STATE OF ARIZONA

HISTORIC PROPERTY INVENTORY FORM

HISTORIC

BRIDGE

INVENTORY

Ligurta Underpass

PROPERTY IDENTI	FICATION		
county	Yuma	inventory number	08406
milepost	0.70	inventory route	Southern Pacific Railroad
location	0.7 mi NE Jct I8	feature intersected	Old US 80
city/vicinity	Ligurta	structure owner	Union Pacific Railroad
USGS quad	Ligurta	UTM reference	11.753900.3618465
STRUCTURAL INFO	RMATION		
main span number	3	main span type	402
appr. span number	0	appr. span type	
degree of skew	48	guardrail type	5
main span length	38.0	superstructure	steel I-beam stringer
structure length	83.0	substructure	concrete abutments and wingwalls
roadway width	31.0	floor/decking	railroad ballast deck
structure width	33.2	other features	modest Art Moderne scoring on pylons
HISTORICAL INFOR	RMATION		
construction date	1949	desianer/enaineer	Arizona Highway Department
project number	FI-82(10)	builder/contractor	Western Constructors Inc., Phoenix AZ
info source:	ADOT bridge records	alteration date(s)	
	0	alterations	
NATIONAL REGIST	ER 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	Α	Β	С	X
program comment	х	signif. statement	well-preser detailing or	ved exam 1 grade se	ple par	of AHD architectural ration

FORM COMPLETED BY

Clayton B. Fraser, Principal



date of photo.: March 2018

018 view direction: southeast east photo no.: DSCF6281 DSCF6289

FRASERDESIGN 2018

In August 1947 Arizona Highway Department engineers began production of construction drawings for a grade separation structure on U.S. Highway 80 east of Yuma. Located near the railroad siding of Ligurta (derived from the Spanish word for lizard), the structure would carry the double tracks of the Southern Pacific Railroad over the highway. It would replace an existing three-span steel girder overpass at this location. As delineated by AHD, the replacement structure consisted of three steel stringer spans simply supported by reinforced concrete abutments and piers. The stringers were rolled wide flanges braced laterally with I-beams riveted to the wide flanges' webs. These stringers carried a concrete slab over which a railroad ballast deck was laid. The deck was bounded on both sides by aluminum baluster guardrails, which were flanked on either end by a concrete bulkhead with a stepped pattern.

AHD designated the project as FGI 82(10) and in the spring of 1948 awarded a contract for its construction to Western Constructors Inc. The Phoenix-based contractors began substructural excavation soon thereafter. Using a steel superstructure fabricated by the Bethlehem Pacific Coast Steel Corporation, Western Constructors completed the Ligurta Underpass in 1949. It carried mainline traffic on U.S. 80 until the highway was superseded by Interstate 8 in the late 1960s and the original route abandoned to Yuma County. Today the Ligurta Underpass continues to carry intermittent traffic on this county road, in unaltered condition.

SIGNIFICANCE STATEMENT

The Ligurta Underpass was built as an integral part of U.S. 80, one of Arizona's most important transcontinental highways. The Underpass was built relatively late as a replacement structure, however, limiting its historical importance as a transportation-related resource. The Ligurta Underpass accrues more significance for its architectural design. The Arizona Highway Department typically maintained two sets of design standards for its grade separations located in urban settings and those located at rural crossings. The urban structures built during the Great Depression generally received architectural treatment—either Spanish Revival or Art Moderne—intended to integrate them visually with their surroundings, while the rural structures tended to be more plain-faced, with minimal architectural detailing. The Ligurta Underpass is a noteworthy exception to this trend. AHD engineers were so concerned with its proportions and retailing that they produced a line-drawing rendering of it in one-point perspective as part of the construction drawings. With its clean proportions and Art Moderne detailing, the structure is distinguished as one of the more aesthetically successful examples among the AHD-designed bridges of the pre-War period.

