HISTORIC BRIDGE INVENTORY

Black Jack Canyon Bridge

PROPERTY IDENTIFICATION

county	Greenlee	inventory number	00258
milepost	154.90	inventory route	US 191
location	0.4 M N Jct SR 75	feature intersected	Cold Creek
city/vicinity	Three Way	USGS quadrangle	York
district	84	UTM reference	12.665460.3647600

STRUCTURAL INFORMATION

main span number	4	main span type	403
appr. span number	0	appr. span type	
degree of skew	0	guardrail type	6
main span length	83.0	superstructure	steel cantilever plate deck girder
structure length	258.0	substructure	concrete abutments, wingwalls and spill-through piers
roadway width	26.0	floor/decking	concrete deck
structure width	29.0	other features	steel beam guardrails with concrete posts and bulkheads

HISTORICAL INFORMATION

construction date	1941	designer/engineer	Arizona Highway Department
project number	FAP 138-A(1)	builder/contractor	George W. Orr, El Paso TX
information source	ADOT bridge records	structure owner	Arizona Department of Transportation
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	51	NRHP eligibility	eligible
		NRHP criteria	A ____ B ____ C x
		signif. statement	well-preserved example of uncommon structural type

FORM COMPLETED BY

Clayton B. Fraser, Principal

FRASERdesign
420 South County Road 23E
Loveland, Colorado 80537
31 October 2004

BLACK JACK CANYON BRIDGE

Structure No.0258

PHOTO INFORMATION

date of photo.: February 2003 view direction: northwest east photo no.: 03.02.7 03.02.8

CONSTRUCTION HISTORY

In the early 1940s the Arizona Highway Department undertook a major reconstruction of the Duncan-Clifton Highway (State Highway 71) south of Clifton. Included among the miles of roadway grading and construction of numerous small drainage structures were three substantial bridges over rocky defiles at Black Jack Canyon (Cold Creek), Negro Canyon [**0267**] and Rattlesnake Canyon [**0270**]. The design and construction of the route were divided into intermediate sections. As the southernmost of the three bridges, the Black Jack Canyon structure was the first undertaken. It was comprised of four steel deck girder spans—the longest of which spanned 83 feet—supported by concrete abutments and spill-though piers on concrete spread footings. These girders supported the bridge's 29-foot-wide concrete deck. Like most rural structures designed by AHD at the time, the Black Jack Canyon Bridge was relatively plain-faced, with the only architectural treatment being the stepped bulkheads that bounded the steel guardrails on the four corners.

In the fall of 1940 highway department engineers completed the drawings for the Black Jack Canyon bridge and designated its construction, along with 4⅓ miles of adjacent highway work, as Federal Aid Project 138-A. Late that year AHD let the contract for this project to George W. Orr of El Paso, Texas. Orr's men began the highway work soon thereafter, finishing the project—including this bridge—on schedule by the following September. Since its completion, the Black Jack Canyon Bridge has since carried mainline traffic, without substantial alteration. In 1982 a second, parallel, structure was built at this crossing to carry the highway's northbound lanes.

SIGNIFICANCE STATEMENT

Beginning in the 1910s, the Arizona Highway Department relied extensively on standard designs for many of its bridges. These relatively small-scale structures were built by the hundreds all over the state and many remain in place today, with varying degrees of physical integrity. For larger structures, AHD often turned to its standard concrete or steel structural types, extending them in span length or span number to form site-specific designs. These three bridges in Greenlee County represent the three most common bridge types of the 1930s and 1940s: a steel beam, a concrete girder and a concrete slab. Other than the superstructural differences, their detailing was essentially identical. They are thus distinguished as the only well-preserved, intact group of structures to illustrate these major structural types from the period. As such they accrue a degree of technological significance for their representative value.

NATIONAL REGISTER EVALUATION

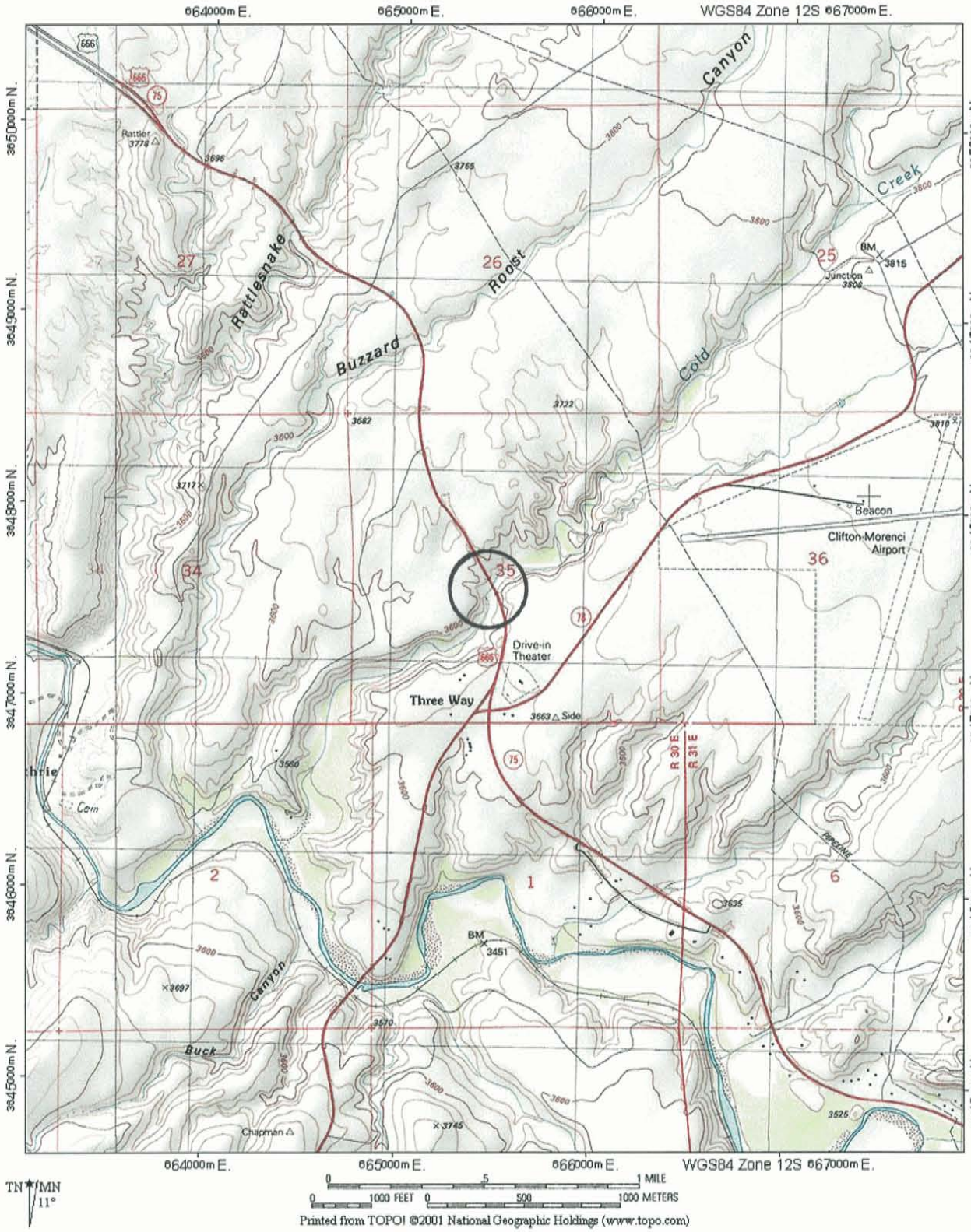
TECHNOLOGICAL SIGNIFICANCE
___ represents the work of a master
___ possesses high artistic values
_x_ represents a type, period or method of construction

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: 1941-1964
THEME(S): Transportation: Highways



Location Map

HISTORIC BRIDGE INVENTORY

Negro Canyon Bridge

PROPERTY IDENTIFICATION

county	Greenlee	inventory number	00267
milepost	157.74	inventory route	US 191; NB
location	3.2 mi N Jct SR 75	feature intersected	Negro Canyon
city/vicinity	Three Way	USGS quadrangle	Guthrie
district	84	UTM reference	12.662590.3650725

STRUCTURAL INFORMATION

main span number	4	main span type	201
appr. span number	0	appr. span type	
degree of skew	0	guardrail type	6
main span length	27.0	superstructure	concrete slab
structure length	110.0	substructure	concrete abutments, wingwalls and spill-though piers
roadway width	26.0	floor/decking	concrete deck
structure width	29.0	other features	steel beam guardrails with concrete posts and bulkheads

HISTORICAL INFORMATION

construction date	1942	designer/engineer	Arizona Highway Department
project number	FAP 138-B(1)	builder/contractor	George W. Orr, El Paso TX
information source	ADOT bridge records	structure owner	Arizona Department of Transportation
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	45	NRHP eligibility	eligible
		NRHP criteria	A ____ B ____ C x
		signif. statement	well-preserved example of standard bridge type, one of a group of prototypical bridges

FORM COMPLETED BY

Clayton B. Fraser, Principal

FRASERdesign
420 South County Road 23E
Loveland, Colorado 80537
31 October 2004

NEGRO CANYON BRIDGE

Structure No. 0267

PHOTO INFORMATION

date of photo.: February 2003 view direction: northwest north photo no.: 03.02.3 03.02.2

CONSTRUCTION HISTORY

In the early 1940s the Arizona Highway Department undertook a major reconstruction of the Duncan-Clifton Highway (State Highway 71) south of Clifton. Included among the miles of roadway grading and construction of numerous small drainage structures were three substantial bridges over rocky defiles at Negro Canyon (formerly Nigger Canyon), Black Jack Canyon (Cold Creek [**0258**]), and Rattlesnake Canyon [**0270**]. The design and construction of the route were divided into intermediate sections. As the southernmost of the three bridges, the Black Jack Canyon structure was the first undertaken. The contract for it was let late in 1940. The contract for the Rattlesnake Canyon Bridge was let in the summer of 1941. As the last of the three structures, the Negro Canyon Bridge was comprised of four concrete slab spans—the longest of which extended 27 feet—supported by concrete abutments and spill-though piers on concrete spread footings. These slabs featured parabolic arches, giving the bridge a girderlike appearance. Like most rural structures designed by AHD at the time, the Negro Canyon Bridge was relatively plain-faced, with the only architectural treatment being the stepped bulkheads that bounded the steel guardrails on the four corners.

Early in 1942 highway department engineers completed the drawings for the Negro Canyon bridge and designated its construction, along with 3¾ miles of adjacent highway work, as Federal Aid Project 138-B. In March 1942 AHD let the contract for this project to George W. Orr of El Paso, Texas. Orr's men began the highway work soon thereafter, completing the project by the end of the summer. The Negro Canyon Bridge has since carried mainline traffic, without substantial alteration. In 1980 a second, parallel, structure was built at this crossing to carry the highway's northbound lanes.

SIGNIFICANCE STATEMENT

Beginning in the 1910s, the Arizona Highway Department relied extensively on standard designs for many of its bridges. These relatively small-scale structures were built by the hundreds all over the state and many remain in place today, with varying degrees of physical integrity. For larger structures, AHD often turned to its standard concrete or steel structural types, extending them in span length or span number to form site-specific designs. These three bridges in Greenlee County represent the three most common bridge types of the 1930s and 1940s: a steel beam, a concrete girder and a concrete slab. Other than the superstructural differences, their detailing was essentially identical. They are thus distinguished as the only well-preserved, intact group of structures to illustrate these major structural types from the period. As such they accrue a degree of technological significance for their representative value.

