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MADRAS RECORD OFFICE.

Government of Madras.

Enlightenment DEPARTMENT.

G.O. No. 919	Press Mis-
662-63	
Dated 28-3-	1871.

Not to be folded or roughly handled

*Proceedings of the Madras Government, Public Works Department,
28th March 1871.*

No. 662. Read the following letter from the Acting Superintending Engineer, 5th Division, to the Secretary to Government, Public Works Department, dated Madras, 24th January 1871, No. 230 :—

In reference to G. O., 7th January 1870, No. 75, G. O., 14th March 1870, No. 30, G. O., 18th May 1870, No. 1,278, and G. O., 12th December 1870, No. 3,005, I have the honour to submit

- 9 Plans.
- 1 Descriptive Estimate of Rupees 3,07,400.
- 2 Abstract Estimates of above.
- 2 Reports, "A and B," on do.
- 3 Specifications for do.

herewith plans, estimates, and specifications, as per margin, for completing the

supply of water to the troops at Bangalore from the Ulsoor tank and the Dhobies' wells.

2. Water for ablutionary and other non-culinary purposes has been distributed, as the Government are well aware, from the Ulsoor tank to the Royal Horse Artillery and Race-course Barracks, since the commencement of the year just past; while drinking water has been provided, by means of puckally bullocks from the Dhobies' wells.

3. The average daily expenditure of water pumped up and distributed from the Ulsoor tank has been, during the period above mentioned, at the rate of 30,000 gallons per diem.

4. The occupation of the barracks has been as follows :—

A.—Horses	...	...	...	...	...	780
B.—Troops, inclusive of women and children	...	...	...	...	...	1,300
C.—Native followers, inclusive of women and children	...	...	...	...	...	2,150

Total units of expenditure... 4,230

5. Considering that there has been no stint in the supply of the Ulsoor tank water to the troops, it must be confessed that the expenditure of water on other than culinary purposes, namely, about 7 gallons a head per diem, as above shown, has been very moderate indeed.

6. On the other hand, I cannot bring myself to believe that any great practical benefit is obtained, or that we gain any useful hints for future guidance in lumping up and averaging, as above, the water expenditure. What object, it may be asked, is there in averaging the amount of water used by an average cooly, in his scanty ablutions, with that expended on watering horses, roads, and gardens, or on swimming baths? Would it not be more satisfactory to assume as data, in our calculations of expenditure, what we know from experience to be about the case?

7. For instance, let us assume 12 gallons a day as the amount of water expended on each horse, we shall then have about 21,000 gallons a day left as being used by the troops and their followers. And allowing 14 gallons a head for the use of the troops, this will leave a little more than a gallon a head for the followers, which is probably not far from the amount actually consumed by them.

8. In continuing this calculation for the water-supply which has still to be undertaken for the European Infantry Barracks, we shall have the following result: The 1st Battalion of the 21st Regiment now occupying these barracks numbers

*Proceedings of the Madras Government, Public Works Department,
28th March 1871.*

886 all told, i. e., inclusive of men, women, and children. To be on the right side, however, I will assume the number as 1,000, and the followers to be, as there are no horses in this case, 500. The daily consumption in the European Infantry Barracks will therefore be at the above-mentioned rates, $14,000 + 500 = 14,500$ gallons.

9. As the Government of India consider it very desirable that the expenditure to complete the supply of water should be reduced as much as possible, the cistern for the European Infantry Barracks is designed as a single one for seven days' supply, instead of a double one as was originally contemplated. The consumption of water for seven days, at 14,500 gallons daily, being 101,500 gallons, the cubical content of the required cistern should be 16,240 cubic feet. It has been designed however slightly in excess of this, so as to leave a top margin of 9 inches. Its actual content is 18,000 cubic feet, namely, 120 feet long, by 25 feet broad, by 6 feet deep.

