HISTORIC BRIDGE INVENTORY

Allentown Bridge

PROPERTY IDENTIFICATION

county	Apache	inventory number	03073
milepost	9.10	inventory route	abd. Indian Route 9402
location	4.4 mi E Houck	feature intersected	Rio Puerco
city/vicinity	Allentown	USGS quadrangle	Houck
district	87	UTM reference	12.667783.3905713

STRUCTURAL INFORMATION

main span number	1	main span type	309
appr. span number	2	appr. span type	702
degree of skew	0	guardrail type	0
main span length	90.0	superstructure	steel rigid-connected Pratt deck truss
structure length	206.0	substructure	concrete abutments and piers
roadway width	15.2	floor/decking	timber deck
structure width	18.0	other features	upper chord: 2 channels w/ cover plate and lacing; lower chord: 4 angles w/ batten plates; vertical/diagonal: wide flange; lateral bracing: 1 angle; floor beam: I-beam; steel lattice guardrails

HISTORICAL INFORMATION

construction date	1923	designer/engineer	Arizona Highway Department
project number	non-FA project	builder/contractor	Midland Bridge Company, Kansas City MO
information source	USBIA bridge records	structure owner	U.S. Bureau of Indian Affairs
alteration date(s)	1929	alterations	timber stringer approach spans added

NATIONAL REGISTER EVALUATION

For additional information, see "Vehicular Bridges in Arizona 1880-1964" National Register Multiple Property Documentation Form

inventory score	76	NRHP eligibility	listed
		NRHP criteria	A x B ____ C x
		signif. statement	well-preserved example of uncommon structural type, located on major route

FORM COMPLETED BY

Clayton B. Fraser, Principal

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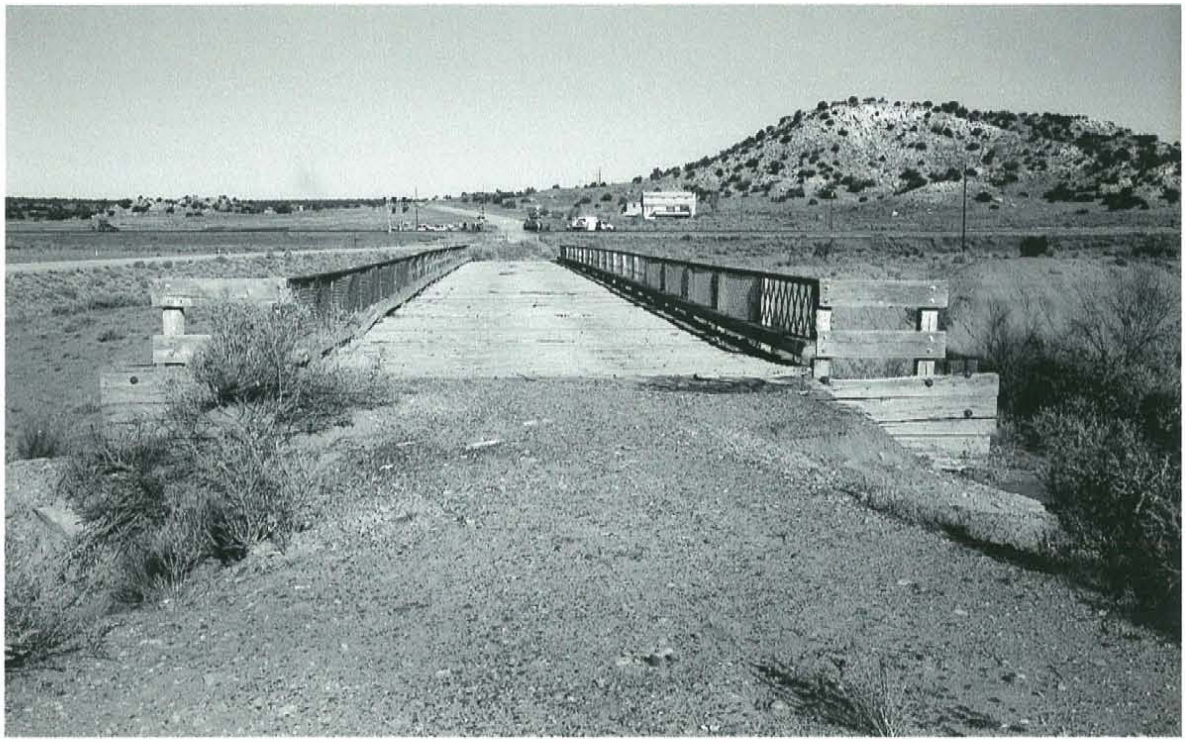
Loveland, Colorado 80537
31 October 2004



