

About three years ago this winter this plant of the United Zinc and Chemical Co. took fire and was entirely destroyed with the exception of the cement siding building and one or two smaller structures which were not in the same group with the rest of the buildings, and consequently not exposed to the flames. The cement building had at this time been up fifteen years, and had shown a remarkable record. During this time it had been exposed to the worst possible conditions, and had shown no signs of deterioration. It had withstood a fire which destroyed its neighbors on three sides. Its cost was very slightly, if any, more than the cost of the wood buildings which had been burned.

The directors of the United Zinc and Chemical Co., therefore, decided that cement siding construction was what they wanted in their future buildings, and the entire plant was rebuilt in this way. In reconstruction, however, they decided to use even better buildings than the one which had stood the test, and consequently built with metal studs lathed on both sides and supported on heavy timber girts and columns.

The Canadian Northern Railway some five years ago erected in Winnipeg a roundhouse according to the second method described; that is, with a double layer of metal lath and plaster on wood studs, giving an air

fact that they do not attempt to make any appreciable difference in the composition of their first and succeeding plaster coats.

This Winnipeg roundhouse is a good illustration of the weatherproof qualities of cement siding. At the same time that it was built the Canadian Pacific Railway built in Winnipeg a roundhouse, using 13-inch solid brick walls. Both buildings are almost exactly alike, being very similar in size, and both constructed according to the standard roundhouse details. Both of these are heated by a fan system, which was installed by the same heating company, according to their own details, and with their guarantee as to the results. Presumably the heating system was alike in both cases.

A roundhouse is very hard to heat. The doors are frequently opened to permit of the passage of engines, and steam from locomotives and cinders is constantly exhausting into the atmosphere. As a result, unless the building is kept warm, the air inside is an impenetrable fog all winter.

During the very severe winter two years ago the Canadian Pacific roundhouse was found almost uninhabitable. It was impossible to keep it warm, and frost collected from $2\frac{1}{2}$ to 3 inches thick on the inside of the brick walls.



Concrete Viaduct, built by the City of Toronto, for carrying sewer pipe over Sunnyside Avenue Ravine.

space, which is very desirable in that climate. Unfortunately for the construction the amount of lime to be used in plastering was not carefully watched.

The first coat might be described as a lime plaster somewhat tempered with cement, and the succeeding coats were cement plaster. The bond between lime and cement is not a perfect one, and as a consequence the Winnipeg roundhouse is now badly disintegrating under the action of the frost.

That this result is not necessary is proven by the numerous instances of similar construction in the United States. The climate in Winnipeg is not a severe one in its result on buildings. Once frozen, there is no further tendency to disintegration in a wall, but every time it thaws and freezes the frost crystals attempt to get in their work. In Winnipeg a wall will freeze and thaw probably not more than ten times through the course of a winter.

In Kansas and Missouri, while there are many instances of this construction being used successfully, a wall freezes and thaws twice a day all winter, easily six or eight times as often as it does in Winnipeg. The fact that these structures stand in that climate is due to the

The Canadian Northern roundhouse, on the contrary, had no frost on the walls. Some difficulty regarding the fog was experienced and the walls dripped constantly, but only froze in the immediate neighborhood of the doors.

Under the terms of their guarantee the Canadian Pacific compelled the heating company to install a larger heating apparatus, but the Canadian Northern expressed themselves as satisfied. This gives a comparison between the weatherproof qualities of 13 inches of brick and of cement siding when constructed with an air space, which, it might be added, is much the cheaper construction of the two.

The types consisting of metal lath and metal studs is generally used when a steel frame building is constructed, and is, therefore, more often substituted for corrugated iron rather than for brick. The girts are spaced ten feet on centres, and the studs are lathed only on one side and plastered on alternate sides until the total builds up to $1\frac{3}{4}$ inches of thickness. This type of construction is used in many instances in the States as a covering for Portland cement plants.

In some cases the inside plaster coats are omitted, and the resulting wall is then only from $\frac{5}{8}$ to $\frac{3}{4}$ -inch