PWD - 1893

[illegible] [illegible] 82
[illegible] [illegible] 10/91

Go No: 2265 – W – dt. 4-9-1893

1+2

4TH SEPTEMBER 1893, No. 2265 W., PUBLIC WORKS.

2265/1

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Buildings and Roads.
Civil Works.

READ—the following paper :—

From J. A. JONES, Esq., MEM. INST. C.E., F.R.S.E., Sanitary Engineer to Government, to the Chief Secretary to Government, dated Fort St. George, 31st July 1893, No. 1564.

With reference to memorandum No. 408, dated the 29th June 1893, transferring to me note by the Acting Chief Engineer, Public Works Department, dated 10th June 1893, regarding the improvement of Guindy water-supply and requesting me to draw up a scheme, I have now the honour to report as follows and to forward plans and estimates.

2. In the Chief Engineer's note it is stated that 900 gallons only are required for baths, but Major Lawley's No. 58, dated 2nd June 1893, paragraph 6, states the requirement to be 1,350 gallons.

3. I had doubts, however, as to this quantity being ample and, after a further inquiry at Guindy and a consultation with Dr. Browning and Major Lawley, the amounts required were finally determined as follows (*vide* letter No. 114 of 14th July 1893 from the Military Secretary to His Excellency) :—

	GALS.
Baths	2,500
Horses	800
Servants	1,200
Wastage, hot water, &c.	500
Total ...	5,000

and on this basis the scheme has been framed.

4. The scheme is as follows :—

(1) The provision of filters of sufficient area to filter the above supply of 5,000 gallons daily.

(2) The provision of a service reservoir to contain the supply and allow filtration to proceed regularly.

(3) The provision of a pump for the raising of the supply to the various places and heights required.

(4) The provision of the necessary pipes for the distribution of the supply.

5. *Filters.*—These with the service reservoir adjoining have been placed nearly opposite the Military Secretary's office. There are two filters, one will ordinarily be out of use for cleaning. Each filter has an area of 16 square yards and at 400 gallons per yard will filter 6,400 gallons daily when clean. The filters have been made of somewhat ample size for the work to be done, so that on special occasions it will be possible to filter an increased quantity. A reduction in size would not effect much economy in cost.

6. In order to have continuous filtration, the supply to the filters will be drawn directly from the garden tank; the pipe to the filters will pass out at the bottom of that tank. The filters are sand filters of the usual pattern with regulating valves to ensure filtration proceeding regularly.

7. *Service Reservoir.*—The filtered water will pass into the service reservoir which will have a capacity of 900 feet. It is in two portions, each of which is $7\frac{1}{2}' \times 10' \times 6' = 450$ feet or 2,812 gallons, equal to slightly more than half-a-day's supply. The service reservoir is necessary to compensate for the difference between the average rate of filtration and the demand.

8. *Hydraulic Pump.*—This pump will draw water from the service reservoir and lift it—

(1) To the top of Government house, a maximum height of 55 feet.
(2) To tanks on the top of the coach-house.
(3) To a tank over the hot water boiler.

The pump will be worked by pressure from the pumping main, the pressure anticipated being ahead of about 42 feet of water. The water from the main will, after working the pump, pass round the filters back again to the main and thence into the garden tank. I have not yet been able to get a proper quotation for a pump of less than Rs. 1,800, but I believe that the Rs. 1,200 in the estimate or probably less will cover the cost; if not, a petroleum engine which needs no attention will be substituted. From the pump the water will pass (1) partially by the existing 5″ main to the upper tank on Government house, (2) partially by an existing main to the tank about the hot water boiler, (3) by a new 2½″ main to the tanks on the top of the coach-house. The pumping will be done during three hours in the morning and three in the evening.

9. *Distribution.*—Before describing the proposed distribution, it is necessary to detail to some extent present arrangements. The tank on the top of the house not only feeds the pipes throughout the house, but by another outlet pipe distributes water to the garden in front of the house. It was this which misled me in my original calculation based on the number of times the tank was filled, as I was unaware the garden was also supplied; this connection will be cut off. The two cisterns in the stable yard are fed by pipes from the garden cistern; this system will be continued *but* to one cistern only. The cisterns or tanks over the kitchen are connected with the pumping main; this connection will be cut off and the tanks taken and placed over the coach-house. The hot water boiler is connected directly to the pumping main; this connection will also be cut off.

10. The distribution will be as follows:—

(1) To the Government house from the upper tank.

(2) From the coach-house tank to (1) one of the stable yard cisterns, (2) the existing fountain, (3) a new self-closing fountain nearer the apothecary's quarters.

(3) From a tank over the hot water boiler room to the hot water boiler.

To effect these proposals alterations in existing pipes are necessary as follows:—

(1) The existing valves at S. on plan will be removed and the pipe line here relaid.

(2) A new valve will be placed at V, all the water passing through hydraulic pump when it is at work; this will be for three hours morning and evening.

(3) A new stoneware pipe in addition to some old pipes will be laid from the large garden reservoir to the small tanks in the garden opposite Government house.

(4) The pipe from the well, where the chain and bucket pump is, to the small tank at the back of Government house will be removed and laid from the garden reservoir to the filters.

11. Sections attached to plans show the various levels of existing pipes, &c., and also sections and cross sections at the Adyar river. The section across the river shows a maximum depth of 9 feet. It was suggested that a bund should be placed across the river below the pumping station, but the cost of any bund or dam which would be of any use would be so great that I have omitted it from my estimates. I have, however, entered a small sum for permanently fixing masonry pillars to support a new screen, and from contingencies I hope to effect some improvements by clearing and sectioning the inlet at the river.

12. *Estimate.*—The estimate amounts to Rs. 7,000; the length of pipe to be lifted and relaid and new pipes to be laid amount to much more than anticipated, so that notwithstanding the reduced quantity of water the estimate is about the same

2

2265/2

amount as previously advised. The working charges will be comparatively small; the pump will cost nothing to work. The only extra cost will be for cleaning the filters and service reservoir, and this can be done and the sand washed at intervals by the gardeners under proper supervision.

13. If the scheme is to be sanctioned, His Excellency's Military Secretary desires it to be carried out before November next when His Excellency will be in Madras. If the scheme is approved very early orders are requested for its execution.

No. 534, Local and Municipal.

Transferred to the Public Works Department.

Fort St. George,
10th August 1893.

(Signed) A. T. PRINGLE,
Assistant Secretary.

Order—dated 4th September 1893, No. 2265 W., Public Works.

The estimate, amounting to Rs. 7,000, for improving the water-supply to the Government house at Guindy, is sanctioned for execution by the Consulting Architect and the amount is appropriated from the Provincial reserve with the Government.

2. This sanction has been registered as Provincial No. 85 W. of 1893–94 and classified as Civil Buildings, Original Works.

(True Extract.)

Major, R.E.,
Under Secy. to Govt., P.W.D.

To the Consulting Architect to Government, with four enclosures.
,, Examiner, Public Works Accounts.
,, Military Secretary to His Excellency the Governor.
,, Local and Municipal Department.

Exd. C. A. Munisawmy,
Spare Copies

BUILDINGS AND ROADS.
CIVIL WORKS.

Govt. of {1893} Madras.

PUBLIC WORKS.

Dated September, 4th.

Recd.

Encl.

G.O., 4th Sept. 1893, No. 2265 W.

SEPTEMBER.

Government House, Guindy

Estimate of Rs. 7,000 for improving the water-supply to —, sanctioned for execution by the Consulting Architect.

3

No 108.

Guindy 16 February 1893.

2265/3

From

The Surgeon to His Excellency
the Governor

To.

The Military Secretary
to H. E. the Governor

2265/3

Sir,

I have the honor to bring to your notice that although the pipe water to Government House Guindy has been improved by conserving the supply above the bridge - still there is much room for further improvement

The water, as now supplied, comes through three wells of sorts in which are placed large stones, presumedly to act as filtering materials, but I doubt whether the water is really rendered any clearer

Before proposing anything definite in this connection I would suggest that the Sanitary Engineer, Mr. Jones, might be asked to give us the benefit of his opinion and act in concert with me in this matter

I think some better filtering arrangement can be made at no great cost

The pumping station is now I believe under the control of the P. W. D. Workshops; but perhaps it may be considered advisable to have the works either wholly or in part under the supervision of the Sanitary Engineer?

