

FIG. 5. Steel Penstock from Powerhouse Roof.

of this space on the main floor as a landing and working bay. Provision is made for future installation of a second turbine.

The turbine, of the Francis reaction type, is rated at 36,000 h. p. and 200 R. P. M. under 226 feet effective head, and is of S. Morgan Smith manufacture. A noteworthy feature is the use of a cylinder gate in addition to the conventional wicket gates. The cylinder surrounds the wicket or regulating gates and is raised

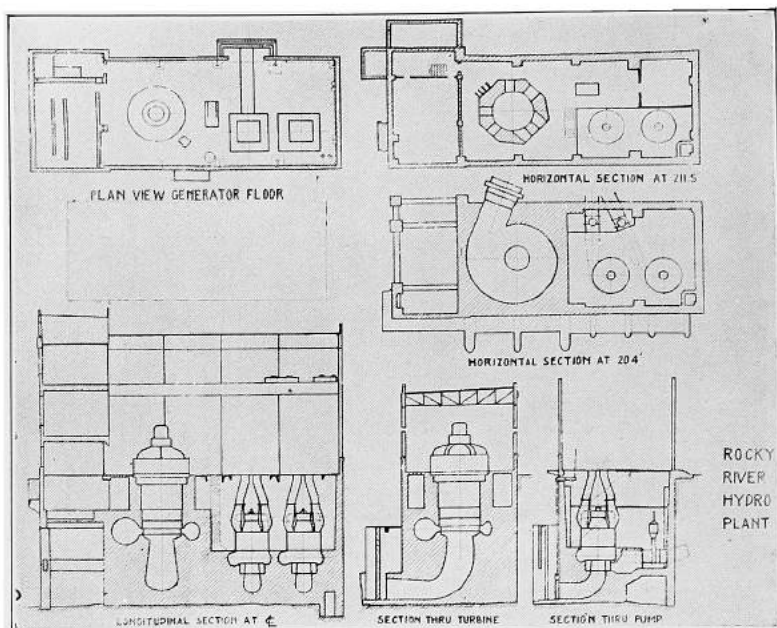


FIG. 6. General Layout of Powerhouse.

or lowered by water pressure from the penstock. When the cylinder gate is closed the turbine runner and wicket gates may be removed for repairs. The cylinder gate takes the place of the customary butterfly or other gate that is otherwise required in the penstock just ahead of the turbine and saved the space and foundation for such a gate. Both turbine and cylinder gate were manufactured as a unit by the S. Morgan Smith Company.

Mounted on the same vertical shaft with the turbine is a 30,000 K.V.A., 13,900 volt General Electric generator, with direct-connected exciter.

Each of the two pumps has a capacity of 250 cubic feet per second, 112,500 gallons per minute, or 162 million gallons per day, against 240 feet head. The pumps are mounted with the shaft vertical. They are pioneers in their class, and are, so far as we know, the largest high-head pumps in America. A model pump with dimensions reduced in exact proportion was made and tested before the full-size machine was built. These pumps were designed and furnished by the Worthington Pump and Machinery Corporation.

Each pump is driven by an 8,100 h. p., 13,200 volt General Electric motor mounted on the same shaft with the pump and driving the latter at 327 R. P. M. The ducts that rise above the motor are merely to ventilate the machine by carrying the hot air away from its immediate vicinity.

The control board, low-tension circuit breakers, storage battery and feeder panels for service to nearby towns are located in the "electrical bay" at the east end of the building.

The powerhouse is founded on solid rock which was fortunately placed by nature at about the proper elevation. The substructure is of mass concrete and no particular problems were involved in its construction. A pleasing architectural design of the exterior of the powerhouse was developed by the use of Old Colonial red brick with white artificial stone trim. (Fig. 7.) The interior is of light buff brick and the floor will be tiled. A 125-ton crane is installed for assembly and possible repairs.

An extensive outdoor substation contains the high-tension circuit breakers, transformers, lightning arresters, and makes the tie to the transmission lines.

CONSTRUCTION OF THE ROCKY RIVER DAM & DIKE.

The design features of the dam have already been described. In construction the first operation was to prepare the foundation by stripping the topsoil containing roots and organic matter.

The next operation was to construct a concrete conduit underneath the future dam to pass the water of Rocky River during construction, and divert the water into the conduit. Following this a trench was dug for the corewall and the concrete portion of the corewall was built. A small dike was thrown across the river to hold a pool and the operation of hydraulic sluicing was commenced.