10. It is to be regretted that the levels of the surface of the ground did not allow of the cistern for the supply of the Infantry Barracks being at the east, instead of the west, end of the barracks, as the item of Rupees 6,950 for continuing the main to the cistern would thus have been saved. The site, however, on which the cistern is designed to be built is that actually selected for it at an earlier stage of the question.

11. The distribution of piping of the Infantry Barracks has been designed with as great a regard to economy as efficiency will allow.

12. The revised estimate now submitted for the supply of water for ablutionary and all other, save culinary, purposes, amounts to Rupees 2,23,700, and provides, as has already been explained, 14 gallons a head per diem for the troops in Cantonment, 12 gallons per diem for each horse, and 1 gallon per diem for each Native follower.

13. For drinking and culinary purposes water will be provided from the Dhobies' wells according to the provisions of the accompanying estimate of Rupees 83,700. It will be seen, on reference to the accompanying Report "B" on the subject from the Executive Engineer, that it is proposed to provide, in the first instance, 3 gallons a head to the troops for drinking and culinary purposes, an allowance which may be increased hereafter provided that it is found that the wells can bear the extra strain.

14. The total sum required for supplying water for all purposes to the troops at this station amounts, therefore, to Rupees 3,07,400. Of this sum there has already been expended, as will be seen from the enclosed two abstract estimates,—

On the Ulsoor water-supply	Rs. 1,95,331
On the Dhobies' wells scheme	25,571
Total... ..	2,20,902

15. It may be mentioned that the estimates submitted on the last occasion for completing the Ulsoor project, and returned by the Government of India,

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28th March 1871.*

amounted to Rupees 2,66,000, while the sum formerly proposed to be expended on the Dhobies' wells estimate was Rupees 1,36,500, making a total for the two projects of Rupees 4,02,500. There is thus a reduction of Rupees 95,100 in the revised estimate now submitted.

16. I have only to state, in conclusion, that I have carefully gone over with Captain Wood, R. E., the whole of the details of the accompanying project, and I trust that as regards the arrangements for the distribution of the water, and for the cut-off valves, etc., these will be found to have been arranged as satisfactorily and as complete as can fairly be expected. The whole of the calculations by which the size of the pipes, cisterns, etc., was determined is given in Captain Wood's Report, "B," enclosed, and no further remarks appear to me to be called for in this respect.

17. I may add that I was desirous of utilizing, if possible, for the new Drinking water scheme, some of the present water standards and pipes. But as so large a quantity of water is used for gardens and washing-up purposes, it does not appear to me desirable to disturb, or curtail, the existing arrangements for such. In order to prevent confusion, or doubt, regarding the two sets of stand pipes, it is proposed to color white those for drinking water, while those for the Ulsoor water will be painted a dark slate color, as at present.

No. 663.

ORDER THEREON, 28th March 1871, No. 919.

MILITARY WORKS, No. 16.

IN September 1869 an estimate for completing the project for supplying water from the Ulsoor tank to the buildings on the Race-course and other parts of the Cantonment of Bangalore at a cost of Rupees 2,66,000 was submitted to the Government of India, but did not meet with sanction, as His Excellency the Governor-General in Council, observing that the scheme was restricted to the provision of water for ablution and cleansing purposes and for the use of cattle only, required information as to the source from which water for drinking and culinary purposes was to be obtained, and suggested the advisability of eliminating from the project the supply for the British Infantry Lines from the Ulsoor tank and the adoption of other arrangements for the purpose.

2. Reports having been subsequently received that the measures sanctioned in January and July 1869 for strengthening the floors of the filters and cisterns connected with the Water Works had been only partially successful, and that one section of the large cistern at the Cavalry Barracks and one division of the filters on the rock were not water-tight, orders

G. O., dated 18th May 1870, No. 1,278. were issued in May 1870 for the re-construction of the floor of the defective filter in a thoroughly effective manner, as the water from the tank could scarcely be used for any purpose till filtered, and it was determined, with reference to the remarks of the Government of India on the needlessly large storage capacity provided in the scheme, that, for the present at least, the half of the great cistern which was in good order should be made to suffice.

