HISTORIC BRIDGE INVENTORY

Granite Creek Bridge

PROPERTY IDENTIFICATION

county	Yavapai	inventory number	00042
milepost	318.13	inventory route	SR 89 A
location	0.3 mi E Jct SR 89	feature intersected	Granite Creek
city/vicinity	Prescott	structure owner	Arizona Department of Transportation
USGS quad	Prescott	UTM reference	12.370057.3831113

STRUCTURAL INFORMATION

main span number	2	main span type	104
appr. span number	0	appr. span type	
degree of skew	0	guardrail type	6
main span length	43.0	superstructure	concrete three-beam deck girder
structure length	89.0	substructure	concrete abutments, wingwalls and pier
roadway width	20.1	floor/decking	concrete deck
structure width	23.8	other features	steel pipe guardrail

HISTORICAL INFORMATION

construction date	1922	designer/engineer	Arizona Highway Department
project number	FAP 19	builder/contractor	Windsor, Coleman & King
info source:	ADOT bridge records	alteration date(s)	ca1980
		alterations	Jersey barrier guardrail installed one side

NATIONAL REGISTER EVALUATION

For additional information, see "Vehicular Bridges in Arizona 1880-1978" National Register Multiple Property Documentation Form

inventory score	51	NRHP eligibility	eligible
interstate exemption	-	NRHP criteria	A ____ B ____ C x
program comment	-	signif. statement	good example of early state standard bridge type

FORM COMPLETED BY

Clayton B. Fraser, Principal

FRASERdesign
5700 Jackdaw Drive
Loveland, Colorado 80537
1 October 2018

PHOTO INFORMATION

date of photo.: May 2018 view direction: north northwest photo no.: DSCF5098 DSCF5101

CONSTRUCTION HISTORY

In 1920 the Arizona Highway Department undertook an improvement of the highway linking Prescott and Jerome. AHD designated this construction Federal Aid Project 19, to be jointly funded by the state and the U.S. Bureau of Public Roads. Located from Jaeger Canyon to Granite Dells, the route under this project crossed Granite Creek northeast of Prescott. Here State Engineer Merrill Butler designed a concrete bridge with two 42-foot spans supported by concrete abutments and pier. The Granite Creek Bridge featured a 20-foot-wide concrete deck, bounded on the sides by AHD-standard steel pipe guardrails with paneled concrete bulkheads. In 1921 a contract to build the bridge was let to Windsor, Coleman & King of Navajo County. The contractors worked on this bridge and a single-span concrete arch over Lynx Creek [**08256**] through the remainder of the year, completing the Granite Creek structure in 1922 for a total cost of almost $12,000. "The credit for the attractive and pleasing appearance of these two bridges," stated the *Prescott Courier* in October 1922, "is due to Merrill Butler, bridge engineer with the Arizona Highway Department who designed both structures." Since its completion, the Granite Creek Bridge carried traffic on this regionally important state route before being relegated to local traffic and, more recently, closed altogether. The original steel-pipe guardrail on one side has been replaced with a Jersey barrier.

SIGNIFICANCE STATEMENT

The State of Arizona had begun using concrete for bridge superstructures as soon as it was formed. The earliest girder bridges, illustrated by the Antelope Hill Bridge [**abd.**] and the Santa Cruz River Bridge [**08166**], employed two deep girders that were cast integrally with the concrete deck. In 1919 the highway department developed a set of standard plans for concrete bridges that included slabs and girders. AHD engineers at that time dropped the two-girder design in favor of a new girder with three somewhat shallower beams. "The slab spans become uneconomical for spans greater than about 24'," Butler stated in 1920. "For greater spans, the three girder deck is the more economical up to about 50'." AHD's implementation of this configuration proved short-lived. According to Butler's successor W.C. Lefebvre in 1922, "A set of 4-girder reinforced concrete decks, ranging in span from 20 feet to 40 feet, have been worked up and are being used in the place of the old 3-girder standard plan which has become obsolete. These new spans, although designed for heavier loads than the old, are more economical in materials and have been used exclusively in the past two years where such spans were required." AHD engineers designed only ten three-girder bridges before shelving this standard, and fewer were actually constructed. The Granite Creek Bridge and the Cordes Bridge [**08249**] appear to be the only three-girder bridges in the state to have survived intact. As such the Granite Creek Bridge is an important, well-preserved example of early AHD 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
- _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

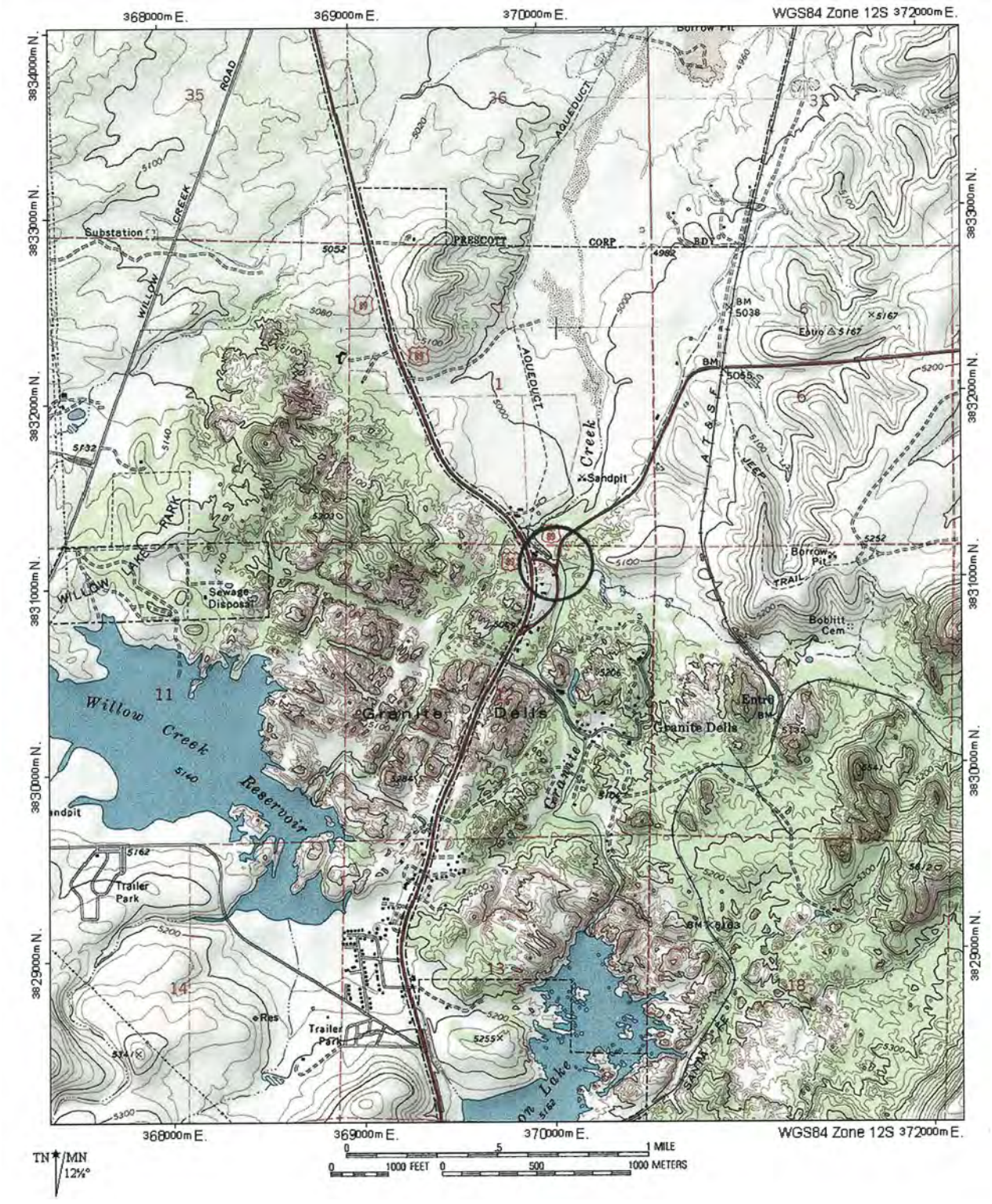
individually eligible _x_ yes ____ no

contributes to district ____ yes _x_ no

AREA OF SIGNIFICANCE: Transportation; Engineering

PERIOD OF SIGNIFICANCE: 1922-1978

THEME(S): Transportation: Highways



LOCATION MAP

HISTORIC BRIDGE INVENTORY

Black Canyon Bridge

PROPERTY IDENTIFICATION

county	Yavapai	inventory number	00758
milepost	209.88	inventory route	SR 260
location	8.8 mi N Jct I 17	feature intersected	Black Canyon
city/vicinity	Bridgeport	structure owner	Arizona Department of Transportation
USGS quad	Cornville	UTM reference	12.410860.3837712

STRUCTURAL INFORMATION

main span number	2	main span type	403
appr. span number	0	appr. span type	
degree of skew	25	guardrail type	8
main span length	90.0	superstructure	welded steel deck girder
structure length	184.0	substructure	concrete abutments, wingwalls and pier
roadway width	30.0	floor/decking	concrete deck
structure width	35.6	other features	variable depth girders; solid concrete guardrails with aluminum tubes and steel Thrie beams

HISTORICAL INFORMATION

construction date	1963	designer/engineer	Arizona Highway Department
project number	S-326(3)	builder/contractor	Copper State Construction Company, Mesa A
info source:	ADOT bridge records	alteration date(s)	1980 1997
		alterations	Thrie beams added to original guardrails; scour protection built

NATIONAL REGISTER EVALUATION

For additional information, see "Vehicular Bridges in Arizona 1880-1978" National Register Multiple Property Documentation Form

inventory score	43	NRHP eligibility	eligible
interstate exemption	-	NRHP criteria	A ____ B ____ C x
program comment	-	signif. statement	well-preserved example of welded steel construction

FORM COMPLETED BY

Clayton B. Fraser, Principal

FRASERdesign
5700 Jackdaw Drive
Loveland, Colorado 80537
1 October 2018

BLACK CANYON BRIDGE

Structure No. 00758

PHOTO INFORMATION

date of photo.: May 2018 view direction: south west photo no.: DSCF5079 DSCF5086

CONSTRUCTION HISTORY

Late in 1960 the Arizona Highway Department began planning for substantial new bridges over Black Canyon and Wilbur Canyon [**00781**], north of Camp Verde. The road between Camp Verde and Cottonwood had been in use for decades, and the existing structures at these crossings had deteriorated to the point of replacement. As delineated by AHD engineers, the replacement structure at Black Canyon would be comprised of two long steel girder spans—each 90 feet in length—supported continuously by reinforced concrete abutments and piers over concrete piles. Each skewed span was made up of four deep deck girders with steel angle lateral braces. The girders were welded steel, with 12-inch-wide flanges and 54-inch-deep webs that increased in depth over the center pier. The girders carried a 27-foot-wide concrete deck, which was bounded on both sides by concrete curbs with tubular aluminum alloy guardrails. As one of the first welded girder bridges built in Arizona, the structure was designed to specifications maintained by AHD, AASHO (American Association of State Highway Officials), ASTM (American Society for Testing Materials) and ASW (American Society of Welding). In 1962 AHD designated the bridge construction as Project S-326(3) and awarded the contract for the work to the Copper State Construction Company of Mesa. A Copper State crew soon thereafter began driving the H-pile substructure for the pier and abutments. The girders were fabricated in the shop, radiographed to check the welds, and moved to the site in eight 90-foot pieces. Once the girders were in place, the workers laid the concrete deck and installed the guardrails. In 1963 the bridge was completed. The Black Canyon Bridge consumed over 150,000 pounds of structural steel and over 450 cubic yards of concrete. Since its completion, it has carried mainline traffic on SR 260. More recently steel Thrie beams have been added onto the original tubular guardrails.

SIGNIFICANCE STATEMENT

In the 1950s and 1960s, as fabrication and welding techniques improved, engineers around the country began experimenting with welded girders in lieu of riveted built-up beams. These typically featured I-shaped girders that increased in web depth over the bearing points. The welding on these earliest structures later proved through ultrasonic testing to be prone to fatigue and stress cracking at the weld lines, however, and the use of this type of girder was discontinued in favor of bolted connections and splices. In Arizona, relatively few welded girder bridges were ever built before the structural configuration fell from favor. The Mountain View Interchange [**01053**] on I 10 in Pima County, the Agua Fria River Bridge [**00382**] on I 17 at Black Canyon City and these two structures in Yavapai County are the only such welded girders identified from the historic period by the statewide inventory. The Black Canyon Bridge is distinguished as a relatively well-preserved example of this technologically important structural type.

