Form No. 10-300 REV. (9/77)

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES INVENTORY -- NOMINATION FORM

FOR NPS USE ONLY
RECEIVED JUL 16 1981
DATE ENTERED OCT 29 1981

SEE INSTRUCTIONS IN *HOW TO COMPLETE NATIONAL REGISTER FORMS*
TYPE ALL ENTRIES -- COMPLETE APPLICABLE SECTIONS

1 NAME

HISTORIC
Coolidge Dam

AND/OR COMMON

LOCATION

STREET & NUMBER
SW of San Carlos
Rural
__NOT FOR PUBLICATION

CITY, TOWN
San Carlos vic. X VICINITY OF

CONGRESSIONAL DISTRICT
04, 2

STATE	CODE	COUNTY	CODE
Arizona	04	Gila, ~~Pinal~~ (also in Pinal County)	07, 21

CLASSIFICATION

CATEGORY	OWNERSHIP	STATUS	PRESENT USE	
__DISTRICT	X PUBLIC	X OCCUPIED	X AGRICULTURE	__MUSEUM
__BUILDING(S)	__PRIVATE	__UNOCCUPIED	__COMMERCIAL	__PARK
X STRUCTURE	__BOTH	__WORK IN PROGRESS	__EDUCATIONAL	__PRIVATE RESIDENCE
__SITE	**PUBLIC ACQUISITION**	**ACCESSIBLE**	__ENTERTAINMENT	__RELIGIOUS
__OBJECT	__IN PROCESS	__YES: RESTRICTED	X GOVERNMENT	__SCIENTIFIC
	__BEING CONSIDERED	X YES: UNRESTRICTED	X INDUSTRIAL	__TRANSPORTATION
		__NO	__MILITARY	__OTHER:

OWNER OF PROPERTY

NAME
Bureau of Indian Affairs, Department of Interior

STREET & NUMBER
3030 N. Central

CITY, TOWN
Phoenix __ VICINITY OF

STATE
Arizona

LOCATION OF LEGAL DESCRIPTION

COURTHOUSE, REGISTRY OF DEEDS, ETC.
Gila County Courthouse

STREET & NUMBER
1400 E. Ash

CITY, TOWN
Globe

STATE
Arizona

6 REPRESENTATION IN EXISTING SURVEYS

TITLE
Arizona Historic Engineering Site Inventory

DATE
April 8, 1975 __FEDERAL X STATE __COUNTY __LOCAL

DEPOSITORY FOR SURVEY RECORDS
History of Engineering Program, Texas Tech University

CITY, TOWN
Lubbock

STATE
Texas

7 DESCRIPTION

CONDITION		CHECK ONE	CHECK ONE
X EXCELLENT	__DETERIORATED	X UNALTERED	X ORIGINAL SITE
__GOOD	__RUINS	__ALTERED	__MOVED DATE_____
__FAIR	__UNEXPOSED		

DESCRIBE THE PRESENT AND ORIGINAL (IF KNOWN) PHYSICAL APPEARANCE

The Coolidge Dam is located in a box canyon on the Gila River, about nine miles below its confluence with the San Carlos River. It is a reinforced concrete multiple-dome dam which consists of three large egg-shaped domes supported by two massive concrete buttresses and by the canyon walls on each side of the structure (see accompanying diagrams). All concrete work is smoothed and finished. The downstream face of the dam features a denticulated cornice and two art deco inspired overhangs, each with a huge concrete bald eagle mounted on its facade.

The dimensions of the Coolidge Dam are impressive. The total crest length is 880 feet and the base width is 200 feet. The dam is 251 feet in height from bedrock to crest. The span between the center points of the two buttresses measures 180 feet and the walls of the dome are four feet thick at the crest and 201 feet thick at the bottom. The buttresses are also massive, measuring 20 feet in thickness at a point 67 feet below the crest and 60 feet at a point 250 feet below the crest. The concrete highway across the top of the dam is 20 feet wide and is supported from below by three reinforced concrete arches, each of which is a 141' 4" clear span.

The reservoir created by Coolidge Dam is over 25 miles long and contains about 1,200,000 acre feet of water. There are two spillways, one on each side of the dam. Each spillway has three gates, 10 feet tall and 50 feet wide. A 10,000 kw. powerhouse with penstocks is set inside the central dome.

