

# ART DECO NOW AND THEN: THE DESIGN HISTORY OF THE HOOVER DAM

By Barbara Billauer Bailey

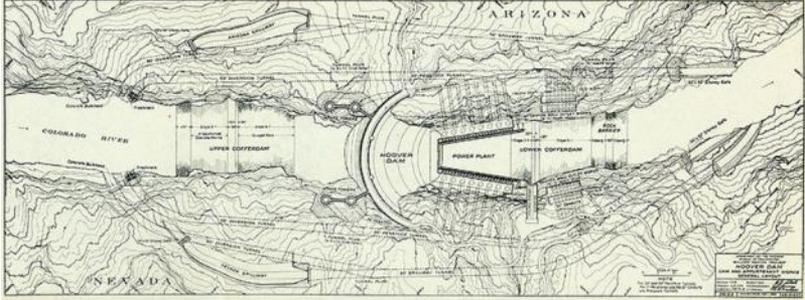


Truth be told, the design process for the Hoover Dam proceeded in exactly the opposite fashion from the Smith Center. First and foremost was the need to design for functionality and the technical difficulties to be overcome in constructing such a monolithic project. Only after these issues were addressed was attention paid to the architecture and overall design.



Since about 1900, the Black Canyon and nearby Boulder Canyon near the Arizona border had been investigated to support a dam that would control floods, provide irrigation water and produce hydroelectric power.

A concrete arch dam was selected for the construction, the largest of its kind at the time. It continues to provide power to Arizona, Nevada and California and improvements continue to be added all based on the art deco motif.

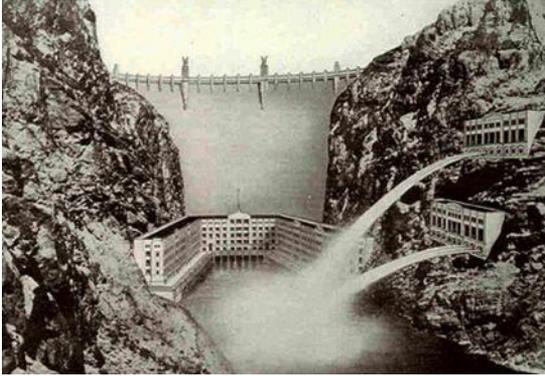


Work on the tunnels began in May 1931, but before construction on the dam could begin, the Colorado River had to be diverted from the project's foundation site. This occurred during the winter of 1932 through specially constructed tunnels, a technological marvel. Each tunnel was 4,000 feet long, 56 feet in diameter, and lined with three feet of concrete, making them the second largest tunnels ever made.



In June 6, 1933, the first round of concrete was poured for the dam's base. To allow the concrete to dry properly and prevent cracking, 230 individual blocks of concrete were poured. All in all, 3.25 million cubic yards of concrete were used, enough concrete to pave a highway 16 feet wide from New York to San Francisco.

The Bureau of Reclamation, at the time of the dam's construction, however, were more concerned with the dam's functionality, and adorned the dam with a Gothic inspired balustrade and eagle statues. Although the engineers' design was highly functional, the unbalanced outlet houses, government-office power-house, and massive eagles set on the roadway towers clashed violently with the image projected of Hoover Dam as a modern structure.



There are four towers sticking up from the top of the dam. The middle two are elevators and they are decorated with bas-relief. The five bas-reliefs on the Nevada elevator tower, done in concrete, show the multipurpose benefits of Hoover Dam: flood control, navigation, irrigation, water storage, and power.

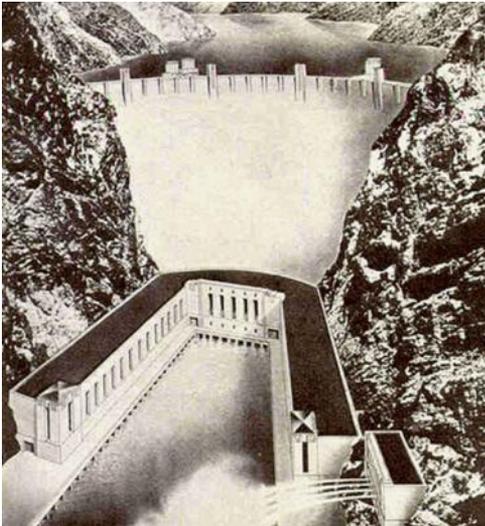
But the initial plans for the facade of the dam, the power plant, the outlet tunnels and ornaments clashed with the modern look of an arch dam, inviting criticism by many as being too plain and unremarkable for a project of such immense scale. Only after the functional components and general engineering schema was decided, was the design and architecture reevaluated and scrapped. The original design for the dam's facade by Bureau of Reclamation engineers made it clear that an architect needed to be brought in.



