

HAYSTACK LANDING RAILROAD DRAWBRIDGE  
Spanning the Petaluma River at Railroad Milepost 31.19  
Petaluma  
Sonoma County  
California

HAER CA-2316  
*HAER CA-2316*

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD  
PACIFIC WEST REGIONAL OFFICE  
National Park Service  
U.S. Department of the Interior  
333 Bush Street  
San Francisco, CA 94104

**HISTORIC AMERICAN ENGINEERING RECORD**  
**HAYSTACK LANDING RAILROAD DRAWBRIDGE**

**HAER No. CA-2316**

- Location:** The Haystack Landing Railroad Drawbridge is located in Sonoma County, California, over the Petaluma River near the City of Petaluma, at River Mile 12.4, approximately 330 feet downstream of the U.S. Highway 101 (US 101) bridge, 120 feet northeast of Petaluma Boulevard South, and approximately 10 miles upstream of the river mouth at San Pablo Bay.
- North End: Latitude: 38.228644; Longitude -122.61427966274027
- South End: Latitude 533783.51; Longitude -122.61401181930161
- Present Owner:** Sonoma-Marín Area Rail Transit Authority.
- Present Use:** The Haystack Landing Railroad Drawbridge is currently in service.
- Significance:** The Haystack Landing Railroad Bridge was determined eligible for listing in the National Register of Historic Places (NRHP) by the California State Historic Preservation Officer's concurrence in 2005, under NRHP Criterion A as an important link in the Northwestern Pacific Railroad's Southern Division extending from Tiburon to Eureka, CA, and under NRHP Criterion C as one of the first steel Warren swing truss railroad bridges on the Sonoma and Marin Railway line. According to the California Historical Resources Inventory (HRI), the Haystack Landing Railroad Bridge is the fourth oldest railroad swing truss bridge in California, and the second oldest Warren swing truss railroad bridge in the state.
- Historian(s):** David Lemon (Senior Architectural Historian, ICF International), lead author; Edward Yarbrough (Senior Architectural Historian, ICF International), co-author; Meg Scantlebury, (Senior Architectural Historian, ICF International), co-author; Aisha Fike (Architectural Historian, ICF International), research contributor.
- Project Information:** This Historic American Engineering Record occasioned by the Sonoma-Marín Area Rail Transit: Haystack Landing Railroad Drawbridge Replacement Project follows the dictates of the Memorandum of Agreement between the United States Coast Guard, the California State Historic Preservation Officer, and the Sonoma-Marín Area Rail Transit District.
- The cultural resources team was led by Meg Scantlebury, Senior Architectural Historian, ICF International. The contract work for the project was performed by ICF International, 620 Folsom Street, Suite 200, San Francisco, CA 94107.

## Part I. Historical Information

### A. Physical History

**1. Date(s) of construction:** The Haystack Bridge was manufactured by the Pennsylvania Steel Company in 1903 and placed into operation at its current site in 1904.

**2. Architect/Engineer:** Pennsylvania Steel Company, Bridge and Construction Department.

**3. Builder/Contractor/Supplier:** Pennsylvania Steel Company, Bridge and Construction Department.

**4. Original plans and construction:** The original plans and construction for the Haystack Bridge resemble that of the extant structure with the exception of the electrical system installed in 1906, and the fenders in 1911 (which were replaced in 2005). The approach spans were also not included in the original plans and construction. Installation dates for the approach spans have not been established, though the good condition of the timbers implies the spans were replaced in recent years. For a detailed description of existing original plans and as-built drawings, see the annotated list of sources below.

**5. Alterations and additions:** The single-track, steel Warren truss swing bridge replaced the original wooden swing bridge over the Petaluma River. The first wooden bridge was constructed in the late 1870s in conjunction with the SFNP acquisition of the Sonoma & Marin Railroad and subsequent completion of the rail line from Petaluma to San Rafael.

