and Great Northern Railway executives such, J. B. Connor, W. B. Clough and J. A. Coram. Indeed, when the bridge was finally advertised for construction, copies of the plans and specifications were available from both the County Commissioners and the townsite company through the headquarters of the Great Northern Railway Company in St. Paul, Minnesota. By January, 1894, the Kalispell Townsite Company had spent over $9,000 on constructing the roads leading to the proposed bridge site, including steel bridges over the Stillwater River and a slough just west of the proposed bridge (both were demolished by the county in the 1990s). The

company solicited signatures on a petition to build the Flathead River bridge and donated $7,500 towards its construction. On February 14, 1894, the county authorized the County Clerk to advertise for the construction of either an all steel or combination steel and wood bridge across the Flathead River. Although the county specified that the bridge be "about 500 feet, to be built on cylinder piers" with a roadway width of 16-feet, the County Commissioners left it to the bidders to develop specific plans for the bridge. The deadline for bids to be submitted to the Commissioners was February 20, 1894. It is likely that the commissioners and townsite company specifically wanted a Minnesota-based bridge contractor to construct the bridge as a duplicate set of the plans and specifications were available from the Great Northern Railway's office in St. Paul.[15]

Although the deadline for proposals was February 20th, the county commissioners did not meet to consider them until February 24th. Fifteen companies submitted bids to construct the bridge, including O.E. Peppard of Missoula and Lewis Gillette, president of the Gillette-Herzog Manufacturing Company, both of whom visited the bridge site the previous week. Bids for the bridge ranged from a high of $18,504 submitted by the Milwaukee Bridge & Iron Works to a low of $9,600 proposed by Hugh L. Cooper. Because of the large number of bids submitted and the wide variety of the designs, the commissioners appointed County Surveyor C. P. Smith to aid them in making their selection. At an evening session on February 24th, the commissioners rejected all bids, except those submitted by Peppard, the Gillette-Herzog company, and Porter Brothers of Spokane, Washington. Three weeks later, the commissioners awarded the contract to Gillette-Herzog for $17,497. The Kalispell Townsite Company contributed $7,500 to the bridge, while the county picked up the remaining $9,997. The *Kalispell Graphic* later crowed that "The bridge will not only be a strong crossing but an imposing structure which will withstand the strong currant [sic] of the Flathead for years to come."[16]

High water prevented Gillette-Herzog from beginning construction of the bridge piers until mid-July, 1894. Company foreman McLean supervised a 35-man work crew largely made up of workers hired in Flathead County. Three of the men were divers, who excavated the foundations of the bridge. The work was slow "as the [piers] have to be sunk seven feet below the bed of the river and all the excavating has to be done by divers who can work only a two and half hour shift at a time." The piers were set on timber piles driven twelve to fifteen feet into the bed of the river. McLean told the Kalispell Inter Lake that once the piles were driven "the interstices are then filled with rock, sand and cement making them as firm as solid rock and strong enough to withstand the swift current for a hundred years to come." Because of the current and depth of the river, the cylindrical steel piers were not all erected until late September, 1894. The laborious work of constructing the piers generated complaints from observers that work was too slow and the bridge would not be completed by the deadline. The first of the steel through truss spans (No. 3), however, was built on-shore and raised into place by a crane in early September. Once the piers were completed, work on the remaining two spans was rapid. The Old Steel Bridge was completed and opened, with no fanfare, on October 19, 1894. The completion of this

bridge spelled the doom of the numerous river ferries that surrounded Kalispell. The Egan Ferry just downstream of it ceased operations in 1894, while the nearby Penny Ferry had closed down by 1900. Only the Holt Ferry remained in operation into the twentieth century, finally replaced by a timber structure in 1942.[17]

