Without these precautions, cold weather work is impossible but the precautions are simple and reasonably inexpensive. Why not do the logical thing and consider the winter as an open season for all but the most exposed class of construction?

Our organization has continued to lay brick and place concrete under zero temperatures in Canada. A part of our normal equipment is sufficient tarpaulins to enclose practically any structure and sufficient salamanders or coke stoves to keep such enclosures warm. Boilers of any type, frequently those used to furnish steam for hoisting, supply live steam for heating aggregates and water, and for thawing snow and ice from forms and reinforcing steel.

While a heavy snow may temporarily delay the delivery of materials, yet deep snow is seldom encountered. It is temperature alone that commonly hampers work, and temperature need not be feared.

Plant Layout for Winter

In laying out a plant for handling concrete in winter, or where the work is likely to run on into winter before completion, there must be provision for the proper heating of materials and water. In case of sand and gravel in open storage piles, it is only necessary to lay a grid of steam pipes under the material piles and place a tarpaulin over the pile. From one main through the centre, branches should extend in both directions every 6 ft. These branches should be drilled with ⅛-in. holes spaced about 18 ins. apart. Several hundred yards of material stored in one pile can be heated in this way with the steam from an ordinary hoisting boiler. Several days prior to concreting, steam should be turned into the pile during working hours, which will be sufficient, except at times of extreme cold, to maintain the necessary temperature.

When material is stored in bins, a series of pipes should be laid on the floor of the bins, feeding from a main pipe at the top of the sloping floor. Steam radiates through the entire contents of the bin and if a canvas cover is pulled over the top when work is stopped at night, the material will retain its heat except in very cold weather, when a small amount of steam may be needed at night.

It is necessary also to heat mixing water, and a steam line running directly into the water tank is the customary way; a 1-in. line being sufficient to heat water for a 1-yd. mixer.

But concrete poured into forms exposed to cold would lose its heat before hardening had progressed sufficiently. Forms must, therefore, be protected and the most satisfactory means is a complete canvas enclosure, with salamanders or coke stoves to maintain a temperature of 45 degs., or over, within. Several hours before concrete is poured, salamanders are started in the story below the forms, unless that story is already heated. Immediately after pouring, a sufficient number of salamanders are placed above the new concrete to ensure its safe and thorough hardening. These will furnish heat for the floor above.

This method of enclosure and heating necessitates that the form work for the floor above that being poured shall be in place, in order to serve as a roof under which concrete may be kept warm; although in the case of steel frame structure, it may be possible to support canvas upon the steel because of the floor above.

Posts Set Upon Blocks

Forms for the story above are supported as usual, upon posts, but since the floor slab of the story supporting these posts is not yet poured, it is customary to set the posts upon concrete blocks of the proper depth, so that upon pouring, the block becomes a part of the finished floor. This requires setting blocks to grade and finishing their upper surface.

It is, of course, necessary that the workmen be watched somewhat more carefully on winter work. Snow or ice in the forms is detrimental to good work. Careful inspection is necessary at every stage of the work, but slipshod methods are probably no more likely to affect quality in winter than in summer.

Where the enclosure in canvas is comparatively complete, workers operate at practically normal efficiency, but there are some delays likely to occur through slow delivery of materials during periods of snow. Yet the added costs are more than compensated for by the certainty of quicker occupancy and reduction of interest on money tied up in the incompleted building. It would seem folly to cease work on a structure where there is need of early use.

FEDERAL CEMENT CO., OWEN SOUND

PUBLIC offering will soon be made of $1,000,000 six per cent. first mortgage bonds of the Federal Cement Co., which will operate at Owen Sound, Ont., it is said, but which is incorporated under the laws of the State of Delaware. This issue, it is understood, will be offered to the public at par and interest, with a bonus of 50% of common stock, by a Chicago financial concern.

The officers of the Federal Cement Co. are: J. G. Lind, vice-president of the St. Mary's Cement Co., president; J. E. Murphy, vice-president of the Vancouver Portland Cement Co., vice-president; J. E. Campbell, secretary-treasurer of the Hepworth Mfg. Co., Hepworth, treasurer; A. D. Creasor, of Owen Sound, secretary; with whom L. N. Rosenbaum, president of the Knickerbocker-Wyoming Oil Co., New York, will constitute the board of directors.

The Federal Cement Co. has contracted to acquire the plants formerly operated by the Union Cement Co. and the Imperial Cement Co. at Owen Sound, it is stated, and plans to remodel them to a capacity of 2,000 barrels daily.

$500,000 RESERVOIR FOR WINNIPEG

NOW that the $15,000,000 water scheme for Greater Winnipeg has been brought to a successful conclusion, that city must at once plan for a reserve supply in case of breakdown in any portion of the 100-mile aqueduct between Winnipeg and Shoal Lake, according to an official report which W. G. Chace, chief engineer, has submitted to the Greater Winnipeg Water Board.

This reserve has been figured on before and from time to time discussion upon it has been allowed to drop. Now, however, Mr. Chace says that the time has come for the board to authorize preparation of the plans, with the idea of completing the whole undertaking next summer. Along with the under-drainage, which experts have agreed is necessary, there will be considerable work to be carried out near Deacon as soon as the frost is out of the ground next year.

This reserve plan is a part of the original scheme as recommended in 1913 by the consulting engineers, Rudolph Hering, F. P. Stearns and J. H. Fuertes.

Deacon, about ten miles from Winnipeg, is where the reservoir will be built. It will have a capacity of 250,000,000 gallons, or, on present needs, a reserve supply sufficient to last 20 days.

The cost of the reservoir is estimated at approximately $500,000.

"Winnipeg and district have now the finest water supply anywhere on the North American continent," says Mr. Chace. "But Winnipeg will need a large reserve to be at all safe. If anything should happen to the aqueduct, we would be up against it within two days."

Asked if the city could not go back to the well system in case of emergency, Mr. Chace replied that the reservoir at Deacon has to be constructed sooner or later and the district might just as well do it next year as at any other time. Its maintenance cost would be negligible after construction, he says. Moreover, the wells formerly used could not be placed in shape again without a heavy expenditure, leaving out of consideration the disadvantage of again having to use hard water.

"This will be one of the best opportunities to provide work next summer that the city and district could wish for," says Mr. Chace.