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

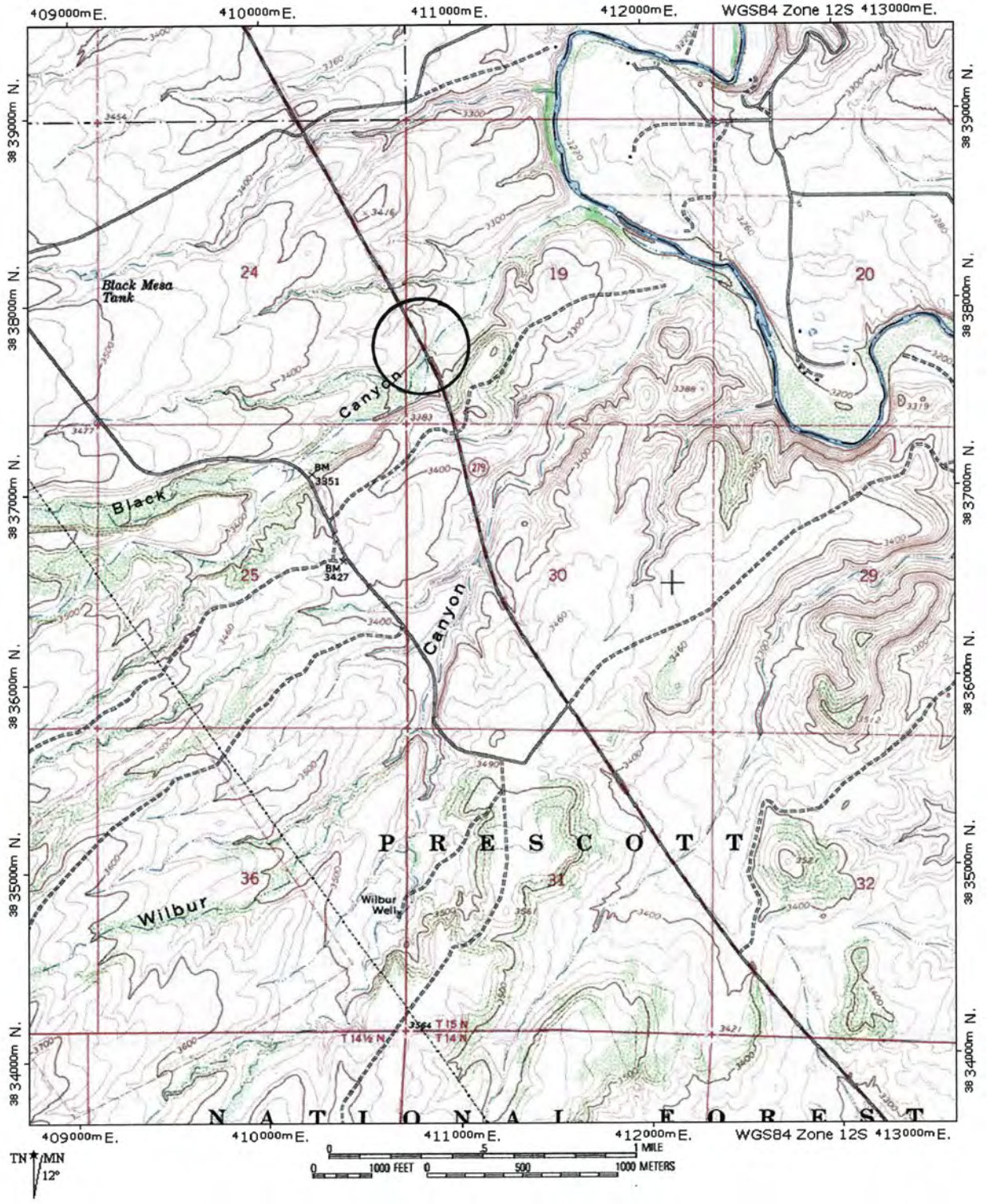
individually eligible _x_ yes ____ no

contributes to district ____ yes _x_ no

AREA OF SIGNIFICANCE: Transportation; Engineering

PERIOD OF SIGNIFICANCE: 1963-1978

THEME(S): Transportation: Highways



LOCATION MAP

HISTORIC BRIDGE INVENTORY

Wilbur Canyon Bridge

PROPERTY IDENTIFICATION

county	Yavapai	inventory number	00781
milepost	210.55	inventory route	SR 260
location	8.1 mi N Jct I 17	feature intersected	Wilbur Canyon
city/vicinity	Bridgeport	structure owner	Arizona Department of Transportation
USGS quad	Cornville	UTM reference	12.411142.3836692

STRUCTURAL INFORMATION

main span number	3	main span type	403
appr. span number	0	appr. span type	
degree of skew	45	guardrail type	8
main span length	103.0	superstructure	welded steel deck girder
structure length	274.0	substructure	concrete abutments, wingwalls and piers
roadway width	30.0	floor/decking	concrete deck
structure width	35.5	other features	variable depth girders; solid concrete guardrails with aluminum tubes and steel Thrie beams

HISTORICAL INFORMATION

construction date	1963	designer/engineer	Arizona Highway Department
project number	S-326(3)	builder/contractor	Copper State Construction Company, Mesa A
info source:	ADOT bridge records	alteration date(s)	1980
		alterations	Thrie beams added to original guardrails

NATIONAL REGISTER EVALUATION

For additional information, see "Vehicular Bridges in Arizona 1880-1978" National Register Multiple Property Documentation Form

inventory score	44	NRHP eligibility	eligible
interstate exemption	-	NRHP criteria	A ____ B ____ C x
program comment	-	signif. statement	well-preserved example of welded steel construction

FORM COMPLETED BY

Clayton B. Fraser, Principal

FRASERdesign
5700 Jackdaw Drive
Loveland, Colorado 80537
1 October 2018

WILBUR CANYON BRIDGE

Structure No. 00781

PHOTO INFORMATION

date of photo.: May 2018 view direction: north east photo no.: DSCF5070 DSCF5075

CONSTRUCTION HISTORY

Late in 1960 the Arizona Highway Department began planning for substantial new bridges over Wilbur Canyon and Black Canyon [**00758**], north of Camp Verde. The road between Camp Verde and Cottonwood had been in use for decades, and the existing structures at these crossings had deteriorated to the point of replacement. As delineated by AHD engineers, the replacement structure at Wilbur Canyon would be comprised of three long steel girder spans—up to 103 feet in length—supported continuously by reinforced concrete abutments and piers over concrete piles. Each skewed span was made up of four deep deck girders with steel angle lateral braces. The girders were welded steel, with 12-inch-wide flanges and 54-inch-deep webs that increased in depth over the center pier. The girders carried a 27-foot-wide concrete deck, which was bounded on both sides by concrete curbs with tubular aluminum alloy guardrails. As one of the first welded girder bridges built in Arizona, the structure was designed to specifications maintained by AHD, AASHO (American Association of State Highway Officials), ASTM (American Society for Testing Materials) and ASW (American Society of Welding). In 1962 AHD designated the bridge construction as project S-326(3) and awarded the contract for the work to the Copper State Construction Company of Mesa. A Copper State crew soon thereafter began driving the H-pile substructure for the pier and abutments. The girders were fabricated in the shop, radiographed to check the welds, and moved to the site in twelve long pieces. Once the girders were in place, the workers laid the concrete deck and installed the guardrails. In 1963 the bridge was completed. Since its completion, it has carried mainline traffic on SR 260. More recently steel Thrie beams have been added onto the original tubular guardrails.

SIGNIFICANCE STATEMENT

In the 1950s and 1960s, as fabrication and welding techniques improved, engineers around the country began experimenting with welded girders in lieu of riveted built-up beams. These typically featured I-shaped girders that increased in web depth over the bearing points. The welding on these earliest structures later proved through ultrasonic testing to be prone to fatigue and stress cracking at the weld lines, however, and the use of this type of girder was discontinued in favor of bolted connections and splices. In Arizona, relatively few welded girder bridges were ever built before the structural configuration fell from favor. The Mountain View Interchange [**01053**] on I 10 in Pima County, the Agua Fria River Bridge [**00382**] on I 17 at Black Canyon City and these two structures in Yavapai County are the only such welded girders identified from the historic period by the statewide inventory. The Wilbur Canyon Bridge is distinguished as a relatively well-preserved example of this technologically important structural type.

NATIONAL REGISTER EVALUATION

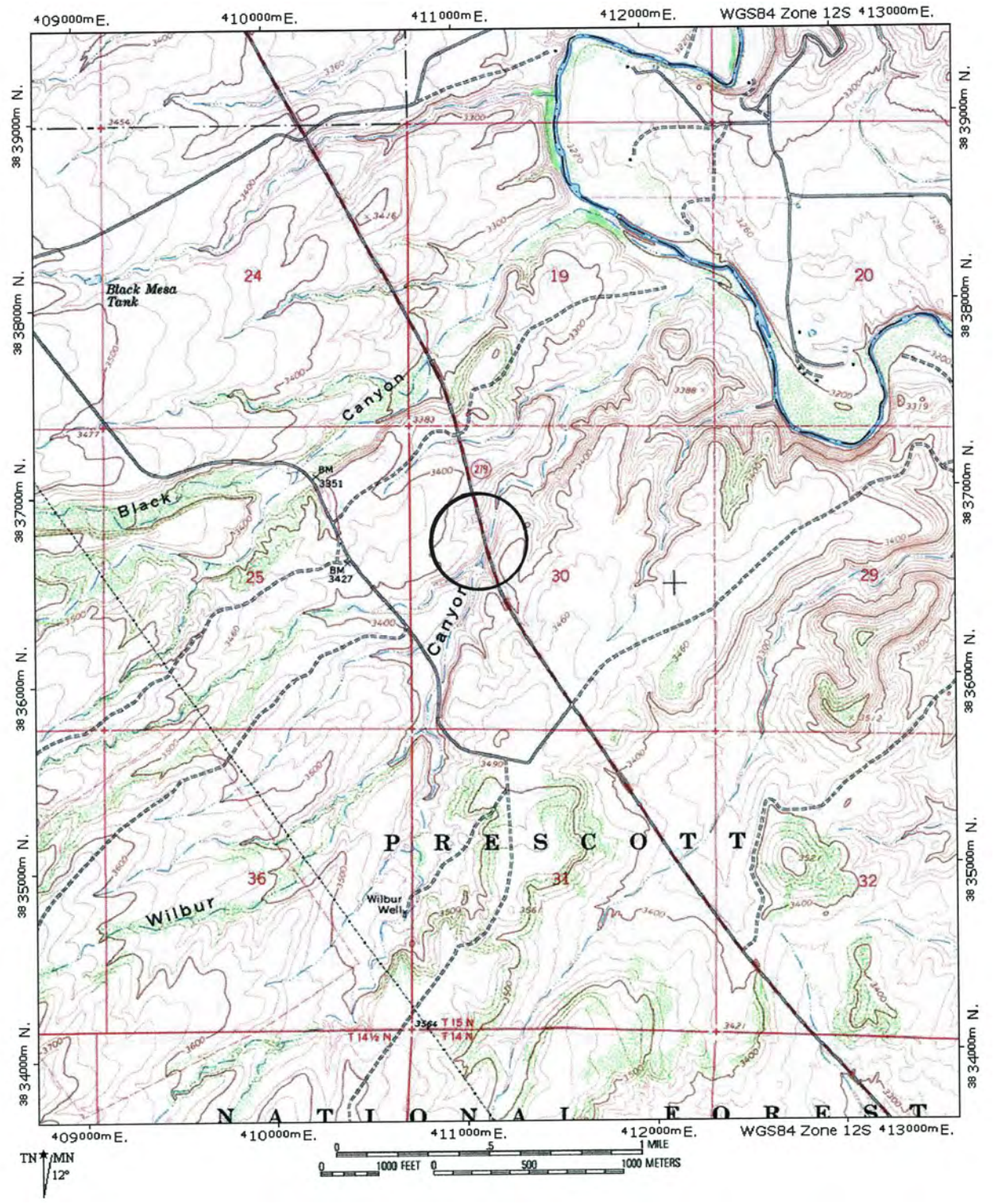
TECHNOLOGICAL SIGNIFICANCE
____ represents the work of a master
____ possesses high artistic values
__x__ represents a type, period or method of construction

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: 1963-1978
THEME(S): Transportation: Highways



LOCATION MAP

HISTORIC BRIDGE INVENTORY

Little Hell Canyon Bridge

PROPERTY IDENTIFICATION

county	Yavapai	inventory number	03381
milepost	0.00	inventory route	abd. US 89
location	0.1 mi West US 89	feature intersected	Little Hell Canyon
city/vicinity	Drake	structure owner	USFS - Prescott National Forest
USGS quad	Meath Spring	UTM reference	12.371760.3882820

STRUCTURAL INFORMATION

main span number	2	main span type	309
appr. span number	0	appr. span type	
degree of skew	0	guardrail type	0
main span length	80.0	superstructure	steel rigid-connected Warren deck truss
structure length	174.0	substructure	concrete abutments, wingwalls and pier
roadway width	18.0	floor/decking	concrete deck over steel stringers
structure width	20.0	other features	upper chord: 2 channels w/ cover plate and lacing; lower chord: 2 angles w/ batten plates; vertical: 4 angles w/ contin. plate; 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	FAP 62	builder/contractor	Monarch Engineering Company, Denver CO
info source:	ADOT bridge records	alteration date(s)	
		alterations	

NATIONAL REGISTER EVALUATION

For additional information, see "Vehicular Bridges in Arizona 1880-1978" National Register Multiple Property Documentation Form

inventory score	82	NRHP eligibility	listed
interstate exemption	-	NRHP criteria	A x B _____ C x
program comment	-	signif. statement	well-preserved example of uncommon structural type, located on regionally important route

FORM COMPLETED BY

Clayton B. Fraser, Principal

FRASERdesign
5700 Jackdaw Drive
Loveland, Colorado 80537
1 October 2018

LITTLE HELL CANYON BRIDGE

Structure No. 03381

PHOTO INFORMATION

date of photo.: May 2018 view direction: south southwest photo no.: DSCF5137 DSCF5140

CONSTRUCTION HISTORY

In the late 1910s Yavapai County surveyed a route between Prescott and Ash Fork as a county road. After completing the route's design, however, the county board of supervisors decided instead to turn the project over to the state and seek federal funding under the Federal Aid Highways Act. The Arizona Highway Department then resurveyed the route to meet federal specifications, divided the construction into four intermediate sections (Federal Aid Projects 36, 36-B, 61 and 62), and over the next three years undertook construction of the extensive 50-mile highway. One of the final phases of the project involved construction of a bridge over Little Hell Canyon, a ruggedly walled watercourse north of Drake. For this crossing, the AHD bridge department engineered a medium-span deck truss supported by reinforced concrete abutments and pier with angled cutwaters. As delineated by AHD, the Little Hell Canyon Bridge was to consist of two 80-foot Warren deck trusses with riveted connections. The trusses featured built-up box beams for the upper chords and paired angles for the lower. They carried a concrete deck over steel stringers; this deck was bounded on the sides by steel lattice guardrails.

Early in 1923 the highway department awarded the construction contract under Federal Aid Project 62 to the Monarch Engineering Company for the Little Hell Canyon Bridge. The Denver-based contractor began excavation for the abutments on March 17 and completed grading the bridge's approaches on November 5. Total cost for the bridge: $25,851. The Little Hell Canyon Bridge carried mainline traffic until its replacement with an new parallel structure in 1951. The 1923 structure now functions as a US Forest Service road beside U.S. Highway 89, in essentially unaltered condition.

SIGNIFICANCE STATEMENT

U.S. Highway 89 was the latter-day iteration of the original north-south territorial route between Prescott and Phoenix. Built as part of a major construction program on the road, the Little Hell Canyon Bridge is historically significant for its integral association with this regionally important highway through central Arizona. Technologically, the bridge is noteworthy as an uncommon vehicular truss type. Nine deck trusses—five of which are Warrens—have been identified in the statewide inventory. All were erected between 1923 and 1934, all spanned between 77 and 116 feet, and all were designed and built either by the Arizona Highway Department or the US Bureau of Public Roads, using industry-standard detailing. The Little Hell Canyon Bridge is distinguished among these as one of the two earliest examples (other: the Allentown Bridge [**03073**] in Apache County). Standing essentially unaltered, the Little Hell Canyon Bridge is an important early Arizona vehicular span.