**B. Historical Context:** The rise of the “Locomotive Age” in the United States occurred in the mid-nineteenth century as Americans constructed thousands of miles of railroad tracks. Widely depicted in literature, paintings, and photographs, the railroad symbolized the young nation’s rush to modernize and to secure its future. Settlers on the West Coast, including those who moved to California during the Gold Rush beginning in 1848, also viewed the railroad as a vital way to physically connect the state with markets on the East Coast and to bring prosperity and growth to isolated territories. The national priority of railroad construction influenced industrialists and financiers in California, particularly in Sacramento and San Francisco. Thus the idea of the transcontinental railroad, tying the country together with a “gigantic sash of iron,” from California to the East Coast took hold (Deverell 1994:10-11).

The Central Pacific Railroad, owned by the “Big Four” Collis P. Huntington, Mark Hopkins, Leland Stanford and Charles Crocker, formed the transcontinental railroad’s western half. The railroad’s groundbreaking occurred in 1863 in Sacramento, California, as tracks were laid eastward across the Sierra Nevada to Utah where it would connect with Union Pacific Railroad tracks being laid westward. The Central Pacific Railroad tracks were laid over the next six years as the Big Four used their extensive political connections to secure advantageous federal land grants and federally funded loans (Deverell 1994:11-15). During the process of developing the transcontinental railroad, the desire of local communities in California to develop their own rail lines grew in the interest of taking advantage of this connection to larger markets. In particular,

rail lines along the state's north coast were rapidly developing to serve the timber industry and to transport building materials to the San Francisco Bay Area.

As Leland Stanford hammered in the final ceremonial spike that joined the transcontinental railroad at Promontory, Utah in May 1869, railroad boosters were promising that railroads would bring economic prosperity and usher California into a modern era. Indeed, the state's railroads bolstered tourism and emigration and greatly increased its commerce, manufacturing, and trade. It also vastly changed towns that lay along its path and led to population increases and infrastructure improvements, such as the installation of utilities and paved streets (Deverell 1994:22-5).

As a whole, the railroad had a significant impact on growth and development both nationally and locally. The NWPRR, a portion of which runs through the entire APE, consolidated forty-two separate smaller lines constructed between 1864 and the early twentieth century in Sonoma and Marin Counties. Although the APE for the proposed project is located within Sonoma County, the history of the NWPRR as it relates to both Sonoma and Marin counties is presented below. An amalgam of smaller rail lines in Marin and Sonoma Counties, the NWPRR's main line runs between Tiburon, a town located along Marin County's eastern coast facing San Francisco Bay, and Eureka, the Humboldt County seat located on the Pacific coastline. When the railroad was first constructed in the nineteenth century, the San Francisco Bay was a principle port of the Pacific Coast, and an obvious destination for railroads stretching from the east, and for lines intended for local traffic in Northern California.

Marin and Sonoma County residents wanted a railway, but were divided over the railway route. Most of the Sonoma County residents agreed that Healdsburg was a natural northern terminus. The towns of Petaluma and Vallejo were in direct competition for a rail route. To insure a profitable outcome, a group of Petaluma residents chartered the Sonoma County Railroad Company on December 26, 1867. They envisioned a line to Healdsburg, with a spur to Bloomfield in western Sonoma County (Kneiss 1956).

Two more companies formed to compete for this new line: the Vallejo-Sonoma-Santa Rosa Railroad and the San Francisco and Humboldt Bay Railroad Company. Soon the three were competing to win the route. All three companies expected to receive a subsidy of \$5,000 per mile from the county coffers. To solve the dilemma the state legislature decreed that the voters would decide which company received the subsidy. As a result, each company waged a strenuous campaign for the right to build the railroad. County residents chose the Sonoma County Railroad on May 12, 1868, which sought to build the railroad through Petaluma. The group had limited success, however, and soon transferred their rights and subsidies to the San Francisco and Humboldt Bay Railroad Company, stipulating that the new company construct ten miles of track by November 1869 (Kneiss 1956).