TECHNOLOGICAL SIGNIFICANCE represents the work of a master possesses high artistic values represents a type, period or method of construction	HISTORICAL SIGNIFICANCE associated with significant per associated with significant eve contributes to historical distric	NATIONAL REGISTER CRITERIA sons Criterion A ents or patterns Criterion B t Criterion C
NATIONAL REGISTER ELIGIBILITY individually eligible x yes no contributes to district yes x no	AREA OF SIGNIFICANCE: PERIOD OF SIGNIFICANCE: THEME(S):	Engineering 1949-1978 Transportation: Highways

FRASERDESIGN 2018

HISTORIC PROPERTY INVENTORY FORM

BRIDGE

INVENTORY

Ligurta Wash Bridge

PROPERTY IDENTIF	FICATION			
county milepost location city/vicinity USGS quad STRUCTURAL INFO	Yuma 3.45 Old US 80 & Ligurta Ligurta Ligurta RMATION	inventory number inventory route feature intersected structure owner UTM reference	08410 Old US 80 Ligurta Wash Yuma County 11.757550.3617810	
main span number appr. span number degree of skew main span length structure length roadway width structure width	4 0 0 36.0 146.0 34.4 35.7	main span type appr. span type guardrail type superstructure substructure floor/decking other features	104 4 concrete deck girder concrete abutments, wingwalls and piers concrete deck with asphalt overlay AHD standard slotted concrete guardrails with Thrie beams at approaches	
HISTORICAL INFOR	RMATION			
construction date project number info source:	1931 FAP 26-D (Reo.) ADOT bridge records	designer/engineer builder/contractor alteration date(s) alterations	Arizona Hiahway Department Canion, Francis & Royden, Phoenix AZ	
NATIONAL REGIST	ER EVALUATION			
		For additional information, see "Vehicular Bridges in Arizona 1880-1978" National Register Multiple Property Documentation Form		
inventory score interstate exemptio program comment	47 n _ -	NRHP eligibility NRHP criteria signif. statement	eligible A _x B C _x well-preserved example of standard structural type, on important route	

FORM COMPLETED BY

Clayton B. Fraser, Principal

date of photo.: March 2018 view direction: southeast north photo no.: DSCF6297 DSCF6304

In the summer of 1930 the Arizona Highway Department contemplated improving a segment of the Oceanto-Ocean Highway in Yuma County. This part of the route, called the Yuma-Wellton Highway, began just east of a railroad stop named Ligurta and extended for 5.6 miles eastward toward Wellton. It included highway grading and surfacing, as well as the construction of two almost identical reinforced concrete bridges over intermittent washes. The structure over Ligurta Wash was comprised of four concrete girder spans supported by concrete abutments and piers. As delineated by AHD engineers, the girders extended 36 feet and featured angled haunches at the supports. The concrete deck cantilevered slightly over the spandrel beams on concrete brackets; it was bounded by concrete guardrails with slotted "doghouse" cutouts. The construction was designated as Federal Aid Project 26, 2nd Reopening. In August 1930 AHD advertised for competitive bids for the project, awarding the construction contract to Canion-Francis & Royden of Phoenix on September 3. The contractors, who had just completed a 3½-mile segment immediately west of this, began work immediately. By the end of the year, under the supervision of AHD Resident Engineer James Parker, they reported the work 50 percent complete. The Canion-Francis & Royden crew completed the highway and bridges in March 1931. The route carried mainline traffic for some 37 years until construction of Interstate 8 in 1967. At that time the Ligurta Wash Bridge was retired from the primary road system and left in place as a county-owned bridge. It now carries local traffic beside the interstate, in unaltered condition.