NATIONAL REGISTER EVALUATION

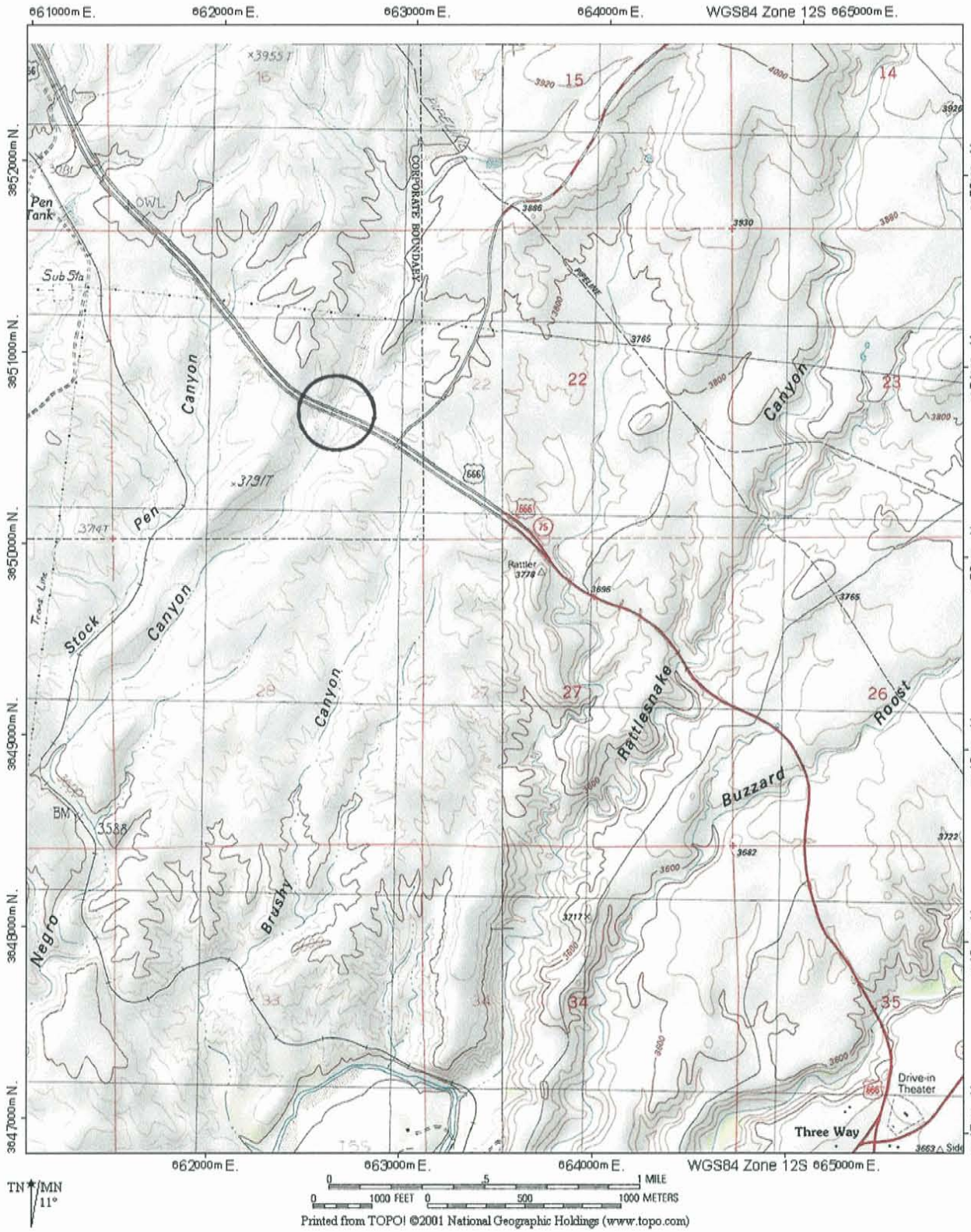
TECHNOLOGICAL SIGNIFICANCE
___ represents the work of a master
___ possesses high artistic values
_x_ represents a type, period or method of construction

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: Engineering
PERIOD OF SIGNIFICANCE: 1942-1964
THEME(S): Transportation: Highways



Location Map

HISTORIC BRIDGE INVENTORY

Rattlesnake Canyon Bridge

PROPERTY IDENTIFICATION

county	Greenlee	inventory number	00270
milepost	156.30	inventory route	US 191; SB
location	1.8 M N Jct SR 75	feature intersected	Rattlesnake Canyon
city/vicinity	Three Way	USGS quadrangle	York
district	84	UTM reference	12.664430.3649428

STRUCTURAL INFORMATION

main span number	5	main span type	204
appr. span number	0	appr. span type	
degree of skew	0	guardrail type	6
main span length	60.0	superstructure	concrete deck girder
structure length	290.0	substructure	concrete abutments, wingwalls and spill-though piers
roadway width	26.0	floor/decking	concrete deck
structure width	29.0	other features	steel beam guardrails with concrete posts and bulkheads

HISTORICAL INFORMATION

construction date	1942	designer/engineer	Arizona Highway Department
project number	NFA 138	builder/contractor	Royden Construction Company, Phoenix AZ
information source	ADOT bridge records	structure owner	Arizona Department of Transportation
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	45	NRHP eligibility	eligible
		NRHP criteria	A ____ B ____ C x
		signif. statement	well-preserved prototype of standard structural type

FORM COMPLETED BY

Clayton B. Fraser, Principal

FRASERdesign
420 South County Road 23E
Loveland, Colorado 80537
31 October 2004

PHOTO INFORMATION

date of photo.: February 2003 view direction: southeast east photo no.: 03.02.4 03.02.6

CONSTRUCTION HISTORY

In the early 1940s the Arizona Highway Department undertook a major reconstruction of the Duncan-Clifton Highway (State Highway 71) south of Clifton. Included among the miles of roadway grading and construction of numerous small drainage structures were three substantial bridges over rocky defiles at Black Jack Canyon (Cold Creek [**0258**]), Negro Canyon [**0267**] and Rattlesnake Canyon. The design and construction of the route were divided into sections, with the work progressing southward from Clifton. As the southernmost of the three bridges, the Black Jack Canyon structure was the first undertaken. The contract for its construction was let late in 1940. In the summer of 1941, as work was underway on it, highway department engineers completed the drawings for the Rattlesnake Canyon structure. As delineated by AHD, the Rattlesnake Canyon Bridge was comprised of five concrete girder spans—the longest of which extended 60 feet—supported by concrete abutments and spill-though piers on concrete spread footings. These girders featured parabolically arched profiles. Like most rural structures designed by AHD at the time, the Rattlesnake Canyon Bridge was relatively plain-faced, with the only architectural treatment being the stepped bulkheads that bounded the steel guardrails on the four corners.

AHD designated the construction of the Rattlesnake Canyon Bridge as non-Federal Aid Project 138 (1941) and let the contract to H.L. Royden of Phoenix. Royden's men began the work soon thereafter, excavating for the foundations. They completed the project the following April. The Rattlesnake Canyon Bridge has since carried mainline traffic, without substantial alteration. In 1982 a second, parallel, structure was built at this crossing to carry the highway's northbound lanes.

SIGNIFICANCE STATEMENT

Beginning in the 1910s, the Arizona Highway Department relied extensively on standard designs for many of its bridges. These relatively small-scale structures were built by the hundreds all over the state and many remain in place today, with varying degrees of physical integrity. For larger structures, AHD often turned to its standard concrete or steel structural types, extending them in span length or span number to form site-specific designs. These three bridges in Greenlee County represent the three most common bridge types of the 1930s and 1940s: a steel beam, a concrete girder and a concrete slab. Other than the superstructural differences, their detailing was essentially identical. They are thus distinguished as the only well-preserved, intact group of structures to illustrate these major structural types from the period. As such they accrue a degree of technological significance for their representative value.

NATIONAL REGISTER EVALUATION

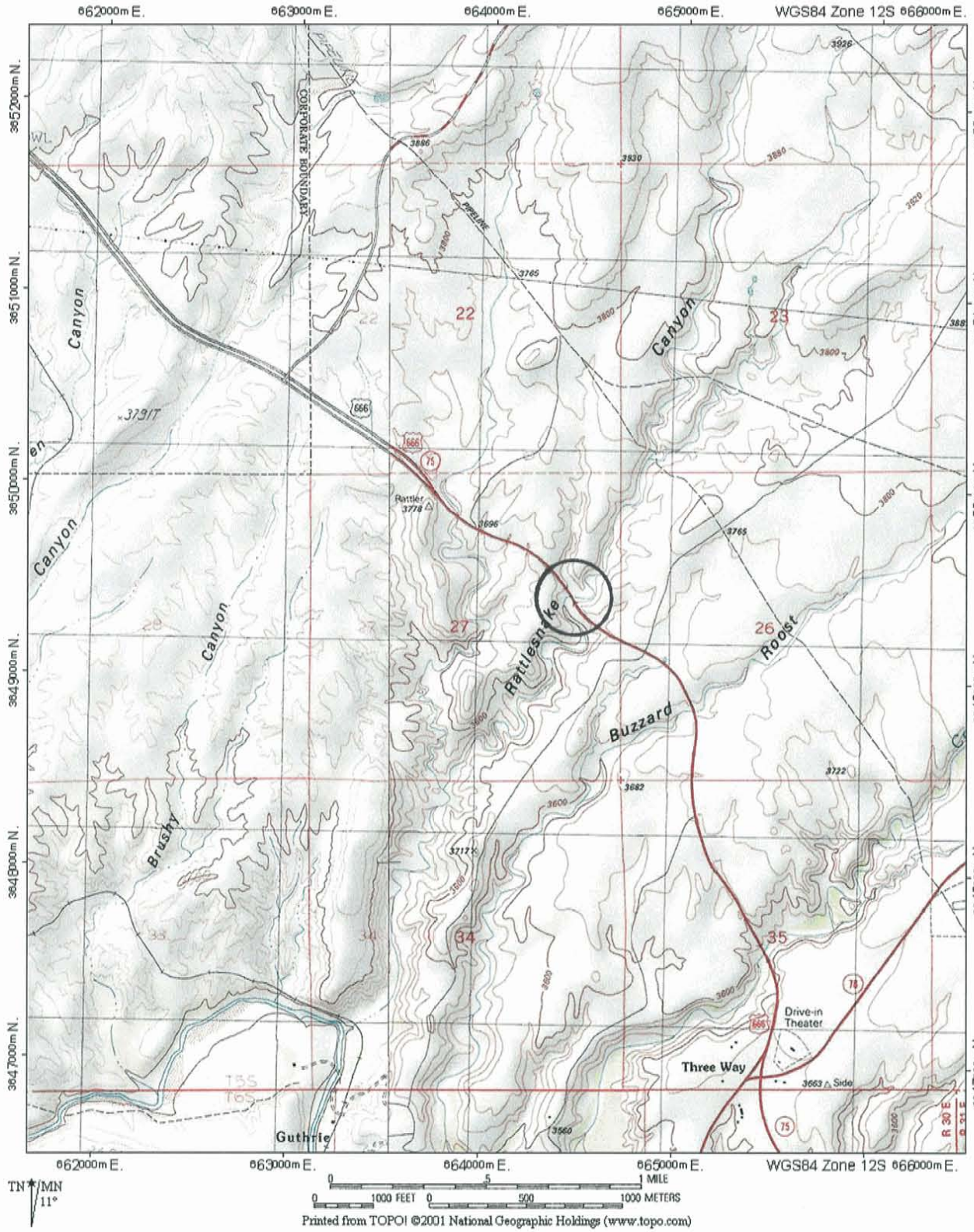
TECHNOLOGICAL SIGNIFICANCE
- ____ represents the work of a master
- ____ possesses high artistic values
- _x_ represents a type, period or method of construction

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: Engineering
PERIOD OF SIGNIFICANCE: 1942-1964
THEME(S): Transportation: Highways



Location Map

HISTORIC BRIDGE INVENTORY

Guthrie Bridge

PROPERTY IDENTIFICATION

county	Greenlee	inventory number	00352
milepost	153.51	inventory route	US 191
location	1.0 M E Jct SR 75	feature intersected	Gila River
city/vicinity	Guthrie	USGS quadrangle	York
district	84	UTM reference	12.664780.3645497

STRUCTURAL INFORMATION

main span number	3	main span type	409
appr. span number	4	appr. span type	402
degree of skew	0	guardrail type	6
main span length	300.0	superstructure	steel rigid-connected cantilevered deck truss
structure length	727.0	substructure	concrete abutments, wingwalls and piers
roadway width	26.0	floor/decking	concrete deck
structure width	31.0	other features	upper / lower chord: 2 built-up channels w/ double lacing; vertical: built-up I-beam; diagonal: wide flange; lateral bracing: 1 2 angles w/ lacing; floor beam: I-beam; aluminum tubular guardrails w/ concrete bulkheads

HISTORICAL INFORMATION

construction date	1950	designer/engineer	Arizona Highway Department
project number	NFAS 46(49)	builder/contractor	Vinson Construction Company, Phoenix AZ
information source	ADOT bridge records	structure owner	Arizona Department of Transportation
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	68	NRHP eligibility	eligible
		NRHP criteria	A x B ____ C x
		signif. statement	outstanding example of large-scale truss construction

FORM COMPLETED BY

Clayton B. Fraser, Principal

FRASERdesign
420 South County Road 23E
Loveland, Colorado 80537
31 October 2004

GUTHRIE BRIDGE

Structure No. 0352

PHOTO INFORMATION

date of photo.: February 2003 view direction: southwest south photo no.: 03.02.10 03.02.11

CONSTRUCTION HISTORY

In July 1948 the Arizona Highway Department began production of construction drawings for a large-scale bridge that would carry the Safford-Clifton Highway (State Highway 71) over the Gila River. Located near Guthrie, the proposed bridge would carry the road on a high line over a broad ravine. As delineated by AHD, the Guthrie Bridge was configured as a three-span Pratt deck truss with riveted connections. The distance between the superstructure and the riverbed below was too great to allow for traditional erection falsework, so AHD designed the Guthrie Bridge as a cantilever truss, with a long central span counterbalanced on either end by shorter anchor spans. The center span extended 300 feet over the river's main channel; the approach spans extended about 100 feet each and were in turn approached by steel girders, the longest of which reached 60 feet. The superstructure was held aloft by concrete pedestals on spread footings. The trusses and girders carried a concrete deck on steel stringers, which was bounded on both sides by aluminum beam guardrails. AHD designated the project as non-Federal Aid Secondary Project 46 and on March 24, 1949, awarded a contract for the bridge's construction to the Vinson Construction Company. The Phoenix-based contractors started work on the substructural excavation that spring. They completed the bridge in 1950 for an aggregate cost of almost $350,000. The Guthrie Bridge was massive, consuming almost 1,500 cubic yards of concrete, 190,000 pounds of reinforcing steel and 1 million pounds of structural steel. It carried highway traffic, first on SH 71, later on US 666 and most recently on US 191. Today the bridge functions in unaltered condition.

