

this kind can be built by three men in less than two days at a cost of about \$30.

Man-holes being of different depths, a standard mould could not be made more than the two top feet. The remainder was made by a frame 3 ft. long x 4 ft. wide of 3 in. by 4 in. scantling braced in position and fastened with lag screws. 1½ inch boards were placed against the outside of the frame, and concrete rammed in against them. The top mould was then set on the posts of the frame and concreted up to the top, leaving the opening at the top 18 in. x 20 in. When the concrete is set, the moulds are taken apart from the inside and passed through the top. A cast iron top with a moveable cover is then put on the concrete, and the bottom, which is of concrete having grooves for the flow of water, is put in, and the man-hole is completed. The cost of a man-hole of course depends entirely on the depth, but an average one, say about 8 or 9 feet deep, in Dartmouth costs about \$40.00.

Some objection might be raised against the use of concrete for man-holes, on account of the heavy traffic on the streets being liable to break off the concrete. The traffic on the Dartmouth streets is very heavy, but no trouble of this kind has occurred as yet.

The ventilators or lamp holes are made by a 9 in. crock pipe coming to within a foot of the surface, with a loose concrete collar set over it, about a foot from the ground surface and resting on the ground around the pipe. A round cast-iron top with a moveable cover is set on the collar as a protection to the pipe.

HOUSE DRAINAGE.

The house drains are all, except in the case of a double house, laid with 4 in. crock pipe. No grade is allowed less than 1 foot fall in 48 ft., and they are all laid to a good even grade. The junctions left at the main for house connections are 6 in. branches bevelled from the main pipe; these are reduced at the main to 4 in.

The main trap of most of the houses is the hand-hole trap as made by the Standard D. P. Co. This is set just outside the foundation wall, and has a 4 in. cast-iron pipe coming to the surface as fresh air shaft, to ventilate the main soil pipe inside the house.

TRENCHING.

Within the town, wherever there were both water and sewer pipes to be laid in the same street, they were laid in the same trench, the sewer pipe being 2 ft. to one side and from 2 to 10 ft. below the water pipe.

A trench intended for the reception of the two pipes was started at the top 5 ft. wide, and continued that width until it was 5½ ft. deep, then one side of the trench was dug down 3 ft. wide to the proper grade for the sewer. The sewer pipe was laid first and the trench filled up to the level for the water pipe, then the water pipe was laid and the trench filled up.

After the water was turned on in the town, wherever there was any filling to be done, a hose was put on the nearest hydrant and the water turned into the trench. This settled the earth excellently, and saved much expense in men ramming in the trench and horses and carts to cart away surplus material. When an earth trench was filled in this way there was very rarely any earth at all to be carted away.

In the house connections, house-drains were usually placed in the same trench as the service pipe, always provided, however, that they were put 1½ ft. below the service pipe. It is the author's opinion that this has had a good deal to do with keeping many of the service pipes from freezing up. The last service that was put in was a combined trench, and had to be filled with frozen earth, and the water pipe froze up while the plumbers were at work at it. This was not discovered until after the trench was filled, so it was left a week or two before steps were taken to thaw it out. The people in the house, however, began to use the sink at once. About ten days after the trench was filled the water started of its own accord, and has been running ever since.