General O'Connor initially formed the San Francisco and Humboldt Bay Railroad Company, but Asbury Harpending quickly took over 90% of the company. Grading proceeded north of Petaluma through the fall and winter of 1868, but by early 1869, the line was running short of funding. The rails had nearly reached Santa Rosa when, in order to raise cash, Harpending and William Ralston (financier of the Central Pacific Railroad) held an unsuccessful auction of the San Francisco lands they had purchased. Construction of the railroad in Sonoma County came to

a halt (Kneiss 1956). The San Francisco and Humboldt Bay Railroad Company reorganized under the name San Francisco and North Pacific Railroad (SFNP) (Kneiss 1956).

A few days before Harpending sold his interests in SFNP to Peter Donahue, an Irish immigrant who became a prominent and influential San Francisco industrialist, in June 1870, Sonoma County voters agreed to a subsidy of \$5,000 per mile to the first railroad company to complete ten miles of track. They also agreed to issue \$25,000 in bonds to the California Pacific Railroad (which had already laid 163 miles of track in northern California) upon the completion of the first five miles from the Napa County line. Voters included a stipulation, however, that if the SFNP--or any other company--was able to complete a railway through the county first, no bonds would be issued to the California Pacific. SFNP owner Donahue moved with amazing speed, putting 100 workers on the line laying track (Kneiss 1956).

Unlike Harpending, Donahue refused to use Chinese laborers, employing instead crews of mostly Irish workers (Stindt 1964). Regular service between Petaluma and Santa Rosa began October 31, 1870. The terminal of the railroad line was a brand new town built by Peter Donahue on Petaluma Creek, christened Donahue. The rival California Pacific owners did not give up easily. They used 100 Chinese laborers to beat the SFNP through the county. To outpace the competition, Donahue rushed more Irish laborers to Santa Rosa. The California Pacific responded by adding 200 more Chinese laborers, and began covering a mile a day. Sonoma County residents cheered on their favorite and wagered on the contest winner (Kneiss 1956).

The race suddenly ended when William Ralston convinced Donahue to sell to Milton Latham, owner of the California Pacific Railroad. Latham was one of the richest men in San Francisco, ex-governor, ex-senator, and head of the London and San Francisco Bank. Donahue made a large profit on the sale of the railroad on April 1, 1871. Donahue agreed to finish laying track to the Russian River using his Irish work force. The SFNP became the Petaluma and Humboldt division of the California Pacific, which was relinquished to the Central Pacific and the Big Four. Incredibly, after so much trouble, the Big Four soon decided that the Sonoma County line would not figure in their long-range plans; by January 1873, Peter Donahue repurchased the line for one million dollars (Kneiss 1956).

Donahue died in 1885 and control of the company passed to his son James, who passed away five years later. Control of the railroad passed from the younger Donahue estate to the California Northwestern Railway Company (CNW), formed by Andrew Markham, Sydney V. Smith, and Arthur W. Foster. While the railroad continued to expand during the 1890s, specifically between Ignacio and Glen Ellen, and through further extension to Guerneville into the Russian River logging country, the decade also saw severe financial problems. The Panic of 1893 damaged railroading interests all over the country, and by 1897, the company was on the auction block. In early 1898, Arthur W. Foster rescued the faltering rail line. Foster incorporated the line with the CNW and began new construction north into timber country. Again, financial instability threatened the CNW and it was absorbed by the Southern Pacific in 1900 (Stindt 1964:15-16).

Another major player became interested in the North Bay Area railroad potential. The Santa Fe Railroad began to incorporate smaller lines to acquire a share of lumber and milling country between Eureka and the Bay Area. By 1903, the Santa Fe had purchased enough local lines to become entrenched in Northern California's coastal timber belt (Stindt 1964:41). The Southern

Pacific took control of Marin and Sonoma county rail lines, and incorporated a new railroad to compete against the Santa Fe's timber lines in 1903 (Stindt 1964:48). Despite the competition, both lines were conscious of the immense costs involved in building separate, competing lines. While one road might prosper, two would prove uneconomical. The competing firms joined forces and formed the NWPRR with 402 miles of track on January 8, 1907. The tourist trade became a central business objective for the NWPRR as hauling agricultural products was no longer profitable (Stindt 1964:48- 49).

