M.R.O. I—77,606—8-6-37.

(1) Number of pages

(2) Date of repair

(3) Initials of the Referencer

MADRAS RECORD OFFICE.

Government of Madras.

Public Works DEPARTMENT.

G.O. No. 1783 Press / Mis.

Dated 22-7- 18 74.

Not to be folded or roughly handled

No. 378. Read again the following letter from the Superintending Engineer, 5th Division, dated 7th June, No. 58, and recorded in Miscellaneous Proceedings, dated 15th June 1871, No. 108 :—

WITH reference to paragraph 8 of G. O., No. 919, dated 28th March 1871, I have the honour to re-forward, duly revised, the plans and estimates (as per margin) for supplying water from the Dhobies' Wells and Ulsoor Tank to the troops at Bangalore, due attention having been given to the suggestions of Government on the subject of increasing the size of the mains.

9 Plans.
1 Descriptive Estimate of Rupees 3,19,100.
2 Abstract Estimates.
3 Specifications.
2 Reports, A. and B.

2. By careful calculations entered into by the Executive Engineer he determined that theoretically a 4¼-inch pipe would suffice for the mains, but to be quite on the safe side, and to meet the views of the Government, 5-inch mains have been estimated for.

3. Captain Wood explains that "the previous size of 3½-inch diameter was taken on the supposition that discharge was going on to the cisterns at the Royal Horse Artillery, European Infantry, and Race-course Barracks at the same time." "The pumps," he remarks, "can only raise 100 gallons a minute, and this has to be distributed in the proportion of 12 gallons to the Royal Horse Artillery, 44 gallons to the European Infantry Barracks, and 44 gallons to the Race-course Barracks, and if at the point of bifurcation (*vide* plan) one main be cut off, the other must be made to deliver the whole 100 gallons per minute," to carry which, as above shown, a 5-inch pipe has now been allowed.

4. The scheme, as admitted by Government in paragraph 7 of their order before referred to, has been drawn up in so full and satisfactory manner that it would be useless for me to do more at present than to re-submit all the documents connected with the project, only stating that the estimates now amount to Rupees 3,19,100, against the sum of Rupees 3,07,400 entered in the Acting Superintending Engineer's letter, No. 230, 24th January 1871, and earnestly requesting that early authority may be given for the re-commencement of the work.

No. 379. Read also letter from the same Officer, dated Cuddalore, 28th June 1871, No. 73.

WITH reference to G. O., No. 1,333, dated 15th May 1871, I have the honour to forward a report, in original, from the Executive Engineer, Bangalore, on the subject of testing the yielding powers of the Dhobies' Wells during the dry season.

1 Report.
1 Tabular statement.
1 Sketch.
1 Bill.

2. The Government will observe that Captain Wood felt himself bound to come to the conclusion that the experiment shows that the Dhobies' Wells under present conditions cannot bear the drain of 35,000 gallons "per diem," the amount required by the troops, etc.

3. If it be deemed advisable to obtain this full supply from these wells, it will be necessary to double their number, for which fortunately ample space is to be found. The additional sixteen wells would cost about 10,000 Rupees.

4. A bill, Rupees 193-3-8, is forwarded for the sanction of Government of the establishment employed during the experiment.

From Captain H. W. WOOD, R. E., Executive Engineer, Bangalore, to the Superintending Engineer, 5th Division, dated Bangalore, 16th June 1871, No. 253.

1 Details of experiment made at Dhobies' Wells.
1 Bill of expenditure incurred in do.
1 Sketch showing the proposed additional wells to be sunk.

In obedience to your Order No. 32, dated 18th May 1871, on Proceedings of Madras Government, Public Works Department, dated 15th idem, No. 1,333, I have the honour to submit a report on the pumping experiment at the Dhoby Wells.

2. Pumping was commenced at 6½ A.M. on 20th May, and was continued until rather more than 47,000 gallons of water were taken from the wells. By gauging the wells before commencing and after ceasing to pump, it appeared that out of the 47,181 gallons abstracted, no less than 16,989 gallons had filtered into the wells during the time the pumps were at work. It was also found that 8,700 gallons filtered into the wells from the time the pumps ceased to raise water on the first day to the moment when they commenced to work again on the second day.

