Arizona Eastern Railroad Bridge
(Southern Pacific Railroad Bridge)
Spanning Salt River
Tempe
Maricopa County
Arizona

HAER No. HAER No. AZ-18

HAER
ARIZ,
7-TEMP,
2-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
National Park Service
Western Region
Department of Interior
San Francisco, California 94102

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7-TEMP,
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HISTORIC AMERICAN ENGINEERING RECORD

Arizona Eastern Railroad Bridge
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Location:	Crossing Salt River at Tempe, Maricopa County, Arizona; Tempe Quadrangle 7.5': UTM coordinates X: 412,293; Y: 3,699,398, Arizona central zone.
Date of Construction:	1905-1915.
Present Owner:	Southern Pacific Transp. Co. Southern Pacific Building One Market Plaza San Francisco, CA 94105
Present Use:	Daily S.P. freight and Amtrak passenger use.
Significance:	Longest-standing railroad bridge at a location notorious for flood damage; last remaining railroad bridge in Tempe. Nine-span Pratt truss style illustrates evolution of bridge engineering of the era. Owned by two of Salt River Valley's most influential railroad companies.
Historian:	Barbara Behan, Research Archives, Salt River Project.

The Southern Pacific Railroad has been an integral part of the history of Arizona as a territory and state. From the time of its original construction across southern Arizona in 1880, the company as well as its competitors have provided the transportation that enabled economic growth during the territorial and early statehood periods. It also was a major influence in the development of the state's most populous regions. The largest of these is the Salt River Valley, where irrigated agriculture flourished in the late nineteenth and early twentieth centuries.

It was in this atmosphere of growth and change shortly after the turn of the century that the Arizona Eastern Railroad, an early affiliate of the Southern Pacific, built the Arizona Eastern (Southern Pacific) Railroad bridge at Tempe. One of many to cross the Salt River in the vicinity, this bridge has considerable historical and economic significance. The purpose of this report is to document the setting in which the structure was built and to analyze its meaning in the greater history of the region it serves.

Economic Background: Arizona

To fully appreciate the role the Arizona Eastern Railroad (AERR) bridge played in the Salt River Valley, it is necessary to understand the context of its establishment and use. The general economic history of Arizona, the Salt River Valley and Tempe at the time of western railroad development influenced and were influenced by such developments; this background provides insight to the significance of this particular structure.

Arizona's economic growth before statehood has been characterized as "the history of large economic units."(1) Large injections of capital, rather than individual entrepreneurship, developed the territory's resources and attracted settlers from the East. In south and central Arizona, the most important of these units included the U.S. Army, mining corporations, large ranches and farms, and the railroad. These entered the territory in roughly the order listed, and became interdependent parts of the entire growth process.

Mining was the first large-scale economic activity in territorial Arizona, and followed the Army's subjugation of the Arizona Indian groups. Ranching and farming were next. Indians and Mexicans had practiced both to some extent in pre-territorial days; however, larger populations of miners coming into the region required production of greater quantities of food. The agricultural development also "stabilized" the new non-Indian

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1. William H. Lyon, "The Corporate Frontier in Arizona," Journal of Arizona History 9 (Spring 1968), 1.

settlements and were a contrast to the more transient mining camps.(2)

The region known as the Salt River Valley is located in south central Arizona. It is a wide, flat valley of desert land fed primarily by the waters of the Gila and Salt rivers. The area's early economic development rested almost exclusively on agriculture and related activities. Before any widespread settlement of the region by European Americans, the area was farmed and irrigated for centuries by various Indian tribes. Military surveyors were attracted to the potential for Anglo agriculture, and after the Civil War, the first permanent settlers from the east arrived. (3)

Phoenix was the first significant town in the Salt River Valley and was established in the late 1860s. Other settlements developed peripherally around it; some of the first were Tempe, Mesa, Glendale, Peoria, and Buckeye. As agriculture-based centers of population, two primary factors made their existence possible: water for farming dispersed by an efficient canal system, and the arrival of the railroad in the 1880s. Some twenty-five years after the founding of these initial settlements, a second generation of outskirt towns appeared. These included Gilbert, Tolleson, Chandler, Litchfield Park, and Goodyear. One basis for their establishment was the reliability of water storage development created by the construction of Roosevelt Dam by the U.S. Bureau of Reclamation in 1904-1910. Like the first generation of towns, these were founded on the promise of irrigated agriculture and industries supported by it.(4)

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2. Odie B. Faulk, Arizona: A Short History (Norman, Oklahoma: University of Oklahoma Press, 1970), 151.

3. United States, Department of War, "Report on Exploration of the Public Domain in Nevada and Arizona," Lts. George M. Wheeler and David W. Lockwood, H. ex. doc. 65, 42nd Congress, 2nd session 1872.

4. For discussion of the growth pattern of Salt River Valley settlements, see Charles S. Sargent, "Towns of the Salt River Valley 1890-1930," Historial Geography Newsletter 5 (Fall 1975), 6. Tolleson, Gilbert and Chandler were for the most part pure farming communities. Goodyear and Litchfield Park were established as company towns for Goodyear Company, which depended on locally grown cotton for rubber and other products.

