

Watmaugh Road Bridge

**California Department of Transportation Bridge #20C-0017
(Hopke Bridge)**

**Spanning Sonoma Creek at Watmaugh Road
City of Sonoma (vicinity)
Sonoma County, California
Sonoma County Landmark #103**

Watmaugh Road Bridge

The crossing at Watmaugh Road was a creek ford until 1891 when the King Iron Bridge Manufacturing Company built a Wooden Bridge.

Built at a cost of \$2,730, the new bridge provided a year-round connection for residents and travelers between the lower Broadway area of the City of Sonoma and rural areas to the southwest.

Right: image of Watmaugh Road crossing (center).
Napa, California, USGS topographic quadrangle, 1902.
Source: United States Geological Survey, Washington,
D.C.

Website, <http://historicalmaps.arcgis.com/usgs/>



Watmaugh Road Bridge

Sonoma County voters passed the Highway Modernization Plan in May 24, 1919. The \$1,640,000* plan funded improvements top roads that linked the communities of Sonoma, Petaluma, Valley Ford, Bodega Bay, and north to the Mendocino County Line; Santa Rosa, Sebastopol, Freestone, and Valley Ford; Healdsburg, Forestville, Guerneville, and Jenner; Healdsburg to the Napa County Line; Cotati, Sebastopol, and Forestville; and Graton and Occidental.

New and replacement bridges were also included. The bond funded construction of six of the 18 existing truss bridges in Sonoma County. Four bridges were built in 1920 and 1929; the remaining two were built in the early 1930s.

Following the Wall Street Crash of 1929, Sonoma County continued working on these road projects, but as the Great Depression took hold, the county found it difficult to continue bond sales, which made progress difficult.

In 1933, the State assumed control of much of Sonoma County's road system, including portions of present-day State Highways 1, 12, 116, and 128. Four of the extant truss bridges were built after that date.

*according to the Federal Reserve's online Inflation Calculator, this is equivalent to \$28,790,690 in 2023 dollars. Source: <https://www.minneapolisfed.org/about-us/monetary-policy/inflation-calculator>

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Under the 1919 Highway Modernization Plan, Sonoma County replaced the first bridge carrying Watmaugh Road over Sonoma Creek as part of a series of improvements to what was then known as the Petaluma-Sonoma Highway. County Surveyor Edward A. Peugh designed the replacement steel truss bridge in 1927. Two years later the Sonoma County Board of Supervisors awarded a contract of \$14,783 to Walter Lewis Proctor to build it.

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Walter Proctor was born February 11, 1870, in River Falls, Wisconsin. He left the family farm and came to California. By 1892 he was a telegrapher operator in Bodega and later a merchant in Marin County and San Francisco in the later 1890s.

He settled in Sonoma County by 1900 and over the next 30 years lived in Bodega and Santa Rosa.

By 1906, Proctor was a general contractor known for moving and raising houses. By 1914, he built several Bridges near Santa Rosa. Walter Proctor died October 26, 1949, in Santa Rosa.



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Common bridge structure types are trusses, arches, or beams that support dead and live loads. The Watmaugh Road bridge is a “Warren pony truss” structure. A truss bridge is a self-supporting structural system “composed of vertical compression and diagonal tension elements” arranged geometrically to support and transfer dead and live loads to the ground via support piers.

The essential difference among the various truss types is how they support their own weight, known as “dead load,” and the weight of persons, things, or weather effects (e.g., wind, ice, or snow), known as “live load.” “In the late eighteenth century, American bridge builders adopted, and adapted truss patterns commonly used in medieval and early modern Europe to frame roofs, and at least since the Renaissance, for the construction of bridges.”*