SIGNIFICANCE STATEMENT

As a pivotal crossing on a regionally important route, the Guthrie Bridge enjoys a degree of significance for its contribution to southern Arizona transportation. The bridge's relatively late construction limits this significance, however. The structure is technologically important as a well-preserved example of large-scale bridge construction. Arizona erected a number of massive steel arches and cantilevered steel deck trusses in the 1940s and 1950s, most of which are impressively scaled spans placed in dramatic settings. A handful of these remain: the Queen Creek Bridge [**0406**] in Pinal County and the Pinto Creek Bridge [**0351**] in Gila County representing the arches, and the Guthrie Bridge, the Hell Canyon Bridge [**0483**] in Yavapai County, and the Cameron Bridge [**0532**] in Coconino County representing the trusses. These were the state's most striking bridges of post-War period. AHD engineers were clearly concerned with the proportions and detailing of the Guthrie Bridge, producing a perspective rendering of it as part of the construction documents. With its clean proportions and grand scale, it numbers among Arizona's most spectacular steel spans.

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

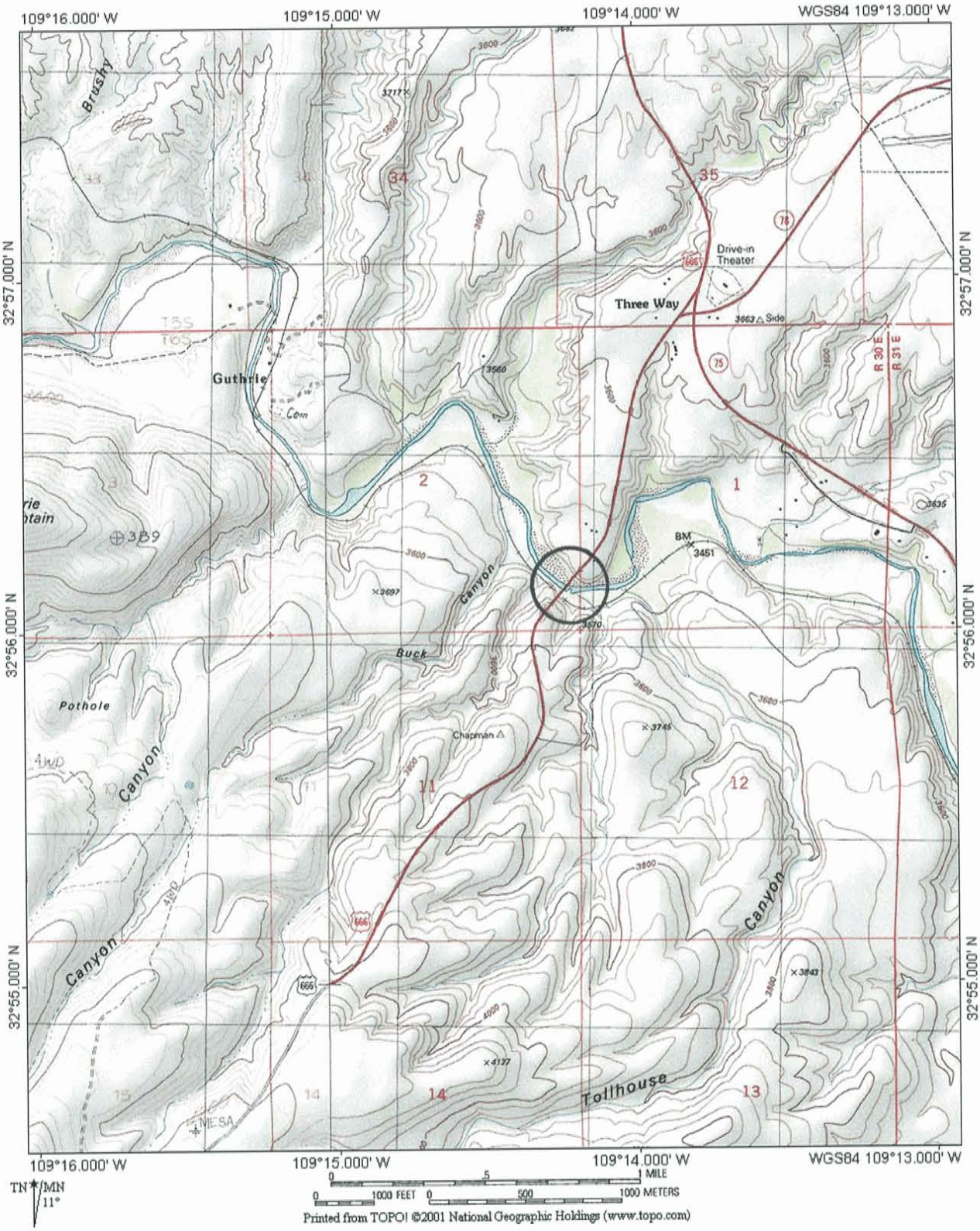
individually eligible _x_ yes ___ no

contributes to district ___ yes _x_ no

AREA OF SIGNIFICANCE: Transportation; Engineering

PERIOD OF SIGNIFICANCE: 1950-1964

THEME(S): Transportation: Highways



Location Map

HISTORIC BRIDGE INVENTORY

Packer Wash Bridge

PROPERTY IDENTIFICATION

county	Greenlee	inventory number	08142
milepost	0.00	inventory route	Fairgrounds Road
location	0.4 mi N Jct SR 75	feature intersected	Packer Wash
city/vicinity	Duncan	USGS quadrangle	Duncan
district	84	UTM reference	12.678110.3623085

STRUCTURAL INFORMATION

main span number	5	main span type	702
appr. span number	0	appr. span type	
degree of skew	0	guardrail type	7
main span length	19.0	superstructure	timber stringer
structure length	97.0	substructure	timber pile bent abutments and piers with timber wingwalls
roadway width	19.0	floor/decking	timber deck with asphalt overlay
structure width	20.7	other features	timber beam guardrails

HISTORICAL INFORMATION

construction date	1935	designer/engineer	Arizona Highway Department
project number	NRS 13	builder/contractor	state work force
information source	ADOT bridge records	structure owner	Greenlee 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	43	NRHP eligibility	eligible
		NRHP criteria	A x B ____ C x
		signif. statement	well-preserved example of early standard structural type; built during Depression

FORM COMPLETED BY

Clayton B. Fraser, Principal

FRASERdesign
420 South County Road 23E
Loveland, Colorado 80537
31 October 2004

PACKER WASH BRIDGE

Structure No. 8142

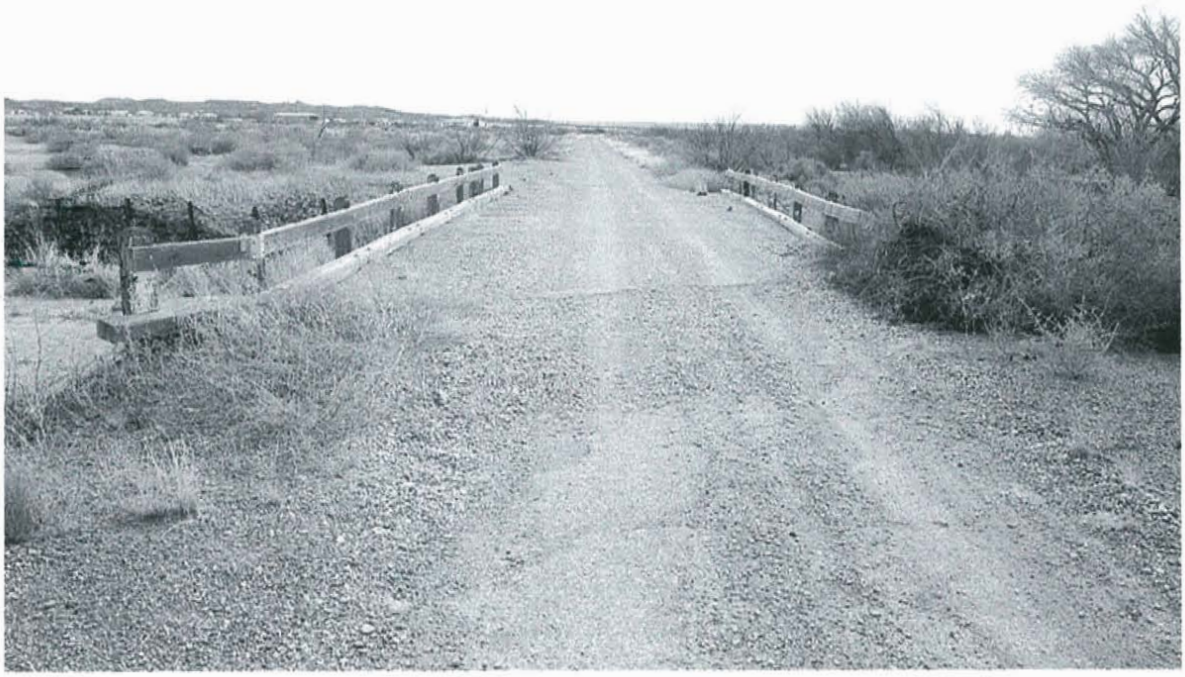


PHOTO INFORMATION

date of photo.: February 2003 view direction: south west photo no.: 03.02.39 03.02.40

CONSTRUCTION HISTORY

Section A of National Recovery Secondary Project 13 and Works Progress Secondary Project 13-A entailed the grading of two small sections of the Duncan-Clifton Highway (State Route 75). Located near Duncan in Greenlee County, the 9-mile-long stretch of road was cut across by a number of small-scale watercourses, including Packer Wash, Waters Wash [**8145**] and Goat Camp Canyon [**8146**]. For these, the bridge department of the Arizona Highway Department designed a series of short-span timber stringer bridges late in 1934. The bridges were developed from AHD standard designs and featured similar, plainly detailed timber components. The Packer Wash Bridge featured five timber stringer spans, the longest of which extended 19 feet between supports. These were carried by timber pile bent abutments and piers. The deck was timber, as were the guardrails.

Under the supervision of AHD Resident Engineer W.R. Stevens, a state work force began construction of the first segment of the road in March 1935, completing it in July. In September Stevens' crew began construction of the second segment and completed it early in 1936. These bridges were included as part of this work. They carried traffic on the highway until the route was subsequently realigned. Today the Packer Wash Bridge and adjacent roadway carry intermittent local traffic.

SIGNIFICANCE STATEMENT

During the 1930s the Great Depression devastated the nation's economy, leaving millions jobless and homeless. By 1933 more than 13 million workers were unemployed, more than 1,000 homes were being foreclosed upon each day, and cities and counties across the country were bankrupt. In an effort to alleviate the financial distress, President Roosevelt established an array of federal agencies whose primary purpose was to funnel billions of dollars of relief money to the destitute citizenry. A favored way of distributing funds to the unemployed was by so-called make-work projects—maintaining national forests and parks, documenting historic sites, constructing buildings, dams, roads, bridges, etc. Arizona received millions of dollars of relief money from the federal government, much of it earmarked for road and bridge construction. The Packer Wash Bridge is historically significant for its representation of this national trend. Although the Arizona Highway Department ordinarily preferred concrete bridges to timber for their better maintenance performance, the AHD bridge department did design a limited number of small-scale timber structures to stretch the state's relief funds. Few of those bridges have survived intact. The Packer Wash Bridge is the only one of the timber structures in Greenlee County that remains unaltered, and as such it is technologically noteworthy.

