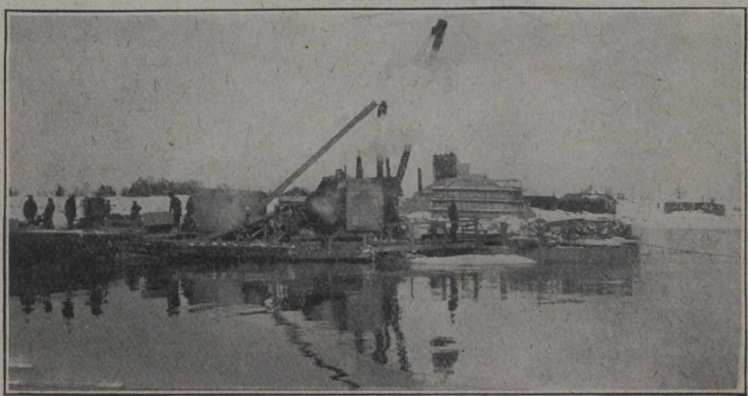
the specifications call for a rate of 500 ft. a minute hoisting and 1,500 ft. a minute propelling capacity along the runway. The bridge will be capable of propelling itself along the track at the rate of approximately 50 to 70 ft a minute, depending upon the wind.

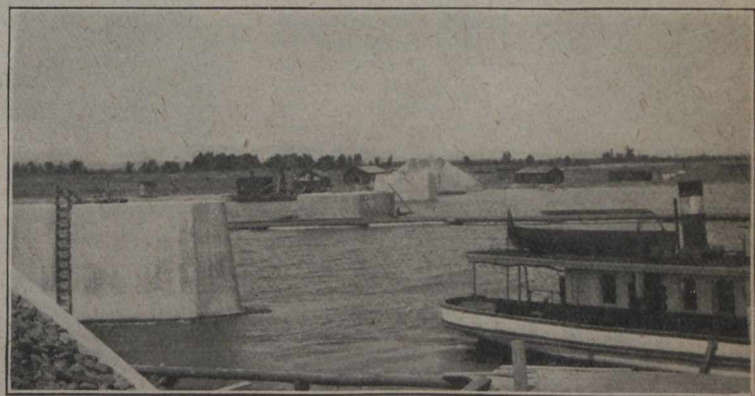
The portal structure at the dock end will be arranged to span two loading tracks spaced 13 ft. centres. A 40 ton bin will be supported directly over these tracks. The shear leg is designed so that a 40-ton receiving bin, together with the necessary shaker feed box and box car loader, may be added in the future if desired. At present it is not contemplated that other than railway coal will be handled here. This whole crane will be operated by steam. Only a single bridge will be erected now; later, if business warrants, the dock may be extended and another bridge added.

The commercial dock will be constructed on a similar plan to the coal dock, and will have a warehouse 36 by 80 ft. built on it, to which tracks will extend, as indicated on the plan. Considerable solid rock dredging will be required here to permit deep draught vessels to approach this dock.

The entire terminal work, excepting the erecting of the coal crane and the dredging, will be completed this autumn. The coal handling crane will be erected early next spring, in time to handle coal early in the season.



Concreting Pivot Pier, January, 1913.



Foundations complete, looking north.

The Foundation Co. is doing the above work on docks and terminal buildings on a percentage contract. The railway company's forces look after all track work and grading for same.

The Algoma Eastern Terminals, Ltd., is the corporate name of the company constructing these terminals. The writer is Chief Engineer, B. E. Barnhill, Sudbury, is Division Engineer, and J. R. Black, Little Current, is Assistant Engineer in direct charge of the work.

Locomotive Failures in Summer and Winter.

In a recent issue of a United States contemporary, attention was drawn to locomotive observations made on a road operating in that country. This road was rather astounded to find on investigation, that contrary to all expectations, the number and extent of its locomotive failures were considerably greater in summer than in winter. This led to an investigation of the cause, leading to the discovery that anticipated greater numbers of breakdowns in the winter, had led the officials to make greater preparations to ward off trouble, with the result that the number of breakdowns was less in winter than summer. When, following this discovery, the same precautions were taken winter and summer, the repairs were found to assume their normal condition of greater in winter than summer. Desiring to ascertain definitely the conditions as they existed on Canadian lines, Canadian Railway and Marine World sent letters outlining the above observations to mechanical operators of the principal Canadian lines, from whom the answers quoted below have been received.

W. H. Winterrowd, Mechanical Engineer, C.P.R.: "Our locomotive failures are somewhat higher in winter than they are in summer. We keep a record of our locomotive failures by means of graphics."