NATIONAL REGISTER EVALUATION

TECHNOLOGICAL SIGNIFICANCE	HISTORICAL SIGNIFICANCE	NATIONAL REGISTER CRITERIA
____ represents the work of a master	____ associated with significant persons	_x_ Criterion A
____ possesses high artistic values	_x_ associated with significant events or patterns	____ Criterion B
_x_ represents a type, period or method of construction	____ contributes to historical district	_x_ Criterion C

NATIONAL REGISTER ELIGIBILITY

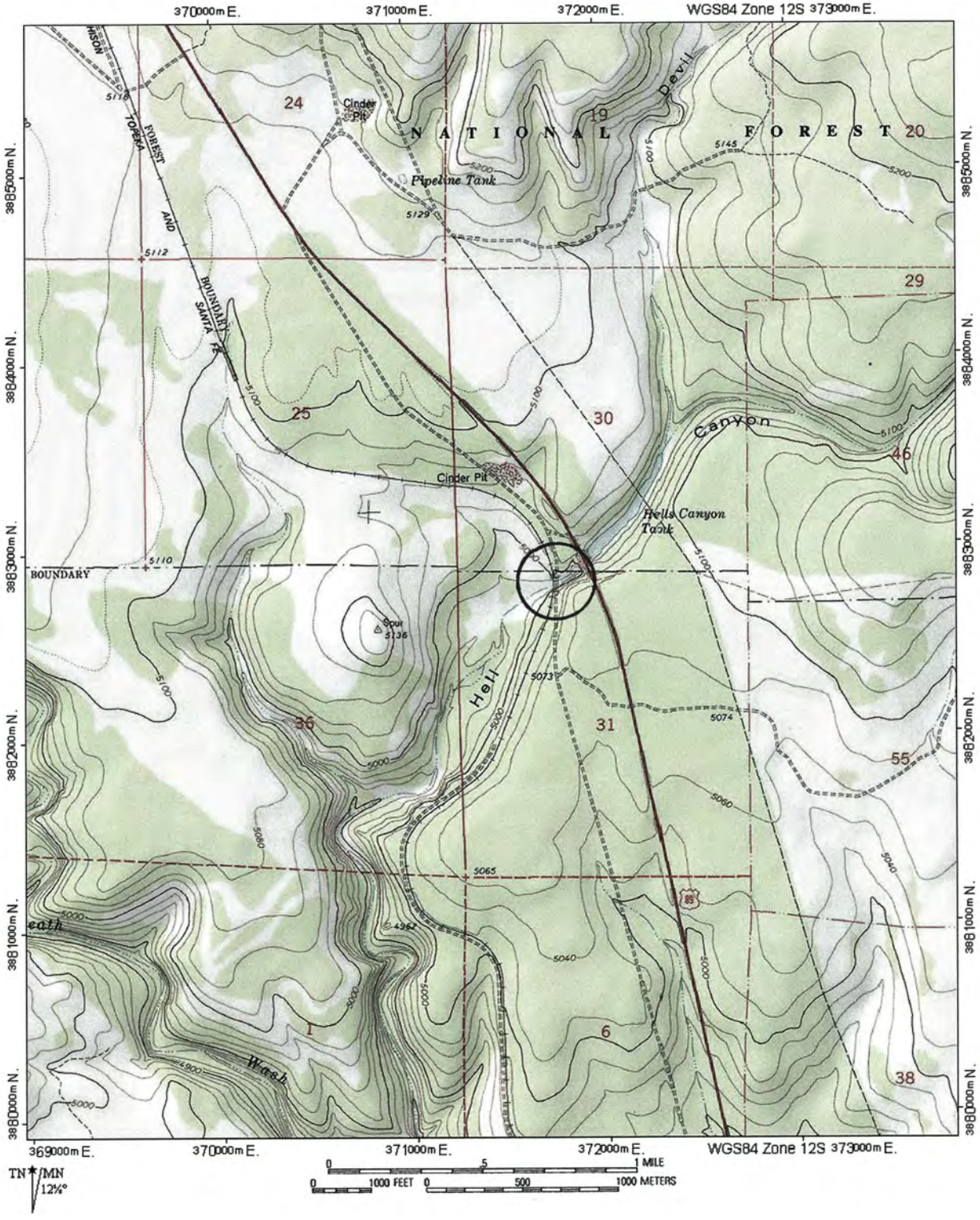
individually eligible _x_ yes ____ no

contributes to district ____ yes _x_ no

AREA OF SIGNIFICANCE: Transportation; Engineering

PERIOD OF SIGNIFICANCE: 1923-1978

THEME(S): Transportation: Highways



LOCATION MAP

HISTORIC BRIDGE INVENTORY

Bumble Bee Bridge

PROPERTY IDENTIFICATION

county	Yavapai	inventory number	08221
milepost	0.00	inventory route	Crown King Road
location	4.0 mi NW Jct I 17	feature intersected	Bumble Bee Creek
city/vicinity	Bumble Bee	structure owner	Yavapai County
USGS quad	Bumble Bee	UTM reference	12.392880.3784035

STRUCTURAL INFORMATION

main span number	2	main span type	302
appr. span number	0	appr. span type	
degree of skew	0	guardrail type	4
main span length	36.0	superstructure	steel I-beam stringer
structure length	75.0	substructure	stone masonry abutments and wingwalls with concrete pier
roadway width	18.9	floor/decking	concrete deck
structure width	21.4	other features	stone masonry parapets

HISTORICAL INFORMATION

construction date	1936	designer/engineer	Arizona Highway Department
project number		builder/contractor	Works Progress Administration
info source:	ADOT bridge records	alteration date(s)	
		alterations	

NATIONAL REGISTER EVALUATION

For additional information, see "Vehicular Bridges in Arizona 1880-1978" National Register Multiple Property Documentation Form

inventory score	55	NRHP eligibility	eligible
interstate exemption	-	NRHP criteria	A x B _____ C _____
program comment	-	signif. statement	well-preserved example of Depression-era bridge design and construction

FORM COMPLETED BY

Clayton B. Fraser, Principal

FRASERdesign
5700 Jackdaw Drive
Loveland, Colorado 80537
1 October 2018

BUMBLE BEE BRIDGE

Structure No. 08221

PHOTO INFORMATION

date of photo.: December 2017 view direction: south west photo no.: DSCF4940 DSCF4946

CONSTRUCTION HISTORY

The Crown King Road was the principle route across the Bradshaw Mountains from Prescott into the Crown King mining district. One community along its length was Bumble Bee, founded in 1863 and named after the bees encountered by the founding prospector. The fortune of Bumble Bee and the Crown King Road waned with the nearby mines, and the Bradshaw Mountain Railroad eventually closed in 1926, but an automobile route was later maintained by Yavapai County along the abandoned railroad grade. In 1935 a Works Progress Administration project was approved to improve the road. Funded for $69,000, the project included construction of a substantial vehicular bridge over Bumble Bee Creek southwest of the town.

In February 1936 *Arizona Highways* reported that a WPA crew had begun work on the bridge, along with smoothing and widening of the road's shoulders. The structure was comprised of two steel I-beam stringer spans, which extended 36 feet. These were supported by stone masonry abutments and wingwalls on concrete footings, with a central concrete pier with battered walls. Typical of WPA work in the 1930s, stone was used extensively on the bridge's construction. In addition to the battered fieldstone abutments, the 19-foot-wide concrete deck was flanked on both sides by fieldstone walls with stone bulkheads at the ends and midspan. The Bumble Bee Bridge was completed in 1936 and has since carried intermittent traffic, largely tourist, in unaltered condition.

SIGNIFICANCE STATEMENT

During the 1930s the Great Depression devastated the nation's economy, leaving millions of Americans 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.—through agencies such the WPA. "Improved traffic arteries from farm to market, mine to market and city streets are in the making as WPA gains impetus on a program under which 50 projects, proposing the expenditure of close to $2 million are at present in operation." stated *Arizona Highways* in February 1936. One of the agency's featured projects of the period in Arizona, the Bumblebee Bridge is noteworthy as a well-preserved and architecturally distinguished example of WPA-sponsored construction.

NATIONAL REGISTER EVALUATION

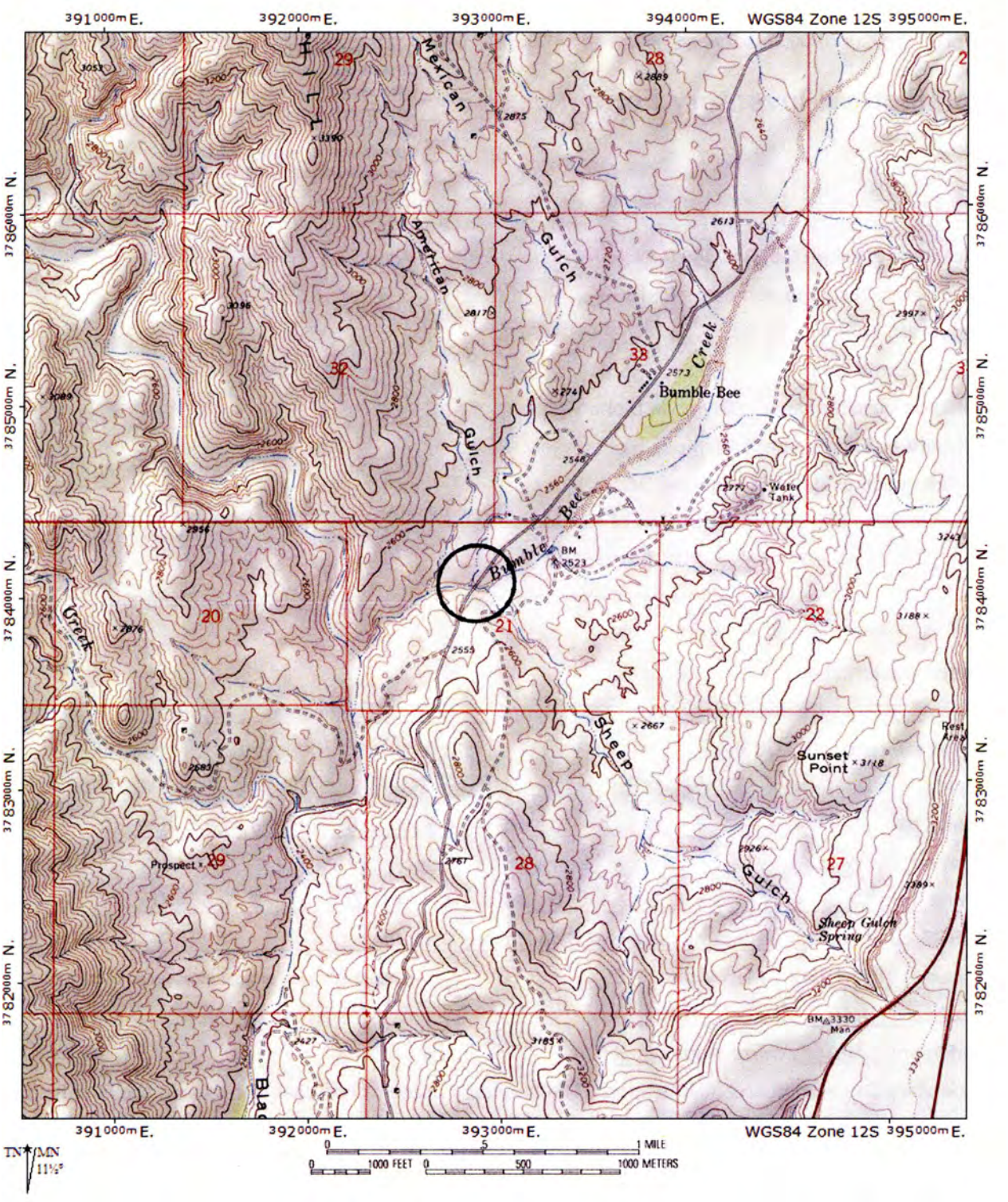
TECHNOLOGICAL SIGNIFICANCE
____ represents the work of a master
____ possesses high artistic values
__x__ represents a type, period or method of construction

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: 1936-1978
THEME(S): Transportation: Highways



LOCATION MAP

HISTORIC BRIDGE INVENTORY

Walnut Grove Bridge

PROPERTY IDENTIFICATION

county	Yavapai	inventory number	08227
milepost	0.00	inventory route	Wagoner Road
location	9.8 mi SE Jct SR 89	feature intersected	Hassayampa River
city/vicinity	Walnut Grove	structure owner	Yavapai County
USGS quad	Walnut Grove	UTM reference	12.355667.3797657

STRUCTURAL INFORMATION

main span number	1	main span type	310
appr. span number	1	appr. span type	310
degree of skew	0	guardrail type	6
main span length	150.0	superstructure	steel rigid-connected Camelback through truss
structure length	196.0	substructure	concrete abutments, wingwalls and pier
roadway width	15.5	floor/decking	timber deck with asphalt overlay
structure width	16.5	other features	upper chord: 2 channels w/ cover plate and lacing; lower chord: 2 channels w/ batten plates; vertical: 2 channels w/ lacing; diagonal: 2 angles w/ batten plates; lateral bracing: 1 angle; floor beam: I-beam; steel lattice guardrails

HISTORICAL INFORMATION

construction date	1924	designer/engineer	El Paso Bridge & Iron Company, El Paso TX
project number		builder/contractor	El Paso Bridge & Iron Company, El Paso TX
info source:	ADOT bridge records	alteration date(s)	ca1970
		alterations	bridge extensively rehabilitated

NATIONAL REGISTER EVALUATION

For additional information, see "Vehicular Bridges in Arizona 1880-1978" National Register Multiple Property Documentation Form

inventory score	66	NRHP eligibility	listed
interstate exemption	-	NRHP criteria	A ____ B ____ C x
program comment	-	signif. statement	well-preserved early example of county-level truss bridge construction

FORM COMPLETED BY

Clayton B. Fraser, Principal

FRASERdesign
5700 Jackdaw Drive
Loveland, Colorado 80537
1 October 2018

PHOTO INFORMATION

date of photo.: May 2018 view direction: west northeast photo no.: DSCF5173 DSCF5182

CONSTRUCTION HISTORY

In 1922 the Yavapai County Board of Supervisors received an urgent citizens' petition for a permanent wagon bridge over the Hassayampa River near the small town of Walnut Grove. Almost two years later, in April 1924, the supervisors eventually agreed to build a steel truss bridge here. They ordered the county clerk to advertise in the bridge industry for competitive bids. Following typical procedure, the county engineer specified only the general dimensions and location of the bridge and requested that bridge companies submit truss designs with their proposals. Four firms responded: the Monarch Engineering Company of Denver, the L.C. Lashmet Construction Company, the Pacific Coast Engineering Company and the El Paso Bridge & Iron Company of Texas. With a proposed erected cost of $7,880, El Paso B&I was the low bidder and received the contract in May.

The contractors began excavating for the substructure soon thereafter, and, using steel components milled by the Carnegie Steel Company, erected this medium-span truss that fall. The bridge built by El Paso B&I was a two-span structure, with a Camelback through truss over the river's main channel and a short Pratt pony truss approach span. Both spans employed rigid connections, the typical built-up steel members and a timber deck on steel stringers. The trusses were supported by concrete abutments and a single solid pier with angled cutwaters. Yavapai County accepted the completed bridge in December. Since that time, the Walnut Grove Bridge has functioned in place at this remote crossing of the Hassayampa River. In 2008 the structure underwent a substantial rehabilitation, involving superstructural painting, minor repairs and replacement of the wooden deck.