I have the honor to be
Sir
Yr: most Obt. Servant

W M Browning
Surgeon Ma
Surgeon to H.E.

SANITARY ENGINEER
No 940
TO THE GOVERNMENT OF MADRAS

No 556

SANITARY ENGINEER
No 1582
30 JUN. 93
TO THE GOVERNMENT OF MADRAS

F X 3920

~~2107/93~~

~~3063~~

6665

5554/53

2/1198/93

564 of 93

X

Local & Municipal Dept.
CURRENT No. 564

GOVERNMENT HOUSE,
Guindy 3rd March 1893.

No. 743

2265/4

From

THE MILITARY SECRETARY TO THE
RIGHT HONORABLE THE GOVERNOR,

2265/4

To

The Secretary to Government
Public Works Department
Chepak.

SIR,

I have the honour to forward for your favorable consideration letter from Surgeon Major Browning, Surgeon to H. E. The Governor, and trust that the proposals made therein may commend themselves to your notice. I thoroughly endorse all that Dr Browning says, and as the question of this water supply is one in which H. E. The Governor takes special interest it is hoped that the matter may receive early attention.

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

R. F. Lawley
Captain,
Military Secretary.

P. W. CURRENT No. 2/17

~~3063~~
~~6069~~/53
6554

Urgent

No 1046 C of 7 March 1893

CHIEF SECRETARY TO THE GOVERNMENT OF MADRAS
7 MAR 93

Referred to the Local and Municipal Department. The undersigned has no objection to offer to the proposals made in the last para of the letter from Surgeon Major Browning

Ag. Secretary to Govt
P.W.D.

Encl 1
Rec: 6.3.93

SANITARY ENGINEER TO THE GOVERNMENT OF MADRAS
In 940
20 APR 93

SANITARY ENGINEER TO THE GOVERNMENT OF MADRAS
In 1582
30 JUN 93

3/1198 L 4/93

2265/5

LOCAL AND MUNICIPAL DEPARTMENT M

CURRENT No. 564 M

From The Public Works Department

SANITARY ENGINEER TO THE GOVERNMENT OF MADRAS 1582

SANITARY ENGINEER TO THE GOVERNMENT OF MADRAS 940

P.W. 3062/93 ~~1669~~ 6554

No. 1046

Dated 7 - 3 - 93

Received 8 - 3 - 93.

Enclosures 1

556

SUBJECT.

Referring letter from the Military Secretary to H.E. the Governor regarding the water supply to Government House Guindy

No 146

Referred to the Sanitary Engineer for remarks.

By order,
A. King
Assistant Secretary

Fort St George
10th March 1893

4/1198/93

10 March

17th 3/93

To the Sanitary Engineer.

S.E. 12 1,000—10-3-93.

6

No. 647,

2265/6

GOVERNMENT OF MADRAS.
OFFICE OF SANITARY ENGINEER,
Fort St. George, 24th March 1893.

From

HORMUSJI NOWROJI, Esq., B.C.E.,
ASSISTANT SANITARY ENGINEER TO GOVERNMENT,
In charge of Sanitary Engineer's office.

To

The Chief Secretary to Government,
Local and Municipal Department.

SIR,

* Herewith returned.

With reference to your endorsement* No 14 dated 10th March 1893, I have the honor to report tha I have inspected the water works of the Governme House at Guindy with Surgeon Major W. B. Brown

2. The supply of water in the existing arrangement passes from the river to the pump throu an oblong cistern 5 ft × 20 ft. The cistern is divide into three chambers by partition walls. The partition walls as well as the outside walls of the cistern are pierced by openings probab like a silting trap (?). Some laterite pieces as big, I am informed, as a mali's head are thrown into the bottom of the cistern, but they do no reach the crown of the openings in the parti so that the river water passes to the pumps

its natural state. If the cistern were filled up to
the top of the centre openings, a filtering action
would take place; but the quantity flowing to
the pumps would, of course, be diminished having
to pass through the filtering material, and the
pumps would not get sufficient supply.

Some improved and enlarged means of fil-
tering is necessary.

There is no information available as to
the consumption of water. But calculated from
the work of the pumps the quantity of water used
should be about 60,000 gallons. It is said that
from a fourth to a third of the above quantity
represents the domestic consumption and the
rest is used for the garden. This gives from 15,000
to 20,000 gallons used for domestic purposes.

A proper sand filter will be expensive
in construction and require double pumping
first from the river on to the filter bed and
again from the collecting reservoir to the dis-
tributing reservoir.

Seeing that the greater portion of the
water pumped is used for the garden it naturally
suggests itself that only the quantity used for
domestic purposes should be filtered. The

garden

garden can continue to have an unfiltered supply.
A supply partly filtered and partly unfiltered can
easily be arranged.

7. A filter with an area of 120 Square yards will give the required supply of 15,000 to 20,000 gallons in 8 hours, and will cost about Rs 3,000. A storage or collecting reservoir with a capacity equal to a day's supply will be necessary and will cost about Rs 1,600. The total cost of this filtering arrangement will be about Rs 6,000 and longer pumping than at present may be necessary.

8 Judging from the natural quality of the water, a more rapid, though less thorough, filtering arrangement at river level as per sketch accompanying will, it is considered, meet the requirements at a less cost than the method above.

9 The cistern is on the principle of upward filtration which has this advantage: that the filtering material is not so readily clogged up as in downward filtration. The chamber A also acts as a settling chamber. The filtering media, it is proposed, should be well weathered laterite gravel, laterite owing to the presence of iron in it is a very good material for filtering.

10 Supposing the quantity to be filtered is 60,000 gallons in 12 hours with a head of one foot, a filter with an area of 60 square yards would prove ample. Such a filter, with settling and clear water chambers as shewn on sketch accompanying, would cost Rs. 5,000.

11 This last arrangement is very simple, proposes to deal with the whole supply, avoids double pumping and is free from the complexity of arrangements for pumping a filtered and unfiltered water at times.

12 Both the above methods have their respective merits and, if Government approves, both the schemes can be worked out fully for the sake of better comparison.

13 To secure a sufficiency of water during the dry months it would be advisable to throw a low dam constructed with boulders across the deep portion of the river just below the pumping station. This dam will also be an advantage from a Sanitary point of view.

14 Just below the bridge which is only a few hundred feet from the pumping station all the dhobies wash (most of the

to the Sanitary Engineer.

the washing for Madras is done here) and in the dry months there is not much perceptible flow in the river, so there is a possibility of the contamination of the river water at the pumping station by diffusion as pointed out by Dr. Browning. The dam will prevent such diffusion.

15 There is one little improvement that can be effected at once. The pumping well is quite unprotected. One portion of the well is covered but the planks have wide open joints. There is no parapet wall to the well so that all the drippings from the engines, oil, water &c. gets into the well. Much of the brownish looking stuff floating on the surface of the water in the well is probably dripping from the engine. When the floor of the engine house is washed some of the water probably gets into the well, though precautions are taken, it is said, to prevent this. A parapet wall to the well and a drain from the engine house floor to the open yard outside would remedy matters. This was brought to the notice of Dr. Browning who said he would have the matter attended to.

16 With regard to the last paragraph of Surgeon Major Browning's letter I beg to

state that the present arrangements should continue until this department has obtained the services of a Mechanical Engineer for whose employment sanction has been obtained from Government. For all repairs to machinery this Department will still have to look to the Public Works Workshops.

GO 1825 M / 7-11-92

I have the honor to be,
Sir,
your most obedient Servant

Assistant Sanitary Engineer to Govt.
hbh In charge of Sanitary Engineer's Office

E 2417
GO 3335/93
~~6617~~
6254

SANITARY ENGINEER TO THE GOVERNMENT OF MADRAS
Dn 940.