NATIONAL REGISTER EVALUATION

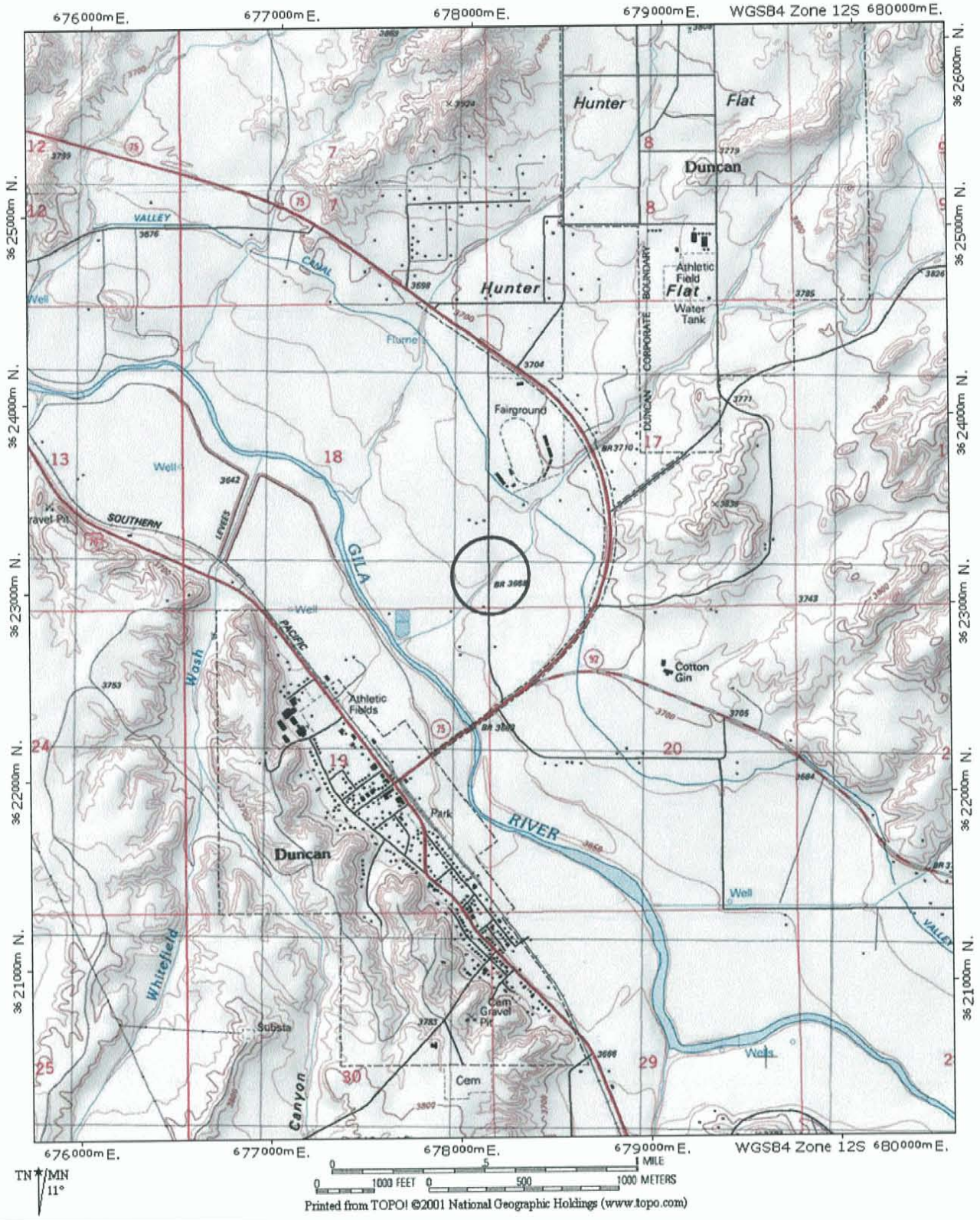
TECHNOLOGICAL SIGNIFICANCE
- ___ represents the work of a master
- ___ possesses high artistic values
- _x_ represents a type, period or method of construction

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: Engineering
PERIOD OF SIGNIFICANCE: 1935-1964
THEME(S): Transportation: Highways



Location Map

HISTORIC BRIDGE INVENTORY

Goat Camp Canyon Bridge

PROPERTY IDENTIFICATION

county	Greenlee	inventory number	08146
milepost	0.00	inventory route	Sheldon Loop Road
location	1.0 mi S Jct SR 75	feature intersected	Goat Camp Canyon
city/vicinity	Sheldon	USGS quadrangle	Sheldon
district	84	UTM reference	12.671562.3631413

STRUCTURAL INFORMATION

main span number	5	main span type	702
appr. span number	0	appr. span type	
degree of skew	0	guardrail type	7
main span length	19.0	superstructure	timber stringer
structure length	97.0	substructure	timber pile bent abutments and piers with timber wingwalls
roadway width	23.2	floor/decking	timber deck with asphalt overlay
structure width	24.7	other features	timber beam guardrails

HISTORICAL INFORMATION

construction date	1936	designer/engineer	Arizona Highway Department
project number	WPSS 13-A	builder/contractor	state work force
information source	ADOT bridge records	structure owner	Greenlee 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	43	NRHP eligibility	eligible
		NRHP criteria	A x B ____ C x
		signif. statement	well-preserved example of early standard structural type; built during Depression

FORM COMPLETED BY

Clayton B. Fraser, Principal

FRASERdesign
420 South County Road 23E
Loveland, Colorado 80537
31 October 2004

GOAT CAMP CANYON BRIDGE

Structure No. 8146

PHOTO INFORMATION

date of photo.: February 2003 view direction: south west photo no.: 03.02.36 03.02.43

CONSTRUCTION HISTORY

Section A of National Recovery Secondary Project 13 and Works Progress Secondary Project 13-A entailed the grading of two small sections of the Duncan-Clifton Highway (State Route 75). Located near Duncan in Greenlee County, the 9-mile-long stretch of road was cut across by a number of small-scale watercourses, including Packer Wash [**8142**], Waters Wash [**8145**] and Goat Camp Canyon. For these, the bridge department of the Arizona Highway Department designed a series of short-span timber stringer bridges late in 1934. The bridges were developed from AHD standard designs and featured similar, plainly detailed timber components. The Goat Camp Canyon Bridge featured five timber stringer spans, the longest of which extended 19 feet between supports. These were carried by timber pile bent abutments and piers. The deck was timber, as were the guardrails.

Under the supervision of AHD Resident Engineer W.R. Stevens, a state work force began construction of the first segment of the road in March 1935, completing it in July. In September Stevens' crew began construction of the second segment and completed it early in 1936. These bridges were included as part of this work. They carried traffic on the highway until the route was subsequently realigned. Today the Goat Camp Canyon Bridge and adjacent roadway carry intermittent local traffic.

SIGNIFICANCE STATEMENT

During the 1930s the Great Depression devastated the nation's economy, leaving millions jobless and homeless. By 1933 more than 13 million workers were unemployed, more than 1,000 homes were being foreclosed upon each day, and cities and counties across the country were bankrupt. In an effort to alleviate the financial distress, President Roosevelt established an array of federal agencies whose primary purpose was to funnel billions of dollars of relief money to the destitute citizenry. A favored way of distributing funds to the unemployed was by so-called make-work projects—maintaining national forests and parks, documenting historic sites, constructing buildings, dams, roads, bridges, etc. Arizona received millions of dollars of relief money from the federal government, much of it earmarked for road and bridge construction. Although the Arizona Highway Department ordinarily preferred concrete bridges to timber for their better maintenance performance, the AHD bridge department did design a limited number of small-scale timber structures to stretch the state's relief funds. Few of those bridges have survived intact. The Goat Camp Canyon Bridge is noteworthy for its multiplicity of spans and relatively good state of preservation. As such it is significant for its representation of this important bridge construction trend.

NATIONAL REGISTER EVALUATION

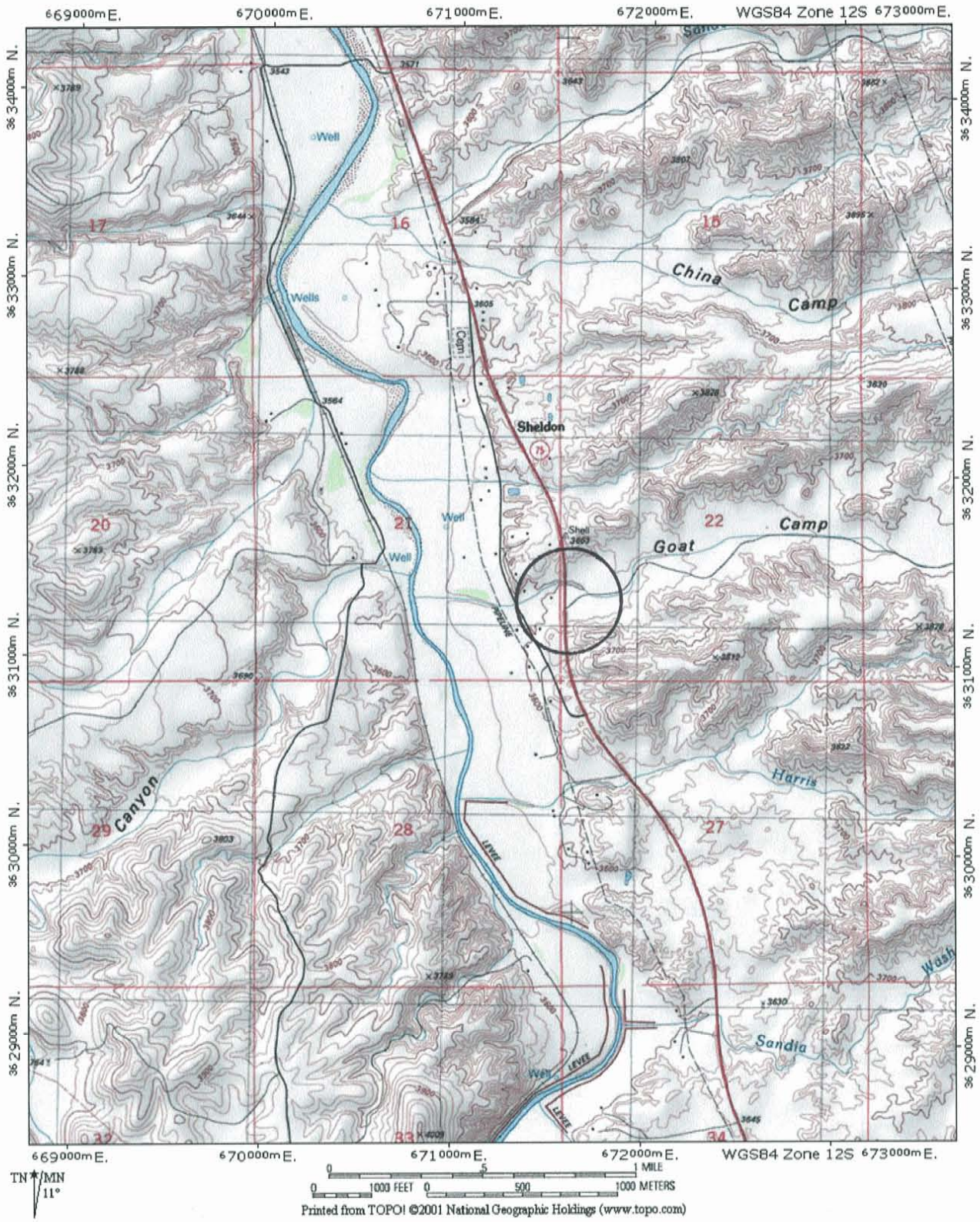
TECHNOLOGICAL SIGNIFICANCE
- ___ represents the work of a master
- ___ possesses high artistic values
- _x_ represents a type, period or method of construction

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: Engineering
PERIOD OF SIGNIFICANCE: 1935-1964
THEME(S): Transportation: Highways



Location Map

HISTORIC BRIDGE INVENTORY

Solomonville Road Overpass

PROPERTY IDENTIFICATION

county	Greenlee	inventory number	08150
milepost	0.00	inventory route	Old Safford Road
location	1.05 mi W Jct US 191	feature intersected	Southern Pacific Railroad
city/vicinity	Clifton	USGS quadrangle	Guthrie
district	84	UTM reference	12.659875.3651995