W. D. Robb, Superintendent of Motive Power, G.T.R.: "You do not state on what roads in the U.S. it is claimed that failures are more numerous in summer than in winter, but I think it must be a road that does not suffer such severe winter conditions or have as much snow as we do in Canada. With the power in practically the same condition, we have a greater number of failures in winter, and our records show an increase of fully 25 to 35%".

S. J. Hungerford, Superintendent of Rolling Stock, Canadian Northern Ry.: "I am inclined to think that there was some unusual condition on the U.S. railway referred to, to cause a decrease of locomotive failures in winter, as it is entirely opposed to general experience and physical conditions. The matter of locomotive failures, however, depends on a great many factors, and it is exceedingly difficult to reduce them to actual failures so that a fair comparison can be made. It is obvious, however, that the chance of fracture during severe weather is greater than in warmer weather, as the metal seems to be affected by the frost, and roadbeds become much more rigid, besides getting out of surface as a result of the frost heaving it in places where the drainage is not perfect. In addition to all this, trains that have been standing for any length of time offer greatly increased resistance, and as the additional resistance due to snow on the track is difficult to determine. it frequently happens that locomotives have to be worked proportionately harder in order to handle tonnage or make time, and this results in greater stresses in machinery, and the greater amount of water evaporated, together with the forcing of the fire, increases the risk of flue leakage. It is also practically impossible under certain weather conditions for employes to examine their locomotives as carefully, or to perform their duties as efficiently, while the usual irregularity of trains in very severe weather also acts as a handicap on locomotive house forces in looking after equipment properly. Taking it altogether, it is my opinion that there is at least twice the chance of failure in winter that there is in summer, in this particular territory at least, and our statistics seem to show this."

G. R. Joughins, Superintendent of Motive Power, Intercolonial Railway: "We, in common with most railways in Canada, find that the failures are greater in winter, but regret that we have no figures that we could give."

Concrete Water Barrels for Railway Bridges.

Concrete water barrels for railway bridges are described by H. McDonald, Chief Engineer, Nashville, Chattanooga & St. Louis Rd., in the 1912 Proceedings of the Engineering Society of the South. One design is 30 in. deep, 24 in. outside diameter at the top, tapering to 22 in. at the bottom. The sides and bottom are 2 in. thick, reinforced with a sheet of expanded metal. The cover is of iron, hinged to a lug embedded in the concrete, and is depressed so as to catch rainwater. They do not leak, the evaporation is slight, and the concrete will resist bullets (which are apt to be fired at the barrels by boys and others). The total cost is about $1 70, divided as follows:

Cover: Galvanized iron, 5 sq. ft. at 3c...	$0.15	
Hinge, bolts, rivets and wire	0.05	
Cost of making, 1 man 1 hour	0.20	$0.40
Barrel: 17 sq. ft. exp. metal at 3c.....	0.51	
0.10 cu. yd. 1:2:4 concrete	0.24	
Forms (25 barrels to one set)	0.10	
Labor	0.30	1.15
Engineering and contingencies, 10%		0.15
Total		$1.70

Other experiments have been made, using a less tapered form of barrel, galvanized iron forms, and poultry netting reinforcements. Plastering the mortar on the reinforcement has not resulted in tight barrels, but 1:2:4 concrete cast and jammed into forms has given good results. It is believed that good concrete water barrels, with metal tops, can be made for $1.30 each, in large quantities. Another design consists of a concrete box let into the ground all but about 1 ft., this upper part being marked with the number of the trestle.

The wooden barrel is the more expensive of the two, considering its capitalized cost, on the basis of six years life, leaving out all consideration of increased cost of maintenance. The ballasted deck trestle is rapidly becoming the standard on most roads, and it is thought that in the future the water barrel will seldom be needed. For this reason concrete barrels are not used to any extent on the N., C. & St. L.R.

Chilled Iron Car Wheels.—In a paper read before the New England Railroad Club recently A. A. Hale stated that, in the development of the freight car from 20,000 to 100,000 lbs. capacity, all parts of the car have been increased in weight, but no part has shown such slight increase as the chilled iron wheel. Car capacity has increased 400%, the weight of axle 149%, the weight of rail 100%, whereas the weight of the wheel has increased only 38%. In the opinion of the author, chilled-iron is the only metal of which wheels are manufactured which will stand up under extremely heavy loads without crushing or flowing.

The Montreal Warehousing Co. expects to have its 1,000,000 bush. extension to its grain elevator B, complete and ready for operation by Nov. 15.