The construction of steel bridges also changed the pattern of roads that provided access to Kalispell. With the completion of the Old Steel Bridge in 1894, the old stage road between the Holt and Egan ferries changed to accommodate the better route across the bridge, contributing to the Egan community's eventual demise. The bridge and relocated Holt Stage Road became the primary access into Kalispell from Bigfork and, by 1914, Columbia Falls and Creston. The route across the bridge was, until 1936, the only access between Kalispell and Glacier National Park. According to historian Kathy McKay, "For decades the main east-west route through Kalispell followed Whalebone Drive to Meridian Road [the town of Ashley's old main street], passed through town along Second Street and exited the east along Conrad Drive, across the Steel Bridge." Both the Theodore Roosevelt International Highway (now U.S. Highway 2) and the National Park-to-Park Highway accessed Kalispell from the east over the Flathead River Bridge after 1921. The bridge was a frequent subject of postcards taken in the Kalispell area.[18]

The first real boom in automobile tourism occurred in northwest Montana in the 1920s, largely sparked by the completion of the interstate Roosevelt and Park-to-Park highways. In 1925, Byron J. McIntire donated land he had homesteaded adjacent to the Flathead River west of the bridge in 1897 to the Kalispell Kiwanis Club to prevent it from falling into the hands of loggers and other developers. Both McIntire and the Kiwanis saw the bridge and the land adjacent to it as one of the local "splendors with which Nature [sic] has so generously endowed us" and sought to preserve it for future generations. To that end, the Kiwanis Club, with donated material and labor from Kalispell businessmen, removed all advertisement signs from trees along the road, filled in a gravel pit north of the west approach to the bridge and planted yellow roses next to the road. Club members also cleaned out the dead timber and developed picnic sites for public use next to the river. Finally, the club erected a cedar log arch across the highway with signs reading "Kiwanis Lane" and "Kalispell Wishes You Good Luck" attached to it. The Kiwanis Club opened the park in the late spring of 1926,

> The public is extended a cordial invitation to make use of the beaches and picnic grounds, and the Kiwanis Club is privileged by the same token to have rendered a fitting tribute to the beautiful valley in which we live.

As late as the 1940s, Kootenai Indians camped around the bridge, adding to the local flavor for tourists coming from and going to Glacier Park. The Kiwanis Lane park eventually grew to include land on both sides of the Flathead River in the immediate vicinity of the bridge. By 1973, however, the club could no longer adequately take care of the property and it was deeded

over to the Montana Department of Fish, Wildlife and Parks for use as a public fishing access site.[19]

By 1929, the Kalispell Chamber of Commerce claimed that nearly all the roads in and around the city had been paved or improved in some way, adding that

> The whole district is covered by a splendid network of highways and laterals, that lead to neighboring towns through immense forests, across rolling valley lands, and into favorite haunts, where fish and game abound, or where the picnic lunch can be spread upon grassy flats in shaded glades.

With the realignment of U.S. Highway 2 in 1936 and the construction of a new steel deck truss bridge across the Flathead River about one mile upstream, the old steel bridge was relegated to the status of being located on a county-owned "lateral." Its new status, however, made it even more suitable as a component of Kalispell's recreation and leisure industries. The bridge now serves hundreds of picnickers, sunbathers, boaters, and fishermen each year, reflecting Kalispell's significance as a recreational destination.[20]

III. THE BRIDGE

A. DESCRIPTION

The Old Steel Bridge near Kalispell is three-span pin-connected Pratt through truss structure with four steel stringer approach spans. The structure rests on concrete piers encased in riveted steel jackets. The bridge is 508-feet long, consisting of two 144-foot spans and one 220-foot main span. The bridge is 16-feet wide with a roadway width of 15-feet. There are two timber stringer approach spans on the east and four timber stringer approach spans on the west. The bridge is supported on the ends by concrete abutments. The truss spans have a vertical clearance of 22-feet from the lower chords to maximum high water. The bridge has a 12-foot vertical clearance on the deck. All of the steel components of the bridge were manufactured by Carnegie Steel.

Substructure

The original plans for the Old Steel Bridge have not survived. While detailed measurements for the superstructure are available as a result of the seven bridge inspections (including one underwater inspection) conducted by the Montana Department of Transportation since 1979, there are no exact measurements extant for the bridge's substructure. There are four piers numbered consecutively from east to west.