The NWPRR became a favorite of Bay Area dwellers seeking the redwood forest experience, and resorts were built to accommodate the tourists. The railroad expended significant resources to meet these demands in Marin County. Sausalito replaced Tiburon as the main southern terminal and tracks were added between San Rafael and San Anselmo. The 1923 Fourth of July celebrations demonstrate the popularity of the rail line, when an estimated 30,000 San Franciscans were ferried across the bay to Sausalito to catch the train north to vacation destinations (Stindt 1964).

In 1929, the Southern Pacific bought out Santa Fe's interest, and the NWPRR became a wholly owned subsidiary. The ensuing 1930s Great Depression made freight transportation nearly nonexistent, and the company abandoned the branch lines (Stindt 1964:54-55). Passenger service also declined and the NWPRR unveiled new, more comfortable cars to combat this decline. The company lowered fares tremendously, with a \$1.25 round-trip fare for San Francisco-Russian River travel. Automobile traffic blossomed in the 1920s and further reduced the passenger railroad business. From the mid-1930s on, the automobile replaced the train as most American's choice for tourist-related travel. The NWPRR abandoned over 138 miles of track during the 1930s Depression (Stindt 1964).

The NWPRR's Depression-era woes were tempered with America's entry into World War II. The Japanese attack on Pearl Harbor resulted in a restructuring of transportation priorities and all the NWPRR engines and cars were pressed into service. Even steam-powered locomotives worked during the war years. The "Redwood Empire" line began to haul lumber and critical war supplies to San Francisco area factories. Due to the high number of Napa and Sonoma county mercury mines, the NWPRR shipped large amounts of this material during World War II (Naughton 1976:6).

After the turbulent 1930s and 1940s, the passengers who once frequented the NWPRR altered their own modes of transportation. By the early 1950s, it was clear to NWPRR leadership that locomotive usage was on the decline. While locomotive use had fluctuated in the past, this time it was clear that the growth of the automobile, long-range trucking, and even buses would have a permanent, nationwide effect on railroading. Passenger service, once the goal of the NWPRR, was no longer a priority. While the transport of lumber was sustained during the post-war economic boom, several passenger-oriented branch lines were dropped. The last complete round trip between San Rafael and Eureka took place in November 1958 (Stindt 1964:55).

Other issues beside profit motive helped shape the future of the NWPRR. In July 1961, a fire ravaged the railroad's Puerto Suello tunnel, located just north of San Rafael, which caused the 1,359-foot tunnel to collapse (Stindt 1964:58). Because of the fire, the NWPRR sought to discontinue service from San Rafael to Tiburon, stating that industries located south of the tunnel

could be adequately serviced by existing barge service. This decision initiated five years of litigation that resulted in a denial of the NWPRR's petition to abandon the line. The section reopened for service in 1967 at a cost of \$12.8 million (Stindt 1974:13).

More branch line closures marked the 1970s, including a 1977 attempt to abandon the line from Ignacio south to San Rafael (Stindt 1974:19). This application, like its predecessor was dismissed. Rail service south of San Rafael halted in 1981 due to the abandonment of the tunnel between San Rafael and Larkspur (Stindt 1974:19-21). Financial woes during the 1980s forced the Southern Pacific to place the NWPRR on the market. By 1983, the asking price had dropped from \$12 million to \$5 million, just above the scrap value of the line. The Southern Pacific purchased the NWPRR (MP 142.5 to Willits) in 1984 (Stindt 1974:24-26).

In 1996, the Southern Pacific line from the town of Outlet, north of Willits, south to the town of Ignacio, in Marin County, became publicly owned. SMART owns the line from MP 68.22 in Healdsburg south to MP 11.4 in Corte Madera. The North Coast Railroad Authority (NCRA) has upgraded the existing railway between Highway 37 (Novato) and Windsor for freight service, which has begun limited operations, as of July 2011.

## Part II. Structural/Design Information

### A. General Statement:

**1. Character:** Warren truss railroad drawbridge represents innovative structural engineering for railroad bridges in 1903.