8 SIGNIFICANCE

PERIOD	AREAS OF SIGNIFICANCE -- CHECK AND JUSTIFY BELOW				
__PREHISTORIC	__ARCHEOLOGY-PREHISTORIC	__COMMUNITY PLANNING	__LANDSCAPE ARCHITECTURE	__RELIGION
__1400-1499	__ARCHEOLOGY-HISTORIC	X CONSERVATION	__LAW	__SCIENCE
__1500-1599	X AGRICULTURE	__ECONOMICS	__LITERATURE	__SCULPTURE
__1600-1699	X ARCHITECTURE	__EDUCATION	__MILITARY	__SOCIAL/HUMANITARIAN
__1700-1799	__ART	X ENGINEERING	__MUSIC	__THEATER
__1800-1899	__COMMERCE	__EXPLORATION/SETTLEMENT	__PHILOSOPHY	__TRANSPORTATION
X 1900-	__COMMUNICATIONS	__INDUSTRY	__POLITICS/GOVERNMENT	__OTHER (SPECIFY)
		__INVENTION		

SPECIFIC DATES 1927 BUILDER/ARCHITECT Major C.R. Olberg - designer

STATEMENT OF SIGNIFICANCE

The Coolidge Dam is a significant structure because it is the first large scale multiple-dome dam ever built and may possibly be the first successful multiple-dome dam of any size ever built. In addition, the Coolidge Dam construction process developed new and unique methodologies and technologies in concrete forming and pouring. Therefore, the Coolidge Dam is a significant structure on two levels: design and construction technology.

The key element of design in the Coolidge Dam is the use of the large egg-shaped domes to form the dam walls and the fact that these massive concrete structures were built with no expansion/contraction joints. The domes are both vertical and horizontal arches which are heavily reinforced with steel to (1) prevent temperature shrinkage cracks (2) anchor the concrete to the foundations and (3) transfer shear forces to the buttresses as the domes approach the crest. The use of reinforcing steel in the domes allowed them to be built as one piece with no joints at all. Moreover, the overall aesthetic appearance of the structure was taken into account. The exterior of the entire dam, including all the concrete surfaces of domes, buttresses, roadway and railings, were finished to a high degree with the application of a special surface compound. This created a smooth finish all over the structure. The architectural features of the dam are also unusual, in that the expenses entailed in building elaborate railings for the roadway, the cornice, the overhangs (complete with eagles), and other ornamental architectural details could have been avoided. However, since the dam was being built as somewhat of a showpiece, these expensive details were added.

The construction features of Coolidge Dam are as important and interesting as the design features. "Unique problems in concrete forming were solved with notable success in the construction of this multiple-dome dam. Despite the lack of precedent and the consequent necessity for pioneering, domes which involved curves in both horizontal and vertical planes were built true to design with smoothly finished surfaces by means of specially developed flexible form panels used practically without change throughout the job. Either by panels or trusses, successive tiers of forms supported on parts of the work completed previously, so that the structure was at all times self-supporting without scaffolding of any sort." Note: The details of the construction features of Coolidge Dam are taken from "Construction Features, Coolidge Multiple-Dome Dam." Engineering News Record. September 20, 1928.

When construction began, suitable materials for concrete aggregate were found in the streambed about a mile below the dam. A crushing, washing and screening plant was installed there and delivery from its stock piles to a concrete mixing plant on

(continued)

9 MAJOR BIBLIOGRAPHICAL REFERENCES

"Aerial-Tramway Development for Construction Haulage." Engineering News Record. May 30, 1929, pp. 856-860.

"A Construction Achievement." Engineering News Record. September 20, 1928, p. 422.

(continued)

10 GEOGRAPHICAL DATA

ACREAGE NOT VERIFIED

ACREAGE OF NOMINATED PROPERTY 21

UTM NOT VERIFIED

QUADRANGLE NAME Coolidge Dam QUADRANGLE SCALE 7.5'

UTM REFERENCES

	ZONE	EASTING	NORTHING
A	12	534960	3670640
B	12	544260	3670590
C	12	544210	3670320
D	12	543960	3670360
E			
F			
G			
H			

VERBAL BOUNDARY DESCRIPTION The nominated boundaries of the Coolidge Dam site are points A, B, C and D on the accompanying map. Point A is located on the northwest end of the dam's crest, point B is on the northeast end, point C is a point on the east

(continued)

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

STATE	CODE	COUNTY	CODE
N/A		Gila	07
STATE	CODE	COUNTY	CODE
		Pinal	21

11 FORM PREPARED BY

NAME / TITLE

Don Abbe, Research Assistant

ORGANIZATION

History of Engineering Program

DATE

June 15, 1980

STREET & NUMBER

P.O. Box 4089, Texas Tech University

TELEPHONE

(806) 742-3591

CITY OR TOWN

Lubbock

STATE

Texas

12 STATE HISTORIC PRESERVATION OFFICER CERTIFICATION

THE EVALUATED SIGNIFICANCE OF THIS PROPERTY WITHIN THE STATE IS:

NATIONAL X STATE ____ LOCAL ____

As the designated State Historic Preservation Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service.