SIGNIFICANCE STATEMENT

The Ligurta Wash Bridge is historically noteworthy for its association with U.S. Highway 80. Alternately known as the Phoenix-Yuma Highway (in Arizona) and the Ocean-to-Ocean Highway (its national designation), the road has served historically as the principal east-west transcontinental route across southern Arizona. During the 1920s and 1930s, it carried the heaviest highway traffic in Arizona. Built in 1930 during a period of extensive highway construction in Arizona, the Ligurta Wash Bridge was an integral part of this significant highway. The bridge is technologically important as a representative example of AHD bridge construction. The state had begun using concrete for bridge superstructures as early as 1910. The earliest girder bridges, such as the Antelope Hill Bridge [**abd.**] in Yuma County and the Santa Cruz River Bridge [**08166**] in Santa Cruz County, employed two deep girders that were cast integrally with the concrete deck. By the 1920s AHD had refined its girder standard to incorporate four or more shallower girders, to create greater underbridge clearance. The Ligurta Wash Bridge uses this latter design. It is today distinguished as one of the best-preserved early examples in Arizona of this revised configuration.

TECHNOLOGICAL SIGNIFICANCE represents the work of a master possesses high artistic values represents a type, period or method of construction	HISTORICAL SIGNIFICANCE associated with significant person x associated with significant even contributes to historical district	NATIONAL REGISTER CRITERIA ons x Criterion A ts or patterns Criterion B Criterion C
NATIONAL REGISTER ELIGIBILITY	AREA OF SIGNIFICANCE: T	'ransportation; Engineering
individually eligible <u>x</u> yes <u>no</u>	PERIOD OF SIGNIFICANCE: 1	931-1978
contributes to district <u>yes x</u> no	THEME(S): T	'ransportation: Highways

HISTORIC

BRIDGE

INVENTORY

Ocean-to-Ocean Bridge

PROPERTY IDENTIF	FICATION		
county milepost	Yuma 0.03	inventory number inventory route	08533 Penitentiary Avenue
location	0.5 mi NE I 8	feature intersected	Colorado River
city/vicinity	Yuma	structure owner	Yuma County
USGS quad	Yuma East	UTM reference	11.723383.3623720
STRUCTURAL INFO	RMATION		
main span number	1	main span type	310
appr. span number	1	appr. span type	309
degree of skew	0	guardrail type	
main span length	336.0	superstructure	steel pin-connected Pennsylvania through truss
structure length	444.0	substructure	concrete abutments, wingwalls and piers
roadway width	18.0	floor/decking	concrete deck with asphalt overlay
structure width	35.0	other features	upper chord: 2 built-up channels w/ cover plate and double lacing; lower chord: 2 rectangular eyebars; vertical: 2 channels w/ lacing; diagonal: 4 rectangular eyebars; lateral bracing: l angle; steel lattice guardrails
HISTORICAL INFOR	RMATION		
construction date	1915	designer/engineer	US Office of Indian Affairs
project number		builder/contractor	Omaha Structural Steel Works, Omaha NE
info source:	ADOT bridge records	alteration date(s)	1943 2002
		alterations	deck replaced; bridge rehabilitated and "Ocean- to-Ocean Highway" sign replicated
NATIONAL REGIST	ER EVALUATION		
		For additional infor National Register M	mation, see "Vehicular Bridges in Arizona 1880-1978" Iultiple Property Documentation Form
inventory score	93	NRHP eligibility	listed
interstate exemptio	n _	NRHP criteria	A <u>x</u> B C <u>x</u>
program comment	-	signif. statement	one of the most important wagon bridges in the Southwest
FORM COMPLETE) BY		
Clayton B. Fra:	ser, Principal		FRASERdesign 5700 Jackdaw Drive Loveland, Colorado 80537 1 October 2018

date of photo.: March 2018

view direction: south southeast

photo no.: DSCF6320 DSCF6324

Structure No. 08533

After years of agitating by Yuma citizens, Arizona Representative Carl Hayden in 1913 steered a bill through Congress authorizing construction of a steel highway bridge over the Colorado River at Yuma. Ostensibly to provide a crossing for the Yuma Indian Reservation across the river in California, the Yuma bridge was funded in part by the Office of Indian Affairs [OIA]. The State of Arizona would contribute \$25,000, as would Imperial County, California. OIA engineers in Washington designed this long-span through truss and located it at the foot of Prison Hill Road, near the Arizona Territorial Penitentiary, immediately upstream from the existing ferry here. As delineated, the structure consisted of a pin-connected Pennsylvania through truss, with a rigid-connected Warren deck truss approach span at one end. The trusses would be carried high over the river by concrete abutments and pier.