SIGNIFICANCE STATEMENT

In the 1920s the Arizona Highway Department was expanding its administrative role on the state road system, but construction of bridges over secondary crossings still fell largely under the purview of the individual counties. The Walnut Grove Bridge is a representative example of a county-built truss—designed, fabricated and erected by a regionally active bridge company under contract with the county engineer. The structure is distinguished technologically as the earlier of two Camelback vehicular trusses found in Arizona (other: the Gillespie Dam Bridge [**08021**] in Maricopa County). It is also the only wagon bridge in the state that combines through and pony truss spans. In essentially unaltered condition at this remote Yavapai County crossing, the Walnut Grove Bridge is a significant remnant of early Arizona bridge construction.

NATIONAL REGISTER EVALUATION

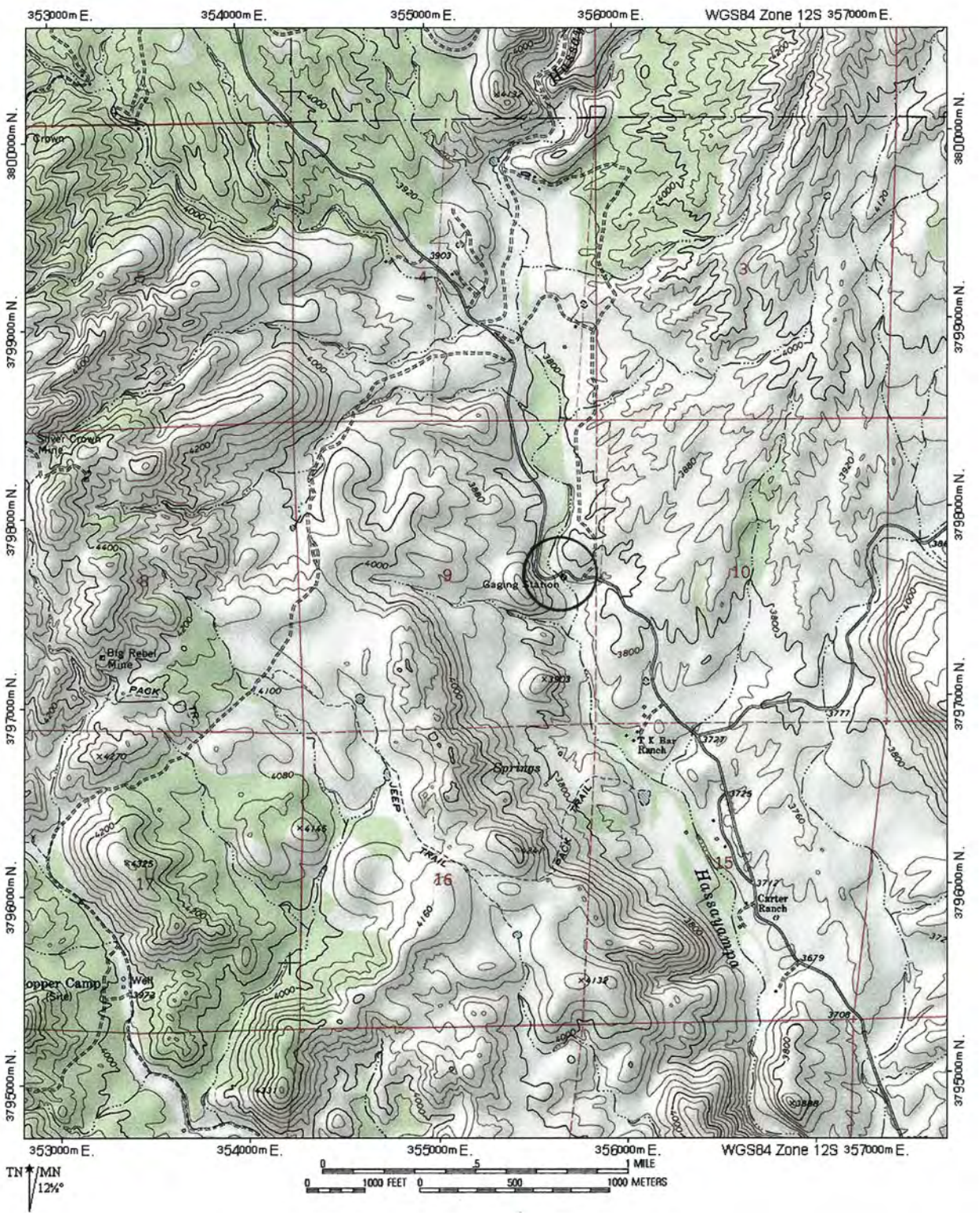
TECHNOLOGICAL SIGNIFICANCE
____ represents the work of a master
____ possesses high artistic values
__x__ represents a type, period or method of construction

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: 1924-1978
THEME(S): Transportation: Highways



LOCATION MAP

HISTORIC BRIDGE INVENTORY

Wash Bridge

PROPERTY IDENTIFICATION

county	Yavapai	inventory number	08235
milepost	0.00	inventory route	Old US 89
location	2.06 mi S Jct SR 89	feature intersected	wash
city/vicinity	Paulden	structure owner	Yavapai County
USGS quad	Chino Valley North	UTM reference	12.366650.3857570

STRUCTURAL INFORMATION

main span number	5	main span type	302
appr. span number	0	appr. span type	
degree of skew	45	guardrail type	4
main span length	40.0	superstructure	steel I-beam stringer
structure length	202.0	substructure	concrete abutments, wingwalls and piers
roadway width	24.2	floor/decking	concrete deck
structure width	27.2	other features	concrete guardrails with slotted cutouts

HISTORICAL INFORMATION

construction date	1933 ca	designer/engineer	Arizona Highway Department
project number	FAP 62-A	builder/contractor	N.G. Hill & Company, Phoenix AZ
info source:	ADOT bridge records	alteration date(s)	
		alterations	

NATIONAL REGISTER EVALUATION

For additional information, see "Vehicular Bridges in Arizona 1880-1978" National Register Multiple Property Documentation Form

inventory score	43	NRHP eligibility	eligible
interstate exemption	-	NRHP criteria	A x B ____ C x
program comment	-	signif. statement	well-preserved, multiple-span example of standard structural type, located on important highway

FORM COMPLETED BY

Clayton B. Fraser, Principal

FRASERdesign
5700 Jackdaw Drive
Loveland, Colorado 80537
1 October 2018

WASH BRIDGE

Structure No. 08235

PHOTO INFORMATION

date of photo.: May 2018 view direction: north west photo no.: DSCF5140 DSCF5142

CONSTRUCTION HISTORY

In the late 1910s the Arizona Highway Department surveyed a route between Prescott and Ash Fork through northern Yavapai County. AHD divided the work into four sections—Federal Aid Projects 36, 36-B, 61 and 62—and over the next three years undertook work on the extensive 50-mile route. In the 1920s the highway was incorporated into U.S. Highway 89. In the early 1930s the highway department determined that traffic on the route necessitated that it be improved. In May 1932 a contract was awarded to N.G. Hill and Company of Phoenix for $260,600. Designated as Federal Aid Projects 62-A and 62-B, the work entailed grading, draining, surfacing and oil processing of some 19½ miles of roadway, beginning 4½ miles south of Ash Fork. Toward the southern end of the project, the contractor was responsible for the construction of a substantial bridge over an unnamed wash. For this structure AHD engineers delineated a five-span steel I-beam stringer bridge, with concrete piers and abutments. The concrete deck was to be bounded on both sides by concrete guardrails with slotted "doghouse" walls and curvilinear bulkheads.

Hill's contract stipulated that the project be completed by 31 January 1933, and at that point his crew had finished some 83 percent of the work. Hill completed the work later that spring. This routing of U.S. 89 carried relatively heavy traffic until the route was realigned over a new bridge in 1967. At that time the 1933 structure was transferred to Yavapai County and now carries local traffic in unaltered condition.

SIGNIFICANCE STATEMENT

US 89 was the latter-day iteration of the original north-south territorial route between Prescott and Phoenix. Built as part of a major construction program on the road, the Wash Bridge is historically significant for its integral association with this regionally important highway through central Arizona. The bridge is technologically important as a representative example of AHD standard bridge construction. The Arizona Highway Department did not begin erecting steel stringer bridges with any regularity until the 1930s. During the Depression AHD built numerous steel stringer bridges, usually short-span iterations with concrete substructures. After World War II AHD built steel stringers in abundance with spans of up to 160 feet. With its 1932-1933 construction date and five 40-foot I-beam spans, the Wash Bridge in Yavapai County is distinguished as one of the first and largest such early structures built in the state.

NATIONAL REGISTER EVALUATION

TECHNOLOGICAL SIGNIFICANCE	HISTORICAL SIGNIFICANCE	NATIONAL REGISTER CRITERIA
____ represents the work of a master	____ associated with significant persons	_x_ Criterion A
____ possesses high artistic values	_x_ associated with significant events or patterns	____ Criterion B
_x_ represents a type, period or method of construction	____ contributes to historical district	_x_ Criterion C

NATIONAL REGISTER ELIGIBILITY

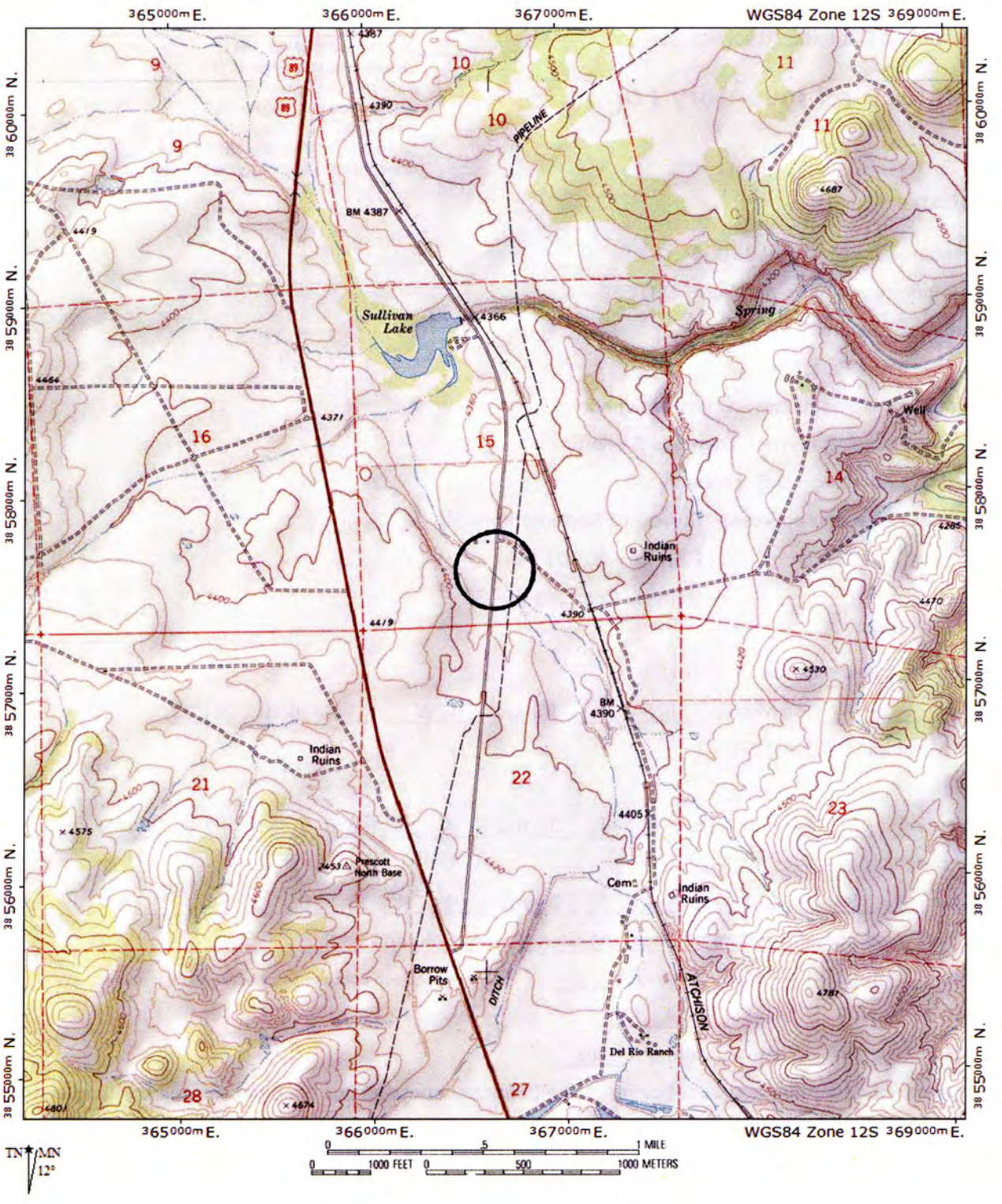
individually eligible _x_ yes ____ no

contributes to district ____ yes _x_ no

AREA OF SIGNIFICANCE: Transportation; Engineering

PERIOD OF SIGNIFICANCE: 1933-1964

THEME(S): Transportation: Highways



LOCATION MAP

HISTORIC BRIDGE INVENTORY

Verde River Bridge

PROPERTY IDENTIFICATION

county	Yavapai	inventory number	08236
milepost	0.00	inventory route	Old US 89
location	1.25 mi S Jct SR 89	feature intersected	Verde River
city/vicinity	Paulden	structure owner	Yavapai County
USGS quad	Chino Valley North	UTM reference	12.366530.3858923

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	100.0	superstructure	concrete filled spandrel arch
structure length	127.0	substructure	concrete abutments and wingwalls
roadway width	20.1	floor/decking	asphalt roadway over earth fill
structure width	23.1	other features	moulded concrete guardrails with corbelled concrete bulkheads and square concrete balusters; concrete corbels at arch ring

HISTORICAL INFORMATION

construction date	1923	designer/engineer	Arizona Highway Department
project number	FAP 61	builder/contractor	L.C. Lashmet Company, Prescott AZ
info source:	ADOT bridge records	alteration date(s)	
		alterations	

NATIONAL REGISTER EVALUATION

For additional information, see "Vehicular Bridges in Arizona 1880-1978" National Register Multiple Property Documentation Form

inventory score	64	NRHP eligibility	listed
interstate exemption	-	NRHP criteria	A x B _____ C x
program comment	-	signif. statement	well-preserved, relatively early standard structural type, located on important highway

FORM COMPLETED BY

Clayton B. Fraser, Principal

FRASERdesign
5700 Jackdaw Drive
Loveland, Colorado 80537
1 October 2018

VERDE RIVER BRIDGE

Structure No. 08236

PHOTO INFORMATION

date of photo.: May 2018 view direction: south west photo no.: DSCF5146 DSCF5150

CONSTRUCTION HISTORY

In the late 1910s Yavapai County surveyed a route between Prescott and Ash Fork as a county road. After completing its design, however, the county board of supervisors instead decided to turn the project over to the state and seek federal funding. The Arizona Highway Department then resurveyed the route to meet federal specifications as a state highway. AHD divided the work into four sections—Federal Aid Projects 36, 36-B, 61 and 62—and over the next three years undertook construction on the extensive 50-mile route. One phase of the project involved construction of a substantial bridge over the Verde River at a rugged, steep-walled canyon south of Paulden. For this structure, the AHD bridge department engineered a long-span concrete arch using its standard, non-Luten design. The structure featured a single 100-foot elliptical arch, with concrete spread footings, earth roadway and moulded concrete guardrails with corbeled bulkheads and square concrete balusters.