Early Transportation in Arizona

It is difficult to overestimate the importance of the railroad to the growth of Arizona. One historian has called it "the greatest event in Arizona in the nineteenth century."(5) As elsewhere in the West, this was the vital link to the outside world and expansions into the arena of established commerce and society. Not only did the railroad provide business with access to distant markets, it also made the world smaller by the communications it provided. Successful development of western resources was underway before the railroad arrived, but truly boomed with the availability of fast, reliable and less expensive transportation.

Transportation in Arizona Territory before 1880 was largely limited to stage service. Before the Civil War, the Butterfield Overland Mail operated from St. Louis through Tucson, then the population center of the territory. The Butterfield line was decimated in the war and was replaced by the Southern Overland Mail. This and other lines provided mail service, passenger transportation, and some freight service throughout the West and Southwest. In Arizona an important stage freight service was the company of Tully & Ochoa of Tucson. Established in 1864, the firm supplied government posts and Indian reservations as well as other entities, hauling freight from points as distant as Kansas City. Around Phoenix, stages ran to Maricopa, about 40 miles to the south, and to the first territorial capitol of Prescott, some 100 miles to the northeast. Sixteen mule teams also were used for hauling freight. All of this stage activity was slow and could be problematic, especially in periods of bad weather.(6)

Because of the scarcity of navigable waterways, inland boat transportation never developed in the trans-Mississippi West to the extent it did farther east. The Colorado was one western river on which a successful steamboat business developed, and was an important source of transport in pre-railroad Arizona. Steamboat passage up and downstream of Yuma provided both passenger and freight service and continued after the development of the railroad. The business was promising enough, in fact, that the Southern Pacific of Arizona ran steamboat operations at Yuma for a short time in the late 1870s. The project was undertaken simultaneously with Southern Pacific's railroad

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5. Faulk, Short History, 153.

6. Faulk, 151-2; David F. Myrick, Railroads of Arizona v. 2: Phoenix and the Central Roads (San Diego: Howell-North Books, 1980), 494, 496.

construction through that town and discontinued after a few years.(7)

Southern Pacific of Arizona

The Southern Pacific of Arizona, a branch of Southern Pacific Railroad, built the first railroad in the Arizona Territory. For this and its continued leadership in railroad development, it has been an integral part of Arizona's growth. The first line reached Tucson from Yuma in 1880; it had been anticipated eagerly for years and was received with much fanfare. The line originally was conceived as an extension of the Central Pacific in California, and connected to the Texas and Pacific at Sierra Blanca, Texas in 1882. Some details surrounding its establishment are illustrative of the territorial period in Arizona.

First, there are many interpretations for the motivations held by Southern Pacific in building the line at all. At this time in the territory's history, it was hardly an attractive place to be in the minds of many Easterners. It was sparsely populated, little developed, and the local Apaches were generally very hostile to non-Indian settlers. Mining activity, while fairly lucrative, was considered less promising than in California; railroad historian David Myrick suggests that, in fact, providing access to California was one primary reason for building the railroad across Arizona.(8)

In the national scope, Southern Pacific was one of the main contenders in a large power game for the transportation development of the West. Industrialist "robber barons" such as Jay Gould of the Texas and Pacific Railroad were the contemporaries of Southern Pacific's own powerful chief, Collis P. Huntington. These men and others competed fiercely in an attempt to secure the first, the best, and the most lines in the undeveloped regions of the West. Extending the Southern Pacific line across Arizona was part of the maneuvering for the first transcontinental railroad, the Union Pacific. In a wider context, the transportation development of the West has been interpreted as a deliberate plan by the eastern industrial establishment to systematically anticipate and provide for the needs of the colonization of the region.(9)

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7. Myrick, Railroads in Arizona v. 1: The Southern Roads (Berkeley: Howell-North Books, 1975), 21.

8. Myrick, Railroads v. 1, 13-14.

9. Myrick, Railroads v. 1, 13; Ira G. Clark, Then Came the Railroads: The Century from Steam to Diesel (Norman, Oklahoma: University of Oklahoma Press, 1958), 275.

Whatever the motives behind building the railroad in Arizona, the economic impacts were profound and long-lasting. Arizona Territory's acting Governor John J. Gosper wrote in 1881 that:

> The completion of the [railroads] ...has, during the year past, worked a wonderful change in all the business interests of the southern half of the Territory, and reflex influences of which have favorably affected all parts of our great Territory. (10)

The railroad was inextricably linked to the economic maturation of each major industry in territorial Arizona. The most immediate effects were felt in the mining industry, which boomed in the town of Tombstone after the establishment of the southern route. In fact, this way was chosen over an alternate one farther north, along the Gila River, for the express purpose of supporting the budding mining activity farther south. By 1882, Tombstone was a booming mining camp and silver production there and elsewhere was credited with pulling the territory out of the economic depression of 1870s. The railroad also boosted the ranching industry as it provided access to eastern packing plants. This impact was felt statewide. In the north, sheep ranching expanded with the construction of the second transcontinental line, the Santa Fe, across northern Arizona, and livestock shipping remained a major function of Arizona rail freight until after World War II. In addition, the railroads enabled the creation and growth of a lucrative lumber business in northern Arizona. With all of this development, new settlers arrived and land values increased.(11)

The Southern Pacific itself made some other, less obvious contributions to the early territory. The company operated hotels at many of its depots, and promoted Arizona tourism nationally. Its advertisements enticed easterners to come experience the healthy climate of the West, visit a dude ranch, and travel in style on one of the line's passenger trains. It was an apt symbol of the changing West when a Southern Pacific train carried Geronimo and his band of captured Apaches out of the Arizona territory to Florida after their final surrender at Fort Bowie in 1886. In a short time, the Southern Pacific had become a vital part of the cultural and social, as well as economic, landscape of late nineteenth century Arizona.

