QUESTIONS AND ANSWERS

GLEN CANYON DAM

U. S. DEPARTMENT OF THE INTERIOR, STEWART L. UDALL, SECRETARY
BUREAU OF RECLAMATION, FLOYD E. DOMINY, COMMISSIONER

U.S. Bureau of Reclamation.

THE DAM

HISTORY

Q. When was Glen Canyon investigated as a potential damsite?

A. First in 1921, then again in 1946 and in subsequent years.

Q. When was Glen Canyon Dam authorized for construction?

A. April 11, 1956, as part of the Colorado River Storage Project.

Q. When did work actually begin?

A. The first blast was detonated on October 15, 1956.

COMPLETION SCHEDULES

Q. When is the dam scheduled to be finished?

A. Construction of the dam and powerplant is scheduled for completion in March 1964.

Q. When is the first power scheduled to be generated?

A. The first power should go on the line in the spring of 1964.

EXCAVATION

COFFER DAMS

Q. What are the coffer dams?

A. Large, temporary earth dams across the floor of the canyon and located upstream and downstream from the foundation and keyway areas which mark the axis of the dam.

Q. Why are coffer dams built?

A. To divert the Colorado River around the damsite through huge diversion tunnels and to keep water out of the work areas during construction of the dam and powerplant. The deepest excavation to bedrock in the dam foundation is 137 feet below the former river level.

DIVERSION TUNNELS

Length (West)	2,749 feet
Length (East)	3,011 feet
Diameter (lined) of both tunnels	41 feet

Q. Why does the west diversion tunnel carry the most water?

A. Because the intake of the west tunnel is 34 feet lower than the intake of the east tunnel.

SPILLWAYS

Q. Where are the spillway intakes located?

A. They are just upstream from the keyways, one on each rim of the canyon.

Q. Where will the spillways discharge?

A. Steep, inclined tunnels will extend from the spillway intakes to intersect with the diversion tunnels far below. Thus, water going through the spillways will emerge from the diversion tunnels as the river water now does.

Q. What is the maximum combined capacity of the two spillways?

A. 276,000 cubic feet per second.

POWERPLANT

Q. Where will the powerplant be located?

A. On the upstream side of the Glen Canyon Bridge just below the dam. The powerhouse will extend across the canyon floor parallel to the bridge.

Q. How large will the powerplant be?

A. The powerhouse structure will be about 665 feet long and about 160 feet, or 16 stories high, above the downstream river level. Eight generating units will be installed. The rated capacity will be 900,000 kw for the powerplant.

Q. What are the square columns between the dam and the powerplant?

A. These huge concrete piers will support the 15-foot diameter penstock pipes which will carry water from the reservoir through the dam and into the turbines in the powerplant.

GENERAL

Q. What are the numerous black spots above the tunnel portals and elsewhere?

A. These are 8-inch square metal plates on the ends of anchor bolts. The anchor bolts extend into the rock to support the relatively thin outer layers of rock.

Q. What are the white markings on the canyon walls?

A. Survey control or reference points which have been painted on the rock.

Q. Why was the small suspension footbridge built?

A. More than 2 years was required to build the Glen Canyon Bridge — the highest steel-arch bridge in the world. Therefore, the footbridge was built so workers could cross the 1200-foot wide canyon; otherwise, it was 200 miles around by road.

CONCRETE PLACEMENT

GENERAL

Q. How much concrete will the dam contain?

A. There will be more than 5,000,000 cubic yards of mass concrete in the dam, and about 400,000 additional cubic yards in the powerhouse, tunnels, and other structures at the damsite.

AGGREGATE (Sand and gravel for the concrete)

Q. Where does the aggregate used to make concrete come from?

A. From the streambed of Wahweap Creek, 6 miles from the damsite.

Q. Is there a conveyor belt from the aggregate plant to the damsite?

A. No. The aggregate is hauled in large bottom-dump trucks.

CEMENT

Q. How much cement will be needed?

A. Approximately 3 million barrels, or 12,000,000 sacks.

Q. Where does the cement come from?

A. From a new cement plant constructed by the American Cement Corporation near Clarkdale, Arizona, 188 miles south of the damsite.

POZZOLAN

Q. What is pozzolan?

A. Pozzolan is a cement-like material which occurs in natural deposits.

Q. Why is pozzolan used?

A. Pozzolan is cheaper than cement; it reduces shrinkage in concrete and develops less heat in concrete during the curing period.

Q. Where is it obtained?

A. Near Flagstaff, Arizona, about 115 miles from the damsite. About 220,000 tons will be used along with 564,000 tons (3,000,000 barrels) of cement.

CONCRETE MIXING PLANT

Q. What is capacity of the mixing plant?

A. The maximum capacity is 480 cubic yards per hour, which is mixed in six, 4-cubic yard concrete mixers.

Q. How large is the mixing plant?

A. It is 217 feet, or more than 20 stories, in height.

HIGHLINE CABLEWAYS

Q. What will the highlines do?

A. Their main function is to carry the buckets of concrete from the batch plant to points of placement in the dam and powerplant.

Q. What is the size and weight of the concrete buckets?

A. 12 cubic yards. When filled, the buckets weigh 31 tons, 24 tons of which is the concrete carried in the buckets.

Q. How large are the highlines?

A. The higher towers are 190 feet tall; the main cable is 4 inches in diameter and about 2,000 feet long.

REFRIGERATION PLANT

Q. Why is the refrigeration plant necessary?

A. A large amount of heat is produced by the chemical action of cement during the setting of the concrete. The heat must be removed to prevent expansion and cracking of the concrete. The refrigeration plant supplies the slush ice and cold water necessary to reduce this heat.

Q. How is the heat controlled?

A. First, the aggregate is sprayed with ice water before going into the mixers. Second, slush ice, along with water, is used in mixing the concrete. Third, cold water is pumped through pipes embedded in the concrete to carry away the heat generated.

Q. How long will cold water have to be pumped through the cooling tubes in the dam?

A. Approximately 12 days immediately following placement of the concrete to prevent uncontrolled cracking. Then for about 52 days in the second stage, which may be many months later and which is for the purpose of assuring uniform shrinking of the huge concrete blocks.

CONCRETE BLOCKS

Q. How large are the blocks of concrete placed in the dam?

A. They vary in size. The largest are 70 feet by 180 feet in area; all blocks will be 7½ feet thick.

Q. Why are blocks used rather than building the dam as one solid piece?

A. Primarily, block placement facilitates cooling of the concrete and controls cracking due to contraction of the concrete. After the blocks have set and cooled, a mixture of cement and water (called grout) is pumped under high pressure into cracks between the blocks to form one solid mass of concrete.

PAGE, ARIZONA

GENERAL

Q. After whom was the town of Page named?

A. The late John C. Page, who served as Commissioner, Bureau of Reclamation, from 1937 to 1943.

Q. Was there a community on the site of Page prior to 1957?

A. No, nothing but raw desert land like that now surrounding the community.

CLIMATE

Q. What is the elevation of Page?

A. 4300 feet, or about 500 feet higher than the rim of the canyon.

Q. What are the extremes of temperature in Page?

A. 105 degrees in summer; 10 degrees in winter.

ACCOMMODATIONS

Q. Does Page have overnight accommodations?

A. Yes, two modern motels are open year around.

Q. Are there any restaurants?

A. Yes, there are now four restaurants in Page. In addition, the contractor's mess hall is open to the public.

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