In September 1922 the highway department awarded a construction contract for the Verde River bridge to L.C. Lashmet. The Prescott contractor began excavating for the substructure on October 16 and worked through the winter, completing the approach grading on March 2, 1923. Total cost of the bridge: $18,380. The Verde River Bridge carried traffic as part of U.S. Highway 89 until the route was realigned over a new bridge in 1967. At that time the 1923 structure was transferred to Yavapai County and now carries local traffic in unaltered condition.

SIGNIFICANCE STATEMENT

U.S. Highway 89 was the latter-day iteration of the original north-south territorial route between Prescott and Phoenix. Built as part of a major construction program on the road, the Verde River Bridge is historically significant for its integral association with this regionally important highway through central Arizona. Additionally, the bridge is technologically important as an early example of a statewide bridge trend. The Arizona Highway Department used three basic arch configurations in the 1910s and 1920s—the Luten arch, the open spandrel arch, and what it termed the "common arch", or segmental filled spandrel design. Long-span examples of the former were engineered by their inventor Daniel Luten and his assistants. The latter two structural types were designed in-house by AHD engineers for medium- and long-span applications. The Verde River Bridge is noteworthy as the longest of the four such arches identified in the inventory (others: Devils Canyon Bridge [**abd.**], Lynx Creek Bridge [**08256**] and Fossil Creek Bridge [**03215**]). All featured similar Luten-type steel reinforcing, span lengths and concrete detailing.

NATIONAL REGISTER EVALUATION

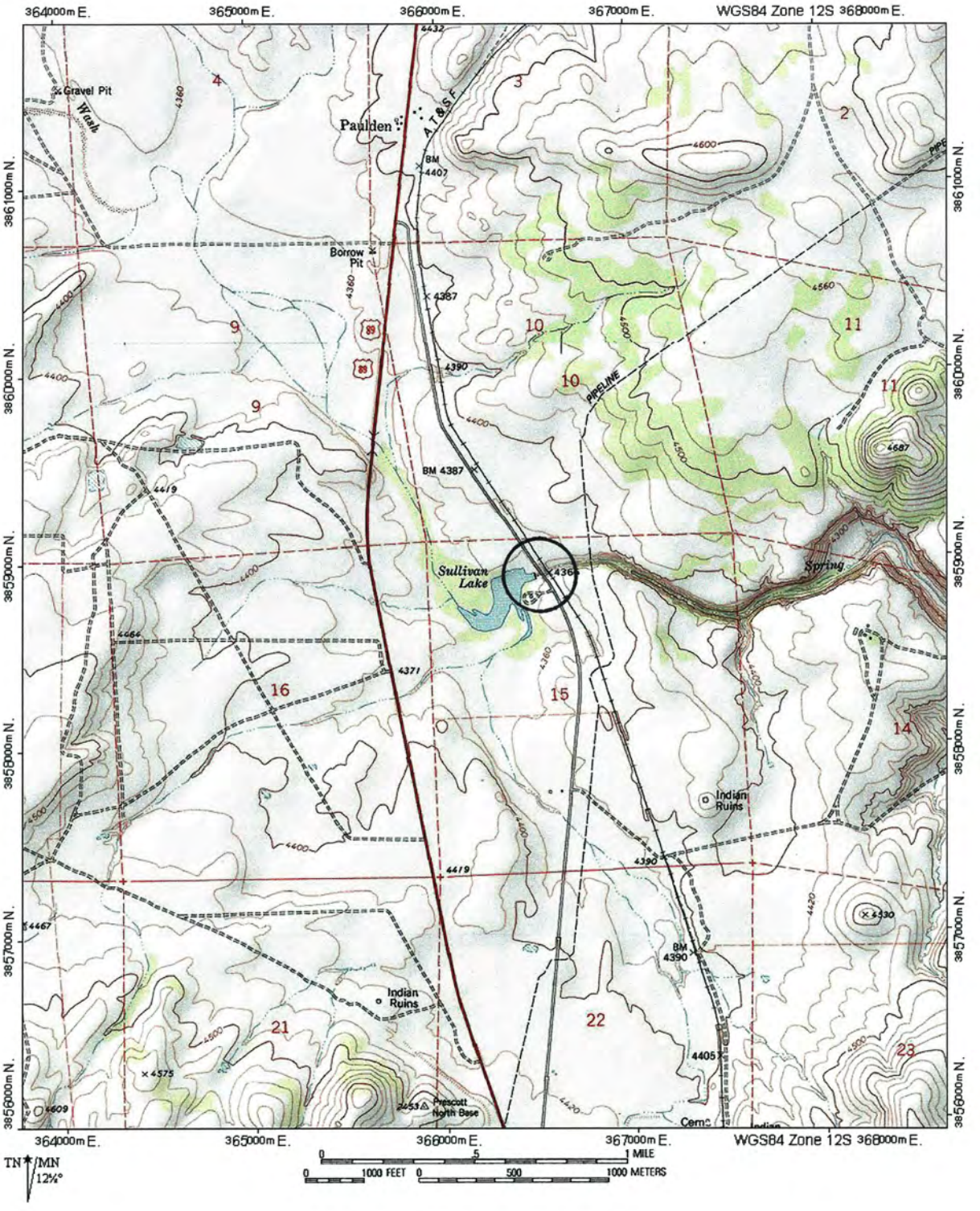
TECHNOLOGICAL SIGNIFICANCE
- ____ represents the work of a master
- ____ possesses high artistic values
- _x_ represents a type, period or method of construction

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: 1923-1978
THEME(S): Transportation: Highways



LOCATION MAP

HISTORIC BRIDGE INVENTORY

Cordes Bridge

PROPERTY IDENTIFICATION

county	Yavapai	inventory number	08249
milepost	0.00	inventory route	Antelope Creek Road
location	3.0 mi West of I 17	feature intersected	Antelope Creek
city/vicinity	Cordes	structure owner	Yavapai County
USGS quad	Cleator	UTM reference	12.392657.3796360

STRUCTURAL INFORMATION

main span number	1	main span type	104
appr. span number	0	appr. span type	
degree of skew	0	guardrail type	6
main span length	40.0	superstructure	concrete three-beam deck girder
structure length	42.0	substructure	concrete abutments and wingwalls
roadway width	20.1	floor/decking	concrete deck
structure width	22.6	other features	steel pipe guardrails

HISTORICAL INFORMATION

construction date	1922	designer/engineer	Arizona Highway Department
project number		builder/contractor	
info source:	ADOT bridge records	alteration date(s)	
		alterations	midspan pier added under superstructure

NATIONAL REGISTER EVALUATION

For additional information, see "Vehicular Bridges in Arizona 1880-1978" National Register Multiple Property Documentation Form

inventory score	51	NRHP eligibility	eligible
interstate exemption	-	NRHP criteria	A ____ B ____ C x
program comment	-	signif. statement	well-preserved example of early AHD bridge design

FORM COMPLETED BY

Clayton B. Fraser, Principal

FRASERdesign
5700 Jackdaw Drive
Loveland, Colorado 80537
1 October 2018

CORDES BRIDGE

Structure No. 08249

PHOTO INFORMATION

date of photo.: March 2018 view direction: southwest east photo no.: DSCF6796 DSCF6799

CONSTRUCTION HISTORY

This small-scale concrete bridge carries a gravel-surfaced county road over Antelope Creek in the small Yavapai County community of Cordes. Now called the Antelope Creek Road, this route used to be State Highway 69, the secondary route between Phoenix and Prescott. The bridge's single-span superstructure is configured with three concrete girders, which are poured integrally with the concrete deck. The girders are simply supported by concrete abutments; the 22-foot-wide deck is bounded on both sides by steel pipe guardrails. The Cordes Bridge was designed by Arizona Highway Department bridge engineer Merrill Butler and erected in 1921-1922. Its plank formwork is crude, the design simple and unarticulated—indicative of its early construction by an unskilled work crew. Since its completion, the Cordes Bridge has carried vehicular traffic, though S.H. 69 has been realigned to the east. Several utility cables have been attached to one of its spandrels, and a supplementary concrete pier has been placed mid-span beneath the original girders to halve its span length. Other than these, the bridge remains unaltered.

SIGNIFICANCE STATEMENT

The State of Arizona had begun using concrete for bridge superstructures as soon as it was formed in 1912. The earliest girder bridges, illustrated by the Antelope Hill Bridge [**abd.**] and the Santa Cruz River Bridge [**08166**], employed two deep girders per span, which were cast integrally with the concrete deck. In July 1919 the highway department developed a set of standard plans for concrete bridges that included slabs and girders. AHD engineers at that time dropped the two-girder design in favor of a new structure with three somewhat shallower beams. "The slab spans become uneconomical for spans greater than about 24'," State Bridge Engineer Merrill Butler stated in 1920. "For greater spans, the three girder deck is the more economical up to about 50'."

AHD's implementation of this configuration proved short-lived. According to Butler's successor W.C. Lefebvre in 1922, "A set of 4-girder reinforced concrete decks, ranging in span from 20 feet to 40 feet, have been worked up and are being used in the place of the old 3-girder standard plan which has become obsolete." He stated, "These new spans, although designed for heavier loads than the old, are more economical in materials and have been used exclusively in the past two years where such spans were required." AHD engineers designed only ten three-girder bridges before shelving this standard; fewer were actually constructed. The Cordes Bridge and the Granite Creek Bridge [**00042**], both in Yavapai County, appear to be the only three-girder bridges in the state to have survived. As such the Cordes Bridge is an important, well-preserved example of early AHD design development.

NATIONAL REGISTER EVALUATION

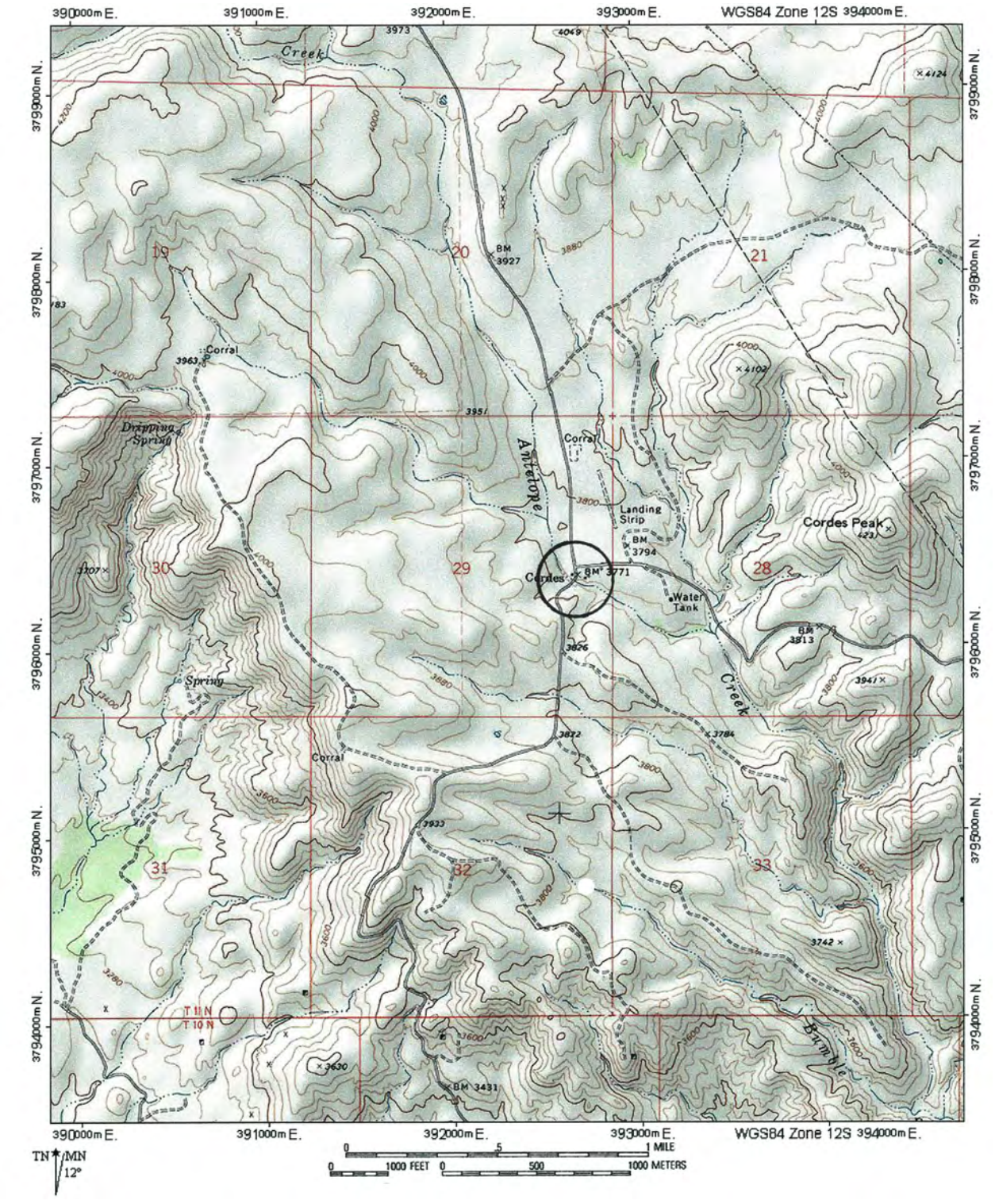
TECHNOLOGICAL SIGNIFICANCE
- ____ represents the work of a master
- ____ possesses high artistic values
- _x_ represents a type, period or method of construction

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: 1922-1978
THEME(S): Transportation: Highways



LOCATION MAP

HISTORIC BRIDGE INVENTORY

Lynx Creek Bridge

PROPERTY IDENTIFICATION

county	Yavapai	inventory number	08256
milepost	0.00	inventory route	Old Black Canyon Highway
location	0.9 mi NE Jct SR 69	feature intersected	Lynx Creek
city/vicinity	Prescott	structure owner	Yavapai County
USGS quad	Prescott Valley South	UTM reference	12.373987.3824243