To protect the construction site from flooding, two cofferdams were constructed. Construction of the upper cofferdam began in September 1932,

even though the river had not yet been diverted. Work on the foundation excavations was completed in June 1933. During excavations for the foundation, approximately 1,500,000 yd<sup>3</sup> (1,150,000 m<sup>3</sup>) of material was removed. Since the dam would be a gravity-arch type, the side-walls of the canyon would also bear the force of the impounded lake. Therefore the side-walls were excavated too, to reach virgin (un-weathered) rock which had not experienced the weathering of centuries of water seepage, wintertime freeze cracking, and the heating/cooling cycles of the Arizona/Nevada desert.

Finally, two years after construction began, Los Angeles-based architect Gordon B. Kaufmann, was brought in to re-design the exteriors. Kaufmann greatly streamlined the design, and applied an elegant Art Deco style to the entire project. He designed sculptured turrets rising seamlessly from the dam face and clock faces on and only then did the dam begin to take on its famed art deco motif.



Gordon Kaufmann's design for dam façade submitted in January 1933.

Most of it was accepted by the reclamation committee <http://xroads.virginia.edu/~ma98/haven/hover/modern.html>

Kaufman "simplified and modernized the various parts of the dam. On the crest, the overhanging balcony and four unequal towers gave way to a series of observation niches and towers that rise from the wall and continue upward unimpeded. The emphasis, according to Kaufmann, was on 'an orderly series of small vertical shadows punctuated by the larger shadows of the elevator and utility towers.' He treated these extrusions as continuations of the dam face, not as separate moldings. The four large towers have

cutback corners and tops reminiscent of the set-back Los Angeles Times Building, but were treated much more simply. The two outer towers were for utilities and public restrooms, while the two inner towers acted as public entrances to the dam; from them, elevators descended inside the concrete to the internal galleries and powerhouse. Appropriately, these inner entrance towers contained the only ornament on the dam--two large cast-concrete panels by sculptor Oskar J.W. Hansen. These panels depicted such subjects as flood control, irrigation, power, and the history of the area. Their low-relief, semiclassical, cubist style typified Art Deco sculpture." (Wilson, 302-303).

Kaufmann also redesigned the spillways to be more streamlined, added lights to the top of the intake towers for nighttime effect, and reworked the powerhouse in a modernist, stripped-classicism style (Wilson, 304-305).

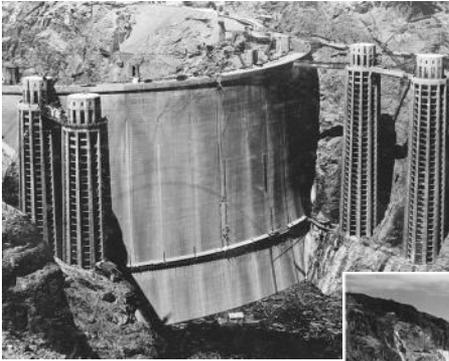


Photo: Ansel Adams, 1942

Denver artist Allen Tupper True then was retained to handle the design and decoration of the walls and floors, incorporating motifs of the Navajo and Pueblo tribes of the region.] With the assistance of the National Laboratory of Anthropology, True researched authentic decorative motifs from Indian sand paintings, textiles, baskets and ceramics. Although there was some initial opposition to this construct., images and colors were based on

Native American visions of rain, lightning, water, clouds, and local animals — lizards, serpents, birds — and on the Southwestern landscape of stepped mesas. In these works, integrated into the walkways and interior halls of the dam, True also reflected on the machinery of the operation, making the symbolic patterns appear both ancient and modern.



Terrazzo floor designed by Alan True for the Hoover Dam, using local Indian motifs.

The Indian motif was repeated throughout the construction. On the Arizona elevator tower is a series of five bas-reliefs, also in concrete, depicting "the visages of those Indian tribes who have inhabited mountains and plains from ages distant." Accompanying the illustrations is the inscription, "Since primordial times, American Indian tribes and Nations lifted their hands to the Great Spirit from these ranges and plains. We now with them in peace buildeth again a Nation."