Abutment No. 1 (east) consists of a simple un-reinforced concrete wall with truncated wing walls. The abutment is currently braced with log backwalls.

Pier No. 1 consists of two concrete columns encased in riveted steel jackets. The piers are five feet in diameter. The pier columns are connected by concrete webwall surmounted by a steel web plate. The east end of Span No. 1 rests on a rocker bearing bolted into the concrete of this pier.

Pier No. 2 consists of two concrete columns encased in riveted steel jackets. The piers are five feet in diameter. The columns rise 22-feet above the low-water of the Flathead River. A concrete web wall with a steel strap cap connects the two columns. The west end of Span No. 1 and the east end of Span No. 2 are co-joined by a riveted steel rocker bearing bolted into the concrete of this pier.

Pier No. 3 also consists of two concrete columns encased in riveted steel jackets. The piers are five feet in diameter. The columns rise 22-feet above the low-water level of the river. A concrete webwall surmounted by a steel webwall connect the two columns. The west end of Span No. 2 and the east end of Span No. 3 are co-joined by a riveted steel rocker bearing set bolted into the concrete of this pier.

Pier No. 4 consists of two concrete columns encased in riveted steel jackets. The piers are five feet in diameter and are 14-feet in height. A concrete webwall surmounted by a steel webwall connect the two columns. The pier carries a riveted rocker bearing at the west end of Span No. 3; the bearing is bolted into the concrete of the pier.

Abutment No. 2 (west) consists of an un-reinforced concrete abutment with no wing walls.

Superstructure

The Old Steel Bridge is a three-span steel pin-connected Pratt through truss bridge with steel stringer approach spans. It consists of one 220-foot truss span and two 144-foot truss spans. Six timber stringer approach spans reach to the through truss spans. The bridge has an overall length of 508-feet and is 16-feet wide with a roadway width of 15-feet.

Span No. 1 (east) is 220-feet in length and 30-feet deep. It consists of eleven panels; each panel is 20-feet wide and 30-feet deep. The lower chords of the span is comprised of eyebars. The upper chords are continuous steel plates riveted atop two channel sections with lacing bars; they are 15" wide and 10" deep. The inclined endposts are continuous steel plates riveted atop two channel sections with batten plates and are 36' 6" long. The hip verticals are paired steel eyebars. The verticals are laced channel sections and are 10" wide and 7" deep. The diagonals are eyebars with turnbuckles. The portal bracing consists of angle sections riveted to the endposts in a lattice pattern. A bronze dedication plate is located on east portal. It reads: "THE GILLETTE-HERZOG MFG. CO./BUILDERS/MINNEAPOLIS MINNESOTA/1894." There are eight top

struts on this span and they consist of laced angle sections, riveted to the upper chords. The top lateral braces are eyebars. There are eight sets of sway braces at each panel point. They consist of crossed angle sections riveted to batten plates on the vertical members. There are also eight struts at the midpoints of the vertical members. They are angle sections with lacing and are riveted to the verticals. At each midpoint strut and on the portal strut there are curved angle sections riveted to the bottom of the midpoint strut and to the verticals and endposts. The deck is supported by eight lines of 6" x 13" timber stringers resting on the top flanges of ten steel I-beam floor beams and spaced 2-feet apart. The 15" x 42.9" steel floor beams are 17-feet long and riveted to the vertical members. Eyebars comprise the bottom lateral bracing of the span. The stringers support a wood deck consisting of 4" x 10" boards. The deck has a badly deteriorated asphalt overlay.