In June 1914 the OIA contracted with the Omaha Structural Steel Works of Nebraska to fabricate and construct the bridge for over \$72,000. But the OIA engineers were unfamiliar with the vagaries of the Colorado River, and problems arose soon after construction began in October. After the falsework was washed away twice that winter, Omaha Steel opted to erect the truss on barges and float it into position. On March 3, 1915, the 336foot-long span was swung in a carefully choreographed maneuver amidst widespread celebrating throughout the town. On May 22 the bridge was ceremoniously opened to traffic. The bridge carried the Ocean-to-Ocean Highway for decades before the highway was superseded by Interstate 8. It still functions in place, bearing local city-street traffic. The structure has recently been rehabilitated and a replica of the original "Ocean-to-Ocean Highway" sign installed on one of its truss webs.

SIGNIFICANCE STATEMENT

The first train crossed the Colorado River on a bridge in September 1877, and the Yuma crossing has been a pivotal one for Southwestern transportation since. The Penitentiary Avenue bridge, located on a site originally intended for a railroad structure, formed a crucial link on the nationally important Ocean-to-Ocean Highway. "This is the first highway bridge built across the Colorado River in all its length," the Yuma Sun stated in 1915. Although the writer neglected the dozens of bridges at the river's upper reaches in Colorado, the Ocean-to-Ocean Bridge was the first highway span over the lower Colorado. Technologically, the structure is significant as the earliest and longest through truss in Arizona, the only Pennsylvania truss and one of only three pin-connected trusses among Arizona's vehicular structures. It is today distinguished as one of the most important early spans in the Southwest.

TECHNOLOGICAL SIGNIFICANCE represents the work of a master possesses high artistic values represents a type, period or method of construction	HISTORICAL SIGNIFICANCEassociated with significant personsassociated with significant events or patternscontributes to historical district	NATIONAL REGISTER CRITERIA x Criterion A Criterion B Criterion C
NATIONAL REGISTER ELIGIBILITY individually eligible <u>x</u> yes <u>no</u> contributes to district <u>yes x</u> no	area of significance: Transportat Period of significance: 1915-1978 Theme(s): Transportat	ion; Engineering ion: Highways

HISTORIC PROPERTY INVENTORY FORM

HISTORIC !

BRIDGE

INVENTORY

Antelope Hill Bridge

PROPERTY IDENTIF	FICATION			
county milepost location city/vicinity USGS quad	Yuma 0.00 3.6 mi NW of Tacna Tacna Wellton Mesa	inventory number inventory route feature intersected structure owner UTM reference	abd. abd. US 95 Gila River Yuma County 11.779955.3623620	
STRUCTURAL INFC	RMATION			
main span number	15	main span type	1 04	
appr. span number	0	appr. span type	2	
degree of skew	0	guardrail type	0	
main span length	65.0	superstructure	concrete two-beam deck girder	
structure length	975.0	substructure	concrete abutments, wingwalls and bullnosed piers	
roadway width	16.0	floor/decking	concrete deck	
structure width	18.0	other features	incised panels on girder spandrels; threaded steel pipe guardrails (removed); concrete curbs	
HISTORICAL INFOR	RMATION			
construction date	1915	designer/engineer	Arizona State Engineer	
project number info source:	ADOT bridge records	builder/contractor alteration date(s)	Perry E. Borchers; convict work force ca1950	
		alterations	bridge badly deteriorated, with several spans washed away	
NATIONAL REGIST	ER EVALUATION			
		For additional information, see "Vehicular Bridges in Arizona 1880-1978" National Register Multiple Property Documentation Form		
inventory score	80	NRHP eligibility	listed	
interstate exemptio	n _	NRHP criteria	A <u>x</u> B C <u>x</u>	
program comment	-	signif. statement	one of state's most important early wagon bridges, located on important route, badly deteriorated	

