



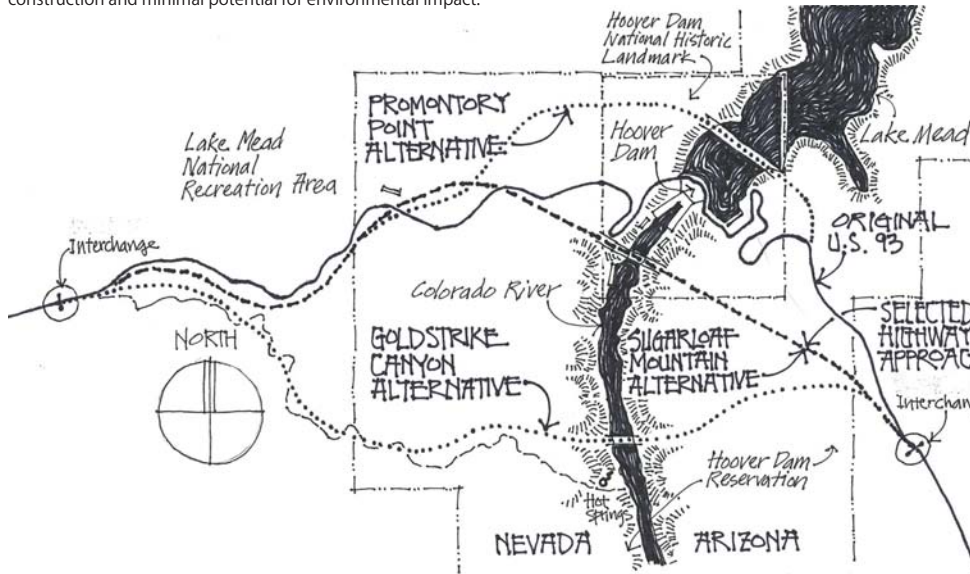
BEST CROSSING SITE

Selecting the best new bridge site was one of the first major decisions in bypassing the river crossing atop Hoover Dam.

The Project Management Team (PMT) identified 13 alternative routes early in the project. These crossings ranged from as far south as Laughlin to as far north as Lake Mead. Only three crossing alternatives near Hoover Dam deserved further study:

- 1) Promontory Point, crossing Lake Mead 1,000 feet north of the dam;
- 2) Sugarloaf Mountain, crossing Black Canyon 1,500 feet south of the dam;
- 3) Gold Strike Canyon, crossing the Colorado River about 4,000 feet south and out of sight of the dam.

The PMT compared the three alternatives to determine the best balance of highway approach and river crossing location. The **Sugarloaf Mountain Alternative** proved to be the best. Its site conditions allowed for optimal traffic flow, straightforward construction and minimal potential for environmental impact.



CHOOSE THE SITE for Crossing & Bridge

TRUSS

1000' total span

This truss type modifies the site to fit the bridge.

STRANGE ASYMMETRY

Also, the bridge shouldn't be locked into the canyon. It needs to move with heat expansion.

GIRDER

875' required

This girder type would require expensive rock blasting over a large area.

ROUND PEG IN A SQUARE HOLE

World record span for this bridge type is 800' over a flat river bed site.

CABLESTAY

250' 1000'

Site must be cut on AZ side to accept this type.

Winds will quickly wear out cables requiring very high maintenance costs.

Visual profile pierces the skyline.

Also, towers move inward to gorge & becomes more visible.

SUSPENSION

Very light line on the skyline.

High winds will buffet cables during construction. Cable fatigue requires inspection often.

HIGH COSTS FOR CONSTRUCTION AND MAINTENANCE as is usual economic metric

Very expensive to build. Can't stage work from below

BEST BRIDGE TYPE

Then, the Project Team selected the **Deck Arch** design as best of the five possible bridge types for the Colorado River crossing.

DECK ARCH

Low maintenance. Extensive rock excavation. Easy construction staging.

The Design Advisory Panel (DAP) also recommended guidelines for the new bridge design. They called for the design excellence of today to honor the achievements of the Hoover Dam designers in their day. This goal guided the design team's work through the further study of six deck arch alternatives. The final decision was to build a unique structure combining a modern steel superstructure with a long-span concrete arch to complement the historic Hoover Dam.

The bridge design is distinctive not only for the setting and length of the arch span, but also for the combined use of steel and concrete to optimize construction and structural performance.