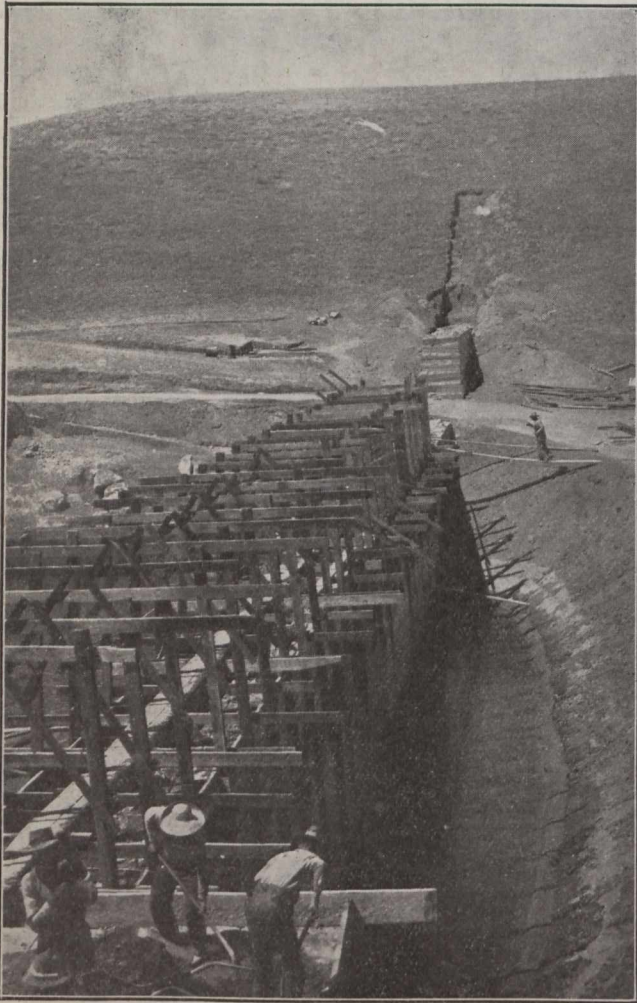


a municipal irrigation system irrigate 135,000 acres of land surrounding the city, and from its 1,500 feet of fall develop a maximum of 120,000 horse-power of electrical energy, for which funds have already been partially provided.

The foregoing briefly explains the impelling motives of the city in undertaking a work of such magnitude and the ultimate possibilities of the project. It is similar to the Panama Canal in that it is without a parallel in history.

It must be remembered that Los Angeles, to accomplish her purpose, went into a naked desert and among high and desolate mountains—a country practically devoid of habitation, fuel or water. The work of preparation in point of the spectacular outrivals the actual construction.



Building the Concrete Core-Wall of the Fairmount Reservoir.

Only the bare outlines can be given here, but the preparatory features included the construction of a standard gauge steam railroad 142 miles in length by the Southern Pacific Railroad Corporation, which secured thereby the hauling of the 20,000,000 ton miles of freight; the building of 315 miles of mountain roads and trails costing 260,000; the installation of three water systems comprising four reservoirs and 150 miles of mains at a cost of \$350,000; the building of a municipal copper line of telephone system with 460 miles of lines and costing \$75,000; the erection of three hydro-electric power houses and 268 miles of high-tension transmission line to furnish motive energy and light along the aqueduct zone at a cost of \$450,000; the construction of a large number of structures of all classes and description for men, animals and machinery; and, finally the purchase of clay and limestone deposits and the erection of a municipal Portland cement mill with two auxiliary tufa grinding mills

at a cost of \$800,000. A little over \$4,000,000 was expended before the work of aqueduct excavation was even started.

Since June of 1909, the excavation has continued at a rate exceeding 50 miles per year. To-day the excavation totals 220 miles. (This is approximate on the date at which I write—December 7th). Much of it has already been tested wherever water has been obtainable, and while no official date has been set for the dedication of the work, March 1st should see the finishing touches completed.

A tabulation showing the classification of the work, together with the total footage, is as follows:—

Classification.	Total footage.
Tunnel	42.69 miles
Power tunnel	9.23 "
Open unlined canal	21.14 "
Open lined conduit	39.56 "
Concrete-covered conduit	97.72 "
Haiwee By-Pass	1.92 "
Siphons (steel and concrete)	12.06 "
Flumes17 "
Power penstock44 "
Other power construction30 "
Reservoirs	8.5 "

Total length of aqueduct system 233.73 miles

The original design of the aqueduct, if the power was not developed, called for the use of the natural bed of the San Francisquito Canon for a distance of about 12 miles. Owing to the large asset in the power feature, hydro-electric power is to be developed simultaneously with the completion of the aqueduct so that instead of being permitted to follow the stream channel the water will be carried along the rim of the canon. This construction has been denominated as "Power" in the above classification and has been undertaken conjointly by the aqueduct and power bureaux, each bearing their pro rata of the expense. Denominated as "Division No. 14," this work was left to the last, as bonds for power construction were not voted until late in 1910. Otherwise the aqueduct might have been completed some months earlier than the date now set. Construction on this section was begun in August of 1911 and the last of the tunnels should be excavated shortly after the first of the year.

The system of reservoirs which is now under construction is one of the largest in existence. The Round Valley reservoir, with an impounding capacity of 340,890 acre feet, which will be situated 50 miles above the intake, will not be constructed until after the aqueduct is in operation. It has been designed solely for the storage of heavy years of precipitation as a safeguard against years of drought. The other reservoirs of the system are under construction and are as follows:—

Name.	Acre feet.
Haiwee	63,800
Fairmont	7,620
Dry Canon	1,325
Fernando (Lower)	25,000

Of the foregoing the Dry Canon reservoir is completed, the Haiwee is practically completed, while the Fairmont and the Fernando are well under construction. The dam of the Lower Fernando will be 700 feet wide at the base, 7,320 feet in length, 130 feet in height, and the fill amounts to 2,700,000 cubic yards. It is being built by sluicing and exclusive of the Gatun dam of the Panama Canal, will be the largest hydraulic filled dam in existence. This reservoir is at the terminus of the aqueduct and is calculated to afford four months' supply for one million population. Two other