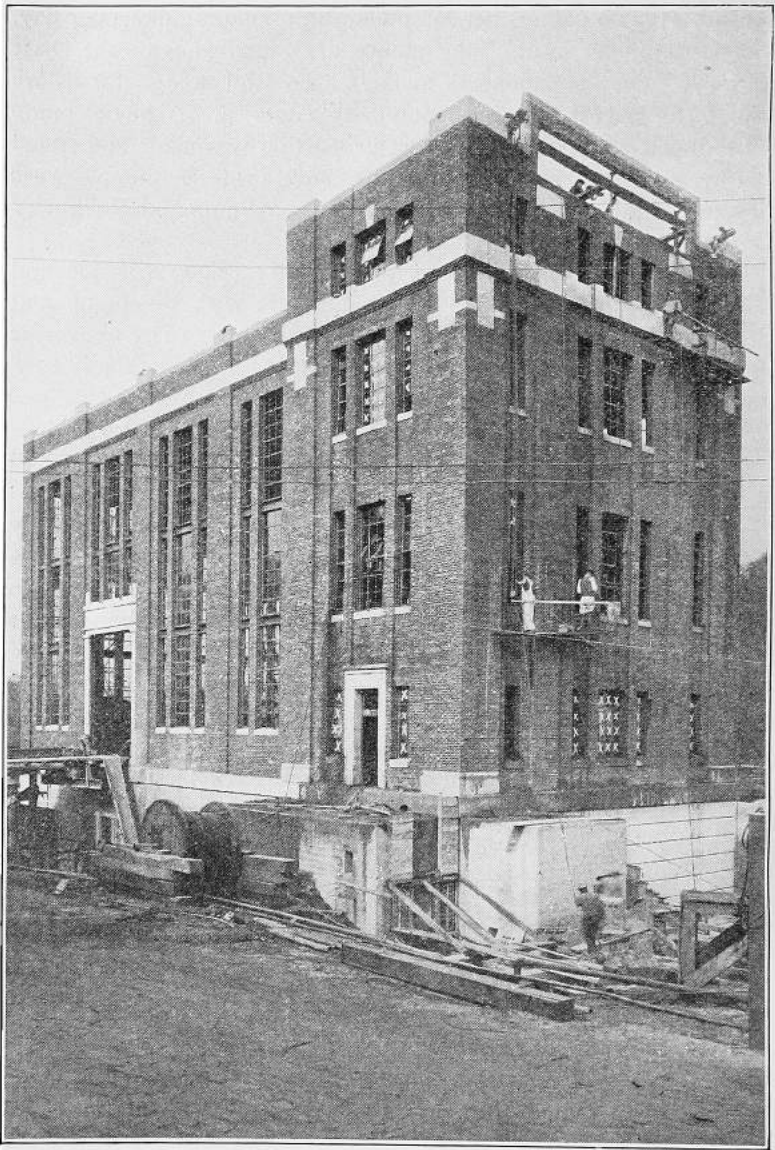


FIG. 7. Exterior View of Powerhouse.

Note in Figure 8 the great width of the structure at the base. The excavator always scoops up a little sand from in front of the sluice pipe to keep the levee above the level of the pool, while the sluicing continues day and night. The sluice pipes discharge near the faces of the dam, the coarser material settles at once while the finer materials stay in suspension longer and settle near the corewall in the center of the dam. The water escapes to a drain leading from the bottom of the perforated chimney shown in the center of the picture in Figure 2.

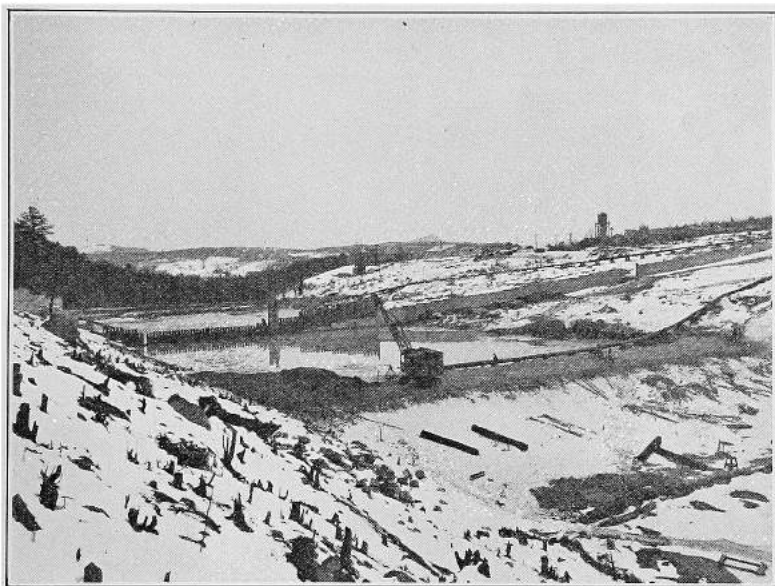


FIG. 8. Pool during early stages of Dam.

The earth for the dam is obtained from the canal, where the 4-yard Bucyrus drag-line excavator is at work. (See Fig. 9.) The excavator dumps the material into a sluicing pit (Fig. 10) where hydraulic giants play upon it and wash it into the sluice pipe. This operation is continued until the dam is completed. Final topping off to make the completed dam is done by the small excavator. (Fig. 11.)