Span No. 2 (central) is 144-feet in length and 23-feet deep. It consists of seven panels; each panel is 20-feet wide and 23-feet deep. The lower chords of the span is comprised of eyebars. The upper chords are continuous steel plates riveted atop two channel sections with lacing bars; they are 12" wide and 7" deep. The inclined endposts are continuous steel plates riveted atop two channel sections with batten plates and are 30.48-feet long. The hip verticals are paired steel eyebars. The verticals are laced channel sections and are 8.5" wide and 5" deep. The diagonals are eyebars with turnbuckles. The portal bracing consists of angle sections riveted to the endposts in a lattice pattern. There are four top struts on this span and they consist of laced angle sections, riveted to the upper chords. The top lateral braces are eyebars. There are four sets of sway braces. They consist of crossed angle sections riveted to batten plates on the vertical members. There are also four struts at the midpoints of the vertical members. They are angle sections with lacing and are riveted to the verticals. At each midpoint strut and on the portal strut there are curved angle sections riveted to the bottom of the midpoint strut and to the verticals and endposts. The deck is supported by eight lines of 6" x 13" timber stringers resting on the top flanges of ten steel I-beam floor beams and spaced 2-feet apart. The 15" x 42.9" steel floor beams are 17-feet long and riveted to the vertical members. Eyebars comprise the bottom lateral bracing of the span. The stringers support a wood deck consisting of 4" x 10" boards. The deck has a badly deteriorated asphalt overlay.

Span No. 3 (west) is 144-feet in length and 23-feet deep. It consists of seven panels; each panel is 20-feet wide and 23-feet deep. The lower chords of the span is comprised of eyebars. The upper chords are continuous steel plates riveted atop two channel sections with lacing bars; they are 12" wide and 7" deep. The inclined endposts are continuous steel plates riveted atop two channel sections with batten plates and are 30.48-feet long. The hip verticals are paired steel eyebars. The verticals are laced channel sections and are 8.5" wide and 5" deep. The diagonals are eyebars with turnbuckles. The portal bracing consists of angle sections riveted to the endposts in a lattice pattern. A bronze dedication plate is located on west portal. Its reads: "THE GILLETTE-HERZOG MFG. CO./BUILDERS/MINNEAPOLIS MINNESOTA/1894." There are four top struts on this span and they consist of laced angle sections, riveted to the upper chords. The top lateral braces are eyebars. There are four sets of sway braces. They consist of

crossed angle sections riveted to batten plates on the vertical members. There are also four struts at the midpoints of the vertical members. They are angle sections with lacing and are riveted to the verticals. At each midpoint strut and on the portal strut there are curved angle sections riveted to the bottom of the midpoint strut and to the verticals and endposts. The deck is supported by eight lines of 6" x 13" timber stringers resting on the top flanges of ten steel I-beam floor beams and spaced 2-feet apart. The 15" x 42.9" steel floor beams are 17-feet long and riveted to the vertical members. Eyebars comprise the bottom lateral bracing of the span. The stringers support a wood deck consisting of 4" x 10" boards. The deck has a badly deteriorated asphalt overlay.

The approach spans are untreated timber structures. Approach Span No. 1 (east) is 16' 7" long and 16-feet wide. It consists of nine lines of 6" x 12" untreated timber stringers with the east end resting on Abutment No. 1 and the west end on top of a timber trestle-type bent. The bent consists of five piles with a horizontal timber cap and a diagonal brace on the east and west sides. Approach Span No. 2 (east) is 17-feet long and 16-feet wide. It consists of nine lines of 6" x 12" untreated timber stringers with the east end resting on the above bent and the west end on top of Pier No. 1. Both approach spans support a 4" x 10" timber deck overlain by a deteriorated asphalt driving surface. The decks are flanked by a W-type steel guardrail bolted to a wood post that is bolted to the outside stringers. A 2" x 4" wood handrail is nailed to the top of the posts.