3. Pumping was resumed and carried out daily until the 26th May, when I gave orders to stop the engine. By that time 6¾ days' work had been accomplished, and about 330,000 gallons of water had been taken from the wells. This quantity I calculate to be about 116,000 gallons in excess of what the whole of the European Troops would consume in the above mentioned time.

4. The wells, however, were very nearly drained dry; when I ceased to pump about 2¾ feet only in depth of water remained in them. By referring to the detailed statement accompanying this report (column 8), it will be seen that four or five days' more pumping would have emptied the wells completely, the absolute loss in depth of water daily being at that juncture about 7 inches.

5. As the experiment had proceeded sufficiently far enough to show exactly what the wells could supply it was accordingly stopped.

6. The experiment shows, I think, conclusively that the Dhobies' Wells under present conditions cannot bear the drain of 35,000 gallons a day, for, although 15,000 gallons a day in excess of this quantity was raised for 6¾ days consecutively, the result (had the pumping been persisted in) would have been that the wells would have been pumped dry.

7. Although the experiment was made in the most unfavourable month for the wells, it must be remembered that 5,000 gallons only daily were taken from them before the experiment was commenced; had 35,000 gallons daily (an average day's supply for all purposes of the European Troops) been abstracted during the two hot months preceding May, it is perhaps more than probable that the water-supply of the wells would have been much less than what was found to be the case while this experiment was in progress.

8. It is to be remarked, however, that the capacity of the wells has been shown by the experiment to be amply in excess of the requirements of the project for which they were constructed in the first instance, namely, the supply of water for culinary purposes to the troops quartered in Bangalore. I should not omit to mention also that the engine at the Dhobies' Wells, although quite equal to raising the small quantity required for culinary purposes of the troops, will be totally inadequate to pump up (assuming it to work one day in three) the considerably larger quantity required for all purposes of the troops.

9. It will be observed from column 8 of the detailed statement annexed to this report, that there was an absolute total decrease of water in the wells of 7 feet 5½ inches. Considering the

exhaustive effect that the suction of the water draining into the wells is not unlikely to have on the permeable stratum through which it flows, and keeping in view the danger of generalising from an isolated experiment, such as the one under notice, I have little hesitation in expressing an opinion that the average depth of water which should permanently remain in the wells, after giving a full supply to the troops, should at the least be not less than ten feet. This is about the depth at which the water in the wells stood at the driest time of this year, and in order to preserve this depth the following course if pursued would, I think, suffice.

10. The wet perimeter of the existing sixteen wells amounts to about 500 feet, and the least quantity obtained daily by filtration during the process of the experiment, while the engine was at rest, was about 8,000 gallons. Also the least quantity of water obtained daily by filtration, during the process of the experiment, while the engine was working, was 17,000 gallons, making a total of 25,000 gallons, or about 10,000 gallons less than the assumed total expenditure of 35,000 gallons daily.

11. If, however, for safety's sake it is assumed that the whole 35,000 gallons should be supplied daily by filtration, we shall require a total wet perimeter of $500 \times \frac{35000}{17000} = 1{,}000$ feet about, or, in other words, the number of wells should be exactly doubled. It will seen from the accompanying sketch that ample space remains for the construction of the additional sixteen wells. Their cost would be about Rupees 10,000, and I think there can be little doubt that 35,000 gallons could then be supplied daily from them without any risk of failure.

12. As mentioned above, the present engine would require to be removed and a more powerful one substituted for it.

P. S.—A bill amounting to Rupees 193-3-8 is forwarded for sanction. This bill includes pay for the establishment who had to perform duties at both Ulsoor Works and Dhobies' Wells; the charge made is an addition of 50 per cent. to their ordinary daily pay, and I beg to recommend it may be sanctioned.

2. The materials used in the experiment are also charged in the bill.

DETAILS OF EXPERIMENT AT DHOBIES' WELLS, ULSOOR, BANGALORE.