STRUCTURAL INFORMATION

main span number	1	main span type	111
appr. span number	0	appr. span type	
degree of skew	30	guardrail type	4
main span length	37.0	superstructure	concrete filled spandrel arch
structure length	43.0	substructure	concrete abutments and wingwalls
roadway width	16.1	floor/decking	gravel roadway over earth fill
structure width	19.2	other features	solid concrete parapet walls; "1907" impressed in concrete

HISTORICAL INFORMATION

construction date	1907	designer/engineer	
project number		builder/contractor	
information source	county bridge records	structure owner	Greenlee County
alteration date(s)		alterations	

NATIONAL REGISTER EVALUATION

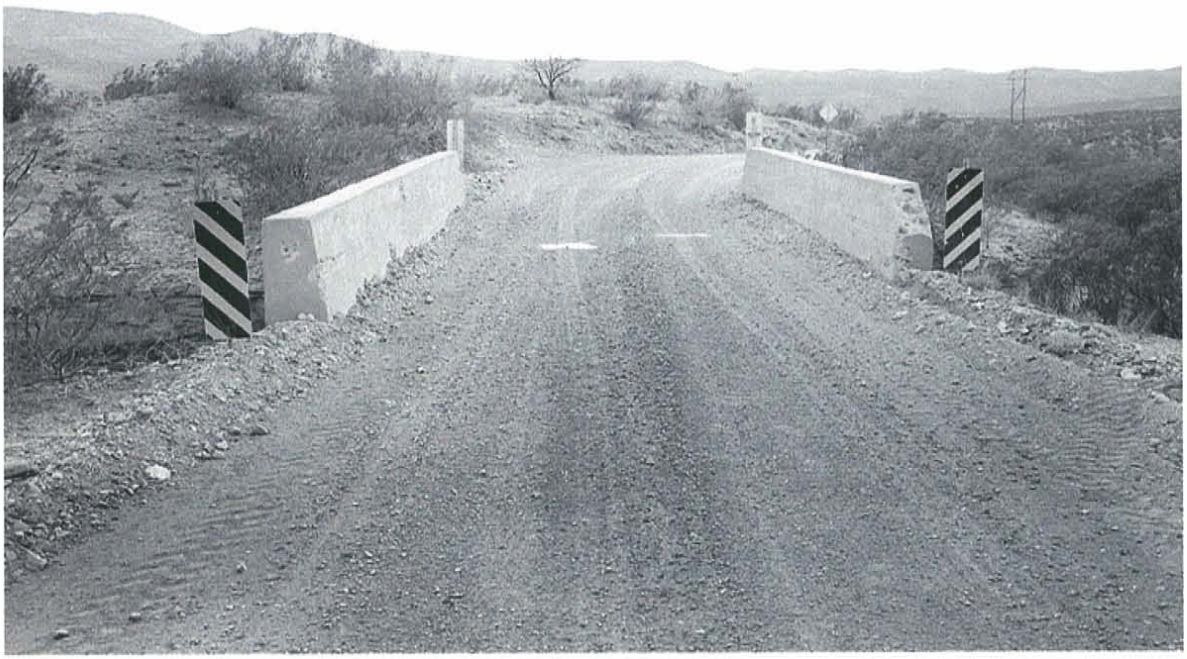
For additional information, see "Vehicular Bridges in Arizona 1880-1964" National Register Multiple Property Documentation Form

inventory score	61	NRHP eligibility	listed
		NRHP criteria	A x B ____ C x
		signif. statement	one of Arizona's two oldest datable vehicular bridges, associated with early toll road

FORM COMPLETED BY

Clayton B. Fraser, Principal

FRASERdesign
420 South County Road 23E
Loveland, Colorado 80537
31 October 2004



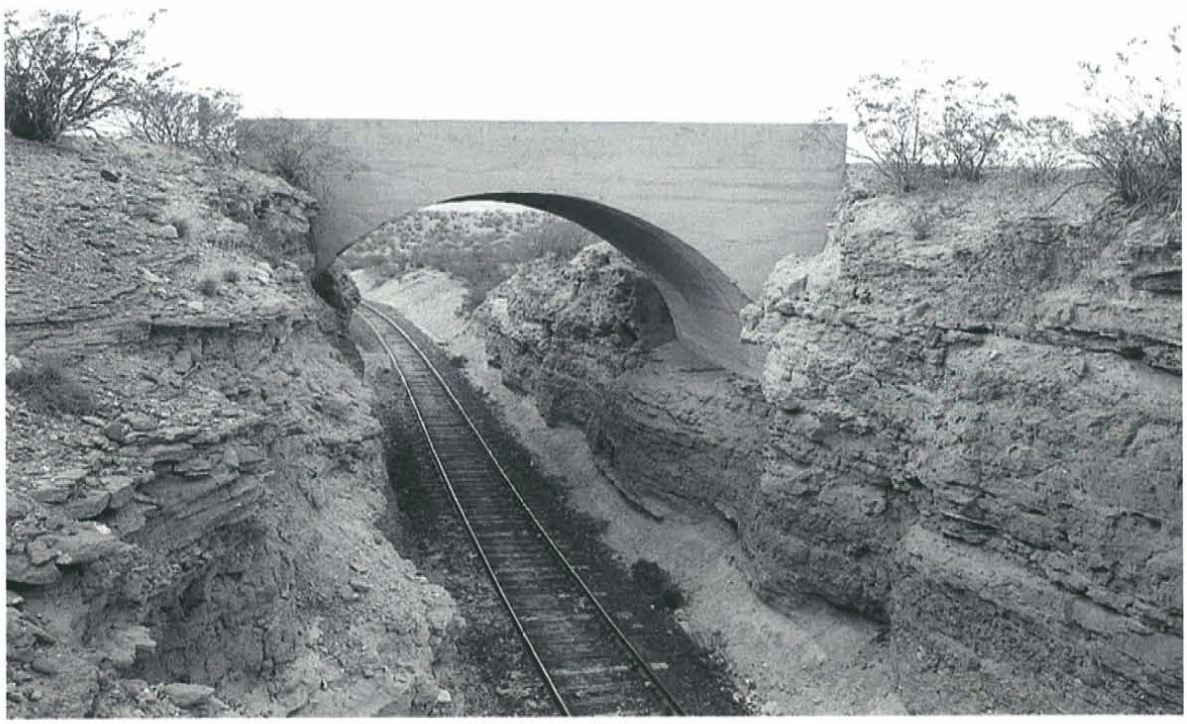


PHOTO INFORMATION

date of photo.: February 2003 view direction: southwest northwest photo no.: 02.11.12 02.11.19

CONSTRUCTION HISTORY

"The entire Clifton-Solomonville Highway was constructed by convict labor," State Engineer B.M. Atwood stated in a 1918 report to the state legislature. Atwood's statement was true to a point, but this early state route had been preceded—at least over part of its route—by an even earlier toll road. Although the origin of the Solomonville Road is obscure, a George B. Goruble was granted a five-year extension of the toll road franchise by Graham County in July 1907. That year two small-scale concrete arches were constructed on the road west of Clifton to carry wagon traffic over the Morenci Southern and the Arizona & New Mexico railroads. The arches were simply constructed, with crude formwork, rudimentary design and a complete absence of architectural detailing. They were later incorporated into the state highway and, when that too was rerouted, into the county road. The two Solomonville Road Overpasses (other: **8151**) now carry intermittent traffic in unaltered condition.

SIGNIFICANCE STATEMENT

Though modest in their scale and design, these two concrete structures are historically significant as the earliest dateable roadway grade separations in Arizona. They are predated by only one other bridge in the state—the Alchesay Canyon Bridge [**1532**] in Maricopa County. More importantly, they are historically significant as the only remaining structures in the state traceable to an early toll road and are therefore important remnants of Arizona territorial history.

NATIONAL REGISTER EVALUATION

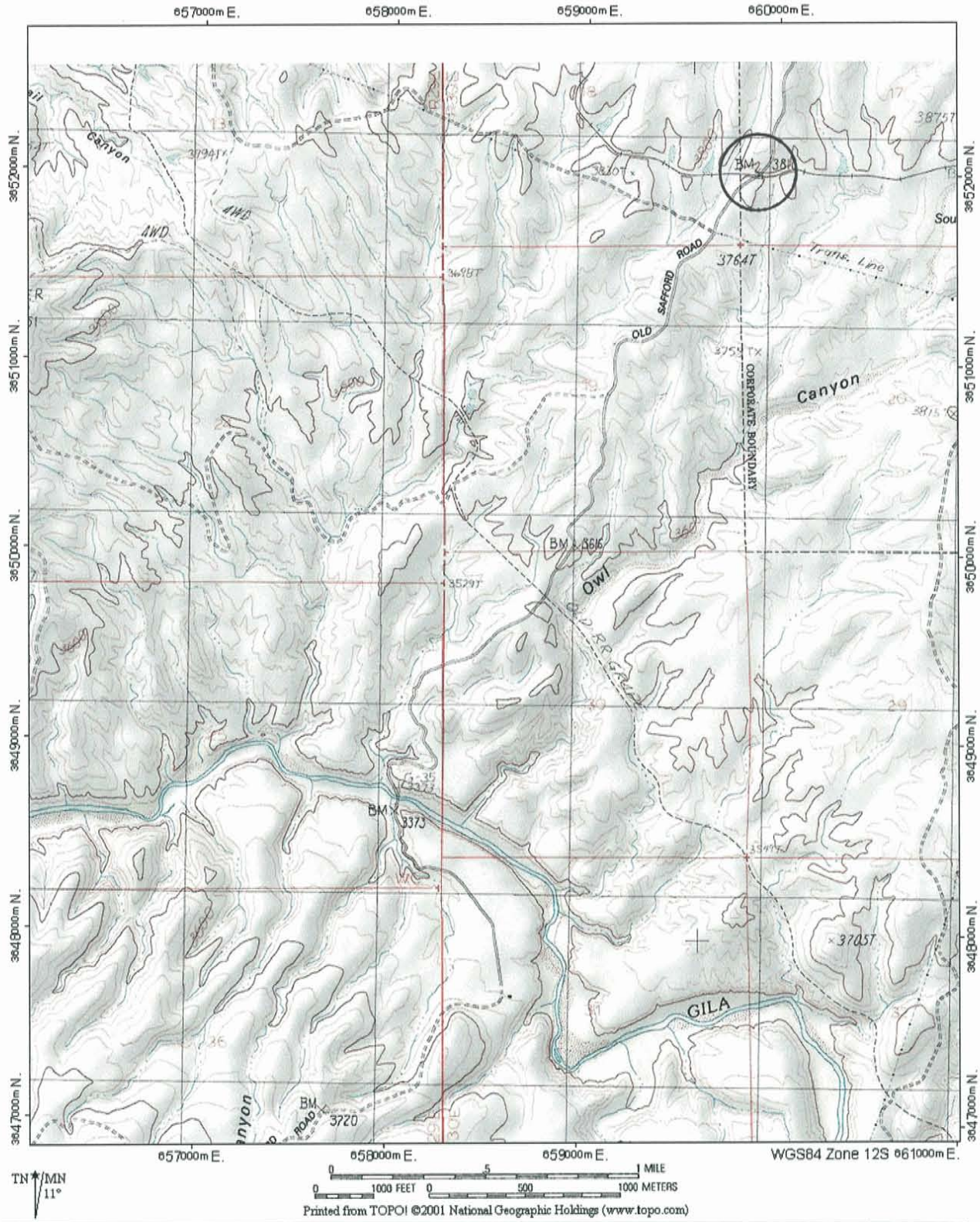
TECHNOLOGICAL SIGNIFICANCE
___ represents the work of a master
___ possesses high artistic values
_x_ represents a type, period or method of construction

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: 1907-1964
THEME(S): Transportation: Highways



Location Map

HISTORIC BRIDGE INVENTORY

Solomonville Road Overpass

PROPERTY IDENTIFICATION

county	Greenlee	inventory number	08151
milepost	0.00	inventory route	Old Safford Road
location	2.71 mi W Jct US 191	feature intersected	abandoned railroad grade
city/vicinity	Clifton	USGS quadrangle	Guthrie
district	84	UTM reference	12.658800.3649767

STRUCTURAL INFORMATION

main span number	1	main span type	111
appr. span number	0	appr. span type	
degree of skew	0	guardrail type	4
main span length	37.0	superstructure	concrete filled spandrel arch
structure length	45.0	substructure	concrete abutments and wingwalls
roadway width	18.5	floor/decking	gravel roadway over earth fill
structure width	22.0	other features	solid concrete parapet walls

HISTORICAL INFORMATION

construction date	1907	designer/engineer	
project number		builder/contractor	
information source	county bridge records	structure owner	Greenlee 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	61	NRHP eligibility	listed
		NRHP criteria	A x B ____ C x
		signif. statement	one of Arizona's two oldest datable vehicular bridges, associated with early toll road

FORM COMPLETED BY

Clayton B. Fraser, Principal

FRASERdesign
420 South County Road 23E
Loveland, Colorado 80537
31 October 2004

PHOTO INFORMATION

date of photo.: February 2003 view direction: southwest northeast photo no.: 02.11.13 02.11.21

CONSTRUCTION HISTORY

"The entire Clifton-Solomonville Highway was constructed by convict labor," State Engineer B.M. Atwood stated in a 1918 report to the state legislature. Atwood's statement was true to a point, but this early state route had been preceded—at least over part of its route—by an even earlier toll road. Although the origin of the Solomonville Road is obscure, a George B. Goruble was granted a five-year extension of the toll road franchise by Graham County in July 1907. That year two small-scale concrete arches were constructed on the road west of Clifton to carry wagon traffic over the Morenci Southern and the Arizona & New Mexico railroads. The arches were simply constructed, with crude formwork, rudimentary design and a complete absence of architectural detailing. They were later incorporated into the state highway and, when that too was rerouted, into the county road. The two Solomonville Road Overpasses (other: **8150**) now carry intermittent traffic in unaltered condition.

