III - HISTORY OF PROJECT

3-01 AUTHORIZATION

Lopez Dam was authorized by the Flood Control Act, approved 22 June 1936 (Public Law 738, 74th Congress) and extended and amended by subsequent Flood Control Acts of 1937, 1938, 1941, 1944, and 1946. The plan for construction, in accordance with the recommendations contained in the report dated 11 April 1940 by the Chief of Engineers, and submitted in House Document 838, 76th Congress, 3rd session, was authorized by the Flood Control Act, approved 18 August 1941.

3-02 PLANNING AND DESIGN

The planning for Lopez Dam was conducted by the LAD in conjunction with local interests including the Los Angeles County Flood Control District (LACFCD). A comprehensive plan for flood control in the Los Angeles County drainage area was presented by the LACFCD at a public hearing conducted by the Los Angeles District, U.S. Army Corps of Engineers (LAD) on 31 March 1936. The plan included provisions for improvement of the Pacoima Wash channel. The LAD subsequently began an investigation for flood control alternatives in the Pacoima Wash basin. The investigation was comprised of several alternatives including: locations for Lopez Dam, improvements to the Pacoima Wash channel, and diversion plans for flow from Lopez Canyon.

Design Memorandum No. 1 on Lopez Reservoir was prepared by the LAD in January, 1953. Design Memoranda Nos. 2 and 3 were prepared in February, 1954. Design Memorandum No. 1 contains the following principal departures from the original project-document plan: (1) constructing Lopez Dam at a more economical site on Pacoima Wash; (2) diverting flow from Lopez Canyon into Hansen Reservoir; (3) providing for a debris-control reservoir instead of a flood- control reservoir; (4) increasing the design peak outflow from 3,000 to 11,000 cubic feet per second; and (5) increasing the capacity of Pacoima Wash channel downstream from Lopez Dam. These departures involve changes in dimensions and elevation of the dam and changes in alignment of the channel. The spillway was intended for routine use. The purpose of Lopez Dam is to provide protection against debris-laden floodwaters for large areas between the dam site and the Los Angeles River. Some degree of flood reduction may be realized due to the physical location of the dam.

3-03 CONSTRUCTION

Construction for Lopez Dam started 1 April 1954 with the work being completed and accepted by the U.S. Army Corps of Engineers (COE) on 1 December 1954. The project was constructed by Vinnell Company, Inc. and copies of the construction contract (Contract No. DA-04-353 ENG-3198) and "as-constructed" drawings (File Nos. 145/1 through 145/22) are on file in the COE LAD office.

On 9 February 1971, an earthquake violently shook the San Fernando area in Los Angeles County. The tremors lasted for approximately 60 seconds. The earthquake was rated 6.6 on the Richter magnitude scale at the California Institute of Technology Seismological Laboratory at Pasadena, California, and

the epicenter was located 9 miles from Lopez Dam. The earthquake resulted in a general uplift of the dam and reservoir of approximately 6.9 feet and significant damage was sustained by the embankment, concrete spillway, spillway subdrain pipes, and pool drain conduit. Repairs were made resulting in the project being restored to original "as-constructed" conditions as shown on the as-constructed record drawings dated July 16, 1971, with the exception of the elevation changes due to the general uplift.

3-04 RELATED PROJECTS

Plate 3-1 shows related projects for the entire Los Angeles County drainage area. Related LACDPW water supply facilities in the Pacoima Wash drainage area are shown on Plate 3-2.

a. Pacoima Dam. Pacoima Dam is located on Pacoima Creek approximately 1.5 miles upstream of the Lopez Dam site. The concrete-arch structure, completed in 1929, is operated and maintained by the LACDPW for flood control and water conservation. Information pertaining to Pacoima Dam and Reservoir is given in Exhibit A.

b. Harding Street Bridge. The highway bridge across Pacoima Wash at Harding Street is located at the upstream end of the reservoir. It was designed for a discharge of 4,000 cfs at a depth of flow of 6 feet. Harding Street is the primary access route to Pacoima Dam.

