

1908-09 .....	40,000,000	kilowatt-hours
1909-10 .....	48,000,000	" "
1910-11 .....	75,000,000	" "
1911-12 .....	102,000,000	" "
1912-13 .....	126,500,000	" "

It was therefore decided that the original plant which had been increased from time to time, bringing the total output up to 42,500 h.p., should, with the available storage in the Coquitlam Lake, be increased to a total of 83,000 h.p., so that the two plants could be operated satisfactorily as a peak load plant in conjunction with other plants contemplated by the company in the future.

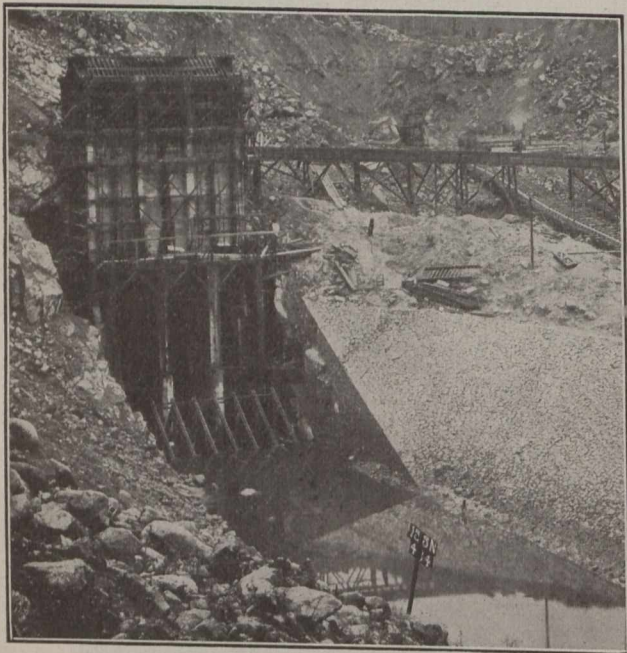


Fig. 5.—Gate Tower at Diversion Tunnel, with Flashboards for Temporary Water Storage.

**New Dam.**—A plan and profile of the new dam which is of the hydraulic-fill type with heavy rock toes, is shown in Figs. 2 and 3 respectively. The preliminary operations of building the dam were begun in the winter of 1908. Much exploration work was rendered necessary by opposition to the construction of the dam from various quarters, to determine the foundation conditions and also the location of rock for the purpose of driving a diversion tunnel for the floods. The result of the exploration showed rock in the east bank which dropped to an unknown depth one-third of the distance across the old river bed; abutting against this rock was a fine strata of blue and yellow impervious clay, making a perfect foundation for a dam of the hydraulic-fill type. The actual construc-

tion of the dam proper was not begun until March, 1912. The main dimensions of the new dam are as follows:—

Height of dam on centre line .....	99 feet
Extreme width of dam at base .....	655 "
Width at crest .....	40 "
Length of dam along crest, exclusive of spillway .....	950 "
Width of spillway .....	250 "
Elevation of spillway above sea level .....	503 "
Crest of dam above sea level .....	518 "
Slope of up-stream face .....	1 in 5
Slope of down-stream face .....	1 in 2 to 1 in 4
Original area of lake, old dam .....	2,328 acres
Area of lake at elevation 503 ft. ....	3,075 "
Storage capacity of lake above elevation 432 feet .....	

192,100 acre-ft. or  
8,369,000,000 cu. ft.

Storage capacity in electric energy at  
78% efficiency ..... 60,600,000 kw. hrs.

For the purpose of diverting the river and flood waters during the construction of the dam, a tunnel 490 ft. in length, having a clear width of 26 ft. with a height of 18½ ft. in the centre, was constructed on the east bank. This tunnel, which has its invert level at El. 435, was designed to carry 12,000 cu. ft. per sec. when the lake level was at El. 475, but the maximum quantity discharged through it did not amount during construction to more than 6,000 cu. ft. The maximum recorded flood over the old dam during the past ten years was 12,000 sec.-ft., or approximately 116 cu. ft. per sec. per sq. mi. of drainage area.

**Gate House.**—The gates for controlling the water through the diversion tunnel were placed in the concrete tower at the end of the approach channel. The bottom of the tower is at El. 455, spanning the tunnel entrance and supported on piers placed parallel to the floors in the tunnel. Girders were provided at the up-stream end of the piers for six temporary steel roller gates each 4 ft. 6 in. wide by 17 ft. high. These gates were controlled during the construction of the works by means of a gasoline hoist placed at El. 475 and arranged so that as the water rose in the lake they could also be operated at El. 508.

Upon the completion of the dam these gates were closed behind with a bulkhead of concrete filling up the whole space at the bottom of the tower, and forming a solid mass of concrete 26 ft. thick.

The tower, illustrated in Fig. 5, is rectangular in form, built up of three separate and independent compartments each 8 ft. by 11 ft. The main sluice gates are three in number, each five feet in diameter, faced with gun metal, and are designed to allow a certain quantity of water to pass down the river at any time for keeping

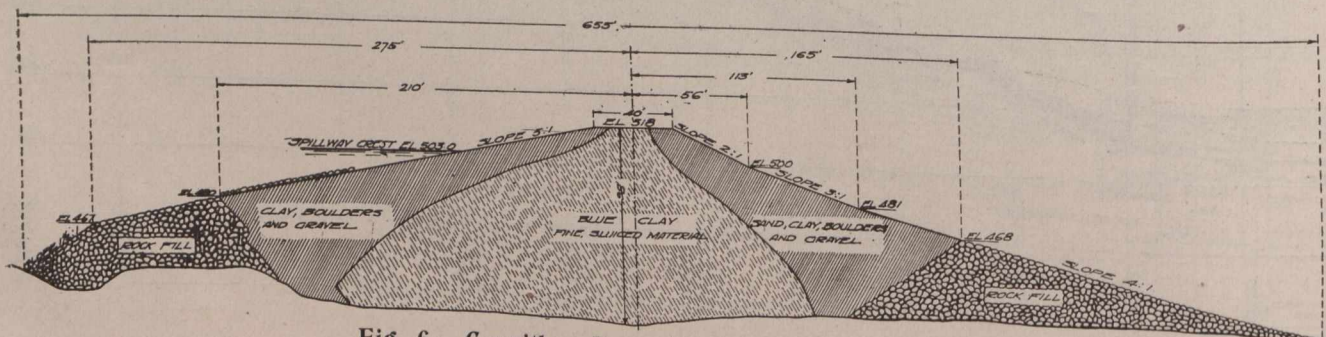


Fig. 6.—Coquitlam Dam, Maximum Cross-Section as Built.