FORM COMPLETED BY

Clayton B. Fraser, Principal

date of photo.: March 2018 - view direction: south northwest photo no.: DSCF6265 DSCF6266

An integral part of the Ocean-to-Ocean Highway across southern Arizona was the bridge over the Gila River. Located at the foot of Antelope Hill, it crossed this problematic river about 3½ miles northwest of Tacna. In 1912 Arizona State Engineer Lamar Cobb first surveyed sites at Antelope Hill and the nearby town of Dome and selected the former for a bridge. The next year his office designed a multiple-span concrete structure comprised of 15 girder spans supported by massive bullnosed concrete piers. The longest of these spans extended 65 feet, and the bridge's overall length was almost 1,000 feet, not including the timber trestle approaches on the ends. In December Cobb advertised for competitive bids to build the immense structure. Opting instead to use prison labor, the state rejected all bids. Cobb then redesigned and rebid the project when it became apparent that not enough prison manpower would be available. In May 1914 Perry Borchers was hired to build the bridge. But Borchers was in over his head. He began construction in June but soon defaulted, and after floods damaged the partially completed structure that winter, the state again undertook the project with prison laborers. The Antelope Hill Bridge was finally opened to traffic on August 18, 1915, with a gala picnic attended by thousands of well-wishers. With a poorly selected site, however, it suffered extensive damage with almost every major flood on the Gila. After years of repeated reconstruction of the concrete bridge and timber pile approach trestles, the Antelope Hill Bridge was replaced in 1929 by the McPhaul Bridge [abd.] and vacated. Today it stands abandoned in place in badly deteriorating condition, with the steel pipe guardrails removed, the deck disintegrating and some of its spans and piers washed away.

SIGNIFICANCE STATEMENT

As a major crossing on a nationally important transcontinental route, the Antelope Hill Bridge is significant for its pivotal role in early Arizona transportation. The bridge is also significant in Arizona history as one of the few structures remaining from the early state period that had been built using prison labor. The bridge is technologically significant as an outstanding example of a formative structural type. Although numerous concrete girder bridges were erected throughout Arizona in the 1910s, 1920s and 1930s, most featured designs with four or more relatively shallow girders. The earliest concrete girders in Arizona typically employed twogirder designs. Of these, only the Santa Cruz **[08166]**, Hell Canyon **[abd.]**, and Antelope Hill bridges remain. The Antelope Hill Bridge is now in ruins, due to the ravages of the Gila River. Although this has impacted its structural integrity seriously, the bridge still conveys a sense of its intact self. The destruction from the river is an integral part of its history, and the extensive damage adds to the bridge's interpretive value. The Antelope Hill Bridge is thus an important early remnant of highway construction in Arizona.

TECHNOLOGICAL SIGNIFICANCE represents the work of a master possesses high artistic values represents a type, period or method of construction	HISTORICAL SIGNIFICANCE associated with significant persons associated with significant events or patterns contributes to historical district	x Criterion A Criterion B Criterion C
NATIONAL REGISTER ELIGIBILITY individually eligible <u>x</u> yes <u>no</u> contributes to district <u>yes x</u> no	area of significance: Transporte period of significance: 1915-1978 theme(s): Transporte	ation; Engineering ation: Highways