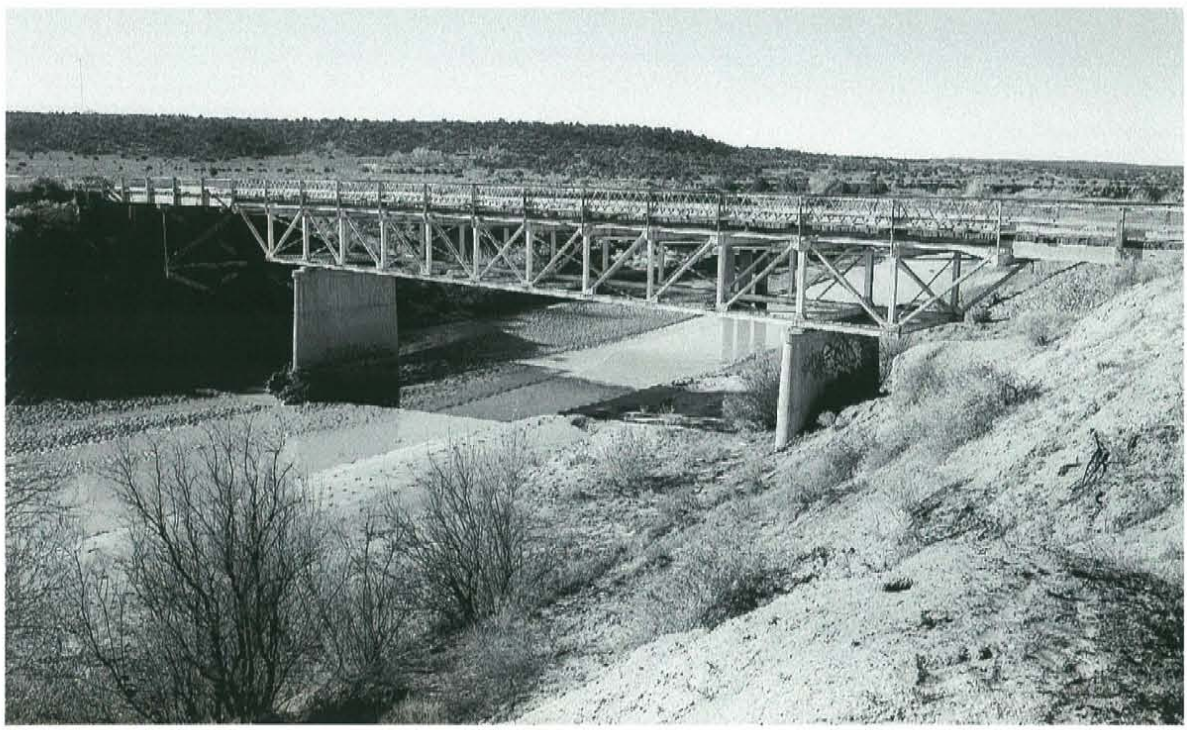


PHOTO INFORMATION

date of photo.: November 2002 view direction: north southwest photo no.: 02.11.01 02.11.07

CONSTRUCTION HISTORY

In 1922 the Arizona Highway Department began the major reconstruction of the Holbrook-Lupton Highway between Adamana and the state line. Located in Apache County, this route was a segment of the transcontinental National Old Trails Highway. Two critical components of the construction project were substantial bridges over the Rio Puerco near the small Indian settlements of Allentown and Sanders. The structure at Sanders [**3074**] was to be comprised of two steel pony truss spans on reinforced concrete abutments and piers. For the Allentown Bridge, staff engineer R.A. Hoffman designed a medium-span deck truss with 20-foot cantilevered ends and timber approach spans. The truss used a rigid-connected Pratt configuration, with riveted box beams for the upper and lower chords. The timber deck was supported by steel I-beam stringers and flanked by steel lattice guardrails.

Using money from the state road fund and an Apache County bond issue, AHD let contracts for the Sanders and Allentown bridges and a small pony truss over Lupton Arroyo at Lupton on January 1, 1923. The Midland Bridge Company of Denver was awarded the contract for the Allentown bridge. A Midland crew began construction of the bridge on January 17. Using steel rolled by the Illinois Steel Company, fabricated and shipped to the site by train, the men worked on the structure that spring and summer. They completed it on July 11 for a total cost of $12,388. Both the Allentown and Sanders bridges carried mainline traffic until 1931, when the highway was realigned along a different route. The Allentown Bridge continued to carry local traffic on the Navajo Indian Reservation until its more recent replacement by a parallel bridge at this crossing. It is now closed to vehicular traffic but remains structurally intact.

SIGNIFICANCE STATEMENT

The National Old Trails Highway, later designated US Highway 66, was a major transcontinental route across northern Arizona. Before the construction of this bridge, traffic on the highway was often forced to wait up to 24 hours when the Rio Puerco was in flood for the river to subside enough to permit fording. The Allentown Bridge, along with the companion structure at Sanders, thus formed an important link on this major interstate route. The Allentown Bridge is further significant as one of the earliest steel trusses built by the Arizona State Engineer, erected by a regionally active bridge contractor. Technologically, the Allentown Bridge is distinguished as one of the two earliest deck trusses identified in the inventory (other: Little Hell Canyon Bridge [**3381**], 1923). Its cantilevered ends are unique among Arizona's vehicular trusses and uncommon among American spans. They represent the first instance of cantilevering by the state's most noteworthy bridge engineer, R.A. Hoffman.

NATIONAL REGISTER EVALUATION

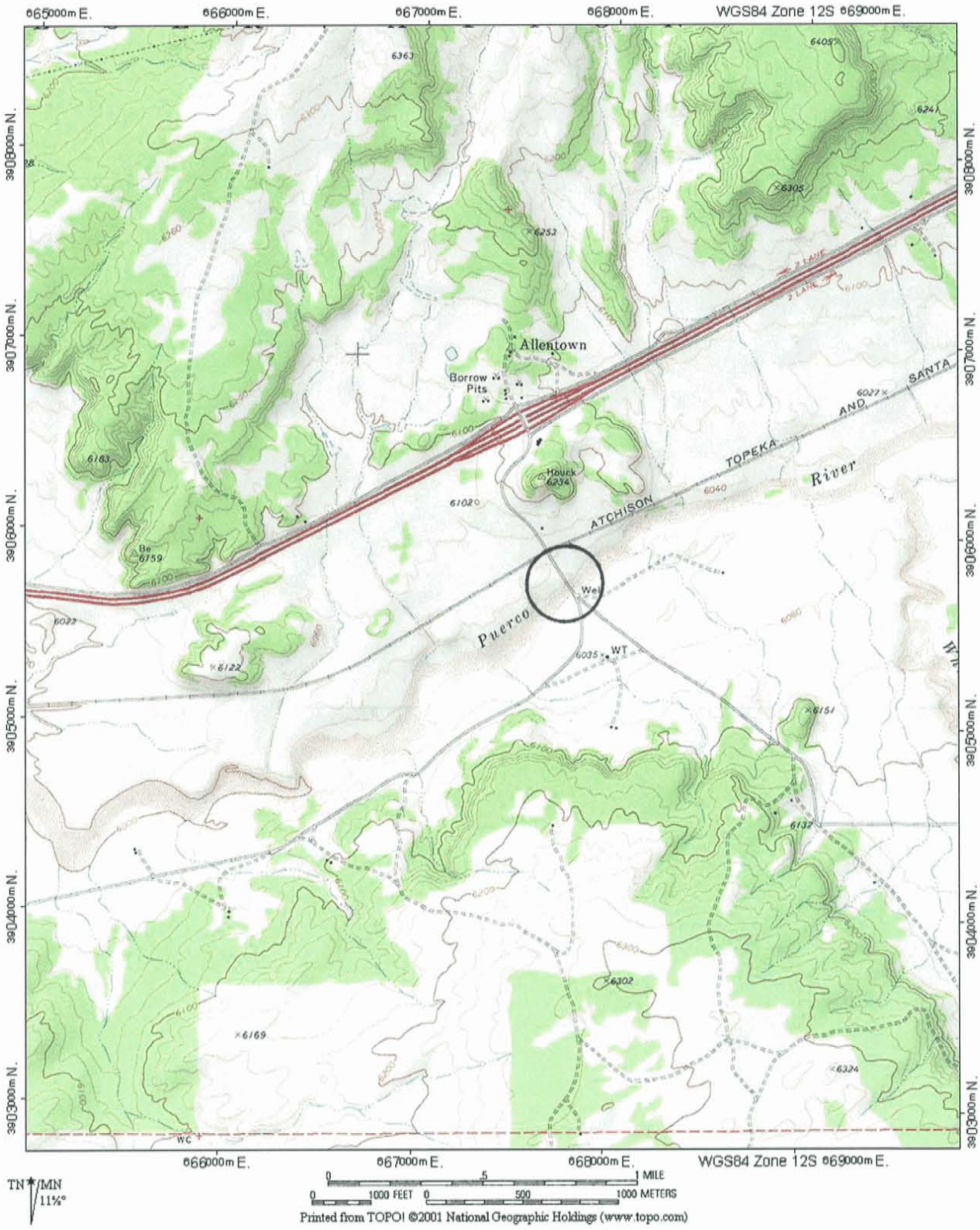
TECHNOLOGICAL SIGNIFICANCE
___ represents the work of a master
___ possesses high artistic values
_x_ represents a type, period or method of construction