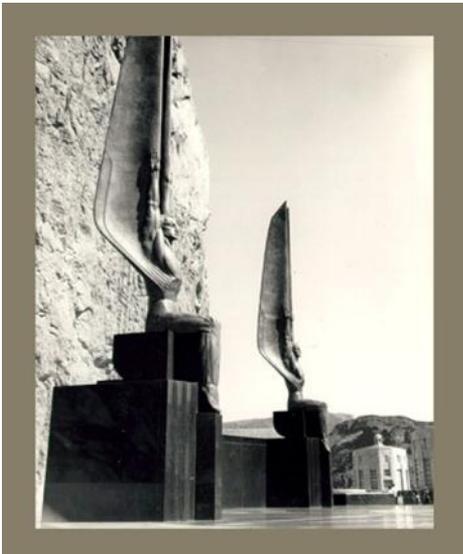
With the agreement of Kaufmann and the engineers, True also devised an innovative color coding for the pipes and machinery. True's work on the Hoover Dam was humorously referred to in a poem published in *The New Yorker*, part of which read, "lose the spark, and justify the dream; but also worthy of remark will be the color scheme."

A competition to find a monument for the dam was arranged; the winner was Oskar Hansen, whose strange winged figures, seated but still thirty feet tall, now adorn the site. Most of the rest of the sculptural aspects were also the work of Norwegian-born, naturalized American Oskar J.W. Hansen. For Hansen, building the dam represented the building genius of America, "a monument to collective genius exerting itself in community efforts around a common need or ideal," he was quoted as saying. He compared the dam to such works as the great pyramids of Egypt, and said

that, when viewing these man-made structures, the viewer often asks of their builders,

"What manner of men were these?" The sculptor, according to Hansen, tries to answer this question objectively, by "interpreting man to other men in the terms of the man himself." "In each of these monuments," he said, "can be read the characteristics of these men, and on a larger scale, the community of which they are part. Thus, mankind itself is the subject of the sculptures at Hoover Dam."

Hansen's principal work at Hoover Dam is the monument of dedication on the Nevada side of the dam. Here, rising from a black, polished base, is a 142-foot flagpole flanked by two winged figures, which Hansen calls the Winged Figures of the Republic. They express "the immutable calm of intellectual resolution, and the enormous power of trained physical strength, equally enthroned in placid triumph of scientific accomplishment.



The winged figures are 30 feet high. Their shells are 5/8-inch thick, and contain more than 4 tons of statuary bronze. The figures were formed from sand molds weighing 492 tons. The bronze that forms the shells was heated to 2,500 degrees Fahrenheit, and poured into the molds in one continuous, molten stream.

The figures rest on a base of black diorite, an igneous rock. In order to place the blocks without marring their highly polished finish, they were centered on blocks of ice, and guided precisely into place as the ice melted. After the blocks were in place, the flagpole was dropped through a hole in the center block into a pre-drilled hole in the mountain.

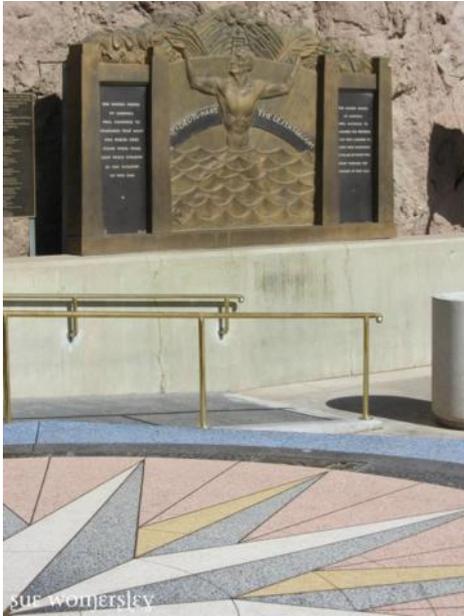
Oskar Hansen's winning sculptures

The great commentator, Wilson notes that "these surrealistic apparitions underscored the unreality of a dam and lake in the middle of a hostile desert" (309). Hansen also was responsible for a star map set in the floor of the monument; this map, indicating dates of historical importance, linked the moment the Hoover Dam was dedicated with such events as the building of the pyramids and the birth of Christ. Hansen believed that "in remote ages to come, intelligent people" would be able to discern "the astronomi-

cal time of the dam's dedication" (Wilson, 310).