SIGNIFICANCE STATEMENT

Though modest in their scale and design, these two concrete structures are historically significant as the earliest dateable roadway grade separations in Arizona. They are predated by only one other bridge in the state—the Alchesay Canyon Bridge [**1532**] in Maricopa County. More importantly, they are historically significant as the only remaining structures in the state traceable to an early toll road and are therefore important remnants of Arizona territorial history.

NATIONAL REGISTER EVALUATION

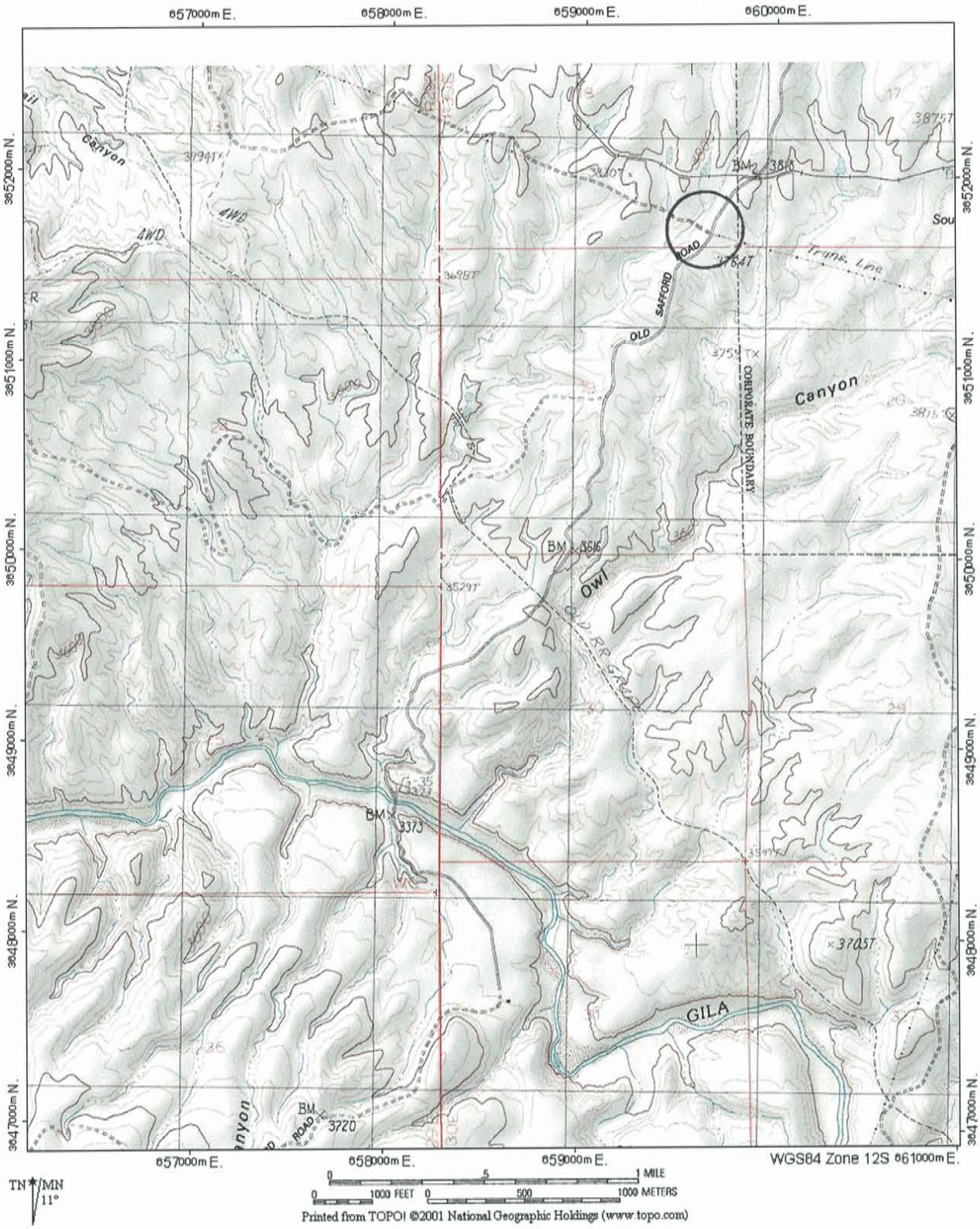
TECHNOLOGICAL SIGNIFICANCE
___ represents the work of a master
___ possesses high artistic values
_x_ represents a type, period or method of construction

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: 1907-1964
THEME(S): Transportation: Highways



Location Map

HISTORIC BRIDGE INVENTORY

Gila River Bridge

PROPERTY IDENTIFICATION

county	Greenlee	inventory number	08152
milepost	0.00	inventory route	Old Safford Road
location	3.97 mi W Jct US 191	feature intersected	Gila River
city/vicinity	Clifton	USGS quadrangle	Guthrie
district	84	UTM reference	12.658053.3648693

STRUCTURAL INFORMATION

main span number	2	main span type	211
appr. span number	0	appr. span type	
degree of skew	0	guardrail type	4
main span length	123.0	superstructure	concrete filled spandrel Luten arch
structure length	288.0	substructure	concrete abutments, wingwalls and pier
roadway width	17.0	floor/decking	gravel roadway over earth fill
structure width	20.8	other features	moulded concrete guardrails with cast concrete balusters and paneled bulkheads

HISTORICAL INFORMATION

construction date	1918	designer/engineer	R.V. Leeson, Daniel B. Luten
project number		builder/contractor	convict work force
information source	ADOT bridge records	structure owner	Greenlee 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	82	NRHP eligibility	listed
		NRHP criteria	A x B ____ C x
		signif. statement	outstanding long-span Luten arch, built by convict labor on regionally important route

FORM COMPLETED BY

Clayton B. Fraser, Principal

FRASERdesign
420 South County Road 23E
Loveland, Colorado 80537
31 October 2004

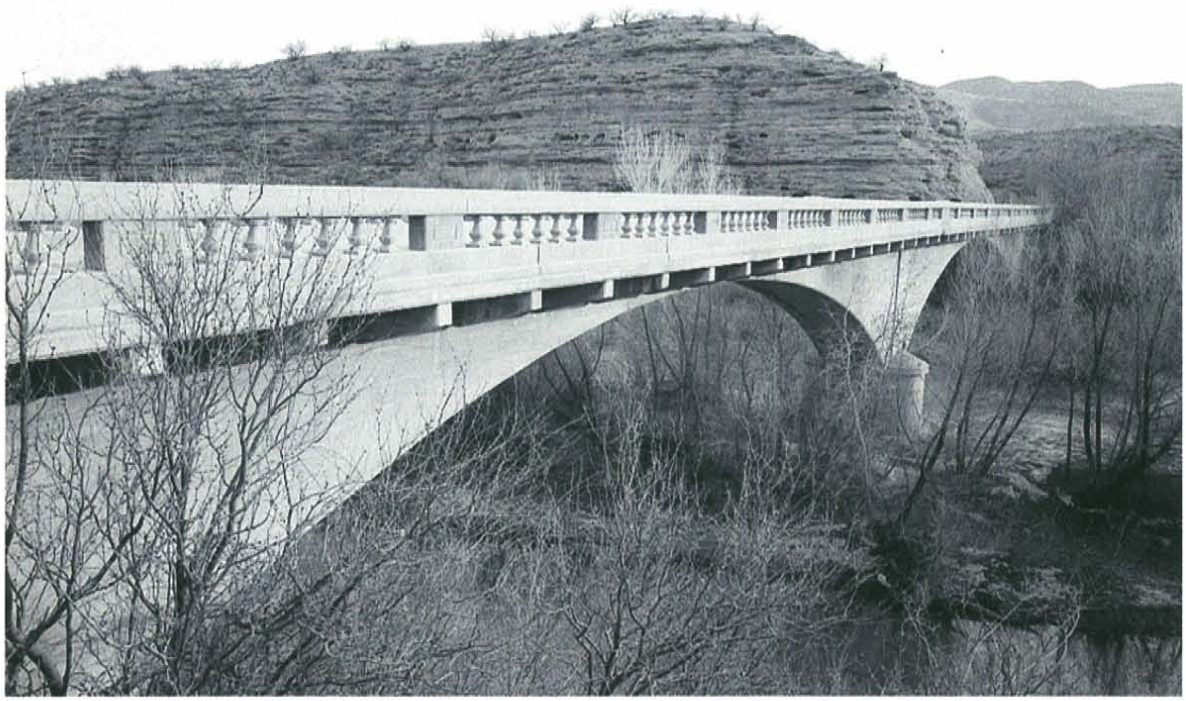


PHOTO INFORMATION

date of photo.: February 2003 view direction: south southeast photo no.: 03.02.22 03.02.24

CONSTRUCTION HISTORY

The Arizona State Engineer designed the Clifton-Solomonville Road in 1917 to follow mountain ridges and thus avoid the need for numerous bridges and drainage structures along its length, but a major crossing of the Gila River in Greenlee County was unavoidable. With the road located on the high route, the preliminary survey showed the highway crossing the river more than 100 feet above the streambed. Accordingly, in March 1917 State Engineer Thomas Maddock designed a 312-foot steel deck arch bridge and budgeted $60,000 for its construction. When the bids came in far over budget, however, the design was scrapped. World War I, with its material rationing, made steel construction impractical, so the state retained R.V. Leeson, the Assistant Chief Engineer for the Topeka Bridge & Iron Company, to design a single 270-foot-long open spandrel arch with concrete girder approaches.

In March 1918, though, the new state engineer, B.M. Atwood, ordered the design changed to two equal-span Luten arches and the highway route dropped closer to the river level. This was the design followed, and that year a convict work force constructed the Gila River bridge for about $200 over the original budgeted amount. The bridge carried vehicular traffic on this regionally important route until the highway was realigned. Today the Gila River Bridge functions in place with its arches in unaltered condition. In 1997 it was rehabilitated with the replacement of the guardrails and grandly rededicated as the Jose M. Subia Memorial Bridge, even though Mr. Subia's connection with the bridge was no greater than the fact that he passed over it occasionally.

SIGNIFICANCE STATEMENT

Had the state engineer built the single-span concrete arch, it would have been one of the longest of its kind in America. The steel arch, if built, would have been the second such structure built in Arizona—a harbinger of the nationally significant Navajo Bridge [**0051**] built a decade later. The Gila River Bridge, as built, was more conservative in its design than either of the two earlier iterations, but it is still a visually striking and historically and technologically important structure. It was the most significant structure on the Clifton-Solomonville Highway, an important early route in eastern Arizona. The bridge is one of a handful of structures remaining in the state that were built using convict labor. Finally, the Gila River Bridge is an outstanding long-span example of the Luten arch design, patented and marketed by Daniel B. Luten. As such it is one of the most significant vehicular bridges in Arizona.