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10. Arizona, "Report of the Acting Governor of Arizona to the Secretary of the Interior," 1881, 916.

11. See Faulk, Arizona, 147, for a discussion of the growth and importance of Tombstone.

The Railroad in Salt River Valley

The first rail line to reach the small communities in the Salt River Valley was established in 1887. It had been eagerly anticipated since the completion of the main Southern Pacific line through Tucson, and several attempts had been made to bring a railroad to the Valley sooner. As elsewhere in Arizona, the Southern Pacific was instrumental in building the first line to Phoenix. Called the Maricopa and Phoenix Railroad, this was not owned by the Southern Pacific, but C.P. Huntington's contacts and friends in the territory looked to him for support of the project. The line was a branch off the main Southern and Pacific to the south, running near the post and stage station of Maricopa, through Tempe and on to Phoenix. The second railroad to traverse the Valley was the Santa Fe, Prescott, and Phoenix, a branch of the northerly Santa Fe transcontinental line. With the completion of this road, the towns of the Salt River Valley were connected both north and south to other territorial towns as well as to both interstate rail lines.(12)

The railroad in the Salt River Valley greatly increased the economic potential of this fast-growing agricultural region, which already had a population of 7,000 in the late 1870s. When the railroad finally was completed, it enabled an "open trading system" to grow between the cities in the Valley as well as a stronger outward focus for trade beyond. The citrus industry grew in importance, in part due to the railroad, as did alfalfa farming and large-scale ranching. All this growth radiated outward, attracting new settlers and investors. The development of the Salt River Valley region finally culminated in the move of the territorial capitol from Prescott to Phoenix in 1889.(13)

Arizona Eastern Railroad

As a burgeoning industry, the railroad business before the turn of the century was characterized by dynamic, fluid changes in corporate ownership and organization. Small companies came into existence every year, and many had only short lives before they sold out or went bankrupt. Southern Pacific was a major player in many of these dealings. Limited mostly to southern and central Arizona, it expanded its holdings there through acquisitions and creation of subsidiaries more than by new construction. One of the more significant of the company's expansions was the establishment of the Arizona Eastern Railroad, which later constructed and owned the current bridge at Tempe.

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12. See Myrick, Railroads v. 2, 484 and 495-502 for a more detailed discussion of early attempts at establishing a line and the initial Maricopa and Phoenix construction; Sargent, Towns, 2.

13. Myrick, Railroads v.2, 489; Sargent, Towns, 6.

The first Arizona Eastern was organized in 1904. It was arranged largely through the efforts of Southern Pacific chief Arizona spokesman and manager, Epes Randolph, who made a name for himself as a powerful railroad leader in southern Arizona. Colis P. Huntington's successor, E. H. Harriman, mandated the organization of the company for the purpose of building a new, low-grade line across southern Arizona; however, the unofficial objective was to block the progress of a rival line along the Gila River south of Phoenix. The new line never became a reality; however, the Arizona Eastern was successful in preventing the construction of rival lines in that area.(14)

In 1902, in an internal merger, the Southern Pacific of Arizona ceased to exist as a separate branch of the Southern Pacific Railroad Company. Eight years later the Arizona Eastern Railroad reorganized in 1910 as a separately owned affiliate of Southern Pacific. The newly organized AERR consolidated six railroads comprising most of Southern Pacific's interests in Arizona and New Mexico, excluding the main Southern Pacific line in the south and two minor lines to Nogales, Mexico. The Arizona Eastern operated 349.29 miles of trackage and covered three major sections of south central Arizona. One of these was the Phoenix Division, including the towns of the Salt River Valley and the site of the Tempe Salt River bridge. The main stations were located in south central Phoenix. Other divisions were the Hayden Division, serving Winkelman and the small town of Christmas; and the Globe Division, connecting Globe, Maimi, Bowie, and Cochise.(15)

From 1910 until 1924, the reorganized Arizona Eastern was a major force in state railroad business and contributed greatly to the development of the Salt River Valley. These years were marked by considerable freedom from the parent company and successful operation under Epes Randolph. The company moved its headquarters and central operations from Globe to Phoenix, establishing a new engine house, several shops and repair facilities, as well as new offices and storehouses in central Phoenix near the present day Southern Pacific station. Other improvements included the construction of three new extension lines. These served, in part, the second wave of agricultural communities developed in the Salt River Valley around 1910. The Chandler branch, southeast of Phoenix, was one example of this; another was the Litchfield Branch in the region to the west. The latter served the needs of the southwest Cotton Company, whose

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14. Myrick, Railroads v. 2, 539; Geoffry P. Mawn, "Phoenix, Arizona: Central City of the Southwest 1870-1920," (Ph.D. Dissertation, Arizona State University, 1979), 517-8.