HISTORICAL SIGNIFICANCE
___ associated with significant persons
_x_ associated with significant events or patterns
___ contributes to historical district

NATIONAL REGISTER CRITERIA
_x_ Criterion A
___ Criterion B
_x_ Criterion C

NATIONAL REGISTER ELIGIBILITY
individually eligible _x_ yes ___ no
contributes to district ___ yes _x_ no

AREA OF SIGNIFICANCE: Transportation; Engineering
PERIOD OF SIGNIFICANCE: 1923-1964
THEME(S): Transportation: Highways



Location Map

HISTORIC BRIDGE INVENTORY

Sanders Bridge

PROPERTY IDENTIFICATION

county	Apache	inventory number	03074
milepost	0.00	inventory route	abd. Indian Route 9402
location	at Sanders	feature intersected	Rio Puerco
city/vicinity	Sanders	USGS quadrangle	Sanders
district	87	UTM reference	12.651975.3897928

STRUCTURAL INFORMATION

main span number	2	main span type	310
appr. span number	2	appr. span type	302
degree of skew	0	guardrail type	0
main span length	75.0	superstructure	steel rigid-connected Pratt pony truss
structure length	190.0	substructure	concrete abutments, wingwalls and piers
roadway width	14.8	floor/decking	timber deck with asphalt overlay
structure width	18.0	other features	upper chord: 2 channels w/ cover plate and lacing; lower chord: 2 angles w/ batten plates; vertical: 4 angles w/ continuous plate; diagonal: 2 angles w/ batten plates; lateral bracing: 1 angle; floor beam: I-beam; steel angle guardrails

HISTORICAL INFORMATION

construction date	1923	designer/engineer	Arizona Highway Department
project number	non-FA project	builder/contractor	Monarch Engineering Company, Denver CO
information source	USBIA bridge records	structure owner	U.S. Bureau of Indian Affairs
alteration date(s)		alterations	

NATIONAL REGISTER EVALUATION

For additional information, see "Vehicular Bridges in Arizona 1880-1964" National Register Multiple Property Documentation Form

inventory score	70	NRHP eligibility	listed
		NRHP criteria	A x B ____ C x
		signif. statement	well-preserved example of uncommon structural type, located on major route

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31 October 2004

PHOTO INFORMATION

date of photo.: November 2002 view direction: north southwest photo no.: 02.11.11 02.11.13

CONSTRUCTION HISTORY

In 1922 the Arizona Highway Department began the major reconstruction of the Holbrook-Lupton Highway between Adamana and the state line. Located in Apache County, this route was a segment of the transcontinental National Old Trails Highway. Two critical components of the construction project were substantial bridges over the Rio Puerco near the small Indian settlements of Sanders and Allentown. The structure at Allentown was to be comprised of a single deck truss span on concrete piers. For the Sanders Bridge, AHD staff engineers designed a pair of medium-span pony trusses, supported by reinforced concrete abutments and piers, with a timber stringer approach span at each end. The trusses used a rigid-connected Pratt configuration, with riveted box beams for the upper chords and paired angles for the lower chords. The timber deck was supported by timber stringers and steel floor beams.

Using money from the state road fund and an Apache County bond issue, AHD let contracts for the Sanders and Allentown bridges and a small pony truss over Lupton Arroyo at Lupton on January 1, 1923. The Monarch Engineering Company of Denver was awarded the contract for the Sanders bridge. A Monarch crew began excavation for the bridge's abutments and pier on May 22, working through the next two months on the substructure. Using steel rolled by the Inland Steel Company, fabricated and shipped to the site by train, the Monarch crew completed the structure on September 10. Total construction cost was a little over $15,000. Both the Allentown and Sanders bridges carried mainline traffic until 1931, when the highway was realigned along a different route. The Sanders Bridge continued to carry local traffic on the Navajo Indian Reservation until its more recent replacement by a parallel bridge at this crossing. Still open to traffic though little used, it remains structurally intact.