c. Lopez Spreading Grounds. Lopez Spreading Grounds is owned and operated by the LACDPW. The facility is located approximately 1,500 feet downstream of Lopez Dam. The Lopez Dam outlet is used by the LACDPW to divert water into the spreading grounds as discussed in Section 2-04. Photographs of the diversion structure and the spreading facility are shown on Figure 2-5. Pertinent information concerning Lopez Spreading Grounds is listed below:

Maximum basin intake capacity	25 cfs
Maximum basin outlet discharge	7 cfs
Allowable water quality sediment limit	1,000 ppm
Storage capacity	25 AF
Percolation rate	7 cfs
* Basin gage height limits	5.0 and 6.0 ft

* Basin gage height limit refers to the depth of water in the basin during spreading operations.

d. Pacoima Wash Channel. The Pacoima Wash channel has been improved from Lopez Dam to the Pacoima Spreading Grounds. The channel improvement projects were completed by the COE as the lead agency with engineering and financial cooperation from the cities of Los Angeles and San Fernando, and the LACDPW. The improvements consisted of channelization, new bridges, drainage confluence and side drainage structures, and utilities relocation. The improved channel cross section varies from rectangular to trapezoidal. The channel capacity is 11,000 cfs at Lopez Dam and increases to 17,000 cfs at the Golden State Freeway crossing as shown on Plate 3-3. The rectangular channel is lined with reinforced concrete. The trapezoidal channel is lined with a combination of reinforced concrete and grouted stone.

e. Pacoima Spreading Grounds. Pacoima Spreading Grounds is owned and operated by the LACDPW. The facility is located approximately 3.5 miles downstream of Lopez Dam. A radial gate (55 feet long and 8.5 feet high) across Pacoima Diversion Channel diverts flows through the intake structure into the spreading grounds. The intake structure consists of four slide gates (each 5 feet x 5 feet). A photograph of the diversion structure is shown on Figure 3-1. An aerial photograph of the spreading facility is shown on Figure 3-2. Pertinent information concerning Pacoima Spreading Grounds is listed below:

Maximum basin intake capacity	600 cfs during storm releases 400 cfs during conservation releases
Maximum basin outlet discharge	Minimal (10 cfs) unless for emergency
Allowable water quality sediment limit	500 ppm
Storage capacity	392 AF
Percolation rate	100 cfs
*Basin gage height limit	5.0 ft

* Basin gage height limit refers to the depth of water in the basin during spreading operations.

The LACDPW removes the radial gate from the channel and does not lower the gate into the channel when flows reach 1,800 cfs.

f. Pacoima Diversion Channel. The Pacoima Diversion channel extends from the Pacoima Spreading Grounds to the Tujunga Wash. It is located southwest of and parallel to the Golden State Freeway, as shown on Plate 3-3. This channel is a man-made structure and was constructed as a part of the Lopez Dam Project. The channel capacity is 17,000 cfs. The trapezoidal section of the channel is lined with a combination of reinforced concrete and grouted stone. The rectangular section is lined with reinforced concrete. The section limits are shown on Plate 3-3.

g. Branford Spreading Grounds. Branford Spreading Grounds are owned and operated by the LACDPW. The facility is located near the Pacoima Diversion Channel/Tujunga Wash confluence. The facility discharges water into the Pacoima Diversion Channel and has no capability of diverting water from the channel. Pertinent information concerning Branford Spreading Grounds is listed below:

Maximum basin intake capacity	1,540 cfs
Maximum basin outlet discharge	1,520 cfs
Storage capacity	250 AF

3-05 MODIFICATIONS TO REGULATION

Design Memorandum No. 1 prepared in January 1953 did not provide for a gate on the outlet conduit. The outlet was designed to drain the low pool after each storm and to discharge material sluiced through Pacoima Dam. The size of the outlet was determined on the basis of free flow for a discharge of 300 cubic feet per second which was the estimated capacity of the sluice outlet of Pacoima Dam.