Number of wells 16, *each* 10 *feet in diameter, together with one pump well (connected with the foregoing) of* 6 *feet in diameter. One foot of water in the wells is equivalent to* 8,030 *gallons. Storage capacity of all the wells is equivalent to* 144,550 *gallons. One revolution of pump shaft is equivalent to* 1·79 *gallons. Zero on gauge being sill of Ulsoor waste weir.*

Month and date.	Number of hours Engine at work.	Number of revolutions per minute.	Total number of revolutions per day.	Reading of gauge in wells, morning. Below sill of waste weir Ulsoor Tank. Feet.	Inches.	Reading of gauge in wells, evening. Below sill of waste weir Ulsoor Tank. Feet.	Inches.	Depth of water during taken pumping from wells. Feet.	Inches.	Absolute loss of depth of water in 24 hours. Feet.	Inches.	Total number of gallons of water pumped.	Depth of water regained by filtration into the wells. During pumping by day. Feet.	Inches.	Engine at rest by night. Feet.	Inches.	Engine at rest by day. Feet.	Inches.	No. of gallons regained by filtration into the Wells. During pumping by day.	Engine at rest by night.	Engine at rest by day.	Rain-fall. In inches	Depth of water below sill of waste weir Ulsoor Tank. In feet.	Remarks.
1	2	3	4	5		6		7		8		9	10		11		12		13	14	15	16	17	18 *
20th May 1871.	10	40·63	24,561	13	6½	17	3	3	8½	...	...	47,181	2	1½	1	1	...	...	16,989	8,700	.....	.....	.....	
21st do...	7½	61·5	27,700	16	2	19	10	3	8	2	7½	49,473	2	5	2	...	...	...	19,361	16,060	.....	.....	.....	
22nd do...	7	65·95	27,700	17	10	20	11	3	5	1	8	49,473	2	11	2	...	...	...	23,376	16,060	.....	.....	3·8	
23rd do...	7	65·95	27,700	18	11	21	7	2	8	1	1	49,473	3	5	1	11	...	...	27,391	15,390	.....	.....	.....	
24th do...	7½	65·95	28,550	19	8	22	0	2	4	...	9	50,209	3	11	1	7	...	...	31,560	12,715	.....	0·390	.....	
25th do...	7½	65·95	28,550	20	5	22	7	2	2	...	9	50,209	4	1	1	7	...	...	32,809	12,715	.....	0·425	.....	
26th do...	5½	56·6	11,870	21	0	22	8	1	8	...	7	33,473	2	5	1	10½	...	...	19,421	16,779	.....	0·115	.....	Part of a day's work.
27th do...	...	.....	.....	20	9½	20	0	...	...	...	...	.....	...	...	...	8	..	9½	.....	5,350	6,357	0·150	.....	
28th do...	...	.....	.....	19	4	19	0	...	...	...	...	.....	...	...	...	7½	...	4	.....	5,020	2,677	.....	.....	
29th do...	...	.....	.....	18	4½	17	10¾	...	...	...	...	.....	...	...	...	5¾	...	5¾	.....	3,850	3,850	0·065	.....	
30th do...	...	.....	.....	17	5	16	10½	...	...	...	...	.....	...	...	...	...	...	7½	.....	.....	5,020	0 160	4·0	

BANGALORE,
16*th June* 1871.

(Signed) H. W. WOOD, Captain, R.E.,
Executive Engineer, Bangalore.

ORDER THEREON, 22nd July 1871, No. 1,933.

MILITARY WORKS, No. 9.

FROM the papers submitted with the first of the letters above recorded it appears that the revised estimate for completing the Ulsoor Water Works at Bangalore, including the supply to the European Infantry Barracks at that station, amounts to Rupees 2,23,700, and the estimate for completing the Dhobies' Wells Project, to Rupees 95,400, total Rupees 3,19,100, of which Rupees 2,20,902 having been expended up to 31st December 1870, Rupees 98,198 remain to be provided, or if the direct supply from the tank to the European Infantry Barracks be omitted, namely, Rupees 28,369, the cost of completing the projects as recently estimated would be Rupees 69,829.

2. With the second letter the Superintending Engineer lays before Government a report from the Executive Engineer at Bangalore on the result of the experiments undertaken, as directed in G. O., No. 1,333, dated 15th May 1871, with a view to ascertaining the capability of the Dhobies' Wells to furnish a sufficient supply of water for all purposes for the use of the European Troops at that station. Captain Wood is of opinion that the wells, sixteen in number, cannot bear the drain of 35,000 gallons per diem, the average daily quantity required by the troops for all purposes, but that, if it be considered advisable to obtain the full supply from wells, it will be necessary not only to double their number, but to substitute a more powerful engine for the one now in use. The additional sixteen wells, he states, will cost about Rupees 10,000. This, added to the balance of former estimate as above, makes a total of Rupees 79,829.

