The work was designed and constructed by the writer under the supervision of Lieut.-Col. H. J. Lamb, district engineer, who is now on the general staff of the 1st Canadian Expeditionary Forces. The safe load for floor of wharf and warehouse is approximately 500 pounds per square foot.

All grading in rear of the structure was performed by the corporation of the City of Windsor under their city engineer, Mr. M. E. Brian, B.A.Sc.

VANCOUVER POWER OFFERS.

A FEW months ago the City of Vancouver began to look about for some source of hydraulic power wherewith it might fulfil its own requirements in the matter of light and power. The British Columbia Electric Railway Company has been supplying the city for a number of years and has ample supply, but the question of rates had evidently created a desire to investigate the feasibility of a municipal scheme.

The following seven propositions have been advanced for the city council's consideration:

A scheme three and a half miles north of Port Haney, 28 miles from the city, was submitted by F. J. Hart. Three hundred feet of head is stated to be available in a canyon on North Lillooet River. The price was $10,000.

W. T. Hoyse offered a potential water scheme on the West River, flowing into Loughboro Inlet, 180 miles from Vancouver, no price being stated.

E. F. McLennan and Frank Kelley submitted a scheme for developing 50,000 to 75,000 horse-power on Glacier Lake, 16 miles north of Harrison Lake, for $10,000.

The Cheakamus proposition of the B. C. Power & Electric Co. was submitted by Messrs. Ducane and Dutcher, the price being $1 a horse-power on the normal development at the dynamo. The estimated development was 100,000 horse-power. The site is 55 miles from the city by a transmission line.

The Nairn Falls Power Company, through Gerald A. Kent, engineer, submitted its sites on the Pacific Great Eastern Railway, 60 and 66 miles from the city. Two power houses are possible, with a total development of 50,000 horse-power. The price quoted was $250,000.

The water-power sites of J. F. Deeks on Howe Sound, and of the Coast Quarries Company at Granite Falls, on the North Arm of Burrard Inlet, were also offered. The price of the former, which included gravel bunkers, was $250,000. The Coast Quarries Company wanted a price equivalent to the value reckoned on the earnings of the last six years, as being five per cent. of the capitalization. The amount invested had been $100,000. There was from 3,000 to 4,000 horse-power available. In the Deeks offer there was 8,000 to 10,000 horse-power mentioned.

Another scheme offered at a previous meeting was that of the Bridge River Company, near Lillooet, where between 300,000 and 400,000 horse-power is said to be available.

Montana have recently enacted an amendment to their state highway law, providing that all bridge contracts shall be let in accordance with plans and specifications standardized and prepared by the state highway engineering department; the plans to be placed on file with the county clerk for 30 days prior to letting contracts. Under these conditions, Montana will be able to obtain not only cheaper but better results than were possible by the former method. In California, it has been proposed to consolidate all highway engineering within the state under the jurisdiction of the state.

VALUE OF MECHANICAL FILTERS IN WATER PURIFICATION.*

THE efficiency of the mechanical filter must be gauged to a very large extent by the character of the water to be treated—for example, if it has an excess of suspended matter; if it contains an unusual amount of peaty matter, causing a dark color, or giving it a plumbo-solvent action; if it contains an excessive amount of iron in solution; if there is evidence of excess of bacteria; or if there are special difficulties in securing a suitable supply, as in the tropics or on military expeditions. The quality of the water is, of course, determined by its origin, be it an upland lake, natural or artificial, or a deep well, free from pollution, or be it a shallow well or a river, polluted or liable to pollution. For convenience, the subject of the efficiency of these filters may be dealt with under five headings: (1) Suspended matter; (2) presence of iron in solution; (3) coloring matter; (4) plumbo-solvent action; (5) bacterial content.

Before considering these separate headings it may be appropriate to notice the change in the general chemical composition of the water brought about by the mechanical filter. The chemical changes resulting from mechanical filtration have been put forward as percentages of purification; but those who put forward chemical results in this way miss altogether the significance of chemical analysis. Chemical analysis of water had originally as its object, before bacteriology was placed in such a secure position, the detection of sewage pollution; in other words, the detection of matter which is dangerous by reason of its perhaps containing pathogenic organisms such as Bacillus typhosus. If the extent of the chemical change in filtration gave any indication of the presence or absence of pathogenic organisms, then it would be of the greatest value; but the results of chemical analysis give no such indication. From the hygienic point of view the writer is, therefore, not interested in the reduction of free or albuminoid ammonia in filtered water. What he is concerned about is the improvement from the æsthetic and the physiological standpoint; whether the suspended or coloring matter, or plumbo-solvent action is removed, or whether injurious bacilli have been eliminated. Beyond this, chemical results are of secondary concern. However, as a matter of general interest it may be stated that the greatest change in the water on being passed through the filter is that the albuminoid ammonia and the amount of oxygen absorbed are decreased.

The following table gives the analyses of water from three supplies, before and after filtration, through mechanical filters of different types:—

	Swineshaw Reservoir. Mather & Platt's Delépine.		Shrewsbury. Bell's Blunt.		Reading Candy's—Smith	
	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered
Oxygen absorbed...	0.1156	0.0522	0.090	0.044	0.150	0.090
Free ammonia.....	0.0138	0.0128	0.0050	0.0045	0.002	0.001
Albuminoid ammonia	0.0080	0.0032	0.021	0.007	0.023	0.008
Nitrous nitrogen.....	0.0	0.0	0.0	0.0	slight trace	0.0
Nitric nitrogen.....	0.120	0.118	0.145	0.150	0.30	0.30
Chlorides.....	1.17	1.18	1.1	1.1	1.40	1.40
Hardness—temp.....	0.06	0.6	0.2	0.2	14.30	14.30
Hardness—perm....	3.3	3.8	4.3	4.3	4.70	4.70
Nature of source....	Moorland		River		River	

Taking the results into consideration one is led to conclude that the general effect of filtration through each

* Extracts from paper read before the Royal Sanitary Institute of Great Britain, May 28, 1915.