15. Myrick, Railroads v. 2, 762, 757-8.

cotton production development in the west Valley largely shaped the future of Litchfield Park and surrounding communities. (16)

As the primary transportation vessel of the Salt River Valley, the Arizona Eastern was the scene of many ordinary and not-so-ordinary occurrences during its brief existence. Several trains traversed the Valley daily, including seven pairs to Phoenix, three to Tempe and Mesa, one to Winkelman, and three to Maricopa via Tempe. Railroad historian David Myrick relates an anecdote in which two young railroad bandits, travelling from Maricopa to Phoenix, successfully held up the train, robbed several passengers, and escaped. The year was 1910. Local sheriff Carl Hayden organized a posse, which included two Pima Indian scouts, and apprehended the robbers at Maricopa. In a letter written many years later from his office in the U.S. Senate, Hayden recalled the words of an old man who witnessed the arrest in Maricopa: "Carl, I'd druther been you, with my rifle in my hand, bringing in them train robbers than be President of the United States."(17)

The second Arizona Eastern, like the first, was a successful tool for blocking construction by Southern Pacific's rival lines in the Phoenix area, specifically the Tucson, Phoenix and Tidewater extension of the El Paso and Southwestern Railroad. In doing this, it helped Southern Pacific to keep its position at the top of the railroad market in the Salt River Valley. This was good for the company but less so for the regional cities, which had been rallying for years for a main line railroad through the area. None of the roads controlled by Southern Pacific had main line status in the early years of the Arizona Eastern, and the nearest main line station was Maricopa. Finally, in a 1924 merger agreement, Southern Pacific acquired the El Paso and Southwestern and announced plans for the construction of a main line through Phoenix, to operate under the company name of Arizona Eastern Railroad. The road was completed in 1926 with much local fanfare and celebration. Not only was it a landmark in the growth of Phoenix and the Salt River Valley but a symbol of the significance of the Southern Pacific as a player in that development.(18)

The year 1924 was an important one also for the Arizona Eastern, as it marked the end of the railroad's autonomy as a separately owned affiliate of the Southern Pacific. From 1924 to 1955, Southern Pacific leased and operated the smaller line as part of its "Pacific Lines;" in 1955, the Arizona Eastern was completely merged with Southern Pacific. In 1969, the Southern

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16. Myrick, Railroads v. 2, 759, 763-8.

17. Myrick, Railroads v. 2, 762, 757-8.

18. Mawn, "Phoenix," 517-8; Myrick, Railroads v. 2, 539.

Pacific Transportation Company acquired ownership of all rail lines as a new affiliate of the Southern Pacific Company.(19)

Growth and Development of Tempe

Unlike most of the Salt River valley towns, Tempe was founded almost simultaneously with Phoenix. However, from the start it maintained more autonomy than many other peripheral settlements. In 1869 the first Anglo settlers arrived in the area. Mexican and Indian groups already sparsely populated the area. The founder of Tempe, Charles T. Hayden, claimed the land near two buttes south of the Salt River in the next year, and there began farming. Settlers attracted by the promise of agricultural wealth began arriving soon after.

Hayden and his family are generally credited with initiating the remarkable growth that soon characterized Tempe (Charles was the father of the same sheriff who apprehended the train bandits at Maricopa and later became Arizona's most renowned Congressman). C. T. Hayden built his famous mill, the second construction of which still is in operation, just south of the river between the years 1872-4. Local Mexican residents worked at the mill, and nearby Indians sold grain for the mill to Hayden. He established numerous other peripheral businesses as well. The second influx of Anglo settlers to the Tempe area was a group of Mormons arriving in the late 1870's. Although many moved farther east to help establish the community of Mesa, several families remained in Tempe.(20)

Tempe was first and foremost an agricultural community. Primary crops in the pre-railroad era included grain and barley. Milling became a big business, and fruit-raising also gained some importance. The first long-staple cotton, which became a major regional crop after the turn of the century, was grown in Tempe in 1885. Tempe farmers, led by C. T. Hayden, also grew the first citrus trees and dates. A more unusual business was ostrich farming, which boomed in Tempe and elsewhere when ostrich feathers were a high-fashion item. Because of these markets and those that developed in support of these activities, by the time the railroads were built in Tempe, a small but diversified agricultural community existed.(21)

A second factor that became of vital importance to the local economy was the creation of the Tempe Normal School in 1885. The four-room, one-teacher school was built on five acres of cow

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19. Myrick, Railroads v. 2, 759.

20. Marsha L. Weisiger, "This History of Tempe, Arizona 1871-1930: A Preliminary Report," 1977, unpublished manuscript, Arizona Collection, Arizona State University, 2-5.

21. Weisiger, "Tempe," 12-13, preface, 18.

pasture on land purchased for $500. Today, the institution is Arizona State University, the largest university in the state with an enrollment of over 40,000, and a major local employer and cultural institution.

After the construction of the railroad in Tempe and other boosts to development, the local economy expanded and diversified. A brief period of oil exploration in the early twentieth century was unfruitful, and although mines in other parts of the territory were still very lucrative, mining never was a major force in the Tempe economy. Agriculture still dominated, with alfalfa, hay, and barley as the primary crops. These were shipped out by train each week to distant markets. Other farm products included honey, citrus, wheat (still largely grown by the local Pima Indians), dates, and, especially during the years 1914-1920, cotton. Tempe's Pacific Creamery became one of the largest in the West, and was later acquired by Borden Company.(22)

The growth of Tempe from its founding to the present was rapid, and echoed the expansion felt all over the Salt River Valley. In 1900 the community had a population of 885; by 1930 it had nearly tripled. The years following the end of World War II saw the greatest increases in population Valley-wide. From 1950 to 1960, Tempe grew from 7700 to 25,000. In 1986, Tempe's population was 136,500 and growing.(23)