3. The Government observe that in the event of its being determined to supply the troops entirely from the Dhobies' Wells, some re-arrangement of pipes and cisterns may be necessary, and before any thing further is done it is desirable the Government should be informed what will be the *total* expenditure for completing *each* project separately including in the case of the wells sixteen additional wells, new steam engine, and any necessary modification of pipes.

4. The cost of the experiments above alluded to, amounting to Rs. 193-3-8, is sanctioned. The amount will be debited to the allotment for Minor New Works under "Military" for Bangalore.

(True Extract.)

Colonel, R.E.,
Secretary to Government.

To the Superintending Engineer, 5th Division,
with 10 Plans, 3 Estimates, 3 Specifications, 2 Reports, and 1 Bill.

" Military Department.
" Controller of Public Works Accounts.

Exd. S. T. Augustin.

Details of Experiment at Dhoby's Wells_Ulsoor / Bangalore. Number of wells 16. Each 10 feet in diameter. Together with one pump well (connected with the forezoing) of 6 feet in diameter. One foot of water in the wells is equivalent to 8030 gallons. Storage capacity of all the wells is equivalent to 1144,550 Gallons. One Revolution of Pump shaft is equivalent to 1.79 Gallons. Zero. on Gauge being sill of Ulsoor Waste Weir.

1	2	3	4	5		6		7		8		9	10		11		12		13	14	15	16	17	18
Month and date.	Number of Hours Engine at work.	Number of revolutions per minute.	Total number of Revolutions per day.	Reading of Gauge in wells morning. Below sill of Waste weir, Ulsoor Tank.		Reading of Gauge in wells Evening.		Depth of water taken down during pumping.		Absolute loss of depth of water in 24 Hours.		Total number of gallons pumped.	Depth of water regained by filtration into the wells. During pumping by day		Engine at rest by night		No of gallons regained by filtration into the wells.			Rain of all.	Depth of water below sill of Ulsoor Tank. in feet.	Remarks.
				Feet	Inches	Feet	Inches	Feet	Inches	Feet	Inches		Feet	Inches	Feet	Inches	During pumping by day.	Engine at rest by night	Engine at rest by day	In inches.		
May 20	10	40.63	24561	13	6½	17	3	3	8½	"	"	47181	2	1½	1	1	"	"	16989	8700	"	"		
1871. 21	7½	61.5	27700	16	2	19	10	3	8	2	4½	49473	2	5	2	"	"	"	19361	16060	"	"		
22	7	65.95	27700	17	10	20	11	3	5	1	8	49473	2	11	2	"	"	"	23376	16060	"	"	3.8	
23	7	65.95	27700	18	11	21	7	2	8	1	1	49473	3	5	1	11	"	"	24391	15390	"	"	"	
24	7½	65.95	28850	19	8	22	0	2	4	"	9	50209	3	11	1	7	"	"	31500	12715	"	0.390	"	
25	7½	65.95	28850	20	5	22	7	2	2	"	9	50209	4	1	1	7	"	"	32809	12715	"	0.425	"	
26	5½	56.6	11870	21	0	22	8	1	8	"	7	33473	2	5	1	10½	"	"	19421	16749	"	0.115	"	Part of a day's work.
27	"	"	"	20	9½	20	0	"	"	"	"	"	"	"	"	8	"	9½	"	5350	6367	0.150	"		
28	"	"	"	19	4	19	0	"	"	"	"	"	"	"	"	7½	"	4	"	5020	2677	"	"		
29	"	"	"	18	4½	17	10¾	"	"	"	"	"	"	"	"	5¾	"	5¾	"	3850	3850	0.065	"		
30	"	"	"	17	5	16	10½	"	"	"	"	"	"	"	"	"	"	7½	"		5020	0.160	4.0		

Executive Engineer's Office
Bangalore 16 June 1871

Captain R.E.
Executive Engineer, Bangalore

No. 58.

Superintg: Engineer's Office, 5th Division,
Cuddalore, 7th June 1871.

From,

Colonel A. J. M. Boileau R. E.,
Superintg: Engineer, 5th Division.