SIGNIFICANCE STATEMENT

The National Old Trails Highway, later designated US Highway 66, was the major transcontinental route across northern Arizona. Before the construction of the Sanders Bridge, vehicular traffic on the highway was often forced to wait up to 24 hours when the Rio Puerco was in flood stage for the river to subside enough to permit fording. The Sanders Bridge, along with a companion structure at Allentown [**3073**], thus formed an important link on this major interstate route. It is further significant as one of the earliest pony trusses built by the Arizona State Engineer, erected by a regionally active bridge contractor. Technologically, the Sanders Bridge is a representative and unaltered example of what was once a standard vehicular truss configuration—the Pratt pony truss.

NATIONAL REGISTER EVALUATION

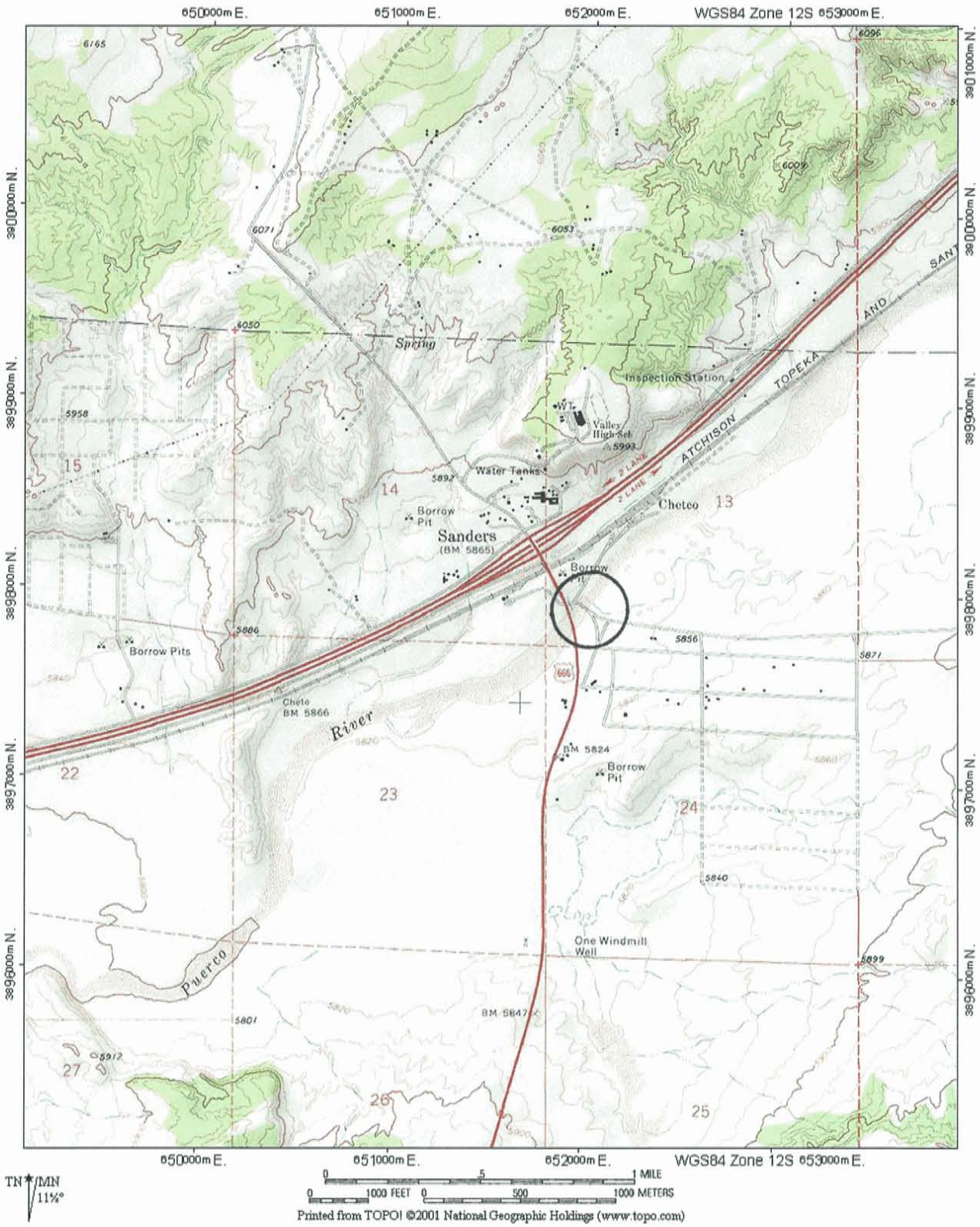
TECHNOLOGICAL SIGNIFICANCE
___ represents the work of a master
___ possesses high artistic values
_x_ represents a type, period or method of construction

HISTORICAL SIGNIFICANCE
___ associated with significant persons
_x_ associated with significant events or patterns
___ contributes to historical district

NATIONAL REGISTER CRITERIA
_x_ Criterion A
___ Criterion B
_x_ Criterion C

NATIONAL REGISTER ELIGIBILITY
individually eligible _x_ yes ___ no
contributes to district ___ yes _x_ no

AREA OF SIGNIFICANCE: Transportation; Engineering
PERIOD OF SIGNIFICANCE: 1923-1964
THEME(S): Transportation: Highways



Location Map

HISTORIC BRIDGE INVENTORY

Querino Canyon Bridge

PROPERTY IDENTIFICATION

county	Apache	inventory number	08071
milepost	0.00	inventory route	Old US 66
location	3.0 mi NE of Cedar Pt TI	feature intersected	Querino Canyon
city/vicinity	Houck	USGS quadrangle	Burntwater Wash
district	87	UTM reference	12.656725.3904450

STRUCTURAL INFORMATION

main span number	3	main span type	309
appr. span number	0	appr. span type	
degree of skew	0	guardrail type	6
main span length	77.0	superstructure	steel rigid-connected Warren deck truss
structure length	269.0	substructure	concrete abutments and pier pedestals with braced steel piers
roadway width	20.0	floor/decking	concrete deck over steel stringers
structure width	21.1	other features	upper chord: 2 channels w/ cover plate and lacing; lower chord: 2 angles w/ batten plates; vertical/diagonal: wide flange; strut and lateral bracing: 1 angle; floor beam: I-beam; steel lattice guardrails