Transportation and Bridges in Tempe

Transportation in Tempe was an integral factor in its development. Passenger service by train began around the 1890s and reached a peak in the decade after the turn of the century. About this time, horse drawn vehicles were the main mode of family transportation; buggies, buckboards, carts and surries and the animal power to drive them could be hired from local liveries or were owned privately. Then, with the advent of the automobile in the early teens, "auto liveries" opened and an auto stage operated between Phoenix, Mesa and Tempe. This growth caused a sharp decline in the use of passenger trains in the Tempe area as well as other parts of the Valley.(24)

The first railroad bridge over the Salt River at Tempe belonged to the first Valley railroad, the Maricopa and Phoenix,

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22. Weisiger, "Tempe," 34.

23. John L. Andriot, compiler and editor, Population Abstract of the United States (McLean, VA: Andriot Associates, 1980), 35; United States Department of Commerce, Bureau of the Census, County and City Data Book 1988 (Washington: U. S. Government Printing Office, 1988).

24. Weisiger, "Tempe," 51, 30.

built in 1887. At the time, C.T. Hayden proposed a wagon road be built with it to enable non-rail traffic to cross the Salt. The Maricopa County Board of Supervisors opposed the measure, and passengers had to continue using ferries to get across. In about 1910, access across the Salt River finally opened to non-railroad traffic with a stage bridge built by convict labor.(25)

The first railroad bridge was located near the current Southern Pacific bridge, and consisted of three wooden trusses and a long southern trestle approach. From the first, inconsistent river flows and flooding threatened it and other structures spanning the Salt River. In fact, frequent bridge washouts were more commonplace than unusual, and Tempe residents were accustomed to the problems caused by the temperamental river. The original Maricopa & Phoenix crossing washed out just four years after it was built, and left the residents of Tempe cut off from contact with Phoenix for three months. Other wooden bridges were built in place of the destroyed one, but many of these too fell victim to seasonal floods. In October of 1902, a much-publicized train wreck caused by a bridge failure, over a dry Salt River, resulted in one death and several injuries, as well as loss of several cattle. Hordes of local residents came out and the event caused great excitement locally.(26)

In 1903-4, the Phoenix & Eastern Railroad installed the first steel bridge across the Salt River at Tempe. The new structure was composed of parts shipped in from a dismantled bridge in Texas, and local residents hailed it as the likely end to flood problems. It came as a shock when this bridge too washed away in the devastating floods of 1905, less than two years after its completion. That same year, the Maricopa and Phoenix and Salt River Valley Railroad built a new bridge which was to become the foundation for the current Arizona Eastern railroad bridge.

The Arizona Eastern Bridge

When the first Arizona Eastern Railroad was organized in 1904, it did not own railroad bridges in Tempe. But in 1908 it purchased the Maricopa and Phoenix and Salt River Valley Railroad, acquiring a bridge across the Salt River that that company built in 1905. This structure included steel spans, a wooden trestle and concrete pilings; spans were acquired second-hand from another local railroad. Workers on the bridge came from Sacramento and may have been convicts; their foreman was a J.M. Nielson and engineer was C. Krumm. Two floods

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25. Weisiger, "Tempe," 26, 51.

26. "Doings of the Flood," clipping probably from the Arizona Republican, December 1, 1905; Salt River Southern Pacific Railroad Bridge Property File, Tempe Historical Museum.

complicated the work in 1905. The first, in January, washed out the temporary track that had been laid, and rose the water depth to 19 feet. The second flood, in March, created flow about 12 feet deep and was presumably less damaging to the bridge. The total cost of the bridge, including materials and labor for trestle approaches, pilings, and superstructure, was $82,145.00.(27)

The significance of this structure to the present bridge is that the latter was constructed as an alteration of the 1905 bridge. By 1910 when the Arizona Eastern Railroad reorganized, train traffic through Phoenix was as great and probably greater than in most other western cities of its population. As daily train service increased, it became more important than ever to secure a reliable bridge for the crossing of the Salt River at Tempe. The bridge that stands there today, finally, was the bridge that withstood the damaging effects of the Salt River flow.

New spans for the bridge were built in 1912, and installed on the bridge presumably in 1915, although some sources indicate the date was two years earlier. It is likely, though not certain, that these spans were placed directly on the original tracks; the 1905 pilings were definitely those used as supports for the new spans. The wooden trestle built by the Maricopa and Phoenix and Salt River in 1905 was replaced by Arizona Eastern in 1926, and still stands.(28)

Other documentary evidence surrounding construction of the bridge is scarce. It is a nine-span steel structure with Pratt type trusses, designed and patented by Thomas and Caleb Pratt in 1844. A common supplier of the day, the American Bridge Company, made the spans. According to one historian of bridge engineering, steel bridges were the norm by the turn of the century, and the Pratt truss was well established as one of the best designs for simplicity, economy of metal, and other engineering features. By the time the Arizona Eastern bridge was constructed, the Pratt truss was one of four or five well-accepted steel truss types and was one of the most common in use for spans less than 250 feet. Truss bridges in general were a common design for railroad bridges, and some period records show that the Arizona Eastern built at least one other bridge

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27. Maricopa & Phoenix and Salt River Valley Railroad, "Salt River Bridge Engineer's Report," 1905, and handwritten notes attached, Chief Engineer's office, Southern Pacific Transportation Company, San Francisco.