SANITARY ENGINEER TO THE GOVERNMENT OF MADRAS
Dn 1582

2265/9

$\frac{\text{S.E.}}{4}$ 13-12-92—500.

E.16 ~~183~~

1825L 7-11-92

P. W. CURRENT No. 3063

E ~~1664/93~~ 6550

E

~~Local & Municipal Dept.~~
~~CURRENT No.~~ 707 M
P.V.

1893.

From
Asst.
The Sanitary Engineer
to Government,
In charge of Sanitary Engineer's Office

To
~~The Chief Secretary
to Government
Local and Munl. Dept.~~

No. 647

Dated 24th }
Despd. 24th } March 1893.
Recd. 30th }

Enclo. 4 (Plans)
Encs. ~~2~~

CHIEF SECRETARY TO GOVERNMENT, MADRAS
24 MAR 93

Subject.

Guindy Government House Water Supply

Submitting his report on the ——.

C.f.

No 195 Transferred to the ~~Military Secretary to H.E. the Governor~~ P.W. Department (By order)

A. F. Pinhey
Assistant Secretary
29th March

Fort St. George
29 March 1893 }

To The Public Works Department.

SANITARY ENGINEER TO THE GOVERNMENT OF MADRAS
S. 940
20 APR. 93

SANITARY ENGINEER TO THE GOVERNMENT OF MADRAS
Gen. 1582
JUN. 93

[with an Endorsement] to the Sanitary Engineer
27/3 a/27/3

10

No. 1683 C

Local & Municipal Dept.
CURRENT No.

Government of Madras.

2265/10

PUBLIC WORKS DEPARTMENT.

Endorsement ~~MEMORANDUM.~~ 2265/10

Dated Madras, 11th April 1893.

From the Local & Municipal Dept.
No. 195. d/ 29th March/93.

Retransferred to the Local & Municipal Dept. with the suggestion that the project be referred to the Sanitary Engineer for consideration.

2. The Assistant Sanitary Engineer suggests two alternative schemes; vide para 12 of his letter, and it seems desirable that the matter should be gone into by Mr. Jones.

O. C. Boddy
Major R.E.

To
The Local & Municipal Dept: Under Secy: to Govt: P.W.D.
with C No. 3063 returned.

x'd. Ned.

2265/11

S-x 15
~~[illegible]~~/153
6554

SANITARY ENGINEER TO THE GOVERNMENT OF MADRAS
1582
30 JUN. 33

Local & Municipal Dept
CURRENT No. 824/12

1825 h 7-0-72

189 3.

Public Works Department.

No. 1683 C.
Dated 11th April 1893
Despatched 12th
Received

L. No 554 M
& 757 M with

CHIEF SECRETARY 13 APL 93

SANITARY ENGINEER 1582

En. 4.

PC ~~[illegible]~~ B × 14
6994/93

SUBJECT.

Transferring with remarks letter from the Sanitary Engineer to Government submitting his report on the Guindy Government House water supply.

SANITARY ENGINEER 940 20 APR 93

No 246

Forwarded to the Sanitary Engineer.

(By order)
Assistant Secretary

P.R.
19/4/93

Fort St George
20 April 1893

To
The Sanitary Engineer.

1814

12

S. E. / 6. 18-1-93—1,000.

No. 969

2265/12

GOVERNMENT OF MADRAS.

OFFICE OF SANITARY ENGINEER,
Fort St. George, 8th May 189

Local & Municipal Dep
CURRENT No. 967/12

2265/12

From

J. A. JONES, Esq., MEM. INST. C.E., F.R.S.E.,
SANITARY ENGINEER TO GOVERNMENT,

To

The Chief Secretary to Government,
Local and Municipal Departmen

SIR,

With reference to your No 246 of 20
April 1893 transferring endorsement of the Pu
Works Department, No 1683 C of 11th April 1893,
have the honor to report as follows:—

2 As stated in the Assistant Sanita
Engineer's note the whole supply to Government
House, Guindy is drawn from the Adyar R
at a point a very short distance from wher
the dhobies wash a large quantity of clothe
this point being about 100 yards below tw
burial and burning grounds one on either s
of the river.

3 The water is at present used for
culinary purposes; of that there can be litt
doubt as it is laid on to the Kitchen an

a
Agai

as the house is most conveniently supplied or through pipes there is very little doubt that the water used for potable purposes will be Adyar water so long as it is there available and so long as any other water has to be carried from a distance.

4. The first point to be considered is should water drawn from such a source have been laid on for use in the house at all? My opinion is that it should not have been. It is a great mistake to select impure water for domestic purposes and then purify it. The source selected for a supply specially to such a place as Government House, Guindy, which several members of the Royal Family have visited to say nothing of many other important personages, and which is the residence of the Governor of Madras should certainly be a supply above suspicion. The question now is, Can this Adyar water be so purified that it can, with proper care, be used safely for domestic purposes? That can be proved only by experiment and by analysis before and after filtration, and any proposals I make in regard to Adyar water must be understood

No. 16
Dated
Despa
Recei

19/4/93
Fort St George }
10th April 1893 }

13

2265/13

understood to be subject to the experimental filtration being successful. The impurities of the Adyar water must vary to a large extent according to the time of year during which the water is dra[illegible]uindy House is used only in the [illegible]ather the water at such periods will be more contaminated than at other periods when the river is practically motionless and solids &c can settle down and the water be drawn off in a clear state.

5. I am unable to concur with the Assistant Sanitary Engineer's recommendation to place the filters between the river and the pumps, because at such point all the water filtered and unfiltered for the house and garden respectively must be pumped through the same pipe, though perhaps at different hours. I am averse to this plan because there is no security in it and it would be difficult to ascertain exactly when the filtered and when the unfiltered water was coming in and health of persons living in Government House would be at the mercy of some one individual who to begin with would be in an unsatisfactory position and a mistake might easily occur.

Again if all the water is to be filtered there properly it can only be so by expensive works and by double pumping

6 I [illegible] that if Adyar water is to be [illegible] supply ought to be delivered on [illegible] beds adjacent to Government House and the kitchens whence the water would pass into a small underground service reservoir. From this the water should be raised to the tank at the top of the house by hand or small engine power.

7 As far as can be gathered from equiries made, when His Excellency is in residence the tank on the house which is 21′×8′×4′ is filled twice daily; the kitchen tanks, of which there are three, are also filled twice daily. The former tank supplies the baths and no doubt the drinking water as well, but to arrange to filter only the quantity required for potable and cooking purposes would mean a duplicate supply in the house and a duplicate set of pipes. It is however a very dangerous thing to have filtered and unfiltered water equally available. There is no security in such a plan.

8. Arrangements must therefore be made to filter the whole domestic supply which is daily

$$2\times21'\times8'\times4' = 1344 \text{ Tank on Government House}$$

$$2\times3\times4'\times4'\times4' = \underline{384} \text{ Tanks on kitchens}$$

$$1728 \text{ C. ft} = 10,800 \text{ gallons.}$$

As the Pumping at the Adyar goes on only during 12 hours all the water required must be filtered within that time, and this would require for proper filtration a filter of 40 square yards area = 360 square feet or 20′×18′ and there must be another filter in reserve.

9. The service tank into which the filtered water would flow would require to hold (below ordinary filtered water level) 1728 C. ft or say 20′×18′×5′.

10 None of these are very expensive works in themselves, but they will require some care in maintenance to secure cleanliness and proper working.

11 The water would require to be raised to the tanks by pumps.

12 One half the water would be required in the morning, the other half in the evening – that is 672 C. ft would have

to be raised about 55 feet in say three hours, and 192 C.ft raised 20 feet in the same three hours. This is equivalent to 864 C.ft or 5400 gallons raised 46 feet in that time or 1800 gallons per hour and would require about half a horse power. A Kerosine oil Engine (which requires no attention when once started) would be a suitable motor; a force pump would also be required. It is however possible to arrange for a small hydraulic pumping engine the power being obtained from the water pumped from the Adyar to the gardens and by this plan a reduction might be made in the amount of the estimate.