STRUCTURAL INFORMATION

main span number	1	main span type	111
appr. span number	0	appr. span type	
degree of skew	0	guardrail type	6
main span length	90.0	superstructure	concrete filled spandrel arch
structure length	120.0	substructure	concrete abutments and wingwalls
roadway width	16.2	floor/decking	asphalt roadway over earth fill
structure width	18.7	other features	steel pipe guardrails with paneled concrete bulkheads

HISTORICAL INFORMATION

construction date	1922	designer/engineer	Arizona Highway Department
project number		builder/contractor	Windsor, Coleman & King
info source:	ADOT bridge records	alteration date(s)	2000
		alterations	replacement bridge built

NATIONAL REGISTER EVALUATION

For additional information, see "Vehicular Bridges in Arizona 1880-1978" National Register Multiple Property Documentation Form

inventory score	57	NRHP eligibility	listed
interstate exemption	-	NRHP criteria	A ____ B ____ C x
program comment	-	signif. statement	well-preserved early example of AHD bridge design

FORM COMPLETED BY

Clayton B. Fraser, Principal

FRASERdesign
5700 Jackdaw Drive
Loveland, Colorado 80537
1 October 2018

PHOTO INFORMATION

date of photo.: May 2018 view direction: northeast west photo no.: DSCF5161 DSCF5165

CONSTRUCTION HISTORY

The early stage and freighting road that connected Fort Whipple at Prescott with other military installations in Arizona followed the Black Canyon, a steep-sided chasm in the center of Yavapai County. In the early 1920s a county faction was agitating for a state highway designation for the Black Canyon Highway. To improve the chances, the county board of supervisors in 1921 decided to replace the existing ford on Lynx Creek, 1½ miles east of Prescott, with a substantial bridge. For the first highway crossing of the creek, Arizona Highway Department bridge engineer Merrill Butler designed this filled spandrel concrete arch. The Lynx Creek Bridge extended 90 feet between the abutments and had a 16-foot-wide roadway. This roadway was flanked on both sides by AHD-standard guardrails, featuring steel pipe guardrails with paneled concrete bulkheads and posts. Yavapai County contracted for approximately $15,000 with Navajo County builders Windsor, Coleman & King, the same firm that had an AHD contract to build the Granite Creek Bridge [**00042**]. With "considerable architectural beauty," according to the *Prescott Courier*, the Lynx Creek Bridge was opened to traffic with great ceremony in October 1922. The Black Canyon Highway was never made a state route. The Lynx Creek Bridge carried vehicular traffic on this secondary route until a parallel structure was built immediately adjacent to the original arch in 2000. The 1922 bridge is now open for pedestrian use.

SIGNIFICANCE STATEMENT

As an alternative to hiring bridge companies or independent engineers, the bridge section of the Arizona Highway Department in the 1920s offered to design non-federal aid county bridges in the state. AHD thus functioned as consulting engineer for these county projects. The counties, however, seldom used this service. The Lynx Creek Bridge is distinguished as the only known major structure the standing that was built under this arrangement. Additionally, the bridge is representative of another early trend. AHD used three basic concrete arch configurations in the 1910s and 1920s—the Luten arch, the open spandrel arch, and what it termed the "common arch", or segmental filled spandrel design. Long-span examples of the former, as illustrated by the Canyon Padre Bridge, the Verde River Bridge [**08152**] and the Holbrook Bridge, were engineered by their inventor Daniel Luten or his assistants. The latter two arch types were designed in-house by AHD bridge engineers for medium- and long-span applications. The Lynx Creek Bridge is one of only four such AHD common arches identified in the inventory (others: Devils Canyon Bridge, Fossil Creek Bridge [**03215**], and the Verde River Bridge [**08236**]. All feature similar span lengths, arch rises and detailing. The Lynx Creek Bridge is a well-preserved example of this 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
- ____ associated with significant events or patterns
- ____ contributes to historical district

NATIONAL REGISTER CRITERIA
- ____ Criterion A
- ____ Criterion B
- _x_ Criterion C

NATIONAL REGISTER ELIGIBILITY

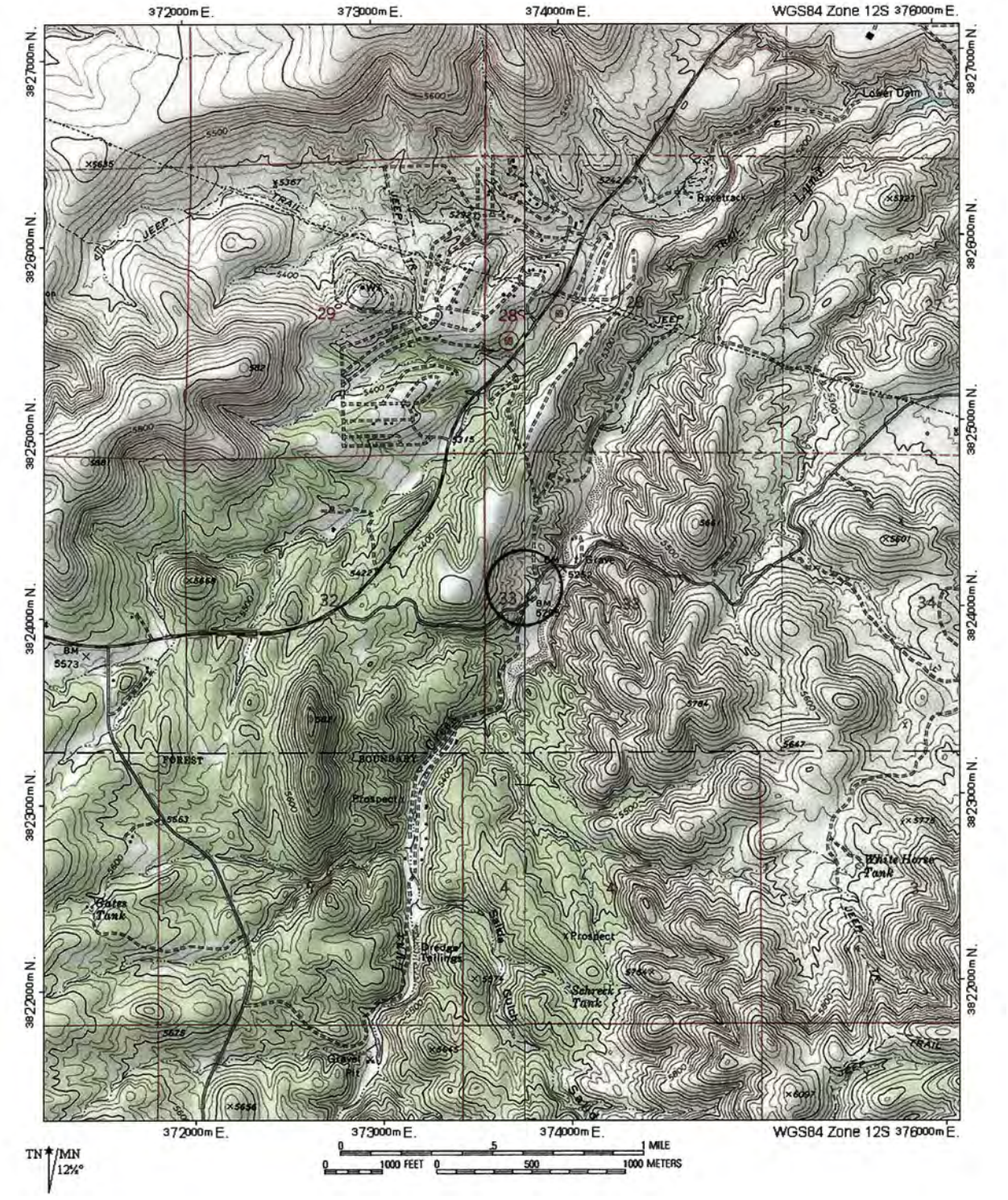
individually eligible _x_ yes ____ no

contributes to district ____ yes _x_ no

AREA OF SIGNIFICANCE: Engineering

PERIOD OF SIGNIFICANCE: 1922-1978

THEME(S): Transportation: Highways



LOCATION MAP

HISTORIC BRIDGE INVENTORY

Broadway Bridge

PROPERTY IDENTIFICATION

county	Yavapai	inventory number	08488
milepost	0.00	inventory route	Broadway Street
location	1.0 mi N SR 89A	feature intersected	Bitter Creek
city/vicinity	Clarkdale	structure owner	City of Clarkdale
USGS quad	Clarkdale	UTM reference	12.403370.3848507

STRUCTURAL INFORMATION

main span number	5	main span type	201
appr. span number	0	appr. span type	
degree of skew	30	guardrail type	4
main span length	27.0	superstructure	concrete slab
structure length	130.0	substructure	concrete abutments, wingwalls and piers
roadway width	18.0	floor/decking	concrete deck with asphalt overlay
structure width	21.3	other features	skewed superstructure; moulded concrete guardrails with paneled concrete parapet walls; concrete lamp post pedestals

HISTORICAL INFORMATION

construction date	1917	designer/engineer	United Verde Copper Company
project number		builder/contractor	Fleming & Stitzer
info source:	ADOT bridge records	alteration date(s)	
		alterations	

NATIONAL REGISTER EVALUATION

For additional information, see "Vehicular Bridges in Arizona 1880-1978" National Register Multiple Property Documentation Form

inventory score	51	NRHP eligibility	listed
interstate exemption	-	NRHP criteria	A x B _____ C x
program comment	-	signif. statement	outstanding early example of common structural type

FORM COMPLETED BY

Clayton B. Fraser, Principal

FRASERdesign
5700 Jackdaw Drive
Loveland, Colorado 80537
1 October 2018

BROADWAY BRIDGE

Structure No. 08488

PHOTO INFORMATION

date of photo.: May 2018 view direction: southeast north photo no.: DSCF5046 DSCF5064

CONSTRUCTION HISTORY

In 1884 Montana copper magnate William A. Clark purchased the United Verde Mines in Yavapai County. After serving a term in the U.S. Senate (Montana; 1902-1908), he later purchased land from the Jordan Ranch near Jerome and in 1910 began construction of a smelter to process the ore from his mines. As construction on the immense smelter complex was nearing completion in 1914, Clark laid out a company town, immodestly naming it Clarkdale and grandly designating the road to his smelter as Broadway. The engineering department of the United Verde Copper Company in 1917 designed this concrete slab structure to carry Broadway over Bitter Creek, which skirts the northern edge of town.

The structure was comprised of five 27-foot spans, supported by tapered concrete piers with angled cutwaters. The bridge featured handsomely articulated concrete detailing, with decoratively formed parapet walls and bulkheads that supported light standards at the four corners. With the drawings complete, the company hired contractors Fleming & Stitzer, who were then grading the railroad to the smelter, to construct the bridge. They apparently completed the bridge structure in 1917. Three years later Yavapai County purchased the Broadway Bridge from Clark. Although Clarkdale later folded with the mines, the Broadway Bridge remained in place. The town now serves largely as a retirement community, and the bridge still carries local traffic over Bitter Creek. The concrete work is all intact, but the metal light standards have been removed.

SIGNIFICANCE STATEMENT

The most common vehicular bridge type in Arizona, the simple reinforced concrete slab is represented by numerous structures in the historic bridge inventory. The Broadway Bridge in Clarkdale displays unadventurous span and total lengths, but is nevertheless technologically significant as one of the earliest intact examples in Arizona of this fundamental bridge design. It is further distinguished by the architectural treatment of its approaches—a rare commodity among the state's starkly engineered concrete spans. The bridge is historically significant for its association with the Verde Copper Company, an important early Arizona industry. One of the few privately constructed roadway spans in Arizona, the Broadway Bridge is an important early transportation resource.

NATIONAL REGISTER EVALUATION

TECHNOLOGICAL SIGNIFICANCE	HISTORICAL SIGNIFICANCE	NATIONAL REGISTER CRITERIA
____ represents the work of a master	____ associated with significant persons	_x_ Criterion A
____ possesses high artistic values	_x_ associated with significant events or patterns	____ Criterion B
_x_ represents a type, period or method of construction	____ contributes to historical district	_x_ Criterion C

NATIONAL REGISTER ELIGIBILITY

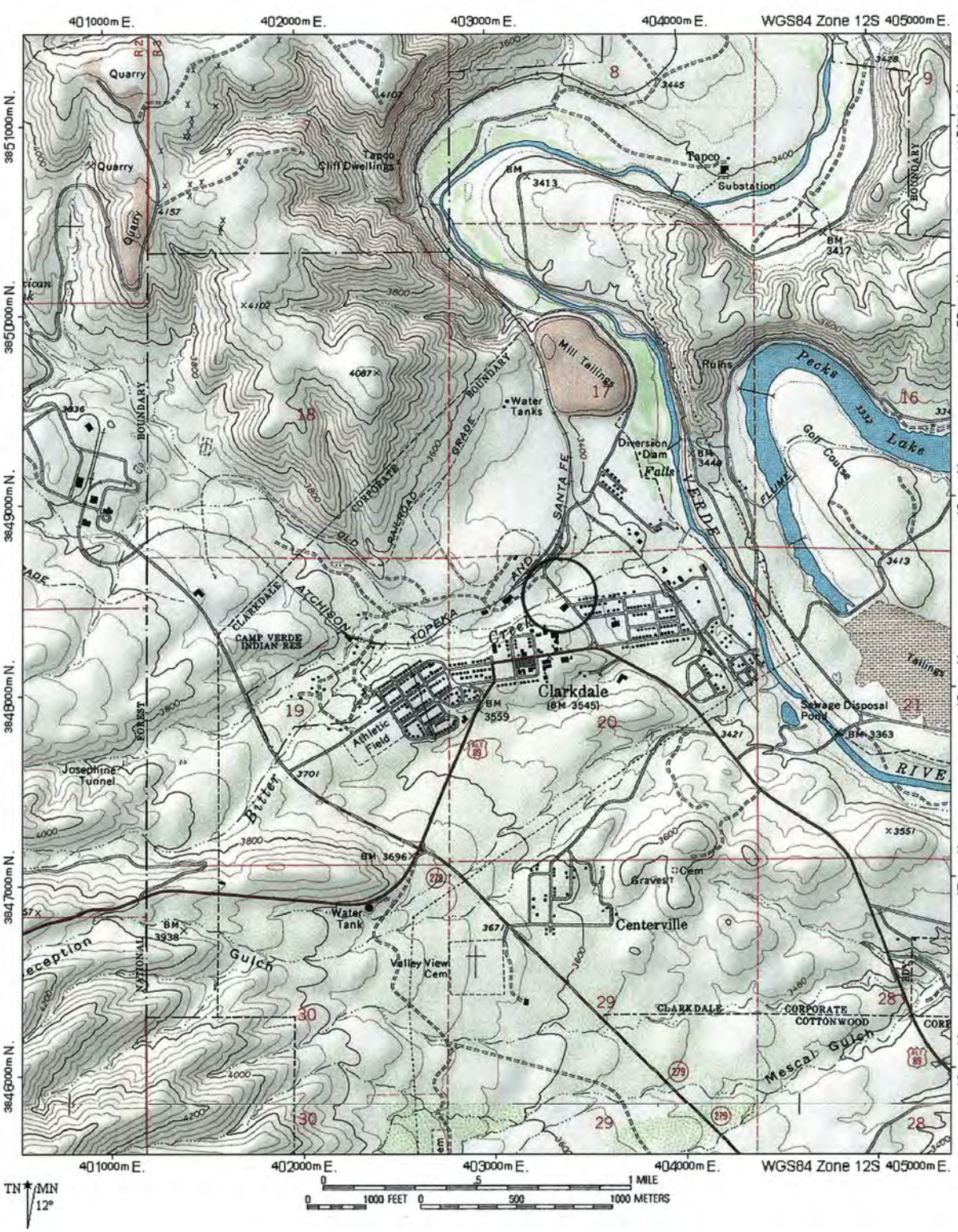
individually eligible _x_ yes ____ no

contributes to district ____ yes _x_ no

AREA OF SIGNIFICANCE: Transportation; Engineering

PERIOD OF SIGNIFICANCE: 1917-1978

THEME(S): Transportation: Highways



LOCATION MAP

HISTORIC BRIDGE INVENTORY

Willis Street Bridge

PROPERTY IDENTIFICATION

county	Yavapai	inventory number	08550
milepost	0.00	inventory route	Willis Street
location	0.1 mi West of SR 89	feature intersected	Granite Creek
city/vicinity	Prescott	structure owner	City of Prescott
USGS quad	Prescott	UTM reference	12.364920.3823430