To,

Colonel J. Carpendale, R. E.,
Secretary to Government, S. W. D.,

Sir,

Enclosures 11.
1 Plans
1 Descriptive Est:
of Rs. 31,900.
2 Abstracts estimates.
3 Specifications
2 Reports A & B.

With reference to para 8 of G. O. No. 919, dated 28th March 1871, I have the honor to re-forward, duly revised, the Plans & Estimates [as per margin] for supplying water from the Pitchilis wells and Elbow Tank to the Troops at Bangalore, due attention having been given to the suggestions of Government on the subject of increasing the size of the mains.—

2. By careful calculations entered into by the Executive Engineer he determined that theoretically a 4½" pipe would suffice for the mains, but to be quite on the safe side and to meet the views of the Government 5" mains

For Major R. E.
Superintg: Engineer
5th Division.

Cuddalore
7th June 1871

Dy. No. 2068/71

Select 2 extra
sections of Sheet
at the Photo-
Branch.

have been estimated for.

3. Captain Wood explains that "the previous size of 3½" diameter was taken on the supposition that discharge was going on to the Cisterns at the Royal Horse Artillery, European Infantry and Race course Barracks at the same time". "The pumps," he remarks, "can only raise 100 gallons a minute and this has to be distributed in the proportion of 12 gallons to the Royal Horse Artillery, 44 gallons to the European Infantry Barracks and 44 gallons to the Race Course Barracks, & if at the point of bifurcation [vide Plan] one main be cut off, the other must be made to deliver the whole 100 gallons per minute" to carry which, as above shewn, a 5" pipe has now been allowed.—

4. The scheme, as admitted by Government in Para 7 of their order, before referred to, has been drawn up in so full and satisfactory manner, that it would be useless for me to do more at present than to resubmit all the documents connected with the project, only stating that the Estimates now amount to Rs. 3,19,100. against the sum of Rs. 3,07,400. entered in the Acting Superintg. Engineer's letter No. 230 - 24th January 1851, and earnestly requesting that early authority may be given for the re-commencement of the work.

I have the hnnr to be
Sir,
Your most obedient Servant,

H. Linnaeus Colonel R.E.
Superintending Engineer, 5th Dn.

No 73.

From, Superintendg: Engr's office, 5th Divn
Cuddalore, 28th June 1871.

To, The Superintending Engineer,
5th Division.

Sir,

I have the honor to forward a report on the Inspection of the Public Works Department, Madras.

Enclosures to G.O. No 1333 dated 15th May 1871.

1 Report
1 Estimate
1 Statement.
1 Statement.
1 Bill.

Mr. Secretary to Government,
Public Works Department,
Madras.

With reference to G.O. No 1333 dated 15th May 1871, I have the honor to forward a report on the Inspection of the Executive Engineer, Trichinopoly, on the subject of Pumping the Gridding Towers of the Dholies wells during the dry season.

2. The Government will observe that Captain Wood left Cuddalore bound to Trichinopoly on the 6th instant.

3. I trust the Madras Government will know that the experiment under Private Conditions, cannot be called a failure, as the Contractor has the chance of £3,000 for the Steam Pumping Engines, the amount required by the Contract, if the Pumps do not work to the satisfaction of the Engineer.

I have the honor to be Sir,
Your most obedient servant,
[illegible]

Ord 28 March 71 No 662. 663

No 378
Ex 8 Letters Rec. 11

No 1871 Dept
From Govt of Madras No 1623.
The Supdg: Engineer,
5th Division
To,
The Secty. to Govt
P.W. Department.

Dated 7th June 1871.
Recd 9th June 1871.
No 58.

Enclosures 17.

Ulsoor Tank and Dholies wells project.
Re-forwarding duly revised, Plans & Estimates for supplying water from the Dholies' wells and Ulsoor Tank to the Roofs at Bangalore.

obtain this full supply from these wells, it will be necessary to double their number for which fortunately ample space is to be found. The additional 16 wells would cost about 10,000 Rupees.

4. A bill Rupees 193-3-8 is forwarded for the sanction of Government of the establishment employed during the experiment.

I have the honor to be
Sir,
Your Most Obedient Servant

A Boileau Lieut. R. E.
Superintg: Engineer, 5th Div.

17 Enc.

Ro 15 May/71 Ro 265-266

Public Works 1871 Oct. Part A
From Nos. 1871 Oct. 21-2016
The Superintg. Engineer
5th Division
To,
The Secretary to Govt.
P. W. Department
Madras.