STATE OF ARIZONA

HISTORIC

HISTORIC PROPERTY INVENTORY FORM

INVENTORY

McPhaul Bridge

BRIDGE

PROPERTY IDENTIF	FICATION		
county milepost location city/vicinity USGS quad STRUCTURAL INFO	Yuma 0.00 0.2 mi N of Dome Dome Laguna Dam RMATION	inventory number inventory route feature intersected structure owner UTM reference	abd. abd. US 95 Gila River Yuma County 11.741563.3627538
main span number appr. span number degree of skew main span length structure length roadway width structure width	1 0 0 798.0 1184.0 14.7 21.0	main span type appr. span type guardrail type superstructure substructure floor/decking other features	313 0 steel suspension bridge with rocker-type towers concrete abutments, deadmen and spill- through piers timber deck with asphalt overlay suspension cables: 3 strands of 290 #8 Roebling bridge wire (5-3/4" diameter); rocker-type braced steel towers w/ cast steel cable cradles; rigid Warren pony stiffening trusses
construction date project number info source:	1929 ADOT bridge records	designer/engineer builder/contractor alteration date(s) alterations	Arizona Hiahway Department Levy Construction Company, Denver CO
NATIONAL REGIST	ER EVALUATION	For additional inform National Register M	mation, see "Vehicular Bridges in Arizona 1880-1978" Iultiple Property Documentation Form
inventory score interstate exemptio program comment	91 n _ -	NRHP eligibility NRHP criteria signif. statement	listed A _x _ B C _x extraordinary long-span example of uncommon structural type, located on important route

FORM COMPLETED BY

Clayton B. Fraser, Principal

date of photo.: March 2018

view direction: north west photo no.: DSCF6317 DSCF6321

When Arizona State Engineer Lamar Cobb first looked for a crossing location of the Gila River for the Oceanto-Ocean Highway in Yuma County, he inspected sites at Dome and Antelope Hill and chose the latter. The Antelope Hill Bridge [**abd.**], a multiple-span concrete girder structure, was completed in 1915 and immediately began suffering damage with almost every flood on the Gila. Eventually, after years of repairs, it was abandoned altogether. The highway had already been rerouted through Telegraph Canyon, eliminating the need for the bridge altogether, when the Highway Department decided to replace the existing ford at Dome with a bridge. Soundings were taken, a site selected near a granite outcrop, and in 1927 the engineers decided to avoid the scouring problems of the Antelope Hill Bridge by free-spanning the river completely with a long suspension bridge.

In January 1928 AHD contracted with the Levy Construction Company of Denver to build the structure for \$152,454. Although AHD engineers had outlined the bridge's location and span, Levy engineered the bridge himself with the assistance of nationally known consulting engineer Ralph Modjeski. Construction began in mid-1928 and was completed in December 1929. Named after Yuma County Sheriff, Harry McPhaul, the McPhaul Bridge carried traffic on U.S. Highway 95 until its replacement in 1968. It was abandoned in place and, though closed, still spans the Gila River in unaltered and relatively good condition.

SIGNIFICANCE STATEMENT

The McPhaul Bridge is significant for several reasons. First, it formed an integral link on a regionally important highway in western Arizona. Second, it was one of two bridges in the state (other: Red Rock Bridge (J.A.L. Waddell)) associated with a pre-eminent American civil engineer—in this case Pennsylvania engineer Ralph Modjeski. Finally the McPhaul Bridge is technologically important as one of two vehicular suspension spans in Arizona (other: Cameron Bridge). Its rocker-type towers are rare among suspension bridges, distinguishing this structure even further among the vehicular spans in the state. Because of their exotic nature and high construction costs, suspension bridges were infrequently erected in this country, and few from the pre-Depression era have remained intact. The McPhaul Bridge is also noteworthy for its scale. At the time of its completion, the bridge had the longest span length of any bridge in the state, and it has the longest span among all the bridges in the inventory. Strikingly beautiful, graceful and exotic as well as historically and technologically important, the McPhaul Bridge is among Arizona's most important vehicular structures.

TECHNOLOGICAL SIGNIFICANCE represents the work of a master possesses high artistic values represents a type, period or method of construction	HISTORICAL SIGNIFICANCE associated with significant persons associated with significant events or contributes to historical district	NATIONAL REGISTER CRITERIA x Criterion A patterns Criterion B x Criterion C
NATIONAL REGISTER ELIGIBILITY	AREA OF SIGNIFICANCE: Tran	nsportation; Engineering
individually eligible <u>x</u> yes <u>no</u>	Period of significance: 1929	-1978
contributes to district <u>yes x</u> no	Theme(s): Tran	nsportation: Highways

LOCATION MAP