Hansen also designed the plaque commemorating the 96 men who officially died during the construction of Hoover Dam, as well as the bas-relief series on both the Nevada and Arizona elevator towers. The plaque, originally set into the canyon wall on the Arizona side of the dam, is now located near the winged figures. It reads:

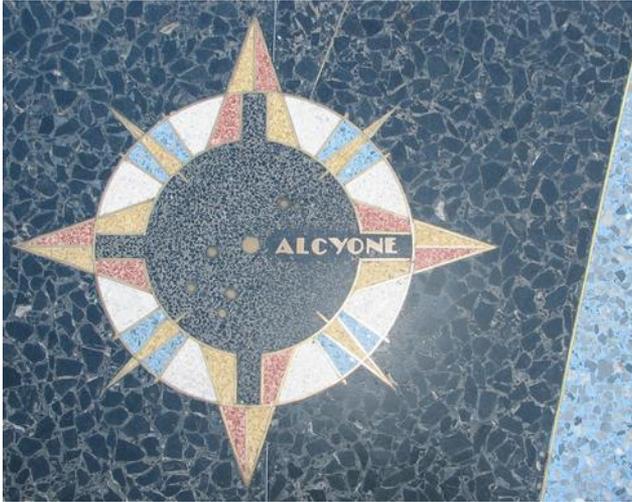
"They died to make the desert bloom. The United States of America will continue to remember that many who toiled here found their final rest while engaged in the building of this dam. The United States of America will continue to remember the services of all who labored to clothe with substance the plans of those who first visioned the building of this dam."



The apparent magnitudes of stars on the chart are shown as they would appear to the naked eye at a distance of about 190 trillion miles from earth. In reality, the distance to most of the stars is more than 950 trillion miles.

In this celestial map, the bodies of the solar system are placed so exactly that those versed in astronomy could calculate the precession (progressively earlier occurrence) of the Pole Star for approximately the next 14,000 years. Conversely, future generations could look upon this monument and determine, if no other means were available, the exact date on which Hoover Dam was dedicated.

Surrounding the base is a terrazzo floor, inlaid with a star chart, or celestial map. The chart preserves for future generations the date on which President Franklin D. Roosevelt dedicated Hoover Dam, September 30, 1935. The apparent magnitudes of stars on the chart are shown as they would appear to the naked eye at a distance of about 190 trillion miles from earth. In reality, the distance to most of the stars is more than 950 trillion miles.



Near the figures and elevated above the floor is a compass, framed by the signs of the zodiac.

"The building of Hoover Dam belongs to the sagas of the daring. The winged bronzes which guard the flag, therefore, wear the look of eagles. To them also was given the vital upward thrust of an aspirational gesture; to symbolize the readiness for defense of our institutions and keeping of our spiritual eagles ever ready to be on the wing."



The Dam itself is replete with modernistic features and art deco design – and in my opinion is a stellar example that imitation cannot compete with the original. Note the hallway and the elevators below:



Turbines reminiscent of a scene from a Jules Verne Novel (picture taken in 1942)

But the design story of the dam is not finished. In 2009 construction of a new bridge 900 feet above the Colorado River began, providing a new link between Nevada and Arizona. The incredible feat of engineering is supported on two massive concrete arches which jut out of the rock face. The arches are made up of 53 individual sections each 24 feet long cast on-site and lifted into place using an improvised high-wire crane strung between temporary steel pylons.



The arches measure more than 1,000 feet across. In the photo above, the structure looks like a traditional suspension bridge. But once the arches were complete, the suspending cables on each side were removed. Extra vertical columns were then installed on the arches to carry the road. The bridge has become known as the Hoover Dam bypass, although it is officially called the Mike O'Callaghan-Pat Tillman Memorial Bridge, after a former governor of Nevada and an American Football player from Arizona who joined the US Army after the 9/11 attack and was killed in Afghanistan.



The completed bridge as seen from Hoover Dam

While the Smith Center is a tremendous tribute to the dam, the alliance between the modernism of the engineering and architecture of the Hoover Dam renders it a coherent and cohesive structure of unusual and inimitable beauty. Because of Kaufmann's design, the engineering feat is appropriately reflected in the magnificence of the facade. Indeed, as an icon of modernism, the Hoover Dam helped to usher in a new era.

The Great Beauty Herself:



For Further Reading:

*Hoover Dam: An American Adventure* by Joseph E. Stevens; published September 15, 1990 by University of Oklahoma Press.

## ABOUT THE AUTHOR

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