There are four untreated timber approach spans on the west. They are numbered consecutively from west to east. Approach Span No. 3 is 16-feet long with the west end resting on Abutment No. 2 and the east end on a trestle-type bent composed of four treated timber pilings with two diagonal braces. Approach Span No. 4 is 18.8-feet in length with both ends resting on trestle-type treated timber bents. Approach Span No. 5 is 14.6-feet in length with both ends resting on trestle-type treated timber bents. Approach Span No. 6 is 9.3-feet in length. The west end rests on a trestle-type treated timber bent, while the east end rests on Pier No. 3. All four approach spans have nine lines of 6" x 12" timber stringers. The stringers support a wood deck composed of 4" x 10"'s boards. The approaches are 16-feet wide and the decks are flanked by steel W-beam guardrails bolted to vertical posts which are bolted to the outside stringers. The guardrail posts have 2" x 4" wood handrails nailed to the tops of the posts.

Material

No figures are available for the amount of steel and concrete used for the construction of the bridge.

Pin-connected Pratt Trusses Bridges in Montana

The modern steel truss bridge was primarily the creation of American inventors. While European bridge-builders concentrated on masonry arch spans during the first six decades of the 19th century, the demands of the expanding railroad networks in the United States forced American engineers to experiment with a variety of different bridge truss types. In 1859,

engineers developed pin-connections for truss bridge. Pin-connections simplified the construction process and permitted prefabrication of bridge components. The rapid expansion of the railroad system and the rise of the bridge companies depended directly on this development. American bridge engineers quickly embraced the new technology and pin-connections became standard to truss bridges throughout the country for the next half-century. After 1883, the railroads aided in the dissemination of the truss bridge in Montana since they could easily transport the components to the vicinity of the construction site.[21]

The Pratt truss was not originally preferred by the railroads because it required more iron for the diagonals and was, consequently, more expensive to build. Although initially more costly than the Howe truss, the Pratt required less maintenance, was more durable and less prone to failure. By 1890, engineers had modified the truss until it was the standard all-steel bridge on both the railroads and the highways. The majority of steel highway bridges constructed in Montana from 1892 to 1920 were simple Pratt trusses.[22]

The first known Pratt truss bridge in Montana was built in 1891 by the Gillette – Herzog Company of Minneapolis, Minnesota across the Gallatin River in Gallatin County near the community of Manhattan.[23] From 1891 to 1917 when the Montana Highway Commission standardized bridge designs, at least 155 pin-connected Pratt trusses were constructed in the state (the number was undoubtedly considerably higher. See footnote 19). Of those, 54% were through trusses and the remainder pony truss structures. The Security Bridge Company of Billings, Montana and the O. E. Peppard Company of Missoula, Montana were the most prolific builders of Pratt trusses from 1907 to 1917, but the Gillette – Herzog Manufacturing Company and King Bridge Company were the most prolific Montana bridge builders in the early 1890s. The Flathead River Bridge was constructed by the Gillette – Herzog company, which constructed at least eight bridges in Montana from 1891 to 1901. Based on the available record, the company appeared to have been most active in Flathead, Gallatin, and Jefferson counties, suggesting it was involved with a pool arrangement that made it a dominant bridge contracting company in western Montana. By 1917, the Montana Highway Commission had developed standardized through and pony truss designs. The designs were for riveted Warren trusses which were more durable and less expensive than the Pratts. Possibly the last county-built pin-connected Pratt through truss bridge built in Montana was the Voges' Bridge across the Yellowstone River (HAER No. MT-103) in Sweet Grass County in 1914.[24]

B. MODIFICATIONS

Other than the periodic replacement of the timber deck and routine maintenance, there have been no alterations or modifications to the Flathead River Bridge. The approach roads are on the original 1894 alignment. The setting of the site has changed somewhat with the development of a Montana Department of Fish, Wildlife & Parks Fishing Access Site on the west approach to the bridge and the construction of a large irrigation intake structure on the east approach.

Residential development is also encroaching on the bridge site and, ultimately, contributed to its deterioration because of increased traffic volumes.