STATE HISTORIC PRESERVATION OFFICER SIGNATURE Ann A. Pritzlaff

TITLE Arizona State Historic Preservation Officer DATE 8 July 1981

FOR NPS USE ONLY

I HEREBY CERTIFY THAT THIS PROPERTY IS INCLUDED IN THE NATIONAL REGISTER

Entered in the National Register

DATE 10/29/81

KEEPER OF THE NATIONAL REGISTER

ATTEST:

DATE

CHIEF OF REGISTRATION

GPO 931-803

United States Department of the Interior
Heritage Conservation and Recreation Service

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the hillside above the dam was made by a 2,000-foot long aerial tramway. This arrangement provided a cheap and dependable means of delivery without having to maintain a bridge across the river for trucks. It also put the mixing plant beside the road, which was convenient for receiving materials. Also, it was well above flood danger and it could chute directly to the distributing tower.

As unique and interesting as the design and construction of the dam are, the overall background of the dam, including the inter-agency and intergovernmental problems overcome in the building of the dam, is even more interesting.

By an act of Congress, on June 7, 1925, $5,500,000 was authorized for the construction of a dam on the Gila River in Arizona to store water for irrigating about 100,000 acres, largely Indian lands, adjoining the Salt River irrigation project. The contract was signed January 1, 1927, under terms calling for completion by July 1, 1929. The price was $2,268,000 exclusive of steel and cement, which were furnished by the government. The total cost of the dam and powerhouse was approximately $4,500,000.

The dam was built by the U.S. Indian Service under the general direction of H.C. Neuffer, designing engineer; J.A. Fraps, assistant designing engineer; C.H. Southworth, construction engineer; and E.L. Rose, electrical engineer. Fred A. Noetzli was consulting engineer throughout the work and, with L.C. Hill, constituted the first board to pass on plans. Later, a second board consisting of W.C. Langfitt and A.J. Wiley was appointed to review the plans. It was on the joint recommendation of these two boards that the unique multiple-dome type was adopted for this site. Contract for the construction was awarded in December, 1926, to Atkinson, Kier Brothers and Spice Company.

The dam was designed for the U.S. Indian Service under the direction of Major C.R. Olberg, who was also in overall charge of the Coolidge Dam Project.

Upon completion of the dam and the beginning of the filling of the reservoirs, other problems developed. The old town and Indian Agency of San Carlos were to be covered with water. Many structures had to be moved and an especially knotty problem developed with the Apache Indian cemetery. The Indians refused to allow remains to be disintered and moved, so a compromise was reached. The cemetery was covered with a large slab of concrete, to protect the dead from the waters of the new lake.

Another problem developed with the Southern Pacific Railroad. Fourteen miles of its tracks had to be realigned, at a cost of $2,400,000. The solution for this problem was reached when the U.S. offered to pay $1,000,000 of the moving expenses for the project.

The dam was completed in mid-1929, and dedicated on March 4, 1930. Ex-President Calvin Coolidge dedicated the dam by smashing a bottle filled with water against the bronze tablet imbedded in the dam.

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"Arizona State Inventory of Historic Places."

Arizona Highways. March 1930, pp. 13-14.

Arizona Republic. March 16, 1970.

Arizona Republic. June 1, 1977.

Arizona Blade-Tribune and Casa Grande Dispatch and Bulletin. Special Coolidge Dam edition, May, 1928.

"Construction Features, Coolidge Multiple-Dome Dam." Engineering News Record. September 20, 1928, pp. 438-442.

"Coolidge Multiple-Dome Dam." Engineering News Record. February 7, 1929, p. 239.

Day, Juliet. "A Dam for Arizona Indians." Arizona Highways. July, 1930, pp. 5-7, 22.

"Features of Design, Coolidge Multiple-Dome Dam." Engineering News Record. September 13, 1928, pp. 396-399.

May, Frank. "Coolidge Dam." Arizona Highways. March 1930, pp. 11-14.

"Proportioning Concrete Mixes for the Coolidge Dam." Engineering News Record. July 12, 1928, pp. 66-67.

"Rapid Progress Being Made on Coolidge Dam." Engineering News Record. April 5, 1928, p. 563.

U.S. Department of Interior, U.S. Indian Service, San Carlos Project, Arizona, Coolidge Dam Blueprints.

"Weighted Gate Closes Opening in Multiple-Dome Dam." Engineering News Record. March 7, 1929, pp. 386-387.

Wegmann, Edward. The Design and Construction of Dams. 8th rev. ed. New York: John Wiley and Sons, Inc., 1927.

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wall of the Gila River Canyon and point D is located at the eastern end of a sharp bend in the Coolidge Dam Road, at a point south of the dam and west of the Gila River. The dam lies within the irregularly shaped box created by these four reference points.