13. The arrangements for delivering water to the gardens need not be disturbed. Some improvements as noted by the Assistant Sanitary Engineer should be made at the Engine House. It is however in a much cleaner state than when first visited, oil however still gets into the well. New double screens are required at the entrance of the channel leading to the engine well.

There

2265/15

15

14. There is a well near the bungalow now occupied by the Farrier from which the drinking water was, I understand, obtained during His Excellency's last visit to Guindy. If this water is found pure on analysis and if it were by experiment found that sufficient water for all domestic purposes can be obtained either from the existing well or by deepening it I am of opinion it would be better to use this throughout the house rather than Adyar water. If the water has to be filtered after raising from the well there would be double pumping and the arrangement would be more expensive than the one already proposed. If sufficient water can be got it is, however, the one to be preferred. If the water is pure enough for drinking neither filtration nor double pumping would be required.

15. But I would deprecate the joint use of this well for drinking with the Adyar water for bathing purposes unless the Adyar water is filtered as proposed. The latter is apparently always used for cooking purposes and that is a sufficient reason for

filtering before use.

16. I have not gone very carefully into the cost of these proposals because I think that it will be best to have it first decided which proposal is acceptable, and whether funds are likely to be available to carry it out. If that is likely both sources ought to be then analysed and filtered under similar conditions to what we intend to employ and analysed again. A small expenditure of Rs 250* will be required for this purpose.

* For pumping well & for filtration experiments.

17. I think Rs 6900 will meet the cost (if the Adyar supply is continued) of the motor, filters, reservoirs &c and it may possibly cost less. The cost of cleaning the filters annually would be about Rs 50 and the cost of working the motor would not be more than Rs 8 daily as the present driver at the Adyar could look after it. These must be taken as very rough estimates.

18. If the well will supply or can be made to supply all the water required for domestic purposes without filtration the

2265/16

the cost would be.

	Rs
1 Motor and Pump	2,000
Covering for — do	250
1000 feet of 4" pipe and laying	900
	Rs 3,150

In all probability the well would have to be deepened considerably.

19. I propose before doing anything further to await the remarks of His Excellency's Military Secretary with Government orders thereon. The proposed transfer of the works to the Sanitary Engineer is not expedient at present as the Public Works Department would still be called on to do the actual maintenance and repairs.

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

pr Sanitary Engineer to Govt.

S.R. 4 13-12-92—300.

E.13

P. W. CURRENT No. ~~4667~~

6594/13

~~Local & Municipal Dept~~

~~CURRENT No.~~ 967/93

1893.

From

The Sanitary Engineer
to Government,

To

The Chief Secretary
to Government
Local and Mun^l Dept

Reco: 18.5.93

No. 969 Enclo 8 (1 Plan)

Dated 8th May 1893.
Despd. 8th May 1893.
Recd. 9 MAY 93

C. Nos 584, 7?? & 824 ?? ?????

Encs. 8

SANITARY ENGINEER TO THE GOVERNMENT OF MADRAS.
No. 1582
Subject.
30 JUN. 93

~~Guindy~~ Government House Water Supply

Subbmitting his remarks on the report of the Assistant Sanitary Engineer to Government regarding the improvement of the ——.

| with endorsements

No. 2071 W d/12. 2. 93
" 1040 C d/7. 3. 93
" 1503 C d/5. 4. 93
" 1603. 4 C d/10. 4. 93
" 1683 C d/11. 4. 93

L.M.

No. 294 dated 15 May.

Transferred to the Public Works Department.

13/5/93 Assistant Secretary.

11/5/93

Fort St George
17th May 1893.

To,

The Public Works Department.

0/19/5
C 10/5
R 15/5
A 11/5.
10/5

No. 245-D

2265/18

Government of Madras.

PUBLIC WORKS DEPARTMENT.

2265/18

MEMORANDUM.

Dated ~~Madras~~, Ootacamund 26 - May 1893.

Letter from the Military Secretary to H.E. the Governor No. 743 d/13 March 1893.

Endorsement thereon in the P.W.D. No. 1046 C d/7th March 1893

Endorsement thereon in the Local & Municipal department No. 146 d/10 Mar. 93.

Letter from the assistant Sanitary Engineer to Govt No. 647 d/24th March 1893.

Endorsement thereon in the Local & Municipal Dept No. 195 d/29 March 93.

Endorsement thereon in the P.W.D. No. 1683.C. d/11th April 93.

Endorsement thereon in the Local & Municipal Department No. 246 d/20 apl 93.

Letter from the Sanitary Engineer to Government No. 969 d/8th May 1893.

Endorsement thereon in the Local & Municipal Department No. 294 d/17 May 93.

The proposals of the Sanitary Engineer are referred to the Military Secretary to His Excellency the Governor for favour of remarks.

J. Hamner
Acting Joint Secretary to Govt.
P.W.D.
Genl. Bdg. & Rds Branch

To
The Military Secretary to
H.E. the Governor
with papers to be returned.

2265/19

1893.

Public Works Department.

No. 245 D

Dated 26th May 1893.

Despatched 26 - May/93.

Received

Ow 5.12/6554/53

SUBJECT.

Water Supply to Govt. House, Guindy - Referring for remarks the proposals of the Sanitary Engineer to Govt. for improving the ___

SANITARY ENGINEER
1582
30 JUN. 93
TO THE GOVERNMENT OF MADRAS.

1/1276 W of 93

7D

No 89.

Government House
Guindy 1st November 1892

From

The Surgeon to H. E. the Governor

To

The Military Secretary to H. E. the Governor

2265/20

Sir.

I have the honor to bring to your notice the fact that the source of the pipe water supply of Government House Guindy is subject to daily pollution

The site of the supply as you may be aware is from the Adyar river between the Sydapett bridge and the railway bridge - except when there is a fresh in the river the water is nearly still over this area the breadth of the river here is probably on an average 15 yards.

All along the site above described the dhobies of Madras and Sydapett may be daily seen washing dirty clothing

The sandy bed of the river is also used by them as temporary camping places and to some extent by them and some of the inhabitants of Saidapett as a lieu d'aisance

The pipe water is I believe supposed to be used for bathing alone but even so the state of things above described to say the least is disgusting - with however the large number of taps available at Government House Guindy the danger of such water being applied to other domestic uses is more than probable and this even with the strictest and most constant supervision that could be exercised over such an area with such a large body of native servants. The water is also I believe freely drunk by the native syces and also I have no doubt by the other domestic servants.

I recommend therefore that all washing be prohibited above the Sydapett bridge and that a police man be stationed to enforce this and further prevent persons using the river bed as a latrine.

I have &c

Sd/ W. B. Browning
Surgeon Major
Surgeon to H.E. the Governor

A true copy

W B Browning
Surgeon Major
Surgeon to H.E. the Governor

2265/20

SANITARY ENGINEER
1582
JUN. 93
TO THE GOVERNMENT OF MADRAS

Pr 5.1/6554/53

2/127 b [illegible] 93

2265/21

No. 96. Guindy 5th December 1892

From.

The Surgeon to H. E. the Governor

To.

The Military Secretary
to H. E. the Governor.

Sir.

× × × × ×

The Collector suggests filtering this occurred to me also but it is manifestly wrong in principle to obtain an impure supply and then filter it. if a pure one requiring no filtering is available. The cost of filters also would be considerable.

I propose however later on, in addressing you on this subject as I think myself some kind of gallery could be built to intercept the ground water and obtain water filtered through the bed and bank of the river.

× × ×

I have &c.
Sd/ W. B. Browning
Surgeon Major
Surgeon to H. E. the Governor

A true Extract

W. B. Browning
Surgeon Major
Surgeon to H. E. the Governor

No. 110. Gundy 14th March 1893.

From.

The Surgeon to His Excellency
the Governor

To.

