

annoyances and costly delays in future systems.

#### SPECIFICATION FOR CAST IRON PIPES.

(1) The pipes are to be cast to the lengths, diameters and thicknesses quoted in the schedule.

(2) The whole of the pipes, bends and other castings are to be of the best metal, remelted in the cupola, of fine grain, homogeneous, of even grey color, to be cast in dry sand moulds, and with a sufficient head of metal to ensure solidity. This head or dead end is in all cases to be cut off in the lathe.

(3) The larger pipes of 4 in. diameter and upwards are to be cast vertically, socket downwards. Pipes of small diameter may be cast on inclined beds. The pipes are to be truly cylindrical in bore, straight in axes, and to have the inner and outer surfaces as nearly as possible concentric. The internal diameter to be such that a wooden disc of  $\frac{1}{8}$  of an inch less in diameter than that specified shall pass freely through the length of the pipe.

(4) All pipes and other castings of uneven thickness, or in which any imperfections shall appear, or any sand holes, air holes, scabs or spongy places occur, or in which any defect may be found plugged or filled up, will be rejected.

(5) Test bars shall be cast from time to time as may be directed. They shall be run while the pipes are being cast, and from the same metal. These bars shall be 3 or 4 ft. long, 2 in. deep and 1 in. broad, and when placed on supports 3 feet apart shall bear without fracture a central load of 30 cwt. applied gradually, and show a deflection of  $\frac{3}{8}$  of an inch.

(6) The whole of the pipes are to be subjected to a proof by hydraulic pressure of 400 ft. head.

Each pipe while under pressure shall be struck hard from end to end with a hammer of from 4 lbs. to 7 lbs. weight, according to the size and thickness of the pipe, and such pipes as may be considered defective in the opinion of the inspecting officer shall be inspected and at once marked to prevent their acceptance if delivered.

(7) Should an inspecting officer not be present while the pipes are being proved, a proof note, showing that the pipes have been tested by the contractor in accordance with this specification, shall be sent for the information of the superintending officer, and such pipes as may then be found defective will be rejected, and must, after due notice, be forthwith removed from premises by and at the cost of the contractor.

(8) The pipes after proof are to be thoroughly cleaned inside and out, and are then to be coated by Dr. Angus Smith's patent process. Each pipe is to be heated uniformly in a proper oven to 100 degrees Fahrenheit and dipped vertically into a mixture of coal tar, pitch, resin and linseed oil (5 to 6 per cent.), which must be kept at a temperature of 300 degrees Fahrenheit, and not allowed to thicken unduly. When each pipe attains the temperature of the above mixture it may be withdrawn gradually, and allowed to cool in a vertical position.

No pipe will be accepted unless perfect cohesion has been affected between the metal and the coating, both inside and out.

(9) Such marks or numbers as may be directed shall be cast on each pipe or other casting for the purpose of identification; and, after the pipes are coated, such paint marks as may be arranged shall be placed on each casting, to facilitate transport, sorting and laying.

(10) The weights of the other pipes and castings will be estimated according to the dimensions quoted in the schedule herewith.

A deviation from the weights to the extent of 5 per cent. will be permitted; that is to say, any pipe more than 2 per cent. below the specified weight will be rejected, and where the tender is by weight any excess beyond 3 per cent. on each separate casting will be paid for.

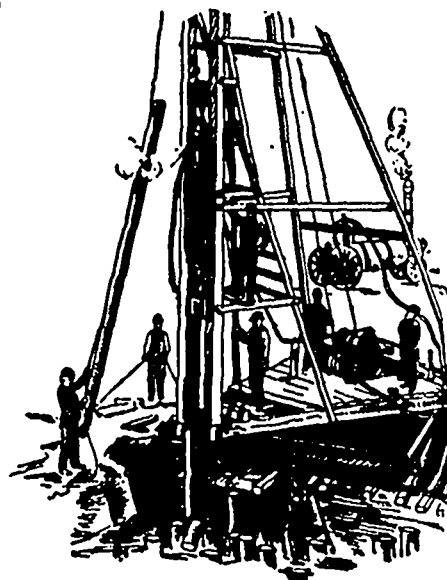
(11) All testing and proving on the contractor's premises shall be carried out at his cost, and to the satisfaction of an inspecting officer, who shall be afforded every facility in the discharge of his duties, and shall be provided by the contractor with such gauges and apparatus as may be necessary for the proper testing and inspection of the work.

#### OFFICER IN CHARGE OF WORKS.

Mr. E. G. Barrow, city engineer of Hamilton, Ont., has been appointed engineer of waterworks and sewage disposal. The office of street commissioner has been dispensed with, and the duties of that official will be merged in those of the city engineer. At a meeting of the council held on Monday last, Mr. E. B. Wingate, a local engineer, was chosen for the position of city engineer.

The imports of cement at Montreal last week were 1,000 barrels English, as against 300 for the previous week, making a total to date of 11,400 English and 28,130 Bel-

gian and German. There has been improvement in trade to note. A sale of 2,000 barrels Belgian was made on local account at \$2, ex wharf. Outside of this sale business is of a jobbing character.



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