

CONCRETE IN COLD WEATHER.

The pressure of building operations has necessitated many modes of doing work during severe winter weather. One instance of this is the use of concrete and mortar in foundations. The details of some concrete work executed at Helsingfors, Finland, which were recorded in the Engineering Record are of some interest in this connection. The concrete work consisted of the foundations of a warehouse and two bridge piers, and was performed in the winter of last year. There was an urgent wish to complete the work for the brief summer season, and the operations were carried on through the winter, although the temperature ranged below 14° above and 40° below zero. The foundations, which were necessary to protect, rested partly on stone cribwork of an old quay and partly on piling, concrete being used to distribute the pressure. The depth of concrete was 31 in. and the breadth 46 in. As this was commenced when the temperature was 4° below Fahr. great care was required in the preparation and protection of the concrete. "For this purpose," says our contemporary, "a movable house heated by two coke stoves was mounted on wheels over the trench. It was 26 ft. long and 20 ft. wide, and was mounted on six four wheel trucks. In this house, during the mixing of the concrete, the temperature was kept at about 54° F. The stone and sand were brought into the house in large quantities, and warmed before using. When mixed, the concrete was placed in the trench through three trap doors in the floor of the house. To keep the outer air from the trench, the walls of the house were continued down to the ground by movable weather shields, whose edges were packed with coarse matting and wood-shavings." Means were taken to

thaw the ice of the ground water in the trenches by the use of steam boilers mounted on wheels, with steam pipes going down to the surface of trench. When the ground under the house and a little in advance of it, was thawed, a 12 in. layer of broken stone was packed in. The concrete was mixed by hand, with the water warmed to between 158° and 176° Fahr., and to protect the concrete until set against frost from sides of trench, sheet piling, with a filling of broken stone, was used. The bed was then covered with a double layer of straw matting, and the trench space covered with planks, matting and trodden snow. After the house was moved on, the space left was warmed by a kettle filled with burning coke. This kept the temperature of the air about 54°, and the setting of the concrete was thus assured. The details are illustrated in the Record, to which we refer our readers. The system is ingen-

ious and practical, and would enable concrete to be laid during the severest weather.

The Chatham Dredging Co., of Chatham, Ont., have completed what is believed to be the largest drainage ditch in America. It is known as the Raleigh Plains ditch, is over ten miles in length, 90 feet wide at the outlet, and tapering to 45 feet, and 9 feet deep. The contract price was in the neighborhood of \$40,000. This huge drain, which empties into Jeannette's Creek, a tributary of the Thames river, serves the townships of Raleigh, Harwich and Tilbury, removing surplus water, which at certain seasons of the year submerged the low-lying farm lands, doing wide-spread and heavy damage. The work of construction has occupied two years. Through litigation, which involved an appeal to the Privy Council, the work has been delayed for years, and the township of Raleigh saddled with law costs aggregating \$25,000.

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