C. OWNERSHIP AND FUTURE

The Flathead River Bridge is currently owned and maintained by Flathead County. The Montana Department of Transportation (MDT) programmed this off-system bridge for replacement in 1998 and a Memorandum of Agreement (MOA) was signed in April, 2002. The Flathead River Bridge was offered for adoption in December, 2001. The County agreed to retain ownership of two of the bridge spans, which will be relocated and incorporated into a bicycle/pedestrian rails-to-trails path at Kalispell. The remaining 220-foot span will be demolished in 2004.

IV. BIOGRAPHICAL MATERIAL

The Gillette-Herzog Manufacturing Company
Sometime during the 1870s, Minnesota entrepreneur Phillip Herzog formed Northwestern Fence Works. By 1884, it had become known as the Herzog Manufacturing Company, specializing in fences, bank railings, and prisons and jails. In 1887, Herzog hired civil engineer Lewis S. Gillette to act as the company's secretary-treasurer, which, by then, had become primarily known as an architectural iron works. Gillette became president of the Herzog company in 1890 and hired his brother, George, as secretary-treasurer. The 1890s were a golden age for iron and steel bridge construction in the Midwest and west. Seeing the economic opportunities for states along the recently completed and St. Paul, Minnesota-headquartered Great Northern Railway, the Gillettes formed a bridge department, hired Alexander Y. Bayne to manage it, and then reorganized as the Gillette – Herzog Manufacturing Company.[25]

Bayne opened a branch office in Butte, Montana in 1897. Along with bridges, the company also constructed other types of steel structures in the state, including the head frame for the Diamond Mine on the Butte hill and cornices and store fronts on Minnesota Avenue in Billings. But it was for bridges that the company was primarily known in Montana. The company built at least two steel pin-connected Pratt through trusses in the state in 1891, including the Nixon (24GA393) and Cameron (24GA829/now demolished) bridges in Gallatin County. The company appears to have been most active in western and southwestern Montana in close proximity to its Butte branch office. From 1891 to 1901, when it merged with 23 other bridge companies to form the American Bridge Company, Gillette – Herzog built at least eight bridges in Montana. Unfortunately, only three of those bridges still exist.[26]

When Gillette – Herzog was absorbed into American Bridge, Lewis Gillette was a director of the conglomerate and Bayne remained the manager of its Gillette – Herzog branch until 1902 when he went into the bridge business for himself. Perhaps wanting to re-establish themselves as an

independent in the bridge industry, Lewis and George Gillette financed J. L. Record and Otis Briggs to form the Minneapolis Steel & Machinery Company in 1902. Although known today primarily for the development of the Minneapolis-Moline farm tractor, Minneapolis Steel was a prolific bridge builder in Montana until 1916 and then fabricated steel bridge components until the early 1940s.[27]

V. FOOTNOTES

1. Don Miller and Stan Cohen, *Military & Trading Posts of Montana*, (Missoula: Pictorial Histories, 1979), 41; Kathryn L. McKay, *Looking Back: A Pictorial History of the Flathead Valley, Montana*, (Kalispell: Northwest Valley Historical Society, 1997), 11, 13-14; Henry Elwood, *Kalispell, Montana and the Upper Flathead Valley*, (Kalispell: Thomas Printing,1989), 2; Carle F. O'Neil, *Muscle, Grit & Big Dreams: Earliest Towns of the Upper Flathead Valley, 1872-1891*, (Kalispell: The Author,1996), 16; Muriel Sibell Wolle, *Montana Pay Dirt*, (Athens, Ohio: Sage, 1963), 289.

2. McKay, *Looking Back*, 15, 17; Elwood, *Kalispell*, 3, 7-8; O'Neil, *Muscle, Grit & Big Dreams*, 32-34, 39; Kathryn L. McKay, *Montana Main Streets: A Guide to Kalispell*, (Helena: Montana Historical Society, 2001), 8.

3. Paul Strong, *Before Kalispell: Demersville, Ashley, Egan, Half Moon, Salish*, (Kalispell: Scott Publishing, 1998), 20, 44; O'Neil, *Muscle, Grit & Big Dreams*, 56; *Flathead Facts: Descriptive of the Resources of Missoula County*, (Missoula: Missoula Publishing Company, 1890), 2; McKay, *Looking Back*, 36.