STRUCTURAL INFORMATION

main span number	2	main span type	104
appr. span number	0	appr. span type	
degree of skew	0	guardrail type	4
main span length	33.0	superstructure	concrete deck girder
structure length	65.0	substructure	stone masonry abutments, wingwalls and pier
roadway width	28.0	floor/decking	concrete deck with asphalt overlay
structure width	40.5	other features	steel pipe guardrails with stone masonry columns

HISTORICAL INFORMATION

construction date	1936	designer/engineer	Arizona Highway Department
project number		builder/contractor	Works Progress Administration
info source:	ADOT bridge records	alteration date(s)	
		alterations	

NATIONAL REGISTER EVALUATION

For additional information, see "Vehicular Bridges in Arizona 1880-1978" National Register Multiple Property Documentation Form

inventory score	45	NRHP eligibility	eligible
interstate exemption	-	NRHP criteria	A ____ B ____ C x
program comment	-	signif. statement	well-preserved example of Depression-era bridge construction

FORM COMPLETED BY

Clayton B. Fraser, Principal

FRASERdesign
5700 Jackdaw Drive
Loveland, Colorado 80537
1 October 2018

WILLIS STREET BRIDGE

Structure No. 08550

PHOTO INFORMATION

date of photo.: May 2018 view direction: east northeast photo no.: DSCF5153 DSCF5155

CONSTRUCTION HISTORY

This small-scale bridge carries Willis Street over Granite Creek in the downtown area of Prescott. The structure is configured with two reinforced concrete deck girder spans supported by stone masonry abutments and pier. The spans reach 33 feet in length; the roadway is 28 feet wide. This roadway is flanked on both sides by concrete sidewalks cantilevered from the outer edges of the girders. The sidewalks are bounded by steel pipe handrails with stone masonry posts. The Willis Street Bridge was built from a standard design produced by the Arizona Highway Department. As indicated by etchings in the concrete, it was erected by the Works Progress Administration in 1936. Since its completion, the bridge has carried city street traffic in unaltered condition.

SIGNIFICANCE STATEMENT

During the 1930s the Great Depression devastated the nation's economy, leaving millions of Americans 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 several million dollars of relief money from the federal government, much of it earmarked for road and bridge construction.

To administer all of this activity, the Roosevelt administration established such bureaus as the Civilian Conservation Corps and the Work Projects Administration (later renamed the Works Progress Administration). This latter agency was responsible for the construction of public buildings around the country as well as countless miles of roads and thousands of bridges. "WPA is doing its share to cut down the tragic death toll of sudden death on America's highway," The *WPA Worker* reported in July 1936. "Under the Emergency Program, workers from relief rolls have replaced thousands of narrow and dangerous bridges. They have built 11,000 new bridges in addition to repairing 17,000 others." In Arizona some 14 bridges have been identified as being built by the WPA. Of these the Willis Street Bridge is distinguished for its well-preserved condition and the level of craftsmanship in its construction.

NATIONAL REGISTER EVALUATION

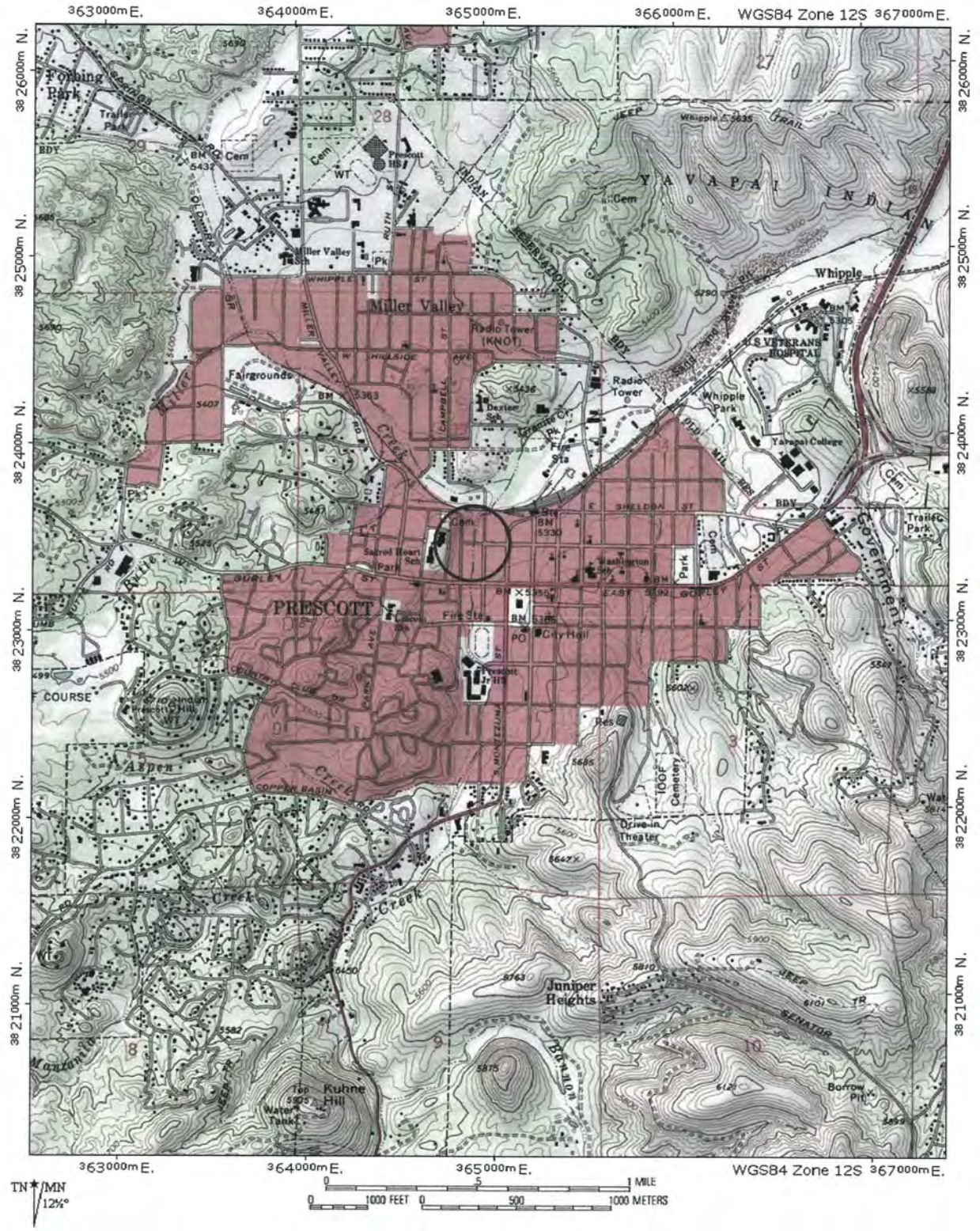
TECHNOLOGICAL SIGNIFICANCE
____ represents the work of a master
____ possesses high artistic values
__x__ represents a type, period or method of construction

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: 1936-1978
THEME(S): Transportation: Highways



LOCATION MAP

HISTORIC BRIDGE INVENTORY

Walnut Creek Bridge

PROPERTY IDENTIFICATION

county	Yavapai	inventory number	08741
milepost	0.00	inventory route	Williamson Valley Road
location	38 mi N of Iron Spring Rd	feature intersected	Walnut Creek
city/vicinity	Paulden	structure owner	Yavapai County
USGS quad	Indian Peak	UTM reference	12.334170.3866640

STRUCTURAL INFORMATION

main span number	1	main span type	310
appr. span number	1	appr. span type	101
degree of skew	0	guardrail type	6
main span length	138.0	superstructure	steel rigid-connected Pratt through truss
structure length	169.0	substructure	concrete abutments and wingwalls
roadway width	13.9	floor/decking	timber deck over timber stringers
structure width	16.1	other features	upper / lower chord: 2 channels or 4 angles w/ cover plate and lacing or batten plates; vertical: 2 channels w/ lacing; floor beam: I-beam; Thrie beam guardrails

HISTORICAL INFORMATION

construction date	1913	designer/engineer	US Office of Indian Affairs
project number		builder/contractor	Midland Bridge Company, Kansas City MO
info source:	ADOT bridge records	alteration date(s)	1936
		alterations	truss superstructure moved to this location

NATIONAL REGISTER EVALUATION

For additional information, see "Vehicular Bridges in Arizona 1880-1978" National Register Multiple Property Documentation Form

inventory score	69	NRHP eligibility	listed
interstate exemption	-	NRHP criteria	A x B ____ C x
program comment	-	signif. statement	outstanding example of early truss construction, once part of important multiple-span bridge

FORM COMPLETED BY

Clayton B. Fraser, Principal

FRASERdesign
5700 Jackdaw Drive
Loveland, Colorado 80537
1 October 2018

WALNUT CREEK BRIDGE

Structure No. 08741

PHOTO INFORMATION

date of photo.: March 2018 view direction: north east photo no.: DSCF5025 DSCF5028

CONSTRUCTION HISTORY

In 1912 Arizona Congressman Carl Hayden passed legislation authorizing the Secretary of the Interior to investigate the necessity for a "suitable steel and concrete wagon bridge" across the Gila River on the San Carlos Indian Reservation. Responsibility for locating and designing the Gila River Bridge fell upon the Indian Office in Washington, D.C. Rather than place the bridge on the Reservation, OIA engineers located it more than 20 miles upriver near Calva. As delineated by OIA in July 1913, the bridge was comprised of seven Pratt through truss spans, each extending 138 feet, for an overall length of almost 1,000 feet. To fabricate and erect the trusses, OIA contracted with the Midland Bridge Company of Kansas City. During the fall of 1913 Midland shipped several carloads of steel to the site by rail and began truss erection. The San Carlos Bridge was reported complete by the end of the year.

The bridge carried vehicular traffic until the south approach was washed away in a 1915 flood, rendering it impassible. The OIA waited until February 1921 to reopen the bridge by erecting four new through trusses. In 1935 the agency decided to replace the bridge entirely. In January 1936 Arizona Highway Department Bridge Engineer Ralph Hoffman designed new concrete substructures to use three salvaged spans from the San Carlos Bridge at two locations in the Prescott National Forest in Yavapai County. Laborers enlisted from the Arizona Transient Camp dismantled the San Carlos Bridge that summer and built the Perkinsville [**09474**] and Walnut Creek bridges. The two structures have since functioned unaltered at these relatively remote forest crossings.

SIGNIFICANCE STATEMENT

One of Arizona's few multiple-span through trusses, the San Carlos Bridge in its original location was historically significant as a regionally important river crossing. It is further distinguished as the earliest dateable OIA-built span in the state. The re-erection of these three trusses in the Prescott National Forest marked a part of a cooperative program developed in 1934 by the Arizona State Transient Directors and the U.S. Forest Service to provide suitable labor projects for the "vast army of unemployed transients" housed in transient camps across the state. Although other such transient-built public works undoubtedly still remain in Arizona, these are the only known examples of bridges constructed as part of this federal/state relief program. The two bridges are technologically noteworthy as the earliest example in the state of one of the most common vehicular truss types built in America—the riveted Pratt through 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: 1913-1978

THEME(S): Transportation: Highways

LOCATION MAP

HISTORIC BRIDGE INVENTORY

Perkinsville Bridge

PROPERTY IDENTIFICATION

county	Yavapai	inventory number	09474
milepost	0.00	inventory route	Perkinsville Road
location	18.8 mi SE Jct SR 89	feature intersected	Verde River
city/vicinity	Perkinsville	structure owner	Yavapai County
USGS quad	Perkinsville	UTM reference	12.389835.3862085

STRUCTURAL INFORMATION

main span number	2	main span type	310
appr. span number	2	appr. span type	101
degree of skew	0	guardrail type	6
main span length	138.0	superstructure	steel rigid-connected Pratt through truss
structure length	330.0	substructure	concrete abutments, wingwalls and spill-through pier
roadway width	14.0	floor/decking	timber deck over timber stringers
structure width	18.4	other features	upper / lower chord: 2 channels or 4 angles w/ cover plate and lacing or batten plates; vertical: 2 channels w/ lacing; floor beam: I-beam; Thrie beam guardrails

HISTORICAL INFORMATION

construction date	1913	designer/engineer	US Office of Indian Affairs
project number		builder/contractor	Midland Bridge Company, Kansas City MO
info source:	ADOT bridge records	alteration date(s)	1936
		alterations	truss superstructure moved to this location

NATIONAL REGISTER EVALUATION

For additional information, see "Vehicular Bridges in Arizona 1880-1978" National Register Multiple Property Documentation Form

inventory score	80	NRHP eligibility	listed
interstate exemption	-	NRHP criteria	A x B _____ C x
program comment	-	signif. statement	outstanding example of early truss construction, once part of important multiple-span bridge

FORM COMPLETED BY

Clayton B. Fraser, Principal

FRASERdesign
5700 Jackdaw Drive
Loveland, Colorado 80537
1 October 2018

PERKINSVILLE BRIDGE

Structure No. 09474

PHOTO INFORMATION

date of photo.: March 2018 view direction: northwest northeast photo no.: DSCF5030 DSCF5035

CONSTRUCTION HISTORY

In 1912 Arizona Congressman Carl Hayden passed legislation authorizing the Secretary of the Interior to investigate the necessity for a "suitable steel and concrete wagon bridge" across the Gila River on the San Carlos Indian Reservation. Responsibility for locating and designing the Gila River Bridge fell upon the Indian Office in Washington, D.C. Rather than place the bridge on the Reservation, OIA engineers located it more than 20 miles upriver near Calva. As delineated by OIA in July 1913, the bridge was comprised of seven Pratt through truss spans, each extending 138 feet, for an overall length of almost 1,000 feet. To fabricate and erect the trusses, OIA contracted with the Midland Bridge Company of Kansas City. During the fall of 1913 Midland shipped several carloads of steel to the site by rail and began truss erection. The San Carlos Bridge was reported complete by the end of the year.