3. Believing that, on the filter-beds being placed in working order, the means of supplying water from the Ulsoor tank to the Race-course and Artillery Barracks for all the purposes for which it is fit would be complete, the Government turned their attention to the question of the provision of drinking water from the Dhobies' wells, which, found to yield water of the most pure and most wholesome description, were purchased in July 1868, when also plans and estimates for a complete water service from them were called for. These plans and estimates were received in August 1869, but were laid aside in consideration of their magnitude, and, meanwhile, only such preliminary operations as the enlargement and connection of the wells, and the erection of an engine-house were proceeded with.

4. Looking to the bad quality of the Ulsoor tank water and to the probability of that from the Dhobies' wells proving sufficient for all the purposes for which it might be required throughout the Cantonment, the Government, with a view to restricting further expenditure on the distribution of the former water, again called for plans and estimates for carrying out a direct service from the Dhobies' wells on the most economical scale compatible with efficiency, and, as the two systems of supply could not be altogether kept separate, they directed them to be treated as one scheme.

5. In compliance with this requisition Lieutenant-Colonel Roberts submits, with his letter recorded at the head of these Proceedings, plans, with estimates amounting to Rupees 3,07,400, for the modified project. This sum is made up of Rupees 2,23,700 and Rupees 83,700, respectively, for the Ulsoor water works and the Dhobies' wells scheme. The former of these two amounts includes Rupees 28,370 for the purpose of supplying water to the European Infantry Barracks in order to render the Ulsoor water works project complete; but, under the opinion expressed by the Government of India, this part of the project may be held in abeyance until it is seen whether or not the Dhobies' wells are capable of affording a sufficient supply for all purposes to those barracks. Deducting Rupees 28,370 from the total of Rupees 2,23,700, there remains Rupees 1,95,330 as the cost of so much of the Ulsoor tank project as has been completed, and this sum, it may be observed, corresponds with the actual expenditure up to date.

6. For the Dhobies' wells scheme the estimate amounts, as already stated, to Rupees 83,700. The wells are sixteen in number, each 10 feet in diameter and 20 feet deep, and they appear to contain an almost inexhaustible supply. This is not however certain, and it is therefore proposed in the first instance to restrict the delivery to 3 gallons per head. Taking 2,400 as the number of European soldiers, including their wives and children, 8,000 gallons will be required daily, of which 1,000 will be for the Royal Horse Artillery Barracks, 3,500 for the Cavalry Barracks, and 3,500 for the Infantry Barracks.

7. The scheme, as now submitted, is drawn up in a very full and satisfactory manner, and, considering the importance of the object to be attained, at what appears to be a reasonable cost.

8. The Government are however of opinion that the dimensions proposed to be given to the main delivery pipes are far too small to admit of the flow of the quantity of water to be forced through them without requiring of the engine an amount of power far in excess of what need be expended in doing the duty it has

to perform, and His Excellency the Governor in Council consequently resolves to return the estimates for revision with a view to the question of the proper size of mains being re-considered, it appearing to His Excellency in Council, as at present advised, that the influence of friction has not been sufficiently recognized, and that due allowance has not been made for the liability of the pipes to become encrusted. A diameter of 5 inches or 6 inches would not, it seems to His Excellency in Council, be too large a size for the head main.

(True Extract.)

Colonel, R.E.,
Secretary to Government.

To the Superintending Engineer, 5th Division.
" Controller of Public Works Accounts.
" Military Department.

provided, by means of probably hundreds
of the "Electric Wells".

3. The average daily expenditure of
water from the point distributed from the
Wilson Tank to the troops, during the period above
mentioned, and the cost of 20,000 gallons per
day.

4. The expenditures of the barracks have been
as follows:-

a. Messes _____ 1750.

b. Fuel, maintenance of "messes"
children _____ 1500.

c. Native followers, maintenance
of some children _____ 2150.

Total units of expenditure _____ 4250.