4. Elwood, *Kalispell*, 7; McKay, *Looking Back*, 18, 39; O'Neil, *Muscle, Grit & Big Dreams*, 24-27; Kedric W. Flint and Nora D. Paul, *Early History of Bigfork and Surrounding Communities*, (Privately Published, 1957), 6; Roberta Carkeek Cheney, *Names on the Face of Montana: The Story of Montana's Place Names*, (Missoula: Mountain Press, 1990), 242.

5. Montana land records indicate that William Egan did not file on his 168-acre homestead in the SE¼ NE¼ and E½ SE¼ of Section 25, T28N, R21W until December, 1891. He converted it to a cash entry in April, 1892. Montana Land Tract Books, volumes 39, 40; Strong, *Before Kalispell*, 19-20, 29; McKay, *Looking Back*, 21, 29, 186-187, 215; O'Neil, *Muscle, Grit & Big Dreams*, 53, 55; Cheney, *Names on the Face of Montana*, 80; *Flathead Facts*, 24; U.S. Census Records: Flathead County, Montana, 1890.

6. McKay, *Looking Back*, 164; Elwood, *Kalispell*, 201, 215; Flint and Paul, *Early History of Bigfork*, 6-7; O'Neil, *Muscle, Grit & Big Dreams*, 62-65.

7. McKay, *Looking Back*, 18, 21; Elwood, *Kalispell*, 8, 13; McKay, *Montana Main Streets*, 8-9; Don Spritzer, *Roadside History of Montana*, (Missoula: Mountain Press, 1999), 157-158; *Flathead Facts*, 3, 11-12.

8. McKay, *Looking Back*, 18-19; O'Neil, *Muscle, Grit & Big Dreams*, 31, 43-44; Montana Land Tract Books.

9. O'Neil, *Muscle, Grit & Big Dreams*, 23; Spritzer, *Roadside History of Montana*, 157; McKay, *Montana Main Streets*, 10; *Flathead Facts*, 2; Carlos Arnaldo Schwantes, *Long Day's Journey: The Steamboat & Stagecoach Era in the Northern West*, (Seattle: University of Washington, 1999), 357-358.

10. McKay, *Looking Back*, 19, 26; Elwood, *Kalispell*, 186; McKay, *Montana Main Streets*, 8; O'Neil, *Muscle, Grit & Big Dreams*, 32, 34, 43-44; Montana Land Tract Books; Strong, *Before Kalispell*, 19.

11. McKay, *Looking Back*, 21, 23, 35; Elwood, *Kalispell*, 30-31, 48; McKay, *Montana Main Streets*, 11-12; O'Neil, *Muscle, Grit & Big Dreams*, 119-120.

12. Montana Land Tract Books; *Flathead Facts*, 2, 11; H. J. Mock, *Kalispell and the Famous Flathead Valley in Northwest Montana*, (Kalispell: Kalispell Chamber of Commerce, 1892), 1-2, 3; McKay, *Looking Back*, 18-19; Elwood, *Kalispell*, 6; H. J. Mock, *Kalispell and the Famous Flathead Valley*, (Kalispell: Kalispell Board of Trade, 1894), 6, 9.

13. Fred L. Quivik, Montana Historic Bridge Inventory, Montana Department of Transportation, 1979-1981; McKay, *Looking Back*, 36; Frederic L. Quivik, *Historic Bridges in Montana*, (Washington DC: National Park Service, 1982), 58.

14. *Kalispell Inter Lake*, 12 May 1893; *Ibid*, 9 June 1893; O'Neil, *Muscle, Grit & Big Dreams*, 43; *Kalispell Inter Lake*, 7 July 1893.