**2. Condition of fabric:** The current condition and fabric of the Haystack Landing Railroad Drawbridge dates to 1903, built on creosote-treated timber piles with treated timber pile bridge approach spans and fender systems. The current condition of the bridge is impartially deteriorated to the point that several, if not all, timber spans, piles and fenders require replacement.

**B. Description:** The Haystack Landing Railroad Drawbridge is identified as milepost 37.19 of the SMART line. The bridge was originally recorded as a steel Pratt truss, but has since been correctly identified as a Warren truss. The bridge's truss is a series of triangulated steel components riveted together to create a rigid structure. In a Warren truss, diagonal components are under tension while vertical components are under compression except for the end diagonals which are under compression and the vertical members adjacent to them which are under tension.

The two truss plans are united at the base by a platform of floor beams connecting each truss at the bottom chord and stringers running the length of the bridge and intersecting the floor beams. The floor structure is covered by a deck of rails, perforated steel, and wood planks.

At the top the trusses are connected by a steel lattice forming portal bracing. Two sets of top lateral bracing of lattice beams crossing from end posts to vertical components are set above each bay at the ends of the bridge at the top chord.

The Haystack Bridge is a vertical truss swing span bridge that was built in 1904 by the Pennsylvania Steel Company for the Northwestern Pacific Railroad. The swing spans include two identical trusses, each 90 feet long, joined by bolted eyebars at the top chords.

The truss spans, the pivot pier, and the control house date to 1904. The electrical system was added in 1906. The fenders were added in 1911 and were largely replaced in 2005. The dates of construction for the approach spans were not established. The good condition of the timbers, compared with the heavily deteriorated timbers on the pivot pier, suggests that the approach spans were replaced in recent decades.

**C. Mechanicals/Operation:** The bridge may be seen as comprising seven elements: the double truss swing spans; the pivot pier, or center pier; north approach trestle; south approach trestle; fenders on the upstream and downstream sides of the bridge; and the various mechanical and electrical equipment components that help the bridge operate. In addition to the swing spans, the bridge may be seen as comprising six additional elements: north and south approach spans, the pivot pier, upstream and downstream fenders, and the control house. Photograph HAER-CA-

2316-01 through HAER-CA-2316-05 show the relationships between and among these various elements. The 2005 determination of eligibility prepared for FEMA documented that the elements of the bridge were built at different times.

**D. Site Information:** The Haystack Landing Railroad Drawbridge Bridge is identified as milepost 37.19 of the SMART line. The bridge is sited in Sonoma County, California over the Petaluma River near the City of Petaluma, at River Mile 12.4, approximately 330 feet downstream of the U.S. Highway 101 (US 101) bridge, 120 feet northeast of Petaluma Boulevard South, and approximately 10 miles upstream of the river mouth at San Pablo Bay.

### **Part III. Sources of Information**

#### **A. Primary Sources:**

Northwestern Pacific Railroad Historical Society, Petaluma, California

ICF International Architectural Historian, Aisha Fike, contacted the Northwestern Pacific Railroad Historical Society (NWPRRHS) Secretary, Gus Campagna, through email on July 22, 2014. The NWPRRHS library is open on Thursdays from 10am to 4pm. Ms. Fike made arrangements with Mr. Campagna to research NWPRRHS's collections associated with the first decade of the Haystack Landing Bridge (1903 to 1913) on July 31<sup>st</sup>, 2014. Mr. Campagna also gave a tour of the library on July 31<sup>st</sup> and assisted Ms. Fike in using the computer system to locate all the available materials on the Haystack Bridge from 1903 to 1913. Ms. Fike returned on August 7<sup>th</sup> to complete her research. The materials available included blueprint plans and drawings from 1903, 1905, 1909, 1911 and 1912, as well as photographs of the construction of the steel truss swing bridge taken in 1908.

Contact: Northwestern Pacific Railroad Historical Society, 1364 N. McDowell Blvd, Petaluma, California, 94954. Mailing address: P.O. Box 667, Santa Rosa, California, 95402. Gus Campagna, Secretary, nwprrhs-sec@comcast.net. [www.nwprrhs.org/index.html](http://www.nwprrhs.org/index.html).