NATIONAL REGISTER EVALUATION

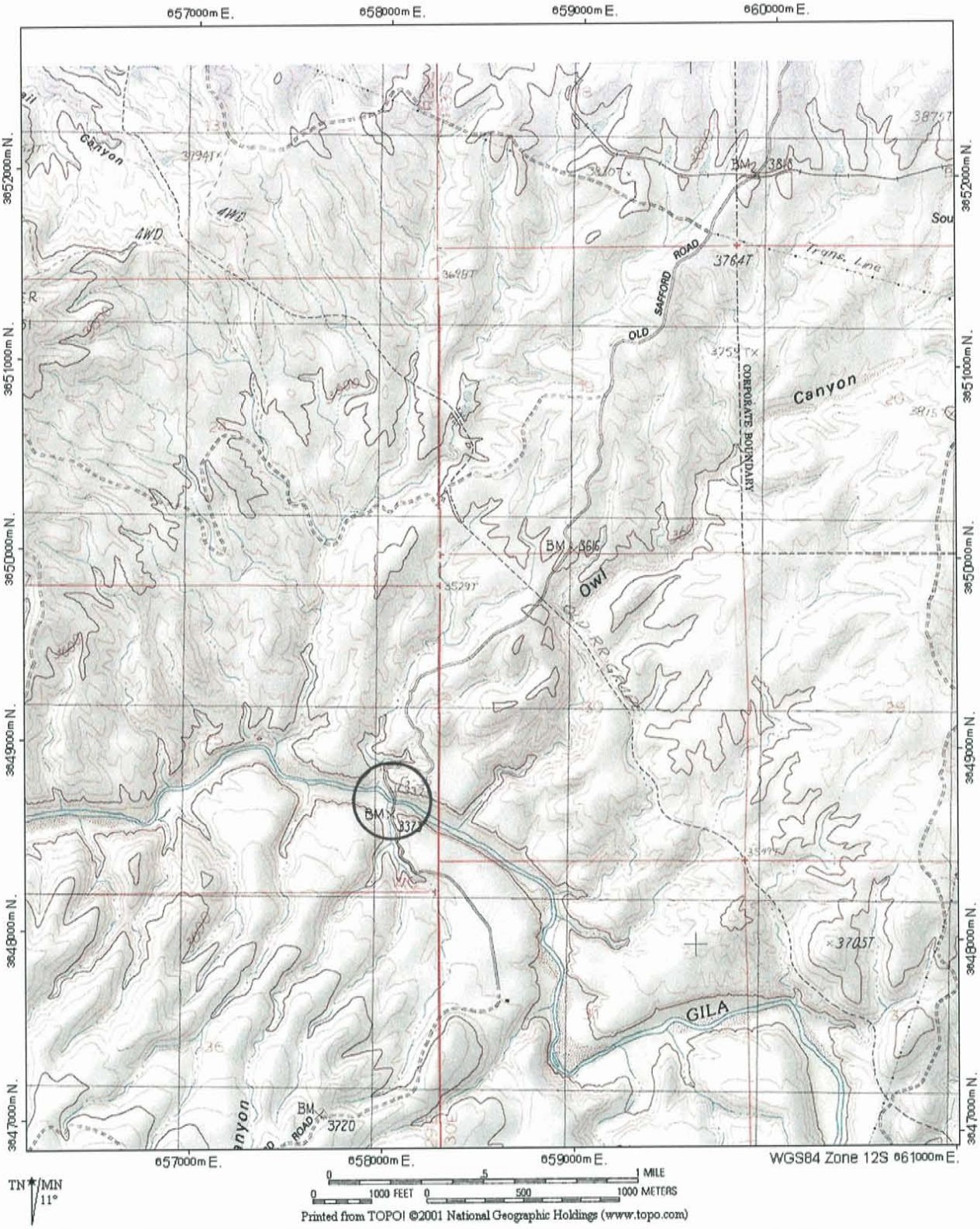
TECHNOLOGICAL SIGNIFICANCE
___ represents the work of a master
___ possesses high artistic values
_x_ represents a type, period or method of construction

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: 1918-1964
THEME(S): Transportation: Highways



Location Map

HISTORIC BRIDGE INVENTORY

Black Gap Bridge

PROPERTY IDENTIFICATION

county	Greenlee	inventory number	08534
milepost	0.00	inventory route	Old Safford Road
location	6.4 mi W Jct US 191	feature intersected	Pumroy Canyon
city/vicinity	Guthrie	USGS quadrangle	Guthrie
district	84	UTM reference	12.657132.3646605

STRUCTURAL INFORMATION

main span number	1	main span type	101
appr. span number	0	appr. span type	
degree of skew	0	guardrail type	4
main span length	22.0	superstructure	concrete rail top slab
structure length	25.0	substructure	stone masonry abutments and wingwalls
roadway width	20.0	floor/decking	concrete deck
structure width	22.4	other features	concrete curbs

HISTORICAL INFORMATION

construction date	1921	designer/engineer	Arizona Highway Department
project number		builder/contractor	convict work force
information source	ADOT bridge records	structure owner	Greenlee 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	73	NRHP eligibility	listed
		NRHP criteria	A x B ____ C x
		signif. statement	rare early structural standard, built by convict labor on regionally important route

FORM COMPLETED BY

Clayton B. Fraser, Principal

FRASERdesign
420 South County Road 23E
Loveland, Colorado 80537
31 October 2004

BLACK GAP BRIDGE

Structure No. 8534

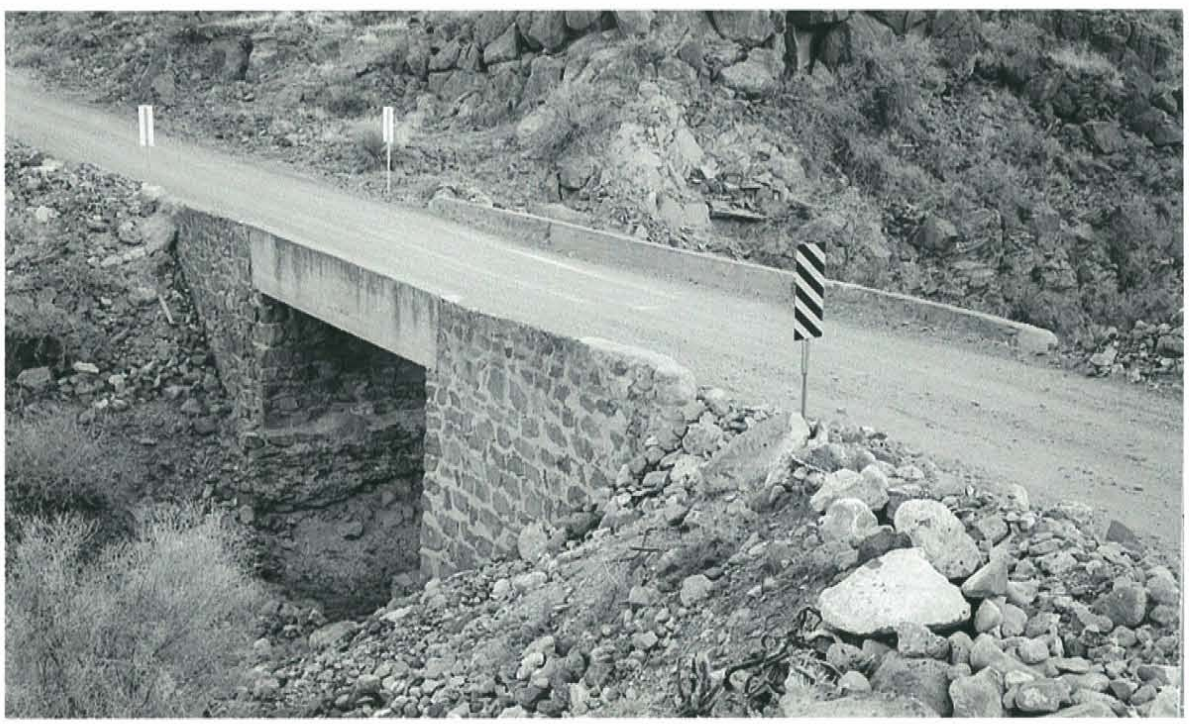


PHOTO INFORMATION

date of photo.: February 2003 view direction: northeast southeast photo no.: 03.02.15 03.02.16

CONSTRUCTION HISTORY

In 1915-1916 the Arizona State Engineer designed and surveyed the Clifton-Solomonville Highway across southern Greenlee and Graham counties. One construction section of the route began at a point three miles west of Clifton and followed a prominent ridge to the Gila River. Beyond the river the road kept to the high ground but crossed more rugged terrain, including this crossing of rocky Black Gap. To cross the gap the state engineer delineated a single-span concrete slab structure with a 22-foot length and 22-foot width. The slab was carried on crudely laid stone masonry abutments. The simplest of structures, it featured no applied ornamentation and even no guardrails. Only low concrete curbs poured integrally with the structural slab helped to keep vehicles from running off the sides. Construction of the road and bridges was accomplished primarily by convict labor. On October 22, 1916, twenty-two convicts from a state prison camp south of Clifton began work without guards, and as the labor force increased to 100, construction continued throughout 1918 and 1919. The Gila River Bridge [**8152**], a two-span Luten arch, was completed in 1918, the roadway in 1920. The convicts built the stone abutments for the Black Gap Bridge at that time, and in August 1920 the state engineer delineated the concrete superstructure. A contractor named Coleman completed the concrete work early the following year as the last link in the highway. The road has since been superseded by US 666 (renumbered US 191) as the main regional artery but still carries local traffic as a county road. The Black Gap Bridge survives intact.

SIGNIFICANCE STATEMENT

Although the territorial and early state engineers of Arizona employed convict labor extensively to construct roadway bridges, only a handful of these early spans still remains. Undoubtedly the most noteworthy convict-built bridges were the multiple-span Tempe Bridge over the Salt River and the Antelope Hill Bridge [**abd.**] and Clifton Bridge over the Gila. The Black Gap Bridge is a more modest representative of this important early construction trend. It is one of just a few rail top slabs identified in the inventory. Using rails spaced at 24 inches on-center as reinforcing, the rail top slab is by nature a short-span structure, used in secondary road situations. The Black Gap Bridge is a typical and unaltered example of this unusual structural subtype. In pristine condition, the structure accrues an additional degree of integrity of setting from the fact that the adjacent roadway is relatively unimproved. The highway was rerouted before it was paved along this stretch, leaving the road and bridge in essentially original condition. The Black Gap Bridge is among a small number of early structures that convey a feeling of what it was like to travel Arizona's state highways in the 1920s and 1930s.

NATIONAL REGISTER EVALUATION

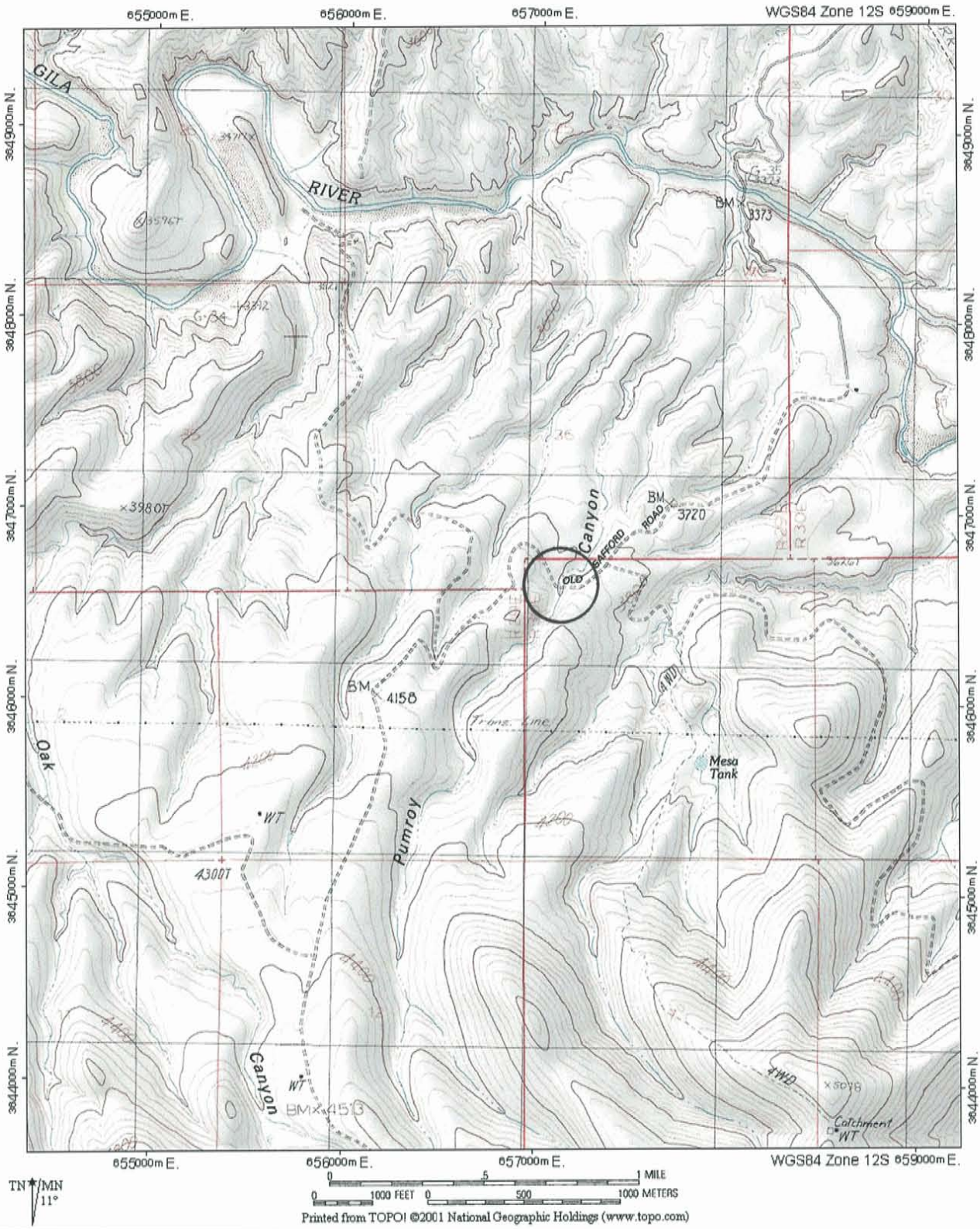
TECHNOLOGICAL SIGNIFICANCE
___ represents the work of a master
___ possesses high artistic values
_x_ represents a type, period or method of construction