Dated 28th June 1871
Rec'd 30th

No 73.

Enclosures 4

Dhobies Wells—

Submitting a Report from the Executive Engineer Bangalore, on the subject of testing the yielding powers of the Dhobies wells during the dry season.

No 399
C & L 5/71 R. 415

No 253

Executive Engineer's Office
Bangalore 16th June 1871.

From

The Executive Engineer
Bangalore

To

The Superintending Engineer
5th Division

Sir,

Enclosures 3
1. Details of experiment made at Dhoby's Wells.
1. Bill of expenditure incurred in —do.—
1. Sketch shewing the proposed additional wells to be sunk.

In obedience to your order No 32 dated 18th May 1871 on Proceedings of Madras Government Public Works Department dated 15th idem No 1333, I have the honor to submit a report on the pumping experiment at the Dhoby Wells.

Pumping was commenced at 6½ a. m. on 20th May and was continued until rather more than 47,000 gallons of water were taken from the wells. By guaging the wells before commencing and after ceasing to pump, it appeared that out of the 47,181 gallons

abstracted, no less than 16,989 gallons had filtered in to the wells during the time the pumps were at work. It was also found that 8,700 gallons filtered into the wells, from the time the pumps ceased to raise water on the first day, to the moment when they commenced to work again on the second day.

Pumping was resumed and carried out daily, until the 26th May, when I gave orders to stop the Engine. By that time 6⅔ days work had been accomplished and about 330000 gallons of water had been taken from the wells. This quantity I calculate to be about 116,000 gallons in excess of what the whole of the European Troops would consume in the above mentioned time.

The wells however were very nearly drained dry - when I ceased to pump, about 2⅔ feet only in depth of water remained in them. By referring to the detailed statement accompanying this report, column

8 it will be seen that four or five days more pumping would have emptied the wells completely: the absolute loss in depth of water daily being at that juncture about 4 inches.

As the experiment had proceeded sufficiently far enough, to show exactly what the wells could supply it was accordingly stopped.

The experiment shows I think conclusively that the Dhoby's Wells under present conditions cannot bear the drain of 35,000 gallons a day, for although 15,000 gallons a day in excess of this quantity was raised for 6⅔ day consecutively, — the result (had the pumping been persisted in) would have been that the wells would have been pumped dry.

Although the experiment was made in the most unfavorable month for the wells, it must be remembered that 5000 gallons only daily were taken from them before the experiment was commenced.

commenced – had 35,000 gallons daily (an average days supply for all purposes of the European Troops) been abstracted during the two hot months preceding May – it is perhaps more than probable that the water supply of the wells, would have been much less than what was found to be the case, while this experiment was in progress.

It is to be remarked however that, the capacity of the wells has been shown by the experiment to be amply in excess of the requirements of the project, for which they were constructed in the first instance, viz the supply of water for culinary purposes to the troops quartered in Bangalore. I should not omit to mention also that the Engine at the Dholey's Wells although quite equal to raising the small quantity required for culinary purposes of the troops, will be totally inadequate to pump up (or running it to work

one day in three) the considerably larger quantity required for all purposes of the troops.

It will be observed from column 8 of the detailed statement annexed to this report that there was an absolute total decrease of water in the wells of 7' 5½" considering the exhaustive effect that the suction of the water draining into the wells, is not unlikely to have on the permeable stratum through which it flows – and keeping in view the danger of generalising from an isolated experiment such as the one under notice – I have little hesitation in expressing an opinion that, the average depth of water which should permanently remain in the wells after giving a full supply to the troops, should at the least be not less than ten feet. This is about the depth at which the water in the wells stood

at

at the driest time of this year – and in order to preserve this depth the following course if pursued would I think suffice.

The wet perimeter of the existing 16 wells amounts to about 500 feet and the least quantity obtained daily by filtration, during the process of the experiment while the Engine was at rest was about 8000 gallons. Also the least quantity of water obtained daily by filtration, during the process of the experiment while the Engine was working was 17,000 gallons making a total of 25,000 gallons or about 10,000 gallons less than the assumed total expenditure of 35,000 gallons daily.

