Item 7652

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MAROONDAH RIVER WATER SUPPLY

DESCRIPTION OF WORKS.

The formal opening of the Maroondah River Works, which is to be accomplished by His Excellency the Governor today, will make the magnificent addition of 25,000,000 gal of water per day to the quantity available for the supply of Melbourne. The river thus tapped has been known for years as the Watts, a designation which it obtained from the regrettable circumstances that a man of that name drowned himself therein. An agreeable change has been made in reverting to the euphonious native name “Maroondah”. The work of constructing the aqueducts has been necessarily a costly and lengthy one, but the result will far more than equal in value all the money expended. The above sketch gives a view of both the Yan Yean and Maroondah systems. The Maroondah scheme was undertaken in the month of August, 1880 from the design and under the direction of Mr M Davidson, late engineer of Melbourne Water Supply and now inspector general of public works, and it has been carried through by him.

The work consists of 25 ½ miles of open channel, 12 tunnels of an aggregate length of 6 ¼ miles, the longest being 1 ¾ miles, and 14 inverted wrought iron siphons of a total length of 9 ¾ miles. The open channel is ll feet 10inches wide across the top, by a depth of 4ft 10in. The sides are sloped at an angle of 45deg and the bottom is an arc of a circle.

The channel line follows the contour of the country as far as practicable, but in some cases it has been necessary to cut into the sides of the steep hills. It has been necessary to protect the sides and bottom of the channel excavation throughout its entire length. This has been done by the insertion in a great portion of the work of 6inches of cement concrete.

The tunnels, the longest of which is through the Long Gully Range and is 97 chains from end to end, have given trouble that was not altogether anticipated. The rock throughout has been har and some of it very hard indeed necessitating the use of air-compressed rock borers. It was sufficiently hard to stand without support for a time but the atmospheric action on it has been such as to cause slips and to necessitate lining. But there was a reason apart from supporting the rock which made the lining necessary. The Silurian formation has a considerable underly, and the strike of the rocks is invariably north and south while the direction of the tunnels is invariably east and west, cutting across the strike. The rocks contained unexpectedly large quantities of highly mineralised water, brackish to a most extreme degree. It was therefore necessary in many places to put in lining for no other purpose than to keep this water out, as it was quite unfit for use.

At various places along the route syphons were required to convey the water over ravines. Wrought-iron rivetted pipes having been used for the metropolitan scheme with great success, the department decided to employ them in the Watts scheme also. The advantages of the wrought-iron pipes over cast iron are many. In the first place their weight is 75 per cent less than that of cast iron and the cost is consequently lessened considerably.

Owing to the lightness of the material, carriage, handling, etc are proportionately reduced, while the jointing is lessened by more than one half, the pipes being made in 20 ft lengths instead of 9 ft which is usually the length of the cast iron pipe.

Man holes are only required every 20 ft, whereas with the cast iron pipe it is necessary to have them every 9 ft. Owing to the quality of the casting composition of the pipes, which are only one quarter the thickness of cast iron are expected to last fully as long.

In San Francisco wrought piping has been in use for the last 26 years, and some pipes recently lifted were found to be as sound as when laid.

Altogether there have been 9 ¼ miles of cast iron pipes laid along the course of the Watts aqueduct. The diameters are 50 in and 53 inch, and the thickness of plates is ¼ in, 5/16 in and ¾ in , while the length of each pipe is 20ft. The pipes are fitted with the ordinary faucet and spigot joint and leaded together. The total weight of the piping is 4,244 tons and the cost £71,141. Cast iron pipes would have cost £170,000. The siphons occur at intervals along the whole distance. At Greensborough where the aqueduct crosses the Plenty River, a bridge has been constructed to carry the pipes. The advantage of the wrought fluming is again apparent here, for if cast iron had been used, the bridge would have to have been four times the strength. The total length of this bridge is 210ft, divided into four spans, two of 55ft and two of 45ft each. The main girders are of the light lattice type, 11ft deep and 11ft 4in in apart, Two wrought iron tubular mains, 53 ins diameter supported at intervals by cross girders and chains are to be placed between the main girders. At the present time only one main is in position, the second will be added when the requirements of Melbourne render it necessary to double the watts supply of water. The bridge is carried upon braced cast iron columns, 18 in diameter, on concrete foundations, and has a clear headway of about 20 ft above the summer level of the river. The whole of the wrought iron piping and also the Plenty River bridge were manufactured by Mephan Ferguson of Carlton Foundry, Melbourne.

The expense of the works has been greatly increased by the high prices paid for the land. The total amount paid for compensation in connection with the land resumed for the works and to secure the cleanliness of the gathering ground is about £50,000 The scheme completed with all its ramifications, including the purchase of the township laud and farm land, and the construction of the works has cost about £800,000. This expenditure includes provision which has been made for a large extension of the works when the necessity arises. By erecting a dam across the Maroondah Valley an immense quantity of water can be impounded winch is at present lost during the winter months and from this source another 25,000,000 gallons per day can be obtained for the supply of Melbourne for 120 days during the hot months of the year, when the consumption is greatest. The whole of the present works have been constructed with a view to this increase, which is bound before long to be required. For instance, in many places it has been found necessary to cover the aqueduct to prevent its becoming polluted; in other cases, to guard against land slips, where very large cuttings have been made in sliding ground. In all such cases the work has been done for an aqueduct to carry, not 25,000,000 gal., but 50,000,000 gal. of water. The tunnels, which represent a very largo expenditure both for excavation and for lining, have been excavated so as to carry double the present quantity, and so with regard to all public-road crossings and bridges which have been constructed at the ultimate height required. The channel itself, where it is simply a channel, is only lined to carry 20 million gallons a day, but it has been so contoured that the carrying-up of its walls for an additional height of 2 ft. in concrete will be a very simple matter. The syphons are only equal to the present development, but the syphon-basins have been fitted with additional outlets and inlets, so that another set of pipes can be laid down without any interruption of the present supply. The ground has in all oases been secured for the increase, so that it will be spoil that while the cost above stated appears to be that for a supply of 25 million gallons a day only, a considerable portion of that cost has been incurred to provide for an increase to 50 million gallons a day.

The Maroondah works join the Yan Yean system at the Preston reservoir, which is 325ft. above the sea level. This is not high enough to supply the more elevated suburbs, but it serves the same purpose by supplying the place of the Yan Yean water, which is thus rendered available for the higher levels.