The Military Secretary
to H. E. the Governor

Sir,

I have the honor to inform you that one reason for the bath water supply being dirty is that the washings of the engine and engine house drop directly into the water chamber. This can be remedied at once by placing a coping along the edge of the chamber and making such openings as are necessary in the walls of the engine room to allow the washings to escape in some other direction. In addition a small portion of the flooring about 3 feet square will require levelling up.

This work should be done at once as the cost must be nominal

I have &c.

sd/ W. B. Browning
Surgeon Major
Surgeon to H.E. the Governor

A true copy

Sd

W B Browning
Surgeon Major.
Surgeon to H.E. the Governor

Guindy
29.10.92

To

Military Secretary

I have ordered × × to close all the Kitchen taps by wrapping them up with cloth and sealing them. Well water only to be used for cooking. it is not a nice idea that the food should be cooked in the water in which the dirty linen of Madras is washed!

× × ×

If the cooks say 40 gallons is not enough we can have a larger one but as long as the taps are available they will use them for all purposes. Indeed I doubt the advisability of having taps anywhere within the Kitchen enclosure. this can be settled later on however.

Sd/ W. B. B.

A true Extract

W B Browning
Surgeon Major.
Surgeon to H.E. the Governor

2265
/23

27

Government House
Ootacamund 29 May 1893.

No. 117

From

The Surgeon to His Excellency
The Governor

2265
/24

To

The Military Secretary to
H. E. The Governor

Sir

In returning the papers refer-
ring to the Guindy water supply I have
honor to make the following remarks

1 It appears to me that Mr
Jones is unacquainted with several impo
-tant points notably that the drinking and
cooking supply has already been arranged an
gone into by the Consulting Architect to
Government.

2 It does not appear to be at all
adviseable as Mr Jones remarks in para V of he
letter to place a filter between the river and th
engine house. It would be unnecessarily
Expensive as the whole of the water would
pass through it which is not required as ther
is no object in filtering the water used for the
gardens

3 I think that Mr Jones and hi
Assistants estimates as to the quantity of
water daily used are far too high. Mr Nowrope
bases his estimates on the theoretical basis of
the work of the engines, and calculates the
daily domestic requirements at 15,000 to 20,000
gallons. if he includes in this figure the
water used by the stables and out-door dome
tics he may be approximately correct, but I
doubt it

4 Mr Jones bases his total estima
of 10800 gallons on the cubic capacity of the
Existing tanks and on "enquiries made" the
result of the latter are not I think correct
I make this remark however open to

correction. I do not think that the house tank is filled twice daily in fact I think the engines do not work every day* and I find it hard to believe that there is a daily house consumption of 8373 gallons. 800 gallons daily per head of average population!

* four times a week is the average I understand –

5 On the average including visitors there are not more than 15 baths per diem estimating each bath at 30 gallons - a very high estimate - 450 gallons would be daily consumed under this heading and if for wastage - hot water &ca &ca this figure be trebled there would still only be 1350 gallons as total daily consumption - the actuals would I think be much lower than this. This figure 1350 if even approximately correct shows Mr Jones' 8373 gallons and Mr Nowrojees 15000 to 20000 to be excessively high. I have excluded the Kitchen supply from Mr Jones' total figure - regarding these Kitchen tanks Mr Jones is apparently not aware that water from this source has not been used since October last vide extracts from my D/O of 29th October 1892 to you, attached for ready reference

6 The arrangements now being made by the Consulting Architect to Government for the drinking and cooking supply leaves only the water in the main building and which is chiefly used for bathing to be dealt with - the water as supplied to the baths is as you are aware from personal Experience not alone very dirty but emits a disgusting odour at times and this is the main reason that led to the present correspondence

7 The aim mentioned in paras 13 and 14 of the Assistant Sanitary Engineer's letter is very desirable the reason is embodied in the concluding part of para 14.

I infer from Mr Jones' letter that nothing has been done to prevent the surface washings of the engine house getting into the supply as now pumped up this subject I have already brought to your notice in my letter No 110 B of 14th March 1893 (copy attached for reference upon which I think you issued orders.

8 Regarding most of the points mentioned by Mr Jones in paras 3 and 4 of his letter I have already as you are aware drawn attention to the subject vide copy of my 89 of 1st Nov. 92 - D/O. 29/10/92 supra and extracts of my letter 96 5/12/92 attached

9 Mr Jones raises the question as to whether the Adyar should be used as a source of supply at all. You will observe in my letter 96 attached that I have already mentioned the general principle to which he draws attention namely the advisability of obtaining a pure supply in the first instance, but I dont see that any other source can be obtained. nor do I see that Mr Jones has found one. I am satisfied from enquiry and personal observation that we cannot look to the wells as a source under this heading

10 Mr Jones does not refer to the fact that there is already at Guindy a small force pump capable of driving water to the reservoir on the roof of the house - it could be utilised in whatever scheme may be ultimately adopted.

11 The subject mentioned by Mr Jones in para 14 of his letter is now being dealt with - the water from the drinking water well was analysed and found to be good

12 When I suggested that the water works at Guindy be placed under the Sanitary Engineer I had in view that he would have all such works under his management - the reason for the suggestion being that Mr Jones from the nature of his appointment would be

probably more conversant with Sanitary engineering requirements than the P. W. D. I now recognise that as he has no executive staff that the suggestion is not at present feasable and that the ~~water~~ works must be entirely under the P. W. D. At the same time it would be a pity to lose his advice on such matters but this can be avoided without in any way clashing with the P. W. D. if the Sanitary Board i.e. Mr Jones and the Sanitary Commissioner be asked to give us the benefit of their advice on the matter.

I have the honor to be
Sir
Your most Obedient Servant

W. B. Browning
Surgeon Major
Surgeon to H. E. the Governor

Jx S.7/6584/93

SANITARY ENGINEER
1582
6 JUN. 93
TO THE GOVERNMENT OF MADRAS

6/1276 M. of 93

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Government House
Ootacamund 30th May 1893.

No. 118.

2265/26

From.

The Surgeon to His Excellency
the Governor

To:

The Military Secretary
to His Excellency the Governor

Sir,

In continuation of my letter No. 117 dated 29th May 1893. I have the hon to suggest that a filter on the plan depicted below - not unlike Mr Nowrojee's - you will observe - be placed near the office in the Guindy grounds from chamber D the wate could be pumped to the reservoir on top of the house by an engine such as Mr Jones describes.

You mentioned yesterday that you would also like the stable water to be filtere this is not alone an excellent plan as regards th horses, but I find that all the syces and their families use the stable hydrants largel for all purposes. This supply can be taken off also from the filter - all that is necessar is a reservoir capable of holding 2 days suppl at least. The present reservoir in the garden would I think answer very well. The gard reservoir at present supplies both the stables and I think the "lotus tank" and th fish pond - the latter communications can be cut off and the garden supply taken direct from the main near the office

The size of the filter will of course have to be proportionate to the quantity of water required for the house and stables.