28. Phone interview, Southern Pacific Transportation Company Tucson Division, August 16, 1989.

very similar to the Tempe structure at another location (see photo of Wellton-Picacho bridge over Gila in field notes).(29)

Labor used to build the current bridge probably consisted of a specialized gang hired by the railroad or by American Bridge Company. Although convict labor often was employed for railroad construction projects in the East, the practice was less common west of El Paso.(30)

In addition to the trusses, the bridge trestle was an important design feature in most railroad bridges. The Arizona Eastern bridge trestle is unique primarily for its longevity. Most wooden trestles of this time period, particularly in wetter climates, generally lasted from ten to thirty years even when treated to prevent decay.(31) That this one has survived sixty-three years is a factor in its historical significance.

The history of bridge engineering itself suggests that the Arizona Eastern bridge was a symbol of the successes of the field as it evolved. Prior to the development of the railroad, "engineering" of bridges was left to the carpenters, who were less concerned with their design and operation. In particular, the rigidity of bridges was much inferior to those of later years. During the period from about 1890 to 1915, bridge engineering grew by leaps and bounds, and structural integrity and permanence were emphasized.(32) The history of railroad bridges at Salt River, with their apparent fragility in the days before the current structure, bears out this story of progress toward more permanent, stable structures culminating with the Arizona Eastern bridge. Thus the greatest historical significance of this structure lies in its permanence in a location in which, previously, other bridges were destroyed soon after their construction by the flood waters of the Salt River or from sheer structural frailty.

Throughout the rest of the twentieth century up to the present, the bridge has served the Arizona Eastern and, after the merger in 1955, the Southern Pacific. Many historic anecdotes document its continued presence in local and regional activities. The years during and immediately following the Second World War, for example, show the nation's railroads experienced extremely heavy use. A rumor in Tempe claimed that, in one day in 1943 or 1944, 29 trains passed through the town in 23 hours; one local resident also recalled that German prisoners of war were

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29. J.A.L. Waddell, Bridge Engineering (New York: John Wiley & Sons, Inc., 1916), 21, 28, 468, 24.

30. David Myrick to Salt River Project, August 12, 1989, Salt River Project Archives.

31. Waddell, Engineering, 536.

32. Waddell, Engineering, 21-2, 30-1.

transported through Tempe on trains and many housed in camps across the river near the present Phoenix Zoo.(33)

Many years later, in 1980, the Southern Pacific system was part of a valley-wide emergency flood relief program instigated by Governor Bruce Babbitt. The company, in conjunction with state agencies and Amtrak Lines, provided train service for commuters when abnormally heavy rains closed most of the usual crossings of the river. The train, carrying five or six cars, was named the "Hattie B." in honor of the Governor's wife. For some ten days it carried over four thousand people daily to locations near their workplaces and homes; the public received the program enthusiastically, although state funds were needed to cover much of the expense. Today, the bridge still is in daily use.(34)

Conclusion

The Arizona Eastern bridge is historically significant because it stands, now as the Southern Pacific Railroad Bridge, as a reminder of several elements in the history of Tempe, Phoenix, and the greater Salt River Valley. As part of the railroad systems that had such a vital role in regional development, it also served two colorful railroad companies in Arizona's history, the Arizona Eastern and Southern Pacific. The bridge documents the success of railroad engineering over the natural challenges posed by the Salt River, and was one of several bridges whose function in linking the towns of the Salt River Valley was historically vital.

