

crete of jelly-like consistency always produces stronger concrete than a wet mix and is preferred where conditions will admit of its use. It is absolutely necessary, however, in reinforced concrete to employ a consistency sufficiently wet to flow around the steel and into the corners of the forms and in rubble concrete, to flow around the large stones.

Concrete should never be placed in running water.

It is almost impossible to satisfactorily plaster a face of hardened concrete.

A wall of concrete may be rendered watertight in various ways:

1. By accurately grading and proportioning the aggregates and the cement. The proportions employed to resist the percolation of water usually range from 1:1:2 to 1:2½:4½, the most common mixture being 1:2:4 or 1:2½:4½. With accurate grading by scientific methods, watertight work may be obtained. For maximum watertightness, a mortar or concrete may require a slightly larger proportion of fine grains in the sand than for maximum density or strength. In general it may be stated that in monolithic construction a wet mixture, a rich concrete and an aggregate proportioned to secure great density will in the majority of cases give the desired results. It is impossible to specify definite thicknesses of concrete to prevent percolation under different heads of water, because of variations in proportions and methods of laying.

2. By special treatment of the surface of the concrete. Various methods have been employed, such as plastering the surface of concrete with rich Portland cement mortar in proportions 1:1 or 1:1½. Watertightness may also be secured by the use of a granolithic finish; by troweling the surface so as to produce a hard finish. Layers of waterproof paper or felt cemented with asphalt or bitumen or tar are extensively used, and sometimes asphalt alone. A mixture of alum and lye has also been used.

3. A waterproof concrete can be prepared by the application of fluates. The operation, however, requires a great deal of time and labor. By the application of an 8 per cent. solution of potash soap, instead of water, in mixing, the concrete can be rendered waterproof, so as to fulfil all requirements as to permeability of water.

The first method suggested is unquestionably the best to secure permanent watertightness, and the writer is not in favor of using waterproofing ingredients or of making surface applications except in cases where such may be required by reason of imperfections in the original concrete.

### NEW BUILDING FOR THE HYDRO-ELECTRIC POWER COMMISSION.

A new office building, to cost approximately \$200,000 is to be erected by the Hydro-Electric Power Commission of Ontario on a newly-purchased site on University Avenue. The building will be 6 stories in height, with white stone frontage and will be constructed of brick. Its floor dimensions are to be 63 x 83 ft. The whole of the building will be used by the Commission. Contracts for the exterior work were let last week to Messrs. Witchall and Sons, Toronto.

Agents of the Grand Trunk Pacific are taking measures to get Belgian settlers for the territory opened by the company's lines in western Canada. It is expected that the European war will result in a rush of settlers to Canada. Belgian farmers are very thrifty people. It is hoped to settle a large tract in the Stuart River district.

## Coast to Coast

**St. Andrews, N.B.**—Plans for the rebuilding of the C.P.R. Algonquin Hotel, burned last April, have been prepared by Barrott, Blackader and Webster, architects, Montreal. A reinforced concrete structure is contemplated.

**Sault Ste. Marie, Ont.**—The third lock of the St. Mary's Falls canal was formally opened to traffic last week. It is 1250 ft. long, 80 ft. wide and 23 ft. deep. Its construction began in 1908, and has cost \$6,250,000. It is rated the longest lock of its kind in the world.

**St. Vital, Man.**—The Manitoba Engineering and Construction Company, of Winnipeg, were awarded, last September, the contract for the construction of a 12-inch cast-iron water main to extend from the pump-house at this point to a reservoir in the National Transcontinental Railway yard at Transcona. This is being proceeded with, and is giving employment to quite a number of laborers. The estimated cost of the line is \$87,000.

**Brandon, Man.**—Last week Mr. J. G. G. Sullivan, chief engineer of western lines for the C.P.R., made the announcement that 350 miles of double-tracking had been completed during the season between Brandon and the Pacific coast. Prior to this year the road had been double-tracked from this point to Fort William, which makes a distance of 909 miles completed to date. The entire distance between Fort William and Vancouver is 1908 miles. It is expected that the line of the C.P.R. between Swift Current and Bassano will be completed in a few days.

**Montreal, Que.**—As announced in another department of this journal, the Grand Trunk Pacific Railway is going ahead with the construction of terminals in British Columbia. Contracts to the value of \$300,000 at the four divisional points, viz., Prince George, Smithers, Pacific, and Endako, have recently been let. They include the construction of roundhouses, machine shops, and other railway facilities, and will require the services of large numbers of mechanics and laborers during the winter months. It is to be noted that large oil storage buildings are included, indicating that the company may have under consideration the use of oil-burning locomotives on its fast transcontinental service.

**Montreal, Que.**—No sooner had the contractors placed the roof on a large extension to the Ross Rifle factory than work was commenced on a second extension, which will double the size of the present factory, and more than double its capacity. The output of the enlarged factory will be at least 500 rifles per day. The contractors for the new structure, the C. E. Deakin Co., of Montreal, have been urged to rush the work, and the concrete foundations are already being placed. The building, which will be of brick construction, is to be handed over on December 1st, ready for the installation of machinery. It is also understood that the Quebec Railway, Light and Power Company has signed up a contract with the Ross factory for a large block of additional power. The machinery and equipment for the extensions are on the way from England.

**St. John, N.B.**—Several large steel bridges are now under construction in this Province. The spandrel arch bridge at St. John, which bridges the Reversing Falls, and which will be utilized for street car and general traffic, is well advanced, and the remaining work will be completed in time for use next spring. The new steel bridge, which the provincial government is constructing at Grand Falls, is almost completed, and in a few days the finishing touches will have been made to the magnificent new bridge.