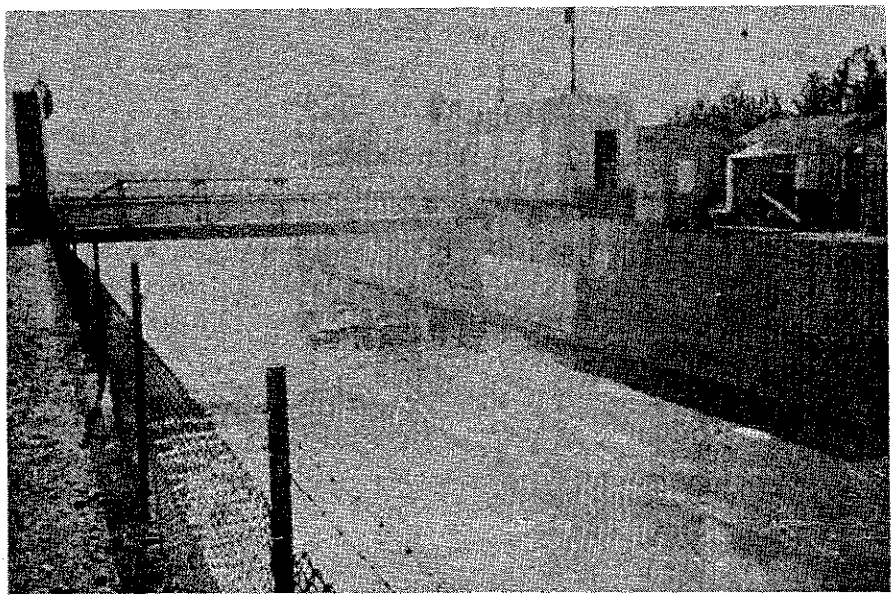

Figure 3-1. Photograph of Pacoima Spreading Grounds Diversion Structure, Looking Downstream.

Figure 3-2. Aerial Photograph of Pacoima Spreading Grounds.

Design Memorandum No. 2 prepared in February 1954 included a gate on the outlet conduit. The gate was added to the design following a model study in which it was determined that conduit flow emerging from the pool drain outlet to join the flow over the spillway would set up undesirable wave turbulence in the downstream spillway channel. The gate allowed the conduit to be closed during spillway flow.

Although no formal water control plan has existed, it was the intent of the original design for the gate to be closed during spillway flow or storms and opened to drain the low pool after each storm or to discharge material sluiced through Pacoima Dam. This procedure has been followed since operation of the dam began in 1954. A temporary modification was in effect from 1959 to 1964. A 1959 agreement allowed the LACDPW to operate the project for water supply purposes. However, the agreement expired in 1964 and has not been renewed. In addition, LAD has allowed temporary closure of the gate to trap material sluiced through Pacoima Dam. This was done with the understanding that LACDPW be responsible for removal of the trapped debris.

This water control manual includes the first formal water control plan for Lopez Dam. The water control plan is consistent with the intent of the original design. The gate will remain fully open except during spillway flow, when it will be fully closed.

3-06 PRINCIPAL REGULATION PROBLEMS

Other than the damage resulting from the February 1971 earthquake described in Section 3-03, there have been no major problems associated with the regulation of Lopez Dam and Reservoir. However, two minor problems have been identified that affect the regulation.

The first problem is associated with non-vegetative debris accumulation. The design for Lopez Dam included a sediment storage space large enough to hold the debris of a 50-year accumulation plus the debris produced by a single flood. Using a one percent debris surface slope projected upstream from the spillway crest, a debris storage allowance of 1,280,000 cubic yards (794 acre-feet) was originally provided. This storage was completely filled with debris by February 1969, only 15 years after completion of the dam. Debris removal is required more frequently due to this higher debris production.

The second problem pertains to seepage that occurs along the downstream toe of Lopez Dam. The seepage occurs when the reservoir level is at the spillway crest or above. The seepage does not appear to be detrimental to the integrity of the dam. However, stability problems could possibly arise at higher water levels or if the water level is maintained at the spillway crest level or above for prolonged time periods. The seepage problem creates a constant need for COE personnel to monitor the dam and limits prolonged reservoir storage. Seepage is also a cause of considerable concern to the local residents.