If however for safety's sake it is assumed that, the whole 35,000 gallons should be supplied daily by filtration, we shall require a total wet perimeter of $500 \times \frac{35000}{17000} = 1000$ ft. about; or in other words the number of wells should be exactly doubled. It will be seen from the accompanying sketch that ample space remains for the construction of the additional 16 wells. Their cost would be about Rs 10,000 and I think there can be little doubt that 35,000 gallons could then be supplied daily from them without any risk of failure.

As mentioned above, the present Engine would require to be removed and a more powerful one substituted for it.

I have the honor to be

Sir,

Your Most Obedient Servant

[illegible] Captain R. E.

Executive Engineer, Bangalore

E.d. A bill amounting to Rupees 193-3-8 is forwarded for sanction. This Bill includes pay for the Establishment who had to perform duties at both

Ulsoor Works and Dhobies Wells - the charge made is an addition of 50 percent to their ordinary daily pay and I beg to recommend it may be sanctioned.

The materials used in the experiment are also charged in the bill.

Captain R. E.
Executive Engineer, Bangalore.

777

Enclosure No 1 in
Lette No 473 of 28th
June 1871, from the
Supdt Engineer,
5th Division, to the
Secty to Govermt, P.W.D.

P.W. 3066/71.

A

No 1933. Public Works Departt
Proceedings of the Madras Government
Under date the 22 July 1871.

Read again letr from the Supg Engineer
5th Divn dated 7 June No 58 and recorded in Mis:
Pro: dated 15th June 1871. No 108.

Read also the following letter

From

The Supg Engineer 5th Divn

(H. E. No 473 of 28th June 1871)

W. Thelwall - Chief
Engineer & Secy to
Govt

In submitting the
question of the
enhanced Mysore Water
Supply, I have stated
that the Sankey
project is adopted
for all future
additions to the Bangalore Water Works
but that the Dhobi wells
project is interfering.

NP.

From the papers submitted with the first of the letters above recorded it appears that the revised estimate for completing the Ulsoor Water Works at Bangalore including the supply to the European Infantry Barracks at that station amounts to Rs 2,23,700, and the estimate for completing the Dhobies Wells Project, to Rs 95,400 — total Rs 3,19,100 of which Rs 2,20,902 having been ex-
- pended

pended up to 31st December, Rs
Rs 98,198 remain to be provided,
or if the direct supply from
the tank to the European
Infantry Barrack be
omitted, namely, Rs 28,369
the cost of completing
the projects as recently
estimated would be
Rs 69,829.

With the second letter
the Supdg Engr lays before
Govt a report from the
Executive Engr at Bangalore
on the result of the ex-
periments undertaken,
as directed in Govt. No 1333
dated 15th May 71, with
a view to ascertaining
the capability of the
Dhobees' Wells to furnish
a sufficient supply of
water for all purposes
for the use of the European
Troops at that station.
Captain Wood is of opinion
that the wells, sixteen
in number, cannot bear
the drain of 35,000 gallons
per diem, the average
daily quantity required
by the Troops for all
purposes, but that, if
it be considered ad-
visable to obtain the
full supply from wells,
it will be necessary not
only to double the
number, but to substitute

a more powerful engine for the one now in use. The additional sixteen wells, the states, will cost about Rs 10,000. This added to the balance of former estimate as above makes a total of Rs 79,829.

The Govt observes that in the event of its being determined to supply the troops entirely from the Dhobees' Wells, some re-arrangement of pipes and cisterns may be necessary, and before any thing further is done it is desirable the Govt should be informed what will be the total expenditure for completing the projects including sixteen additional wells - new steam engine - and any necessary modification of pipes.

The cost of the experiments above alluded to amounting to Rs 193-3-8 is sanctioned - the amount will be debited to the allotment for Minor New Works under Military for Bangalore.

+ each project separately

To The S. Engr & to Govt with 10 plans, 3 estes, 3 specifns 2 reports and one bill
15th July Dept
9/15th Contr of P.W. Accts Dept 24/7/71

5/5

Estr. 2/12 3 Fig 10

Govt of HISTR Works.

PUBLIC WORKS.

To The Superintending Engr
5th Division

Date

Recd.

22nd July 1933.

Nos.

Letter Date Noted in Margin
Letters Book the
Despatched 5th Div.
Secondly Letter, Re-
ceived Date Noted
Letters Book and
Copies Despatched
Together with Enclosures.