The house reservoir contain

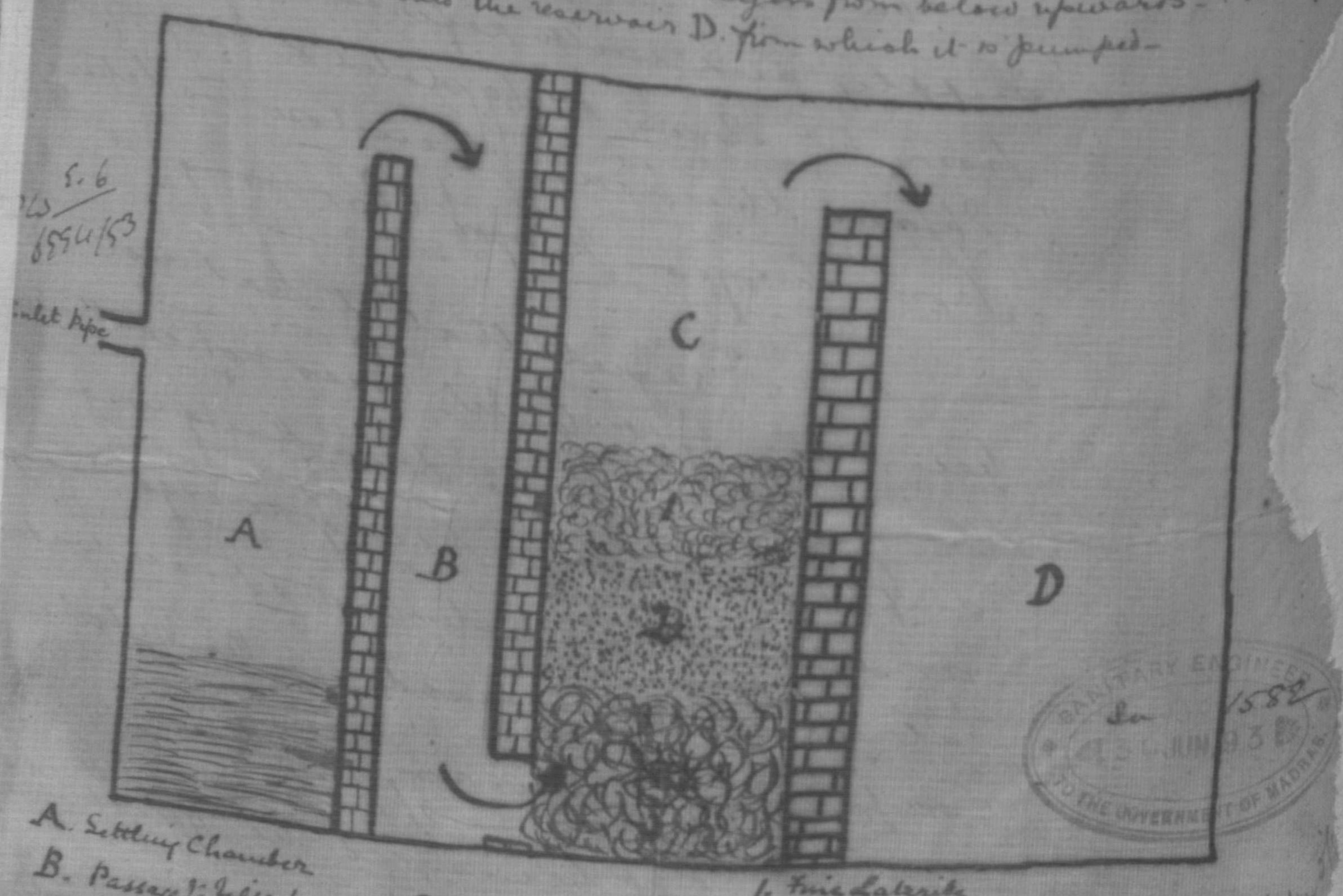
oughly 4200 gallons this is nearly a three
ays supply according to the estimate
ade in my letter of yesterday, date 10
allons should be allowed per head of
lable population and 16 gallons per ave-
age head of horses. These latter figures you
ill be able to supply.

I have the honor to be
Sir
Your most Obt. Servant

W. B. Browning
Surgeon Major
Surgeon to H. E. the Governor

The water coming through the inlet pipe settles in A to a certain extent. Flows through B. into C. where it is filtered by the successive layers from below upwards. Finally the purified water flows into the reservoir D. from which it is pumped.

PW 5.6 / 8854/53



A. Settling Chamber
B. Passage to filter proper
C. Filter.
D. Clear water reservoir

1. Fine Laterite
2. Charcoal
3 Coarse Laterite

Sanitary Engineer to the Government of Madras
No 1582
4 JUN 93

7/1276

№ 58

2265/27

Government House
Ootacamund
2nd June 1893

From
Captain the Hon'ble R. T. Lawley
Military Secretary to
The Rt. Hon'ble the Governor
Ootacamund

To
The Secretary to Government
Public Works Department
Stone House Hill

Sir

In returning correspondence in connection with the Guindy water supply and with reference to letter from Mr. Jones No. 969 dated 8th May 1893 I have the honor to enclose two letters from Surgeon Major Browning

1. I regret that it had not been brought to Mr. Jones' notice that the question of the drinking water supply was also being re-organized and that in future no river water at all will be used in the kitchen or for any culinary purposes.

2. That being so, the question remains what is the average daily

consumption of water that it will be necessary to filter? and on this point I fully agree with Dr. Browning that both Mr. Jones' and Mr. Nowroji's estimates appear too high.

3. Filtered water is required for

(a) domestic purposes in the main building.

(b) Stables.

(c) The Servants.

4. As regards (a) the chief consumption of water in the house is of course chiefly on baths; the allowance estimated for by Dr. Browning in para 5 of his letter No. 117 is certainly liberal, though he has somewhat under-estimated the number of baths. The number daily used by the house party alone should be put at 20; and when there are guests staying in the house 30 more may be required, though this of course is only on exceptional occasions. I agree therefore with Dr. Browning that 450 allons per diem is a fair averag

30 baths @ 30 g
= 900 g

2265
28

allowance for baths, but it should be possible on the occasion of a large party ~~and~~ stopping in the house for this supply to be doubled.

5. As regards (b) the stables, I agree with Dr. Browning that 16 gallons per diem should be allowed for each horse; this gives a daily consumption of 800 gallons to which should be added (c) the water drawn from the stable hydrants by the servants. I should say if we estimated this at another 1200 gallons a day we should be within the mark.

800 galls

1200

6. Taking therefore 1350 as estimated by Dr. Browning as the daily house consumption, 800 for the stables and 1200 for servants, we get altogether a daily consumption of 3350 or say 3500 gallons that ought to be filtered.

7. As to what is the best plan of filter to use I am not competent to give an opinion, but it appears to me that the arrangement proposed in para 1. of Dr. Browning's No. 118 to the best viz that the filter be placed near the office where all the pipes bifurcate from the main.

If however, as Dr. Browning suggests all the garden water passes through the "reservoir in the garden" that supplies the stables it will be necessary - vide Mr. Jones para 13 - to disturb the arrangement for delivering the water to the gardens as the water pumped into this "garden Reservoir" will be for stable and servants' use and the unfiltered garden water must be taken by separate pipes either to the Lotus Tank or some other suitable receptacle.

8. I imagine the daily requirements of filtered water being so much less than Mr. Jones was led to believe, that the cost of the filtering apparatus will be reduced in proportion.

I have the honor to be,
Sir,
Your most Obedt. Servt.

R. T. Lawley Capt.
Military Secretary

SANITARY ENGINEER
Inw 1582
30 JUN. 93
TO THE GOVERNMENT OF MADRAS.

8/127 [illegible]

2265/~~30~~ 29

P. W. CURRENT No. ~~4557~~ E5

1893. 6594/93

From

Captain The Honble R. Hardy
Military Secretary to the
Rt. Hon. the Governor,
Ootacamund.

To

The Secretary to Government
Public Works Dept.
Stone House Hill

Dated: 2nd }
Despd: 3rd } June
Recd: }

No. 58

Enclo: 1 file

No. 245 ~~Dd~~/26-5-93
1683 C d/11-4-93
1633 C / 1634 d/10-4-93
1533 C d/5-4-93
1046 C d/7-3-93
391 ~~d/13-2-93~~

PW 5·5 / 6554/53

Subject
Regarding water supply to Government House Grounds

Recd 5-6
Entd 16

For orders

BW

No. C/6.

30

2265/30 Public Works Department

Note by the Ag. Chief Engineer
Public Works Department

Read —
Letter from the Military Secretary to His Excellency the Governor No. 58 dated 2nd June 1893.

It is not quite clear who should now deal with this question — the Consulting Architect or the Sanitary Engineer, but as the latter has now some personal experience of the local circumstances of the case, the project required should perhaps be drawn up by him.

Filtered water is required to the under noted extent.

		Gallons
2500	Baths	900
800	Horses	800
1200	Servants	1200 ✓
500	Wastages – Hot water &c.	600
5000	Total	3500 gallons

water for the garden to be taken off from the main, before it enters the filter.

40—800-23-3-93.