5. Considering that there has been no
short in the supply of the Wilson Tank
water to the troops, it must be confessed
that the expenditure of water on other than
culinary purposes, viz: about 14 gallons a
head per diem, as above shown, has been
very moderate indeed.

6. On the other hand, I cannot
bring myself to believe that any great

expenditure is required for the purpose of
gaining and maintaining the water supply
in the water supply. In fact, the
water supply is not a problem, it may
be asked, is there in carrying the
amount of water used by the troops
only, in the security of the water, and
spreaded in watering horses, roads and
gardens, or in swimming baths? Would
it not be more satisfactory to assume
as data, in our calculations of expenditure,
that, what are known for expenditure
tells about the case?

7. For instance, let us assume 12
gallons a day as the amount of water
expended in each house, we shall then
have about 24000 gallons a day left as
being used by the troops and their
followers. And allowing 14 gallons a head
for the use of the troops, this will leave
a little more than 2000 gallons a head for
the followers, which is probably not
far from the amount actually consumed
by them.

8. In continuing this calculation
for the water supply which has been

the installation for the European
Infantry Barracks, we shall have the
standing water. The 1st Battalion of
the 21st Regiment now occupying them
occupies numbers 1 to 6 all told; i.e. includes
men, women and children. To be on
the right side, however, I have assumed
a number as 1000, and the following
60; as there are no houses in this
area, 500. The daily consumption in
the European Infantry Barracks will
therefore be at the above-mentioned
rates $14000 + 500 = 14500$ gallons.

As the Government of India
consider it very desirable that the
expenditure on the supply of
water should be reduced as much
as possible, the Cistern for the European
Infantry Barracks is designed as a
single one for 4 days' supply, instead of
a double one as was originally con-
templated. The consumption of water for 4
days at 14,500 gallons daily being 58,000
gallons, the actual content of the aqueduct
cistern should be 58,000 c. feet. It has been
designed, however, slightly in excess of this,
so as to leave a top margin of 9 inches.

Its

Its actual content is 15,000 c. feet, viz: 120 ft.
long by 25 ft. broad, & 6 ft. deep.

It is to be regretted that the
level of the surface of the ground did
not allow of the cistern for the supply
of the Infantry Barracks being at the
head, instead of the foot, end of the
barracks, as the item of £6950 for
continuing the main to the cistern
would thus have been saved. The
situation, however, of the cistern is
designed to be built is that actually
selected for it, at an earlier stage of the
question.

11. The distribution of piping
of the Infantry Barracks has been
designed with as great a regard to
economy as efficiency will allow.

12. The actual estimate now
submitted for the supply of water for
abstaining any and all other uses containing
purposes amounts to £22,5700, and
provides, as has already been explained,
14 gallons a head per diem for the
troops in cantonment, 12 gallons per
diem for each horse, & 1 gallon per
diem for each native follower.

For drinking & bathing purposes, water will be provided from the Sholiers' wells according to the provisions of the accompanying Estimate of Rs 25,402. It will be seen, as appears to the accompanying Report "B", that the Government of India is proposed to provide, in the first instance, 3 gallons a head to the troops for drinking & bathing purposes - an allowance which may be increased hereafter, provided that it is found that the wells can bear the extra strain. -

The total sum required for supplying water for all purposes to the troops at this station amounts therefore to Rs 50,400. Of this sum there has already been expended, as will be seen from the enclosed two Abstract Estimates, on the Ulsoor Water Supply. -

Rs 1,95,331.
on the Sholiers' wells scheme - 25,511

Total Rspees - 220,902.
Leaving for execution Rspees 86,498. -

It may be mentioned that the Estimates submitted on the last occasion for completing the Ulsoor Project, and

returned by the Government of India, amounted to Rs 2,66,000, which sum, formerly proposed to be paid by the Sholiers' wells Section, at a cost of 1,36,500, making a total of Rs. two Lakhs of Rs 4,02,500. This is thus a reduction of Rs 95,000 in the total Estimate now submitted. -