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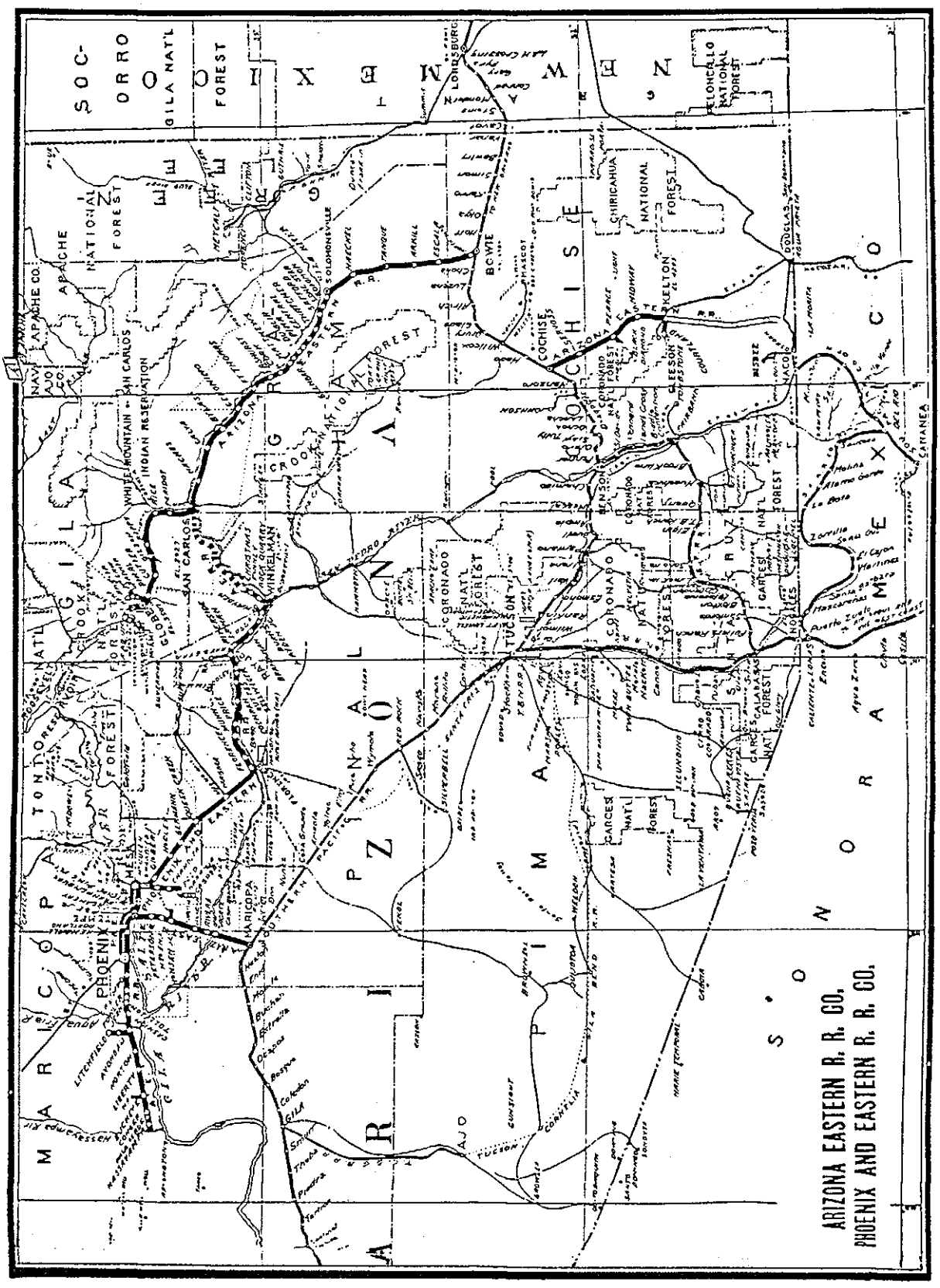
33. Interview with Don DeHart, 7/26/85, by Jill Young, "Tempe Depot Research," Railroads file, Tempe Historical Museum.

34. Myrick, Railroads v. 2, 818.



Arizona Eastern R.R. System (heavy black)

ca. 1910

Reproduced from David Myrick, Railroads of Arizona v. 2: Phoenix and the Central Roads (San Diego: Howell-North Books, 1980), 757.

Original and Subsequent Owners: References to the chain of title to the land and the corporate history of the railroads owning the land was provided by G.L. Murdock, Chief Engineer, Southern Pacific Transportation Company, by letter dated March 27, 1989.

1908 P.F. Dunne purchases Maricopa and Phoenix and Salt River Valley R.R. Co. by sheriff's sale sells to Maricopa and Phoenix R.R. Co. by deed dated January 10.

1910 Maricopa and Phoenix R.R. Co. consolidated with Arizona Eastern R.R. Co.

1934 Southern Pacific Co. purchases Phoenix and Eastern R.R. Co. by deed dated August 9.

1945 Arizona Eastern R.R. Co. purchases the line of Southern Pacific R.R. Co. running from Phoenix to Winkelman by deed dated October 31.

1955 Arizona Eastern R.R. Co. merged with Southern Pacific R.R. Co.

1955 Southern Pacific R.R. Co. merged with Southern Pacific Co.

1969 Southern Pacific Co. merged with Southern Pacific Transportation Co.

Project Information

Arizona Eastern Railroad Bridge
(Southern Pacific Railroad Bridge)

The north timber trestle on the Southern Pacific Railroad Bridge at Tempe is being removed and replaced by Southern Pacific with a more structurally sound approach. This alteration is for a project by Papago Park Center, a wholly owned subsidiary of Salt River Project. Salt River Project is a local water and electric utility comprised of the Salt River Valley Water Users' Association and the Salt River Project Agricultural Improvement and Power District, a political subdivision of the state of Arizona.

The Salt River Project began as a federal reclamation project and has been one of the most successful. Today, part of the Project's water system still is owned by the Bureau of Reclamation and Salt River Project is the sole operator of that system.

The following persons participated in the preparation of this documentation: Barbara Behan (Salt River Project), David Introcaso (Salt River Project), Mike C. Smith (Papago Park Center), and personnel from the repositories used in research. The records were prepared from February to December 1989.

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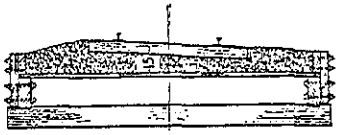
Tempe, Arizona. Salt River Project Archives. Notes from phone interviews and correspondence.

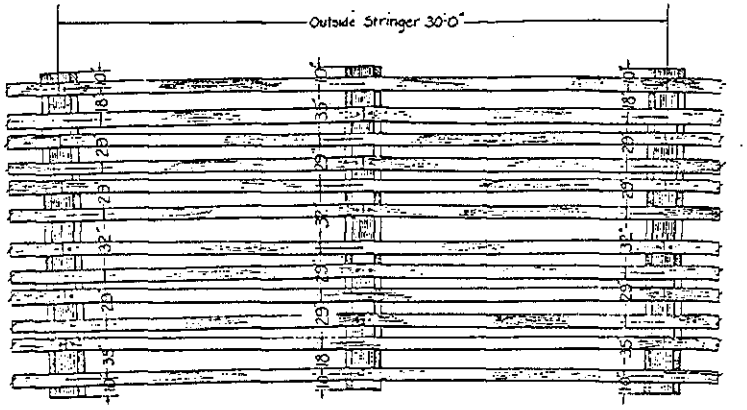
Tempe, Arizona. Tempe Historical Museum.