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: 1921-1964
THEME(S): Transportation: Highways



Location Map

HISTORIC BRIDGE INVENTORY

Park Avenue Bridge

PROPERTY IDENTIFICATION

county	Greenlee	inventory number	09633
milepost	0.00	inventory route	Park Avenue
location	100' W of US 191	feature intersected	San Francisco River
city/vicinity	Clifton	USGS quadrangle	Clifton
district	84	UTM reference	12.658840.3658795

STRUCTURAL INFORMATION

main span number	1	main span type	310
appr. span number	0	appr. span type	
degree of skew	0	guardrail type	0
main span length	210.0	superstructure	steel pin-connected Parker through truss
structure length	216.0	substructure	concrete abutments and wingwalls
roadway width	18.0	floor/decking	timber deck with asphalt overlay
structure width	31.4	other features	upper chord: 2 channels w/ cover plate and double lacing; lower chord: 2 rectangular eyebars; vertical: 2 channels w/ lacing; diagonal: 2 rectangular eyebars; floor beam: I-beam; steel lattice guardrails; cantilevered sidewalks

HISTORICAL INFORMATION

construction date	1918	designer/engineer	Midland Bridge Company, Kansas City MO
project number		builder/contractor	Midland Bridge Company, Kansas City MO
information source	city bridge records	structure owner	City of Clifton
alteration date(s)	ca1950	alterations	deck replaced

NATIONAL REGISTER EVALUATION

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

inventory score	81	NRHP eligibility	listed
		NRHP criteria	A x B _____ C x
		signif. statement	one of Arizona's most important early vehicular spans

FORM COMPLETED BY

Clayton B. Fraser, Principal

FRASERdesign
420 South County Road 23E
Loveland, Colorado 80537
31 October 2004

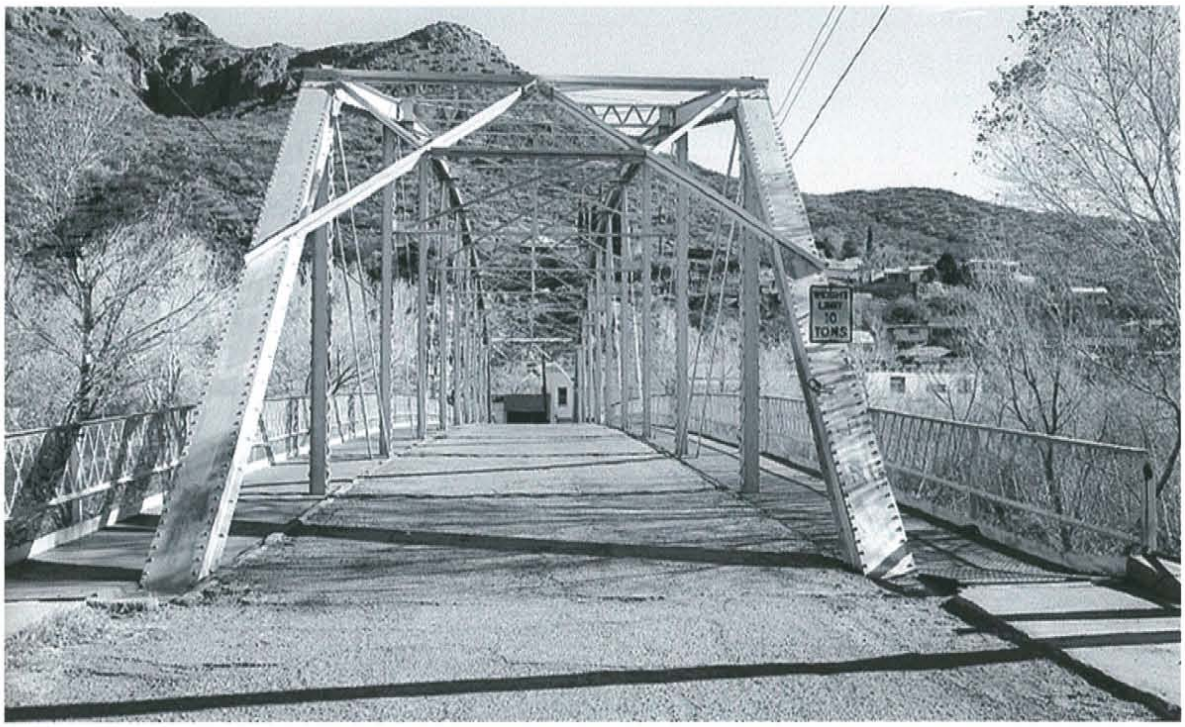


PHOTO INFORMATION

date of photo.: February 2003 view direction: northeast northwest photo no.: 03.02.32 03.02.33

CONSTRUCTION HISTORY

Built around 1903, the first Park Avenue bridge was a 220-foot, riveted Parker truss that spanned the San Francisco River in the Clifton town center. The salvaged railroad truss withstood numerous floods at this location, but the long-span bridge eventually proved too narrow with its 10-foot single-track roadway to carry heavy cross-town traffic. In 1917 the Clifton Town Council moved to replace the railroad span, advertising for competitive proposals for a replacement structure. The town contracted with the Midland Bridge Company of Kansas City, Missouri, for bridge substructure, superstructure and approach grading. Midland Bridge engineered this long-span Parker through truss, which was actually shorter by ten feet than its predecessor. The truss featured pinned connections, with built-up box beams for the upper chords and punched rectangular eyebars for the lower chords. The cambered deck was floored with timbers. Plank-floored pedestrian sidewalks cantilevered outside of the truss webs on both sides. These were bounded on both sides by steel lattice guardrails.

Midland began to work on the abutments in October 1917 and, using steel components milled by the Illinois Steel Company, completed the bridge in February. Total cost: just under $32,000. When it was opened to traffic on February 10, 1918, the Park Avenue Bridge was touted by the *Copper Era* as "a thing of beauty and a joy forever." It has functioned intact since.

SIGNIFICANCE STATEMENT

The Park Avenue Bridge has for decades formed the only link between east and west Clifton. As such, it is a historically important transportation-related resource. Technologically, the bridge is significant as the only pinned Parker through vehicular truss remaining in the state. Pin-connected trusses, though never common in Arizona, were erected at several major highway crossings between 1885 and 1915. The Duncan, Florence, Victorville, Clear Creek and Chevelon Creek bridges all employed pinned through trusses. This structural type has suffered a tremendous attrition since then, and as a result, the trusses in Clifton and Yuma [**8533**] are the only pinned wagon trusses remaining in the state. It is not coincidental that both are long-span, polygonal-chorded examples, built in urban areas in which the replacement cost would be prohibitively high. The Park Avenue Bridge is a curious throwback to prevailing bridge trends, however, in that it replaced a riveted truss of a greater span length. In original condition with its creosoted timber deck intact, the bridge is one of Arizona's most noteworthy early vehicular spans.

NATIONAL REGISTER EVALUATION

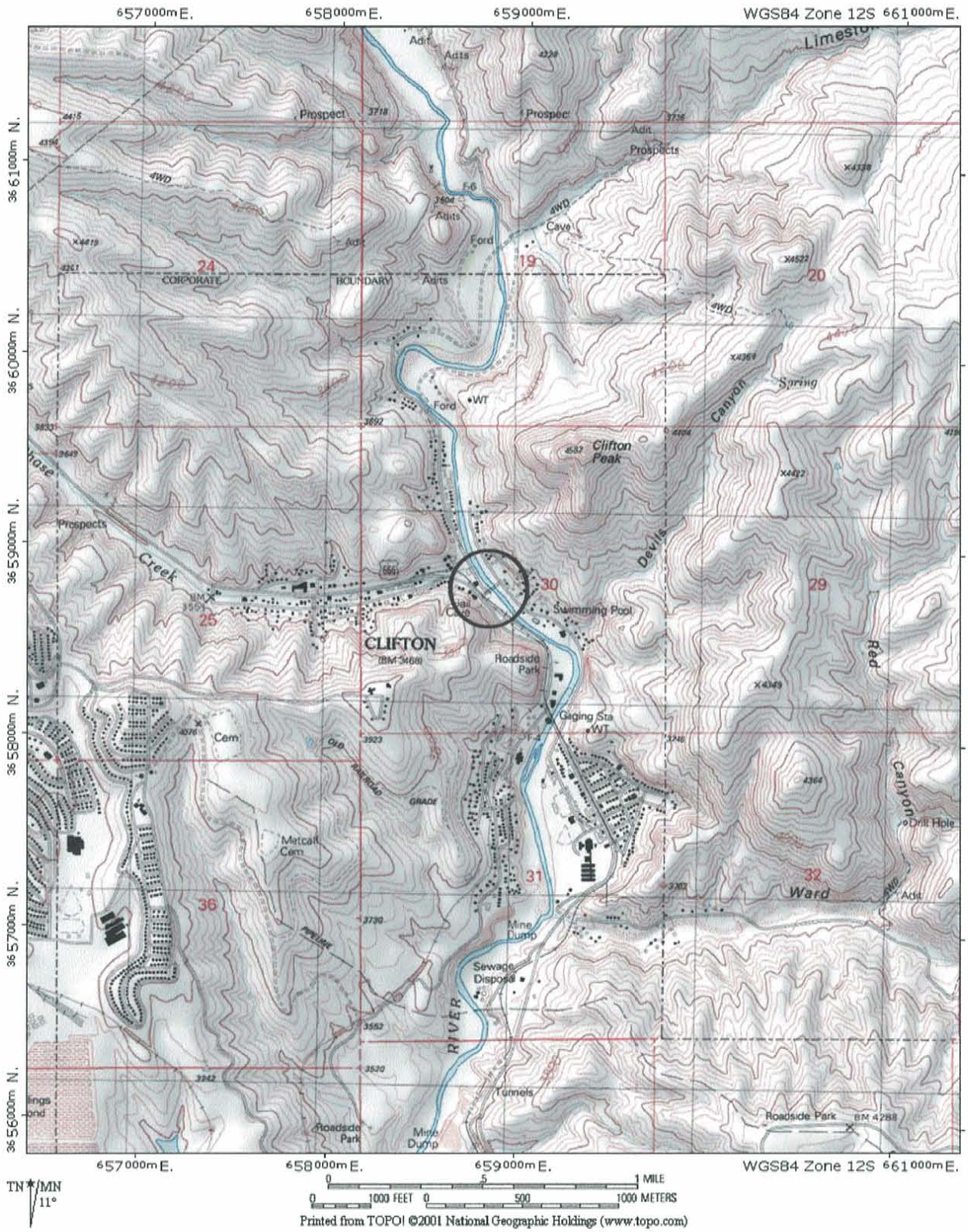
TECHNOLOGICAL SIGNIFICANCE
___ represents the work of a master
___ possesses high artistic values
_x_ represents a type, period or method of construction

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: 1918-1964
THEME(S): Transportation: Highways



Location Map