The bridge carried traffic until the south approach was washed away in a 1915 flood, rendering it impassible. For some reason, the OIA waited until February 1921 to reopen the bridge by erecting four new through trusses. In 1935 the agency decided to replace the bridge entirely. In January 1936 Arizona Highway Department Bridge Engineer Ralph Hoffman designed new concrete substructures to use three salvaged spans from the San Carlos Bridge at two locations in the Prescott National Forest in Yavapai County. Laborers enlisted from the Arizona Transient Camp dismantled the San Carlos Bridge that summer and built the Perkinsville and Walnut Creek [**08741**] bridges. The two steel structures have since functioned unaltered at relatively remote forest crossings.

SIGNIFICANCE STATEMENT

One of Arizona's few multiple-span through trusses, the San Carlos Bridge in its original location was historically significant as a regionally important river crossing. It is further distinguished as the earliest dateable OIA span in the state. The re-erection of these three trusses in the Prescott National Forest marked a part of a cooperative program developed in 1934 by the Arizona State Transient Directors and the U.S. Forest Service to provide suitable labor projects for the "vast army of unemployed transients" housed in transient camps across the state. Although other such transient-built public works undoubtedly still remain in Arizona, these are the only known examples of bridges constructed as part of this federal/state relief program. The two bridges are technologically noteworthy as the earliest example in the state of one of the most common vehicular truss types built in America—the riveted Pratt through truss.

NATIONAL REGISTER EVALUATION

TECHNOLOGICAL SIGNIFICANCE	HISTORICAL SIGNIFICANCE	NATIONAL REGISTER CRITERIA
____ represents the work of a master	____ associated with significant persons	_x_ Criterion A
____ possesses high artistic values	_x_ associated with significant events or patterns	____ Criterion B
_x_ represents a type, period or method of construction	____ contributes to historical district	_x_ Criterion C

NATIONAL REGISTER ELIGIBILITY

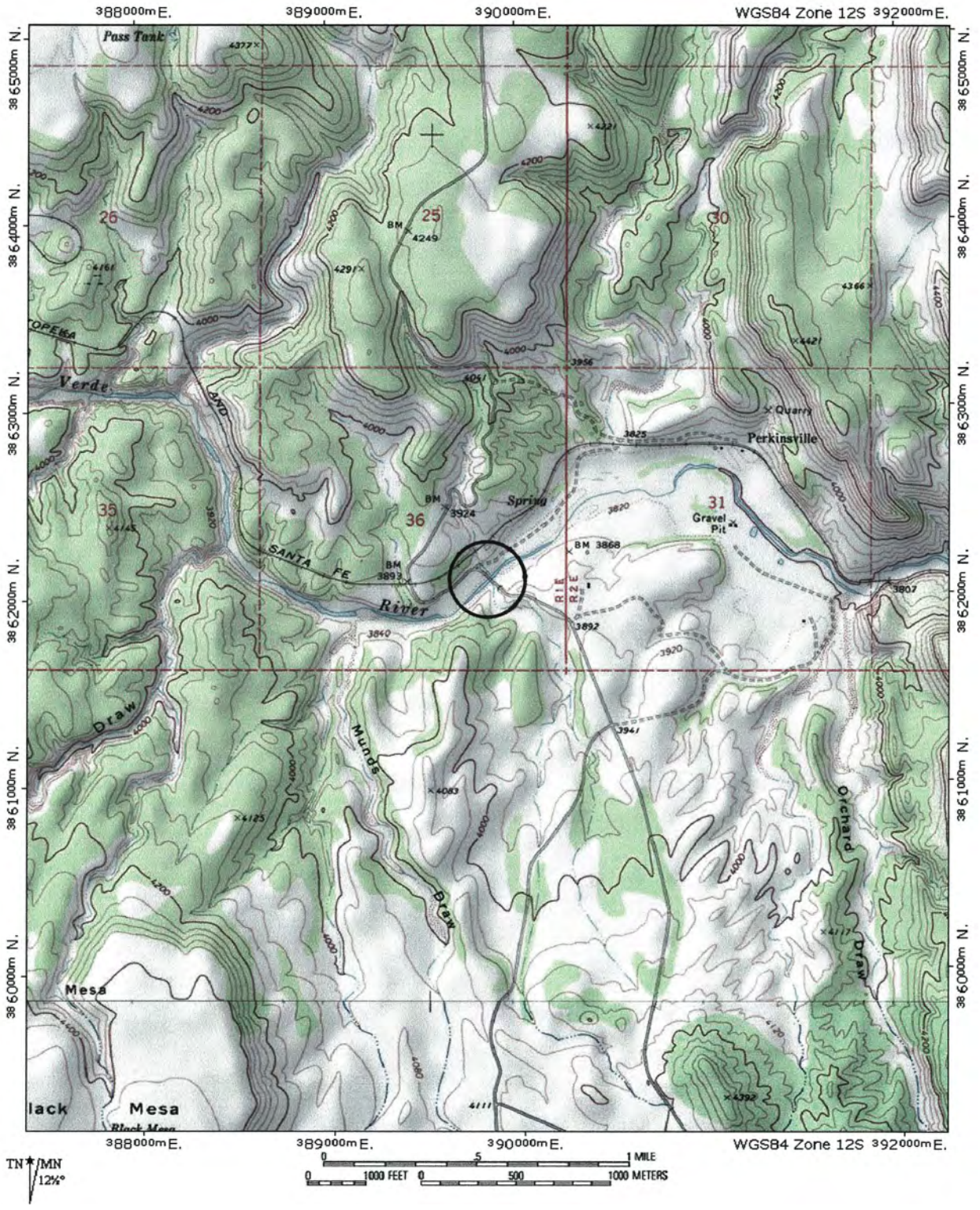
individually eligible _x_ yes ____ no

contributes to district ____ yes _x_ no

AREA OF SIGNIFICANCE: Transportation; Engineering

PERIOD OF SIGNIFICANCE: 1913-1978

THEME(S): Transportation: Highways



LOCATION MAP

HISTORIC BRIDGE INVENTORY

Hell Canyon Bridge

PROPERTY IDENTIFICATION

county	Yavapai	inventory number	abd.
milepost	0.00	inventory route	abd. US 89
location	0.5 mi SW of Drake	feature intersected	Hell Canyon
city/vicinity	Drake	structure owner	Yavapai County
USGS quad	Paulden	UTM reference	12.373842.3871603

STRUCTURAL INFORMATION

main span number	5	main span type	103
appr. span number	0	appr. span type	
degree of skew	0	guardrail type	0
main span length	50.0	superstructure	concrete two-beam deck girder
structure length	230.0	substructure	concrete abutments and wingwalls w/ tapered spill-through concrete piers
roadway width	19.5	floor/decking	concrete deck
structure width	22.0	other features	two-girder superstructure with arched girders; moulded concrete guardrails w/ paneled concrete bulkheads and square balusters

HISTORICAL INFORMATION

construction date	1923	designer/engineer	Arizona Highway Department
project number		builder/contractor	L.C. Lashmet Company, Prescott AZ
info source:	ADOT bridge records	alteration date(s)	
		alterations	mining conveyor belt structure installed on deck

NATIONAL REGISTER EVALUATION

For additional information, see "Vehicular Bridges in Arizona 1880-1978" National Register Multiple Property Documentation Form

inventory score	63	NRHP eligibility	listed
interstate exemption	-	NRHP criteria	A x B _____ C x
program comment	-	signif. statement	undistinguished example of uncommon structural type, undocumented

FORM COMPLETED BY

Clayton B. Fraser, Principal

FRASERdesign
5700 Jackdaw Drive
Loveland, Colorado 80537
1 October 2018

HELL CANYON BRIDGE

Structure No.: abandoned

PHOTO INFORMATION

date of photo.: May 2018 view direction: west north photo no.: DSCF5118 DSCF5123

CONSTRUCTION HISTORY

In the early 1920s the Arizona Highway Department undertook extensive road construction to build the 50-mile-long Prescott-Ash Fork Highway. The largest of the drainage structures along the route spanned Hell Canyon, a rugged wash near Drake, just north of the famous Santa Fe Railroad trestle. AHD bridge engineers initially designed and contracted for a 154-foot open spandrel arch similar to other bridges over Cienega Creek [**08293**] and Queen Creek [**abd.**] then underway elsewhere in the state. Additional substructural investigation, however, revealed that the bridge's south abutment would rest on a sizeable boulder field, providing an unstable foundation condition for an arch of that scale. Late in 1922 State Engineer W.C. Lefebvre changed the bridge's design to this multiple-span concrete girder with high concrete piers. Each span featured two slightly arched girders that bore directly on the tapered concrete piers. The 20-foot-wide concrete roadway was bounded by concrete guardrails with paneled bulkheads and square balusters.

Using most of the reinforcing steel already on-site, contractor L.C. Lashmet began construction of the Hell Canyon Bridge on January 15, 1923. His crew completed the structure on July 12 for a total cost of just over $34,000. The Hell Canyon Bridge functioned on U.S. Highway 89 until its replacement by a route realignment in 1954. It now stands abandoned and closed to vehicular traffic. Recently, a nearby mining operation has placed a gravel conveyor structure on the bridge's deck.

SIGNIFICANCE STATEMENT

"The high trestle has a very pleasant effect, with the arched girders on the high, slightly tapered piers," Lefebvre stated. "It was completed at approximately the same contract price as was the bid for the arch and compares favorably with it in every aspect." A major crossing on one of the state's important early regional routes, the Hell Canyon Bridge is significant as an outstanding representative of an unusual structural type. Although numerous concrete girder bridges were built throughout the state in the 1920s and 1930s, most featured designs with four or more relatively shallow girders. The earliest bridges built in the 1910s typically employed two-girder designs, and of these only three remain. The Hell Canyon Bridge is a throwback to this earlier design, made necessary by the need to use available materials then on the ground at the site. It is distinguished by its picturesquely arched girders and handsomely proportioned piers. A visually striking structure, the Hell Canyon Bridge is an important remnant of early highway construction in Arizona. The placement of the conveyor structure on the bridge's deck does diminish its integrity of association and setting, but the latter structure is considered a removable alteration.

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

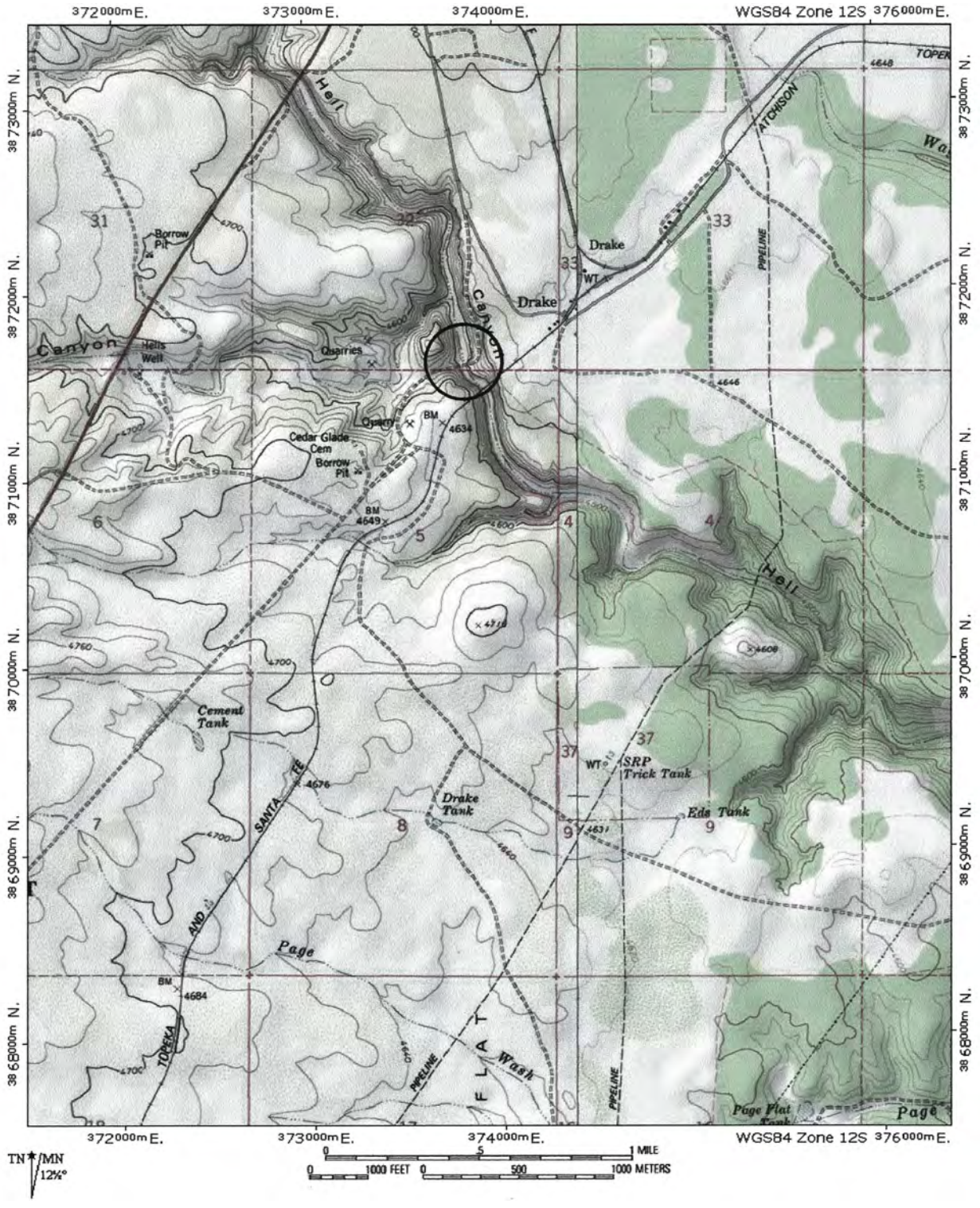
individually eligible _x_ yes ____ no

contributes to district ____ yes _x_ no

AREA OF SIGNIFICANCE: Transportation; Engineering

PERIOD OF SIGNIFICANCE: 1923-1978

THEME(S): Transportation: Highways



LOCATION MAP