#### Source

Pennsylvania Steel Company, Bridge and Construction Department. Single Track, 180ft Draw Span, California N.W. Ry. Co., Sheet No's C-11/2, 4, 9, 14; C-12/3, 6, 8. June and July 1903. 90.039.0362 a-g, F-1.

#### Discussion

Seven original as-built 24" x 36" drawings of the steel swing Haystack Landing Bridge over the Petaluma River designed by the Pennsylvania Steel Company. These include the Erection Diagram (C-11/2), End Posts & Gussets (C-11/4), Posts & Diagonals (C-11/9), Machinery Supports etc. (C-11/14), Main Shafting (C-12/3), End Locking Machinery (C-12/6), Center Castings (C-12/8).

#### Source

Pennsylvania Steel Company, Bridge and Construction Department. Bill of Pins. June 18, 1903. 93.026.0259 a.

#### Discussion

An original as-built drawing of the steel swing Haystack Landing Bridge over the Petaluma River designed by the Pennsylvania Steel Company containing the bill of pins and pin drawings. The bill of pins is a detailed parts list including four separate styles of pins, or nuts required for assembly of the single track bridge.

Source

Petaluma and Santa Rosa RR Co. Profile from Forestville to Petaluma, Mile 23.84 to Mile 0. Ca. 1905. 93.26.1285 WD-19.

Discussion

A 12" x 55' pen and ink on waxed linen track map on a scale of 200'=1" horizontal/6'=1" vertical drawn by the Petaluma and Santa Rosa Railroad Company. The section viewed contains the drawing of the "312 ft Pile Bridge" over the Petaluma Creek near the McNear Railroad station.

Source

Robert Moulton. Replacing the Petaluma Bridge, Northwestern Pacific Railroad. Photo No's M237, M238, M239, M240, M241, M242. Photographer unknown. 1908. 90.006.0039 Moulton Photo Binder.

Discussion

Collection of six photos of the Haystack Bridge taken during replacement of the old wooden truss bridge by the new all steel swing bridge. The photo descriptions note that the "work was done quickly so as to not interrupt the flow of railroad and river traffic." This collection includes images of: the old wooden truss as it's being replaced (M237), the steel truss being installed into place (M238), overall view taken from the hill to the southwest of the replacement activity (M239), the installation of the new bridge (M240), the crew of workmen standing on the newly installed bridge with the old wooden bridge in the background (M241), and the first train to cross the newly installed bridge (M242).

Source

Northwestern Pacific Railroad Co. Circular Track for the Petaluma Creek Drawbridge. March 1909. 93.026.0160 a.

Discussion

An 8 1/2" X 14" blueprint sectional fabrication diagram of the Haystack Bridge. It depicts 12 cast steel sections as shown to form a circular ring with an outside diameter of 19'-1" with the top to be turned to a conical surface as shown.

Source

Northwestern Pacific Railroad Co. Crossing of Petaluma Creek, Profile and Plan of Pier Protection. April 1911. 90.039.0364 M-2.

Discussion

A 20" x 20" pen and ink on waxed linen plan map of the piling clusters to protect the end and middle piers of the bridge. Additionally, a profile of the Petaluma Creek along the bridge line shows the location of piers as extant in 1911 in black ink and as proposed in red ink.

Source

Northwestern Pacific Railroad Co. Haystack and McNear, Sonoma County. June 30, 1912. 90.039.0186 a, T-8.

Discussion

A 10" x 48" blueprint diagram of the Northwestern Pacific Railroad track line at the McNear station showing the drawbridge and the former railroad spur crossing southeast at the bridge and Petaluma Creek.

Source

Northwestern Pacific Railroad Co. Haystack, Sonoma County. August 1912. 93.026.1100 W-10.