16. I have only to state, in conclusion, that I have conferred with the Engineer-in-Chief, the whole of the details of the accompanying project, and I trust that all is in the arrangements for the distribution of the water, and for the cut-off valves, &c., there will be found to be as well arranged, as satisfactory and as complete as can fairly be expected. The whole of the calculations by which the size of the pipes, cisterns, &c., was determined is given in Captain Woods Report "B", enclosed, and no further remarks appear to me to be called for in this respect. -

17. I may add that I was desirous of utilizing, if possible, for the new drinking water scheme, some of the present water standards and

pipes. But as a large quantity of it
is used for gardens and watering-up
purposes, it does not appear to be
desirable to disturb, or control, the
existing arrangements for such. In
order to prevent confusion, and doubt
regarding the two sets of stand-pipes,
it is proposed to color white those for
drinking water, white those for
other uses with the painted, a dark
slate color, as at present. —

I have the honor to be
Sir,

Your most obedient Servant.

Richd. Roberts Smith & Co. Esq.
Asst. Superintg. Engineer, 5th District.

pp. Dept.
No 919

8a

noted
10/1/91

papers. But use a large quantity of. as
is used in various and sundry -

1871 March
No. 439
To Mr. Secy. to Govt.
S. D.

Order 24th Jan 1871
Recd - 31st
No 930.
In closed 17.
S. D. to Plans, for
completing the supply
of water to the troops
at Bangalore from the
Ulloor Tank. Also the
S. D. to Wells.

Ch 662

No 919 - 28 March 71

Dec 17th March 1871 No 205
6 13 March 71 No 16

P. P. Dept

No 919

Proceedings of the Madras Government
Under date the 28th March 1871

Read the following

90

By Superintendent of the 5th Division
No 230 of 26 Aug 1871

N
A. A.
S. D.

In September 1869
an estimate for completing
the project for supplying
water from the Ulloor Tank
to the buildings on the Race
Course and other parts of
the Cantonment of Bangalore
at a cost of Rs. 26,000 was
submitted to the Govt. of
India, but did not meet
with sanction, as His Excellency

the Governor General in Council, observing that the scheme was restricted to the provision of water for ablu- tion and cleansing purposes and for the use of cattle only, required information as to the source from which water for drinking and culinary purposes was to be obtained, and suggested the advisability of elimin- ating from the project the supply for the British Infantry Lines from the Ulster Tank and the show of other arrangements.

for the purpose.

Reports ^{have} been subsequently received that the measures sanction- ed in January and July 1869 for strengthening the floors of the filters and cisterns connected with the Water Works had been only partially successful and that ~~notwithstanding~~ ~~the excellent quality of~~ ~~the work recently car-~~ out one section of the large cistern at the Cavalry Barracks and one division of the filter on the rock were not

water. Right orders were
issued in May 1870 for
the reconstruction of the floor
of the defective filter in a
thoroughly effective manner,
as the water from the tank
could scarcely be used
for any purpose till filtered,
and it was determined,
with reference to the remarks
of the Govt. of India on the
needlessly large storage
capacity provided in the
scheme, that, for the
present at least, the
half of the great cistern
which was in good
order should be made

G. O. of 18th May 70 No 1278

to suffice.

Believing that, on
the filter-bed being placed
in working order, the means
of supplying water from
the Ulloor Tank to the Race
Course and Artillery Barracks
for all the purposes
for which it is fit —
would be complete, the
Government turned their
attention to the question
of the provision of drinking
water from the Shobier
Wells, which, found to
yield water of the most
pure and most wholesome
description, were purchased
in July '68, when also

plans and estimates for a complete water service from them were called for. These plans and estimates were received in August 1869 but were laid aside in consideration of their magnitude, and, meanwhile, only such preliminary operations as the enlargement and connection of the wells and the erection of an engine-house were proceeded with.

