

crete curtain walls and roof. It is 51 feet wide x 120 feet in length, and was designed to accommodate four compressors each of 4,500 cu. ft. of free air per minute capacity. Three compressors are now in commission, with space left for an additional unit. One compressor, designed and built by Fraser & Chalmers, of London, England, is of special design, being fitted with Hoerbiger valves of variable volume gear of the Doerfel type, which automatically adjust the output of the machine to the exact requirements of the demand for air, thus doing away with peak loads and thereby reducing the cost of power, which is purchased upon a basis of peak loads. The cylinders are 22½ in. x 38 in. x 30 in. stroke. The speed is 125 r.p.m. This machine has a complete range of capacity from zero to full load, automatically controlled by suitable governor gear. The other two compressors were designed and built by the Nordberg Manufacturing Company, of Milwaukee, Wis. They are designed to run at full load continuously, and have no variable volume gear; the cylinders are 22 in. x 37 in. x 31 in. stroke. The valves are Corliss and the speed is 125 r.p.m. These compressors possess the unique advantage of being reversible; thus in the event of an interruption to the supply of electric power they may be operated as steam engines and their motors may be driven as generators of electric power. The supply of steam for this purpose can be obtained from a battery of four Wickes vertical water-tube boilers, each having 3,000 sq. ft. of heating surface and connected through suitable breeching to an induced draft fan which enables the boilers to be run at a high overload during such time as the compressor plant is being used as an auxiliary steam-driven electric power plant.

In addition to the usual intercoolers each compressor is equipped with a Fraser & Chalmers vertical aftercooler, each having 1,100 sq. ft. of cooling surface and so designed that the tubes and tube plates can be lifted out of the cooler shell for cleaning.

The boiler house is built on the east end of the compressor building and is of the same type of construction. It accommodates the electrically driven pumps for mill water. A concrete intake and suction well has been built to insure a liberal supply of clean water at all seasons of the year.

### SURVEY WORK IN THE TRENCHES.

Writing from the trenches in France to the editor of *The Canadian Engineer*, Eric S. Fowlds, formerly assistant engineer, Trent Valley Canal, now attached to the 2nd Field Company, Divisional Engineers, First Canadian Contingent, states: "Engineering conditions out here are, as might be expected, rather different from those in civil life, and a survey in the trenches is quite a novel experience. It is all prismatic compass work, of course, and in spite of the amount of iron close at hand I have gotten some very good results,—especially as a great deal of it must be done through a periscope. One holds the compass in one hand and the periscope in the other and tries to hold them both steady despite what is going on around him. A periscope has the unfortunate habit of drawing a fire if held up too long in one spot. But by the time the fire gets heavy we have generally moved along, and the infantry get it, whereupon they pass some very vivid reflections upon our meddlesome ways. One picks up some new and very original expressions out here in that way. It's a great life, though, and in many ways a very good experience. There is another thing about it—employment out here is very good."

### COMPLETION OF SOOKE LAKE WATERWORKS SYSTEM FOR VICTORIA, B.C.

ON Friday, May 28th, Mayor Stewart opened the gate valves at the Sooke Lake dam, and put into operation Victoria's new water supply of 17,000,000 gallons per day. This supply is about three times the present consumption of the city, including that of the municipalities of Oak Bay and Saanich. Hence it will be ample for many years to come.

The new system is the third to serve the city of Victoria. The first was by carrier and the second was a municipal plant established in 1874. For the past ten years or more the scheme just put into service has been the subject of consideration and controversy. So interesting is its history that the following outline is abstracted from a full account in *The Times* (Victoria) of recent date. The location of Victoria, at the extreme south end of Vancouver Island, and surrounded on two sides by salt water, greatly augmented the difficulty of solving its problem of water supply. A northern source had been the first selected by the early advisers of the city, but twenty years after its inauguration fault was found both with the quantity and quality of Elk Lake water. However, by supplementing existing sources, the day when a definite choice of an abundant supply would have to be made was put off for a number of years.

**History of the Scheme.**—Arthur L. Adams, of San Francisco, an expert who had reported fully on the Goldstream supply in 1905 (controlled by the Esquimalt Waterworks Company) was called in to make a supplementary report on the possible sources of supply. He reported in December, 1907, on the various schemes, both to make Elk Lake afford a supply in the interval till a new supply could be secured, and also on the Millstream and Sooke proposals.

Sooke Lake he recommended on account of its being an almost ideal source of supply, and submitted two alternative schemes, one involving a tunnel under the mountain, to Goldstream, and the other a natural outlet down Sooke River and then paralleling the coast to Victoria.

This latter route, which was eventually adopted, had been recommended by Mr. Devereux a year earlier, as the only practicable route for obtaining a gravity water supply from Sooke Lake to the city. The route was not examined then as his instructions did not embrace the detour.

In the January following, a referendum was adopted in favor of Sooke Lake as the eventual future supply for Victoria. A private bill was promoted in the legislature to enable the council to proceed to Sooke Lake for the supply, and to seek to sell power for commercial purposes. Strong opposition developed, and the bill was withdrawn ultimately. Little progress was made on the general scheme in that year, temporary improvements patching the system up till the following year. In 1909 a bill was carried through the legislature to enable the council to submit a by-law for the purpose of expropriating the undertakings of the Esquimalt Waterworks Company. The agitation continued during the summer, and on August 26, 1909, a by-law to expropriate the lands and undertakings was submitted, but was defeated.

In 1910 the electors failed to reaffirm their adhesion to the policy of going to Sooke Lake as the future supply of the city. However, a citizens' committee was appointed early in the year, which carried out a thorough investigation into the rival claims. It eventually recommended the expropriation of the Esquimalt Waterworks Company's undertakings. The decision was based on