Discussion

A 13" x 14" pen and ink on waxed linen railroad track layout showing line side structures. Map includes drawings of levees, fence along track line, water traps, and structures include the Haystack drawbridge, rock bunkers and conveyers of Petaluma Rock Company, the Riverside Hotel, a barn, an engine house and the Cronen dwelling.

California State Railroad Museum, Sacramento, California

ICF International Architectural Historian, Aisha Fike, contacted the California State Railroad Museum Librarian, Kathryn Santos, on July 22<sup>nd</sup>, 2014, by phone. Ms. Fike made arrangements with Ms. Santos to visit the museum library on August 7<sup>th</sup>, 2014 to research their collections associated with the first decade of the Haystack Landing Bridge (1903 to 1913). Ms. Santos called Ms. Fike on August 6<sup>th</sup> to inform her she was not able to locate any materials on the Haystack Bridge at the California State Railroad Museum library. ICF International on-call historian James Williams had conducted preliminary research at the California State Railroad Museum on May 13, 2014 and had located the original as-built drawings of the bridge. Ms. Fike provided the information obtained by Mr. Williams to assist Ms. Santos in locating the materials. Ms. Santos provided Ms. Fike the museum's order form through email to obtain electronic copies of the ten 1903 as-built drawings in the Pennsylvania Steel Company collection of the Haystack Bridge. Ms. Fike emailed the order form to Ms. Santos on August 14<sup>th</sup> 2014.

Contact: California State Railroad Museum Library, 111 I Street, Sacramento, California, 95814. Kathryn Santos, Librarian, library.CSRM@park.ca.gov, (916) 323-8073, www.crmf.org/library-and-collections.

Source

Pennsylvania Steel Company, Bridge and Construction Department. Single Track, 180ft Draw Span, California N.W. Ry. Co., Sheet No's C-11/2, 3, 4, 5, 7, 8, 9, 10, 11, 13, 14. June and July 1903. ID 55110.

### Discussion

A number of original as-built 24" x 36" blueprint drawings of the steel swing Haystack Landing Bridge over the Petaluma River designed by the Pennsylvania Steel Company. These include the Erection Diagram (C-11/2), Top Chords (C-11/3), End Posts & Gussets (C-11/4), Portals & Top Laterals (C-11/5), Bottom Chords (C-11/7), Floor Beams (C-11/8), Posts & Diagonals (C-11/9), Bottom Laterals (C-11/10), Stringers & Stringer Bracing (C-11/11), Stringers (C-11/13), Machinery Supports (C-11/14) [the Machinery Supports drawing is recorded as C-11/11 because the label has faded; the NWPRRHS collection confirmed that it is C-11/14]. The "Stringer" sheet has the date stamp June 1, 1908 indicating the date of the construction of the bridge.

### **B. Secondary Sources:**

Condit, Carl W.

1968 *American Building*. University of Chicago Press, Chicago, Illinois.

Deverell, William

1994 *Railroad Crossing: Californians and the Railroad, 1850-1910*. University of California Press, Berkeley, California.

Kneiss, G. H.

1956 *Redwood Railways: A Story of Redwoods, Picnics and Commuters*. Howell-North, Berkeley, California.

Naughton, T. E.

1976 National Register of Historic Places Nomination Form, Cloverdale Railroad Station, Cloverdale, Sonoma County, California. On file at the U.S. Department of the Interior, National Park Service, National Register of Historic Places Archive, Washington, D.C.

Stindt, Fred A.

1964 *Northwestern Pacific Railroad: Redwood Empire Route*. Fred A. Stindt Press, Kelseyville, California.

URS Corporation

2011 "Sonoma-Marín Area Rail Transit, Petaluma River Bridge at the City of Petaluma, Sonoma County, California, Task Order 4.0A, Haystack Bridge MP 37.19 over Petaluma River, Condition Assessment Report," January 2011. Hereafter URS, "Condition Assessment Report."

URS Group, Inc. and Dewberry & Davis LLC

2005 Cultural Resources Technical Report, Retrofit of Bridges Project, North Coast Railroad Authority, FEMA-1203-DR-CA

### **C. Likely Sources Not Yet Investigated:**

Oral histories.