Looking to the bad quality of the

9
Woon Lake water and to the probability of that from the Shobies' Wells proving sufficient for all the purposes for which it might be required throughout the Cantonment, the Govt., with a view to restricting further expenditure on the distribution of the former water, again called for plans and estimates for carrying out a direct service from the Shobies' Wells on the most economical scale compatible with

efficiency), and as the two systems of supply could not be altogether kept separate, they directed them to be treated as one scheme.

In compliance with this requisition Lt Col Roberts submits, with his letter recorded at the head of these Proceedings, plans, with estimates amounting to Rs 3,07,400 for the modified project. This sum is made up of Rs 2,23,700 and Rs

Rs 83,700 respectively, for the Almor Water Works and the Shobies¹³ Wells scheme. The former of these two amounts includes Rs 28,370 for the purpose of supplying water to the European Infantry Barracks in order to render the Almor Water Works Project complete, but, under opinion expressed by Govt of India, the part of the project ~~the (advantage)~~ ~~omitted, and~~ held in abeyance

until it is seen whether
or not the Shobies' Wells
are capable of affording
a sufficient supply
for all purposes to
these Barracks. Deducting
Rs. 28,370 from the total
of Rs. 2,23,700, there remains
Rs. 1,95,330 as the cost
of so much of the Meer
Tank Project as has
been completed, and
this sum it may be
observed, corresponds
with the actual expendi-
-ture up to date.

For the Shobies'
Wells Scheme the

the estimate amount
as already stated, is
Rs. 83,700. The wells are
16 in number, each 10
feet in diameter and
20 feet deep, and they
appear to contain an
almost inexhaustible
supply. This is not
however certain, and
it is therefore proposed
in the first instance
to restrict the delivery
to 3 gallons per head
taking 2400 as the
number of European
soldiers including
their wives and chil-

1000 gallons will be required
daily, of which 1000 will
be for the Royal Horse
Artillery Barracks, -
500 for the Cavalry Barracks,
and 3500 for the Infantry
Barracks.

The scheme, as
now submitted, is drawn
up in a very full and
satisfactory manner,
and, considering the
importance of the object
to be attained, at
what appears to be
a reasonable cost.

The Government
are

12
are however of opinion
that the dimensions pro-
posed to be given to the
main delivery pipes are
far too small to admit
of the flow of the quantity
of water to be forced
through them without
requiring of the engine
an amount of power
far in excess of what
need be expended in
~~performing~~ ^{doing} the duty
it has to ~~do~~ ^{perform}, and His
Excellency the Governor in
Council consequently
... lies to return the
notes for review.

with a view to the question
 of the proper size of
 mains being reconsidered,
 it appearing to His
 Excellency in Council,
 as at present advised,
 that the influence of friction
 has not been sufficiently
 recognized, and that due
 allowance has not been
 made for the liability
 of the pipes to become
 encrusted. A diameter
 of 6" would not, it seems,
 to His Excellency in Council,
 be too large a size for
 the head main.

W.A.B.

To the Super. Engr. 5th Div.
 Controller
 11th Sept
 Recd 29/3/71

Pro 6' August /68 87° 122 - 123
 " 18' Decr ——— 371 - 371
 " 16' January /69 — 267 - 268
 " 1st July ——— 9 - 10
 " 6' Sept ——— 138 @ 141
 " 11' Decr ——— 193 - 194
 " 7' January /70 — 144 - 145
 " 4' March ——— 30 Ind
 " 18' May ——— 281 - 282
 " 8' Sept ——— 114 - 116
 " 19' Decr ——— 225 - 226

Further Pro 12 1933 of 22-7-71

with a view to the question
the proper size of

C/No 439
Sob. of 1871 Madras.
PUBLIC WORKS.

To the Superintending Engr
5th Division

Dated

Recd.

Recd.

28th Dec. 1871 No. 919.

Nos. 62162

Uleor & Dhobies' Wells Projects.

Papers on the latter from
the Superintending Engr
submitting estimates for com-
pleting the Uleor & Dhobies'
wells projects at Bangalore.