HISTORICAL INFORMATION

construction date	1930	designer/engineer	Arizona Highway Department
project number	FAP 83-A	builder/contractor	F.D. Shufflebarger, Phoenix AZ
information source	county bridge records	structure owner	Apache County
alteration date(s)		alterations	

NATIONAL REGISTER EVALUATION

For additional information, see "Vehicular Bridges in Arizona 1880-1964" National Register Multiple Property Documentation Form

inventory score	74	NRHP eligibility	listed
		NRHP criteria	A x B ____ C x
		signif. statement	well-preserved example of uncommon structural type, located on important interstate route

FORM COMPLETED BY

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31 October 2004

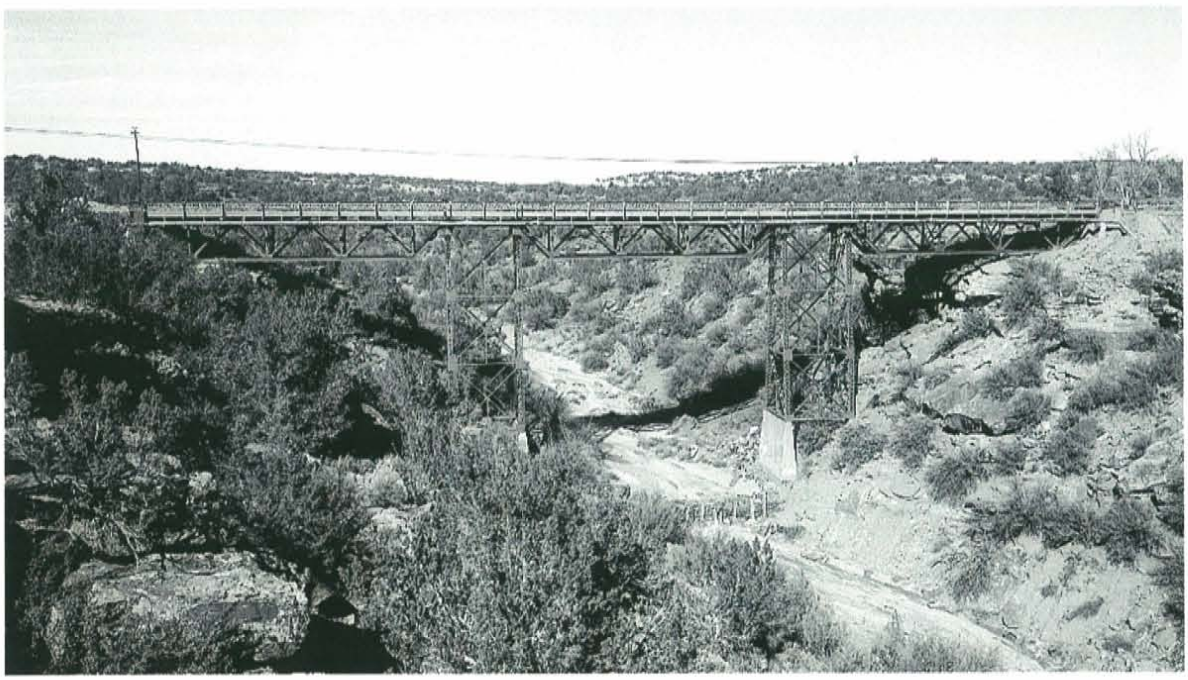


PHOTO INFORMATION

date of photo.: November 2002 view direction: east north photo no.: 02.11.37 02.11.30

CONSTRUCTION HISTORY

In 1929 the Arizona Highway Department undertook an extensive rehabilitation and relocation of US Highway 66—the major east-west artery across northern Arizona—between Sanders and Lupton in Apache County. In addition to the 22¼ miles of roadway grading and surfacing, the project included construction of several bridges and drainage structures. Largest of these was a three-span truss that spanned rugged Querino Canyon about four miles southwest of Houck. The Querino Canyon Bridge featured medium-span rigid-connected Warren deck trusses, simply supported by trussed steel four-leg bents atop concrete pedestals. The bridge's concrete deck was supported by steel stringers and floor beams and flanked on both sides by steel lattice guardrails. As delineated by AHD and later modified at the request of the Bureau of Public Roads, the Querino Canyon Bridge would consume some 288,000 pounds of structural steel, 34,000 pounds of reinforcing steel and 307 cubic yards of concrete.

AHD designated the road and bridge construction as Federal Aid Project 83-A and in November awarded the contract for the work to Phoenix contractor F.D. Shufflebarger for $184,604. Shufflebarger's men began roadwork at year's end and in 1930 began the bridge's substructure. Using steel rolled by the Inland Steel Company for the superstructure, he completed the bridge behind schedule by December 1930. The Querino Canyon Bridge carried mainline traffic on US 66 until the route was realigned in 1949. The highway was later incorporated into Interstate 40 in the late 1960s and a steel stringer bridge built over the canyon south of the 1930 structure. Since the realignment, the Querino Canyon Bridge and the adjacent roadway have carried intermittent local traffic on the Navajo Indian Reservation. The structure remains in pristine condition, without substantial deterioration or alteration.

SIGNIFICANCE STATEMENT

As an important crossing of rerouted US 66, the Querino Canyon Bridge formed an integral link on one of America's primary transcontinental routes. It is thus an important feature in Arizona's transportation network, built during a period of intensive highway construction in the state. The bridge is also technologically significant as an intact example of an uncommon structural type. The Querino Canyon Bridge is one of four multiple-span deck-trussed bridges identified in the statewide inventory (others: Dead Indian Canyon [**0032**]; Black River [**3128**]; and Sand Hollow Wash [**8662**]). All were medium-span structures erected between 1929 and 1934 at rural northern Arizona crossings, and all featured industry-standard truss configurations and detailing. With its structural integrity intact, the Querino Canyon Bridge is a well-preserved representative of this noteworthy highway design trend.

