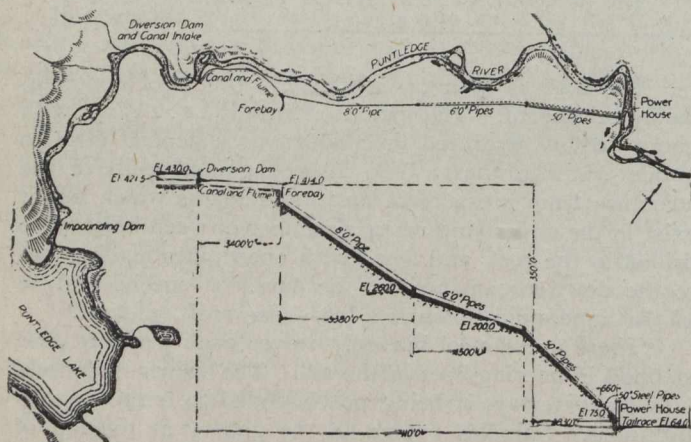


bevel-gear operating stands and hand cranks located on an overhead working platform.

Canal and Flume.—From the diversion dam to a point as near the power house site as the topography will allow, but distant therefrom approximately 3 miles, the water is led in an open canal and flume aggregating 3,400 ft. in length to a forebay. The first section consists of rock masonry-lined canal 14 ft. x 7 ft. deep, for a distance of 330 ft. This leads to an open semi-circular wood-stave flume 2,200 ft. in length and 12 ft. in diameter. The flume rests in round iron supports suspended from stringers. Water enters it from the canal through a small spillway.

The flume leads to 900 ft. of open canal, the first part of which runs through unlined clay, and the remainder of which is concrete lined by concrete plaster on two layers



Puntledge River Development in Plan and Profile.

of triangular mesh. The cross-section of the canal varies somewhat according to the material through which it is excavated, but corresponds in area and capacity to that of the flume. The gradient from the diversion dam to the forebay is 0.002.

The latter section of the canal leads to a circular reinforced concrete flow tank, and has about 100 ft. of spillway just at the intake to the forebay. The latter is about 25 ft. in diameter and 25 ft. in depth. It is reinforced concrete structure, cylindrical in form with vertical axis, the canal entering on one side and a pipe 8 ft. in diameter connecting on the opposite side. The intake to the forebay closes by a counterbalanced tainter gate about 12 ft. wide and 9 ft. deep. The tank is divided by a wall and screen to separate the entry from the delivery sides, forming a sedimentation basin at the entry side at the bottom of which a blowoff is provided. Just above the forebay

the canal is provided with a spillway with drainage to the river, to carry away any surplus water at this point.

From the forebay the penstock line consists of a single 8-ft. wood stave pipe leading for a distance of 2,380 ft. to a reinforced concrete Y with gates. From this Y one 6-ft. wood stave pipe leads for 4,477 ft. to a second Y, which has two inlets, being provision for a second 6-ft. pipe and four outlets. This second Y is also of reinforced concrete and has a 72-inch crane gate valve on the inlet pipe, tested to 240 pounds, and two 50-inch valves on the outlet pipes installed at present. The present installation from this on consists of two 50-inch wood stave pipes for 3,056 ft. It will be noted from the above that there is provision for four of these 50-inch pipes. Below the 50-inch wood pipe there is 660 ft. block beam steel pipe $\frac{3}{8}$ inch thick at the upper end and $\frac{7}{16}$ inch thick at the lower end, leading directly into the power house. They are laid in trenches, much of which is in solid rock.

By means of gate valves placed in the 72-inch and in the 50-inch penstock lines either of the lower or 50-inch penstocks may be fed from either or both of the 6-foot pipes above described, each 72-inch pipe line having a valve at each end and each of the 50-inch pipes having a valve at the structure to which they connect.

Expansion joints are fitted about midway in each steel pipe. These are steel castings with packed slip-joints. Each joint is in a concrete chamber and the steel pipe is laid in tarred felt through the walls of this chamber so that it is free to slip. The lower ends of the steel penstocks are anchored near and at the power house foundation and terminate within the building with a cast iron closing piece connecting them to hydraulic shut-off valves installed at the respective turbines.

Power House.—The power house is built of reinforced concrete on a rocky site at the river's edge; only approximately one-half of the principal building contemplated has been erected for the annex section of the building which contains the switching and other electrical apparatus and the wire outlets has been built complete. Provision has been made in the design for extension of the main body of the building to house the remaining units without disturbance to the operation of the present plant.

The annex section, which is three stories high and $18\frac{1}{2} \times 65\frac{1}{2}$ ft. in floor dimensions, has the upper floors of concrete supported by I-beams. The roof of the entire building is built of concrete laid on ribbed-steel mesh plastered underneath. The roof framing of the annex section consists of 9-in. 12-lb. I-beam rafters and that of the main section of steel trusses placed 20 ft. centre to centre, supporting 9-in. 21-lb. I-beam purlins. The sides



Diversion Dam with Beginning of Masonry-lined Canal. Note Fish Ladder on Right.