

41 hydrants, with branch pipes complete and set at.....	.65	2,665
Special castings and pipes of extra thickness in special places.....		
Dam, allow.....		500
Gate-house and screen-chambers, inlet and outlet to ditto, waste weir and bywash		1,500
Stopcocks, 1-10", 1-9", 2-8", 18-6", 3-4", 1-3", set.....		1,500
Add for rock excavations, brook diversion small embankments and deep cuttings		662
Say 200 house service branch pipes at \$9		1,500
Supertendence, engineering and contingencies.....		1,800
		<u>3,135</u>
Total probable cost of works complete.....		\$48,000

The foregoing is an estimate for the cheapest system which it would be advisable for you to adopt, and provides for jointing the pipes with wooden wedges.

The estimated cost of the entire works with a 10-inch main laid the whole way—as recommended—is \$49,200, and with a 9 inch main \$47,000. If "turned and bored" joints are adopted, as recommended, about \$500 must be added to the estimates, and if lead joints are used add \$2,500.

Arrangements have been made upon the plans for the insertion of "hatch boxes" at suitable places, so that your whole system of pipes can be readily cleaned out in after years in the event of their being corroded to any extent. This be done by putting scraping machines in the pipes at the "hatch boxes." These machines are propelled by the force of the water alone, and by providing "hatch boxes" as suggested, the cost of cleaning out the pipes at any time will be extremely small. A record of the correct positions of these openings in the pipes must, of course, be carefully kept.

With regard to cement pipes or pipes of wrought iron and cement I have only to say that I know of no engineer of eminence ever having recommended their use, or of any place of importance having adopted them for general use. With cast iron you are dealing with a well tried article and with a certainty, while with a combination of wrought iron and cement you are dealing with an uncertainty and consequently one which I cannot recommend.

Your obedient servant,

E H. KEATING.

TD

227

W555K43

57942