Not all of the material could be placed in the dam by gravity sluicing. As the dam rose in height it became necessary to wash the excavated material into dredge pumps, which pumped it into

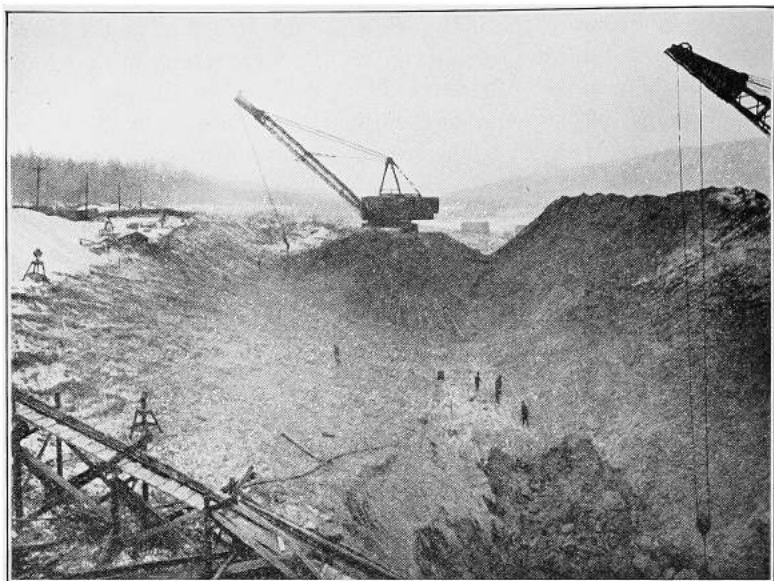


FIG. 9. Four-Yard Drag-Line Excavator digging Canal.

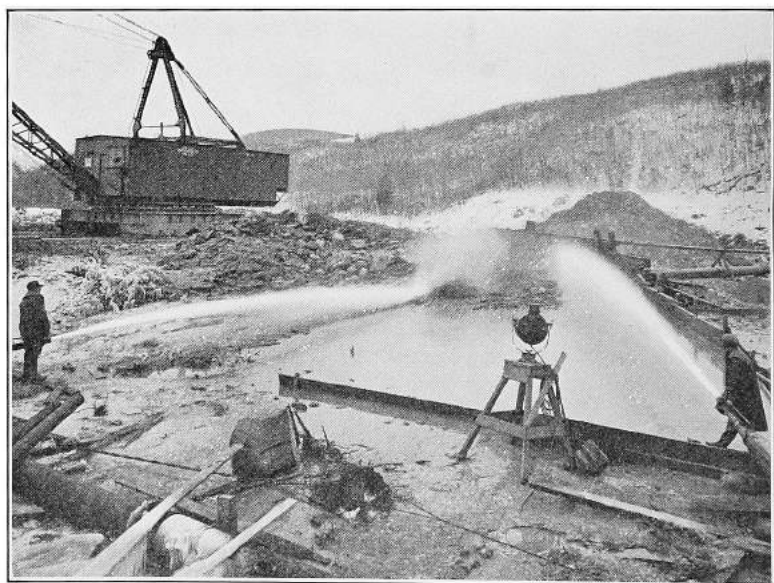


FIG. 10. Sluicing Pit.

place. Except for the insertion of dredge pumps in the sluice lines, the process was the same as for gravity sluicing.

Hydraulicking cannot be carried on in the freezing months of winter but the 4-yard dragline excavator kept working during the winter of 1926 and 1927 and built up large storage piles of earth beside the canal to be sluiced into the dike in the spring and summer of 1927. A considerable volume of earth was placed in the upper part of the dike by direct casting from the drag-line excavator.

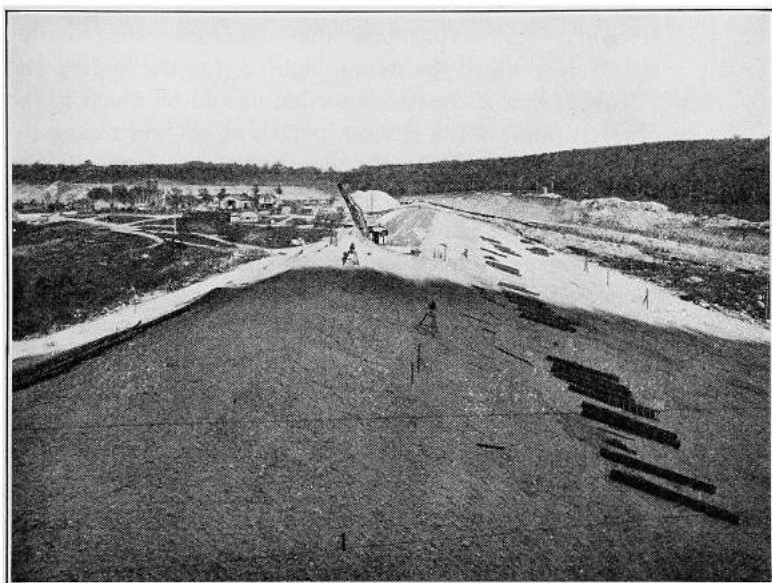


FIG. 11. Completing Main Dam.

The Rocky River project will form an important addition to the already large generating capacity of The Connecticut Light & Power Company and will be tied in with the large steam plant at Devon, the hydro plants at Stevenson and Bulls Bridge, and other plants. The development was designed and constructed by The U. G. I. Contracting Company for The Connecticut Light and Power Company, the owners of the Rocky River project. The entire job is now nearly completed and will be in partial operation this summer.