C.S. 39



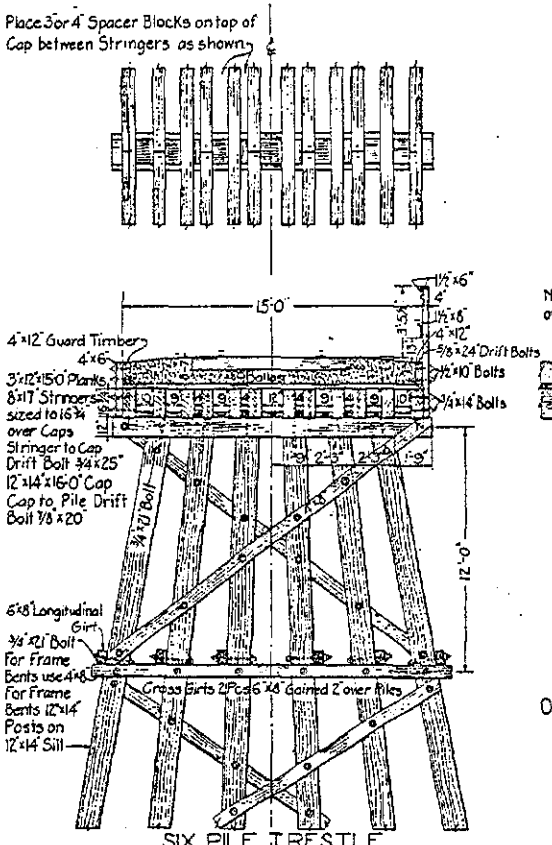
TRESTLE ON CURVE

Stringers spaced as per plan of arrangement for curved track



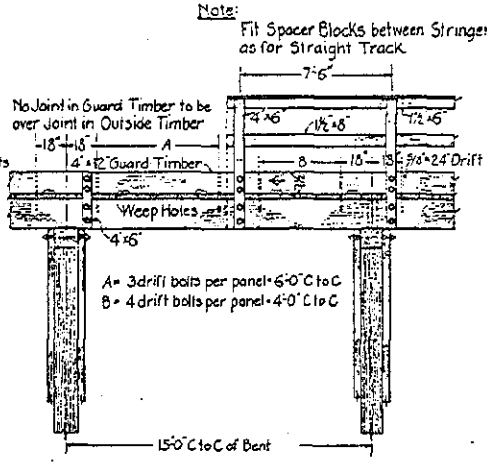
ARRANGEMENT OF STRINGERS FOR CURVED TRACK

Note:
Fit Spacer Blocks between Stringers similarly as for Straight Track

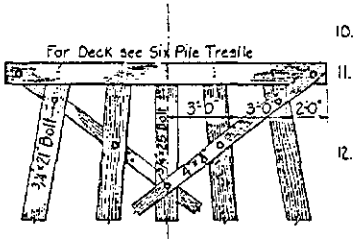


SIX PILE TRESTLE

ORDINARY TRESTLE | TRESTLE WITH SIDEWALK



ORDINARY TRESTLE TRESTLE WITH SIDEWALK



FIVE PILE TRESTLE

SCALE
12' 0 2' 4' 6' 8'

GENERAL NOTES

1. For longitudinal bracing see drawing C.S. 322
2. No longitudinal bracing to be used for heights less than 16 ft from ground surface to top of cap.
3. Sway bracing to be omitted for heights less than 7 ft from ground surface to top of cap.
4. Coarse ballast (no dimension less than 1 inch) to be used next to guard timbers.
5. Floor planking to be spiked with 6 inch spikes, two at each end and one at each intermediate stringer.
6. Bents to be spaced radially on curves and spaced so that outside stringer will be 30 ft long.
7. Superelevation to be effected by increasing depth of ballast under outer rail, the depth of ballast under inner rail remaining constant.
8. Outside stringers to be drift bolted to caps at every bent. Inside stringers to be drift bolted to caps at ends only except for trestles two bays long, for which they are to be drift bolted to caps of all bents.
9. Creosoted timber to be used for piles, caps, stringers, guard timbers and deck planking, also for sway bracing when authorized by General Manager. Untreated timber to be used for hand railing and spacer blocks; also for sway bracing when creosoted bracing not specially authorized.
10. The center line of piles prolonged should meet at a common point about 26 ft above base of rail.
11. The six pile ballasted deck trestle is to be used on all main and branch lines where power heavier than Cooper's E 50 is operated or is expected to be operated within the life of the trestle.
12. The five pile ballasted deck trestle is to be used where no power heavier than Cooper's E 50 is or will be operated.

VOID

SOUTHERN PACIFIC LINES
COMMON STANDARD
SINGLE TRACK
BALLASTED DECK TRESTLE
15'-0" WIDE

SCALE AS SHOWN

ADOPTED MAY 1905
REVISED AUG. 1925

Arizona Eastern R.R. Bridge
(Southern Pacific R.R. Bridge)
HAER No. AZ-18
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