NATIONAL REGISTER EVALUATION

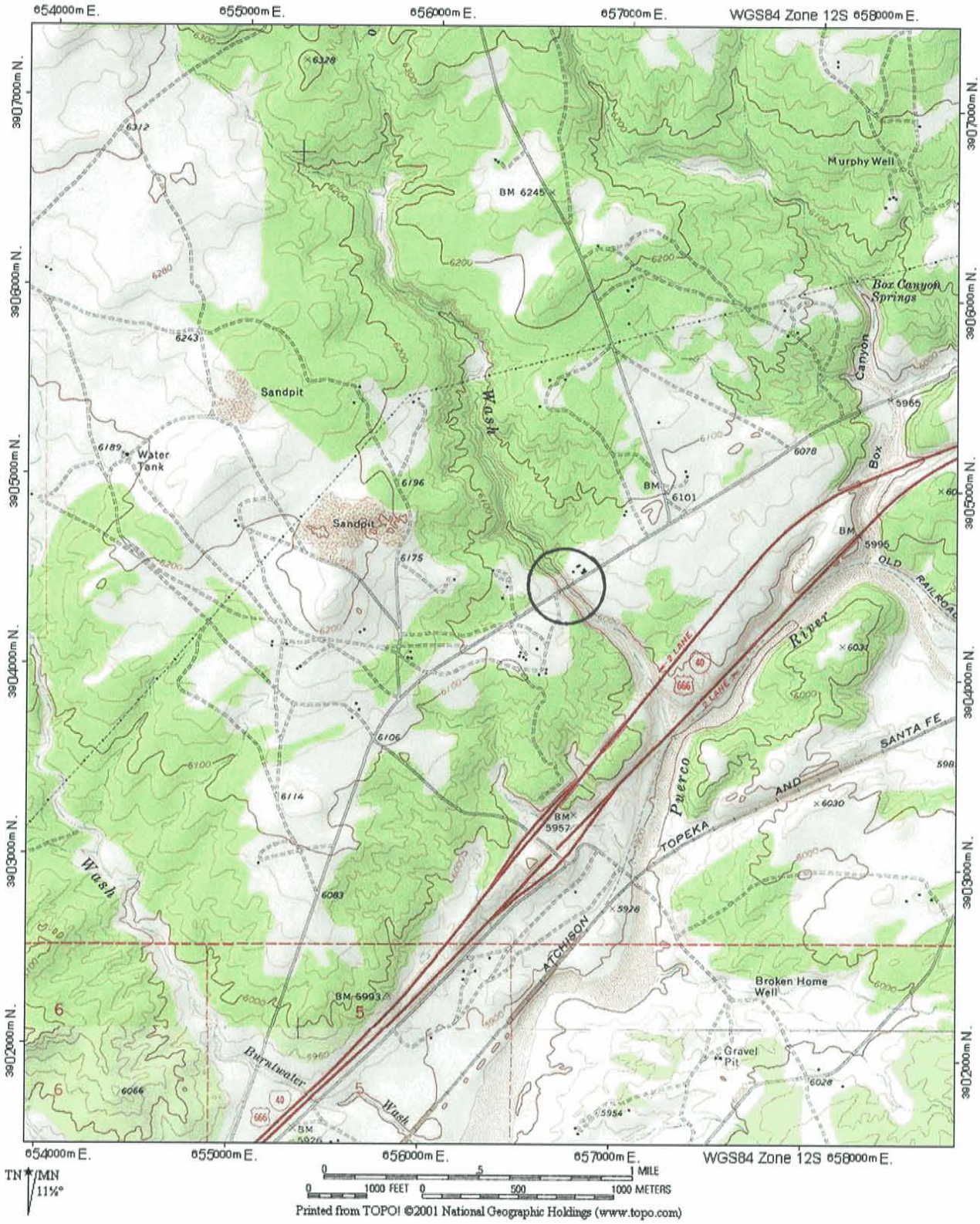
TECHNOLOGICAL SIGNIFICANCE
___ represents the work of a master
___ possesses high artistic values
_x_ represents a type, period or method of construction

HISTORICAL SIGNIFICANCE
___ associated with significant persons
_x_ associated with significant events or patterns
___ contributes to historical district

NATIONAL REGISTER CRITERIA
_x_ Criterion A
___ Criterion B
_x_ Criterion C

NATIONAL REGISTER ELIGIBILITY
individually eligible _x_ yes ___ no
contributes to district ___ yes _x_ no

AREA OF SIGNIFICANCE: Transportation; Engineering
PERIOD OF SIGNIFICANCE: 1930-1964
THEME(S): Transportation: Highways



Location Map

HISTORIC BRIDGE INVENTORY

Concho Bridge

PROPERTY IDENTIFICATION

county	Apache	inventory number	08480
milepost	0.00	inventory route	Concho Creek Road
location	0.1 mi S of SR 61	feature intersected	Concho Creek
city/vicinity	Concho	USGS quadrangle	Concho
district	87	UTM reference	12.628325.3815607

STRUCTURAL INFORMATION

main span number	1	main span type	104
appr. span number	0	appr. span type	
degree of skew	0	guardrail type	4
main span length	30.0	superstructure	concrete through girder
structure length	34.0	substructure	concrete abutments and wingwalls
roadway width	17.5	floor/decking	concrete deck with asphalt overlay
structure width	21.4	other features	solid concrete guardrails with recessed rectangular panels

HISTORICAL INFORMATION

construction date	1922	designer/engineer	Arizona Highway Department
project number	FAP 6	builder/contractor	state work force
information source	county bridge records	structure owner	Apache County
alteration date(s)		alterations	

NATIONAL REGISTER EVALUATION

For additional information, see "Vehicular Bridges in Arizona 1880-1964" National Register Multiple Property Documentation Form

inventory score	83	NRHP eligibility	eligible
		NRHP criteria	A ____ B ____ C x
		signif. statement	well-preserved, early example of singular structural type