15. Ora Johnson Halvorson, "Charles E. Conrad of Kalispell: Merchant Prince With a Gentle Touch," *Montana The Magazine of Western History*, XXI:2, (Spring, 1971), 62; *Kalispell Graphic*, 7 March 1894; *Kalispell Inter Lake*, 9 June 1893; *Kalispell Graphic*, 14 February 1894; General Land Office Map, Township 28 North, Range 21 West, January 1894; *Kalispell Inter Lake*, 2 November 1894.

16. *Kalispell Graphic*, 28 February 1894; *Ibid*, 14 February 1894; *Ibid*, 21 February 1894; *Ibid*, 7 March 1894; *Ibid*, 14 March, 1894; *Ibid*, 8 August 1894.

17. *Kalispell Graphic*, 18 July 1894; *Kalispell Inter Lake*, 24 August 1894; *Kalispell Graphic*, 12 September 1894; *Kalispell Inter Lake*, 14 September 1894; *Ibid*, 19 October 1894; *Ibid*, 2 November 1894; Quivik, *Historic Bridges*, 58; McKay, *Looking Back*, 36.

18. Recently on eBay, at least three different postcard views of the Flathead River Bridge have been offered for auction. The author was, unfortunately, only successfully bid on one of the postcards. See Data Page 25. McKay, *Looking Back*, 120, 131, 161; McKay, *Montana Main Streets*, 14, 17; George C. Reeder, editor, *Theodore Roosevelt International Highway: Guide Through Montana*, (Glasgow, Montana: Montana Division of the Theodore Roosevelt International Highway, 1923, 7-12, 14.

19. Reeder, *Roosevelt International Highway*, 14; Montana Land Tract Books; *Thirteenth Annual Report of the Water Department, City of Kalispell, Montana, Year Ending December 31, 1926*, (Kalispell: City of Kalispell, 1927), 52; McKay, *Looking Back*, 132; Debra Dils, Montana Department of Fish, Wildlife & Parks, interview by Jon Axline, Montana Department of Transportation, 5 April 2002.

20. *The Flathead: A Paradise of Grandeur and Opportunity and Kalispell, the Distributing Center*, (Kalispell: Kalispell Chamber of Commerce, 1929), 24; Minutes, Montana State Highway Commission, Montana Department of Transportation.

21. Jon Axline, *Monuments Above the Water: Montana's Historic Highway Bridges, 1860 – 1956*, (Helena: Montana Department of Transportation, 1993), 31.

22. Axline, *Ibid*, 33.

23. The first all-steel bridge in the state was constructed across the Missouri River at Fort Benton in 1887. When the Montana Department of Transportation conducted its first historic bridge inventory in 1981, the earliest date found for a still-standing bridge was 1891. Because the bridge inventory only included bridges that were still standing and did not investigate the individual county records for bridges that no longer existed, the 1891 date may be incorrect. On-going investigation will most likely push that date further back. Quivik, *Historic Bridges*, 40, 59, 61.

24. Quivik, Montana Historic Bridge Inventory; Quivik, *Historic Bridges*, 40; *Superior Mineral County Press*, 4 January 1917; *Second Biennial Report, State Highway Commission of Montana, 1919 – 1920*, (Helena: State Highway Commission, 1920), 63 - 64; Montana Department of Transportation, Historic American Engineering Record No. MT-103, Voges Bridge.

25. Frederic L. Quivik, Montana's Minneapolis Bridge Builders, *IA: The Journal for Industrial Archeology*, 10:1, (1984), 41-42; Quivik, Historic Bridges, 40..

26. R. L. Polk, *Butte City Directory*, (Helena, Montana: R. L. Polk & Company, 1897); Quivik, "Montana's Minneapolis Bridge Builders," 42-44; Jiusto, "Tales Spun Along the Tracks: A History of Downtown Billings," (Billings, Montana: Downtown Billings Historic and Architectural Survey, 1998), 14; Quivik, *Historic Bridges*, 40, 59, 61.

27. Quivik, "Montana's Minneapolis Bridge Builders," 44, 45-46; "Minneapolis Steel and Machinery Company" in The Northern Great Plains: Farm Machinery Companies. Available at www.memory.loc.gov.

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