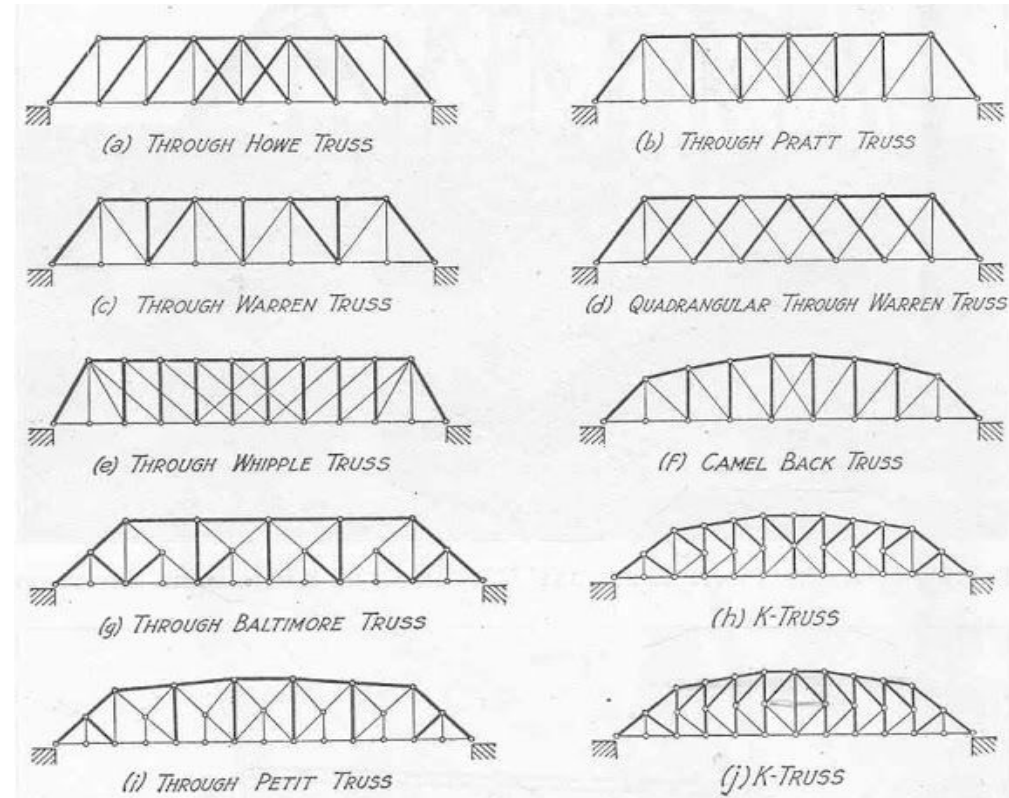
American entrepreneurs patented new bridge trusses, technological advances in iron and steel manufacturing processes improved material quality, corporate consolidation among fabricators and manufacturers, and increasing government preference for consistency in design and safety “led to the dominance of the Pratt, Parker, and Warren trusses, still common today.”*

* Source: Watmaugh Road Bridge Over Sonoma Creek Replacement Project. Draft Environmental Impact Report. September 2012. Sonoma County, California. Website: <https://historicbridges.org/california/watmaugh/documentation.pdf>.

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In 1848, James Warren and Willoughby Monzani patented a bridge design configured as a repeating equilateral. Known as the Warren Truss, it is a relatively light truss configuration that ensures no individual strut, beam, or tie is subject to bending or straining forces, but only to tension or compression. Loads on the diagonals alternate between compression and tension (approaching the center), with no vertical elements, while elements near the center must support both tension and compression in response to live loads. This configuration combines strength with economy of materials and can therefore be relatively light.

Image at right: truss types. Source: Oklahoma State Engineer's Office: <https://okbridges.wkinsler.com/technology/index.html>



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The popularity of the personal automobile compelled government to invest in infrastructure to “open up” and promote economic growth in areas far from the railroad. Truss bridges quickly found favor with road improvement groups, local and state transportation commissions, and city and county engineers. Sonoma County's first metal truss bridges were originally railroad bridges. The Haupt Creek Bridge and the Big Sulphur Creek Bridge were both originally former Northwest Pacific Railroad bridges.

By 1900 concrete replaced metal truss as the preferred bridge type nationwide and most often used for smaller, simpler spans. Ease of design, durability, and construction made concrete especially attractive to local governments, and were usually designed by county surveyors and state engineers.



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Sonoma County's bridges represent a variety of techniques and materials. The most numerous type are reinforced concrete bridges, while metal truss bridges are less represented in the county.

Sonoma County's truss bridges reflect various phases of the county's historical development of its transportation network. They also reflect technological changes affecting transportation both statewide and nationwide during the early-20th century.

The table at right summarizes extant highway truss bridges in Sonoma County.

Time Frame	Era	Bridge Name	Truss Type
Pre-1900	Railroad	Haupt Creek** (LM)	Pratt through
		Big Sulphur Creek** (LM)	Pratt through
1900-1919	Railroad	Clarks Crossing** (LM)	Parker through
	Early Roads	Hacienda Bridge** (LM)	Parker through
		Lambert Bridge** (LM)	Parker through
1920-1933	County Plan	Healdsburg Bridge	PA Petit through
		Wohler Road** (LM)	Parker through
		Guerneville Bridge** (LM)	Parker through
		Austin Creek (LM)	Pratt through
		Watmaugh Road** (LM)	Warren pony
		Arnold Drive** (LM)	Parker through
1934-1950	State Support	D Street Bridge (basculer)*	Warren variation
		Monte Rio Bridge (LM)	Pratt pony
		Westside Road	Pratt pony
		Crocker Road	Warren pony
		<u>Jimtown</u> Bridge	Cantilever pony

* – Funded by the City of Petaluma

** – Contributor to Sonoma County Historic Bridges Thematic District

LM – Sonoma County Landmark

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Parker through-truss bridges are the best represented of the extant truss bridges in Sonoma County. Pratt-style through-truss bridges are the second most frequent type, followed by Pratt pony trusses. In 1985, when the California Department of Transportation bridge survey was completed, Sonoma County had four Warren truss bridges, in addition to the Warren variation bascule bridge in Petaluma. Two Warren trusses were since demolished but two pony truss bridges have survived.

Below summarized highway truss bridge types remaining in Sonoma County as of 2012.

Design	Number
Parker Through	6
Pratt Through	4
Pratt Pony	3
Warren (polygonal) Pony	2
Warren (bascule) Pony	1
Pennsylvania Petit Through	1
Cantilever Pony	1