It is suggested that the papers be sent to the Local and Municipal Department again, with a request that the Sanitary Engineer be directed to draw up a scheme based on the supply of filtered water (3500 gallons) now reported to be necessary, with provision for the distribution of unfiltered water for garden purposes.

Ag Chief Engineer P.W.D.
Genl. Bds & Roads Branch

Ootacamund
10th June 1893.

Pr 5.4
6554/93

Du 1582

9/1276 M of 93

2265/31

31

Local & Municipal Dept

PUBLIC WORKS DEPARTMENT.
CURRENT No. 1276 M

PROCEEDINGS OF THE MADRAS GOVERNMENT.

READ the following

Letter from the Military Secretary to His Excellency the Governor No. 43 dated 3rd March 1893.

Endorsement thereon in the P.W. Dept. No. 1046 C dated 7th March 1893.

Endorsement thereon in the Local and Municipal Dept. No. 146 dated 10th March 1893.

Letter from the Assistant Sanitary Engineer No. 647 dated 24th March 1893.

Endorsement thereon in the Local and Municipal Dept. No. 195 dated 29th March 1893.

Endorsement thereon in the P.W. Dept. No. 1683 C dated 11th April 1893.

Endorsement thereon in the Local and Municipal Dept. No. 246 dated 20th April 93

Letter from the Sanitary Engineer to Govt. No. 969 dated 8th May 1893

40—800-23-3-93.

Endorsement thereon in the Local and Municipal Dept. No. 294 dated 17th May 1893.

Memorandum from the P. W. Dept. No. 245 D dated 26th May 1893

Letter from the Military Secretary to His Excellency the Governor No. 58 dated 2nd June 1893

Note by the Ag. Chief Engineer P. W. dept. dated 10th June 1893

CHIEF SECRET 14 JUN 93 GOVERNMENT

No. 391 D dy 14th June 1893.

Transferred to the Local and Municipal Department for issue of the requisite orders to the Sanitary Engineer.

PW 53
6594/53

Hannan
Ag. Jt. Secretary to Govt. P.W.D.
General Bds & Roads Branch

To
The Local & Municipal Dept.
with papers in original

2265
32

[9]

LOCAL AND MUNICIPAL DEPARTMENT.

Local & Municipal Dep
CURRENT No. 1276 M

From

The Public Works Department.

C.S.

No 408

Transferred to the Sanitary Engineer with the request that he will draw up the required scheme.

(By order)

N. S. [illegible]
Assistant Secretary.

[illegible]
Fort St. George
29th June 93

SANITARY ENGINEER
1582
15 JUN. 93
TO THE GOVERNMENT OF MADRAS

25/6/93

No. 391

Dated 14 6 93.

Received 16 6 93.

Enclosures 7 to [illegible] 504, 707 824 & 967 [illegible]

Enclosure to letter No. 1564 of 1893

Re E 2 6994

SUBJECT.

Guindy Water-supply.

Transferring papers relating to the water-supply to the Government House, Guindy, for issue of the requisite orders to the Sanitary Engineer.

(with enclosures)

To

The Sanitary Engineer

11/7

1916 Ar 576.

33

S. E./6. 18-1-93—1,000.

No. 1564

2265/33

GOVERNMENT OF MADRAS.

OFFICE OF SANITARY ENGINEER,

Fort St. George, 31st July 1893.

Local & Municipal Dep
CURRENT No. 1641 M

From

J. A. JONES, Esq., MEM. INST. C.E., F.R.S.E.,

SANITARY ENGINEER TO GOVERNMENT,

1 Pro

To

The Chief Secretary to Government

Local and Municipal Department.

SIR,

With reference to Memo No 408 dated the 29th June 1893 transferring to me note by the Acting Chief Engineer, Public Works Department dated 10th June 1893 regarding the improvement of Guindy Water Supply and requesting me to draw up a scheme I have now the honor to report as follows and to forward plans and estimates.

2. In the Chief Engineer's Note it is stated that 900 gallons only are required for baths but Major Lawley's No 58 dated 2d June 1893, Para 6 states the requirement to be 1350 gallons.

This included wastage & hot water — For baths Major Lawley only estimated 450 gallons

Our figures were

baths	900
wastage	600
Total	1500

3. I had doubts however as to this quantity being ample and after a further enquiry at Guindy and a consultation with Dr Browning and Major Lawley the amounts required were finally

O.K.

finally determined as follows (vide letter No 111 of 14th July 1893 from the Military Secretary to His Excellency)

Baths	2,500
Horses	800
Servants	1,200
Wastage Hot water &c	500
	5,000 gallons

and on this basis the scheme has been framed.

4 The scheme is as follows:—

(1) The provision of filters of sufficient area to filter the above supply of 5000 gallons daily.

(2) The provision of a service reservoir to contain the supply and allow filtration to proceed regularly.

(3) The provision of a pump for the raising of the supply to the various places and heights required.

(4) The provision of the necessary pipes for the distribution of the supply.

---

5. *Filters* — These with the service reservoir adjoining have been placed nearly opposite the Military Secretary's Office. There are two

filters

34

2265/34

filters, one will ordinarily be out of use for cleaning. Each filter has an area of 16 square yards and at 400 gallons per yard will filter 6400 gallons daily when clean. The filters have been made of somewhat ample size for the work to be done so that on special occasions it will be possible to filter an increased quantity. A reduction in size would not effect much economy in cost.

6 In order to have continuous filtration the supply to the filters will be drawn directly from the garden tank — the pipe to the filters will pass out at the bottom of that tank — The filters are sand filters of the usual pattern with regulating valves to ensure filtration proceeding regularly.

7 *Service Reservoir* — The filtered water will pass into the service reservoir which will have a capacity of 900 feet. It is in two portions each of which is 7½ × 10 × 6 = 450 feet or 2812 gallons equal to slightly more than half a day's supply. The service reservoir is necessary to compensate for the difference between the average rate of filtration and the demand.

8. *Hydraulic Pump* — This pump will

draw water from the service reservoir and lift it

(1) To the top of Government House a maximum height of 55 feet.

(2) To tanks on the top of the Coach house.

(3) To a tank over the Hot Water Boiler.

The pump will be worked by pressure from the pumping main, the pressure anticipated being a head of about 42 feet of water. The water from the main will after working the pump pass round the filters back again to the main and thence into the Garden Tank. I have not yet been able to get a proper quotation for a pump of less than Rs 1200 but I believe that the Rs 1200 in the estimate or probably less will cover the cost if not, a petroleum engine which needs no attention will be substituted. From the pump the water will pass (1) partially by the existing 6" main to the upper tank on Government House (2) partially by an existing main to the tank above the Hot Water Boiler (3) by a new 2½" main to the tanks on the top of the Coach House. The pumping will be done during three hours in the morning and three in the evening.

Distribution

2265/35

9 Distribution — Before describing the proposed distribution it is necessary to detail to some extent present arrangements. The tank on the top of the house not only feeds the pipes throughout the house but by another outlet pipe distributes water to the garden in front of the house. It was this which misled me in my original calculation based on the number of times the tank was filled as I was unaware the garden was also supplied — this connection will be cut off. The two cisterns in the stable yard are fed by pipes from the garden cistern this system will be continued but to one cistern only. The cisterns or tanks over the kitchen are connected with the pumping main — this connection will be cut off and the tanks taken and placed over the Coach house. The Hot water boiler is connected directly to the pumping main — this connection will also be cut off —

10. The distribution will be as follows:

(1) To the Government House from the upper tank

(2) From the Coach House Tank to (1) one of the stable yard cisterns (2) the existing fountain (3) a new self closing

fountain near the Apothecary's quarters.

(3) From a tank over the Hot Water Boiler Room to the Hot Water Boiler

To effect these proposals alteration in existing pipes are necessary as follows.

(1) The existing valves at S on plan will be removed and the pipe line here relaid.

(2) A new valve will be placed at V, all the water passing through Hydraulic Pump when it is at work – this will be for three hours morning and evening.