FORM COMPLETED BY

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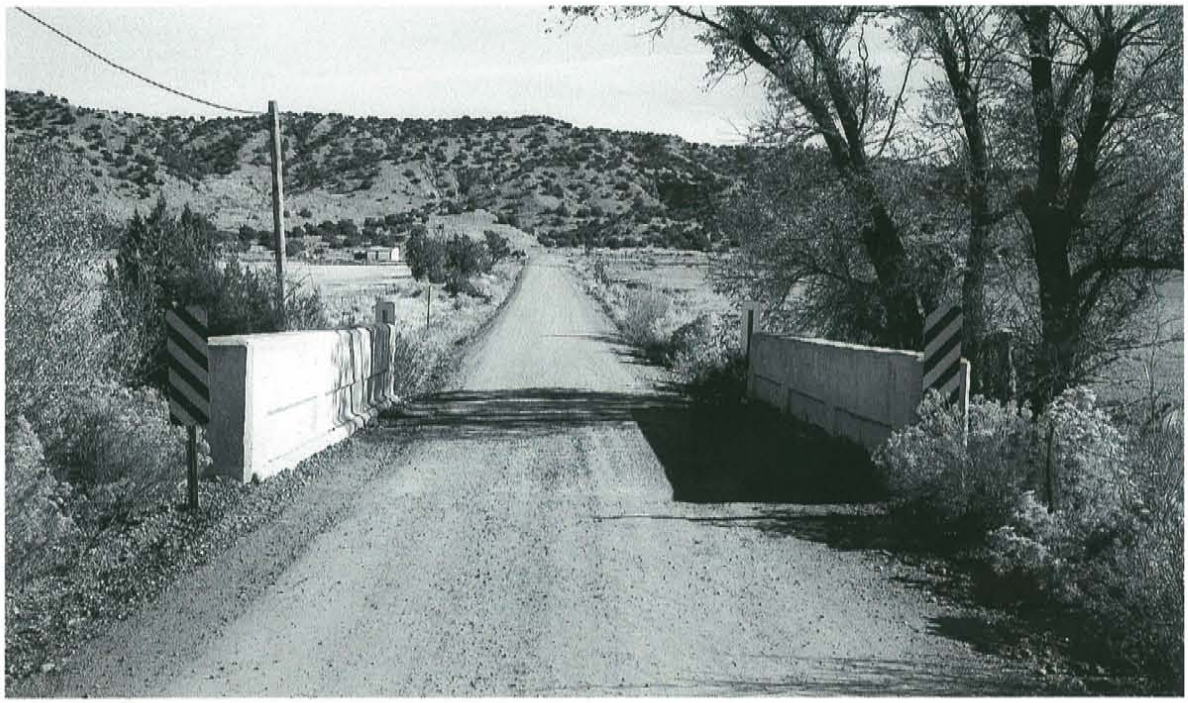
31 October 2004



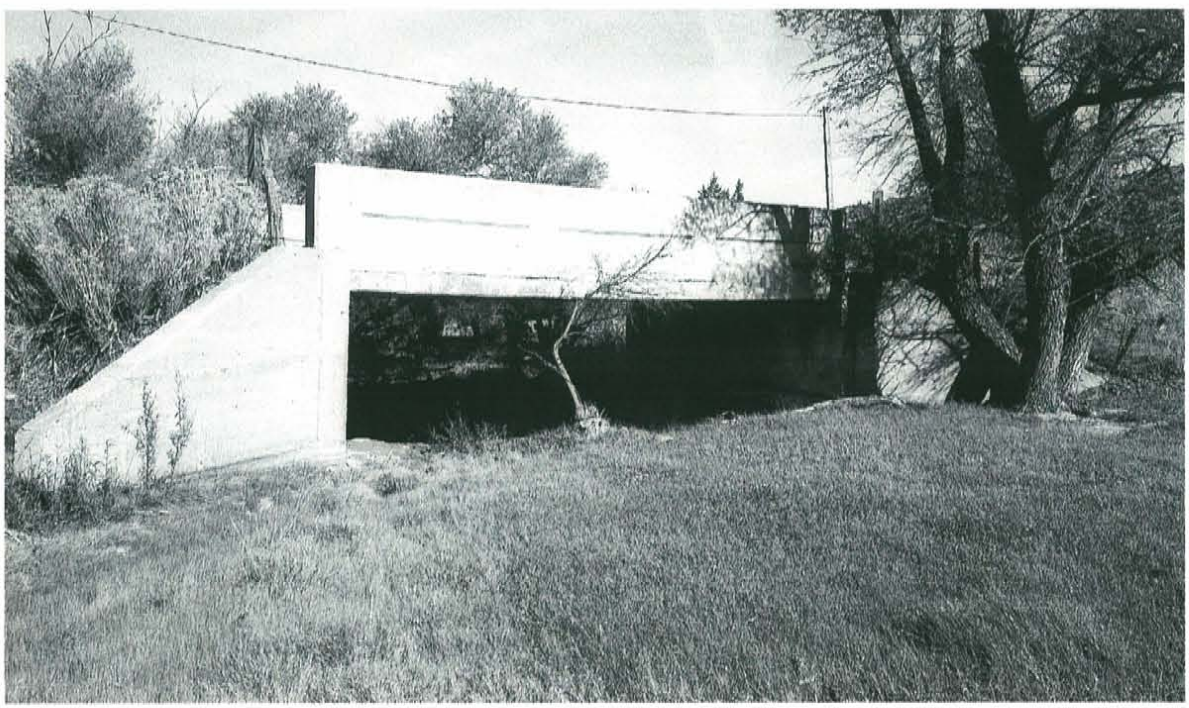


PHOTO INFORMATION

date of photo.: November 2002 view direction: northeast south photo no.: 02.11.39 02.11.41

CONSTRUCTION HISTORY

Federal Aid Project No. 6—covering 12½ miles of the Holbrook-St. Johns Highway between Hunt and Concho in Apache County—was originally approved by the Arizona Highway Department in 1918. When insufficient funding delayed its construction, however, the county voted a $140,000 bond issue in 1920 to build the road itself. The county commenced work in 1921 on a non-federal basis. While Apache County constructed the adjacent roadway in 1922, a work crew made up of state-employed laborers built this single-span concrete girder bridge over Concho Creek in the crossroads settlement of Concho. The bridge used an AHD short-span design, featuring concrete mass abutments and wingwalls, concrete deck and reinforced concrete through girders with recessed architectural panels. The total construction cost for the Concho Bridge, including grading of the approaches, was $9600. The highway was designated US 180 three years later. In 1954 it was rerouted around Concho, and the bridge was turned over to Apache County. In pristine condition, the Concho Bridge now carries local traffic.

SIGNIFICANCE STATEMENT

Arizona began developing standard designs for short-span, reinforced concrete bridges as early as 1910, two years before statehood. Concrete bridges—and particularly concrete girder spans—were just beginning to find favor among American engineers at that time. Arizona Highway Department engineers drafted standards for concrete deck girder and concrete slab structures, but they rarely used concrete through girder spans. The advantage of this structural type was that it required less clearance between the roadway and the high water mark than did the deck girder. Its disadvantages were that it required somewhat more material than the deck girder and it was not as flexible: with the structural members above the deck, the through girder spans could not be subsequently widened.

The disadvantages outweighed the advantages, and the through girder as a structural type languished in comparison with more popular deck girders in Arizona. In fact, the Concho Bridge is the only known instance in which this structural type was used by the state. Constructed by a state work crew on a road built by the county, the Concho Bridge is apparently the only concrete through girder bridge undertaken by the state engineer's office. It is thus distinguished as a singular representative in the state of this esoteric structural type and a well-preserved example of early AHD concrete bridge design.

NATIONAL REGISTER EVALUATION

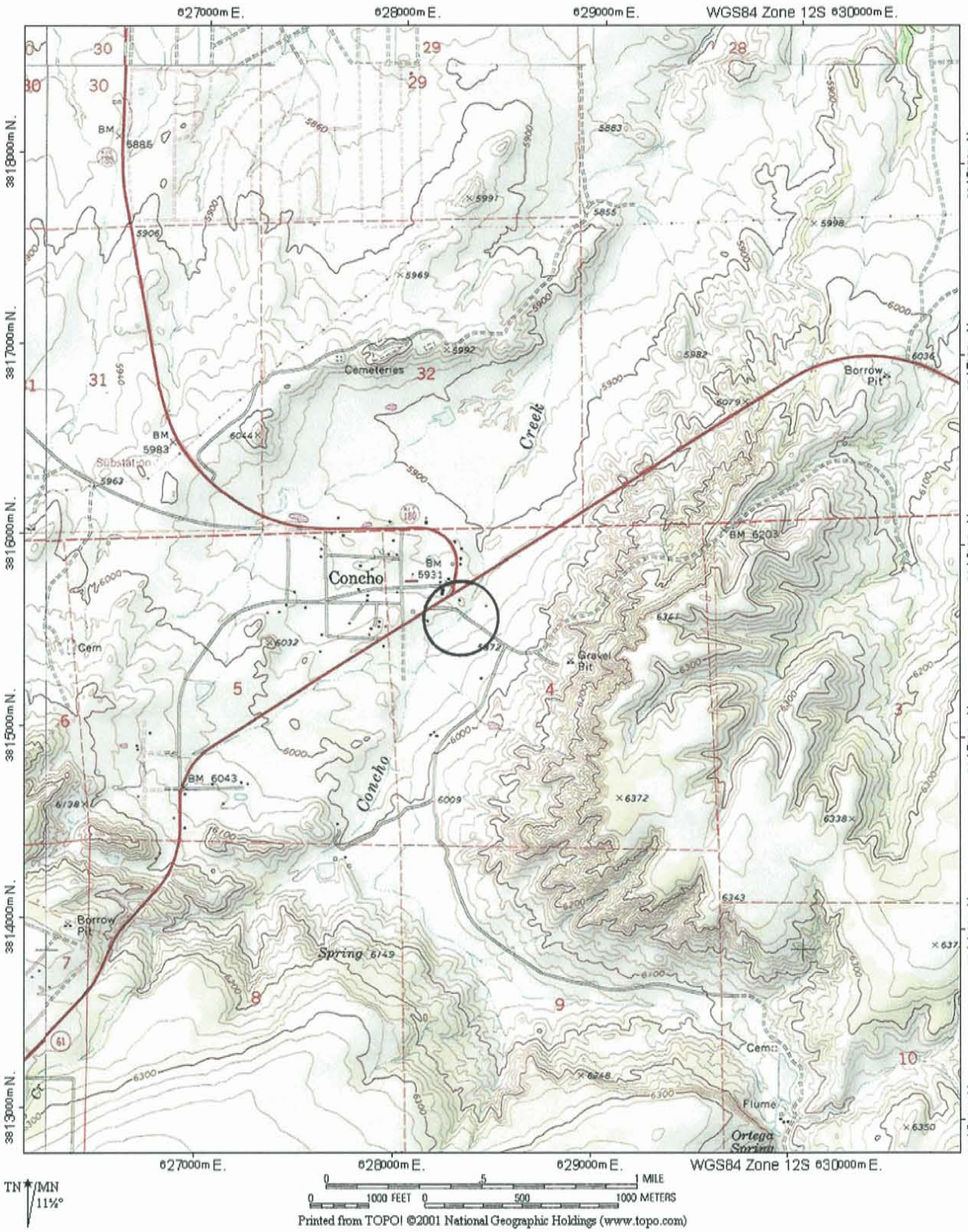
TECHNOLOGICAL SIGNIFICANCE
___ represents the work of a master
___ possesses high artistic values
_x_ represents a type, period or method of construction

HISTORICAL SIGNIFICANCE
___ associated with significant persons
___ associated with significant events or patterns
___ contributes to historical district

NATIONAL REGISTER CRITERIA
___ Criterion A
___ Criterion B
_x_ Criterion C

NATIONAL REGISTER ELIGIBILITY
individually eligible _x_ yes ___ no
contributes to district ___ yes _x_ no

AREA OF SIGNIFICANCE: Transportation; Engineering
PERIOD OF SIGNIFICANCE: 1922-1964
THEME(S): Transportation: Highways



Location Map