(3) A new stoneware pipe in addition to some old pipes will be laid from the large garden Reservoir to the small tanks in the garden opposite Government House.

(4) The pipe from the well, where the chain and bucket pump is, to the small tank at the back of Government House will be removed and laid from the Garden Reservoir to the filters.

11. Sections attached to plans shew the various levels of existing pipes &c and also sections and cross sections at the Adyar River – The Section across the River shews a maximum depth

depth of 9 feet. It was suggested that a bund should be placed across the river below the Pumping Station but the cost of any bund or dam which would be of any use would be so great that I have omitted it from my estimates. I have however entered a small sum for permanently fixing masonry pillars to support a new screen and from contingencies I hope to effect some improvements by clearing and sectioning the inlet at the River.

12. Estimate – The estimate amounts to Rs 7,000 the length of pipe to be lifted and relaid & new pipes to be laid amount to much more than anticipated so that notwithstanding the reduced quantity of water the estimate is about the same amount as previously advised. The working charges will be comparatively small the pump will cost nothing to work. The only extra cost will be for cleaning the filters and service reservoir and this can be done and the sand washed at intervals by the gardeners under proper supervision.

13. If the scheme is to be sanctioned His Excellency's Military Secretary desires it to be carried out before November next

when His Excellency will be in Madras. If the scheme is approved early instructions are requested for its execution.

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

Sanitary Engineer to Govt.

16/3/10

2265/37

P. W. CURRENT No. 6994

1893.

From

The Sanitary Engineer
to Government,

To

The Chief Secretary
to Government
Local & Municipal Dept.

Regrs: 11-8-93

No. 1564

Dated 31st } Smalo 22 (1 plan & 1 ... 2 plans)
Despd. 31st } July 1893.
Recd. 1 AUG. 93

Encs. p 2 [illegible]

Subject.

Gundy Water Supply

Forwarding his report plans and estimates for the improvement of ——

(with an endorsement)

No. 534 Letter

Transferred to the Public Works Department.

7/8/93

Assistant Secretary

10th August 1893

Note for the [illegible]

It is presumed that the Cons. Architect will carry out the work.

No. 3910 d/ 14-6-93
245 d/ 26-5-93.
1683 C d/ 11-4-93.
1633-34 C d/ 10-4-93.
1533 C d/ 5-4-93

To
The Public Works Department.
(with plans)

2265/38

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Public Works Department.

Current No. 6994

Letter No. 534

Dated 10th August 1893

From the Local & Municipal Dept.

TECHNICAL NOTE.

Name of work Improving the Guindy water supply at Govt. House.

Amount of estimate Rs 7,000

With reference to this office memo No. 3910 dated 14th June 1893 the Sanitary Engineer to Govt. submits plans & estimates amounting to Rs 7,000 for improving the Guindy water supply at Govt. house.

The amount of the estimate is made up as follows:

New screen at river near Engine house	Rs 16
Filter beds	1,66
Service reservoir	5
Supply & delivery pipes including laying & jointing	2,74
Hydraulic pump including erection	1,300
Shed for pump	100
Petty supervision	300
Contingencies	313
Total Estimate	Rs 7,000

The estimate has been framed in consultation with Dr. Bradding & Major Lawley, Military Secretary to H.E. the Governor & the scheme has been based for a daily supply of 5000 gallons of filtered water, calculated as below

Bath 2500 galls. Horses 800, servants 1200 & washing hot water &c. 500 total 5000 gallons daily consumption.

The estimate submitted provides for the following:–

(a) The provision of filter beds to supply 5000 gallons daily.

(b) The provision of a service reservoir to contain the required supply

(c) The erection of a pump for raising the supply to various places & heights.

(d) The provision of the necessary distribution pipes.

(e) The provision of new screen at head in the Adyar river near Engine house.

The filter beds & service reservoir will be constructed in one block near the Military Secretary's Office. The filters will be two in number, one will generally be out of use for cleaning purposes, each filter will be 12 feet square & 7.10" high with its foundation sunk 7.10" below ground surface & capable of containing the required daily supply. These filters will draw its supply directly from the Garden tank by a 5" main. The filters will be built on a bed of Surki concrete 18" in depth & the walls of brick in surki mortar plastered with cement ½" thick. The filter materials will be of sand & gravel to a depth of 4 feet as shown on sheet No. 1 & will be fitted with regulating valves to ensure filtration regularly. Dr. Bunning in his letter No. 118 dated 30th May 93

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suggests that the filtering materials should be fine laterite, then charcoal & below coarse laterite, this has not been estimated for by the Sanitary Engineer.

The Service reservoir will be attached to the filter beds & the filtered water will pass in the reservoir which will have a capacity of 900 C.ft. The reservoir will be divided into two by a cross wall 1.10½" thick making the dimensions of each reservoir 10' × 7.6" & when full it will have a depth of 6 feet of water, the cubical capacity of each reservoir will then be 450 C.ft. or 2808 gallons equal to a little over half a day's supply.

From the service reservoir the filtered water will be drawn by a hydraulic pump & lifted to the following tanks.

(1) Tank on Govt. house laid to a maximum height of 55 feet, partially by the existing 5" main, so as to distribute throughout Govt. house.

(2) Tank laid above hot water boiler partially by the existing main.

(3) To tanks laid on top of Coach house by a new 2½" main, so as to distribute to the stable yard cisterns, the existing fountain & a new self closing fountain proposed to be laid near the apothecary's quarters.

The Sanitary Engineer states that the suggestion of [illegible] the river below the pumping station with each inundation, but he has therefore omitted it from his estimate. Provision has been made for [illegible] masonry pillars to support a new [illegible] & from the item of Contingencies to clean & restore the inlet at the river.

The rates are fair except for plastering with cement which is high viz Rs 9-0-0 against Rs 6-0-0. The saving will be trifling if schedule rate be adopted.

The working charges is stated to be comparatively small, as the pump will [illegible] to work, the only cost being the cleaning of the filters & reservoirs which the Sanitary Engineer believes can be done by the gardeners under proper supervision.

The estimate & plans have been transferred by the Local & Municipal Dept. probably with the object of having the work carried out by the Consulting Architect.

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This may I think be sanctioned —

The only question is the source of supply, viz, the Garden Tank.

S. Browning in para 9 of his letter No. 117 of 29-5-93 says that he has satisfied himself that this tank would not do as a source of supply — Mr. Jones has apparently satisfied himself the other way —

The work is urgent if it is to be completed before or by November & so may be sanctioned — I suppose the draft should be initialed by the Mil. Secy. but [illegible] away.

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No. 2265 W/4 September 1893.

PROCEEDINGS OF THE MADRAS GOVERNMENT

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B & R
Civil works

READ the following

Endorsement in the Local & municipal Dept on letter from the Sanitary Engineer to Govt No. 1564 dated 31 July 1893 } H.E. No. 534 of 10 August 1893

G.P.

The estimate amounting to Rs 7,000 for improving the water supply to the Government House at Guindy, is sanctioned for execution by the Consulting Architect and the amount is appropriated from the Provincial reserve with the Govt.

2. This sanction has been registered as Provincial No. 85 W of 1893-94 and classified as Civil Buildings Original Works.

DESPATCHED
11 SEP. 93

To.

The C.A. to Govt with 4 [illegible]
" Exr. P.W. Accts
" Mily. Secy to H.E. the Governor
" Local & Munl. Dept

(40—2,000—18-6-93.)

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14.9.93

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391 D. d/ 14-6-93
245 D d/ 26-5-93
1633 C d/ 11-4-93
1633-24 C d/ 10-4-93
1033 C d/5-4-93
1046 C d/7-3-93
391 W d/ 13-2-93

Estimate for impro
water supply to the
Govt. House, Gane

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23/8 Hrs 29-8

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163
153
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C No 6994

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Govt. of 1180.4 Madras.
PUBLIC WORKS.

~~Printed copy~~

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No 16 Septr 1883 No 2265 W

Govt. Hosl, Guindy

Estimate of Rs 7000 for improving the water supply to ______ sanctioned for execution by the Cons: Architect

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